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Via electronic submission: <https://ftcpublic.commentworks.com/ftc/jewelryguidesreview>

June 3, 2016

Re: Jewelry Guides, 16 CFR Part 23, Project NO G71101

The following constitutes the comments of the undersigned trade associations and entities (“JVC Coalition”). These comments are submitted in response to the Federal Register Notice issued by the Federal Trade Commission (“Commission” or “FTC”) on December 28, 2015 regarding its proposed revisions to the *Guides for the Jewelry, Precious Metals, and Pewter Industries* (“Guides” or “Jewelry Guides”).

The JVC Coalition represents the entire jewelry industry – manufacturers, wholesalers, distributors, precious metal suppliers and refiners, gemstone dealers, and retailers. We are grateful for the opportunity to comment on the Commission’s proposed revisions to the Jewelry Guides, and appreciate the attention that will be afforded our response.

I. INTRODUCTION AND SUMMARY OF PRINCIPLE RECOMMENDATIONS

The FTC Guides are of enormous importance to the Jewelry Industry. To the great benefit of consumers, the Guides function as accepted standards within the trade, helping to create a level playing field and to sustain consumer confidence. In the absence of other specific laws that govern the manufacture and sale of our products, they are studied in detail and closely adhered to by the large majority of the industry. The JVC Coalition has thus carefully considered the Commission’s Proposed Guides and offers our comments and recommendations below. Our principle recommendations are summarized here:

1. Surface applications of precious metals

- a. Thickness of coating for use of terms “Gold Plated(d)” (in the context of electrolytic applications) and “Gold Electroplate(d):” The existing safe harbor of 7 millionths of an inch (.175 microns) is adequate to meet consumer expectations.

Increasing the safe harbor to 15 millionths of an inch (.381 microns), as proposed by the Commission, is not necessary as explained below.

- b. Minimum thickness standard for mechanical surface applications of gold:
 - i. A minimum thickness standard, as proposed by the Commission, is not necessary to meet consumer expectations as explained below.
 - ii. The standard for a gold coating on an article described as “gold filled” should continue to be set at 1/20th the weight of the metal in the entire article, but without a thickness requirement.
 - iii. The gold coating on an article described as “gold plate(d),” “rolled gold plate” or “gold overlay” should not fall below 1/20th the weight of the metal in the entire article, but no minimum thickness standard should be required. While the current Guides require sellers to disclose the weight ratio if it falls below 1/20th, it does not impose a minimum weight ratio (or minimum thickness).
- c. Electrolytic surface applications of gold: A twenty-two karat minimum is not necessary to meet consumer expectations; however, the examples to proposed Section 23.3(c)(3) should make clear that the disclosure of karat quality is required, e.g., “22 Kt. Gold Plate,” “18 Kt. Gold Electroplate,” or “14 Kt. Gold Washed.”
- d. “Reasonable durability” should be required of any product represented to have a surface application of precious metal.

2. Below Minimum Threshold Silver Alloys

- a. Sellers may use the term “silver” to describe these products, but only if the following disclosures are made:
 - i. The quality fineness of the silver in the alloy must be identified.
 - ii. The product containing the silver alloy must be described as “Low Silver,” e.g., “750 PPT Low Silver.”
 - iii. The product must be stamped indicating the parts per thousand of silver and the designation “Low Silver” or “LS.”

- iv. Buyers must be advised that “this article materially differs with respect to tarnish and corrosion resistance from a product made with at least 925 PPT Silver.”

3. Below Minimum Threshold Gold Alloys

- a. Sellers may use the term “gold” to describe these products, but only if the product has at least eight karats of gold, and the following disclosures are made:
 - i. The quality fineness of the gold in the alloy must be identified, with a minimum required threshold of 8 karats.
 - ii. The product containing the gold alloy must be described as “Low Gold,” e.g., “8 Kt. Low Gold.”
 - iii. The product must be stamped indicating the karat quality and the designation “Low Gold” or “LG.”
 - iv. Buyers must be advised that “this article materially differs with respect to tarnish and corrosion resistance from a product made with at least 10K gold.”

4. Composite Stones

- a. “Composite” and “manufactured composite” should be designated as the appropriate terms to describe these products. The term “lead-glass-filled” should not be allowed.
- b. The Commission’s proposed note to Section 23.25 states that “[i]t would be unfair or deceptive to describe products filled with a *substantial* quantity of lead glass in the following way...” [emphasis added]. Any amount of lead glass (or other binder or filler) in a stone should be disclosed. Thus, the term “substantial” should be removed from the proposed note.
- c. The Commission should amend the proposed note to clarify that its guidance applies to any composite stone, not just those containing lead glass.

5. Synthetic Diamonds and Use of the Term “Cultured”

The term “cultured” should not be allowed to describe these diamonds, even when qualified with the terms “synthetic,” “laboratory-grown,” “laboratory-created” or “[manufacturer-name]-created.”

6. **Disclosure of Treatments to Pearls**

The Commission should add a note to its proposed section addressing pearl treatments to state that sellers must disclose if a pearl has been dyed.

7. **Handmade**

The Commission should create a safe harbor in Proposed Section 23.2 making clear that jewelry that is hand cast may be described as “handmade” or “hand-wrought.”

II. “GOLD PLATE(D)” AND “GOLD ELECTROPLATE(D):” MINIMUM THICKNESS OF SEVEN MILLIONTHS OF AN INCH (.175 MICRONS) WILL MEET CONSUMER EXPECTATIONS

In the Proposed Guides, the safe harbor for use of the terms “plate(d)” (in the context of electrolytic applications) and “electroplate(d)” has more than doubled, from 7 millionths of an inch (.175 microns) to 15 millionths of an inch (.381 microns). This increase is not necessary to protect consumers.

In 2012, we advised the Commission that a minimum thickness of 7 millionths of an inch (.175 microns) was adequate to ensure the reasonable durability of electrolytic applications of gold, consistent with consumer expectations.¹ This recommendation was based on testing that simulated normal wear, and on long experience in the industry with electrolytic applications of varying thicknesses.² Seven millionths of an inch has been the Commission’s standard for use of the term “electroplate(d)” since at least 1996, when the Jewelry Guides were last reviewed. There is no record at JVC, or institutional memory, of ever receiving complaints relating to this standard. We therefore again recommend seven millionths of an inch (.175 microns) as the minimum standard for products described as “gold plate(d)” and “gold electroplate(d).”

An element of confusion was inadvertently inserted into this discussion in a test report prepared by Leach Garner. This report was included with JVC’s 2013 Response in support of its recommendations regarding mechanical applications of gold.³ The test was conducted to

¹See 2012 JVC SUBMISSION at p. 9-16, and Exhibits 1 and 13 to the 2012 Response.

²See TABER INDUSTRIES, WEAR TEST REPORT (2013); TANURY INDUSTRIES VIBRATION WEAR TEST REPORT (2013); see also Statement from Michael A. Akkaoui (June 4, 2013), in 2013 JVC SUBMISSION app. at Exhibits 8, 7 and 6, respectively.

³LEACH GARNER TEST REPORT (2013) in 2013 JVC SUBMISSION app. at Exhibit 5.

compare mechanical and electrolytic applications of gold exposed to severe wear. According to the test report, the collected data supported a minimum thickness of 15 millionths of an inch (.381 microns) for electrolytic applications of gold. This observation, which contradicts the comprehensive testing, careful analysis and industry expertise supporting our recommended minimum of 7 millionths of an inch (.175 microns), was not explained in the report.

The attached statement of Grigory Raykhtsaum, one of the metallurgists who authored the Leach Garner report, provides explanation and context for his test findings.⁴ In short, the “tumble” test conducted by Leach Garner subjected samples to “severe” wear, resulting in a gold loss of about 14 millionths of an inch (.356 microns) on those samples with electrolytic applications. The test corresponded to a degree of prolonged handling and wear that was likely to exceed the life of an actual jewelry product. While these severe test results may have provided helpful comparative information for his company, Mr. Raykhtsaum explains that they are not useful or relevant for setting industry-wide standards based on normal wear. As an industry veteran, he observes that seven millionths of an inch (.175 microns) has long been the standard in the trade for “electroplate,” and that he is unaware of consumer complaints related to this minimum.

The standard for use of the terms “plate(d)” and “electroplate(d)” should be based on “normal” wear tests, the type conducted in support of our 2012 and 2013 Responses, recommending a minimum thickness of 7 millionths of an inch (.175 microns). It was not the intention of the Leach Garner report, nor is it necessary, to upend industry practice by more than doubling the thickness requirement for electroplated products. For that reason, we again recommend a minimum thickness of 7 millionths of an inch (.175 microns) for products described as “plate(d)” or “electroplate(d).”⁵

⁴Statement from Grigory Raykhtsaum (May 20, 2016), Exhibit 1.

⁵See *infra* Part IV (The JVC Coalition there is recommending that a 22 karat minimum not be required for electrolytic applications of gold. This does not impact our recommendation here concerning thickness. While the higher karat quality does impact tarnish resistance, that problem is not solved by increasing the thickness of the application.); see also Statement from Michael Akkaoui, *supra* note 2.

III. MINIMUM THICKNESS STANDARDS NOT REQUIRED FOR USE OF TERMS DENOTING A MECHANICAL APPLICATION OF GOLD

The Commission proposes to add a minimum thickness requirement of 170 millionths of an inch (4.3 microns) for use of the terms “gold plate(d)” (when used in the context of mechanical applications), “gold filled,” “rolled gold plate” and “gold overlay.” This is a change from the existing Guides, which do not have a thickness requirement for use of these terms, other than “plate(d).”⁶ The minimum thickness requirement in the Proposed Guides would be in addition to a minimum weight ratio required for use of the term “gold filled:” the gold alloy in articles described by this term must be at least 1/20th the weight of the metal in the entire article. After much consideration, and review of test results and JVC complaint records, the JVC Coalition has concluded that a thickness minimum is not required for products with mechanical applications of gold alloy, as it provides no added benefit to consumers. We do recommend, however, that the weight ratio not be allowed to fall below 1/40th for use of the terms “gold plate(d),” “rolled gold plate” and “gold overlay.” We recommend no change to the current guidance regarding “gold filled.”

In 2013, the JVC Coalition recommended that, in certain circumstances, sellers of coated products be required to disclose that “reasonable durability is not assured,” depending on the type of precious metal used in the coating, and method of surface application. In the case of mechanically applied coatings of gold alloy, we recommended that the disclosure be made if the thickness of the application fell below 170 millionths of an inch (4.3 microns).⁷ That recommendation was based on a test performed by metallurgist Grigory Raykhtsaum of Leach Garner in 2013.⁸ The results of that test indicated that when exposed to severe wear – described in the test report as “prolonged actual wear” – samples with mechanical applications of gold alloy lost approximately 170 millionths of an inch (4.3 microns).⁹ According to Mr. Raykhtsaum, a thickness of 170 millionths of an inch (4.3 microns) is “common” in articles with a weight ratio of 1/40th – the ratio that is accepted in the industry as the minimum standard for

⁶The minimum thickness required for “plate(d)” in the current Guides, at Section 23.4(c)(2), is 20 millionths of an inch (.5 microns).

⁷2012 JVC SUBMISSION at 9-16, *see also* 2012 JVC SUBMISSION app. at Exhibits 1 and 13.

⁸*See* Statement from Grigory Raykhtsaum, 2013 JVC SUBMISSION app. at Exhibit 4; LEACH GARNER TEST REPORT, *supra* note 3.

⁹The level of wear simulated by the test is described by the metallurgist who performed the tests, Grigory Raykhtsaum, in his 2013 statement, *supra*, as well as his statement of May 20, 2016, attached here as Exhibit 1.

mechanical applications of gold alloy. He thus recommended that consumers be advised that “durability is not assured” if the thickness of the application fell below this level.¹⁰

In a change from our recommendation in 2013, we have now concluded that the test results do not support a thickness requirement for articles with mechanical applications of gold alloy. First, the test performed by Mr. Raykhtsaum subjected samples to severe, not normal, wear. In fact, the test corresponded to a degree of prolonged handling and wear that was likely to exceed the life of an actual jewelry product.¹¹ Research conducted since the test indicates that consumers do not expect such a high level of performance from coated products.¹² This understanding of consumer expectations is corroborated by a review of JVC’s case files between April 2013 and April 2016. During that period, JVC did not receive any complaints related to the thickness of a surface application of precious metal.

Second, while it may be accurate that a thickness of 170 millionths of an inch (4.3 microns) is “common” in articles that conform to a 1/40th weight ratio, that is not to say it is always the case. Design and size may have an impact on thickness, resulting in thicker – or thinner – coatings on all or part of a product, even though the weight ratio is 1/40th. It is difficult to predict each variable that might cause a minimum thickness to deviate from a weight ratio. The imposition of a minimum thickness may thus lead to unintended consequences that interfere with the manufacture of products with mechanically applied coatings of gold.

For these reasons, we believe that a specific minimum thickness should not be included in the Guides for articles with mechanically applied coatings of gold alloy. We do recommend, however, that the weight ratio of gold alloy to metal in the entire article not be allowed to fall below 1/40th for use of the terms “gold plate(d)” (when used in the context of mechanical applications), “gold overlay” and “rolled gold plate.” Many in the industry believe this minimum already to be in place, because of the examples provided in the current Guides at Section 23.4 (c) (3), e.g., “1/40th 12Kt. Rolled Gold Plate” and “1/40th 12 Kt. R.G.P.” They act

¹⁰See 2016 Statement from Grigory Raykhtsaum, *supra* note 4.

¹¹*Id.*

¹²2016 HARRIS STUDY, Exhibit 2, p. 3-4, and Questions 775 (surface applications of gold), 800 (surface applications of silver), 805 (surface applications of platinum), 810 (surface applications of palladium) and 815 (surface applications of rhodium).

accordingly. Nonetheless, an explicit statement to the effect that 1/40th is the minimum would remove confusion on this issue. More importantly, it would work to the benefit of consumers, who do expect a minimum thickness of precious metal on products described as having a coating of that precious metal.¹³ While not expressed in terms of “thickness,” a 1/40th weight ratio minimum does ensure a lower limit of gold on products with mechanical surface applications and will thus meet consumer expectations.

IV. ELECTROLYTIC SURFACE APPLICATIONS OF GOLD: 22 KARAT MINIMUM NOT REQUIRED TO MEET CONSUMER EXPECTATIONS, BUT EXAMPLES IN GUIDES SHOULD MAKE CLEAR THAT KARAT QUALITY MUST BE DISCLOSED

A. Twenty-Two Karat Minimum Not Required to Meet Consumer Expectations

In the JVC Coalition’s 2013 Submission, we recommended a 22 karat minimum for electrolytically applied surface coatings of gold,¹⁴ an increase from the existing ten karat minimum.¹⁵ Our recommendation was based on industry experience, indicating that a higher karat quality better ensured consistency, and better prevented tarnish, than did a low-karat application of gold.¹⁶ The Commission’s proposed Guides now include a 22 karat minimum for products described as “plate(d)” (when used in the context of electrolytic applications), “electroplate(d),” “gold flashed” and “gold washed” – terms that are used to denote an electrolytic application of gold.

Research conducted since 2013, however, indicates that this high karat minimum is not necessary to meet consumer expectations. Moreover, it may have an unintended impact on the marketing of products with rose – or other – colored applications, as it is difficult to manufacture those articles at such a high karat level. These products have been in the marketplace for several years, and have not generated complaints. We therefore now recommend, for any product

¹³*Id.*

¹⁴See 2013 JVC SUBMISSION, p. 11-12.

¹⁵See 16 C.F.R. §23.4(c)(4) (the minimum is expressed in this section as “...an electroplating of gold, or of a gold alloy of not less than 10 karat fineness, which has a minimum thickness throughout equivalent to .175 microns (approximately 71,000,000ths of an inch) of fine gold . . .”).

¹⁶See Statement from Michael A. Akkaoui Regarding Electrolytic Applications of Precious Metals on Jewelry Products, 2013 JVC SUBMISSION, app. at Exhibit 6; see also Richline, *Reasons to Avoid Low K Gold Plating*, submitted by Richline to the FTC (Sept. 28, 2012) (submission number 560895-00022).

represented as having an electrolytic application of gold, a minimum karat quality of at least 10 karats, and a clear indication in the Guides, by way of examples, that the karat quality must be disclosed. Additionally, as addressed in the section below, the reasonable durability of these products must be assured.

Our recent research indicates that expectations regarding coated products are low. Consumers, by large majorities, expect that these products – regardless of the type of precious metal in the coating – will tarnish sooner than products that are precious metal throughout, and will be less durable.¹⁷ This research is corroborated by JVC’s recent review of its own complaint files. During the three-year period from April 2013 to April 2016, almost 600 complaints were made to JVC by consumers regarding retailers, or by one industry member regarding another. With the exception of complaints regarding rhodium coatings on products described as “white gold,” none of these cases involved dissatisfaction with an application of a precious metal over another metal.¹⁸ During this period, products in the marketplace included those with low-karat quality coatings of gold.

The likely reason for these research results, and the lack of complaints, is that consumers pay far less for products with applications of precious metals than for products that are precious metal throughout. Their expectations are aligned with price, and with a basic understanding, noted above, that these products do not perform as well as products that are precious metal throughout. Additionally, manufacturers often mitigate tarnishing characteristics, usually by the application of a flash coat of high karat quality gold, or of a polymer clear coat. While these applications may not be long lasting, they do provide some basic protection, adequate to meet consumer expectations regarding these products.

A further reason to forego the 22 karat minimum concerns consumer preferences and the chemistry of electroplating. Surface applications of gold are produced in many colors. At least

¹⁷See 2016 HARRIS STUDY, *supra* note 12.

¹⁸JVC received approximately forty complaints regarding applications of rhodium over white gold during this period. Purchasers had not been informed that the white color of the “white gold” product was a result of the rhodium coating; as the coating wore off, the gold substrate – which was not as white as the rhodium – became visible and purchasers were disappointed. This issue will be remedied if the FTC adopts its proposed section 23.7 which requires disclosure of surface-layer applications of rhodium.

one of these colors, “rose,” is difficult to achieve if the chemistry of the plating “bath” is over 18 karats.¹⁹ Products that have an application of rose gold are widely available in the marketplace, and are purchased with frequency by consumers. If a 22 karat minimum is required for use of the defined terms that denote electrolytic applications of gold, industry members would not be able to use those terms when marketing products with applications of rose gold – even though there is no indication that consumers are unhappy with this product.

In reviewing this issue with industry professionals and metallurgical experts we have thus concluded that a minimum karat fineness of 22 karats is not advised.

B. Examples in the Guides Should Make Clear that Disclosure of Karat Quality is Required for Products Represented to Have a Surface Applications of Gold

Allowing consumers to have a full range of product choice, including products with lower karat applications of gold, makes sense as long as consumers have the information they need to make an informed decision between products. That information includes the karat quality of the gold. The examples provided in the Proposed Guides, at section 23.3(c)(3), for use of terms that indicate an electrolytic surface application of gold should be revised to include this information, e.g., “22 Kt. Gold Plate,” “18 Kt. Gold Electroplate,” or “14 Kt. Gold Washed.”

While Section 23.3(b)(2) of the proposed Guides may already make this clear,²⁰ the absence of karat fineness designations in the examples has caused confusion. This is particularly the case since karat fineness designations are included in the examples for mechanical applications of gold at current Section 23.3(c)(3).

Since karat quality is one of the factors that impacts tarnish resistance, plating consistency, and, of course, value, consumers should have this information, and it should be clear to marketers that they are required to provide it.²¹ A majority of consumers understand that karats are a measure of

¹⁹This is because achieving the rose color requires copper in the alloy at a level that reduces the quality fineness to about 18 karats. See Statement from Richard DePoto (2016), Exhibit 3.

²⁰See 16 C.F.R. §23.4(b)(2) (stating that it is unfair or deceptive to use the term “gold” unless it is preceded by a correct designation of the karat fineness of the alloy).

²¹See Statement from Michael Akkaoui, *supra* note 2.

the weight of gold, and that the proportion of gold in the product has an impact on tarnish resistance.²² The disclosure of the karat quality of a gold application enables a knowledgeable decision, allowing consumers to choose the product that meets their criteria – not only for price, design and color - but for tarnish resistance.

V. A “REASONABLE DURABILITY” REQUIREMENT SHOULD BE APPLIED TO ANY PRODUCT REPRESENTED TO HAVE AN APPLICATION OF PRECIOUS METAL

The manufacture of products with applications of precious metals is complex, with many factors affecting the durability, tarnish resistance and consistency of the applications. These factors include the type and quality fineness of the precious metal in the application, the substrate used under the application, the thickness of the application, the method used to affix the application to the substrate, and whether or not a clear coat has been applied to the surface.²³ As technology changes, these factors may change as well. It is difficult, and perhaps counter-productive, to anticipate every permutation of coated product, and every term that might be used as a descriptor, and then attempt to devise standards for each. We thus recommend a simpler approach: the requirement that “reasonable durability,” as defined by the Commission in its Proposed Guides, be assured for any product represented as having a surface application of precious metal.²⁴

The Proposed Guides include reasonable durability requirements for some products with surface applications, but not others.²⁵ For example, “gold electroplate,” “gold filled” and “silver plate” must be reasonably durable. Yet, not so “platinum plated,” “rhodium plated,” “gold washed,” or “gold flashed,” to name just a few. Research indicates, however, that large majorities of

²²See 2016 HARRIS STUDY, *supra* note 12, p. 3, Questions 760 and 770.

²³See Transcript of Jewelry Guides Roundtable (June 19, 2013), at 98-99, 104-05 and 112.

²⁴See Proposed FTC Guides for the Jewelry, Precious Metals, and Pewter Industries (to be codified in 16 C.F.R. §23) (stating “reasonable durability” means “that all areas of the plating are of such thickness as to assure coverage that reasonable consumers would expect from the surface application.”).

²⁵“Reasonable durability” is required for use of the terms “gold plate(d),” “gold filled,” “rolled gold plate,” “gold overlay” and “gold electroplate(d).” It would also be required for products represented as having a coating of silver. Products with coatings of precious metals other than gold and silver, such as those in the platinum group, are not covered by the “reasonable durability” requirement. Neither are products with coatings of precious metal, of any type, that are described with the terms “flashed,” “washed,” “[precious metal]-over” or “[precious metal]-layered.”

consumers expect that if a product is described as having a surface application of precious metal, there should be a minimum thickness required for that application, indicating that they do have some expectations regarding durability.²⁶ Our recommendation, to require reasonable durability – across precious metal types, methods of application, and descriptive terms – would address this gap between the proposed standards and consumer expectations. Importantly, it would apply to applications of any precious metal, providing a baseline standard for coated products, whether the application was comprised of gold, silver, platinum, or a platinum group metal.

This recommendation is made with the expectation that the Guides will continue to set detailed standards in Proposed Sections 23.3 and 23.4, beyond “reasonable durability,” for many of the traditional terms that indicate applications of gold.

VI. SILVER AND GOLD ALLOYS WITH PRECIOUS METALS IN AMOUNTS BELOW MINIMUM THRESHOLDS

The JVC Coalition recommends that marketers be allowed to inform buyers that a product contains silver, even if the quality fineness is under the current threshold of 925 parts per thousand. In order to prevent confusion and deception regarding these products, however, marketers must describe them as “low silver” and include that descriptor in the stamp, along with the quality fineness, e.g., “850 PPT Low Silver” or “500 PPT LS.” Marketers should also disclose that the item “materially differs with respect to tarnish and corrosion resistance from a product made with at least 925 PPT silver.” Our recommendation with respect to gold is the same, with one exception: there should be a floor below which marketers should not be allowed to use the term “gold.” For the reasons stated below, the appropriate floor is a quality fineness of eight karats. Similar to our recommendation regarding silver, the fact that the quality fineness is below threshold should be disclosed in the stamp, by indicating the karat quality and using the descriptor “low,” e.g., “8 Kt. Low Gold” or “9K LG.” Additionally, the disclosure regarding tarnish and corrosion resistance must be provided.

²⁶See 2016 HARRIS STUDY, *supra* note 12.

A. The Commission's Proposed Guide Will Lead to Consumer Confusion and Cannot Be Tested or Enforced

The Commission proposes to allow marketers to label an item as “gold” or “silver,” even if the alloy in the item is below 10 karats gold or 925 parts per thousand silver, if two conditions are met. First, the quality fineness must be identified, and second, the marketer must have: “competent and reliable scientific evidence that such product does not differ materially from a product composed throughout of an alloy of gold of at least 10 karat fineness with respect to...corrosion resistance, tarnish resistance and any other attribute or property material to consumers.”

The existing thresholds for gold and silver, 10 karats and 925 parts per thousand respectively, have been long maintained in the United States; in the case of silver, this standard has been used for centuries. The Commission's proposal would disrupt these traditions, allowing marketers discretion – based on untestable criteria – to identify products as, for example, “5K Gold,” or “700 Sterling.” This will effect a radical, unwarranted and unwelcome change in the manufacturing of jewelry in our industry. Moreover, it will result in consumer confusion about jewelry made of precious metal. The JVC Coalition urgently recommends that the Commission reconsider this proposed revision to the Guides.

Consumers are well aware that there are minimum required amounts of precious metal in the jewelry items they purchase. For example, in our recent study, 71% of respondents stated that gold jewelry has 50% or more gold in the alloy.²⁷ Consumers also believe that the amount of gold in an alloy will have an impact on the color, likelihood of tarnishing, corrosion and overall durability of a product.²⁸ The same is true of silver.²⁹ However, consumers are not entirely clear about the real meaning of the karat designation.³⁰ To now allow items to simply be marked, for example, “8K,” without further disclosure or designations will be confusing and will reverse generations of consumer education and industry practice regarding the quality of gold or silver jewelry.

²⁷See *id.* at Question 765.

²⁸See *id.* at Question 760.

²⁹See *id.* at Question 790.

³⁰See *id.* at p. 3 and Questions 770-774.

The FTC’s suggested revision appears to be premised on the assumption that “[r]ecent technological advances...have made it possible for some below-threshold alloys to meet consumer expectations regarding the properties formerly associated only with higher content jewelry.”³¹ The assumption that below threshold alloys can be produced that will meet consumer expectations regarding corrosion and tarnish resistance is not supported by scientific evidence. According to the attached statement of Stewart Grice, the metallurgist who invented a below minimum threshold alloy that Tiffany & Co. markets as “Rubedo,” all alloys with less than 10 karat gold or 925 parts per thousand silver will tarnish and corrode at a quicker rate than higher gold and silver content alloys.³² His own invention, Rubedo, will not perform the same as 10 karat gold in that the tarnish and corrosion resistance is substantially compromised. No newly developed technology has changed this fact.

Moreover, according to Mr. Grice, it would not be possible to develop “competent and reliable scientific evidence” regarding below minimum threshold alloys for a number of reasons. Not all 10 karat gold alloys perform similarly. No universal standard for alloy content or for testing procedures exists for use to compare 10K to below threshold alloys.

To substantiate Mr. Grice’s statement, JVC purchased a number of items of jewelry (and one 10 karat sample from a refiner) identified as being made of 10 karat gold. We sent these samples to Underwriters Laboratories for testing on the rate of tarnish resistance of these items, all of which were identified as 10 karat gold.³³ JVC also purchased one sample made using a below minimum threshold alloy marketed as “YellOra”. This item is identified and stamped as “480 PM”. The report indicates that the rate of tarnishing (how many hours it takes for the sample to change appearance from very slight change to severe change) for each of the 10 karat samples differs from each of the other 10 karat samples.³⁴ The rate of tarnishing for the YellOra sample was entirely different from the rates of all the 10 karat samples and resulted in severe changes to

³¹FTC’s *Statement of Basis and Purpose*, 2015, p. 65 (citing to an assertion made at the 2013 roundtable by Mr. Hershkovitz about his alloy, marketed as “YellOra”). *See also* UNDERWRITERS LABORATORIES TEST REPORT, Exhibit 4, p. 11-12 (indicating that the assertion by Mr. Hershkovitz regarding his under minimum threshold alloy marketed as YellOra cannot be supported by scientific evidence. The rate at which this alloy tarnishes is not comparable to 10 karat gold.)

³²Statement from Stewart Grice (2016), Exhibit 5.

³³*See* UNDERWRITERS LABORATORIES TEST REPORT, Exhibit 4.

³⁴*See id.* at p. 3-10.

the appearance of the alloy at a much quicker rate than any 10 karat sample – after only one hour of exposure.³⁵

There are no standardized and repeatable tests which could be used to establish that a below threshold alloy does not materially differ from an alloy that is at threshold or above. As explained by Mr. Grice, this is not only because alloys differ, but also because the varying conditions under which 10 karat gold or 925 parts per thousand silver is worn will impact the rate of tarnish and corrosion resistance. This will also be true for alloys with less than the minimum amounts. And, because there is such variety in alloys (as indicated by the Underwriters Laboratories report), and the conditions under which jewelry is worn vary greatly, no standardized test could ever be developed that would provide comparable results when performed in artificially created circumstances. Further, there is no consensus within the industry on one manner to test gold and silver alloys for tarnish resistance or corrosion, because each alloy can be designed for different wear features, and the testing cannot be tailored to every alloy, and every circumstance under which jewelry is worn. The manner in which an alloy is tested can be altered to ensure that the product “passes” for tarnish or corrosion resistance.

A further concern relates to allowing the marketers themselves to offer the “competent and reliable scientific evidence” on their own products, since it will always be possible for marketers to manipulate the test results. Since different alloys perform differently under different circumstances of use, marketers themselves cannot be relied upon to demonstrate that their alloys would meet general consumer expectations under all circumstances. In fact, this proposed system of evidence proffered by the marketers themselves and not by a neutral third party tester will be impossible to implement. The effect of eliminating minimum thresholds for gold and silver based on marketers’ own testing data will result in a wide variety and quality of scientific evidence. Policing the many alloys and the accompanying variety of scientific evidence that might come on the market will be near impossible. Creating a regulatory platform that marketers know is impossible to police is not in the best interest of preventing consumer deception.

In 1996, when the FTC issued the last amended Jewelry Guides, it addressed maintaining the 10 karat minimum standard for the use of the word “gold” and the 925 parts per thousand minimum

³⁵See *id.* at p. 11-12. Thus, the statement of Mr. Hershkovitz at the FTC Roundtable in 2013 regarding the performance of his below threshold alloy (marketed as YellOra) is not supported by scientific data.

standard for use of the word “silver.” With regards to “gold,” the FTC decided to retain the 10 karat standard, referencing discussions that began on this topic in 1977 to the fact that the 10 karat standard had been in effect since at least 1933, and to the 1,200 comments opposing any change.³⁶ With regard to both gold and silver, the FTC connected the existing minimums to testing of alloys, and proof that articles of less than 10 karat gold, or less than 925 parts per thousand silver, tend to tarnish and corrode. The clear finding at that time was that the minimum thresholds for both silver and gold should be maintained. In fact, today, nothing has changed – the technology has not been developed nor is it likely to be developed to alter the conclusions drawn by the FTC in 1996.³⁷

The JVC Coalition thus recommends that the FTC provide specific guidance for marketers of alloys containing gold or silver at below minimum required thresholds that ensures that the consumer is aware that the product they purchase, while containing precious metal, is substantially different from “traditional” precious metal alloys, and that it performs differently. This will prevent consumer confusion and confusion among manufacturers, and will avoid creating a system that cannot be reliably monitored or policed.

B. Recommended New Guidance for under Minimum Threshold Alloys

Under the current Guides, marketers are not permitted to identify the precious metal in an alloy containing gold or silver if it does not meet the required minimum thresholds. In 2012, the JVC Coalition proposed a method by which marketers would be permitted to do so. Our suggestion was that marketers use percentages, instead of karats or parts per thousand, to disclose precious metal content, and use some other form of labeling other than stamping, which would be reserved for above threshold alloys. By this suggestion, the JVC Coalition did not intend to recommend a process that would essentially end the use of minimum thresholds for gold and silver jewelry, which is the ultimate impact of the FTC’s proposed revision. Instead, the JVC Coalition proposals were designed to permit marketers to identify the gold or silver in below minimum threshold alloys, and to provide a means to distinguish those products from those made with the minimum thresholds and above. However, the JVC Coalition does acknowledge that there might be confusion in the use of percentages to disclose the weight of gold or silver in an

³⁶See 61 Fed. Reg. 105, p. 27185-27186 and note 99.

³⁷See Statement from Stewart Grice, supra note 3232.

alloy when consumers are accustomed to karat or parts per thousand designations. Our recommendations are thus as follows:

Gold

The JVC Coalition proposes that the FTC allow marketers to identify the quality fineness of the gold in a below minimum threshold alloy by using karat or parts per thousand disclosures, as long as the amount of gold is at least eight karats. Additionally, identification of gold in a product should only be allowed if the marketer also discloses that the below threshold alloy materially differs from an alloy of gold that is at least 10 karats with respect to tarnish or corrosion resistance.

We also recommend that below threshold alloys be designated as “low gold.” For example, a jewelry item made of eight karat gold alloy should be stamped “8 Kt. Low Gold” or “8K LG” and the required disclosure should be: “This item materially differs with respect to tarnish and corrosion resistance from a product made with at least 10K gold.” Of course, if a marketer chooses not to identify the gold in the alloy, no such disclosure would be required. Such alloy could still be labeled using a trade name such as “Rubedo” or “YellOra” with no further disclosure necessary.

The reason for relaxing the standard for use of the term “gold,” but setting a floor at eight karats, is twofold. First, the Coalition recognizes that there is a market for lower-priced products made of gold alloy, and does not want to impede its sale if done non-deceptively, as outlined above. However, there is also concern that confusion and deception is inevitable if the threshold is allowed to drop below eight karats. For example, a product might look the same as 18 karat white gold, yet be composed primarily of an alloy of silver with only one karat of gold. Allowing this product to be identified as “1K gold,” even if qualified with the karat quality and the term “low,” and even if accompanied with a disclosure, is an extreme departure from established norms, and contrary to long-held conceptions of “gold” as valuable, and thus desirable. A floor below which it would be impermissible to describe a product as containing gold is essential.

Second, it makes sense to choose eight karats as the floor. The international market has experience with both eight and nine karat gold, with eight being the standard in Denmark and

Greece, and nine in France, the UK, Austria, Portugal and Ireland.³⁸ Thus, there is a foundation for the notion that the quality fineness of a product identified as karat gold might be as low as eight karats. With that foundation, and the additional requirements recommended here – the identification of the product as “low gold,” the disclosure of karat quality and the disclosure regarding tarnish and corrosion – consumers are not likely to be deceived about products that are between eight and 10 karats.

Silver

For the reasons stated above, the JVC Coalition proposes that the FTC allow marketers to identify the quality fineness of the silver in a below minimum threshold alloy by using parts per thousand disclosures. Additionally, the marketer must also disclose that the below threshold alloy materially differs from an alloy of silver that is at least 925 parts per thousand with respect to tarnish or corrosion resistance. Last, the JVC Coalition recommends that these alloys be designated as “low silver” and stamped accordingly, e.g., “750 PPT Low Silver” or “750 PPT LS.”

VII. COMPOSITE STONES

A. The Terms “Composite” and “Manufactured Composite” are Accurate Descriptors for these Products

The FTC has proposed, in its revision to the Guides, a nomenclature system for these products that is based on the differentiation between products made up of one piece of precious or semi-precious stone infused with lead glass, and products which contain small bits of precious or semi-precious stone bound together by lead glass. The examples provided in the proposed guide indicate that the terms “lead-glass-filled ruby” or “lead-glass-filled composite ruby” and “lead-glass-filled composite corundum” or “lead-glass-filled composite corundum” should be used to properly denote these products.³⁹ The JVC Coalition instead recommends that either the term “composite” or “manufactured composite” be used to describe any precious or semi-precious stone that contains lead glass or other filler, whether or not the stone itself is one piece or small bits. Additionally, we recommend that the use of “lead-glass-filled” not be allowed.

³⁸See *About Gold Jewellery*, WORLD GOLD COUNCIL, <http://www.gold.org/jewellery/about-gold-jewellery>.

³⁹FTC Request for public comments on proposed amendments to the Guides for Jewelry, Precious Metals, and Pewter Industries (16 C.F.R. §23) at 37; Note to Section 23.25 of the Proposed Guides.

The FTC's proposed application of the term "composite" is inconsistent with the dictionary definition of the word, the jewelry industry's use of the term, and the FTC's own usage of the term elsewhere in the FTC Guides. "Composite" is routinely used to describe the two elements of the filler and the stone, not to distinguish between one piece of stone vs. many small bits of stone.

The dictionary definition of the word composite is "made up of distinct parts".⁴⁰ This word is commonly used in advertising to describe consumer products which consist of two distinct materials combined into a single product.⁴¹ In the jewelry industry, the term composite is used to indicate a manufactured product which is made up of a gemstone material that is combined with another product (i.e. filler) to create a single stone.⁴² The binder can be a polymer, lead glass, an inexpensive or imitation gemstone material, or some other binding material. This combination of two materials creates a single stone product which is able to be cut and polished like a natural stone. The phrase "composite" is similarly used by laboratories, manufacturers, and retailers alike to describe these products.

The FTC's proposed guidance, however, uses the term "composite" to indicate the difference between those lead glass-filled products made up of one piece of base material and those made up of small bits of base material. That distinction is not the central issue with these products; it is the addition of filler to the gem material that is the element that triggers the disclosure obligation. By restricting the use of the word composite to describe the base material only, the FTC's proposed guidance is inconsistent with the plain meaning of the term and its current usage in the industry. The FTC's proposal is also inconsistent with the current usage of the word composite elsewhere in the Guides to describe cultured pearls, which are made up of a nucleus coated with nacre.⁴³ This merging of two different materials (nucleus and nacre) is designated as

⁴⁰MERRIAM-WEBSTER'S ONLINE DICTIONARY, <http://www.merriam-webster.com/dictionary/composite> (last visited Apr. 26, 2016).

⁴¹See, e.g., *Composite Kitchen Countertop*, HGTV, <http://www.hgtv.com/remodel/kitchen-remodel/composite-kitchen-countertop>.

⁴²See, e.g., Gagan Choudhary, *A New Type of Composite Turquoise*, GEMS & GEMOLOGY, Summer 2010, Vol. 46, No. 2, <http://www.gia.edu/gems-gemology/summer-2010-turquoise-composite-choudhary>; see also Statement from Christopher P. Smith (2016), Exhibit 6.

⁴³FTC Guides, proposed 16 C.F.R. §23.19(b) ("Cultured pearl: The composite product created when a nucleus (usually a sphere of calcareous mollusk shell) planted by humans inside the shell or in the mantle of a mollusk is coated with nacre by the mollusk.").

“composite” which is consistent with the dictionary definition of the term and our proposed usage regarding composite stones.

The FTC proposal similarly prohibits the use of the term "manufactured" to describe lead-glass-filled and other composite stones. Since lead glass-filled stones are always a manufactured product, the FTC's guidance risks restricting marketers who choose use the term “manufactured” to describe this process, and may also choose to use the term “composite”, to non-deceptively and accurately explain their products to consumers.

Additionally, it is currently difficult for marketers to know whether the lead glass-filled products they are selling are made up of one piece of, for example, corundum, or are made up of small bits of corundum.⁴⁴ Common modern laboratory equipment, such as microscopes and spectrometers, can show this distinction, but it is unreliable, as sometimes the original piece of corundum is broken into small pieces in the manufacturing process. Other tests which can determine the original makeup of the product are destructive tests, which leech out the lead glass and then evaluate the remaining corundum for its origin state. This is impractical for marketers at the end of the supply chain, who may not be able to determine the nature of the product they purchased from a distributor, and who do not want to destroy the product they are trying to sell.

Last, the term "lead-glass-filled" is not an accurate descriptor for these products. This is because it incorrectly implies that the items started with intact stones that simply required “filling.” “Composite,” or “manufactured composite” conveys a more accurate picture – that these products are lead glass and ruby/corundum or other stone that have been heavily bound using lead glass, or have been melded together.⁴⁵

The JVC Coalition therefore recommends that the terms “composite” and/or “manufactured composite” be used to describe all gemstones filled with lead glass or other binder, as indicated in our suggested version of the Note to Section 23.25, at Part E, below.

⁴⁴See Statement from Christopher P. Smith, *supra* note 42.

⁴⁵*Id.*

B. “Substantial” Amounts of Lead Glass or Other Binder or Filler

The FTC's guidance recommends that rubies and corundum which are filled with a "substantial" amount of lead glass may not be advertised using certain terms.⁴⁶ However, the FTC did not define the word “substantial” or provide any guidance regarding the minimum amount of lead glass required in order to trigger this disclosure. Although most lead-glass-filled rubies contain substantial amounts of lead glass,⁴⁷ practically, the amount of lead glass in a stone product does not change the risks of destruction for this product.⁴⁸ Any amount of lead glass that comes into contact with a substance such as a household cleaner, a jeweler’s pickling solution, or lemon juice will react poorly and ruin the stone.

The purpose of disclosure in this instance is to alert the consumer that special care is necessary for these products, and to alert consumers that the product is not a natural gemstone. This disclosure, in turn, also protects jewelers repairing these products. Most jewelers use a pickling solution to clean products before repairs, or to remove oxidation and flux from newly soldered jewelry.⁴⁹ This is a common bench jeweler practice. If the presence of lead glass is not known, a jeweler may unsuspectingly drop the repair item into the pickling solution, and become liable for “ruining” a product they had no reason to suspect would be destroyed. Therefore, it is important to both consumers and jewelers that any amount of lead glass always be disclosed; this disclosure protects consumers when purchasing the product and will protect the product during repairs.

Using the word "substantial" as the trigger defeats the purpose of the disclosure when any amount of lead glass can cause destruction of the product. As indicated in our recommended

⁴⁶See FTC Guides Request for public comments, 16 C.F.R. §23, at 37 (The FTC specifically proposes in the revisions that it would be “unfair or deceptive to describe products filled with a substantial quantity of lead glass in the following way: . . . with the unqualified word “ruby” . . . as a ‘treated’ ruby . . . as a ‘laboratory-grown,’ ‘laboratory-created’, ‘[manufacturer name]-created’, or ‘synthetic’ ‘ruby’ . . . as a ‘composite ruby’ . . . as a ‘hybrid ruby’ . . . or as a ‘manufactured ruby’ . . .”).

⁴⁷See 2012 JVC SUBMISSION at 27.

⁴⁸Additionally, there is no such product that contains a “*de minimus*” amount of lead glass; gemstone products with small fractures would be filled with a different substance and marketed as “fracture-filled”.

⁴⁹*What is Pickle Used for in Jewelry Making?*, INTERNATIONAL GEM SOCIETY, <https://www.gemsociety.org/article/pickle/>.

version of the Note to Section 23.25, below, the JVC Coalition recommends eliminating this word in the guidance, and urges that gemstones with any amount of lead glass filling, or other binder, be disclosed as “composite” or “manufactured composite”.

C. Ruby vs. Corundum

The FTC makes a distinction between base material in these products that begins as ruby, and base material which begins as corundum. Ruby is a subset of corundum; it is that corundum which is of gem quality and has a red appearance.⁵⁰ Some lead-glass-filled gemstone products may start as ruby, which combines with lead glass to create one stone. Some composite gemstone products can start as low-grade red corundum, which with the introduction of lead glass, can appear solidly red to the naked eye. The JVC Coalition supports the FTC’s division of this product into “ruby” and “corundum” designations.

D. Growing Use of Composite Methods to Create New Products

Lead glass is already being used in products other than rubies to bring low-grade natural products to market. Currently, we are aware that lead glass is being used with sapphires.⁵¹ Small amounts of cobalt-doped lead glass are filled into highly fractured blue corundum in order to enhance its appearance.⁵² As with lead-glass-filled rubies, these stones are able to be etched and dissolved by acids, heat and ultrasonic cleaning.⁵³ Additionally, composite turquoise – bits of turquoise bound by a polymer – is already on the market. Using the term “sapphire” or “turquoise” without qualification to describe these products would be unfair and deceptive.

It is practical to assume that manufacturers will continue to develop methods of infusing low-grade base gemstone products with lead glass, polymers, and other fillers, some of which may interact poorly with commonly-used substances.⁵⁴ It is important to craft the Guides to apply to

⁵⁰Ruby, GIA GEM ENCYCLOPEDIA, <http://www.gia.edu/ruby>.

⁵¹Guy Lalous, *Cobalt-Doped Composite Sapphires: A Blessing or a Curse?*, GEMS & GEMOLOGY, Fall 2013, Vol. 49, No. 3, <http://www.gia.edu/gems-gemology/FA13-cobalt-doped-sapphire-lalous>.

⁵²See Statement from Christopher P. Smith, supra note 42.

⁵³Megan Austin, *Side Effects of Glass-Filled Sapphires*, JEWELLER MAGAZINE (2013), <http://www.jewellermagazine.com/Article.aspx?id=3326&h=Side-effects-of-Glass-filled-sapphires>.

⁵⁴See, e.g. Macy’s Gemstone Treatment & Care Guide, MACY’S (providing examples of currently manufactured gemstones and their treatments), <http://www1.macys.com/ce/splash/gemstone-guide/index>.

the products currently on the market, as well as those which may come to market in the future before the next Guides revision. Thus, the JVC Coalition recommends that the FTC amend the guidance for lead-glass-filled stones to clarify that it applies to all composite stones that consist of precious or semi-precious stone combined with another filler or binder material to create a new stone product. This is reflected in our recommended version of the Proposed Note to Section 23.25, below, in the first sentence, where we make clear that it would be unfair or deceptive to describe products filled with a quantity of lead glass **or any other filler or binder material** in the following way...” (emphasis added).

E. The JVC Coalition’s Recommended Version of the Note to Section 23.25 Regarding Composite Gemstones

The JVC recommends that the Proposed Note to Section 23.25 regarding products filled with lead glass or other binder material be revised as follows:

Note to § 23.25: It would be unfair or deceptive to describe products filled with any quantity of lead glass or any other filler or binder material in the following way: (1) with the unqualified word “ruby,” “sapphire,” “emerald,” “topaz,” or name of any other precious or semi-precious stone; (2) As a “treated ruby” or other “treated” precious or semi-precious stone; (3) As a “laboratory-grown,” “laboratory-created,” “[manufacturer name]-created,” or “synthetic” “ruby” or other natural stone; or (4) As a “hybrid ruby” or other “hybrid” precious or semi-precious stone without qualification. The following are examples of descriptions for such products that are not considered deceptive: (1) use of the term “composite corundum” or “manufactured composite corundum” to describe a product made with low-grade corundum (not ruby) that is infused with lead glass; (2) use of the term “composite ruby” or “manufactured composite ruby” to describe a product made with ruby that is infused with lead glass.

VIII. “CULTURED” DIAMONDS

Synthetic, lab created diamonds are a legitimate and appropriate item to join the array of other quality items that jewelers have to offer their customers. The marketing of synthetic diamonds in jewelry is a growing part of our industry, and presents new opportunities for marketers to add products at various price points. The JVC Coalition’s interest in the nomenclature used to describe this product pertains entirely to ensuring that consumers understand the product and that marketers employ non-deceptive trade practices to accurately describe it. Towards that end, the

Guides should make clear that the words “cultured,” and “cultivated,” when used to describe lab created diamonds, are a misleading and a deceptive trade practice, and add confusion to an already confused landscape of marketing material. The FTC Guides should be a clarifying set of safe harbors and should not permit terms which instead add to confusion and create misleading descriptions of this product.

A. Inconsistent Use of the word “Cultured” within the FTC Jewelry Guides

In section 23.20 (k), the FTC Guides provide: “[i]t is unfair or deceptive to use the word “synthetic” or similar terms to describe cultured or imitation pearls.” This FTC guidance makes sure that marketers of pearls do not equate or use the word “synthetic” to describe any pearl product that is “cultured.” Yet, in its new proposal, the FTC allows the word “cultured” to be used, with the other required qualifiers, such as “laboratory-grown,” to describe synthetic diamonds. Thus, if this proposal is included in the Guides, “synthetic” would not be allowed as a modifier of “cultured pearls,” but “cultured” would be allowed as a modifier of “synthetic diamonds.” This is contradictory guidance. One term – “cultured” – would have two diametrically opposed meanings and permitted usages within the Guides.

In standard statutory or regulatory drafting cannon, identical or similar terms should be construed in the same way. Words in one place within a statutory or regulatory act or provision should have the same meaning in every other place within that act or provision. Courts have held that “[o]ne ordinarily assumes that identical words used in different parts of the same act are intended to have the same meaning.”⁵⁵

B. Inconsistencies in the Use of the Term “Cultured” Lead to Confusion and Deception

Inconsistency in the use of one term within one body of guidance inevitably results in confusion and potentially deceptive representations. The Guides are meant to provide a clear “safe harbor” for sellers who can be assured that when they follow the guidance provided, they do not engage in deceptive trade practices. Instead, in this instance, when marketers are provided with inconsistent and confusing guidelines on the non-deceptive meaning of “cultured,” either they do

⁵⁵*Utility Air Regulatory Group v. E.P.A.*, 134 S. Ct. 2427 (2014); *see also Law v. Siegel*, 143 S. Ct. 1188 (2014) (“[There is no reason] to depart from the normal rule of statutory construction that words repeated in different parts of the same statute have the same meaning.”)

not know what trade practice to employ or they will take advantage of the confusion for their own purposes.

While some marketers will simply not know how to appropriately use the nomenclature, others may leverage this confusion to make deceptive claims. This is especially true in connection with the traditional use of the word “cultured” in the jewelry industry. The most accepted use of the term applies to the organic process of culturing pearls in a marine farm setting (growing, by means of natural methods). Using the word “cultured” to describe the mechanical crystallization and/or the chemical synthesis of minerals or other elements in a factory setting is a misleading and strained use of the term at best, even when accompanied with the words “laboratory grown” or “laboratory created.” Already there are numerous instances of synthetic diamond marketers seeking to take advantage of the positive implications in the word “cultured” and thus add to the already confused landscape of marketing that surrounds these products.⁵⁶

For example, a newly formed association of makers of synthetic diamonds states on their web site that their products are “cultured within greenhouses.”⁵⁷ At least one marketer has picked up on this theme, advertising that “[l]ike the most exotic orchid found in nature, the orchid lovingly grown in the greenhouse is rare and beautiful. The same is true for Pure Grown Diamonds”⁵⁸ These claims using the word “cultured” are designed to mislead the reader into believing that their synthetic product is made in a natural manner similar to growing an orchid in a greenhouse or the culturing of a pearl in a farm setting. In fact, synthetic diamonds are manufactured employing sophisticated mechanical and chemical engineering in factories. These misleading descriptions are clearly designed to associate the production of synthetic diamonds with positive organic methods, thus deceptively raising the desirability and value of a synthetic diamond by making factually erroneous claims.

⁵⁶An internet search of the words “cultured diamonds” results in numerous instances of use of the phrase “cultured diamonds” without the words “lab created” or “lab grown” associated. This phrase is now well known and often used in the industry – most often without any other modifiers, although required by the FTC Guides.

⁵⁷See *Advocacy*, INTERNATIONAL GROWN DIAMOND ASSOCIATION, <http://theigda.org/advocacy/commitment-to-sustainability/> (“[b]y virtue of being cultured within greenhouses under controlled conditions...”) and again at <http://theigda.org/education/a-grown-diamond-is-a-diamond/> (“Source of Diamonds: Diamond Growing Greenhouses”).

⁵⁸See *Educational Library: Growing Seeds*, PURE GROWN DIAMONDS, <https://www.puregrowndiamonds.com/education/about-grown/>.

Often, these claims are accompanied by representations that the products are more “green” or environmentally friendly than mined diamonds. For example, a lab created diamond marketer labels its products “eco-friendly,” but provides no substantiation for that claim.⁵⁹ Another marketer of lab created diamonds asserts on its website that “[c]ompared to mining diamonds, our growing process has very little direct impact on the environment,” again with no substantiation.⁶⁰ In fact, this website discloses that their synthetic diamonds are manufactured in Singapore, which has no known source of non-renewable energy, therefore making this claim unsubstantiated and misleading.⁶¹

Another marketer states on its website: “Cultured diamonds do not require any diamond mining, making them a perfect choice for those seeking to minimize the environmental impact of a jewelry purchase.”⁶² Of course, this ignores the environmental impact of the quantity of non-renewable energy used in factories to produce this product.

Allowing the use of the word cultured, even when accompanied with “lab-created,” since at least 2007 has resulted in an unwarranted association of these products with claims of “green” or “eco-friendly.” This misleads buyers into believing that the product is created in an environmentally friendly process, similar to organically cultured pearls. This is a deceptive claim used to falsely enhance this product and is a result of the confused guidance on the use of the word “cultured” that is currently provided by the FTC.

Given the inconsistent use of the term “cultured” within the Guides, and the demonstrated practice of marketers to connect this concept to claims of “green” or “eco-friendly” in a misleading way, the term should not be permitted as a descriptor for synthetic diamonds, even when used with other required terminology, such as “laboratory-grown.”

⁵⁹DIAMOND FOUNDRY, www.diamondfoundry.com (wherein synthetic diamonds are labeled “eco-friendly”).

⁶⁰PURE GROWN DIAMONDS, www.puregrowndiamonds.com.

⁶¹See Press Release, Ila Technologies Opens Diamond Greenhouse in Singapore (Mar. 18, 2015), <http://www.diamonds.net/News/NewsItem.aspx?ArticleID=51681>. The most recent emissions figures (2013) relating to electricity used in Singapore are available at:

https://www.ema.gov.sg/cmsmedia/Publications_and_Statistics/Publications/SES%202014%20Chapters/Chapter%2007%20Other%20Energy-Related%20Statistics.pdf

⁶²*Lab-Created Diamonds*, BRILLIANT EARTH, <http://www.brilliantearth.com/lab-created-diamonds/>.

C. Need for Harmonized International Standards for Labeling Synthetic Diamonds

Starting in 2007, the JVC and its Coalition partners have requested that the Commission harmonize its guidance regarding synthetic diamonds with international norms that disallow the term “cultured” to describe those products. In 2008, the FTC declined to do so, stating that “international jewelry associations . . . may base their standards on factors other than deception or unfairness . . . these association standards may serve a different purpose than the Commission Guides.”⁶³ Again, in 2015, in response to another such request, the FTC explained that “standards . . . developed through an industry consensus building process driven by considerations such as facilitating trade and promoting international cooperation” would not comply with the stated purpose of the Jewelry Guides: preventing deceptive claims to consumers.⁶⁴

There is now a new widely accepted international standard, the goal of which goes well beyond “facilitating trade” or “promoting international cooperation.” In July 2015, the International Organization for Standardization (ISO)⁶⁵ adopted a standard entitled “*Jewelry – Consumer Confidence in the Jewelry Industry*.”⁶⁶ The stated purpose for the new ISO standard is: “The jewellery (sic) industry relies upon product integrity and transparency for consumers to have confidence in the products they are buying. Consumers will not always have the technical expertise to understand the exact provenance and processing of a diamond and as a result, are reliant upon labelling and product descriptions as well as guidance from the individual seller.”⁶⁷ That purpose and those of the FTC Jewelry Guides are fully aligned.

The relevant provision of the new ISO standard is Section 3.4 which holds: “[t]he qualifiers such as natural, real, genuine, precious, **cultured, cultivated**, and gem shall not be used to describe any synthetic diamond” (emphasis added).⁶⁸

⁶³See Letter from FTC to trade associations (Jul. 21, 2008).

⁶⁴See FTC Guides Revision Statement of Basis and Purpose: Proposed Revisions to the Jewelry Guides, dated December 2015, p. 7 and 104.

⁶⁵See generally, *About ISO*, INTERNATIONAL ORGANIZATION FOR STANDARDIZATION, <http://www.iso.org/iso/home/about.htm> (ISO is a worldwide federation of national standards bodies (ISO member bodies). The United States is a member of ISO through the US member organization American National Standards Institute (ANSI).).

⁶⁶ISO 18323:2015, Exhibit 7.

⁶⁷*Id.* at v.

⁶⁸*Id.* at 4.

This newly published standard was developed and issued as a result of a lengthy, robust and public consultation process which included a project committee of technical experts from a wide range of sources (trade bodies, academia, public authorities and industry), public inquiry and a formal voting offered to all ISO members (including the U.S.).⁶⁹ Through the U.S. based standard setting organization, American National Standards Institute (ANSI), the U.S. has immediate access to the ISO standards development processes. Therefore, the ISO standard is applicable in the U.S. through the ANSI mandate which requires consistency with ISO published standards.⁷⁰

In contrast to the new ISO standard, FTC guidance permits use of the term “cultured” or “cultivated” as long as the terms provided in current Section 23.23 are also used (in the Proposed Guides this would be Section 23.25). This is inconsistent with the new ISO standard and other important international standards and laws, as reported in the JVC Coalition’s previous submissions to the FTC.⁷¹ International harmonization is now more compelling, given the alignment of purpose (consumer protection), and the use of the ISO standard throughout the world and in the U.S. through ANSI.

ISO’s study concluded that the use of the “cultured” descriptor is confusing and inconsistent with the stated purpose of the ISO standards: developing descriptors “specifically designed to be understood by the consumer.” ISO also states (in reference to synthetic diamonds): “. . . without clear and accurate labelling, the increased availability of synthetic diamonds to consumers can cause confusion over exactly what type of product is being sold to them . . . consumers will be less familiar with the variety of terms that have been used by sellers to describe synthetic diamonds.”⁷² The conclusion of their careful analysis regarding the use of the term “cultured,” even in combination with other terms, to describe synthetic diamonds was to disallow it under any circumstance. FTC Guidance should align with this standard.

⁶⁹See *ISO Directives*, ISO IEC Part 1 (2016), www.iso.org/directives.

⁷⁰See *ISO Programs Overview*, AMERICAN NATIONAL STANDARDS INITIATIVE, http://www.ansi.org/standards_activities/iso_programs/overview.aspx?menuid=3.

⁷¹See 2012 JVC SUBMISSION at 23-25.

⁷²See ISO 18323:2015, *supra* note 66, at 1 and v.

D. Inconsistencies with International Norms Creates Confusion in the U.S. Marketplace

For the FTC to provide guidance to marketers operating in the U.S. that is plainly inconsistent with widely accepted international norms has already created an uncertain and confusing landscape of terminology. Our recent consumer perception study establishes that consumers seek consistency - 85% stated that they would find it confusing if different terms were used in the U.S. and other countries and 91% stated that the same terms should be used for man-made diamonds both in the U.S. and abroad.⁷³

As noted above, the FTC standards have already created confusion for U.S. consumers in that marketers seek to leverage the positive meanings associated with the word “cultured” to their economic advantage. Further, we have demonstrated the frequent use of the word “cultured” with no other qualification. The U.S. is the one jurisdiction where “cultured” is permitted as a descriptor for this product, and has thus caused a line of marketing to be developed which will continue to promote unsubstantiated claims which mislead consumers. As already demonstrated, the phrase “cultured” or “cultivated in greenhouses” is often used to describe how these items are produced, and is frequently accompanied by unsubstantiated claims that synthetic diamonds are “eco-friendly” or “green,” even though their production actually consumes large amounts of non-renewable energy. The U.S. is now the only place where this misleading marketing can be employed.

Marketers seeking to take advantage of the rules in the U.S. will sell here to the disadvantage of the U.S. consumer. Consumers are already highly confused about these products, as repeatedly demonstrated in consumer surveys.⁷⁴ These additional descriptors – “cultured” or “cultivated” – should not be added to the existing array of terms that often fail to assist consumer understanding, and in fact confuse the picture.

This confusion creates a framework that allows marketers to strain language and heightens the uncertainty consumers already display about these products. We once again request that the FTC align its guidance with the international standards based on consumer protection, prevention of deception and unfairness in the jewelry marketplace, and revise the Guides to disallow the

⁷³See 2016 HARRIS STUDY, *supra* note 12, at 11-12.

⁷⁴*Id.* at p. 2-3, 7-16.

descriptors “cultured” and “cultivated” to describe synthetic, laboratory grown or laboratory created diamonds.

IX. DISCLOSURE OF TREATMENT TO PEARLS

A. Consumer Desire for Disclosure

Our previous research in the area of dyed pearls indicates that a majority of consumers (92%) think it’s important to be told a dyeing procedure takes place to give brightly colored pearls their color.⁷⁵ When consumers purchase dyed pearls, they often do not know that the color has been caused by dyeing, not by an organic process within the pearls while they are growing.⁷⁶ It is important to ensure that consumers are not deceived by non-disclosure of this practice.⁷⁷

B. Jewelry Trade Disclosure Practice

Existing jewelry organizations already promote disclosures of dyeing for pearl products. These organizations have chosen to proactively require disclosure of this treatment specifically for the purpose of educating consumers and preventing consumer deception.

The American Gem Trade Association, the trade association for colored gemstone and pearl dealers, defines dyeing as “the introduction of coloring matter into a gemstone to give it new color, intensify present color or improve color uniformity.”⁷⁸ Disclosure of dyeing pearls is required for all AGTA members in order to protect and inform both down-market industry purchasers and end-market consumers.

CIBJO, the World Jewellery Confederation, also requires disclosure of dyed pearls.⁷⁹ CIBJO’s requirement reflects its important policy of protecting consumer confidence in the jewelry industry.⁸⁰

C. Triggering Disclosure Requirements

The JVC Coalition supports the FTC’s recommendation to add the new Section 23.24 requiring disclosure of treatment to pearls. The three triggering standards for disclosure of treatment to

⁷⁵See 2012 JVC SUBMISSION, HARRIS INTERACTIVE REPORT, at 5.

⁷⁶See *id.*; see also 2012 JVC SUBMISSION, MVI REPORT, at 19-20.

⁷⁷See HONORA, <http://www.honora.com/learn-about-honora/pearl-colors/> (showing examples of pearl colors available in the market).

⁷⁸See AGTA DISCLOSURE REQUIREMENTS FOR NATURAL GEMSTONES, Exhibit 8.

⁷⁹See CIBJO THE PEARL BOOK, Exhibit 9, at 12.

⁸⁰See *Mission Statement*, CIBJO THE WORLD’S JEWELRY CONFEDERATION, <http://www.cibjo.org/mission-statement/>.

gemstones therefor apply to pearls. Because marketers may be unclear which of the three disclosure standard triggers the requirement for this disclosure, we seek a specific note to this section that dying is a treatment that must be affirmatively disclosed, as follows: “Dyeing of pearls must be disclosed.”

X. HANDMADE

The Proposed Guides allow use of the terms “handmade” or hand-wrought” to describe products that have been entirely shaped and formed from raw material, including finishing and decoration, by hand labor and manually controlled methods. Pursuant to the standard, these methods must permit the maker to control and vary the construction, shape, and finish of each part of the product. As illustrated by the attached statement of Linus Drogs, owner of Au Enterprises, the process of hand casting jewelry meets these criteria.⁸¹ Moreover, over 66% of consumers agreed with the proposition that an article of jewelry that was cast in a hand-carved wax mold, and then hand finished, could appropriately be described as “handmade.”⁸²

There is confusion in the industry, however, about this definition, resulting in a reluctance to use the terms “handmade” or “hand-wrought” for hand cast jewelry, even though they may be fully appropriate, and would convey information consumers would want to have. For that reason, we recommend the creation of a safe harbor at Proposed Section 23.2 to make this clear, as follows: “An industry product that has been hand-cast from hand-carved or hand-modeled wax or hand-cast from hand-made molds may be described as “handmade” or “hand-wrought.”

XI. THE COMMISSION’S QUESTIONS

A. Surface Application of Precious Metal

- 1. What expectations of durability do consumers have for products with a surface application of precious metals as compared to products composed throughout of precious metals?*

⁸¹See Statement from Linus Drogs (2016), Exhibit 10.

⁸²See SURVEYMONKEY HANDMADE SURVEY (2016), Exhibit 11.

- a. *Please specify which metal you are referring to if your answer varies depending on the metal.*
- b. *Do these expectations differ by type of product, e.g., wedding ring, brooch?*
- c. *Provide any evidence supporting your position.*

Consumers expect, by large percentages, that products with surface applications of precious metal will tarnish sooner, and be less durable, than products that are precious metal throughout. A large majority of consumers also expect that if a product is described as having a coating of precious metal, that a minimum thickness should be required for that coating. These expectations exist with regards to surface applications of gold, platinum, silver, rhodium and palladium.⁸³

2. *How do consumers understand the qualifiers for coated products described in Sections 23.4 (b) and (c) (e.g., “gold plate(d),” “gold filled,” “rolled gold plate,” “gold overlay,” “gold electroplated(d),” “heavy gold electroplate,” “gold flashed,” “gold washed”) and in Section 23.5 (“vermeil”)? Please specify which terms you are referring to in your response.*
 - a. *Do consumers distinguish between these terms? If so, how do they understand the differences between these terms in terms of durability and value?*
 - b. *Do consumers understand “plate(d)” to describe only electrolytic applications?*
 - c. *Are any of these qualifier used for other precious metal coatings, such as silver, platinum, and platinum group metals? If so, do consumers understand these terms differently when used to describe these metals? How? Please specify which metal you are referring to if your answer varies depending on the metal.*
 - d. *Provide any evidence supporting your position.*

Consumers have some familiarity with these terms.⁸⁴ However, this level of understanding, along with the engrained use of the terms by the industry, support their continued use in Sections 23.4 (b) and (c).

Some of the qualifiers are currently in use for silver and other precious metals. The charts below show the frequency of use of each qualifier, for precious metals other than gold, in terms of the approximate number of jewelry products offered on Amazon.com in each category. These numbers are inexact, as searching by a particular term will yield results for that term, as well as

⁸³See 2016 HARRIS STUDY, *supra* note 1212.

⁸⁴See 2016 HARRIS STUDY, *supra* note 12, at 3-4, and Question 780; *see also* 2012 HARRIS INTERACTIVE REPORT at 27-28 in 2012 JVC SUBMISSION, Exhibit 2.

for related terms. Nonetheless, the results give some indication of use of the terms in the marketplace. Note that these search results are as of March 2016 but could easily change in the future.⁸⁵

	Plated	Filled	Rolled Plate	Overlay
Silver	1,157,000	3,200 (wire)	0	8,000
Platinum	86,000	0	0	1
Rhodium	308,000	0	0	0
Palladium	3	0	0	0

	Electroplate(d)	Heavy Electroplate	Flashed	Washed	Vermeil ⁸⁶
Silver	5,000	0	0	0	0
Platinum	460	0	0	0	0
Rhodium	2	0	2	0	0
Palladium	0	0	0	0	0

3. *Do the qualifiers in Sections 23.4(b) and (c), and in Section 23.5, adequately qualify the use of “gold” terms of other abbreviations to describe a coated product?*

a. *Why or why not?*

b. *Provide any evidence supporting your position.*

The qualifiers, as defined in the Commission’s proposed Sections 23.4(b) and (c) are, in large part, adequate to describe products coated with gold. We discuss areas of concern in our comments preceding these questions in Parts II through V, and in answer to questions 4 through 11, below.

As noted above, these terms are only partly understood by consumers. Many manufacturers and retailers, however, are very familiar with them, and seek to abide by the standards set forth in the Guides to create reliable products, and trustworthiness in the industry. This has worked to the benefit of consumers.

4. *Are there other disclosures that would adequately qualify the references to a precious metal to describe a coated product?*

a. *If so, what are they?*

⁸⁵See 2012 JVC SUBMISSION at 12 (When JVC first commented on this issue in 2012, we noted that similar searches on Amazon.com, and other shopping sites, produced significant results for silver and for the platinum group metals).

⁸⁶The term “vermeil” is used in the context of silver, but only when silver is the substrate and gold is the surface layer, so those results are not included on this chart.

- b. *If additional disclosures are necessary, explain the manner and form in which marketers should make them to ensure they are clear and conspicuous to consumers.*
- c. *How do consumers interpret them?*
- d. *Provide any evidence supporting your position.*

For the reasons explained in our comments preceding these questions at Part IV, and below, at question 11, we no longer recommend a minimum of 22 karats for surface applications of gold. We do recommend that the examples in proposed section 23.3(c)(3) be revised to make clear that the karat fineness of the application must be disclosed, e.g., “22 Kt. Gold Plate,” “18 Kt. Gold Electroplate,” or “14 Kt. Gold Washed.”

- 5. *Should the Commission amend the silver section of the Jewelry Guides (23.6) to advise marketers against using silver terms to describe all, or part of, a coated product unless they adequately qualify the term to indicate the product has only a surface layer of the advertised precious metal?*
 - a. *If so, why? If not, why not?*
 - b. *Provide any evidence supporting your position.*

Yes, for three reasons. First, as a matter of basic consumer protection it is important that buyers be informed that a product that looks like silver throughout may only have a surface application of that precious metal. Second, adding the provision will align the Commission’s guidance for silver coated products with its guidance for gold coated products (Section 23.4 (b)(3)). This makes sense, since the possibility of consumer deception is identical, whether the surface layer is silver or gold. And, third, adding the provision will align the Guides with the National Gold and Silver Stamping Act. The Act does not allow use of the terms “sterling” or “coin” for products that are not sterling or coin throughout. Those products must be stamped or otherwise described as “silver plate” or an abbreviation, alerting the buyer to the fact that the product is not silver throughout.

- 6. *Should the Commission amend the platinum section of the Jewelry Guides (23.7) to advise marketers against using platinum terms to describe all, or part of, a coated product unless they adequately qualify the term to indicate the product has only a surface layer of the advertised precious metal?*
 - a. *If so, why? If not, why not?*
 - b. *Provide any evidence supporting your position.*

Yes. The first two arguments set forth above, regarding products coated with silver, apply with equal force to not only platinum, but to any platinum group metals that is used as a surface layer application, such as rhodium.

7. *Is there any evidence that consumers better comprehend one method of disclosing the amount of precious metal in the outer layer of a surface application over another (for instance, weight ratio versus percentage, versus coating thickness)?*

We are unaware of any evidence that indicates consumers' actual comprehension on this issue. Some evidence exists, however, regarding consumer preferences: in the Harris Interactive study conducted in August 2012,⁸⁷ a majority of respondents (56 percent) answered that they would choose to know the percent of precious metal content in the entire item rather than the thickness of the metal's plating when buying plated jewelry. Twenty-four percent would choose to know the thickness of the plating.

8. *Should the Guides advise disclosure methods that differ depending on the application method?*
 - a. *If so, why? If not, why not?*
 - b. *Provide any evidence supporting your position.*

A disclosure of weight ratio should only be required for products with mechanical applications of gold, and only if the ratio falls below 1/20th the total weight of metal in the product. While we are unaware of any consumer testing on the issue of weight ratio disclosures, it is currently required by the Guides for use of the terms "rolled gold plate" and "gold overlay," which has been industry practice for decades, and has not resulted in consumer complaints. (Note that we recommend that the weight ratio not be allowed to fall below 1/40th.) This is further discussed at Part III in the comments that precede these questions.

9. *The Commission proposes to eliminate Section 23.4(c)(2), a safe harbor advising marketers that they may use the term "gold plate" without qualification (other than fineness) to describe products on which at least 10K gold has been applied by any process (electrolytic or mechanically plated) when coatings have a minimum thickness throughout equivalent to one-half (1/2) micron of fine gold.*
 - a. *Is retaining the safe harbor threshold set forth in Section 23.4(c)(2) (i.e., gold alloy coating of at least 10 karats with a minimum thickness throughout equivalent to one-half micron of fine gold) necessary to prevent deception?*
 - b. *If so, why?*

⁸⁷See 2012 JVC SUBMISSION, Exhibit 21, at 29.

c. *Provide any evidence supporting your position.*

In general, consumers do not show a detailed familiarity with the term “plate(d).”⁸⁸ Moreover, within the industry, and in marketing materials, the term is often used as a generic term for a product with a surface application of precious metals. For these reason, the safe harbor for use of “plate(d)” contained in Section 23.4(c)(2) is no longer required and may be eliminated without risk to consumers. This assumes, of course, that the newly defined safe harbors for mechanical and electrolytic “plate(d)” would instead be contained in the Proposed Guides at Sections 23.3(c)(2) and (3), respectively.

10. *Is there any evidence that applying a thicker layer of lower-karat gold equivalent to 15 millionths of an inch (approximately 0.381 microns) of 22 karat gold produces comparable results in terms of coating durability, tarnish resistance, corrosion resistance, or other attributes? If so, please provide it.*

The evidence indicates that the thickness of the application does not have an impact on tarnish or corrosion resistance. It does have an impact on “wearability,” in that the thicker the application the longer it will take to wear off (assuming the manufacturer uses appropriate chemistry to achieve the thicker coating).⁸⁹ Note, however, that the layer need not be 15 millionths of an inch (approximately 0.381 microns) of 22 karat gold to meet consumer expectations. As described more fully in our comments that precede these questions, at Parts II and IV, the existing safe harbor of 7 millionths of an inch (.175 microns) of at least 10 karat gold is adequate, as long as the karat quality is disclosed, and as long as reasonable durability is assured.

11. *The Commission proposes to revise the safe harbors in Section 23.4(c)(4) for using the term “gold electroplated” and “gold plated” to state a minimum thickness of 15 millionths of an inch using 22 karats. Would an electrolytic application of 7 millionths of an inch of 22 karat gold be adequate to assure reasonable durability?*

The standard of seven millionths of an inch is adequate to meet consumer expectations of reasonable durability. However, the application does not have to be a minimum of 22 karats. A minimum of 10 karats is adequate to protect consumers as long as sellers disclose the karat quality of the gold, and as long as reasonable durability is assured. Please see our comments preceding these questions, at Part IV, for further detail.

12. *The proposed safe harbors for “heavy gold electroplate(d)” and “heavy gold plate(d)” applications retain the minimum thickness amount in Section 23.4(c)(4) of 100µin (2.5µ), but uses 22 karat gold. Is this necessary to prevent consumer deception?*

⁸⁸See 2016 HARRIS STUDY, *supra* note 12, p. 3-4 and Question 780.

⁸⁹See 2013 JVC SUBMISSION, Exhibit 6, *Statement from Michael A. Akkaoui Regarding Electrolytic Applications of Precious Metals on Jewelry Products* (2013).

- a. *If so, how?*
- b. *Provide any evidence supporting your position.*

A 22 karat gold minimum is not necessary to prevent consumer deception. However, the karat quality should be disclosed and reasonable durability should be assured. Please see our comments preceding these questions, at Part IV, for further detail.

13. *The Commission proposes to update the safe harbor in Section 23.4(c)(3) for using the terms “gold filled,” “gold overlay,” and “rolled gold plate” to specify a minimum coating thickness of 170 millionths of an inch (approximately 4.3 microns). It also proposes to retain the advice that marketers using the terms “gold overlay” and “rolled gold plate” should disclose the actual weight ratio of the item when the plating does not constitute 1/20th of the weight of the metal in the entire article. Are these revisions necessary to prevent deception?*

- a. *If so, why? If not, why not?*
- b. *Provide any evidence supporting your position.*

In a change from our recommendation in 2013, we do not now advise the imposition of a thickness requirement for products with mechanical applications of gold. We do recommend, however, that the weight ratio not fall below 1/40th for use of the terms “gold plate(d),” “rolled gold plate” and “gold overlay.” We do not recommend any change to the guidance concerning “gold filled.” For more detail, please see our comments that precede these questions at Part III.

14. *The proposed safe harbor for “vermeil” applications retains the minimum thickness amount in Section 23.5(b) of 100µin (2.5µ), but uses 22 karat gold. Is this necessary to prevent consumer deception?*

- a. *If so, how?*
- b. *Provide any evidence supporting your position.*

A 22 karat gold minimum is not necessary to prevent consumer deception. However, the karat quality must be disclosed and reasonable durability should be assured. Please see our comments preceding these questions, at Part IV, for further detail.

15. *How do consumers understand the phrase “over” when used to describe jewelry (such as “gold over silver”)?*

- a. *Does marketers’ use of this phrase cause consumer confusion or deception?*

- b. *If so, should the Commission issue guidance to address the use of the term “over”? What should the guidance be?*
- c. *Provide any evidence supporting your position.*

Majorities of consumers answer “don’t know” when asked about various terms indicating a surface-layer application of precious metals. Twenty-two percent believe that “gold-over” and “gold-plated” are the same thing, and 28% believe that “gold-over” uses low karat gold (less than 10K).⁹⁰ We are not aware, however, of any evidence that a lack of detailed familiarity is contributing to consumer deception. That is likely because a large majority of consumers expect that products coated with precious metal will not perform as well as products that are precious throughout,⁹¹ and because they pay less for these products than products composed of precious metal throughout. For this reason, we do not recommend that the Commission issue guidance on this term, other than to make clear that whenever a marketer indicates that a product contains a coating of precious metal, reasonable durability must be assured.

16. *How do consumers understand the phrase “gold layered” when used to describe jewelry?*
- a. *Does marketers’ use of this phrase cause consumer confusion or deception?*
 - b. *If so, should the Commission issue guidance to address the use of the term “gold layered”? What should the guidance be?*
 - c. *Provide any evidence supporting your position.*

Majorities of consumers answer “don’t know” when asked about various terms indicating a surface-layer application of precious metals. Twenty-six percent believe that “gold-layered” items are typically more durable than “gold electroplated” items. As noted above, however, at question 15, we are not aware of any evidence that this lack of detailed familiarity is contributing to consumer deception. For this reason, we do not recommend that the Commission issue guidance on this term, other than to make clear that whenever a marketer indicates that a product has a surface application of precious metal, reasonable durability must be assured.

17. *How do consumers understand the phrase “clad” when used to precious metals?*
- a. *Does marketers’ use of this phrase cause consumer confusion or deception?*

⁹⁰See 2016 HARRIS STUDY, *supra* note 12, p. 3-4, Questions 780-81.

⁹¹See 2016 HARRIS STUDY, *supra* note 12.

- b. *If so, should the Commission issue guidance to address the use of the term “clad”? What should the guidance be?*
- c. *Provide any evidence supporting your position.*

We have not tested the term “clad.”

- 18. *How do consumers understand the phrase “bonded” when used to describe jewelry?*
 - a. *Does marketers’ use of this phrase cause consumer confusion or deception?*
 - b. *If so, should the Commission issue guidance to address the use of the term “bonded”? What should the guidance be?*
 - c. *Provide any evidence supporting your position.*

We have not tested the term “bonded.”

- 19. *How do consumers understand the phrase “gold-tone” or “goldtone” when used to describe jewelry?*
 - a. *Does marketers’ use of this phrase cause consumer confusion or deception?*
 - b. *If so, should the Commission issue guidance to address the use of these terms? What should the guidance be?*
 - c. *Provide any evidence supporting your position.*

We have not tested the terms “gold-tone” or “goldtone.”

- 20. *Are there other terms not addressed in the current Guides or in the Commission’s proposed amendments that marketers use to describe coated jewelry products?*
 - a. *If so, what are those terms?*
 - b. *How do consumers understand these terms?*
 - c. *Does marketers’ use of these terms cause consumer confusion or deception?*
 - d. *If so, should the Commission issue guidance to address the use of these terms? What should the guidance be?*
 - e.

We are unaware of other terms that require guidance.

21. *Should the Commission delete the Note to Section 23.4(b) concerning use of the words “Duragold,” “Diragold,” “Noblegold,” “Goldine,” “Layered Gold,” and terms of similar meaning?*
- a. If so, why? If not, why not?
 - b. Provide any evidence supporting your position.

These terms are no longer used in the industry. For that reason, guidance on these terms is not required.

22. *Should the Commission retain the Appendix to the Jewelry Guides – Exemptions Recognized in the Assay for Quality of Gold Alloy, Gold Filled, Gold Overlay, Rolled Gold Plate, Silver, and Platinum Industry Products?*
- a. *If so, why? If not, why not?*
 - b. *Are any changes to the Appendix needed to address consumer deception?*
 - c. *Provide any evidence supporting your position.*

The appendix lists products that are recognized as exempted from the karat or parts per thousand minimum threshold requirements of the Guides. In two sections of the appendix, however, the industry product known as a "bracelet and necklace snap tongue" has been left out as an item that is exempt. Those sections are (a) and (d). Therefore, we ask that the Commission amend the appendix to include "bracelet and necklace snap tongues" in every list of exempted items, including (a) and (d).

B. Products Consisting of More than One Precious Metal

23. *The Commission proposes to advise marketers to list precious metals in the order of their relative weight in the product from greatest to least, unless the context makes it clear that the metal listed first is not predominant. Would this proposal alter how surface-plated products are described?*
- a. *If so, how? Provide any evidence supporting your position.*
 - b. *How would this proposed guidance affect provisions in the Guides concerning precious metal applications? For example, to prevent consumer deception, would a provision regarding use of the term “gold overlay” have to be amended to*

advise manufacturers to describe the product instead as “silver with gold overlay?”

No, this proposal would not alter how surfaced-plated products are described.

24. *Are there examples of non-deceptive descriptions and markings listing precious metals out of order of their relative weight?*
- a. *If so, please provide them.*
 - b. *Does your answer differ depending on where the description appears, e.g., hangtags vs. advertisements vs. marketing. If so, how?*
 - c. *Provide any evidence supporting your position*

The examples provided by the Commission in its proposed Section 23.8(c) are appropriate examples of non-deceptive descriptions.

C. Alloys with Precious Metals in Amounts Below Minimum Thresholds

[GOLD]

25. *What do consumers expect in terms of performance or other objective qualities when purchasing a product described or marked as “gold”?*
- a. *Does the type of product or the intended duration of use affect the consumers’ expectations for the product’s performance or other objective qualities?*
 - b. *Provide any evidence supporting your position*
26. *Is there a specific word or phrase that could be used to describe gold alloy products of less than 10 karats that would adequately convey how they differ from products with at least 10 karats in terms of the properties, attributes or qualities material to consumers?*
- a. *If so, identify the word or phrase and provide evidence demonstrating that it adequately conveys the differences between products.*

In the comments that proceed these questions, at Part VI, we recommend that the term “low gold” be employed. Therefore, a disclosure would be: “8k Low Gold.” The disclosure should be contained in the stamp as well, e.g., “8K Low Gold” or “8K LG.” Our recommendations include that the marketer would be required to disclose that “[t]his item materially differs with respect to tarnish and corrosion resistance from a product made with at least 10K gold.”

27. *Are alloy jewelry products containing less than 10 karats of gold currently being marketed?*

- a. *If so, how are such products described?*
- b. *How are such products marked?*
- c. *Provide material exemplars describing or showing such products.*

There are products being marketed now that are made of alloys that contain less than 10 karat gold. To our knowledge, these are marketed as YellOra and Rubedo (a Tiffany product). These can be found at www.yellorajewelry.com and at www.tiffany.com. The Tiffany marketing does not state that it contains any precious metal. The marketing for YellOra does identify that there is precious metal in the alloy – and identifies the precious metals used. This is a violation of Section 23.4(c)(1) of the current Guides.

28. *How do consumers understand a gold content disclosure that is stated as a percentage, rather than karats (e.g., “33% gold” versus “8 karats”)?*

Previously submitted data indicates that many consumers are comfortable with disclosures of gold content using percentages. In fact, this is the preferred method. In the study submitted in 2012, 80% of respondents stated it was very important to disclose precious metal content and 67% preferred disclosure of precious metal content using percentages.⁹² It is interesting to note that while most consumers preferred disclosure of gold content using karats (when karat is described as a “weight disclosure”), their understanding of the exact meaning of the karat disclosure is weak. Only 29% of respondents accurately described the weight of gold in an item marked 14K.⁹³

- a. *Are consumers able to compare accurately the gold content of different jewelry items when one is described using karats and the other using percentage?* Based on the data submitted in September 2012 and June 2013 to the FTC as described above, the answer to this question is probably not. Percentages are understood by most consumers, but karats are also somewhat understood, although not the full meaning of the karat designation.
- b. *Will using percentages for this disclosure confuse consumers?* A significant portion of consumers do not accurately understand the exact meaning of karat disclosures. Two thirds of consumers prefer percentage disclosures for precious metal content. Moreover, percentage disclosures are more commonly used for many content disclosures in other products and are therefore well understood (for example textile content of clothing). Thus, percentage disclosures will probably not confuse consumers and will be a good indicator to consumers that they are purchasing below

⁹²See 2012 JVC SUBMISSION, Exhibit 2, HARRIS INTERACTIVE REPORT, Slide 31. See also 2013 JVC SUBMISSION, Exhibit 1, GOOGLE CONSUMER SURVEY (2013).

⁹³See 2013 JVC SUBMISSION, Exhibit 1, GOOGLE CONSUMER SURVEY (2013).

- minimum threshold alloys. However, we are cognizant that there might be confusion when comparing, for example, an 8% gold alloy designation to an 8K gold alloy designation. Thus, we recommend retaining the karat disclosure for below threshold alloys, when adding the designation “low gold” and a disclosure that “[T]his item materially differs with respect to tarnish and corrosion resistance from a product made with at least 10K gold.”
- c. *If evidence indicates that percentage disclosures will confuse consumers because the content disclosures for other gold products use karats, is there other evidence that indicates the benefits of percentage disclosures will outweigh the confusion? Using percentage disclosures for under threshold products provides a method that is distinct from above minimum threshold products but may confuse consumers when they compare this content disclosure to above threshold alloys using karat designations.*
 - d. *Provide any evidence supporting your position. See surveys conducted by Harris Interactive (submitted by the JVC Coalition to the FTC in September 2012 and Google Consumer Surveys, May 22, 2013 - May 27, 2013; submitted to the FTC by the JVC Coalition, June 5, 2013.*
29. *In addition to disclosing the amount of gold in an alloy, what other information if any, is needed to avoid consumer confusion?*
- a. *If additional disclosures are necessary, explain the manner and form in which marketers should make them to ensure that they are clear and conspicuous to consumers. For low gold items, we recommend that the following disclosure be made: “This item materially differs with respect to tarnish and corrosion resistance from a product made with at least 10K gold.” Marketers would be advised to follow the FTC’s existing guidance on disclosures to ensure that the information regarding material differences was clear and conspicuous, whether communicated in a brick and mortar store, or on line or on a smart phone screen. We also recommend that the products be stamped “low gold” or “LG.”*
 - b. *How do consumers interpret such additional disclosures? The language proposed to make this disclosure is very clear and will convey the required information to the consumer about the differences in performance when buying jewelry of below minimum threshold content.*
 - c. *Provide any evidence supporting your position.*

[SILVER]

30. *Section 23.6 advises that it is unfair or deceptive to use the terms “solid silver” “sterling silver,” “sterling” and the abbreviation “ster” to mark, describe, or otherwise represent all or part of an industry product unless it is at least 925/1000the pure silver.*
- a. *How do consumers understand the terms “solid silver,” “sterling silver,” “sterling,” and “Ster.”?*
 - b. *Would an amendment advising marketers to use th4e terms “solid silver,” “sterling silver,” “sterling” or the abbreviation “Ster.” To mark or describe all or part of a product that is less than 925.1000ths pure silver, but otherwise has all the material properties and attributes of traditional sterling silver, create consumer confusion or cause consumer injury?*
 - c. *Why or why not?*
 - d. *Provide any evidence to support your position.*

Please review our answer in the comments that proceeds these questions at Part VI. Consumers are well versed through centuries of sterling silver designations as to the meaning of these abbreviations and descriptors.

31. *Section 23.6 advises that it is unfair or deceptive to use the word “coin” or coin silver” to mark, describe or otherwise represent all or part of an industry product unless it is at least 900/1000ths pure silver.*
- a. *How do consumers understand the terms “coin” and “coin silver”?*
 - b. *Would an amendment advising marketers that they may non-deceptively use the terms “coin” or “coin silver” to mark or describe all or part of a product that is less than 900/1000ths pure silver, but otherwise has all the material properties and attributes of traditional coin silver, create consumer confusion or cause consumer injury?*
 - c. *Why or why not?*
 - d. *Provide any evidence supporting your position.*
32. *What do consumers expect in terms of performance or other objective qualities when purchasing a product described or marked as “silver”?*
- a. *Does the type of product or the intended duration of use affect consumers’ expectations for the product’s performance or other objective qualities?*

b. *Provide any evidence supporting your position.*

33. *Is there a specific word or phrase that could be used to describe silver alloy products of less than 925/1000ths pure silver that would adequately convey how they differ from products with at least 925/1000ths in terms of the properties, attributes or qualities material to consumers?*

a. *If so, identify the word or phrase and provide evidence demonstrating that it adequately conveys the differences between the products.*

Our recommendation is to allow below minimum threshold alloys containing less than 925 PPT silver to be described using parts per thousand and the descriptor: “low silver” (e.g., “800 PPT Low Silver” or “LS”) with this added disclosure: “This item materially differs with respect to tarnish and corrosion resistance from a product made with at least 925 PPT Silver”

34. *Are alloy jewelry products containing less than 925/1000ths pure silver currently being marketed?*

a. *If so, how are such products described?*

b. *How are such products marked?*

c. *Provide marketing material exemplars describing or showing such products.*

Both Rubedo and YellOra contain below minimum threshold amounts of silver. Only YellOra states that there is silver in the alloy in their marketing material – Rubedo does not identify any precious metal in their marketing material, but the quantity was revealed in the patent application.

35. *How do consumers understand a silver content disclosure that is stated as a percentage, rather than parts per thousand (e.g., “85% silver” vs. “850 silver”)?*

a. *Are consumers able to compare accurately the silver content of different jewelry items when one is described using parts per thousand and the other using percentages?*

b. *Will using percentages for this disclosure confuse consumers?*

c. *If evidence indicates that percentage disclosures will confuse consumers because the content disclosures for other silver products use parts per thousand, is there other evidence that indicates the benefits of percentage disclosures that will outweigh the confusion?*

d. *Provide any evidence supporting your position.*

Please see previous answer to Question 28 and the comments that proceed these questions at Part VI.

36. *In addition to disclosing the amount of silver in an alloy, what other information, if any, is needed to avoid consumer deception?*
- a. *If additional disclosures are necessary, explain the manner and form in which marketers should make them to ensure they are clear and conspicuous to consumers.*
 - b. *How do consumers interpret such additional disclosures?*
 - c. *Provide any evidence supporting your position.*

As with gold, we recommend that when describing below threshold silver, the term “low silver” be used along with a designation of parts per thousand, and the following disclosure should be required: “This item materially differs with respect to tarnish and corrosion resistance from a product made with at least 925 PPT silver.”

[PLATINUM]

37. *Are there significant differences between platinum alloys that are at least 500 parts per thousand pure platinum and those that are less than 500 parts per thousand in terms of properties, attributes, or qualities material to consumers?*
- a. *If so, describe those differences in detail.*
 - b. *Provide any evidence supporting your position.*

In response to questions 37 through 41, the JVC Coalition recommends that there be no change to section 23.6 of the Proposed Guides regarding platinum. This guidance was revised fairly recently, in 2010, and has served since then to protect consumers from deception regarding this precious metal. Moreover, we concur with the Commission’s analysis, offered on page 68 of its Statement of Basis and Purpose, that consumers expect platinum products to be substantially composed of pure platinum. For this reason, the existing guidance on platinum need not be revised.

38. *Is there a specific word or phrase that could be used to describe platinum alloy products of less than 500 parts per thousand pure platinum that would adequately convey how they differ from products with at least 500 parts per thousand in terms of properties, attributes, or qualities material to consumer?*
- a. *If so, identify the word or phrase.*

- b. *Provide evidence demonstrating that it adequately conveys the differences between the products.*
39. *Are alloy jewelry products containing less than 500 parts pure platinum currently being marketed?*
- a. *If so, how are such products described?*
- b. *How are such products marked?*
- c. *Provide marketing material exemplars describing or showing such products.*
40. *How do consumers understand a platinum content disclosure that is stated as a percentage, rather than parts per thousand (e.g., “45% platinum” vs. “450 platinum”)?*
- a. *Are consumers able to compare accurately the platinum content of different jewelry items when one is described using parts per thousand and the other using percentage?*
- b. *Will using percentages for this disclosure confuse consumers?*
- c. *If evidence indicates percentages disclosures will confuse consumers because the content disclosures for other platinum products use parts per thousand, is there other evidence that indicates the benefits of percentage disclosures will outweigh the confusion?*
- d. *Provide any evidence supporting your position.*
41. *Is there any evidence that disclosing the amount of platinum contained in a below threshold alloy (i.e. less than 500 parts per thousand pure platinum) will sufficiently alert consumers to the differences between products containing platinum in amounts above and below the Guides thresholds?*
- a. *In addition to disclosing the amount of platinum in the alloy, what other information, if any, is needed to avoid consumer deception?*
- b. *If additional disclosures are necessary, explain the manner and form in which marketers should make them to ensure that they are clear and conspicuous to consumers.*
- c. *How do consumers interpret such additional disclosures?*
- d. *Provide any evidence supporting your position.*

D. DESCRIBING GOLD QUALITY

42. *42. To what extent are gold products presently sold in the United States described or marked using parts per thousand?*

While the JVC Coalition has not undertaken any study to answer this question in detail, it is the experience of marketers in our industry that there is a substantial use of parts per thousand disclosure of the weight of all precious metal in alloys. This is especially true for items made of 417 parts per thousand gold (10K). This is simply a matter of tradition and usage.

- a. Is the gold quality of these products also described or marked using karat designations? It is standard practice to use one method of disclosure of weight of precious metal per item.*
- b. Provide any evidence supporting your position.*
43. *How well do consumers understand gold content expressed in parts per thousand?*
- a. Are consumers able to compare accurately the gold content of different jewelry items when one is described using karats and the other using parts per thousand?*
- b. Provide any evidence supporting your position?*
44. *Should section 23.4 be revised to include examples that describe and mark gold quality using only parts per thousand, in addition to the existing karat examples?*

This is useful to marketers who are marking their items for sale employing parts per thousand disclosures. This is already well accepted in the trade.

- a. Why or why not?*
- b. Provide any evidence supporting your position.*

E. Composite Stones

45. *The comments on, and the Commission's analysis of, lead-glass-filled stones centered on rubies, as did the submitted consumer perception evidence. However, other stones filled with substantial amounts of lead glass may be marketed with similar terms and therefore raise similar issues.*
- a. Should the Commission amend the Guides to address lead-glass-filled composite stones other than rubies? If so, does the proposed guidance ensure that consumers will not be misled about the composition of other lead-glass-filled composite stones*

and these products' performance, durability, value, and any special care requirements?

b. Provide any evidence supporting your position.

Yes, the Commission should amend the Guides to address lead-glass-filled composite stones other than rubies, as well as stones that use fillers other than lead glass. As stated above, at Section VII, there are already cobalt-doped lead-glass-filled sapphires and polymer-filled turquoise on the market, and we expect other products to follow.

46. *How do consumers understand the term "manufactured" when used to describe a gemstone (e.g., "manufactured ruby")?*

a. Does marketers' use of this phrase cause consumer confusion or deception?

b. If so, should the Commission issue guidance to address the use of this term? What should the guidance be?

c. Provide any evidence supporting your position.

47. *Do the terms suggested in the proposed Note to Section 23.23 (now renumbered as Section 23.25) as examples of accurate descriptors for lead-glass-filled products imply deceptive claims? For example, a product may be composed of multiple pieces of corundum fused together with lead glass. In this example,*

a. Would the term "lead-glass-filled corundum" to describe such a product deceptively imply that this product is a single stone infused with lead glass?

b. Would the term "lead-glass-filled composite corundum" be more accurate?

c. Is it material to consumers whether lead-glass is infused into one piece of corundum rather than multiple pieces?

d. Some commenters explicitly distinguish "corundum" from "ruby" as the starting point for material for infusion with lead glass, while others do not make that distinction. Should the Guides distinguish between "ruby" and "corundum" in its guidance for lead-filled stones?

e. For a. through d. above, explain why or why not and provide any evidence supporting your position.

The JVC Coalition recommends that the FTC change its proposal to indicate that the terms "composite" and/or "manufactured composite" are the appropriate descriptors for lead-glass-filled products, and products with other types of fillers, given the plain meaning of the term

“composite” and the current usage of these terms in the trade. Although it is unclear if consumers distinguish between corundum and ruby, use of the term “composite” to refer to the stone and the filler would be more accurate. The term “lead-glass-filled” should not be used in marketing materials. Please see our comments that precede these questions at Part VII.

There is a distinction between ruby and corundum: ruby is red corundum, and corundum material can come in many other colors. A product with non-red corundum and lead glass can appear red or even be dyed red.⁹⁴ These products should never be called “ruby”.

F. Gemstone Treatments and the Term “Natural”

48. *Is it material to consumers to know about a treatment that:*

- a. *is permanent;*
- b. *does not create special care requirements for the gemstone; or*
- c. *has a significant effect on the stone’s value?*
- d. *Why or why not?*
- e. *Provide any relevant consumer perception evidence.*

The JVC Coalition is extremely supportive of the existing treatment disclosure requirement, and strongly recommends that it remain as written.

49. *Are consumers familiar with the types of treatments used to enhance gemstones? Provide any evidence on this issue.*

Consumers are sometimes familiar with types of treatments used to enhance gemstones and the special care requirements they create. The compliance rate for disclosing is very high. Many jewelry companies do excellent work educating their consumers about these treatments. For examples, please see Macy’s Gemstone Treatment and Care Guide,⁹⁵ and Jewelry Television’s Gemstone Enhancement and Care.⁹⁶

50. *Are consumers aware that many gemstone treatments create special care instructions for enhanced stones? Provide any evidence on this issue.*

⁹⁴See K. Schmetzer, H.A. Hmi, E.I.Jegge, and E-J. Schupp, *Dyed Natural Corundum as a Ruby Imitation*, GEMS & GEMOLOGY, 112-115 (Summer 1992), http://www.gia.edu/cs/Satellite?blobcol=gfile&blobheader=application%2Fpdf&blobheadername1=Content-Disposition&blobheadername2=MDT-Type&blobheadername3=Content-Type&blobheadervalue1=attachment%3B+filename%3DDyed-Natural-Corundum-as-a-Ruby-Imitation&blobheadervalue2=abinary%3B+charset%3DUTF-8&blobheadervalue3=application%2Funknown&blobkey=id&blobtable=GIA_DocumentFile&blobwhere=1355958401619&ssbinary=true.

⁹⁵See *Gemstone Treatment and Care Guide*, MACY’S, *supra* note 54.

⁹⁶See *Gemstone Enhancement and Care*, JEWELRY TELEVISION, <http://www.jtv.com/library/gemstone-chart.html>.

See above answer to question 49.

51. *Is the Commission's guidance advising sellers to disclose that a gemstone has been treated and has special care requirements necessary to prevent deception?*

Yes, the Commission's guidance advising sellers to disclose that a gemstone has been treated and has special care requirements is still necessary to prevent deception. The point of sale remains the best way to convey this information to consumers.

52. *Is the Commission's guidance recommending that sellers identify the special care requirements still necessary to prevent deception?*

Yes, the Commission's guidance recommending that sellers identify the special care requirements of certain products is still necessary to prevent deception. The JVC Coalition recommends that guidance requiring a marketer to provide specific recommendations for special care be added and that the FTC should amend this note to show that it is unfair or deceptive to fail to identify the special care requirements. Without requiring disclosure of the special care requirements, consumers may not be informed about the products they purchase and could risk damaging them. Although the Internet has made much of this information readily available, a marketer cannot rely on every consumer being able to access this information: there are still consumers who do not have Internet access or are unskilled in searching for this kind of educational information. Nor should it be the consumer's obligation to do this research apart from the point of purchase. Requiring sellers to disclose these special care requirements will ensure that all consumers have the necessary knowledge of these requirements and can properly care for the products they purchase.

53. *How do consumers understand the term "natural" when used to describe gemstones?*

- a. *Does marketers' use of this term cause consumer confusion or deception?*
- b. *If so, should the Commission issue guidance to address this term? What form should this guidance take?*
- c. *Provide any evidence supporting your position.*

JVC has not tested consumer perceptions of this term when applied to gemstones.

G. Varietals

54. *Should the Commission revise the Guides by adopting the proposed Section 23.27?*

- a. *If so, why?*
- b. *If not, why not?*
- c. *Provide any evidence supporting your position.*

Yes, the Commission should revise the Guides by adopting the proposed Section 23.27. This section will prevent retailers from unfairly leveraging the mineral varietal names in order to deceive consumers as to the identity and value of their products.⁹⁷

H. Cultured Diamonds

55. *How do consumers understand the terms:*
- a. *“laboratory-grown cultured diamond”;*
 - b. *“[manufacturer name]-created cultured diamond”;*
 - c. *“synthetic cultured diamond”?*
 - d. *Provide any relevant consumer perception evidence.*

See answer below.

56. *Are there other disclosures that would adequately qualify the term “cultured” in the context of diamonds? Provide any relevant consumer perception evidence.*

A plurality of respondents did not know if the terms “[manufacturer name] created diamond” and “cultured [manufacturer name] created diamond” were the same (44%). A similar plurality did not know if “lab created diamond” was the same as a “cultured lab-created diamond” (45%). A plurality of consumers did not know if a “lab grown diamond” was the same as a “cultured lab grown diamond” (45%). A plurality of consumers did not know that a “synthetic diamond” was the same as a “cultured synthetic diamond” (43%). Smaller numbers (33% or 34%) thought that these terms identified the same product.⁹⁸ Given this landscape of ignorance and confusion, allowing the term “cultured” to be added will not help and will further confuse consumers. This is especially true given the manner in which marketers are already connecting “cultured” diamonds to phrases like “cultured in greenhouses” and claims that manufacturing diamonds is more environmentally friendly than mining natural diamonds. These claims are misleading and have not been substantiated. The currently designated descriptors in the FTC Guides are those that are accepted in the international community, and therefore marketers should be restricted only to those terms to describe synthetic diamonds. They should not be permitted to modify those terms using the word “cultured”. Please see our comments that precede these questions, at Part VIII.

I. Gem/Gemstone

57. *Would eliminating Section 23.25 (Misuse of the word “gem”) create consumer confusion or cause consumer injury?*
- a. *Why or why not?*

⁹⁷See 2012 JVC SUBMISSION at 18-19.

⁹⁸See 2016 HARRIS STUDY, *supra* note 12, p. 2; Questions 710-735.

b. Provide any evidence supporting your position.

The JVC Coalition agrees that this section should be eliminated, so long as the term “gem” is added to Section 23.23 as proposed by the FTC. JVC frequently references the existing Guides to explain to marketers why they cannot use the word “gem” to describe a cubic zirconia or other imitation gemstone.

58. *Would eliminating Section 23.20(j) create consumer confusion or cause consumer injury?*

a. Why or why not?

b. Provide any evidence supporting your position.

No, the JVC Coalition does not believe that eliminating this section will create consumer confusion or cause consumer injury. Pearls are considered gems by the jewelry industry and consumers, and marketers should not be restricted from using this terminology.⁹⁹

59. *How do consumers understand the difference between “gem” and “gemstone”?*

a. Do they differentiate between these terms?

b. Do consumers consider produces labeled as “gems” to be more valuable, symmetrical, or rare than “gemstones”?

c. Provide any relevant consumer perception evidence.

JVC has not tested consumer perceptions on this subject.

60. *Do marketers use the term “gem” to describe pearls?*

a. If so, how?

b. Provide any evidence supporting your position.

Yes, many marketers use the term “gem” to describe pearls. For example, Mikimoto describes its pearls as “among the most coveted gems in the world” in the education section of their website.¹⁰⁰ Honora described its Chinese freshwater pearls as an “astounding gem [set] apart from the pearls of the past” in a blog post.¹⁰¹

⁹⁹See *Pearl*, GEMOLOGICAL INSTITUTE OF AMERICA, <http://www.gia.edu/pearl> (referring to pearls as gems in its educational materials); see also *Pearls*, THE INTERNATIONAL COLORED GEMSTONE ASSOCIATION http://www.gemstone.org/index.php?option=com_content&view=article&id=141:sapphire&catid=1:gem-by-gem&Itemid=14 (defining pearl as an “organic gem”).

¹⁰⁰*Welcome to Pearls*, MIKIMOTO PEARL BASICS, <http://www.mikimotoamerica.com/pearl-guide/pearl-basics>

¹⁰¹*Honora Pearls on the CBS Early Show*, HONORA, <http://www.honora.com/blog/personalities/honora-pearls-on-the-cbs-early-show/#sthash.xJMn3b9K.dpuf>.

61. *How do consumers understand the term “gem” in the context of pearls?*
- a. *Do they differentiate between pearls described as “gems” and other pearls?*
 - b. *Do consumers consider pearls labeled as “gems” to be more valuable, symmetrical, or rare than other pearls?*
 - c. *Provide any relevant consumer perception evidence.*

JVC has not tested consumer perceptions on this topic.

J. Geographic/Regional Identification of Pearls

62. *62. Are any pearl products marketed or sold using names or terms that indicate a geographic or regional designation other than the location where the pearl formed?*
- a. *If so, what are the names or terms?*
 - b. *Does the use of these names or terms result in consumer deception?*
 - c. *Provide any evidence on this issue.*

JVC’s interpretation of the existing Guides does not allow marketers to describe or sell pearl products using names or terms that indicate a geographical or regional designation other than the location where the pearl formed. JVC has received approximately 32 complaints over the past four years regarding misrepresentation of geographical origin of pearls.¹⁰²

63. *Should section 23.21 be revised to state it is unfair or deceptive to misrepresent the location in which cultured pearls are produced?*
- a. *Why or why not?*
 - b. *Provide any evidence supporting your position.*

Yes, this section should be revised to make it clear that it is unfair or deceptive to misrepresent the location in which cultured pearls are produced. Any claims using a regional name to indicate the type of pearl when that pearl was not actually produced in that region are unsubstantiated and deceptive.¹⁰³

64. *How do consumers understand the term “paraiba” or “Paraiba” when used to describe a gemstone product?*
- a. *Provide any evidence supporting your position.*

¹⁰²These complaints most often deal with “South Sea” and “Tahitian” geographic designations.

¹⁰³See CIBJO THE PEARL BOOK, *supra* note 79.

JVC has not tested consumer perceptions on this topic.

65. *Is there a standard or consensus in the industry regarding how copper-bearing tourmalines are identified and described?*
- a. *If so, does the industry standard meet consumer expectations regarding such products?*
 - b. *To what extent is “paraiba” used to describe tourmalines found in Africa?*
 - c. *Provide any evidence supporting your position.*
66. *Does copper-bearing tourmaline found in Brazil differ from copper-bearing tourmaline found in Africa with respect to its optical, physical, or chemical properties?*
- a. *If so, how does it differ?*
 - b. *Are there any other material differences between copper-bearing tourmaline found in Brazil and copper-bearing tourmaline found in Africa?*
 - c. *If so, what are the differences?*
 - d. *Provide any evidence supporting your position.*
67. *To the extent copper-bearing tourmalines found in Africa are marketed and sold using the term “paraiba” or “Paraiba,” is there any evidence of consumer misperception or injury resulting from the practice? If so, please provide it.*
68. *Should the Commission amend the Guides to address claims about product rarity?*
- a. *If so, why? If not, why not?*
 - b. *Provide any evidence supporting your position.*

It is a basic tenant of the FTC that all advertising and marketing claims must be able to be substantiated in order to be non-deceptive. If a marketer is making a claim about product rarity, it must be truthful and it must be substantiated. The JVC Coalition believes that this guidance is adequate for the purposes of this topic, and we do not see any need for the Guides to address this issue specifically.

K. Disclosure of Treatments to Pearls

69. *Is it material to consumers to know about a treatment that:*
- a. *is permanent;*

- b. *does not create special care requirements for the pearl or cultured pearl; or*
- c. *has a significant effect on the pearl product's value?*
- d. *Why or why not?*
- e. *Provide any relevant consumer perception evidence.*

The JVC Coalition agrees that it is material to consumers to know about a treatment that is permanent, does not create special care requirements, but does have a significant effect on the pearl product's value. Please see the comments preceding these questions regarding this issue, at Part IX.

70. *70. Are consumers familiar with the nature and types of treatments used to enhance pearls and cultured pearls? Provide any evidence on this issue.*

Please see our answer to Question 49 above.

71. *Are consumers aware that many pearl treatments cause special care instructions for the product? Provide any evidence on this issue.*

Please see our answer to Questions 50-51 above.

72. *Is the Commission's guidance in proposed Section 23.23 advising sellers to disclose that a pearl or cultured pearl has been treated and has special care requirements necessary to prevent deception?*

Yes, this guidance is necessary to prevent deception, and the JVC Coalition strongly supports this proposed addition to the Guides. Additionally, we recommend that the FTC add a note to the proposed Section 23.23 clarifying that dyeing of pearls must be disclosed. Please see our answer in Questions 50-51 above and our comments prior to the Questions, at Part IX.

73. *Is the Commission's additional guidance recommending that sellers identify the special care requirements necessary to prevent deception?*

Yes, the Commission's guidance recommending that sellers identify the special care requirements of certain products is necessary to prevent deception. The JVC Coalition recommends that this guidance should be mandatory, and that the FTC should amend this section to show that it is unfair or deceptive to fail specifically identify the special care requirements of gemstone treatments. Without requiring disclosure of the special care requirements, consumers may not be informed about the articles they purchase and could risk damaging pearl, or other, products. Although the Internet has made much of this information readily available, a marketer cannot rely on every consumer being able to access this information: there are still consumers who do not have Internet access or are unskilled in searching for this kind of educational information. Further, the consumer should not be the party with the burden to acquire this information. It should be delivered at or before the point of purchase by the seller. Requiring

sellers to disclose these special care requirements will ensure that all consumers have knowledge of these requirements and can properly care for the products they purchase.

L. Hand-Made Claims

74. *Would a revision adding precious metal clays, ingots, and casting grain to the list of “raw materials” listed in the Note to Section 23.3 Paragraph (a) risk consumer deception?*

a. *If so, why? If not, why not?*

b. *Provide any evidence supporting your position.*

We do not believe that this revision would risk consumer deception, and are unaware of any evidence to that effect. For our recommendation regarding the standard for “handmade” claims please see our comments that precede these questions at Part X.

M. Synthetic Claims

75. *Section 23.23(c) of the current Guides states that it is unfair or deceptive to use the word “synthetic,” among other terms, with the name of any natural stone to describe any industry product unless such industry product has essentially the same optical, physical, and chemical properties as the stone named. How do consumers understand the term “synthetic” when used to describe a diamond or other gemstone?*

According to a study performed by the JVC of over 500 consumers, the understanding of the term “synthetic” is no better or worse than their understanding of other terms authorized for use to describe these products, or to describe an imitation gemstone.¹⁰⁴

a. *Does marketers’ use of this phrase cause consumer confusion or deception?*

Based on the responses the JVC Coalition received in its consumer research, use of the term “synthetic” is no more confusing or deceptive than any other term authorized for use by the Guides.

b. *Do consumers differentiate the term “synthetic” from the terms “laboratory-grown,” “laboratory-created,” “[manufacturer-name]-created”?*

Based on the responses the JVC Coalition received in its consumer research, consumers do not differentiate among these terms very well. In fact, a significant portion of consumers in the study (40.8%) did not know if these terms are accurate to describe a man-made product that has all the optical, physical and chemical properties of a natural gemstone.

c. *Do consumers differentiate the term “synthetic” from the terms “imitation” or “simulation”?*

¹⁰⁴See 2016 GOOGLE STUDY, *supra* note 12.

Based on the responses received by the JVC Coalition, consumers do not differentiate among these terms to describe a gemstone that is not real.¹⁰⁵

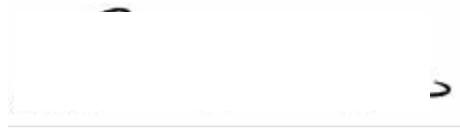
XI. CONCLUSION

For the reasons expressed above, we ask that the Commission accept the recommendations made in this submission. Thank you for your consideration of this important request.

Respectfully submitted:

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President, CEO and General Counsel
Jewelers Vigilance Committee



Ruth Batson
Executive Director and CEO
American Gem Society



David Bonaparte
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Jewelers of America



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¹⁰⁵*Id.*

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Jeffrey Post
Secretary Treasurer
Natural Color Diamond Association



Ronnie VanderLinden
President
Diamond Manufacturers and Importers of America

Attached: Exhibits 1 through 12

**Statement of Grigory Raykhtsaum Regarding Surface Applications of Gold on Jewelry
Products
May 20, 2016**

I, Grigory Raykhtsaum, am Director of Metallurgy at Leach Garner, a company that manufactures precious metal products for the jewelry and industrial market, including articles with mechanically applied surface applications of precious metals, as well as precious metal alloys, beads, chains and jewelry findings.

Professional Background

I have been employed as Director of Metallurgy at Leach Garner since May of 2012. I was earlier employed by Stern-Leach, now part of Leach Garner, from 1984 to 2008, as a Senior Technologist and Senior Metallurgist. During that period, I was engaged in research and development for new products, and managed the Materials Characterization and Assaying laboratories for the company. Among my responsibilities was the design of corrosion and tarnish tests for precious metal alloys and coatings, as well as the development of standard methods for mechanical testing of finished jewelry. From 2008 to 2012, I was Vice President, Technology and Research and Development, at Sigmund Cohn Corporation in Mt. Vernon, New York, where I specialized in the manufacture of products composed of platinum group metals.

I hold an MS degree in Physics from the Polytechnic Institute in St. Petersburg, Russia. I have also completed all the courses required for a PhD degree in Materials Science at the Technological Institute at Northwestern University in Evanston, IL. I am a member of the International Precious Metals Institute (IPMI).

This statement is based on testing I performed in 2013,¹ on a review of testing performed by Tanury Industries and Taber Industries in 2013,² and described in the Statement of Michael

¹ Leach Garner Report, May 25, 2013, attached to 2013 JVC Coalition Response as Exhibit 5.

² Taber Industries Wear Test Report, May 24, 2013; Tanury Industries Vibration Wear Test Report, June 3, 2013, both attached to 2013 JVC Coalition Response as Exhibits 8 and 7 respectively.

Akkaoui dated June 4, 2013,³ and on my education and professional experience in the field of metallurgy and precious metal application processes.

Leach Garner Testing in 2013

In May of 2013 I conducted a study to illustrate the differences between articles with mechanically applied surface layers of precious metal, and articles with electrolytically applied surface layers of precious metal, when subjected to severe wear.⁴ In what is known as an “abrasion test,” samples of each type were placed in mass finishing equipment with a mixture of walnut shells and moderately abrasive paste and tumbled for several hours, to replicate “severe” wear. The test corresponded to a degree of prolonged handling and wear that was likely to exceed the life of an actual jewelry article.

After two and a half hours of exposure to this abrasive medium, the gold loss on the electrolytically plated items was 14 millionths of an inch. The gold loss on the items with mechanical applications after that period was 120 millionths of an inch, and 170 millionths of an inch after eight and a half hours.⁵ I co-authored a report, dated May 25, 2013, detailing the purpose of the test, the test method, and the results. In that report, I used the phrase “**prolonged exposure to normal wear and handling**” [emphasis added] to describe the severe wear test conditions described above.⁶

In the concluding section of my report I stated that the data supported a minimum thickness of 15 millionths of an inch for gold electroplate (.175 microns). Regarding mechanical applications of

³Statement of Michael A. Akkaoui, June 4, 2013, attached to 2013 JVC Coalition Response as Exhibit 6.

⁴ In the mechanical process, , a thin layer of karat gold is heat- and pressure-bonded to a substrate composed of a different metal. In the electrolytic process, a thin layer of gold or gold alloy is electronically deposited onto the substrate.

⁵ Leach Garner Report, May 25, 2013, *supra*. The reason that that the abrasion test removes more surface layer application from the electroplate than from the mechanical plate is indicated in Table 2 of the report, at page 2. Electroplated gold is much harder than 14K gold filled. The elements used in electrolytic platings of gold or gold alloy increase the hardness of the surface layer, making it very resistant to wear. The mechanical process, which relies on heat and pressure to cause the surface layer to adhere to the underlying metal, does not increase the hardness of the gold alloy in the surface layer.

⁶ Leach Garner Report, May 25, 2013, *supra*.

gold, Inoted in a statement submitted to the FTC in 2013 that a minimum thickness of 170 millionths of an inch (4.32 microns) would protect against “excessive – even harsh – handling.”⁷ These minimum thicknesses, of 15 millionths of an inch for gold electroplate and 170 millionths of an inch for mechanical applications of gold, would endure the type of severe wear replicated in two and a half hours, and eight and a half hours, respectively, of abrasion testing.

Explanation of Test Results and Recommendations

The purpose of this statement is to provide explanation and context for these conclusions. As noted above, our test goal was to compare the performance of mechanical applications of precious metal with electrolytic applications, and to show that electroplate was significantly inferior, due to thickness limitations required by that process. As noted above, to make that comparison, we subjected samples to *severe*, not normal, wear conditions. Thus, the test we conducted is not helpful in determining the appropriate minimum thickness for products that are exposed to normal wear.

Gold Electroplate

As to gold electroplate, the standard of seven millionths of an inch (.175 microns) is long established in the trade and I am unaware of consumer complaints related to it. For that reason, I do not recommend any change to this standard. Seven millionths of an inch will withstand normal wear, as demonstrated by the Tanury and Taber testing described above.

Mechanical Applications of Gold

As to mechanical applications of gold, the testing I performed and reported on in 2013 does not provide a basis for establishing a minimum thickness requirement gauged to normal wear.⁸ Moreover, I am unaware of any consumer complaints related to the lack of a thickness minimum for use of these terms. For these reason, I do not recommend that one be imposed.

⁷ 2013 JVC Coalition Response, *Statement of Grigory Raykhtsaum, September 25, 2012*, attached to that Response as Exhibit 4

⁸ The current *Jewelry Guides* do not contain a minimum thickness requirement for use of any terms that describe mechanical surface application of gold.

This is change from the recommendation that I made to the FTC in 2013 regarding mechanical applications of gold. At that time, as noted above, I recommended the imposition of a minimum thickness standard (170 millionths of an inch) for any article with a mechanical application of gold, based on the severe wear test I described. I have now concluded that the imposition of a thickness standard, particularly one that is based on a severe wear test, is not required. The weight fraction of karat gold fully and adequately describes articles with mechanically applied applications, and sets a sufficient standard.

I recommend that mechanical applications of gold not drop below 1/40th the weight of the metal in the entire article.⁹ This was my original recommendation to the FTC in 2012, which I have now concluded is the correct one.¹⁰ As I noted then, “[i]n my experience, gained over 28 years in the field, reasonable durability is achieved when the amount of precious metal in the product...constitutes at least 1/40th of the weight of the metal in the entire article.” This is accepted practice in the industry, and works to the benefit of consumers, but is not explicitly stated in the Jewelry Guides.

Thank you for the opportunity to share my expertise with the Commission.



Grigory Raykhtsaum
Director of Metallurgy

May 20, 2016

Date

Leach Garner
49 Pearl Street
Attleboro, MA 02703

⁹ There is as weight ratio requirement at Section 23.4(c)(3) of the current *Jewelry Guides* for use of the term “gold filled” – the gold in the article must be 1/20th the weight of the metal in the entire article. If the weight ratio falls below 1/40th, the terms “rolled gold plate” or “gold overlay” may be used, and the weight ratio must be disclosed. However, there is no minimum weight ratio for use of either term.

¹⁰ 2012 JVC Coalition Response, *Statement of Grigory Raykhtsaum, September 25, 2012*, attached to that response as Exhibit 9.

Jewelers Vigilance Committee

Presented by: Harris Poll
April 20, 2016

Survey Methodology

The 2016 Jewelers Vigilance Committee (JVC) survey was conducted online within the United States by Harris Poll on behalf of the JVC between March 29 and April 4, 2016 among 1,014 US residents age 18+ who have either purchased fine jewelry in the past year or would at least consider purchasing any in the future. Figures for age, sex, race/ethnicity, education, region and household income were weighted where necessary to bring them into line with their actual proportions in the population. Propensity score weighting was used to adjust for respondents' propensity to be online.

All sample surveys and polls, whether or not they use probability sampling, are subject to multiple sources of error which are most often not possible to quantify or estimate, including sampling error, coverage error, error associated with nonresponse, error associated with question wording and response options, and post-survey weighting and adjustments. Therefore, Harris Poll avoids the words "margin of error" as they are misleading. All that can be calculated are different possible sampling errors with different probabilities for pure, unweighted, random samples with 100% response rates. These are only theoretical because no published polls come close to this ideal.

Respondents for this survey were selected from among those who have agreed to participate in Harris Poll surveys. The data have been weighted to reflect the composition of the adult population. Because the sample is based on those who agreed to participate in the Harris Poll panel, no estimates of theoretical sampling error can be calculated.

For the purposes of this report, the term "jewelry non rejecter" refers to those US residents age 18+ who have either purchased fine jewelry in the past year or would at least consider purchasing any in the future.

NOTE: A (*) means less than one-half percent responding; and a (-) means non-response or zero percent

Key Findings

DIAMONDS

Seven in ten (70%) of jewelry non rejecters have seen or heard the term 'cultured' used when purchasing gems or jewelry, and when asked what they think it means, an array of responses were given.

When asked to compare the meaning of two terms describing diamonds, a plurality on each comparison answered that they **did not know** if the two terms being compared were the same: *a [manufacturer name]-created diamond and a cultured [manufacturer name]-created diamond (44%), a laboratory-created diamond and a cultured laboratory-created diamond (45%), a laboratory-grown diamond and a cultured laboratory-grown diamond (45%), and a synthetic diamond and a cultured synthetic diamond (43%)*. About a third in each case answered yes: *a [manufacturer name]-created diamond and a cultured [manufacturer name]-created diamond (34%), a laboratory-created diamond and a cultured laboratory-created diamond (33%), a laboratory-grown diamond and a cultured laboratory-grown diamond (33%), and a synthetic diamond and a cultured synthetic diamond (33%)*.

- *In all cases, men are more likely than women to think each pair of terms meant the same.*

When asked if the process for creating a cultured laboratory-grown/created diamond and a cultured pearl are the same, nearly half (49%) **did not know**, with 15% saying **yes** and 35% saying **no**.

- Those aged 18-34 are more likely than those aged 45-54 and aged 55 or older to think that the processes are the same (23% vs. 8% and 10%).

When asked which was the best description of the term "cultured laboratory-grown/created" diamond, half (50%) of jewelry non rejecters said they didn't know or that none did. About 1 in 5 each said **"a natural diamond seed grown in a press in a laboratory"** (21%) and **"an artificial seed grown in a laboratory"** (19%). Fewer felt it meant an *artificial seed grown in a natural environment (like a cultured pearl) (16%) or a natural seed grown in a natural environment (like a cultured pearl) (14%)*.

- Reflecting upon the fact they are more likely to think the processes were the same, those aged 18-34 are more likely than those aged 35-44, 45-54, and 55 or older to think that an artificial seed grown in a natural environment (like a cultured pearl) [28% vs. 14%, 12%, 5%] or a natural seed grown in a natural environment (like a cultured pearl) [22% vs. 11%, 8%, 10%] is the best description of the term "cultured laboratory-grown/created" diamond.

When asked whether several descriptions meant that the diamond was man-made or natural, a large majority in each case feel the terms describe man made diamonds: *a laboratory-created diamond (81%), a synthetic diamond (79%), a cultured laboratory-created diamond (72%), a laboratory-grown diamond (71%), a cultured laboratory-grown diamond (65%), and a cultured [manufacture name]-created diamond (62%)*.

The term "cultured" seemed to more confusion with some, with 1 in 5 jewelry non rejecters not sure about each of these terms. For comparison, about 1 in 10 is confused by the other terms.

A plurality (45%) of jewelry non rejecters state that synthetic diamond is the best term to describe a man-made diamond. In a distant second is laboratory-created diamond (29%), followed by less than 1 in 10 who answered cultured laboratory-created diamond (7%), laboratory-grown diamond (6%), cultured laboratory-grown diamond (5%), and diamond (4%). Another 5% didn't feel any of these terms fit.

- Women are more likely than men to say laboratory-created diamond (34% vs. 24%).

When asked why they selected what they did, the majority of those who chose synthetic diamond (n=460) say that they did so because the term describes that the diamond is **not "real" or natural** (57%). The plurality (21%-41%) of those who chose a term with "laboratory" in it, say the term **describes how the diamond was made**.

After randomly being assigned one of 6 terms to describe a diamond, and being asked to evaluate true/false statements using the term, a large majority, regardless of the term inserted state it's "true" that **"a [] is generated by man in special conditions..."** [Laboratory -created diamond (71%), Laboratory-grown diamond (74%), Cultured laboratory - created diamond (59%), Cultured laboratory-grown diamond (66%), Synthetic diamond (74%), Cultured diamond (62%), Cultured [manufacturer name]-created diamond (65%)].

Similarly, a majority in each case say “**false**” to their term meaning the **same as a natural diamond** [Laboratory - created diamond (59%), Laboratory-grown diamond (70%), Cultured laboratory - created diamond (60%), Cultured laboratory-grown diamond (64%), Synthetic diamond (79%), Cultured diamond (52%), Cultured [manufacturer name]-created diamond (63%)].

A majority in each case also say “**false**” to their term meaning having the **same value as a natural diamond** [Laboratory -created diamond (62%), Laboratory-grown diamond (66%), Cultured laboratory - created diamond (61%), Cultured laboratory-grown diamond (58%), Synthetic diamond (78%), Cultured diamond (48%), Cultured [manufacturer name]-created diamond (60%)].

And in each case each say “**false**” to their term meaning having **as rare as a natural diamond** [Laboratory -created diamond (68%), Laboratory-grown diamond (65%), Cultured laboratory - created diamond (71%), Cultured laboratory-grown diamond (62%), Synthetic diamond (73%), Cultured diamond (52%), Cultured [manufacturer name]-created diamond (56%)].

Strong majorities agree that:

- Different terms should be clearly defined for consumers. (93%)
- The same terms for man-made diamonds should be used universally (i.e., in the United States and other countries). (91%)
- I would find it confusing if different terms were used in the United States and other countries when describing man-made diamonds. (85%)
- Different terms are used for man-made diamonds in an attempt to trick consumers. (81%)
 - Men are more likely than women to agree with this (85% vs. 78%).

GOLD

When asked to think about alloys made with various proportions of gold and how the proportion impacted aspects of the alloy, nearly 8 in 10 jewelry non rejecters(77%) say that the resale value is majorly/moderately impacted. About 7 in 10 (71%) say that overall durability is majorly/moderately impacted, followed by just over 6 in 10 who felt color (65%), likelihood to tarnish (62%), and likelihood to corrode (61%). Surprisingly, nearly 3 in 4 (73%) think the purity of the gold used is major or moderately impacted based on its proportion in the alloy.

- Those aged 18-34 are more likely than those aged 45-54 and 55 or older to think there is a major/moderate impact on **the likelihood to tarnish**(72% vs. 51% and 58%) and **the likelihood to corrode**(73% vs. 54% and 52%).

Over 7 in 10 (71%) jewelry non rejecters feel that the minimum amount of gold needed for an item to be described as “gold” is 50% (or more)—with 20% expected all or almost all pure gold. Three percent stated it would not matter, while 16% were not sure.

True or False? Six in ten (59%) correctly say it is true that a karat is measurement of weight for precious metals—but nearly 1 in 5 (18%) said they didn’t know. Meanwhile 3 in 10 (31%) incorrectly thought the terms carat and karat mean the same thing and 3 in 10 (30%) didn’t know. When it comes to the amount of gold in an item, less than half in each case know that it is true 14K means the gold is 14/24th pure (46%) and that it is false that 14K means there is only 14% of gold in the item (49%). In both cases, sizeable percentages (41% and 31%, respectively) say they don’t know the correct answer.

With respect to gold coating, sizeable percentages in each case did not know how to respond to the true/false statements.

Don’t know percentages:

- Gold flashed items are generally very durable. (61%)
- A gold-filled item must be made of at least 25% gold. (59%)
- Gold over uses low karat gold (less than 10K). (58%)
- Rolled gold plate and gold overlay are the same thing. (58%)
- Gold electroplated typically lasts longer than gold washed. (57%)
- Gold layered items are typically more durable than gold electroplated items. (56%)
- Gold washed and gold flashed are just as thick as gold-plated. (55%)
- Gold overlay always uses silver as the base metal under the overlay. (54%)
- Rolled gold plate and gold plated items are created by two different processes. (54%)

- There are no standard thickness requirements for items that are heavy gold electroplated. (54%)
- Gold over and gold plated are the same thing. (49%)
- Gold plated items use low karat gold (less than 10K). (48%)
- Different metals are used as a base for different processes such as gold plated, gold washed and gold layered. (41%)
- Gold plated items are not likely to tarnish over time. (33%)

Meanwhile, minorities in each case got it right or wrong.

- Those aged 18-34 are more likely than all other ages groups (35-44; 45-54; and 55+) to think “*gold washed and gold flashed are just as thick as gold-plated*” (21% vs. 9% and 9% and 7%).

Expectations for gold plated items were generally reasonable, with 8 in 10 (84%) expecting that if a product is described as having a coating of gold, that there should be a minimum thickness required for that coating; about 3 in 4 (73%) expecting that products that are coated with gold will tarnish sooner than products composed throughout of gold, and about 7 in 10 (69%) expecting that products that are coated with gold will be less durable than products that are composed throughout of gold.

SILVER

When asked to think about alloys made with various proportions of silver and how the proportion impacted aspects of the alloy, nearly 7 in 10 jewelry non rejecters say that the likelihood to tarnish (72%), resale value (71%), and overall durability (71%) is majorly/moderately impacted, followed by just over 6 in 10 who state likelihood to color (62%) and corrode (65%) are.

One in five (20%) say that a silver item should contain all or almost all pure silver to be described as “sterling silver”, while another 1 in 4 (24%) say a minimum of 92.5 percent. About 1 in 5 (21%) don’t know.

About 1 in 5 (22%) say that a sterling silver item should contain all or almost all pure silver to be described as “sterling silver”, while another 1 in 4 (26%) say a minimum of 92.5 percent. About 1 in 5 (22%) don’t know.

When asked about silver coated items, large majorities had specific expectations of the items. Nearly 9 in 10 (87%) say they expect that if a product is described as having a coating of silver, that there should be a minimum thickness required for that coating. About 3 in 4 say they expect that products that are coated with silver will tarnish sooner than products composed throughout of silver (73%) and that products that are coated with silver will be less durable than products that are composed throughout of silver (73%).

PLATINUM

When asked about platinum coated items, large majorities had specific expectations of the items. Nearly 9 in 10 (87%) say they expect that if a product is described as having a coating of platinum, that there should be a minimum thickness required for that coating. About 2 in 3 say they expect that products that are coated with platinum will be less durable than products that are composed throughout of platinum (68%) and that products that are coated with platinum will tarnish sooner than products composed throughout of platinum (66%).

PALLADIUM

When asked about palladium coated items, large majorities had specific expectations of the items. Over 8 in 10 (84%) say they expect that if a product is described as having a coating of palladium, that there should be a minimum thickness required for that coating. About 2 in 3 say they expect that products that are coated with palladium will be less durable than products that are composed throughout of palladium (67%) and that products that are coated with palladium will tarnish sooner than products composed throughout of palladium (65%).

RHODIUM

When asked about rhodium coated items, large majorities had specific expectations of the items. Over 8 in 10 (82%) say they expect that if a product is described as having a coating of rhodium, that there should be a minimum thickness required for that coating. About 2 in 3 say they expect that products that are coated with rhodium will be less durable than products that are composed throughout of rhodium (67%) and that products that are coated with rhodium will tarnish sooner than products composed throughout of rhodium (66%).

CORE QUESTIONS

DIAMONDS

BASE: QUALIFIED RESPONDENTS

Q700 Have you ever seen or heard the term 'cultured' used when purchasing gems or jewelry?

	Total
Base	1014
Yes	70%
No	30%

BASE: QUALIFIED RESPONDENTS

Q705 Regardless of whether you have seen or heard the term before, what does 'cultured' specifically mean to you in the context of gems and jewelry? Please type your response below, in your own words. Please be as thorough as possible.

	Total
Base	1014
CHARACTERISTICS OF JEWELRY (NET)	60%
TYPE OF JEWEL/GEM/STONE (SUB-NET)	33%
Pearls/Cultured pearl	22%
Jewel/Stones/Gems (Unspec.)	8%
Jewelry/Made specifically for jewelry	5%
Other type of jewel/gem/stone mentions	2%
NATURAL (SUB-NET)	16%
Artificially made/created/Not natural	11%
Natural	4%
Grown under water/sea/salt water	1%
Other natural mentions	*
QUALITY (SUB-NET)	12%
Quality/High quality	4%
Real/Not fake	2%
Fine goods/jewelry	2%
Not real/Fake	1%
Hand made	1%
Pure	1%
Other quality mentions	1%
STYLE (SUB-NET)	7%
Classy/Sophisticated	4%
Refined	3%
Other style mentions	1%
APPEARANCE (SUB-NET)	4%
Attractive/Beautiful looking	1%
Polished/Shined	1%

Colored/Color of jewel/gem/stone	1%
Other appearance mentions	1%
UNIQUENESS (SUB-NET)	2%
Unique/Different/New	2%
Other uniqueness mentions	*
SIZE/SHAPE (SUB-NET)	1%
Shaped/Shaped in a certain way	1%
Other size/shape mentions	1%
MISCELLANEOUS CHARACTERISTICS OF JEWELRY (SUB-NET)	3%
Cut of the jewel/gem/stone	2%
Other miscellaneous characteristics of jewelry mentions	1%
CREATED PROCESS (NET)	41%
RAISED/FARMED (SUB-NET)	10%
Grown/Farmed (Unspec.)	8%
Raised/Farm raised	3%
GENERAL CREATED PROCESS (SUB-NET)	6%
Process used to make/create it	2%
It's made/created (Unspec.)	2%
Where it is made/created/Describes the origin of it	2%
Treated in some way	*
Other general created process mentions	*
Lab Process (SUB-NET)	5%
Made/Created/Grown in a lab	5%
Other lab process mentions	1%
MANUFACTURED (SUB-NET)	2%
Manufactured	2%
Other manufactured mentions	*
MISCELLANEOUS CREATED PROCESS (SUB-NET)	27%
Man made/created	16%
Pearls that are created/grown inside of oysters	4%
Made/Created in a controlled environment/conditions	4%
Aged/Vintage	1%
Harvested	1%
Cultured/Cultivated	1%
Altered/Scientifically altered	1%
Other miscellaneous created process mentions	4%
WORD APPEAL (NET)	9%
Relating to a specific culture	3%
Good/Like it	2%
Enhanced	1%
Other word appeal mentions	4%

ECONOMY (NET)	3%
Expensive	2%
Valuable/High value	1%
Other economy mentions	*
MISCELLANEOUS (NET)	2%
Only heard the term before	*
Other mentions	2%
None	2%
Don't know	11%
Declined to answer	2%

BASE: QUALIFIED RESPONDENTS

Q710 Do these terms relating to diamonds mean the same thing?

Summary Table: Yes

	Total
Base	1014
A [manufacturer name]-created diamond and a cultured [manufacturer name]-created diamond	34%
A laboratory-created diamond and a cultured laboratory-created diamond	33%
A laboratory-grown diamond and a cultured laboratory-grown diamond	33%
A synthetic diamond and a cultured synthetic diamond	33%

A laboratory-created diamond and a cultured laboratory-created diamond

	Total
Base	1014
Yes	33%
No	22%
Don't know	45%

A laboratory-grown diamond and a cultured laboratory-grown diamond

	Total
Base	1014
Yes	33%
No	22%
Don't know	45%

A [manufacturer name]-created diamond and a cultured [manufacturer name]-created diamond

	Total
Base	1014
Yes	34%
No	22%
Don't know	44%

A synthetic diamond and a cultured synthetic diamond

	Total
Base	1014
Yes	33%
No	24%
Don't know	43%

BASE: QUALIFIED RESPONDENTS

Q715 Is the process used to create a cultured laboratory-grown/created diamond and a cultured pearl the same?

	Total
Base	1014
Yes	15%
No	36%
I don't know	49%

BASE: QUALIFIED RESPONDENTS

Q720 Which of the following, if any, describe the term "cultured laboratory-grown/created" diamond?

	Total
Base	1014
ANY LISTED (NET)	50%
A natural diamond seed grown in a press in a laboratory	21%
An artificial seed grown in a laboratory	19%
An artificial seed grown in a natural environment (like a cultured pearl)	16%
A natural seed grown in a natural environment (like a cultured pearl)	14%
Don't know	42%
None of these	7%

BASE: QUALIFIED RESPONDENTS

Q725 For each of the following terms used to describe types of diamonds, please indicate whether you think this diamond is a natural diamond or a man-made diamond.

A cultured laboratory-created diamond

	Total
Base	1014
...is a man-made diamond	72%
...is a natural diamond	10%
I don't know	18%

A cultured laboratory-grown diamond

	Total
Base	1014
...is a man-made diamond	65%
...is a natural diamond	16%
I don't know	19%

A laboratory-created diamond

	Total
Base	1014
....is a man-made diamond	81%
...is a natural diamond	6%
I don't know	14%

A laboratory-grown diamond

	Total
Base	1014
....is a man-made diamond	71%
...is a natural diamond	12%
I don't know	16%

A synthetic diamond

	Total
Base	1014
....is a man-made diamond	79%
...is a natural diamond	8%
I don't know	12%

A cultured [manufacturer name]-created diamond

	Total
Base	1014
....is a man-made diamond	62%
...is a natural diamond	18%
I don't know	20%

BASE: QUALIFIED RESPONDENTS

Q735 In your opinion, which of the following would be the most accurate term to describe man-made diamonds?

	Total
Base	1041
ANY LISTED (NET)	95%
Laboratory-created diamond	29%
Laboratory-grown diamond	6%
Cultured laboratory-created diamond	7%
Cultured laboratory-grown diamond	5%
Synthetic diamond	45%
Diamond	4%
None of these	5%

BASE: QUALIFIED RESPONDENTS

Q740 In your own words, please explain below why you chose the option [INSERT FROM Q735] in the previous question as the most accurate term to describe man-made diamonds?

	Laboratory-created diamond (A)	Laboratory-grown diamond (B)	Cultured laboratory-created diamond (C)	Cultured laboratory-grown diamond (D)	Synthetic diamond (E)	Diamond (F)
Base	293	68	75	40	460	41
Term describes it is not "real"/natural	27%C	21%	10%	14%	57%ABC	7%
Term describes how it was made	41%CE	21%	34%E	38%	10%	11%
Term is the most accurate/correct/best fit	12%	11%	18%	6%	9%	14%
Term is clear/honest/not deceptive	4%	7%	1%	3%	10%A	2%
Term sounds good	2%	8%	4%	2%	3%	2%
Just an opinion/guess	1%	-	2%	1%	1%	-
A diamond is diamond	1%	-	1%	-	-	11%
Other mentions	3%	11%A	11%A	7%	5%	33%
None	1%	6%AE	-	-	0	-
Don't know	3%	6%	5%	29%	4%	13%
Declined to answer	5%	9%	14%	-	2%	6%

BASE: QUALIFIED RESPONDENTS

Q750 Man-made diamonds are often described in different ways. How strongly do you agree or disagree with the following statements?

Summary Table: Strongly/Somewhat Agree

	Total
Base	1041
Different terms should be clearly defined for consumers.	93%
The same terms for man-made diamonds should be used universally (i.e., in the United States and other countries).	91%
I would find it confusing if different terms were used in the United States and other countries when describing man-made diamonds.	85%
Different terms are used for man-made diamonds in an attempt to trick consumers.	81%

I would find it confusing if different terms were used in the United States and other countries when describing man-made diamonds.

	Total
Base	1041
STRONGLY/SOMEWHAT AGREE (NET)	85%
Strongly agree	40%
Somewhat agree	44%
STRONGLY/SOMEWHAT DISAGREE (NET)	15%
Somewhat disagree	10%
Strongly disagree	5%

The same terms for man-made diamonds should be used universally (i.e., in the United States and other countries).

	Total
Base	1041
STRONGLY/SOMEWHAT AGREE (NET)	91%
Strongly agree	52%
Somewhat agree	40%
STRONGLY/SOMEWHAT DISAGREE (NET)	9%
Somewhat disagree	5%
Strongly disagree	4%

Different terms are used for man-made diamonds in an attempt to trick consumers.

	Total
Base	1041
STRONGLY/SOMEWHAT AGREE (NET)	81%
Strongly agree	30%
Somewhat agree	51%
STRONGLY/SOMEWHAT DISAGREE (NET)	19%
Somewhat disagree	15%
Strongly disagree	4%

Different terms should be clearly defined for consumers.

	Total
Base	1041
STRONGLY/SOMEWHAT AGREE (NET)	93%
Strongly agree	70%
Somewhat agree	24%
STRONGLY/SOMEWHAT DISAGREE (NET)	7%
Somewhat disagree	4%
Strongly disagree	3%

BASE: QUALIFIED RESPONDENTS

Q755 Do you believe the following statements are true or false?

Summary Table: True

	Laboratory - created diamond (A)	Laboratory - grown diamond (B)	Cultured laboratory - created diamond (C)	Cultured laboratory - grown diamond (D)	Synthetic diamond (E)	Cultured diamond (F)	Cultured [manufacturer name]-created diamond (G)
Base	142	145	144	144	145	149	145
A ... is generated by man in special conditions.	71%	74%	59%	66%	74% ^C	62%	65%
A ... has exactly the same properties as a natural diamond.	20%	38% ^{ADE}	31%	20%	22%	31%	27%
A ... holds its value over time like a natural diamond.	21%	18%	23%	21%	15%	26%	27%
A ... is grown on a farm in natural conditions.	15%	8%	15%	16%	18%	24% ^B	18%
A ... is generated the same way as a natural diamond.	15%	16%	19%	9%	15%	25% ^D	13%
A ... is the same as a natural diamond.	13%	10%	21% ^D	9%	10%	20%	14%
A ... has the same value as a natural diamond.	10%	6%	14%	12%	9%	12%	12%
A ... is as rare as a natural diamond.	9%	7%	7%	6%	11%	14%	20% ^{BCD}

A ... is the same as a natural diamond.

	Laboratory - created diamond (A)	Laboratory - grown diamond (B)	Cultured laboratory - created diamond (C)	Cultured laboratory - grown diamond (D)	Synthetic diamond (E)	Cultured diamond (F)	Cultured [manufacturer name]-created diamond (G)
Base	142	145	144	144	145	149	145
True	13%	10%	21%D	9%	10%	20%	14%
False	59%	70%F	60%	64%	79%ACDFG	52%	63%
Don't know	28%E	20%	19%	27%E	11%	28%E	23%

A ... is generated the same way as a natural diamond.

	Laboratory - created diamond (A)	Laboratory - grown diamond (B)	Cultured laboratory - created diamond (C)	Cultured laboratory - grown diamond (D)	Synthetic diamond (E)	Cultured diamond (F)	Cultured [manufacturer name]-created diamond (G)
Base	142	145	144	144	145	149	145
True	15%	16%	19%	9%	15%	25%D	13%
False	54%	49%	47%	54%	67%BCF	41%	55%
Don't know	31%E	35%E	34%E	37%E	17%	34%E	32%E

A ... has the same value as a natural diamond.

	Laboratory - created diamond (A)	Laboratory - grown diamond (B)	Cultured laboratory - created diamond (C)	Cultured laboratory - grown diamond (D)	Synthetic diamond (E)	Cultured diamond (F)	Cultured [manufacturer name]-created diamond (G)
Base	142	145	144	144	145	149	145
True	10%	6%	14%	12%	9%	12%	12%
False	62%	66%F	61%	58%	78%ACDFG	48%	60%
Don't know	28%E	27%E	25%E	30%E	12%	40%CE	28%E

A ... is as rare as a natural diamond.

	Laboratory - created diamond (A)	Laboratory - grown diamond (B)	Cultured laboratory - created diamond (C)	Cultured laboratory - grown diamond (D)	Synthetic diamond (E)	Cultured diamond (F)	Cultured [manufacturer name]-created diamond (G)
Base	142	145	144	144	145	149	145
True	9%	7%	7%	6%	11%	14%	20%BCD
False	68%F	65%	71%F	62%	73%FG	52%	56%
Don't know	22%	28%	23%	33%E	16%	34%E	24%

A ... is grown on a farm in natural conditions.

	Laboratory - created diamond (A)	Laboratory - grown diamond (B)	Cultured laboratory - created diamond (C)	Cultured laboratory - grown diamond (D)	Synthetic diamond (E)	Cultured diamond (F)	Cultured [manufacturer name]-created diamond (G)
Base	142	145	144	144	145	149	145
True	15%	8%	15%	16%	18%	24%B	18%
False	46%F	48%F	41%	37%	44%	30%	40%
Don't know	39%	45%	44%	46%	39%	45%	42%

A ... is generated by man in special conditions.

	Laboratory - created diamond (A)	Laboratory - grown diamond (B)	Cultured laboratory - created diamond (C)	Cultured laboratory - grown diamond (D)	Synthetic diamond (E)	Cultured diamond (F)	Cultured [manufacturer name]-created diamond (G)
Base	142	145	144	144	145	149	145
True	71%	74%	59%	66%	74%C	62%	65%
False	10%	7%	13%	9%	15%	10%	13%
Don't know	19%	20%	28%E	25%E	11%	28%E	22%

A ... has exactly the same properties as a natural diamond.

	Laboratory - created diamond (A)	Laboratory - grown diamond (B)	Cultured laboratory - created diamond (C)	Cultured laboratory - grown diamond (D)	Synthetic diamond (E)	Cultured diamond (F)	Cultured [manufacturer name]-created diamond (G)
Base	142	145	144	144	145	149	145
True	20%	38%ADE	31%	20%	22%	31%	27%
False	42%	33%	39%	28%	44%E	30%	37%
Don't know	39%	29%	30%	53%BCEG	35%	39%	35%

A ... holds its value over time like a natural diamond.

	Laboratory - created diamond (A)	Laboratory - grown diamond (B)	Cultured laboratory - created diamond (C)	Cultured laboratory - grown diamond (D)	Synthetic diamond (E)	Cultured diamond (F)	Cultured [manufacturer name]-created diamond (G)
Base	142	145	144	144	145	149	145
True	21%	18%	23%	21%	15%	26%	27%
False	41%F	38%F	39%F	34%	51%DFG	20%	32%
Don't know	38%	44%	38%	45%	34%	54%ACE	41%

BASE: QUALIFIED RESPONDENTS

Q730 How much value do each of the following have when compared to a natural diamond?

Summary Table: A lot/Somewhat more resale value

	Total
Base	1014
Cultured diamond	18%
Cultured [manufacturer name]-created diamond	12%
Laboratory-created cultured diamond	9%
Laboratory-created diamond	8%

Laboratory-created diamond

	Total
Base	1014
A LOT/SOMEWHAT MORE RESALE VALUE (NET)	8%
A lot more resale value	2%
Somewhat more resale value	6%
The same resale value	16%
A LOT/SOMEWHAT LESS RESALE VALUE (NET)	76%
Somewhat less resale value	44%
A lot less resale value	32%

Cultured diamond

	Total
Base	1014
A LOT/SOMEWHAT MORE RESALE VALUE (NET)	18%
A lot more resale value	8%
Somewhat more resale value	10%
The same resale value	24%
A LOT/SOMEWHAT LESS RESALE VALUE (NET)	58%
Somewhat less resale value	37%
A lot less resale value	21%

Laboratory-created cultured diamond

	Total
Base	1014
A LOT/SOMEWHAT MORE RESALE VALUE (NET)	9%
A lot more resale value	2%
Somewhat more resale value	8%
The same resale value	18%
A LOT/SOMEWHAT LESS RESALE VALUE (NET)	72%
Somewhat less resale value	45%
A lot less resale value	28%

Cultured [manufacturer name]-created diamond

	Total
Base	1014
A LOT/SOMEWHAT MORE RESALE VALUE (NET)	12%
A lot more resale value	3%
Somewhat more resale value	9%
The same resale value	21%
A LOT/SOMEWHAT LESS RESALE VALUE (NET)	67%
Somewhat less resale value	42%
A lot less resale value	25%

GOLD

BASE QUALIFIED RESPONDENTS

Q760 Items made with gold are often mixed with other metals to form an alloy. How much of an impact do you think the proportion of gold to other metals in an alloy has on each of the following attributes of items made from an alloy?

Summary Table: Any Impact

	Total
Base	1014
Resale value	96%
Overall durability	93%
Color	92%
Likelihood to tarnish	90%
Purity of the gold used in the alloy	90%
Likelihood to corrode	89%

Summary Table: Major/Moderate Impact

	Total
Base	1014
Resale value	77%
Purity of the gold used in the alloy	73%
Overall durability	71%
Color	65%
Likelihood to tarnish	62%
Likelihood to corrode	61%

Resale value

	Total
Base	1014
ANY IMPACT (NET)	96%
A MAJOR/MODERATE IMPACT (SUB-NET)	77%
A major impact	41%
A moderate impact	37%
A slight impact	19%
No impact	4%

Color

	Total
Base	1014
ANY IMPACT (NET)	92%
A MAJOR/MODERATE IMPACT (SUB-NET)	65%
A major impact	26%
A moderate impact	39%
A slight impact	28%
No impact	8%

Likelihood to tarnish

	Total
Base	1014
ANY IMPACT (NET)	90%
A MAJOR/MODERATE IMPACT (SUB-NET)	62%
A major impact	28%
A moderate impact	34%
A slight impact	28%
No impact	10%

Likelihood to corrode

	Total
Base	1014
ANY IMPACT (NET)	89%
A MAJOR/MODERATE IMPACT (SUB-NET)	61%
A major impact	29%
A moderate impact	33%
A slight impact	28%
No impact	11%

Overall durability

	Total
Base	1014
ANY IMPACT (NET)	93%
A MAJOR/MODERATE IMPACT (SUB-NET)	71%
A major impact	35%
A moderate impact	36%
A slight impact	22%
No impact	7%

Purity of the gold used in the alloy

	Total
Base	1014
ANY IMPACT (NET)	90%
A MAJOR/MODERATE IMPACT (SUB-NET)	73%
A major impact	41%
A moderate impact	32%
A slight impact	17%
No impact	10%

BASE: QUALIFIED RESPONDENTS

Q765 When buying gold items, what do you expect the minimum amount of gold needed in that item for it to be described as “gold”?

	Total
Base	1014
50% OR MORE (NET)	71%
All or almost all pure gold	20%
90% - 99%	14%
80% - 89%	12%
70% - 79%	11%
60% - 69%	6%
50% - 59%	8%
40% - 49%	2%
30% - 39%	1%
20% - 29%	2%
10% - 19%	4%
Less than 10% pure gold	1%
It wouldn't matter how much gold it contained	3%
Not sure	16%

BASE: QUALIFIED RESPONDENTS

Q770 Do you believe the following statements are true or false?

Summary Table: True

	Total
Base	1014
A karat is a measurement of weight for precious metals.	59%
A gold item that is described as 14K means the gold is 14/24ths pure.	46%
The terms carat and karat mean the same thing.	31%
A gold item that is described as 14K means there is only 14% of gold in the item.	20%

A karat is a measurement of weight for precious metals.

	Total
Base	1014
True	59%
False	23%
Don't know	18%

A gold item that is described as 14K means the gold is 14/24ths pure.

	Total
Base	1014
True	46%
False	12%
Don't know	41%

A gold item that is described as 14K means there is only 14% of gold in the item.

	Total
Base	1014
True	20%
False	49%
Don't know	31%

The terms carat and karat mean the same thing.

	Total
Base	1014
True	31%
False	38%
Don't know	30%

BASE: QUALIFIED RESPONDENTS

Q775 Some jewelry products consist of precious metal (gold, silver or platinum) throughout, and some consist of a coating of precious metal over another metal.

Please think specifically about gold items you might purchase. How much do you agree or disagree with the following statements, regarding these products.

Summary Table: Strongly/Somewhat Agree

	Total
Base	1014
I expect that if a product is described as having a coating of gold, that there should be a minimum thickness required for that coating.	84%
I expect that products that are coated with gold will tarnish sooner than products composed throughout of gold.	73%
I expect that products that are coated with gold will be less durable than products that are composed throughout of gold.	69%

I expect that products that are coated with gold will tarnish sooner than products composed throughout of gold.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	73%
Strongly agree	32%
Somewhat agree	41%
STRONGLY/SOMEWHAT DISAGREE (NET)	27%
Somewhat disagree	21%
Strongly disagree	6%

I expect that products that are coated with gold will be less durable than products that are composed throughout of gold.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	69%
Strongly agree	30%
Somewhat agree	39%
STONGLY/SOMEWHAT DISAGREE (NET)	31%
Somewhat disagree	24%
Strongly disagree	8%

I expect that if a product is described as having a coating of gold, that there should be a minimum thickness required for that coating.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	84%
Strongly agree	34%
Somewhat agree	50%
STONGLY/SOMEWHAT DISAGREE (NET)	16%
Somewhat disagree	12%
Strongly disagree	4%

BASE: QUALIFIED RESPONDENTS

Q780 Items can have varying degrees of gold coating. For each of the following, please indicate whether you think the statement is true or false.

Summary Table: True

	Total
Base	1014
Different metals are used as a base for different processes such as gold plated, gold washed and gold layered.	48%
Gold plated items use low karat gold (less than 10K).	36%
Rolled gold plate and gold plated items are created by two different processes.	35%
There are no standard thickness requirements for items that are heavy gold electroplated.	30%
Gold over uses low karat gold (less than 10K).	28%
Gold electroplated typically lasts longer than gold washed.	28%
Gold layered items are typically more durable than gold electroplated items.	26%
A gold-filled item must be made of at least 25% gold.	26%
Gold plated items are not likely to tarnish over time.	26%
Gold over and gold plated are the same thing.	22%
Gold overlay always uses silver as the base metal under the overlay.	21%
Rolled gold plate and gold overlay are the same thing.	15%
Gold flashed items are generally very durable.	15%
Gold washed and gold flashed are just as thick as gold-plated.	12%

Gold washed and gold flashed are just as thick as gold-plated.

	Total
Base	1014
True	12%
False	33%
Don't know	55%

Gold over and gold plated are the same thing.

	Total
Base	1014
True	22%
False	29%
Don't know	49%

Gold electroplated typically lasts longer than gold washed.

	Total
Base	1014
True	28%
False	14%
Don't know	57%

Gold over uses low karat gold (less than 10K).

	Total
Base	1014
True	28%
False	14%
Don't know	58%

Gold layered items are typically more durable than gold electroplated items.

	Total
Base	1014
True	26%
False	18%
Don't know	56%

Gold plated items use low karat gold (less than 10K).

	Total
Base	1014
True	36%
False	16%
Don't know	48%

There are no standard thickness requirements for items that are heavy gold electroplated.

	Total
Base	1014
True	30%
False	16%
Don't know	54%

Different metals are used as a base for different processes such as gold plated, gold washed and gold layered.

	Total
Base	1014
True	48%
False	11%
Don't know	41%

Gold plated items are not likely to tarnish over time.

	Total
Base	1014
True	26%
False	42%
Don't know	33%

Gold flashed items are generally very durable.

	Total
Base	1014
True	15%
False	24%
Don't know	61%

A gold-filled item must be made of at least 25% gold.

	Total
Base	1014
True	26%
False	15%
Don't know	59%

Rolled gold plate and gold overlay are the same thing.

	Total
Base	1014
True	15%
False	26%
Don't know	58%

Rolled gold plate and gold plated items are created by two different processes.

	Total
Base	1014
True	35%
False	11%
Don't know	54%

Gold overlay always uses silver as the base metal under the overlay.

	Total
Base	1014
True	21%
False	25%
Don't know	54%

SILVER

BASE: QUALIFIED RESPONDENTS

Q785 Items made with **silver** are often mixed with other metals to form an alloy. How much of an impact do you think the proportion of silver to other metals in an alloy has on each of the following attributes of items made from an alloy?

Summary Table: Major/Moderate Impact

	Total
Base	1014
Purity of the silver used in the alloy	72%
Likelihood to tarnish	72%
Resale value	71%
Overall durability	71%
Likelihood to corrode	65%
Color	62%

Resale value

	Total
Base	1014
MAJOR/MODERATE IMPACT (NET)	71%
A moderate impact	38%
A major impact	33%
NO/SLIGHT IMPACT (NET)	29%
A slight impact	23%
No impact	6%

Color

	Total
Base	1014
MAJOR/MODERATE IMPACT (NET)	62%
A major impact	25%
A moderate impact	38%
NO/SLIGHT IMPACT (NET)	38%
A slight impact	28%
No impact	10%

Likelihood to tarnish

	Total
Base	1014
MAJOR/MODERATE IMPACT (NET)	72%
A major impact	28%
A moderate impact	44%
NO/SLIGHT IMPACT (NET)	28%
A slight impact	21%
No impact	7%

Likelihood to corrode

	Total
Base	1014
MAJOR/MODERATE IMPACT (NET)	65%
A major impact	30%
A moderate impact	35%
NO/SLIGHT IMPACT (NET)	35%
A slight impact	27%
No impact	8%

Overall durability

	Total
Base	1014
MAJOR/MODERATE IMPACT (NET)	71%
A major impact	30%
A moderate impact	41%
NO/SLIGHT IMPACT (NET)	29%
A slight impact	23%
No impact	7%

Purity of the silver used in the alloy

	Total
Base	1014
MAJOR/MODERATE IMPACT (NET)	72%
A major impact	33%
A moderate impact	39%
NO/SLIGHT IMPACT (NET)	28%
A slight impact	20%
No impact	8%

BASE: QUALIFIED RESPONDENTS

Q790 When buying **silver** items, what do you expect the minimum amount of silver in that item necessary for it to be described as "silver"?

	Total
Base	1014
All or almost all pure silver	20%
92.5% pure silver	24%
80% pure silver	13%
75% pure silver	7%
66.6% pure silver	5%
50% pure silver	7%
Less than 50%	3%
Don't know/not sure	21%

BASE: QUALIFIED RESPONDENTS

Q795 When buying sterling **silver** items, what do you expect the minimum amount of silver in that item necessary for it to be described as "sterling silver"?

	Total
Base	1014
All or almost all pure silver	22%
92.5% pure silver	26%
80% pure silver	10%
75% pure silver	7%
66.6% pure silver	4%
50% pure silver	5%
Less than 50%	3%
Don't know/not sure	22%

BASE: QUALIFIED RESPONDENTS

Q800 Please think specifically about silver coated items you might purchase. How much do you agree or disagree with the following statements, regarding these products.

Summary Table: Strongly/Somewhat Agree

	Total
Base	1014
I expect that if a product is described as having a coating of silver, that there should be a minimum thickness required for that coating.	87%
I expect that products that are coated with silver will tarnish sooner than products composed throughout of silver.	73%
I expect that products that are coated with silver will be less durable than products that are composed throughout of silver.	73%

I expect that products that are coated with silver will tarnish sooner than products composed throughout of silver.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	73%
Strongly agree	27%
Somewhat agree	46%
STRONGLY/SOMEWHAT DISAGREE (NET)	27%
Somewhat disagree	21%
Strongly disagree	6%

I expect that products that are coated with silver will be less durable than products that are composed throughout of silver.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	73%
Strongly agree	26%
Somewhat agree	46%
STRONGLY/SOMEWHAT DISAGREE (NET)	27%
Somewhat disagree	24%
Strongly disagree	3%

I expect that if a product is described as having a coating of silver, that there should be a minimum thickness required for that coating.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	87%
Strongly agree	40%
Somewhat agree	48%
STRONGLY/SOMEWHAT DISAGREE (NET)	13%
Somewhat disagree	11%
Strongly disagree	2%

PLATINUM

BASE: QUALIFIED RESPONDENTS

Q805 Some jewelry products consist of precious metal throughout, and some consist of a coating of precious metal over another metal.

Please think specifically about **platinum**coated items you might purchase. How much do you agree or disagree with the following statements, regarding these products.

Summary Table: Strongly/Somewhat Agree

	Total
Base	1014
I expect that if a product is described as having a coating of platinum, that there should be a minimum thickness required for that coating.	87%
I expect that products that are coated with platinum will be less durable than products that are composed throughout of platinum.	68%
I expect that products that are coated with platinum will tarnish sooner than products composed throughout of platinum.	66%

I expect that products that are coated with platinum will tarnish sooner than products composed throughout of platinum.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	66%
Strongly agree	23%
Somewhat agree	43%
STRONGLY/SOMEWHAT DISAGREE (NET)	34%
Somewhat disagree	25%
Strongly disagree	9%

I expect that products that are coated with platinum will be less durable than products that are composed throughout of platinum.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	68%
Strongly agree	23%
Somewhat agree	45%
STRONGLY/SOMEWHAT DISAGREE (NET)	32%
Somewhat disagree	26%
Strongly disagree	6%

I expect that if a product is described as having a coating of platinum, that there should be a minimum thickness required for that coating.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	87%
Strongly agree	39%
Somewhat agree	48%
STRONGLY/SOMEWHAT DISAGREE (NET)	13%
Somewhat disagree	11%
Strongly disagree	2%

PALLADIUM

BASE: QUALIFIED RESPONDENTS

Q810 Please think specifically about **palladium coated** items you might purchase. How much do you agree or disagree with the following statements, regarding these products.

Summary Table: Strongly/Somewhat Agree

	Total
Base	1014
I expect that if a product is described as having a coating of palladium, that there should be a minimum thickness required for that coating.	84%
I expect that products that are coated with palladium will be less durable than products that are composed throughout of palladium.	67%
I expect that products that are coated with palladium will tarnish sooner than products composed throughout of palladium.	65%

I expect that products that are coated with palladium will tarnish sooner than products composed throughout of palladium.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	65%
Strongly agree	19%
Somewhat agree	46%
STRONGLY/SOMEWHAT DISAGREE (NET)	35%
Somewhat disagree	29%
Strongly disagree	6%

I expect that products that are coated with palladium will be less durable than products that are composed throughout of palladium.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	67%
Strongly agree	20%
Somewhat agree	47%
STRONGLY/SOMEWHAT DISAGREE (NET)	33%
Somewhat disagree	28%
Strongly disagree	5%

I expect that if a product is described as having a coating of palladium, that there should be a minimum thickness required for that coating.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	84%
Strongly agree	33%
Somewhat agree	51%
STRONGLY/SOMEWHAT DISAGREE (NET)	16%
Somewhat disagree	14%
Strongly disagree	2%

RHODIUM

BASE: QUALIFIED RESPONDENTS

Q815 Please think specifically about rhodium coated items you might purchase. How much do you agree or disagree with the following statements, regarding these products.

Summary Table: Strongly/Somewhat Agree

	Total
Base	1014
I expect that if a product is described as having a coating of rhodium, that there should be a minimum thickness required for that coating.	82%
I expect that products that are coated with rhodium will be less durable than products that are composed throughout of rhodium.	67%
I expect that products that are coated with rhodium will tarnish sooner than products composed throughout of rhodium.	66%

I expect that products that are coated with rhodium will tarnish sooner than products composed throughout of rhodium.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	66%
Strongly agree	18%
Somewhat agree	48%
STRONGLY/SOMEWHAT DISAGREE (NET)	34%
Somewhat disagree	27%
Strongly disagree	6%

I expect that products that are coated with rhodium will be less durable than products that are composed throughout of rhodium.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	67%
Strongly agree	20%
Somewhat agree	47%
STRONGLY/SOMEWHAT DISAGREE (NET)	33%
Somewhat disagree	28%
Strongly disagree	5%

I expect that if a product is described as having a coating of rhodium, that there should be a minimum thickness required for that coating.

	Total
Base	1014
STRONGLY/SOMEWHAT AGREE (NET)	82%
Strongly agree	33%
Somewhat agree	49%
STRONGLY/SOMEWHAT DISAGREE (NET)	18%
Somewhat disagree	14%
Strongly disagree	3%

SCREENING QUESTIONS

BASE: QUALIFIED RESPONDENTS

Q600 Which of the following items, if any, have you purchased in the past year, either for yourself or for someone else? Please select **all** that apply.

	Total
Base	1014
Lawn or gardening equipment	29%
Major appliance	28%
Fine jewelry	27%
Automobile	24%
None of these	38%

BASE: QUALIFIED RESPONDENTS

Q605 How likely are you to consider purchasing **fine jewelry**, either for yourself or someone else, in the future?

	Total
Base	1014
Will definitely consider	29%
Will probably consider	22%
Will possibly consider	49%
Will not consider at all	-

Demographics

BASE: QUALIFIED RESPONDENTS

Q268 Are you...?

	Total
Base	1014
Male	49%
Female	51%

BASE: QUALIFIED RESPONDENTS

Q280 Age

	Total
Base	1014
18 - 34	34%
35 - 44	18%
45 - 54	17%
55+	30%
MEAN	44.4

BASE: QUALIFIED RESPONDENTS

Q410 Which one of the following best describes your employment status?

	Total
Base	1014
EMPLOYED (NET)	66%
Employed full time	44%
Employed part time	12%
Self-employed full time	5%
Self-employed part time	4%
Not employed, but looking for work	3%
Not employed and not looking for work	1%
Retired	14%
Not employed, unable to work due to a disability or illness	4%
Student	6%
Stay-at-home spouse or partner	7%

BASE: QUALIFIED RESPONDENTS

Q462 Which of the following income categories best describes your total 2015 household income before/after taxes?

	Total
Base	1014
Less than \$15,000	7%
\$15,000 to \$24,999	7%
\$25,000 to \$34,999	9%
\$35,000 to \$49,999	12%
\$50,000 to \$74,999	17%
\$75,000 to \$99,999	12%
\$100,000 to \$124,999	11%
\$125,000 to \$149,999	6%
\$150,000 to \$199,999	7%
\$200,000 to \$249,999	2%
\$250,000 or more	4%
Decline to answer	7%

BASE: QUALIFIED RESPONDENTS

Q320 Region

	Total
Base	1014
East	22%
Midwest	22%
South	32%
West	24%

BASE: QUALIFIED RESPONDENTS

Q364 What is your marital status?

	Total
Base	1014
Never married	27%
Married or civil union	50%
Divorced	12%
Separated	2%
Widow/Widower	2%
Living with partner	7%

BASE: QUALIFIED RESPONDENTS

Q437 What is the highest level of education you have completed or the highest degree you have received?

	Total
Base	1014
HIGH SCHOOL OR LESS (NET)	28%
Less than high school	1%
Completed some high school	9%
Completed high school	14%
Job-specific training program(s) after high school	5%
SOME COLLEGE (NET)	37%
Some college, but no degree	22%
Associate Degree	14%
COLLEGE GRAD+ (NET)	35%
College (such as B.A., B.S.)	19%
Some graduate school, but no degree	2%
Graduate degree (such as MBA, MS, M.D., Ph.D.)	14%

BASE: QUALIFIED RESPONDENTS

Q485 Race/Ethnicity

	Total
Base	1014
White	66%
Hispanic	13%
Black/African American	12%
Native American or Alaskan Native	1%
South Asian	-
Chinese	2%
Korean	1%
Japanese	1%
Other Southeast Asian	2%
Filipino	1%
Some other race	1%
Decline to Answer	1%

Statement of Richard DePoto Regarding Rose Colored Electrolytic Applications of Karat Gold
May 25, 2016

I, Richard DePoto, am the Business Development Manager for Umicore GT / Uyemura International located at 240 Town Line Road in Southington, CT. Uyemura / Umicore GT is a company that produces, among other types of finishes, gold plating electrolytes for plating gold on various metals and materials.

Professional and Educational Background

I currently serve as Business Development Manager and Product Specialist for the Umicore GT / Uyemura International Corp.

I received a Bachelor of Science degree in Chemical Engineering from the University of Stony Brook in New York and have been involved in the chemical plating industry for over 30 years.

I have held numerous senior level engineering positions with companies such as Photocircuits in Glen Cove, NY, Akzo-Nobel in Riverhead, NY, and Amp Connector in Harrisburg, Pennsylvania. I have been with Uyemura International Corp for the past 10 years. During that period I have specialized in Electrolytic and Electroless precious metal plating.

I have authored numerous technical papers on Electroless and Electrolytic plating, and have authored and presented technical papers at the industry's annual technical meetings, NASF SUR/FIN, for the past three years (2013, 2014 and 2015). These papers have been published in the NASF scientific journal.

Rose Colored Electrolytic Applications of Karat Gold

Products with surface-layer applications of gold are produced by immersing a substrate, made of silver or a base metal, into a liquid bath of a gold alloy, and subjecting it to electric current, causing the gold alloy to adhere to the substrate. Gold alloy baths are created in dozens of colors and alloys, including rose.

The plated deposit from the Arguna 500 LC' Rose Gold bath, one of our products, is an alloy of 75% gold and 25% copper. The color of the deposit, Rose Gold, is the direct result of the ratio in the plated alloy. Any change to that alloy will result in a deposited color that does not match the

targeted color and the luster of the product. For example, an increase in the percentage of gold to 20 karat would produce a deposited color which would be gold rich and too yellow to meet the specifications for Rose Gold. The Rose Gold color and industry standard of Arguna 500 LC is the direct result of a plated 18K gold and copper deposit and cannot be adjusted without a significant change in color.

Thank you for the opportunity to share my expertise with the Commission.



Richard DePoto

May 25, 2016

Date

Uyemura / Umicore International
240 Town Line Rd
Southington, CT 06489



Test Report

PREPARED FOR:

Jewelers Vigilance Committee
Attn: Cecilia Gardner
801 2nd Avenue, Suite 303
New York, NY 10017

Testing ID: 100120812

Order Number: 2222.6

Trace Code & Receipt Date(s): A160340, May 3, 2016

Dates Test(s) Conducted: May 13, 2016 – May 17, 2016

Report Date: May 23, 2016

PRODUCT(S) TESTED:

Description	Stamping (Hallmark)	1 st Sample	Duplicate Sample
Hoop	SLC 10K	H-A	H-B
Stud*	LXG 10K	S-A	S-B
Ring	10 K S	R-A	R-B
Metal Square	No Stamp	MS-A	MS-B
Bracelet	SLC 480 PM	B-A	B-B

*The stud is too small to cut in half therefore performance testing was performed on S-A and S-B was the control sample.

TEST(S) PERFORMED:	TEST METHOD(S):	RESULT(S):
Confirmation of Stamping	Visual Inspection	Ref Only
Infrared Analysis for the presence of E-Coating	Doc ID 1248	Ref Only
Metal Content by XRF for screening purposes only	Doc ID 5294	Ref Only
Performance Testing	24 Hour Liver of Sulfur Exposure	Ref Only

TESTING DETAILS:

The submitted samples are photographed and visually examined and results were recorded on data sheets. A close up photograph of each stamp (hallmark) was requested by the client.

The samples were analyzed by FTIR for the presence of E-Coating using a Nicolet iS10 FTIR spectrophotometer equipped with an ATR accessory.

The samples were analyzed by XRF for metal content using a Fisherscope X-Ray XDV DD.

Performance testing was performed utilizing the following procedure:

- Samples are cut in half to result in four samples.
 - One half of the sample is subjected to wear and abrasion as outlined below. The other half sample is not abraded and use as the control.

Wear / Abrasion

Samples are subjected to wear/abrasion per EN12472 standards and this procedure attempts to simulate the wear and corrosion on a coated article during two years of normal use.

1. Samples are degreased using a neutral commercially available detergent – two minutes at room temperature, rinse with deionized water gently dry
2. Samples are exposed to corrosive medium – DL-lactic acid, sodium chloride and deionized water (simulates

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UL Verification Services, Inc., 1559 King Street, Enfield, CT 06082 USA
Phone: (860) 749-8371 | Fax: (860) 749-0196 | Email: QAINFO@UL.COM | Website: www.ul.com/consumer-products

**TEST RESULTS**

perspiration) – items are suspended a few centimeters above the corrosive medium in a closed container, and placed in an oven for two hours at 50°C. Samples are removed rinsed with deionized water and placed on absorbent paper and allowed to air dry at room temperature.

3. Samples are placed in a tumbler with wear media consisting of an abrasive paste and granules of coconut, walnut, peanut and almond shells ground to particles having dimensions between 0.8 mm and 1.3 mm.
4. Samples are tumbled at 30 rotations per minute for a total of five hours, 2.5 hours in the clockwise direction and 2.5 hours in the counter clockwise direction
5. Samples are removed, gently wiped with a soft cloth.

Following abrasion, the “worn” samples are photographed and subject to a proprietary chemical solution for 24 hours. Samples are observed and photographed every hour for the first eight hours and then again after 24 hours of exposure. Evaluation is noted at each incremental time frame and reported back as outlined in the table below. Half numbers are reported when a sample results fall between a severity ranges.

Severity	Severity Rating
No Change	0
Very Slight Change	1
Slight Change	2
Moderate Change	3
Severe Change	4

NOTE(S):

See individual Test Results attached.

Dina Flemati
Client Services Specialist
jvh



TEST RESULTS

Hoop H-A

Chemical/Analytical				
Test Property	Test Method/Citation	Product Requirement	Test Results	Rating
Confirmation of Stamping	Visual Analysis	The result of this test is reported for reference only; the result is not rated.	Identified as SLC 10K. The item is stamped SLC 10K.	Ref Only
Infrared Analysis for the Presence of E-Coating	Doc ID 1248	The result of this test is reported for reference only; the result is not rated.	The submitted sample was analyzed for the presence of e-coating using a Nicolet iS10 FTIR spectrophotometer. E-coating was not detected on the sample	Ref Only
Precious Metal Content	Doc ID 5294	The result of this test is reported for reference only; the result is not rated.	Gold Content: 41.56% Copper Content: 38.85% Silver Content: 12.89% Zinc Content: 5.52% Indium content: 1.18% Rubidium Content: 0.00%	Ref Only
Test Property	Test Method/Citation	Exposure Period	Test Results	Rating
Performance Testing	24 Hour Exposure to Liver of Sulfur	1 Hour	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	2 Hours	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	3 Hours	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	4 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	5 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	6 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	7 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	8 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	24 Hours	Degree of Tarnishing: Abraded: 4	Ref Only



TEST RESULTS

Hoop H-B

Chemical/Analytical				
Test Property	Test Method/Citation	Product Requirement	Test Results	Rating
Confirmation of Stamping	Visual Analysis	The result of this test is reported for reference only; the result is not rated.	Identified as SLC 10K. The item is stamped SLC 10K.	Ref Only
Infrared Analysis for the Presence of E-Coating	Doc ID 1248	The result of this test is reported for reference only; the result is not rated.	The submitted sample was analyzed for the presence of e-coating using a Nicolet iS10 FTIR spectrophotometer. E-coating was not detected on the sample	Ref Only
Precious Metal Content	Doc ID 5294	The result of this test is reported for reference only; the result is not rated.	Gold Content: 41.54% Copper Content: 39.69% Silver Content: 9.62% Zinc Content: 8.09% Indium content: 1.02% Rubidium Content: 0.04%	Ref Only
Test Property	Test Method/Citation	Exposure Period	Test Results	Rating
Performance Testing	24 Hour Exposure to Liver of Sulfur	1 Hour	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	2 Hours	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	3 Hours	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	4 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	5 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	6 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	7 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	8 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	24 Hours	Degree of Tarnishing: Abraded: 4	Ref Only



TEST RESULTS

Stud S-A

Chemical/Analytical				
Test Property	Test Method/Citation	Product Requirement	Test Results	Rating
Confirmation of Stamping	Visual Analysis	The result of this test is reported for reference only; the result is not rated.	Identified as LXG 10K. The item is stamped LXG 10K on the post and 10K on the backing.	Ref Only
Infrared Analysis for the Presence of E-Coating	Doc ID 1248	The result of this test is reported for reference only; the result is not rated.	The submitted sample was analyzed for the presence of e-coating using a Nicolet iS10 FTIR spectrophotometer. E-coating was not detected on the sample	Ref Only
Precious Metal Content	Doc ID 5294	The result of this test is reported for reference only; the result is not rated.	Gold Content: 41.30% Copper Content: 40.13% Silver Content: 8.05% Zinc Content: 10.52% Rubidium Content: 0.00%	Ref Only
Test Property	Test Method/Citation	Exposure Period	Test Results	Rating
Performance Testing	24 Hour Exposure to Liver of Sulfur	1 Hour	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	2 Hours	Degree of Tarnishing: Abraded: 2.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	3 Hours	Degree of Tarnishing: Abraded: 2.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	4 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	5 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	6 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	7 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	8 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	24 Hours	Degree of Tarnishing: Abraded: 3.5	Ref Only



TEST RESULTS

Stud S-B

Chemical/Analytical				
Test Property	Test Method/Citation	Product Requirement	Test Results	Rating
Confirmation of Stamping	Visual Analysis	The result of this test is reported for reference only; the result is not rated.	Identified as LXG 10K. The item is stamped LXG 10K on the post and 10K on the backing.	Ref Only
Infrared Analysis for the Presence of E-Coating	Doc ID 1248	The result of this test is reported for reference only; the result is not rated.	The submitted sample was analyzed for the presence of e-coating using a Nicolet iS10 FTIR spectrophotometer. E-coating was not detected on the sample	Ref Only
Precious Metal Content	Doc ID 5294	The result of this test is reported for reference only; the result is not rated.	Gold Content: 40.88% Copper Content: 39.96% Silver Content: 8.10% Zinc Content: 10.99% Rubidium content: 0.06%	Ref Only
Test Property	Test Method/Citation	Exposure Period	Test Results	Rating
Performance Testing	24 Hour Exposure to Liver of Sulfur	1 Hour	Degree of Tarnishing: Not Tested used as a control	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	2 Hours	Degree of Tarnishing: Not Tested used as a control	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	3 Hours	Degree of Tarnishing: Not Tested used as a control	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	4 Hours	Degree of Tarnishing: Not Tested used as a control	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	5 Hours	Degree of Tarnishing: Not Tested used as a control	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	6 Hours	Degree of Tarnishing: Not Tested used as a control	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	7 Hours	Degree of Tarnishing: Not Tested used as a control	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	8 Hours	Degree of Tarnishing: Not Tested used as a control	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	24 Hours	Degree of Tarnishing: Not Tested used as a control	Ref Only



TEST RESULTS

Ring R-A

Chemical/Analytical				
Test Property	Test Method/Citation	Product Requirement	Test Results	Rating
Confirmation of Stamping	Visual Analysis	The result of this test is reported for reference only; the result is not rated.	Identified as 10 K S. The item is stamped 10K S.	Ref Only
Infrared Analysis for the Presence of E-Coating	Doc ID 1248	The result of this test is reported for reference only; the result is not rated.	The submitted sample was analyzed for the presence of e-coating using a Nicolet iS10 FTIR spectrophotometer. E-coating was not detected on the sample	Ref Only
Precious Metal Content	Doc ID 5294	The result of this test is reported for reference only; the result is not rated.	Gold Content: 40.89% Copper Content: 39.76% Silver Content: 9.96% Zinc Content: 9.46% Rubidium Content: 0.07%	Ref Only
Test Property	Test Method/Citation	Exposure Period	Test Results	Rating
Performance Testing	24 Hour Exposure to Liver of Sulfur	1 Hour	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	2 Hours	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	3 Hours	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	4 Hours	Degree of Tarnishing: Abraded: 2.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	5 Hours	Degree of Tarnishing: Abraded: 2.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	6 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	7 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	8 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	24 Hours	Degree of Tarnishing: Abraded: 3.5	Ref Only



TEST RESULTS

Ring R-B

Chemical/Analytical				
Test Property	Test Method/Citation	Product Requirement	Test Results	Rating
Confirmation of Stamping	Visual Analysis	The result of this test is reported for reference only; the result is not rated.	Identified as 10 K S. The item is stamped 10K S.	Ref Only
Infrared Analysis for the Presence of E-Coating	Doc ID 1248	The result of this test is reported for reference only; the result is not rated.	The submitted sample was analyzed for the presence of e-coating using a Nicolet iS10 FTIR spectrophotometer. E-coating was not detected on the sample	Ref Only
Precious Metal Content	Doc ID 5294	The result of this test is reported for reference only; the result is not rated.	Gold Content: 41.34% Copper Content: 39.40% Silver Content: 9.98% Zinc Content: 9.23% Rubidium Content: 0.06%	Ref Only
Test Property	Test Method/Citation	Exposure Period	Test Results	Rating
Performance Testing	24 Hour Exposure to Liver of Sulfur	1 Hour	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	2 Hours	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	3 Hours	Degree of Tarnishing: Abraded: 2	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	4 Hours	Degree of Tarnishing: Abraded: 2.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	5 Hours	Degree of Tarnishing: Abraded: 2.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	6 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	7 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	8 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	24 Hours	Degree of Tarnishing: Abraded: 3.5	Ref Only



TEST RESULTS

Metal Square MS-A

Chemical/Analytical				
Test Property	Test Method/Citation	Product Requirement	Test Results	Rating
Confirmation of Stamping	Visual Analysis	The result of this test is reported for reference only; the result is not rated.	Identified as not having a stamp. The item is not stamped.	Ref Only
Infrared Analysis for the Presence of E-Coating	Doc ID 1248	The result of this test is reported for reference only; the result is not rated.	The submitted sample was analyzed for the presence of e-coating using a Nicolet iS10 FTIR spectrophotometer. E-coating was not detected on the sample	Ref Only
Precious Metal Content	Doc ID 5294	The result of this test is reported for reference only; the result is not rated.	Gold Content: 41.64% Copper Content: 42.08% Silver Content: 12.63% Zinc Content: 3.58% Rubidium content: 0.06%	Ref Only
Test Property	Test Method/Citation	Exposure Period	Test Results	Rating
Performance Testing	24 Hour Exposure to Liver of Sulfur	1 Hour	Degree of Tarnishing: Abraded: 2.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	2 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	3 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	4 Hours	Degree of Tarnishing: Abraded: 3.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	5 Hours	Degree of Tarnishing: Abraded: 3.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	6 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	7 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	8 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	24 Hours	Degree of Tarnishing: Abraded: 4	Ref Only



TEST RESULTS

Metal Square MS-B

Chemical/Analytical				
Test Property	Test Method/Citation	Product Requirement	Test Results	Rating
Confirmation of Stamping	Visual Analysis	The result of this test is reported for reference only; the result is not rated.	Identified as not having a stamp. The item is not stamped.	Ref Only
Infrared Analysis for the Presence of E-Coating	Doc ID 1248	The result of this test is reported for reference only; the result is not rated.	The submitted sample was analyzed for the presence of e-coating using a Nicolet iS10 FTIR spectrophotometer. E-coating was not detected on the sample	Ref Only
Precious Metal Content	Doc ID 5294	The result of this test is reported for reference only; the result is not rated.	Gold Content: 41.37% Copper Content: 42.02% Silver Content: 12.61% Zinc Content: 3.98% Rubidium content: 0.02%	Ref Only
Test Property	Test Method/Citation	Exposure Period	Test Results	Rating
Performance Testing	24 Hour Exposure to Liver of Sulfur	1 Hour	Degree of Tarnishing: Abraded: 2.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	2 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	3 Hours	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	4 Hours	Degree of Tarnishing: Abraded: 3.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	5 Hours	Degree of Tarnishing: Abraded: 3.5	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	6 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	7 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	8 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	24 Hours	Degree of Tarnishing: Abraded: 4	Ref Only



TEST RESULTS

Bracelet B-A

Chemical/Analytical

Test Property	Test Method/Citation	Product Requirement	Test Results	Rating
Confirmation of Stamping	Visual Analysis	The result of this test is reported for reference only; the result is not rated.	Identified as SLC 480 PM. The item is stamped SLC 480 PM.	Ref Only
Infrared Analysis for the Presence of E-Coating	Doc ID 1248	The result of this test is reported for reference only; the result is not rated.	The submitted sample was analyzed for the presence of e-coating using a Nicolet iS10 FTIR spectrophotometer. E-coating was not detected on the sample	Ref Only
Precious Metal Content	Doc ID 5294	The result of this test is reported for reference only; the result is not rated.	Gold Content: 24.70% Copper Content: 40.24% Silver Content: 23.15% Zinc Content: 8.56% Palladium Content: 1.81% Indium Content: 1.54%	Ref Only
Test Property	Test Method/Citation	Exposure Period	Test Results	Rating
Performance Testing	24 Hour Exposure to Liver of Sulfur	1 Hour	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	2 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	3 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	4 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	5 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	6 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	7 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	8 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	24 Hours	Degree of Tarnishing: Abraded: 4	Ref Only



TEST RESULTS

Bracelet B-B

Chemical/Analytical				
Test Property	Test Method/Citation	Product Requirement	Test Results	Rating
Confirmation of Stamping	Visual Analysis	The result of this test is reported for reference only; the result is not rated.	Identified as SLC 480 PM. The item is not stamped.	Ref Only
Infrared Analysis for the Presence of E-Coating	Doc ID 1248	The result of this test is reported for reference only; the result is not rated.	The submitted sample was analyzed for the presence of e-coating using a Nicolet iS10 FTIR spectrophotometer. E-coating was not detected on the sample	Ref Only
Precious Metal Content	Doc ID 5294	The result of this test is reported for reference only; the result is not rated.	Gold Content: 25.12% Copper Content: 40.88% Silver Content: 22.35% Zinc Content: 8.35% Palladium Content: 1.78% Indium Content: 1.51%	Ref Only
Test Property	Test Method/Citation	Exposure Period	Test Results	Rating
Performance Testing	24 Hour Exposure to Liver of Sulfur	1 Hour	Degree of Tarnishing: Abraded: 3	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	2 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	3 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	4 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	5 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	6 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	7 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	8 Hours	Degree of Tarnishing: Abraded: 4	Ref Only
Performance Testing	24 Hour Exposure to Liver of Sulfur	24 Hours	Degree of Tarnishing: Abraded: 4	Ref Only

STATEMENT OF STEWART GRICE ON TARNISH AND CORROSION RESISTANCE TESTING

1. Qualifications and Experience

Stewart Grice, BSc, MPhil, CEng, MIMMM

Since 2000, I have been employed as the Vice President of Mill Products, Hoover & Strong Inc., a precious metal refiner located in Richmond, Virginia. I have been employed as a metallurgist for the past 26 years, specifically in the area of jewelry manufacturing. From 1990 – 1994 I was employed as a Metallurgist and then Senior Metallurgist for Johnson Matthey Jewelry, Birmingham, U.K. From 1994 – 2000 I was employed as a Metallurgical Manager for Cookson Precious Metals, Birmingham, U.K.

I have a BTEC Higher Diploma in Physical Science (Physics) from Preston Polytechnic in the United Kingdom. I also have a Bachelor of Science Degree in Applied Science (Materials Science) from The Polytechnic, Wolverhampton, U.K. and a Master of Philosophy Degree in Metallurgy and Materials from The University of Birmingham, U.K.

I am a professional member of the Institute of Materials, Minerals and Mining (MIMMM) and a Chartered Engineer with the Engineering Council of Great Britain and Northern Ireland (CEng).

I have authored many technical papers relating to jewelry materials and processing and trade press articles for the jewelry industry press and co-authored a chapter of the ASM International Metals Handbook, Volume 9, on metallography and microstructures.

I have served on the following Committees: British Jewellery and Giftware Federation 1998 – 2000, British Jewellers' Association Nickel Working Group 1998 – 2000, Technical Committee ST1/53 (Jewellery) of the British Standards Institution 1998 – 2000, MJSA White Gold Task Force: 2003 – 2005, MJSA Innovation Advisory Council: 2005 – 2006 and the Research & Development Group, The Mokume Gane Guild: 2005 – 2007.

I have received the following awards for published work from the Santa Fe Symposium on Jewelry Manufacturing Technology, an annual symposium considered the foremost in the world for jewelry manufacturing: The Santa Fe Symposium Collaborative Research Award: 2001, 2005, 2006, 2010 & 2014 The Santa Fe Symposium Award for Excellence in Research: 2003, 2005 & 2006; The Santa Fe Symposium Honorary Ambassador Award: 2005.

My experience within the jewelry industry ranges from alloy design for jewelry, technical support for both factory and customer processes, production management and business unit management:

2. Development of the alloy marketed as "Rubedo"

I have designed and developed over 100 alloys for the jewelry and dental industries, taking these from initial concept and composition specification, through process design, material and product testing, to the adoption of final alloys and products. Material and product testing includes corrosion and/or tarnish resistance testing, the aim of which is to ensure any new alloys that have been developed meet both company and customer expectations as far as tarnish resistance is concerned.

In 2011, I designed and developed the alloy marketed by Tiffany as "Rubedo" – an under 10kt gold alloy. Our internal alloy designation for this metal was "MP6".

The alloy design criteria included the following:

- The alloy must be less than 10kt fineness.
- The alloy must have an aesthetically pleasing pink color.
- The alloy must have a tarnish resistance greater than sterling silver and be acceptable to Tiffany when worn by the end user (but not necessarily tarnish free.)

After working with several unacceptable alloys designs (from a tarnish resistance standpoint) using both 10% and 20% gold fineness that I submitted to Tiffany, the combination of precious and other metals now known as MP6 (marketed as “Rubedo”) was accepted. MP6 has 32% gold fineness making it just under 8kt. Additions of silicon and germanium were included in the composition to inhibit tarnishing in order to make MP6 resist tarnishing for longer than an alloy with such low gold content but without these additions.

Tarnish testing of the final alloy used to make Rubedo jewelry by Tiffany (MP6) showed it to be superior to sterling silver but inferior to a traditional 10kt pink alloy. As part of the patent application, this fact was included. (Exhibit , page 8, paragraph 33).

Because I am the inventor of the alloy known as “Rubedo” and performed the tarnish testing of this alloy as part of our design process, it is my professional opinion that Rubedo does not perform as well as a 10kt alloy as far as tarnish resistance is concerned. Thus, there is no “reliable and scientific evidence that a product (“Rubedo”) does not differ materially from a product composed throughout of an alloy of gold of at least 10kt fineness with respect to the following attributes or properties: corrosion resistance, tarnish resistance and any other attribute or property material to consumers.”

3. Tarnish and corrosion resistance of under 10k gold alloys

Tarnish is a mild form of corrosion that usually results in discoloration of an item of jewelry. All metals corrode, some just have more resistance to corrosion than others – precious metals and noble metals have high tarnish resistance.

It is my professional opinion that all alloys containing less than 10kt gold fineness will perform in a manner that is inferior to 10k or above alloys in areas that are material to the consumer, specifically tarnish and corrosion resistance. Our testing of the Rubedo alloy is an example of this – 8kt even with additions (silicon and germanium) to inhibit tarnishing performs worse than 10kt without additions.

If an alloy has 10kt gold fineness, it contains 41.67% gold by weight, the remaining elements present typically being silver (a precious metal but susceptible to sulfur tarnishing), copper and zinc, which are both base metals and by definition will readily tarnish and corrode.

One important factor for tarnish and corrosion resistance is the atomic percentage of the gold present – how many gold atoms are present. Gold is a dense material and each atom is relatively heavy when compared to silver, copper and zinc. For a 10kt alloy, which is 41.67% gold by weight, there are considerably less atoms of gold present than this percentage. A typical 10kt alloy only contains 20% of the atoms present as gold atoms, leaving about 80% as silver and base metals. For an 8kt alloy, this atomic percentage drops even lower to around 15%, leaving 85% of the alloy made up of other metals. This makes the metal even more susceptible to corrosion and tarnishing – with more base metal atoms present, the alloy will be susceptible to tarnishing. For karat gold alloys, the best way to increase tarnish resistance is to add more gold.

4. Tarnish and corrosion resistance – under 925 ppt sterling silver

Although fine silver will react with sulfur and eventually tarnish, due to their metallurgy silver-copper alloys tarnish at a greater rate. For 925 sterling silver, typically 7.5% copper is added to the composition. As the percentage of copper present in a silver alloy increases, the higher the degree of tarnishing and the quicker it tarnishes. To try and decrease the rate of tarnish in silver alloys, other elements other than copper can be added however these usually result in detrimental side effects such as reduced hardness (meaning the item will not stand up as well to wear in normal use), or they may have an inferior color and luster making them less attractive.

The most common way to increase tarnish resistance in silver alloys is to add additions of silicon and/or germanium but this will only work to a certain extent - the material has to have a basic amount of intrinsic tarnish resistance for this to work. The Rubido tests demonstrate that even though these additions have been made, the tarnish resistance is still inferior to the standard higher quality alloy.

5. No standardized testing protocols exist for tarnish and corrosion resistance for silver and gold alloys

There are a variety of corrosion and tarnish tests employed in the jewelry industry, but none is either directly related to another, or directly related to performance under actual wearing conditions. The tests available are all accelerated tests and give data when samples are introduced to a chemically created atmosphere, not real life conditions. Further, because of the wide variety of alloys of silver and gold, no standard industry test exists that is uniformly applicable. Nor can there be a standardized test to account for the variety of conditions under which these products are used. Thus, it is not possible to determine the tarnish resistance of a sub-10kt alloy or a sub-925 silver alloy reliably given the variety of the alloys and the consumers who wear the products. In my expert view, results for tarnish and corrosion testing will vary greatly depending on the test used and who does the testing. This raises issues pertaining to a manufacturer testing their own alloy and claiming to have reliable "scientific" evidence. There is no standardized testing protocol for tarnish and corrosion resistance for gold or silver alloys to which a manufacturer's "scientific evidence" can be compared.

An accredited test laboratory should perform testing under standardized conditions pertaining to ambient temperature, humidity, and the condition of the samples to produce reliable results. Depending on the micro-structure of an alloy, it can be less or more resistant to tarnishing if processed in different ways; the alloy is the same, just the manufacturing process it has gone through is different. For example, a test sample can be produced to have a small grain size - which will aid tarnish resistance - whereas when products are manufactured into actual jewelry, the same small grain size cannot be replicated, potentially resulting in an increased rate of tarnish. Some jewelry alloys can have segregated (non-homogenous) microstructures under certain conditions resulting in base metal rich areas - again making them more susceptible to tarnishing. Samples could be produced for testing that have more homogenous structures and so potentially will tarnish at a lower rate. A manufacturer can use an alloy that does not pass the tarnish tests when processed under standard jewelry making conditions, but be declared sufficiently tarnish or corrosion resistant when processed in a manner to aid tarnish resistance, such as using small grain size or even covering the item with a thin clear coating of plastic.

If marketers are required to have evidence of tarnish and corrosion resistance, all tests will need to be done with a standardized baseline alloy in standard conditions using a specific unalterable process to make comparative results meaningful. This is especially difficult in that all tarnish testing needs to be accelerated to replicate years of wear, bringing uncertainty into the process.

There would need to be collaboration between alloy designers and test laboratories to develop a baseline alloy which would tarnish in a repeatable manner over the duration of the test. In reality, creating such an alloy and test and then relating it to actual standard use is not possible. Alloys vary, conditions and use vary, conditions for testing (temperature control, humidity control, etc.) vary, testing capacity varies. Creating a system that is based on the marketers' creating their own reliable "scientific evidence" where there are no standardized alloys and no standardized methods to test alloys that vary greatly will prove impossible to implement.

Signed: _____

Dated: APRIL 26th 2016

Statement of Christopher P. Smith, G.G., Regarding “Composite” Rubies

I. Biography and Background

I, Christopher P. Smith, G.G., am a 30 year veteran of the gem and jewelry industry with a distinguished international career. I began my interest in gemology in 1986, when I joined the GIA Laboratory, then in Los Angeles, CA, after graduating from their graduate gemologist and graduate jeweler's programs. Although initially a diamond grader, I quickly transitioned into the Gem Identification department where I worked with such notable gemologists as Shane McClure, Robert E. Kane, Chuck Fryer, Emmanuel Fritsch, and many others.

In 1991, I went to work for the Gübelin Laboratory of Luzern, Switzerland, where I eventually became Director of the Laboratory. At that time, I was the first gemologist ever to have worked for both the GIA and Gübelin laboratories. In nearly 12 years at the Gübelin Laboratory, I oversaw operations, developed key new services, and expanded the scope of Gübelin's operations globally.

I also pioneered research into several areas of gemology, including the further development and refinement of country-of-origin criteria for rubies, sapphires, emeralds, alexandrites, and other gemstones. This innovative work included the characterization of ruby and sapphire from a number of newly discovered deposits, such as rubies and sapphires from Mong Hsu, Nepal, Tajikistan, and Vietnam, as well as other localities.

As part of my research activities, I have visited a number of gem mines, including those in Myanmar, Sri Lanka, the Ural Mountains in Russia, Australia, Tanzania and Thailand. While focusing a great deal of my efforts on the determinations for country-of-origin, I have also worked extensively on the distinction between treated and non-treated gems, including research on a variety of heating techniques for corundum, HPHT treatment of diamonds, and other treatments. The origin-of-color and its identification in ruby, sapphire, diamond, coral, tanzanite and other materials, the identification of and distinction between natural and synthetic gems, and the further development of analytical techniques and their applications in gemology also have been focuses of my work.

In 2003, I returned to the GIA Laboratory, this time in New York. As the Director of Identification Services, I was involved with the development of colored gemstone services and research. In December of 2006, I joined the American Gemological Laboratories (AGL) as Vice President and Chief Gemologist to spear-head the growth and development of their colored gemstone services. In April of 2009, I became President and owner of AGL.

I have made innovations to several areas of gemological testing and its applications for the gemstone industry, including: landmark studies on the detection of HPHT treatment of type II diamonds; methods for examining the internal growth structures of gemstones;

the application of infrared spectroscopy for the distinction between non-heated and heated rubies and sapphires; the 'TE' system of classifying and quantifying the heat treatment and presence of heating residues in rubies and sapphires; the development of 'off-site' gemological testing for major laboratories; and most recently, a revolutionary classification system for gem-quality rubies and sapphires.

Along with my identification and research work, I have published and lectured extensively on various gemological topics. In 2010 I was awarded an honorary Fellowship (FGA) by the Gemmological Association of Great Britain (Gem-A) for my career-long commitment to the advancement of gemology. In 2009 I received the Antonio C. Bonnanno award for Excellence in Gemology from the Accredited Gemologists Association (AGA). In 2007, I was awarded the Richard T. Liddicoat award by the American Gem Society (AGS). I am a past recipient of the Most Valuable Article Award in Gems & Gemology and have been a member of their technical review board since 1993. I was also a founding member of the Laboratory Manual Harmonization Committee (LMHC).

II. Composite Stones

A. Nomenclature

The product more commonly known as “Composite Ruby” is a relatively new manufactured material used as a stone set into jewelry. This material starts out as low-grade corundum which is bound with a lead-glass filler to produce a stone that appears to be of higher quality.

The lead-glass present in these stones makes up a significant portion of the weight of these stones. In some stones there is more corundum than glass in others there is more glass than corundum, however the lead-glass always represents a significant percentage of the actual weight of the stone. Thirdly, the lead-glass has a golden yellow color that further augments the color of the stone.

My laboratory, AGL, identifies this product as “Composite Ruby” on our evaluative laboratory reports. I originally pioneered the use of this term in 2007 to describe and disclose all stones that have been treated/manufactured in this way. AGL has never deviated from this disclosure policy, together with special disclosure that this product requires special care and handling. As it stands now, this term is industry-accepted as the one that most clearly identifies the product as made up of two disparate but fundamental materials, corundum/ruby and lead glass. Without one of those two materials, the product would not exist. The term “Composite Ruby” is synonymous with this manufactured lead-glass and corundum composite material.

B. Product Origins

This product starts its manufacturing process in the rough, unpolished state. An initial stage of the process involves an acid bath, where foreign mineralizations and other imperfections are removed and the structure of the rough stone is opened up. After this stage the rough stones come out porous and very brittle, readily breaking into pieces. These stones are then taken en masse and infused or rebound with a high lead-content glass. It is the resulting masses of high lead-content glass and ruby that are then fashioned into polished stones. In some cases the finished polished stone is composed of only a single piece of ruby bonded with lead-glass. In other cases, there are multiple pieces of ruby bonded with lead-glass. Typically, my laboratory receives the higher-level products for evaluation, but we have certainly seen product that is made up of small pieces of ruby or corundum which did not have the same origin.

C. Other Varietals

Sapphire is the varietal name for any color of corundum other than red, which is ruby. For several years we have been seeing a range of other colors of corundum that have been manufactured in the same way using a high lead-content glass. The term "Composite Sapphire" is used to describe this material.

More recently, I am now starting to see a newer type of Composite Sapphire possessing a deep blue color, where the blue color is being added by including the element cobalt to the chemistry of the lead-glass.

~~CHRISTOPHER P. SMITH, G.G.~~

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**Jewellery — Consumer confidence in
the diamond industry**

Bijouterie — Confiance du consommateur dans l'industrie du diamant



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 174, *Jewellery*.

Introduction

A diamond is a mineral; it forms and grows under natural geological processes.

The jewellery industry relies upon product integrity and transparency for consumers to have confidence in the products that they are buying. Consumers will not always have the technical expertise to understand the exact provenance and processing of a diamond and as a result, are reliant upon labelling and product descriptions as well as guidance from the individual seller.

The recent development of new technologies in the diamond industry has provided consumers with greater availability of synthetic diamonds which are produced in a factory or laboratory (see 2.4 NOTE 3). They have essentially the same chemical composition and physical (including optical) properties as a diamond and essentially the same crystal structure but due to the growth environment, differences in the growth structure take place at the atomic level.

A major concern held by the diamond industry is that without clear and accurate labelling, the increased availability of synthetic diamonds to consumers can cause confusion over exactly what type of product is being sold to them. While the provenance and labelling of a diamond is widely understood, the consumer will be less familiar with the variety of terms that have been used by sellers to describe synthetic diamonds.

The diamond industry is concerned that a consumer can inadvertently buy a synthetic diamond or other product believing it to be a diamond and similarly, the synthetic-diamond industry does not want its products to be seen as a cheap alternative to a diamond or as a product that consumers will only buy if they are not fully aware of its provenance.

Considering that synthetic diamonds are nowadays set in jewellery pieces it is therefore in the interests of both sectors of the market that consumers are able to make informed purchasing decisions.

This document is specifically designed to be understood by the consumer and seeks to address the potential for confusion by setting out clear and accurate guidelines on accepted nomenclature.

The Standard is based largely on existing industry self-regulation documents and labelling that provide voluntary guidance for the industry on how to describe diamonds, treated diamonds, synthetic diamonds, composite diamonds and imitations of diamonds.

The following definitions apply in understanding how to implement an ISO International Standard and other normative ISO deliverables (TS, PAS, IWA).

- “shall” indicates a requirement;
- “should” indicates a recommendation;
- “may” is used to indicate that something is permitted;
- “can” is used to indicate that something is possible, for example, that an organization or individual is able to do something.

ISO/IEC Directives, Part 2 (sixth edition, 2011), 3.3.1, defines a requirement as an “expression in the content of a document conveying criteria to be fulfilled if compliance with the document is to be claimed and from which no deviation is permitted.”

ISO/IEC Directives, Part 2 (sixth edition, 2011), 3.3.2, defines a recommendation as an “expression in the content of a document conveying that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required, or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.”

Jewellery — Consumer confidence in the diamond industry

1 Scope

This International Standard specifies a set of permitted descriptors for the diamond industry and is specifically designed to be understood by the consumer. The Standard also includes a series of definitions which aim to provide further clarity for traders and maintain consumer confidence in the diamond industry as a whole.

This International Standard will cover the nomenclature to be used by those involved in the buying and selling of diamonds, treated diamonds, synthetic diamonds, composite diamonds and imitations of diamonds.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

natural

formed completely by nature without human intervention during the formation

2.2

diamond

mineral consisting essentially of carbon crystallised in the isometric (cubic) crystal system, with a hardness on the Mohs' scale of 10, a specific gravity of approximately 3,52 and a refractive index of approximately 2,42, created by nature

Note 1 to entry: The denomination "diamond" without further specification always implies "natural diamond". These two terms are equivalent and carry the same meaning.

2.3

treated diamond

diamond (2.2) having undergone any human intervention other than cutting, polishing, cleaning and setting, to permanently or non-permanently change its appearance

EXAMPLES Coating, fracture filling, heating, irradiation, laser drilling, HPHT treatment or any other physical or chemical process

2.4

synthetic diamond

laboratory-grown diamond

laboratory-created diamond

artificial product that has essentially the same chemical composition, crystal structure and physical (including optical) properties as a diamond

Note 1 to entry: The English terms laboratory-created diamond or laboratory-grown diamond may be used synonymously with synthetic diamond. Where there is no acceptable local direct translation of the English terms laboratory grown diamond or laboratory created diamond then only the translation of the term synthetic diamond should be used.

Note 2 to entry: Abbreviations such as 'lab grown', 'lab created' "lab diamond" or 'syn diamond' shall not be used.

Note 3 to entry: The word "laboratory" refers to the facility which produces the synthetic diamonds. This should not to be confused with a gemmological laboratory that is dedicated to the analysis, authentication, identification, classification (grading) of diamonds.

2.5

composite stone
assembled stone

stone constructed of two or more parts

2.6

brilliant

<noun>round polished diamond with a brilliant cutting style

2.7

artificial stone

crystalline stone that has no natural counterpart

2.8

imitation of diamond
diamond simulant

any artificial product used to imitate the appearance of *diamond* ([2.2](#))

See 3.6.

2.9

stone

gemstones (including diamonds), treated gemstones, synthetic stones, composite stones and artificial stones usable for jewellery

2.10

gemstone

mineral of natural origin, rough, cut and/or polished, often used in jewellery for reasons of combined beauty, rareness and value

Note 1 to entry: "Gemstones" may be qualified with the terms "precious", "real", "genuine" and "natural".

2.11

gem

gemstone and/or organic substance of natural origin, often used in jewellery for reasons of combined beauty, rareness and value

Note 1 to entry: "Gems" may be qualified with the terms "precious", "real", "genuine" and "natural".

2.12 Characteristics

2.12.1

clarity

relative absence or presence of internal characteristics/inclusions and external characteristics/blemishes

2.12.2

colour

relative absence or presence of hue, saturation and lightness in standardized observation conditions

2.12.3

cut

comprises shape, proportions, symmetry and polish

2.12.4

carat

unit of weight

Note 1 to entry: One carat being equivalent to 200 mg (0,20 g).

2.12.5**shape**

outline when viewed perpendicular to the table facet

2.12.6**total weight**

combined weight of multiple diamonds, combined weight of multiple treated diamonds, combined weight of multiple synthetic diamonds or combined weight of multiple imitations of diamonds

Note 1 to entry: In the case of different materials being combined in a piece of jewellery or sold loose, the weight of the different categories of stones shall not be totalled.

2.12.7**fluorescence**

appearance of luminescence when viewed under ultraviolet (UV) light

2.12.8**diamond grading**

to determine and to describe the most important features of a polished diamond (see [2.2](#))

EXAMPLE Clarity, colour, cut and carat weight.

Note 1 to entry: *Synthetic diamonds* ([2.4](#)) may also be graded.

2.13 Treatments**2.13.1****treatment**

any human intervention, other than the accepted practices of cutting, polishing, cleaning and setting that alters the appearance of a stone

EXAMPLE Coating, fracture filling, heating, irradiation, laser drilling, HPHT treatment or any other physical or chemical process

2.13.2**fracture filling**

to fill the whole or part of a fracture/fissure with a substance, e.g., glass, with the purpose of making the fracture/fissure less visible

2.13.3**irradiation**

exposure to radiation to change the colour

2.13.4**laser drilling**

burning a channel with a laser between the surface of a diamond and an inclusion (generally black), the channel being used as a conduit to allow a chemical treatment of the inclusion with the purpose of making the inclusion less visible

2.13.5**HPHT treatment**

changing the colour through a treatment involving both High Pressure and High Temperature (HPHT)

Note 1 to entry: HPHT treatment can also affect the clarity.

2.13.6**coating**

substance applied over the surface, or part of the surface for modifying the appearance

2.14 Documentation

2.14.1

commercial documents

written documents, including electronically, digitally or on the internet, to record the terms of a sale and purchase price whether actual or pending

EXAMPLE Certificates, bills of sale, invoices, memorandums, approbations, offers, receipts, advertisements, appraisals or any other documents of a similar nature or meaning

2.14.2

disclosure

release of relevant information about a *diamond* (2.2), *synthetic diamond* (2.4) or *imitation of diamond* (2.8) and their treatments

3 Disclosure

3.1 Misuse of terminology

It is contrary to the purposes of this document to make any misleading or deceptive statement, representation or illustration relating to origin, formation, production or condition of any diamond, treated diamond, synthetic diamond, imitation of diamond or composite diamond that does not conform in all respects with any and all the clauses contained herein, in their selling, marketing or distribution as defined in this International Standard.

3.2 Diamond

The denomination “diamond” without further qualification shall only be used for diamonds in accordance with the definition 2.2.

3.3 Treated diamond

A diamond having undergone a treatment shall be disclosed as a “treated diamond” and/or a specific reference to the particular treatment and the description shall be immediately apparent and unambiguous.

The terms “natural treated diamond” or “treated natural diamond” shall not be used because they can be misleading.

Any special care requirements that the treatment creates shall be disclosed.

No abbreviations shall be used.

3.4 Synthetic diamond

A synthetic diamond shall be disclosed as defined in 2.4 and the description shall be immediately apparent and unambiguous. For the disclosure of a synthetic diamond, no abbreviation shall be used.

The qualifiers such as natural, real, genuine, precious, cultured, cultivated and gem shall not be used to describe any synthetic diamond.

Brand names and manufacturers names combined with the word diamond are insufficient disclosure when applied to synthetic diamonds.

Synthetic diamonds can have undergone a treatment.

3.5 Composite stone

Composite stones in which all parts are composed of diamonds shall be called composite diamond or diamond doublet.

A composite stone where some but not all the parts are diamonds shall be described by the words “doublet” (two parts) or “triplet” (three parts) or “composite” (two or more parts), and these words shall be immediately combined with the correct names of the components of the assembled product, the names of which shall be mentioned from the upper part downwards and be separated by a slash (/).

EXAMPLE A doublet whose upper portion is diamond and whose lower portion is synthetic diamond is called a “diamond/synthetic diamond doublet” or “doublet diamond/synthetic diamond”.

3.6 Imitations of diamond

When any artificial product is used to imitate a diamond it shall be described by its proper name, (e.g. “glass”, “plastic”, “synthetic corundum”, “cubic zirconia”), or by the name “imitation of diamond” or “diamond simulant”, and the description shall be immediately apparent and unambiguous (see [4.3.3](#) to [4.3.6](#)).

3.7 Gemstones that might be misrepresented as diamonds

A gemstone other than diamond whose colour, cut and appearance might be misrepresented as a diamond shall always be referred to by its mineral name, and not described as “imitation of diamond” (see [4.3.7](#)).

4 Glossary

4.1 General

This glossary contains a non-exhaustive list of terms that the consumer could encounter.

4.2 Possible treatments of diamonds which shall be disclosed

- Coating
- Fracture filling
- HPHT-treatment
- Irradiation
- Irradiation and annealing
- Laser-drilling
- Painting
- Varnishing, and
- any combination of the above.

4.3 Products that might be misrepresented as diamonds

4.3.1 General

Diamonds exist in various colours, the products and stones listed below can exist in the same multiplicity.

4.3.2 Synthetic diamonds

At present, synthetic diamonds can be produced by 2 different techniques:

- a) High Pressure High Temperature (HPHT) or
- b) Chemical Vapour Deposition (CVD).

4.3.3 Other synthetic stones

- Synthetic moissanite.
- Synthetic rutile.
- Synthetic sapphire.
- Synthetic quartz.
- Synthetic spinel.

4.3.4 Artificial stones

- Artificial stone Cubic Zirconia (CZ).
- Artificial stone Fabulite ®, Strontium Titanite.
- Artificial stone YAG (Yttrium Aluminium Garnet).
- Artificial stone GGG (Gadolinium Gallium Garnet).

4.3.5 Composite stone

- Synthetic white spinel/artificial stone.
- Fabulite ® doublet.

4.3.6 Glass

- Glass.
- Lead glass.
- Lead crystal.
- Strass.

4.3.7 Gemstones that might be misrepresented as diamonds

- Quartz/Rock Crystal.
- Sapphire.
- Topaz.
- Zircon.
- Beryl.

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gemstone information manual

fifteenth edition

INDUSTRY INFORMATION GUIDE FOR
NATURAL GEMSTONES,
ENHANCED NATURAL GEMSTONES &
MAN-MADE STONES—
including care & handling recommendations



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American
Gem Trade
Association

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Note: A Review Board, consisting of Association representatives and Laboratory technical advisors, will meet from time to time to make necessary modifications to this industry manual.

INTRODUCTION

The Federal Trade Commission Guides for the Jewelry Industry as revised April 10, 2001 are designed to prevent unfair or deceptive trade practices. The revised Guides contain new language as to gemstone enhancement disclosure requirements which apply equally to diamonds and all other natural gemstone materials.

This manual contains information necessary for minimal compliance with the revised FTC Guides and ethical jewelry trade practices. It also provides a useful method to communicate required gemstone treatment disclosure information within the trade.

FTC DISCLOSURE REQUIREMENTS

With the exception of the normal fashioning (cutting and polishing) of a gemstone, it is the seller's responsibility at all levels of commerce to clearly disclose to the buyer at the time of sale:

- 1) Whether the gemstone is natural or not;
- 2) All information pertinent to any enhancement process done to a natural gemstone when:
 - a. the treatment is not permanent and its effects are lost over time; or
 - b. the treatment creates special care requirements for the gemstone to retain the benefit of the treatment; or
 - c. the treatment has a significant effect on the value of the gemstone.

Minimal disclosure information would include whether the gemstone is natural or man-made; if natural, whether the gemstone has been treated in any manner where 2 (a), (b) or (c) above apply; and in such cases, the nature of the treatment, its permanence and any special care requirements.

As to "significant effect on value," the position of the FTC is that treatment has a significant effect on the value of a gemstone whenever the effect of treatment on value is likely to affect a reasonable buyer's purchasing decision. Such is the case whenever there is a significant (more than slight) difference in value between a treated gemstone and an untreated gemstone of the same type, size and appearance. The FTC's comments to the revised Guides state that "the consumer's point-of-view is the relevant viewpoint from which to analyze the necessity for disclosure." Treatment must be disclosed whenever a buyer, without disclosure of treatment, would believe that two seemingly identical gemstones, one treated and one not, are identical or very comparable in value, when in fact, they are not.

Small gemstones, whether mounted or not, are not exempt from any disclosure requirements. However, when applying the "significant value" test in the case of jewelry products, the effect on the composite value of the mounted piece should be considered.

When it is not known with certainty whether or not a gemstone has been treated, but treatment is suspected (as in the case of gemstone types which are known to be routinely treated), the FTC states that "it is prudent and appropriate to disclose gemstone treatments rather than remain silent when there is a possibility that the stones have been treated."

This minimum disclosure information is required by the FTC. Failure to disclose that a gemstone is not natural, or enhancement information as to a treated natural gemstone in compliance with the FTC Guides, subjects the violator to FTC enforcement action, civil penalties and trade sanctions.

Any seller who is uncertain as to these requirements may write the American Gem Trade Association, 3030 LBJ Fwy., Ste. 840, Dallas, TX 75234 or the Jewelers Vigilance Committee, Inc., 25 W. 45th St., Ste. 1406, New York, NY 10036.

These disclosure requirements are applicable to all sellers at each and every level of gemstone and jewelry commerce, including sellers of uncut gemstone material and cut and polished gemstones, manufacturers and

wholesalers of jewelry containing natural or man-made gemstones, and retail sales to consumers. Disclosure must be made at the point of sale prior to sale; provided, however, that where a gemstone or a jewelry product which contains gemstones can be purchased without the buyer personally viewing the product (e.g., catalog sales, catalog showrooms, mail order houses, online services, televised shopping programs or other media sales programs, telephone sales, etc.), disclosure must be made in the solicitation for or description of the product.

DISCLOSURE METHODS WITHIN TRADE

Gemstones have historically and traditionally been enhanced. The methods of the enhancement processes vary within each variety and change as new and better methods are developed.

The Federal Trade Commission, with the cooperation of the Jewelers Vigilance Committee and other industry associations, requires the jewelry industry to inform all buyers of gemstone enhancement. This manual provides a listing of traditional, historical and contemporary enhancements, as well as a convenient means of communicating treatment information within the trade.

The codes listed in this manual provide an easy-to-understand shorthand system for labeling to be used only within the trade. Each material that may require disclosure has been assigned a code consisting of one or more letters indicating the enhancement (or possibility of enhancement) and identifying the pertinent process. Disclosure should be made within the trade on every tag, stone paper, container, invoice, memorandum or other commercial document each time a seller offers for sale or sells a gemstone or jewelry product containing gemstones to a buyer within the trade. Use of the disclosure codes provided herein gives the gem and jewelry industry a convenient means of complying with disclosure of gemstone treatment within the trade as required by the Federal Trade Commission Guides.

It should be remembered, however, that use of the codes to accomplish disclosure within the trade is a matter of convenience and choice. A seller is free to use any language or method to disclose treatment that fulfills the FTC requirements. Use of the codes, however, is encouraged to promote a uniform and consistent communication language.

CONSUMER DISCLOSURE REQUIREMENTS

The information in this manual will assist retail sellers in meeting disclosure requirements by providing all necessary information that must be disclosed to consumers. However, when disclosing to retail consumers, all required disclosure must be made in plain language. Codes and/or abbreviations are not sufficient. Various trade associations publish a variety of consumer information products which are available to retail sellers as aids to communicate required disclosure information to retail consumers.

AGTA MEMBER REQUIREMENTS

The above requirements are applicable to all sellers at all levels of commerce within the trade. The disclosure requirements of the American Gem Trade Association are more stringent than the FTC minimal requirements, and all AGTA Members are bound by and must disclose in accordance with the AGTA Code of Ethics, which is not changed by the revision of the FTC Guides.

This edition of the Gemstone Information Manual was submitted to the Federal Trade Commission on behalf of the gem and jewelry industry for informational purposes.

DEFINITIONS

ENHANCEMENT: Any traditional process other than cutting and polishing that improves the appearance (color/clarity/phenomena), durability or availability of a gemstone.

A gemstone enhancement is considered permanent as long as the effect of the enhancement does not change under normal wear, cutting, repair, cleaning or display conditions. If a gemstone enhancement is not permanent, appropriate disclosure is required.

With respect to treatment, all natural gemstones can be divided into two basic categories:

1) Those which are not enhanced.

N The "N" symbol appears on the chart only for natural gemstones which are not currently known to be enhanced (Alexandrite, Garnet, etc.). However, the "N" symbol can also be used for other natural gemstones in the event that a gemstone has received no enhancement and the seller will provide a guarantee that there has been none. That gemstone must be accompanied by a commercial document, such as an invoice, a memorandum and/or a laboratory report, to support the fact that the gemstone is not enhanced.

2) Those treatment processes not covered under the "N" symbol are addressed in a specific manner as shown on pages 9 through 18.

Since many enhancements are difficult or impractical to prove definitively, the approach taken in this manual is, unless otherwise indicated, to assume that such traditional enhancement has been done to that particular gemstone. This assumption has been made in order to protect both the seller and the consumer.

For example, Ruby "F." The surface cavities are filled with a foreign matter such as glass. Within the industry, this gemstone must be labeled with the letter "F." This information must also be provided to the consuming public in writing using plain language. Abbreviations and codes are not sufficient.

NOTE: Multiple enhancement techniques are sometimes applied to the same material. All treatments must be listed. Example: Diamond "LF" (Laser and Filling).

Defined below are the specific enhancement codes and designations to be used in the

GEMSTONE INFORMATION CHART. (See pages 9 through 18.)

SYMBOLS FOR SPECIFIC FORMS OF ENHANCEMENT

- N** Natural: No modification (or currently has no known modification process).
- B** Bleaching: The use of heat, light and/or other agents to lighten or remove a gemstone's color.
- C** Coating: The use of such surface enhancements as lacquering, enameling, inking, foiling or sputtering of films to improve appearance, provide color or add other special effects.
- D** Dyeing: The introduction of coloring matter into a gemstone to give it new color, intensify present color or improve color uniformity.
- F** Filling: The filling of surface-breaking cavities or fissures with colorless glass, plastic, solidified borax or similar substances. This process may improve durability and/or appearance, and/or to add weight.
- H** Heating: The use of heat to effect desired alteration of color, clarity and/or phenomena. If residue of foreign substances in open fissures is visible under properly illuminated 10X magnification, H F should be used.
- HP** Heating and Pressure: The use of heat and pressure combined to effect desired alterations of color, clarity and/or phenomena.
- I** Impregnation: The impregnation of a porous gemstone with a colorless agent (usually plastic) to improve durability and appearance.
- L** Lasering: The use of a laser and chemicals to reach and alter inclusions in gemstones, usually diamonds.
- O** Oiling/Resin Infusion: The filling of surface-breaking fissures with colorless oil, wax, resin or other colorless substances, except glass or plastic, to improve the gemstone's appearance.
- R** Irradiation: The use of neutrons, gamma rays or beta particles (high energy electrons) to alter a gemstone's color. The irradiation may be followed by a heating process.
- U** Diffusion: The use of chemicals in conjunction with high temperatures to produce ARTIFICIAL color change and/or asterism-producing inclusions.
- Note:** It is a violation of the FTC Guides to fail to disclose diffusion on gemstones in advertising, promotional literature or commercial documents. Suggested methods of disclosure are:
 "(Gemstone): chemically colored (Color) by diffusion."
 Example: "Sapphire: chemically colored blue by diffusion."
- If the color of the diffused gemstone does not permeate the entire stone, then the following statement must also appear:
 "Although the color induced in diffusion treated gemstones is permanent, it does not permeate the entire gemstone; therefore, recutting or repolishing is not recommended."
- W** Waxing/Oiling: The impregnation of a colorless wax, paraffin or oil in porous opaque or translucent gemstones to improve appearance.

DESIGNATIONS

The above disclosure language must be printed in a type-size and location so as to be conspicuous. Designations are based on a consensus of opinion rather than any available documentation.

- A. Enhancement Frequency Designations
 - 1. Rarely 2. Occasionally 3. Commonly 4. Usually 5. Always 6. Unknown
- B. Enhancement Stability Designations
 - 1. Excellent 2. Very Good 3. Good 4. Fair 5. Poor 6. Variable
- C. Care Designations
 - 1. Normal 2. Special 3. Extra Special

INTRODUCTION OF THE GEMSTONE INFORMATION CHART

Please keep in mind the following information when reading and interpreting the Gemstone Information Chart:

- The column labeled FREQUENCY USED represents a reasonable estimate of how commonly a particular enhancement process is utilized in the trade, based on a consensus of opinion.
- The columns FREQUENCY USED and STABILITY refer specifically to the enhancement process applied to the material.
- The CARE REQUIRED and SPECIAL ADVICE columns reflect two basic concerns. The first relates to special care that may be necessary to preserve the effect of the enhancement applied to the material, and the second issue addresses the need for any special care required by the specific gemstone variety, irrespective of enhancement.

SC The "SC" symbol is used to designate those gemstones that require special care. If a gemstone enhancement is not permanent, appropriate disclosure is required. Please refer to the CARE REQUIRED and SPECIAL ADVICE columns in the following charts for those gemstones requiring special care.

	N	None	---	---	---	Normal	
Alexandrite							
Amazonite	W	Impregnated with a colorless wax, paraffin or oil to improve appearance	Usually	Good to Fair	Special (SC)	Special (SC)	Avoid heat, chemicals and ultrasonic
	I	Impregnated with plastic and other hardened resins to improve appearance	Usually	Very Good	Special (SC)	Special (SC)	Avoid chemicals and ultrasonic
Amber	D	Dyed or surface treated to add color	Occasionally	Fair	Special (SC)	Special (SC)	Avoid chemicals and ultrasonic
	H	Heated to improve appearance and "sun-spangles," or deepen color	Usually	Very Good to Good	Special (SC)	Special (SC)	Avoid chemicals and ultrasonic
	D	Dyed or surface treated to add color	Rarely	Variable	Special (SC)	Special (SC)	Color fades, avoid heat and extended sun
	HP	Changed color and/or artificially aged, treated in autoclave	Commonly	Very Good	Normal	Normal	Avoid chemicals and ultrasonic
Amblygonite	R	Irradiated to improve colors	Occasionally	---	Special (SC)	Special (SC)	Color fades, avoid heat and chemicals
Amethyst	H	Heated to lighten color and/or to remove "smokey" components	Occasionally	Excellent	Special (SC)	Special (SC)	Some unheated material may fade in long exposure to sunlight
Ametrine	H	None	---	---	Normal	Normal	
Ammolite	ASBL	Impregnated with colorless hardened substances to increase stability	Commonly	Good to Fair	Special (SC)	Special (SC)	Avoid heat, household chemicals and ultrasonic
Andalusite	N	None	---	---	Normal	Normal	
Aquamarine	H	Heated to remove yellow component, thereby producing a pure blue color	Usually	Excellent	Normal	Normal	
Beryl Blue ("Maxixe" Type)	R	Irradiated blue from pale pink to colorless	Always	Poor	Extra-Special (SC)	Extra-Special (SC)	Color fades, avoid light and heat
Pink	R	Irradiated to improve color	Rarely	Fair	Special (SC)	Special (SC)	Avoid heat
Yellow-Green	N	None	---	---	Normal	Normal	

Beryl (continued)		O	The penetration of colorless oil and resins into fissures to improve appearance	Commonly	Very Good to Fair	Special (SC)	Avoid high temperatures, steam cleaning, chemicals and ultrasonic
Red		R	Produced by irradiation	Usually	Variable	Normal/Special depending on method (SC)	Certain stones may fade in light or heat
Yellow		D	Dyed	Usually	Excellent to Good	Normal	
Chalcedony		D	Dyed	Always	Excellent to Good	Normal	
Agate		D	Dyed	Usually	Excellent	Normal	
Black (Onyx)		D	Dyed	Commonly	Good to Fair	Special (SC)	Certain stones may fade in light or heat
Banded		D	Dyed	Usually	Good to Fair	Special (SC)	Certain stones may fade in light or heat
Blue		D	Heated to produce color	Usually	Excellent	Normal	
Green		D	Dyed to produce color	Occasionally	Excellent to Good	Special (SC)	Certain stones may fade in light or heat
Carmelian		H	Heated to produce color	Commonly	Fair	Normal	Avoid chemicals
Jasper		W	Waxed	---	---	---	
Chrysoprase		N	None	---	---	---	
Chrysoberyll		R	Irradiated to change color	Rarely	Excellent	Normal	For safety requirements, if neutron irradiated, refer to code letter "R," page 7
Cat's Eye		N	None	---	---	Normal	
Transparent Varieties:		N	None	---	---	Normal	
Yellow		N	None	---	---	Normal	
Brown		N	None	---	---	Normal	
Green		N	None	---	---	Normal	
Citrine		H	Produced by heating various types of quartz	Usually	Excellent	Normal	

Coral		D,I	Assembled with polymers and dyed	Occasionally	Fair	Special (SC)	Avoid chemicals and solvents
Black		D,I	Assembled with polymers and dyed	Occasionally	Fair	Special (SC)	Avoid chemicals and solvents
White		D,I	Assembled with polymers and dyed	Occasionally	Fair	Special (SC)	Avoid chemicals and solvents
Pink		D,I	Assembled with polymers and dyed	Occasionally	Fair	Special (SC)	Avoid chemicals and solvents
Orange		D,I	Assembled with polymers and dyed	Occasionally	Fair	Special (SC)	Avoid chemicals and solvents
"Gold"		D,I	Assembled with polymers and dyed	Occasionally	Fair	Special (SC)	Avoid chemicals and solvents
Red		D,I	Assembled with polymers and dyed	Occasionally	Fair	Special (SC)	Avoid chemicals and solvents
Diamond		L	Laser drilled to improve appearance	Occasionally to Commonly	Very Good	Normal	
Colorless to Faint Yellow		C	Coated to disguise off-color	Rarely	Very Good to Poor Depending on Method	Variable	Recutting, steam cleaning, ultrasonic and occasionally alcohol may adversely affect color and appearance
		F	Surface cavities or fractures filled with a hardened substance	Occasionally	Very Good	Special (SC)	Recutting or extreme heat may remove filling material
		HP	Heated with pressure to alter color and/or clarity	Rarely	Unknown	Normal	
Colored		L	Laser drilled to improve appearance	Occasionally	Very Good	Normal	
		F	Surface cavities or fractures filled with a hardened substance	Rarely	Very Good	Special (SC)	Recutting or extreme heat may remove filling material
		R	Irradiated and/or heated to induce "fancy" colors	Occasionally	Excellent to Very Good	Normal except green	Avoid heating treated green stones as the color may change. Some green stones have been radium irradiated for safety requirements; refer to the NRC
		C	Coated to "fancy" colors	Rarely	Fair to Poor	Special (SC)	Recutting, steaming and ultrasonic may adversely affect color and appearance

Diamond (continued)	Colored	H	Heated to alter color	Rarely	Unknown	Normal	
Diopside (Chrome)	HP	HP	To create fancy colors	Commonly	Excellent		
	N	N	None	----	----	Special (SC)	Avoid sudden temperature changes and harsh chemicals
Emerald	O	O	The penetration of colorless oil, wax and resins into fissures to improve appearance	Usually	Very Good to Fair	Special (SC)	Avoid sudden temperature changes, steaming, chemicals and ultrasonic
	D	D	Dyed with color agents	Occasionally	Variable	Special (SC)	Avoid sudden temperature changes, steaming, chemicals and ultrasonic
Garnet							
Almandite	N	N	None	----	----	Normal	Avoid sudden temperature change
Demantoid	H	H	To improve color	Occasionally	Good	Normal	Avoid sudden temperature change
Grossularite	N	N	None	----	----	Normal	Avoid sudden temperature change
Pyrope	N	N	None	----	----	Normal	Avoid sudden temperature change
Rhodolite	N	N	None	----	----	Normal	Avoid sudden temperature change
Spessartite	N	N	None	----	----	Normal	Avoid sudden temperature change
Tsavorite	N	N	None	----	----	Normal	Avoid sudden temperature change
Hematite	N	N	None	----	----	Normal	
Iolite	N	N	None	----	----	Normal	
Ivory & Bone	B	B	Bleached to whiten and remove discoloration	Commonly	Good	Special (SC)	Avoid chemicals and ultrasonic, may discolor in time
	D	D	Dyed for artistic purposes	Occasionally	Good	Special (SC)	Avoid chemicals and ultrasonic, may discolor in time

Ivory & Bone (continued)	W	W	Impregnated with colorless paraffin wax	Occasionally	Good	Special (SC)	Avoid chemicals and ultrasonic, may discolor in time
Mammoth (Ivory)	I	I	Impregnated with colorless hardened substances to increase stability	Commonly	Good	Normal	
Jade							
Jadeite	W	W	Coated with colorless wax	Commonly	Fair	Normal to Special (SC)	Avoid ultrasonic
	B or W	B or W	Two-step bleaching and wax impregnation	Rarely	Poor	Special (SC)	Avoid heat, chemicals and ultrasonic
Green, White and Purple	B and S	B and S	Two-step bleaching and polymer impregnation	Commonly	Very Good to Good	Special (SC)	Avoid heat, chemicals and ultrasonic
	D	D	Dyed to imitate natural colors	Occasionally	Variable	Special (SC)	Avoid strong light, chemicals and ultrasonic, may discolor in time
Nephrite	D	D	Dyed selectively to alter color for artistic purposes in carvings	Rarely	Unknown	Special (SC)	Avoid chemicals, ultrasonic and strong light
Kunzite	H	H	Heated to improve color from certain locations	Commonly	Fair	Special (SC)	Natural and/or treated materials may fade — avoid ultrasonic and strong light
	R	R	Irradiated and heated to darken color	Commonly	Fair to Poor	Special (SC)	Natural and/or treated materials may fade — avoid heat, ultrasonic and strong light
Lapis Lazuli	W	W	Coated with colorless wax or oil to improve appearance	Commonly	Fair	Normal to Special (SC)	Avoid chemicals and ultrasonic
	D	D	Dyed to provide color and/or uniformity	Commonly	Variable	Special (SC)	Avoid chemicals and ultrasonic
Malachite	W	W	Coated with colorless wax	Occasionally	Fair	Special (SC)	Avoid chemicals and ultrasonic
	I	I	Impregnated with plastic and/or other hardened agents to improve durability and appearance	Rarely	Good	Special (SC)	Avoid chemicals and ultrasonic
Moonstone	O	O	Oiled to improve clarity	Occasionally	Fair	Normal	Avoid ultrasonic

Opal White, Black & Semi-Black	O	Impregnated with colorless oil, wax and resins	Rarely	Fair	Special (SC)	Avoid ultrasonic, heat and solvents
	I	Impregnated with colorless plastic to increase durability and improve appearance	Rarely	Good	Special (SC)	Avoid heat and solvents
Matrix	D	Sugar solution inling in acid bath to darken background and enhance color play and intensity	Commonly	Good	Special (SC)	Avoid solvents and repolishing
	O	Infusion of unhardened essentially colorless substances into voids to improve appearance	Occasionally	Fair	Special (SC)	Avoid heat, chemicals, ultrasonic and repolishing
Fire Opal	N	None	-----	-----	Special (SC)	Avoid heat
Cat's Eye	I	Impregnated with colorless resins to give durability and improve appearance	Usually	Good	Special (SC)	Avoid heat, chemicals and ultrasonic
Hydrophane	O	Impregnated with colorless oil, wax and resins to hide crazing	Commonly	Fair	Special (SC)	Avoid heat, solvents and ultrasonic
	D	Dyed with colorants	Occasionally	Good	Special (SC)	Avoid acids and oils
	I	Impregnated with colorless plastic to improve appearance and increase durability	Commonly	Good	Special (SC)	Avoid heat and solvents
Pearl Natural	B	Bleached to improve color and appearance	Usually	Very Good	Special (SC)	Avoid chemicals, cosmetics and ultrasonic
	D	Dyed with or without chemical treatment combined with heat to produce gray to black	Rarely	Very Good to Good	Special (SC)	Avoid chemicals, cosmetics and ultrasonic
	B	Bleached to improve color and uniformity of white color only	Usually	Excellent	Special (SC)	Avoid chemicals, cosmetics and ultrasonic
	D	Dyed to give rose, blue or golden overtones	Usually	Good	Special (SC)	Avoid chemicals, cosmetics and ultrasonic

Pearl (continued) Cultured	D	Dyed blue, black and other colors includes use of colored nuclei	Occasionally	Variable	Special (SC)	Avoid chemicals, cosmetics and ultrasonic
	D	Dyed all colors (freshwater)	Usually	Very Good	Special (SC)	Avoid chemicals, cosmetics and ultrasonic
	R	Irradiated to produce blue, gray, black and bronze colors	Occasionally	Very Good	Special (SC)	Avoid chemicals, cosmetics and ultrasonic
	D	Chemical treatment combined with heat to produce gray to black	Commonly	Very Good to Good	Special (SC)	Avoid chemicals, cosmetics and ultrasonic
Wabe "Pearl"		See Assembled Materials on page 21	-----	-----	Extra-Special (SC)	Avoid household chemicals, cosmetics, abrasives and sudden shock
Peridot	O	Penetration of colorless oil, wax and resins into voids to improve appearance	Rarely	Good to Fair	Special (SC)	Avoid sudden temperature changes, harsh chemicals and ultrasonic
	F	Surface fractures filled with a colorless hardened substance	Rarely	Good	Special (SC)	Avoid sudden temperature changes, harsh chemicals and ultrasonic
Rhodonite	D	Dyed to "even out color"	Occasionally	Poor	Special (SC)	Avoid chemicals and ultrasonic
Ruby	H	Heated to improve color and appearance (residue of foreign substance is not visible under 10X magnification)	Usually	Excellent	Normal	
	D	Dyed with colored oil to improve appearance	Rarely	Poor	Special (SC)	Avoid household chemicals and ultrasonic
	F	Intentional filling of surface cavities and fractures with a foreign material, including glass, which is visible under 10X magnification	Commonly	Fair to Poor	Special (SC)	Fracture filling requires special care. Avoid heat, ultrasonic and common household chemicals. See page 21
	R	Irradiated to change color	Rarely	Unknown	Normal	For safety requirements, if neutron irradiated, refer to code letter "R" on page 7

Ruby (continued)	U	Diffusion of an element or elements (with the exception of hydrogen) into the lattice of a stone during the application of heat to create artificial color or asterism. Effects may be throughout the stone or at or near the surface. See Symbols for Specific Forms of Enhancement, page 7	Occasionally -----	Excellent or Good when effect is not near surface Normal or Special when effect is near surface	Normal Special (SC)	Avoid repolishing or recutting when effect is near surface (1)
Sapphire	H	Heated to produce, intensify or lighten color and/or improve color uniformity and appearance	Usually	Excellent	Normal	
	U	Diffusion with an element or elements (with the exception of hydrogen) into the lattice of a stone during the application of heat to create artificial color or asterism. Effects may be throughout the stone or at or near the surface. Most colors may be produced. See Symbols for Specific Forms of Enhancement, page 7	Commonly -----	Good when effect is not near surface Normal or Special when effect is near surface (1)	Normal Special (SC)	Avoid repolishing or recutting when effect is near surface
	R	Irradiated to provide temporary intense yellow or orange color	Occasionally	Very Poor	Extra Special (SC)	Fades quickly in light or heat
Serpentine	D	Dyed various colors	Commonly	Good to Fair	Special (SC)	Dye may fade
	W	Impregnated with colorless wax	Commonly	Very Good to Good	Special (SC)	Avoid ultrasonic
Sodalite	D	Dyed	Rarely	Fair	Special (SC)	Dye may fade
Spinel	N	None	-----	-----	Normal	
Spodumene Green	R	Irradiated to produce green color	Rarely	Poor	Extra Special (SC)	Color fades in light or heat

Spodumene (Continued) Yellow	R	Irradiated to produce yellow color	Rarely	Poor	Extra Special (SC)	Color fades in light or heat
Sugilite	D	Improvement of color	-----	Fair	Normal	Avoid chemicals
Tanzanite	H	Heated to produce violet-blue color	Usually	Excellent	Special (SC)	Avoid sudden temperature changes and harsh abrasives
Topaz Blue	R	Irradiated brown and often heated to produce blue color	Usually	Excellent	Normal	For safety requirements, if neutron irradiated, refer to code letter "R," page 7
Yellow/Orange	R	Irradiated to intensify color	Occasionally	Variable	Special (SC)	Avoid heat and strong light
Pink/Red	H	Heated chromium-bearing pinkish-brown to orange stones	Usually	Excellent	Normal	
Brown	N	None	-----	-----	Special (SC)	May fade in exposure to sunlight
Green	R	Irradiated to produce a green color	Occasionally	Poor	Extra Special	Color fades in exposure to sunlight
Green	U	Diffusion of color at or near surface. See Specific Forms of Enhancement, page 7	Usually	Good	Special (SC)	Avoid repolishing or recutting
All Colors	C	Any substance applied to the surface of the gemstone to artificially modify color and/or appearance	Commonly	Poor	Special (SC)	Avoid repolishing or recutting, steaming, chemicals or ultrasonic
Tourmaline	N	None	-----	-----	Normal	
Chrome Vanadium	N	None	-----	-----	Normal	
Cat's Eye	H	Heated to improve color	Rarely	Excellent	Normal	
Yellow/Orange	R	Irradiated to improve color	Rarely	Very Good	Normal	

Tourmaline (continued) Green, Blue	H	Heated to improve color	Commonly	Excellent	Normal	
	O	The penetration of colorless oil or resins into voids to improve appearance	Occasionally	Good to Fair	Special (SC)	Avoid temperature changes, steaming, chemicals and ultrasonic
Pink, Red, Purple	H	Heated to improve color	Occasionally	Excellent	Normal	
	R	Irradiated to intensify color	Commonly	Good	Normal	
Turquoise	O	Penetration of colorless oil or unhardened resins into voids to improve appearance	Occasionally	Good to Fair	Special (SC)	Avoid temperature changes, steaming, chemicals and ultrasonic
	D	Penetration of coloring agents into voids to improve appearance	Occasionally	Fair to Poor	Special (SC)	Avoid temperature changes, steaming, chemicals and ultrasonic
Zircon Green, Brown Yellow Blue and Colorless Red Pink	I	Impregnated with plastic to create or improve color and increase durability	Commonly	Good	Special (SC)	Avoid hot water and household chemicals
	W to enhance or create color	Impregnated with colorless oil or wax	Commonly	Fair to Poor	Special (SC)	Avoid hot water and household chemicals
Zircon Green, Brown Yellow Blue and Colorless Red Pink	D	Dyed to improve color	Rarely	Poor	Extra-Special (SC)	Avoid hot water and household chemicals
	N	None	---	Good	Special (SC)	Avoid harsh abrasives
Zircon Green, Brown Yellow Blue and Colorless Red Pink	H	Heated to improve color	Rarely	Good	Special (SC)	Avoid harsh abrasives
	H	Brownish crystals are heated to these colors	Always	Good	Special (SC)	Avoid strong UV light
Zircon Green, Brown Yellow Blue and Colorless Red Pink	H	Heated to change brownish crystals to red	Commonly	Good	Special (SC)	Avoid harsh abrasives and strong UV light
	H	Improves color to pink	Usually	Good	Special (SC)	Avoid harsh abrasives and strong UV light

INFORMATION REQUIREMENTS FOR MAN-MADE MATERIALS THAT RESEMBLE NATURAL GEMSTONES

INTRODUCTION

This manual sets forth proper methods to comply with FTC Guides regarding synthetic, simulated and imitation stones. Historically, materials have been produced to duplicate or imitate the appearance of natural gemstones. When non-natural materials or other gemstone substitutes are offered for sale, it is the seller's responsibility to inform buyers that these "man-made materials" are not "natural gemstones." This information is required by the Federal Trade Commission (FTC).

Such information is required at each and all levels of gem and jewelry commerce. Those specially responsible to inform buyers include sellers of the uncut and cut/polished non-natural materials; manufacturers and wholesalers of jewelry containing non-natural materials; retailers, including sales over the counter, catalog, catalog showrooms, mail order rms, internet, television or other media sales programs; and advertisers.

Anyone who is uncertain about these requirements may write the American Gem Trade Association, 3030 LBJ Fwy., Ste. 840, Dallas, TX 75234 or the Jewelers Vigilance Committee, 25 W. 45th St., Ste. 1406, New York, NY 10036.

PURPOSE

This manual provides an easy-to-understand shorthand system for labeling. Each of the broad non-natural material categories has been assigned a code consisting of two or more letters. Each code identifies the nature of material from which it was made.

The appropriate code is to be used within the trade on every tag, stone paper, container, invoice, memorandum or other commercial document each time a seller offers for sale or sells one of these materials to a buyer within the trade.

However, codes and abbreviations are not sufficient when dealing with the consuming public. In order to clearly disclose the nature of these products, and to make it perfectly clear that they are not natural gemstones, plain language, not codes or abbreviations, must be used in all advertising and promotion, stone papers, containers, sales slips, invoices, memoranda or other commercial documents. For example, the word(s) "Synthetic" or "Laboratory Grown," "Imitation," "Assembled," or some other word or phrase of like meaning must be used in place of, or in addition to, abbreviations or code symbols.

Trade names used to promote various products must be accompanied by a specific reference to the actual composition of the material(s) the product contains.

TAG CODES AND DEFINITIONS

I. SYNTHETIC STONES

The term "synthetic" is scientifically correct and is appropriate for use within the trade. When communicating to the consumer, retail jewelers have the option to call these materials either synthetic or by some other word or phrase of like meaning so as to clearly disclose the nature of such product and the fact that it is not a natural gemstone, such as "man-made" or "laboratory grown."

SYN The tag code may be used to describe "synthetic" materials that have essentially the same optical, physical and chemical properties as a naturally occurring counterpart. The code name may not be used as a noun; thus a stone must not be referred to as a "synthetic." In all cases, the name of the stone must also be used; thus, a stone must be referred to as "synthetic ruby," "laboratory grown sapphire," or "Chatham-Created emerald," etc.

Examples: SYN Emerald, Ruby, Sapphire (various colors and colorless), Spinel, Alexandrite, Cat's Eye Alexandrite, Amethyst, etc.

The Tag Code may not be used with the consuming public; only plain language is acceptable.

Synthetic stones are as stable in color and composition as their natural untreated counterpart.

II. IMITATION PRODUCTS – SIMULANTS (SUBSTITUTES)

IMIT "IMIT" is the tag code used for a manufactured product fabricated in such materials as glass, ceramic or plastic designed to imitate or resemble the appearance, but not duplicate the characteristic properties, of a natural gemstone.

These materials may require special care; avoid household chemicals, cosmetics, abrasives and sudden shocks.

"IMIT" is also the tag code for a simulant, which is defined as a man-made single crystal product that is used to simulate the appearance, but not duplicate the characteristic properties of the natural gemstone it imitates.

Examples are: synthetic Spinel, synthetic Sapphire, synthetic Quartz, YAG, GGG, strontium titanate, and synthetic Cubic Zirconia produced in various colors to imitate gemstones of different species.

This category also includes non-single crystal materials such as imitation Lapis Lazuli and imitation Coral.

NOTE: Trade names used to promote various simulant products in these categories must be accompanied by a specific reference to the actual composition of the simulant crystal material.

TAG CODES AND DEFINITIONS

III. ASSEMBLED MATERIALS

ASBL "ASBL" is the tag code for products made of multiple layers or combinations of manufactured and/or natural material fused, bonded or otherwise joined together to increase stability and/or imitate the appearance of a natural gemstone, create a unique design or generate unusual color combinations.

EXAMPLES:

ASBL Opals – (Various Combinations) Doublets and Triplets

ASBL Garnet – Glass Doublets

ASBL Sapphire – Synthetic Sapphire Doublets

ASBL Colorless Beryl – joined by green bonding (Triplets)

ASBL Mabe "Pearls" color coated, dyed, bleached, lled with hardened substances and a Mother of Pearl back. Sometimes coating can be plastic or polymer to protect the thin nacre.

ASBL Bonded material such as Turquoise, Lapis, etc.

The "ASBL" coded stones require special care; avoid household chemicals, cosmetics, abrasives and sudden shocks.

IV. COMPOSITE MATERIALS

CMP "CMP" is the tag code for products made of disparate parts or elements in their construction.

EXAMPLES:

CMP Rubies – Lead Glass Filled Composite

CMP Sapphires – Lead Glass Filled Composite

CMP Emeralds – Pieces Bonded with Polymer

CMP Turquoise – Reconstructed and Bonded with Polymer

The "CMP" coded stones require special care; avoid household chemicals, heat, abrasives, ultrasonic and sudden shocks.



THE WORLD JEWELLERY CONFEDERATION

2015-1

2015-8-13

CIBJO/Pearl Commission

THE PEARL BOOK

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Foreword

CIBJO is the French acronym for the Confédération Internationale de la Bijouterie, Joaillerie, Orfèvrerie, des Diamants, Perles et Pierres, which translates as the International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones (normally shortened to the International Jewellery Confederation). Founded in 1926 as BIBOAH, a European organisation whose mission was to represent and advance the interests of the jewellery trade in Europe, it was reorganised in 1961 and renamed CIBJO, in 2009 it was once again reorganized and officially named “CIBJO, The World Jewellery Confederation”. Today CIBJO, which is domiciled in Switzerland, is a non-profit confederation of national and international trade associations including commercial organisations involved in the jewellery supply chain. It now has members from countries representing all five continents of the world. CIBJO printed its first deliberations on terminology and trade practices in 1968.

It is the task of CIBJO to record the accepted trade practices and nomenclature for the industry throughout the world. The records of the trade practices complement existing fair trade legislation of a nation or in the absence of relevant national laws they can be considered as trading standards. In countries where laws or norms exist, which conflict with the laws, norms or trade practices in other countries, CIBJO will support the national trade organizations to prevent trade barriers developing. The purpose of CIBJO is to encourage harmonization, promote international co-operation within the jewellery industry, consider issues which are of concern to the trade worldwide and to communicate proactively with members. Foremost amongst these the aim is to protect consumer confidence in the industry. CIBJO pursues all of these objectives through informed deliberation and by reaching decisions in accordance with its Statutes. CIBJO relies upon the initiative of its members to support and implement its standards, and to protect the trust of the public in the industry.

The work of CIBJO is accomplished through Committees, Commissions and Sectors. Committees and Commissions consider standards for use in the jewellery supply chain. Sectors represent levels of trade in the jewellery industry. Sectors and commissions advise the Executive Committee on current trade practices and issues that affect the jewellery industry.

Three independent sectors exist within the confederation:

Sector A - The Products Sector

Sector B - The Supply chain Sector

Sector C - The Service Sector

The Executive Committee may appoint Commissions that consider detailed issues. At present these are:

Coloured Stone

Diamond

Ethics

Gemmological

Pearl

Marketing & Education

Precious Metals

World Jewellers Vigilance

The Commissions for Diamonds, Gemstones, Pearls and Precious Metals have collated the guidelines, which present the accepted trade practices for applying descriptions to these materials. It is in the best interest of all those concerned to be aware of them.

The Sectors and Commissions will propose changes in the standards, also known as the Blue Books, to the Executive Committee. After review the Executive Committee will submit the accepted proposals for adoption to the Board of Directors and if approved they will notify the assembly of delegates of the changes at the annual congress. Furthermore it is our mutual responsibility to support these recommendations, which concern all professional people connected with diamonds, gemstones, pearls and precious metals. CIBJO Standards are subject to government regulations in the respective jurisdictions of CIBJO members.

The national umbrella organization for each country represents, in principle, all the national trade organizations involved in the sectors mentioned above. This democratic structure, which has contributed to CIBJO's world-wide recognition also includes international trade and commercial organizations, it provides an international forum for the trade to collectively draw attention to issues and implement resulting decisions.

CIBJO Secretariat:

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Web site: www.cibjo.org

Introduction

This CIBJO Pearl guide is designed to assist all those involved in natural pearls, cultured pearls, composite cultured pearls (5.47) and imitation of pearls (5.93) by recording the trade practices and nomenclature for the industry throughout the world.

The standard/rules is non-judgmental and the definitions and clauses contained herein are formatted and worded only to ensure that each pearl, cultured pearl and artificial product bought or sold is done so with clarity and honesty. The stability of the market place depends upon the use of the proper nomenclature and the declaration of all known facts that ensure a fully informed purchase or sale, throughout the distribution pipeline all the way to the final consumer..

In the case of natural and cultured pearls it is important that those involved in sales or purchases can relate to the mollusc that produces each pearl variety and to their life environment: saltwater or fresh water. Such knowledge helps in the understanding of colour, structure, stability and rarity. It is also important to understand the culturing process; through this knowledge the differences between beaded and non-beaded culture and the relationships between nacre thickness and productivity become clear and explainable to the end user.

The Scope (1) of the guide is set out, as are the Normative References (2). The Terms and Definitions (5) are expansive and are extensively cross-referenced throughout the Classification of Pearl Categories (3), Normative Clauses (4) and Annexes and Tables (Clauses 6 to 11). It is important that the reader refers to the relevant Terms and Definitions when consulting each Normative Clause.

The CIBJO Pearl Commission

Aug-15

NATURAL, CULTURED, COMPOSITE AND IMITATION PEARLS – TERMINOLOGY AND CLASSIFICATION (NOMENCLATURE)

1. Scope

The terminology and classification for pearls (5.143), cultured pearls (5.53), composite cultured pearls (5.47) and imitation of pearls (5.93) are established with reference to commercial usage and are in conformity with the practices of the natural and cultured pearl and jewellery trade. It shall be used by all traders participating as members of CIBJO member organizations within all member nations.

NOTE – CIBJO recognises that its standards are subject to government regulations in the respective jurisdiction of CIBJO members. In the event there are no government regulations in a member's country, the local Industry Rule will take precedence as long as it is stricter.

2. Normative references

The following referenced industry guides and conventions are useful for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the guides (including any amendments) applies.

The Diamond Book, *CIBJO*, International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones), the World Jewellery Confederation, S.S. Del Sempione KM.28 20017 RHO Milano, Italy. cibjo@cibjo.org

The Gemstone Book, *CIBJO* (International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones), the World Jewellery Confederation, S.S. Del Sempione KM.28 20017 RHO Milano, Italy. cibjo@cibjo.org

The Coral Book, *CIBJO*, International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones), the World Jewellery Confederation, Piazzale Carlo Magno,1, 20149 Milano, Italy. cibjo@cibjo.org

The Precious Metal Book, *CIBJO* (International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones), the World Jewellery Confederation, S.S. Del Sempione KM.28 20017 RHO Milano, Italy. cibjo@cibjo.org

The Gemmological Laboratory Book, A Guide for the Management and Technical Operations of Gemmological Laboratories, *CIBJO* (International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones), the World Jewellery Confederation, S.S. Del Sempione KM.28 20017 RHO Milano, Italy. cibjo@cibjo.org

Convention on International Trade in Endangered Species of Wild Fauna and Flora, *Appendices I, II and III valid from 22 May 2009*. International Environment House • Chemin des Anémones • CH-1219 Châtelaine, Geneva, Switzerland, info@cites.org.

3. Classification of pearl categories

The jewellery industry recognizes four categories of pearl: Natural pearls (5.125), cultured pearls (5.53), composite cultured pearls (5.47) and imitations of pearls (5.93). See charts in Clause 6 annex A.

3.1. Natural pearls

Natural pearls (5.125) are formed by various saltwater and freshwater molluscs without human intervention. See 6.1., natural pearl chart.

3.1.1. Treated pearls

Natural pearls that have been altered to change their appearance, composition and/or durability by methods other than what is considered to be normal procedures (see clause 4.4.2.1).

3.2. Cultured pearls

Cultured pearls (5.53) are formed with human intervention in the interior of productive living molluscs (5.113) in a variety of conditions depending upon the mollusc and the goals. See clause 6.2., cultured pearl chart.

NOTE - Cultured pearls may be subdivided into nacreous cultured pearls (5.120), non- nacreous cultured pearls (5.128), beaded (5.16) or non-beaded cultured pearls (5.127) (these may be further subdivided into *freshwater* cultured pearls (5.72), and *saltwater* cultured pearls (5.160))

3.2.1. Treated cultured pearls

Cultured pearls that have been altered to change their appearance, composition and/or durability by methods other than what is considered to be normal procedures (see clause 4.5.2.1).

3.3. Artificially produced composite cultured pearls

Products composed of two or more parts of which at least one is usually a hollowed out and re-filled cultured blister pearl, they may be assembled by bonding (5.28) or by other artificial methods.

3.4. Imitations of pearls

Products that only simulate the appearance of a natural pearl (5.125) or cultured pearl (5.53).

4. Normative Clauses

4.1. General clauses

4.1.1. Description

All materials listed in clause 3 shall be named, described and displayed in accordance with the definitions, annexes and the terminology set out in all the clauses herein. This

applies to all publications, advertisements (5.4), communications addressed to consumers and to the specific information given to a purchaser, prior to or during a final sale, as well as to all commercial documents (5.46) (e.g., offers, labels, memos, delivery notes and invoices) and to appraisals, etc.

4.1.2. Disclosure

Full disclosure (5.58) by the vendor to the purchaser of all material information (5.109) shall take place whether or not the information is specifically requested and regardless of the effect on the value of the product being presented or sold.

4.1.2.1. Verbal disclosure

Full verbal disclosure (5.58) shall take place using clear and understandable language prior to the completion of a sale.

4.1.2.2. Written disclosure

Full written disclosure (5.58) shall be conspicuously included on all commercial documents (5.46) in clear and plain language so as to be readily understandable to the purchaser. The disclosure shall immediately precede the description of the materials classified in clause 3 and shall be equally conspicuous to that description.

4.1.3. Terms designed to disguise

It is contrary to the purposes of this document to make any misleading or deceptive statement, representation or illustration relating to origin, formation, production, condition or quality that does not conform in all respects with any and all the clauses contained herein.

Within certain contexts the term “natural treated pearl” may be misleading and is discouraged, for the term “treated natural pearl” emphasis shall be given to the word “treated”.

4.1.4. Display

In cases when pearls, cultured pearls, composites and imitation pearls are displayed, or jewellery is decorated, with composites, imitations or treated pearls and or treated cultured pearls that require specific information (5.175), an easily noticeable and legible label adjoining each item shall clearly indicate the details of its composition in accordance with the clauses herein.

4.1.5. Weight

the weight of cultured pearls shall be expressed in momme (5.114), kan (5.96) liang (5.101), carats (5.32) or grams (5.83). The weight of a natural pearl shall be expressed in pearl grains (5.82), liang (5.101), or carats (5.32), (four grains are equal to one metric carat) or methgal (5.112) a unit of weight used in the Arabian Gulf that is equal to 4.5 grams, note also the chaw (5.35).

IMPORTANT: It is acknowledged that the weight of a natural or cultured pearl may change over time.

IMPORTANT: If the drill hole of a natural pearl has been plugged it is important that this is stated when the weight is declared.

NOTE: It is an unfair trade practice to misrepresent the weight of any natural or cultured pearl or to deceive as to the weight of any natural or cultured pearl. It is also an unfair trade practice to state or otherwise represent the weight of all natural or cultured pearls contained in any article unless such weight figure is accompanied with equal emphasis and prominence by the words "total weight", or words of similar meaning, so as to indicate clearly that the weight so stated or represented is that of all pearls in the article and not that of the centre or largest one.

NOTE: The SI (Système International) generally uses the term *mass* instead of *weight* (5.190). Mass is a measure of an object's inertial property, or the amount of matter it contains. Weight is a measure of the force exerted on an object by gravity or the force needed to support it.

4.1.6. Measurement

The measurements of a single natural or cultured pearl shall be expressed to the nearest one fourth (.25) of a millimetre for sizes below 10 mm and nearest tenth (.10) of a millimetre for sizes 10 mm and above.

4.1.6.1. Single pearl

The following measurements shall be contained in the description of a single natural or cultured pearl;

- round shape: widest diameter
- fancy shape: maximum length, maximum diameter

4.1.6.2. Graduated strands

The measurements used to describe a graduated strand of natural and/or cultured pearls shall include the maximum diameter of the largest and the smallest. The measurements shall be expressed to the nearest one tenth (.10) of a millimetre.

4.1.6.3. Uniform strands

The measurements used to describe a uniform strand of natural and/or cultured pearls shall be expressed in one half (0.5) mm to 1.99mm variations and stated as the minimum size, e.g., 6 - 6.5 mm, dependent upon the average size of the strand.

4.2. Natural and cultured pearls

4.2.1. Use of terms

Only those pearls that conform to the definition contained in 5.125 shall be described as natural pearls and only those pearls that conform to the definition contained in 5.53 shall be described as cultured pearls and all descriptions for natural pearls and cultured pearls shall conform to the content of all other clauses herein.

4.2.2. Biological name

Pearls and cultured pearls that are not listed in Clause 4.2, or defined in clause 5 or Clause 10, shall be described by the biological name of the mollusc from which they originate only.

NOTE: Biological name of the natural or cultured pearl may be used to correctly identify the natural or cultured pearl instead of the commercial name (Clause 10). Use the descriptive adjective for the natural pearl or cultured pearl, if any is needed, as indicated in Clause 10.

NOTE: the correct biological name preceded or followed by a colour description may substitute for any commercial name.

4.2.3. Geographical area

the names of specific geographical areas shall only be used to refer exclusively to pearls and or cultured pearls which are found or grown exclusively from that area e.g., “Biwa Cultured Pearl” (5.19) shall only be used to describe cultured pearls grown in freshwater bivalve molluscs in Lake Biwa, Japan, etc, unless the name of the geographical area is part of the commercial name as listed in Clause 10 e.g., South Sea Cultured Pearl (5.171), etc.

4.2.4. Non-permanent treatments

Pearls and cultured pearls subjected to alterations in clauses 4.4.2.3.1 and 4.5.2.3.1 that are not permanent shall require prior to the closing of the sale a declaration that the process is not permanent and that they require special care. See Clause 8.2.

4.3. Trade codes

Trade codes listed in Clause 7 shall only be used within the industry; they shall not be used for the general public. The codes are intended to facilitate the insertion of vital information on tags attached to merchandise, on invoices and or other commercial documents (5.46) used within the trade.

4.3.1. Trade codes for untreated/unmodified natural and cultured pearls that require special care (s/c)

Care advice should be regarded as normal for natural and cultured pearls across the product range and a code is unnecessary. However, there are particular cases where a code would be useful, examples of which are (also see Clauses 7)

Natural Abalone Pearl, (sc). – Often hollow and therefore fragile.

Natural Conch Pearl, (sc). – Colour may fade or change if exposed to long periods of sunlight or short exposures to x-rays

Cultured Conch Pearl (sc) – Colour may fade or change if exposed to long periods of sunlight or short exposures to x-rays

4.3.2. Trade codes for treatments

The codes listed in Annex 7 shall only be used on commercial documents (5.46) within the industry; they are not to be used for the general public. Methods of pearl treatment disclosure shall be in accordance with Clause 4.5.2.3.1. for cultured pearls and Clause 4.4.2.3.1. for natural pearls. Where multiple treatments have been applied multiple codes shall be used, e.g., BW (Bleached/Waxed). Where special care is required to preserve the results of a treatment the initials sc (Special Care) shall be added after the code, e.g., Dsc (Dyed/Special Care). Also see Clause 8.

4.4. Natural pearl clauses

4.4.1. Terms

4.4.1.1. Natural Pearl

The term natural pearl shall only be used to describe natural pearls (5.125) i.e., pearls produced naturally within a natural pearl sac (5.126) and without any human intervention.

4.4.1.2. Oriental pearl

the term 'oriental pearl' (5.139) shall only be used for natural saltwater pearls (5.161, 5.125) and shall not be used to denote the quality or appearance of a pearl.

4.4.1.3. Pearl

If the word "pearl" (5.125) is used without qualification it shall refer only to a "natural pearl". However, to avoid confusion and /or misinterpretation it is recommended that natural pearls be labelled as "natural pearls". The term "pearl" as used in the jewellery industry shall always be preceded with the term "cultured" for cultured pearls, "composite" for composite pearls or "imitation" for imitations of natural pearls and cultured pearls.

It is understood that the term 'pearl' is not generic when used in the trade and as described in the previous paragraph, even if the term is used in a broader sense within the public domain.

The unqualified term "pearl" shall not be used when referring to an imitation or simulant of a pearl in either commercial or non-commercial documents.

4.4.1.4. 'Freshwater natural pearl'

the term 'freshwater (5.71) natural pearl' (5.125) shall only be used to describe natural freshwater pearls.

4.4.2. Altered natural pearls

There are three categories of natural pearls that have their appearance, composition and or durability altered:

4.4.2.1. Natural pearls altered by normal procedures

Natural pearls which had only normal procedures applied i.e., drilling, faceting, carving, polishing (5.155), buffing (5.30) and/or cleaning (5.41), do not require this information to be stated in their description at the point of sale. However drilled and or cut portion of pearls which are not visible in jewellery and pearls that have been Chinese drilled (5.36) shall be disclosed. For full disclosure instructions see clause 4.4.2.3.1.

NOTE – Cleaning does not include *maeshori* (5.105) treatment procedures

4.4.2.2. Natural pearls requiring general information on treatments

Natural pearls that have been bleached to produce a white appearance shall have an asterisk on commercial documents (5.46), immediately following the description or name of the pearls that relates to a footnote of equal prominence to the description or name that appears on the same page that indicates that the pearls have been bleached.

Example:natural pearls*

*These natural pearls have been bleached to change their original colour and produce a uniform white appearance.

4.4.2.3. Natural pearls altered by methods requiring specific treatment declarations

Natural pearls that have been treated by coating (5.43), dyeing (5.60), filling (5.65), irradiation (5.95), oiling (5.134), peeling/working, (0), tinting (5.185) and waxing (5.189) require specific information at the point of sale. See clause 4.4.2.3.1. and clause 9.1 Annex D.

4.4.2.3.1. Disclosure requirements for natural pearls requiring specific information on treatments

When making reference, to a pearl (5.125) that has been treated as described in clause 4.4.2.1 and 4.4.2.3 above the words 'natural pearl', 'pearl', or the 'colour description' shall immediately be preceded or followed by a word or words that describe the treatment and shall, prior to the closing of the sale, require a verbal explanation that the natural pearl has been treated. In the event of a written presentation, the word describing the treatment shall be of equal emphasis and prominence, with characters of the same size and colour as those of the name itself. Do not abbreviate.

Examples: Coated natural pearl; "*colour*" (dyed) natural pearl; Filled natural pearl; Yellow (heated) natural pearl, Black (irradiated) natural pearl; Oiled natural pearl; Waxed natural pearl; worked natural pearl; or treated natural pearl.

4.4.2.3.2. Inability to inspect a treated natural pearl

If a treated natural pearl (5.125) is offered for sale without an opportunity for the buyer to personally inspect the product, (e.g., advertising (5.4) in direct mail, catalogues, online services, televised shopping programmes, etc.) an explanation shall be made that it is a treated natural pearl in the presentation and/or description of the product prior to the close of the sale.

4.4.2.3.3. Other treatments

Treatments (5.188), in addition to those mentioned in clause 4.4.2.2 must be disclosed in accordance to clause 4.4.2.3

4.5. Cultured pearls clauses

4.5.1. Terms

4.5.1.1. The term “cultured”

the term ‘cultured’ (5.51 and 5.53) shall only be used for cultured pearls (5.53). This applies to all cultured pearls, whichever method, species or body of water is used for their formation.

NOTE: the placing of an asterisk next to the word pearl making reference to an explanation of the fact the product is a cultured pearl does not comply with this clause.

A cultured pearl that has been artificially coated, and the outer layer is not composed of nacre laid down by a mollusc shall be considered an imitation.

4.5.1.2. “Freshwater cultured pearl”

the term ‘freshwater cultured pearl’ (5.72) shall always be used for cultured pearls that have been cultured in freshwater rivers, lakes and ponds. When making reference to a freshwater cultured pearl, the words ‘cultured pearl’ shall immediately be preceded by the word ‘freshwater’ and shall, prior to the closing of the sale, require a verbal explanation that it is a freshwater cultured pearl, and in the event of a written presentation, shall immediately be preceded by the word ‘freshwater’, with equal emphasis and prominence, with characters of the same size and colour as those of the name itself. Do not abbreviate. If a freshwater cultured pearl can be purchased without personally viewing the product, (e.g., direct mail, catalogues, online services, televised shopping programmes) explanation shall be made that it is a freshwater cultured pearl in the presentation and/or description of the product prior to the close of the sale.

NOTE: The placing of an asterisk next to the name of a freshwater cultured pearl, making reference to a footnote explanation of the fact that the product is a freshwater cultured pearl, does not comply with the requirements of this clause.

4.5.1.3. “Saltwater cultured pearl”

the term ‘saltwater cultured pearl’ (5.160) shall always be used for cultured pearls cultured in bodies of saltwater. When making reference to a saltwater cultured pearl, the words ‘cultured pearl’ do not need to be preceded by the word ‘saltwater’ but shall, prior to the closing of the sale, require a verbal explanation only that it is a cultured pearl, this applies also in the event of a written presentation. Do not abbreviate. If a saltwater cultured pearl can be purchased without personally viewing the product, (e.g., advertising (5.4) in direct mail, catalogues, online services, televised shopping programmes, etc.) explanation shall be made that it is a cultured pearl in the presentation and/or description of the product prior to the close of the sale.

Note -The placing of an asterisk next to the name of saltwater cultured pearl, making reference to a footnote explanation of the fact that the product is saltwater cultured pearl, does not comply with the requirements of this clause.

4.5.2. Altered cultured pearls

There are three categories of cultured pearls that have their appearance, composition and or durability altered:

4.5.2.1. Cultured pearl altered by normal procedures

Cultured pearls which only had normal procedures applied i.e., drilling, faceting, carving, polishing (5.155), buffing (5.30) and/or cleaned (5.41), do not require this information to be stated in their description at the point of sale. However drilled and or cut portion of cultured pearls which are not visible in jewellery shall be disclosed. For disclosure instructions see clause 4.5.2.3.2

Cultured pearls that have been cut (5.55) shall be clearly described as half or three quarter cut cultured pearls.

NOTE - Cleaning does not include *maeshori* (5.105) treatment procedures.

4.5.2.2. Cultured pearls requiring general information on treatments

Cultured pearls that have been bleached to produce a uniform white appearance shall have an asterisk on commercial documents (5.46), immediately following the description or name of the pearls that relates to a footnote of equal prominence to the description or name that appears on the same page that indicates that the cultured pearls have been bleached.

Example:cultured pearls*

*These cultured pearls have been bleached to remove or change their colour to white.

*Cultured pearls grown in the Akoya pearl oyster are usually bleached to remove blemishes between the nucleus and the nacre, to change the colour of the nacre or produce a uniform white appearance.

4.5.2.3. Cultured pearls altered by methods requiring specific treatment declarations

Cultured pearls that have been treated by dyeing (5.60), filling (5.65), heating (5.89), irradiation (5.95), lustre enhancements e.g., “maeshori” (5.105), oiling (5.134), peeling/working (5.148), tinting (5.185), waxing (5.189) and chemically altered (5.37) require specific information on the treatments to be declared at the point of sale. See clause 4.5.2.3., and clause 9.2 Annex D.

4.5.2.3.1. Disclosure requirements for cultured pearls requiring specific information on treatments

When making reference, to a cultured pearl (5.53) that has been treated as described in 4.5.2.3 above the words ‘cultured pearl’ or the ‘colour description’ shall immediately be preceded or followed by a word or words that describe the treatment and shall, prior to the closing of the sale, require a verbal explanation that the cultured pearl has been treated. In the event of a written presentation, the word describing the treatment shall be of equal emphasis and prominence, with characters of the same size and colour as those of the name itself. Do not abbreviate.

Examples: “*Colour*” dyed cultured pearl; Filled cultured pearl; Yellow (heated) cultured pearl, Black (irradiated) cultured pearl; Oiled cultured pearl; waxed cultured pearl; black cultured pearls which have been treated to produce a chocolate colour; or treated cultured pearl.

4.5.2.3.2. Inability to inspect a treated cultured pearl

If a treated cultured pearl is offered for sale without an opportunity for the buyer to personally inspect the product, (e.g., advertising (5.4) in direct mail, catalogues, online services, televised shopping programmes, etc.) an explanation shall be made that it is a treated cultured pearl in the presentation and/or description of the product prior to the close of the sale.

4.5.2.3.3. Other treatments

Treatments (5.188), other than those mentioned in clause 4.5.2.3 must be disclosed in accordance to clause 4.5.2.3.1.

4.6. Artificially produced composite cultured pearls clauses

Assembled/Composite cultured pearls shall be described by the words composite or assembled according to the composite construction (except when they can be defined as an imitation (5.93) and shall, prior to the closing of the sale, require a verbal explanation that it is an assembled/composite pearl product, and, in the event of a written presentation, shall be immediately preceded by the correct names of the components of the assembled product, the names of which shall be mentioned from the upper part downwards and be separated by a slash (/). Except where all parts of the assembled/composite pearl products are of the same substance (excluding any cement) when the name of this substance shall be stated only once. Do not abbreviate. The terms assembled or composite, in the event of a written presentation, shall appear with equal emphasis and prominence, with characters of the same size and colour as those of the names of the components. Do not abbreviate. If an assembled/composite cultured pearl can be purchased without personally viewing the product, (e.g., advertising (5.4) in direct mail, catalogues, online services, televised shopping programs, etc.) explanation shall be made that it is an assembled/composite pearl in the presentation and/or in the description of the product prior to the close of the sale.

NOTE: The placing of an asterisk next to any name or combination of names of a pearl, making reference to a footnote explanation of the fact that the product is an assembled/composite, does not comply with the requirements of this clause.

Do not use a qualifying title other than 'assembled' or 'composite' to describe any product classified under 4.6.1.

4.6.1. Description and display

Assembled/Composite cultured pearls shall be named and described in accordance with (5.12) and all other clauses herein.

NOTE: The terms 'assembled' or 'composite' may be used interchangeably.

4.6.2. Composite cultured blister

Assembled/Composite cultured blisters shall be named and described in accordance with (5.12 and 5.54) and all other clauses herein.

4.7. Imitation of pearl clauses

4.7.1. Description and display

Imitations (5.93) or simulants (5.168) of natural pearls and cultured pearls shall, prior to the closing of the sale, require a verbal explanation that it is an imitation or simulant of a natural or cultured pearl, and, in the event of a written presentation shall be immediately preceded by the word 'imitation' or 'simulated', with equal emphasis and prominence, with characters of the same size and colour as those of the name itself, e.g., simulated pearl, imitation pearl etc. Do not abbreviate. If an imitation (5.93) or simulant (5.168) of a natural pearl or a cultured pearl can be purchased without personally viewing the product, (e.g., advertising (5.4) in direct mail, catalogues, online services, televised shopping programmes, etc.) explanation shall be made that it is an imitation or simulant pearl in the presentation and/or description of the product prior to the close of the sale.

NOTE: The placing of an asterisk next to the word pearl, making reference to a footnote explanation of the fact that the product is an imitation, simulant of a pearl or cultured pearl does not comply with this clause.

4.7.2. Terms other than 'imitation' or 'simulated'

Do not use a qualifying term other than 'imitation' or 'simulated' to describe any product defined in (5.93), (5.168) and (4.7).

4.7.2.1. "Cultured pearl-like", "semi-cultured-pearl", "faux pearls", "mother of pearl", etc.

the terms "cultured pearl-like", "semi-cultured-pearl", "faux pearls", "mother of pearl" or any other similar expression shall not be used when referring to imitation (5.93) or simulated pearls (5.168).

4.7.2.2. Trade marks

When Trade Marks, brands, or fancy names are used to describe imitations of pearls or cultured pearls the use shall not conceal the fact that the product is an imitation, e.g., Trade Marks shall be used in the following format:

'Majorica Imitation Pearl', indicating that the article in question is an imitation of a pearl whose trademark is "Majorica".

4.7.3. Commercial names

The name of an imitation or simulated pearl shall not be similar to the name, or the sound of the name (neither entirely, nor abbreviated, nor by way of an allusion), of any natural or cultured pearl.

4.7.4. Geographical areas

Do not use the name of a geographical area associated with the production, processing or exporting of natural or cultured pearls in connection with and or referring to imitation pearls.

5. Terms and definitions

For the purposes of these CIBJO Standard/rules, the following terms and definitions apply;

5.1. Abalone Cultured Blister

a cultured blister (5.54) from an abalone (5.2).

5.2. Abalone Pearl

a natural pearl, usually multi-coloured blue or green hue, found in gastropod molluscs of the *Haliotis* (10.24) genus in the Pacific, Atlantic and Indian Ocean.

5.3. Adductor muscle

the muscle attached to both valves of a bi-valve (5.18) that causes the shell to close when it contracts.

5.4. Advertisement

the activity of attracting public attention to a product or business, as by announcements in the print, broadcast, or electronic media.

5.5. Akoya

see (10.45 and 10.3).

5.6. Akoya cultured pearl

a beaded cultured pearl produced in *Pinctada fucata (martensii)* (10.45), the Akoya pearl oyster.

5.7. Alteration

Any change made to a pearl, cultured pearl or artificial products.

5.8. Arabian Gulf

An area in Southwest Asia that is an extension of the Indian Ocean located between Iran and the Arabian Peninsula.

5.9. Arabian Gulf pearls

natural pearls produced from the *Pinctada Radiata* (10.52).

5.10. Artificial products

Products which are partially or completely made by man.

5.11. Assembled

See composite (5.47) cultured pearl and assembled cultured pearl blister (5.12).

5.12. Assembled cultured blister

assemblages of a purpose-grown cultured blisters (5.54) which have been cut from their shell, the original bead (5.132) upon which they grew being removed and the cavity filled with various types of man-made materials, and backed by a layer of shell, the assemblages being held together by an adhesive; commonly known as Mabe (5.104) or Hankei (5.88) and occur in both fresh and saltwater environments. Not to be confused with cut cultured pearl (5.55).

5.13. Bahraini pearl

a natural pearl from Bahraini waters in the Arabian gulf produced from the *Pinctada Radiata* (10.52).

5.14. Baroque

an irregularly shaped natural or cultured pearl. Baroque was originally a French adjective used to describe objects or pearls that were not symmetrical in shape.

5.15. Basra Pearl

a natural pearl from the Arabian gulf produced from the *Pinctada Radiata* (10.52).

5.16. Bead for cultured pearls

a sphere (usually) or other shape (occasionally) originally formed by cutting and polishing a nacreous shell used to accommodate the nacre (5.116) secreted from a cultured pearl sac (5.52). The bead eventually forms the centre of a beaded cultured pearl (5.17).

Note: Atypically, beads formed from natural or cultured pearls of various types or other materials may be used, however, in such circumstances the product shall be described as containing an atypical bead or the type of bead shall be named, e.g., an “atypical bead cultured pearl”, a “turquoise bead cultured pearl”.

5.17. Beaded Nacreous Cultured Pearl

beaded cultured pearls are usually nacreous (5.119) formations secreted in the interior of a pearl oyster (5.145). A bead (5.16) is inserted into the mollusc along with a piece of mantle tissue which eventually forms the cultured pearl sac (5.52) around the bead which is in turn responsible for the secretion of nacreous layers. The outer layers of beaded nacreous cultured pearls are concentric and composed of a complex scleroprotein named conchiolin (5.49) and of calcium carbonate (usually in the form of aragonite). See nacreous cultured pearls.

5.18. Bivalve

a member of the molluscan class Bivalvia, having a two-part shell, e.g., clam, oyster, mussel, and scallop.

5.19. Biwa Cultured Pearl

a freshwater beaded or non-beaded cultured pearl produced in Lake Biwa, Japan, using the freshwater bivalve mollusc *Hyriopsis schlegeli* (10.27). See also 5.186.

5.20. Black Cultured Pearl

natural colour, cultured black pearl produced using either *Pinctada margaritifera* (10.49) (the Tahitian cultured pearl (5.178), *Pinctada mazatlanica* (10.51) or *Pteria sterna* (10.59) or other pearl oysters (5.145). The colour is not caused by any subsequent processing.

5.21. Black Natural Pearl

natural colour, natural black pearl produced by *Pinctada margaritifera* (10.49 *Pinctada mazatlanica* (10.51) or *Pteria sterna* (10.59). Colour not caused by any subsequent processing.

5.22. Bleaching

to remove or change a colour by means of chemical and or physical agents or light.

5.23. Blister cultured pearl

a cultured pearl that has perforated the mantle of the mollusc and has adhered, through layers of nacreous or non-nacreous secretions applied by the mollusc, to the inner wall of the shell. The subsequently formed layers of nacreous or non-nacreous material are continuous with those of the inner wall of the shell. They are round or irregular in shape and the base of the blister cultured pearl may be worked (0).

5.24. Blister natural pearl

a natural pearl that has perforated the mantle of the mollusc and has naturally adhered, through layers of nacreous or non-nacreous secretions applied by the mollusc, to the inner wall of the shell. The subsequently formed layers of nacreous or non-nacreous material are continuous with those of the inner wall of the shell. They are round or irregular in shape and are secreted without human intervention. Blister pearls are known in the Arabian Gulf as "Nimro". The base of natural blister pearls may be worked (0).

5.25. Body colour

the dominant, overall colour of the natural or cultured pearl.

5.26. Bombay Bunches

strands of round salt water natural seed pearls (*ranging from less than 1 mm to 3 mm*) (5.165), mostly with medium to high lustre and well-matching colour. These bunches are known by the trade as Bombay Bunches and are mostly marketed in Europe.

5.27. Bombay pearls

commercial name for natural pearls chiefly from *Pinctada radiata* (10.52), fished from the Arabian Gulf and Red Sea and exported through Bombay, India.

5.28. Bonding

the cohesion of two or more parts or layers. See composite pearl or cultured pearl definition 5.47

5.29. Bonus cultured pearl

See Lagniappe cultured pearl (5.100) and Keshi cultured pearl (5.98).

5.30. Buffing

removing organic residues from the surfaces of natural and cultured pearls following harvest (see also polishing, 5.155).

5.31. Button-shaped

a symmetrical domed-shape with or without a flattish bottom.

5.32. Carat

a unit of weight (5.190), one carat being equivalent to 200 milligrams (1/5 gram).

5.33. Carved

cultured pearl that has been engraved on the surface.

5.34. Cerclé

see circled 5.39.

5.35. Chaw

The chaw is a system of converting weight into volume. Pearls in the Arabian Gulf and India are often sold by chaw.

5.36. Chinese drilling

Two drill-holes that penetrate a pearl from two different points on the same side, in general the flat or less round side, and meet at a point within the pearl. This drilling was designed to facilitate the use of pearls as buttons.

5.37. Chemically altered

a treatment that changes the colour of a pearl or cultured pearl without the use of a dye.

5.38. Choker

a strand of uniform sized natural pearls, cultured pearls or imitations of pearls measuring 35-40cm (14 to 16 inches) in length.

5.39. Circled

a pearl also known as *cerclé* (5.34) with one or more concentric rings or indented grooves around it.

5.40. Clam pearl

natural pearl from the hard-shell and giant clams, e.g., *Mercenaria mercenaria* (quahog) (10.41), *Tridacna gigas* (giant clam) (10.69) *et.al.*

Note: see Clause 2 Normative References; Convention on International Trade in Endangered Species of Wild Fauna and Flora

5.41. Cleaned

a process that that employs water and sometimes mild detergents and /or soft powders to remove loose extraneous matter only from the surface of a natural or cultured pearl.

5.42. Cleaning

following its removal from a mollusc, a pearl maybe cleaned of debris by immersion in water that contains various detergents. This process does not include any bleaching chemicals and is known as 'cleaning'.

5.43. Coating

an artificial layer of any natural or artificial substance spread over the surface, or part of the surface, of natural pearls and cultured pearls for protection, colouration, increased lustre and other optical phenomena (orient and overtone), decoration or to alter their appearance; a covering layer.

5.44. Collar

a strand of pearls, cultured pearls or imitation pearls measuring 25-33cm (10 to 13 inches) in length.

5.45. Colour

colour has three attributes: hue, tone, and saturation. Hue is the basic impression of colour—yellow, green, blue, etc. Tone is the relative impression of lightness or darkness of the colour. Saturation is the strength or intensity of the colour. In general the colour of nacreous natural and cultured pearls may be described in terms of a combination of 'body colour' (5.25), 'overtone' (5.140) and 'orient' (5.138).

Nacreous natural pearls from the Arabian Gulf pearls have a wide selection of colours that have other traditional and distinctive trade names; white (Abyadh), dull white (Basali), black (Aswad), cream with a reddish hue (Nabati), white with a pinkish hue (Mushayer), whitish-blue or whitish-grey (Singbassi), white or cream with a bluish hue (Samawi), white with strong iridescent colours (Gallabi), white or cream with a strong green hue (Akhthar), glassy white or whitish-blue with high lustre (Alzujaji), rose pink (Wardi), light yellow (Ashgar), cream (Keremi).

5.46. Commercial document

Any writing or electronic transmission that evidences, anticipates or concludes a Commercial Transaction, including any agreement, memorandum of agreement, purchase order, blanket purchase order, blanket purchase agreement, purchase order acknowledgment, request for proposal, quote, warranty, representation certification, guaranty, import documentation, packing list, bill of sale, memorandum of consignment, receipt and in advertising. Commercial documents include mandatory information of the seller, and when necessary the buyer.

5.47. Artificially produced composite pearl or cultured pearl

Product composed of two or more previously separate parts or layers, assembled by bonding (5.28) or other artificial methods of which at least one is a natural pearl or a cultured pearl.

5.48. Conch Pearl

a non-nacreous natural pearl consisting of calcium carbonate arranged concentrically in a crossed lamellar microarchitecture. This structural characteristic usually produces a flame-like surface pattern and porcelaneous sheen. Such pearls are produced by various gastropods including the Queen Conch (*Strombus gigas*) (10.67), Horse Conch (*Pleuroploca gigantea*) (10.54), and the Emperor Helmet (*Cassis madagasgerensis*) (10.8). Also known as pink pearls. See also (10.11) conch.

Note: see Clause 2 Normative References; Convention on International Trade in Endangered Species of Wild Fauna and Flora

5.49. Conchiolin

protein material ($C_{32}H_{48}N_2O_{11}$) constituting the organic portion of nacre.

5.50. Coque de perle

a shell section, cut from the curved nacreous surface of a polished Chambered *nautilus* then finished like an assembled pearl. *Coques de perles* are often assembled into jewellery, to resemble large oval half-pearls.

5.51. Culture

the growth of biological material, microorganisms, animal tissue or pearls with human intervention, in specially controlled conditions.

5.52. Cultured Pearl Sac

a pearl sac produced / grown from a graft (5.80) of mantle tissue (5.106) artificially inserted into the body of a host mollusc or created from mantle damage due to human handling.

5.53. Cultured Pearls

cultured pearls are formed in the interior of productive living molluscs within a cultured pearl sac (5.52) with human intervention and a variety of conditions depending upon the mollusc and the goals. See 5.120, and 5.128.

5.54. Cultured Blister

See 5.121.

5.55. Cut Cultured Pearls

cultured pearls that have been cut in half or three quarters to produce a flat base.

5.56. Cut Natural Pearls

natural pearls that have been cut to produce a flat base.

5.57. Cyst pearls

natural pearls (5.125) that occur in a pearl-sac (5.147) and not in direct contact with the shell of a pearl-producing mollusc.

5.58. Disclosure

The act of providing all material information (5.109). To fully inform a purchaser, prior to or during a final sale.

5.59. Dobo pearls

a commercial name for cultured pearls traded and exported through Dobo in Indonesia.

5.60. Dyed/Dyeing

application of a dye or stain to natural materials or artificial products to alter their colour.

5.61. Drilled

a pearl with a cylindrical hole engineered to enter at one point and exit on the opposite side. Also see part-drilled (5.142) and Chinese drilled (5.36).

5.62. Essence d'orient

French term for a solution of powdered fish scales in resin or other coating, used for manufacturing imitation pearls.

5.63. Faceted cultured pearls

cultured pearls with multiple flat, convex or concave facets that have been artificially formed on their surface.

5.64. Faceting

a polishing technique applied to cultured pearls, to obtain multiple facets.

5.65. Filling

to introduce a substance that occupies a whole or part of a void.

5.66. Fine pearl

see natural pearl.

5.67. Fissure

a very narrow opening; a fine fracture.

5.68. Fracture

An opening; a crack.

5.69. Fracture filling

To occupy the whole or part of a fracture with a substance, e.g. glass, resins, oil, etc.; to pervade; to spread throughout; to occupy completely; or make full, with the purpose of making the fracture less visible.

5.70. Frequency

the rate of occurrence (according to current knowledge) for a treatment being applied to pearls including bleaching, bonding, dyeing, irradiating, oiling, staining, tinting and/or waxing. Expressed as Unknown: Rarely: Uncommon: Occasionally: Common: Usually: or Always: in Clause 9.

5.71. Freshwater

a body of water that is non-saline, e.g., rivers, lakes, ponds and marshes.

5.72. Freshwater Cultured Pearl

cultured pearls produced in molluscs (mussels) in freshwater, e.g., *Hyriopsis schlegelii* (10.27), *Hyriopsis cumingii* (10.26).

5.73. Freshwater Natural Pearl

A natural pearl produced by a bivalve (5.18) mollusc (5.113) living in freshwater (5.71).

5.74. Gem

Another term, often used as an adjective, to describe an exceptional pearl or cultured pearl noting perfection or very high quality.

NOTE – the term “Gem” shall only be used to qualify the terms “real”, “precious”, “genuine” and “natural”.

5.75. General information

a method to provide information, at the time of sale, when materials have been subjected to an alteration (5.7) that requires a verbal disclosure (see clause 4.1.2.1.) and a general comment on a commercial document, see clause (5.46)

5.76. Genuine

actually possessing the alleged or apparent attribute or character.

5.77. Gonad

the sex or reproductive organ.

5.78. Gonad grown cultured pearl

a cultured pearl grown in the gonad (5.77) of a pearl producing mollusc.

5.79. Gonad natural pearl

a horn or cusp-shaped natural pearl common in abalone (10.1), formed in the similarly shaped reproductive organ or gonad (5.77).

5.80. Graft

a piece of epithelium tissue cut from the mantle (5.106) of a nacre (5.116) producing mollusc that is inserted into the body of another nacre producing mollusc (5.118), (usually of the same species), to initiate the growth of a cultured pearl sac (5.52) and a cultured pearl (5.53).

5.81. Grafting

the action of introducing tissue cut from the mantle (5.106) of a nacre (5.116) producing mollusc into the body of another nacre-producing mollusc (5.112) (usually of the same species) to initiate the growth of a cultured pearl sac (5.49) and a cultured pearl. Grafting can be done into the recipient oyster's mantle (5.106) or gonad (5.77) mantle-grown cultured pearls (5.107) or gonad-grown cultured pearls (5.78).

5.82. Grain

a unit of weight often used in the trade to approximate the weight of a natural pearl or a diamond, a grain is equal to 0.25ct.

5.83. Gram

1/1000 of a kilogram.

5.84. Gulf pearl

a natural pearl from the Arabian Gulf produced from the *Pinctada Radiata*.

5.85. Half composite cultured pearl

see 5.45.

5.86. Half cultured blister

see 5.54.

5.87. Half cultured pearl

see 5.55.

5.88. Hankei or Mabe

Japanese trade term for cultured blister (5.54).

5.89. Heating

to heat a pearl or cultured pearl to a temperature that may alter its appearance.

5.90. Hinge pearl

a natural pearl of irregular and usually elongated shape, found near the hinge of bivalve (5.18) molluscs – not cut from the shell.

5.91. Hollow cultured pearl

a cultured pearl with a large enclosed cavity.

5.92. Hollow pearl

a natural pearl with a large enclosed cavity.

5.93. Imitation of Pearl

artificial products that only simulate the appearance of natural or cultured pearls. Any product, including organic nucleus, which have been artificially coated by natural or artificial substances, and which the outer layers are not secreted in the interior of the productive molluscs (see Simulant 5.168).

5.94. Invertebrate

an animal without an internal backbone. Examples are snails and clams (molluscs), crabs and shrimp (crustaceans), starfish and sea urchins (echinoderms), worms (annelids), corals and sea fans (cnidarians or coelenterates).

5.95. Irradiated / Irradiation

exposing pearls, cultured pearls, diamonds, gemstones, synthetic stones and artificial products to any form of radiation which is controlled wholly or partially by man, usually to alter their appearance.

5.96. Kan

a unit of pearl weight equal to 1,000 momme (5.114) or 3.75 kilograms.

5.97. Kharag

the Arabic name given for the person who specializes in working pearls.

5.98. Keshi

An old Japanese trade name for a small saltwater natural or non-beaded cultured pearl that is essentially baroque in shape.

Note: the term Keshi used without qualification has been misused and is not recommended terminology for any type of pearl product unless qualified with either 'natural' or 'cultured', whichever is appropriate.

5.99. Keshi Cultured Pearl

a trade term that designates a non-beaded cultured pearl (5.127) formed accidentally or intentionally by human intervention in marine pearl oysters such as the Akoya oyster (*Pinctada fucata* 10.45, Silver/Gold lipped oyster (10.66) (*Pinctada maxima* 10.50 and Black lipped oyster (*Pinctada margaritifera* 10.49) and is a by-product of the culturing process. The creation results from the formation of a pearl sac either following injury of the mantle rim upon human handling, from a partial piece of the inserted (grafted) mantle tissue (5.106) or the whole inserted piece (5.150) following the rejection of a bead (5.120). See also South Sea Keshi Cultured Pearl (5.172). Alternative name; Lagniappe (or Bonus) Working

a method used that removes blemishes or reshapes mainly natural pearls. Often applied to natural blister pearls (5.24) to remove or disguise any remaining shell attachment and to natural pearls that are out-of-round to baroque in order to give them a round shape. Not commonly applied to cultured pearls. See for comparison 'peeling' (5.148).

5.100. Lagniappe cultured pearls

cultured pearls that are a by-product of the culturing process in the USA, the term, is said to be derived from the New World Spanish la ñapa, "the gift," and ultimately from Quechua yapay, "to give more." The word came into the rich Creole dialect mixture of New Orleans and there acquired a French spelling. It is still used in the Gulf States of the USA, especially southern Louisiana, to denote a little bonus. By extension, it may mean "an extra or unexpected gift or benefit. See also Keshi cultured pearl (5.99).

5.101. Liang

Imperial Chinese unit of weight equal to 250 carats (5.32).

5.102. Lustre

The quality and quantity of light a natural or cultured pearl reflects from its surface or near surface. The appearance is often classified in Europe and the America's; excellent (reflections are bright, sharp, and distinct), good (reflections are bright but not sharp), fair (reflections are weak, hazy, and blurred) or poor (reflections are dim and diffused).

In the Arabian Gulf the lustre of natural pearls is classified as; Jiwan "meaning beauty in India (excellent perfect lustre), Shireen "meaning sweet in India" (very good lustre), Gholwah "meaning round Pearls" (Average lustre), and Badlah "meaning irregular pearls" (Poor to average lustre).

5.103. Lustre enhancement

any treatment, other than polishing, applied to enhance the lustre of a natural or cultured pearl, e.g., "maeshor" (5.105)

5.104. Mabe

Japanese trade term designating an assembled cultured blister (5.12) from *Pteria penguin* (10.58) the Mabe oyster (10.32).

5.105. Maeshori treatment

a multi-part chemical treatment, including exposure to heat and or light, that temporarily enhances lustre.

5.106. Mantle

the mantle is an organ found in molluscs. It is the dorsal body wall covering the main body, or visceral mass. The outer epidermis (surface towards the shell) of this organ secretes calcium carbonate to create a shell.

5.107. Mantle grown cultured pearl

a cultured pearl grown in the mantle (5.107) of a producing mollusc.

5.108. Marine Gastropod

a univalve mollusc that lives in the sea, e.g., (5.48) and (5.111).

5.109. Material information

any information that if disclosed (5.58), prior and or during the time of sale, would either alter the value, saleability or desirability of a pearl listed in clause 3, including any care, cleaning and/or maintenance requirements.

5.110. Matinee

a strand of pearls, cultured pearls or imitation pearls measuring 50-60cm (20 to 24 inches) in length.

5.111. Melo Pearl

a natural non nacreous pearl (5.129) found in one of the *melo* volutes (10.36, 10.37, 10.38 10.39, and 10.40).

5.112. Methgal

a unit of weight that equals to 4.5 grams.

5.113. Mollusc

an invertebrate (5.94) animal of the phylum Mollusca.

5.114. Momme

unit of pearl weight, equal to 0.13 ounces or 3.75 grams; 1,000 momme = 1 kan (5.96). This unit was most frequently applied by the Japanese pearl industry to cultured pearls, sometimes spelt *monme*.

5.115. Mother-of-pearl

the smooth, hard, iridescent coating on the inner surface of some species of molluscs, composed of microscopic crystals of aragonite and/or calcite (a form of calcium carbonate) deposited in thin layers with organic conchiolin; scientifically known as nacre (5.116). Usually pearls produced by the particular mollusc have the same colour composition and general quality as the mother-of-pearl of the particular mollusc.

5.116. Nacre

biogenic material of nacreous natural (5.122) and cultured pearls. Nacre is composed of layers of microscopic platelets of aragonite and/or calcite (calcium carbonate), bound together by a fine network of a complex scleroprotein called conchiolin (5.49). This characteristic structure produces optical effects (orient, overtone) from within the pearl. Nacre is secreted from the mantle (5.106) of pearl oysters (5.141) and some gastropods.

5.117. Nacre thickness

the thickness of nacre (5.116) overlaying the nacreous shell bead (5.120) in a beaded cultured pearl, usually expressed as an average in millimetres. Nacre thickness is only relevant in the case of beaded cultured pearls (5.17). It refers strictly to the thickness of the nacre covering the nacreous shell bead and may not be correlated with nacre quality, i.e., the nacre, whether “thick” or “thin”, may be of a variety of qualities. Nacre thickness is closely related to the culturing period and may have some impact on the colour, lustre and durability of the beaded cultured pearl (5.17).

5.118. Nacre volume

expressed as a percentage of the total volume of a bead cultured pearl when excluding the bead.

5.119. Nacreous

composed of nacre (5.116).

5.120. Nacreous Cultured Pearls

pearls produced with or without the insertion by man of a bead (5.16) initially by grafting (5.81) mantle tissue that eventually forms a cultured pearl sac (5.52), which in turn produces the nacre necessary for the formation of a nacreous cultured pearl; the mollusc being maintained in culture until the pearl is harvested. Cultured pearl sacs (5.52) once produced may be re-used following the harvesting of cultured pearls to produce further beaded or non-beaded nacreous cultured pearls.

Cultured pearls are usually nacreous (5.119), unattached formations, secreted within a cultured pearl sac (5.52) in the interior of pearl oysters (5.145) including *Pinctada maxima* (10.50), *Pinctada margaritifera* (10.49), *Pinctada mazatlanica* (10.51), *Pinctada fucata* (10.45), *Pteria penguin* (10.58), and *Pteria sterna* (10.59) as well as the freshwater mussels *Cristeria plicata* (10.12), *Hyriopsis schlegeli* (10.27) and *Hyriopsis cumingii* (10.26).

The surfaces of nacreous cultured pearls are composed of nacre (5.116) that is laid down in concentric layers while within the cultured pearl sac (5.52). The secretion of the nacreous layers from the cultured pearl sac, within of the pearl oyster (5.145) is a natural process instigated and partially controlled by man. This applies to all cultured pearls whether grown with or without a bead (5.16). The term 'cultured' is applied to pearls that have been cultured (5.53) and is not applied to other pearls.

5.121. Nacreous Cultured Blister

a nacreous cultured blister attached to the shell of a mollusc. A cultured blister is formed following the insertion by man of a nacreous or non-nacreous material that is or becomes attached to or lies against the inside of the shell of a mollusc. The mantle tissue (5.106) secretes layers of nacre on the material's surface. These nacreous layers form over the inserted material and continue onto the interior of the shell, making one cohesive whole between the shell, the material and the newly formed nacreous layers. Following harvest, the cultured blister is cut from the shell, the material remaining in position.

5.122. Natural

substances which have been formed completely by nature without human interference and subsequently modified, if at all, only by means set out in clause **Error! Reference source not found.**

5.123. Natural Blisters

a blister, is an internal protuberance of the shell caused by the intrusion of foreign bodies between the mantle and the shell. The interior may or may not be hollow and the secretion occurs naturally, without human intervention.

5.124. Natural materials

Materials that are completely formed by nature, without human intervention during its formation, that may subsequently be cut, drilled, polished or treated.

5.125. Natural Pearls

natural pearl formations secreted, without human intervention, in the interior of molluscs and within naturally formed pearl sacs (5.147). They are composed of a complex scleroprotein named conchiolin (5.49) and of calcium carbonate in the form of aragonite and or calcite arranged in concentric layers. Natural pearls may be nacreous (5.117) or non-nacreous. (5.129). See also 5.13 and 5.15.

5.126. Natural Pearl Sac

see Pearl Sac (5.147)

5.127. Non-beaded cultured pearl

a cultured pearl grown without a bead (5.16).

5.128. Non-Nacreous Cultured Pearls

pearls produced with or without the insertion by man of a bead (5.16) by grafting (5.81), mantle tissue that eventually forms a cultured pearl sac (5.52), which in turn produces the calcium carbonate necessary for the formation of a non-nacreous cultured pearl; the mollusc being maintained in culture until the pearl is harvested. Cultured pearl sacs (5.52) once produced may be re-used following the harvesting of cultured pearls to produce further beaded or non-beaded non-nacreous cultured pearls.

Non-nacreous Cultured pearls are unattached formations, secreted within a cultured pearl sac (5.52) in the interior of *Strombus gigas* (10.67) and are referred to as cultured *conch pearls* (5.48), which are non-nacreous pearls consisting of calcium carbonate arranged concentrically in a crossed lamellar microarchitecture. This structural characteristic usually produces a flame-like surface pattern and porcelaneous sheen. A natural process instigated and partially controlled by man forms the outer layers. This applies to all cultured non-nacreous cultured pearls whether grown with or without a bead (5.16). The term 'cultured' is applied to pearls that have been cultured (5.51) it is not applied to other pearls.

Note: see Clause 2 Normative References; Convention on International Trade in Endangered Species of Wild Fauna and Flora

5.129. Non-nacreous natural pearls

natural pearls without a nacreous surface layer, e.g., clam pearls (5.40), conch pearls (5.48), melo pearls (5.111), some pen pearls (5.149) and scallop pearls (5.163).

Note: see Clause 2 Normative References; Convention on International Trade in Endangered Species of Wild Fauna and Flora

5.130. Non-nucleated cultured pearl

a term used in the trade for a non-beaded (5.127) and keshi (5.98) cultured pearls.

5.131. Normal procedure

Natural and cultured pearls which have only been drilled (5.61), cut (5.55 and 5.56), faceted (5.63), carved (5.33), polished (5.155), buffed (5.30) and/or cleaned (5.41).

NOTE - For drilled and cut pearls and cultured pearls see clauses 4.4.2.1 and 4.5.2.1

5.132. Nucleus

a bead (5.16) around which a beaded cultured pearl (5.17) is formed.

5.133. Objet d'art

an object considered to be of artistic worth.

5.134. Oiling

a process, called '*decraqueler*', sometimes applied to natural and cultured pearls, whereby the surface of pearls are soaked in warm oil; to diminish the appearance of cracks.

5.135. Once-the-weight

natural pearls are not priced at so much per grain (5.82) but by an elaborate method using base price referred to as the 'unit base price'. By a simple squaring of the weight of an individual pearl in grains and multiplying the result by the base (unit) price the value is arrived at. The pearl trade uses the phrase 'once-the-weight' which is the weight of the pearl squared which is once times its own weight. Often this phrase is abbreviated to 'the once'.

5.136. Opera

a strand of pearls measuring 70-90cm (28 to 35 inches) in length.

5.137. Organic substances

natural products of animal or plant origin used in jewellery or *objets d'art*.

5.138. Orient

an optical phenomenon caused by the interference and diffraction of light from within the surface of some nacreous pearls; producing delicate shades of iridescent colours.

5.139. Oriental Pearl

an old commercial name for some natural saltwater pearls (5.125).

5.140. Overtone

the presence of an additional colour on a pearl or pearl product, usually pink, gold, green, or blue.

5.141. Oyster

a common name applied to a number of bivalved molluscs (5.18) (Kai in Japanese), some of them not closely related. Pearl oysters are of the family *Pteriidae*. True (edible) oysters are of the family *Ostreidae*. Tree oysters are of the family *Isognomonidae*.

5.142. Part-Drilled

a pearl with a cylindrical hole engineered to enter at one point but which does not exit. Sometimes known as half-drilled.

5.143. Pearl

See natural pearl clause 5.125.

5.144. Pearl Doctor

pearl specialist who can predict which layers to remove from a pearl with a dull and blemished surface to reveal an inner pearl which in most cases could be of a higher lustre and of more value. See clause 5.148.

5.145. Pearl Oyster

marine bivalves classified in the family Pteriidae and the genera *Pinctada* and *Pteria*, e.g., *Pinctada maxima* (10.50), *Pinctada margaritifera* (10.49), *Pinctada mazatlanica* (10.51), *Pinctada fucata (martensii)* (10.48), *Pinctada imbricata* (10.46), *Pinctada radiata* (10.52), *Pinctada maculata* (10.47), *Pteria penguin* (10.58), and *Pteria sterna* (10.59).

5.146. Pearl Polishing

the action of producing a polish; a technique applied to pearls and cultured pearls to remove some surface blemishes and increase lustre (5.155).

5.147. Pearl-sac

a pearl-sac is naturally derived from the internal or external layer of the epithelium of the mantle (5.106) or of the gill plates. The epithelial cells of the pearl-sac secretes mainly nacre (5.116) in the case of pearl-oysters (5.145) and a non-nacreous calcium carbonate in the form of aragonite or calcite in the case of molluscs other than pearl-oysters, which becomes deposited over the foreign body, forming a natural pearl in due course of time. See also cultured pearl sac (5.52).

5.148. Peeling

a technique applied to lightly remove layers of nacre (5.116) from a pearl. Also see working (0).

5.149. Pen Pearl

see Pinna Pearl (5.154).

5.150. Piece

a “piece” of mantle tissue (5.106).

5.151. Piece holder

tool to catch the graft (5.80) or mantle tissue (5.106) piece (5.150) for insertion during the grafting (5.81) procedure; also known as piece needle (5.152).

5.152. Piece needle

see piece holder, clause 5.151.

5.153. Piece process

a “piece” of mantle tissue from a donor mollusc is grafted, by man, into a host mollusc to begin the formation of a cultured pearl sac (5.52), the essential part of the culturing process (termed the “piece process”).

5.154. Pinna pearl

a natural orange non-nacreous or silvery 'nacreous' pearl, produced by a pen shell (also see pen pearl clause 5.149), a marine bivalve mollusc of the genus *Pinna* or *Atrina* (family Pinnidae).

5.155. Polishing

the action of producing a polish; a technique applied to natural and cultured pearls to remove some surface blemishes and increase lustre. (also see clause 5.146).

5.156. Princess

a strand of natural, cultured or imitation pearls measuring 43-48cm (17 to 19 inches) in length.

5.157. Real

genuine (5.76); not artificial (See clause 5.10).

5.158. Rope

a strand of pearls, cultured pearls or imitation pearls measuring about 115cm (45 inches) and longer in length.

5.159. Saltwater

a body of water that is saline e.g., sea, oceans, lagoons.

5.160. Saltwater Cultured pearl

a cultured pearl produced by a saltwater mollusc (5.113).

5.161. Saltwater Natural Pearl

a natural pearl produced by a saltwater mollusc (5.113).

5.162. Sautoir

any pearl, cultured pearl or imitation pearl necklace which is longer than opera length necklace 70-90cm (28 to 35 inches). A *sautoir* is about 90cm (36 inches).

5.163. Scallop Pearl

a natural pearl produced by one of the scallops (pectinidae) (10.65). They are non-nacreous (5.129) but differ in surface appearance and composition to other non-nacreous pearls such as the conch (5.48) and melo (5.111) varieties. The surface appearance is comprised of a patchwork of cells with each cell being formed from three sub-cells. The orientation of these sub-cells and the low magnification fibrous appearance of structures within them give the scallop pearl a peculiar surface sheen.

5.164. Scottish pearls

natural freshwater pearls from *Margaritifera margaritifera* (10.34) in Scotland.

5.165. Seed Pearl

a small salt or freshwater natural pearl which is generally less than two millimetres in diameter.

5.166. Shape

The shapes (or outlines) of a natural and cultured pearl may be broadly divided into seven descriptors; round, near-round, oval, button, drop, semi-baroque and baroque. Natural pearls in Arabian Gulf are classified locally as; "Dana" Perfectly Round (size over 7 mm), "Sijni" or Dam'ah" drop-shaped, "Batan" button shaped, "Baythawi" oval shaped, and "Emtaaz" Baroque.

5.167. Sieves

Selections of fine graduated sieves (trays) are used for sorting pearls into different sizes. In the Arabian Gulf these start from Ras (*meaning head or biggest pearl*) Batin, Theyl, Rubaa, Bukka and finally the Shiteet (*meaning seed pearls*)

5.168. Simulant

see (5.93) imitation

5.169. Skinning

see peeling clause (5.148).

5.170. South Sea

an area of the Pacific and the Indian Oceans (including the Indian Ocean) between Myanmar and Northern Australia and inclusive of Indonesia and the Philippines, the habitat of the *Pinctada maxima* (10.50) pearl oyster.

5.171. South Sea cultured pearl

a cultured pearl (5.50) from a *Pinctada maxima* (10.50). Extensively cultured in areas of the Indian and Pacific Oceans, including Myanmar, Indonesia, Philippines, and Northern Australia.

5.172. South Sea Keshi Cultured Pearl

a trade term for a keshi cultured pearl grown in *Pinctada maxima* (10.50). A South Sea (5.172) keshi cultured pearl (5.98) or a South sea non-beaded cultured pearl formed accidentally in *Pinctada maxima*, it is a by-product of the culturing process. The creation results from the formation of a cultured pearl-sac (5.52) either following injury of the mantle rim upon handling, or from a partial piece of the inserted (transplanted) mantle tissue (5.106), or the whole inserted piece (5.150) following the rejection of a bead (5.16). Some are hollow or contain relatively large amounts of organic matter.

5.173. Spat

larval molluscs (5.113) that have settled on a hard substratum, to grow to adulthood.

5.174. Special care

additional care needed to preserve the appearance of natural and cultured pearls, or artificial products (5.10) or any alteration that may have been applied.

5.175. Specific information

a method to provide information to consumers in all publications, advertisements, communications, commercial documents (5.46) and at the time of sale, when materials have been subjected to a treatment that requires a combination of a verbal and written disclosure see clause 4.1.2.1. and 4.1.2.2. Also see clause 4.1.2

5.176. Stability

a measure of the ability of gemstones and organic substances (5.137) to maintain their appearance under normal wear and care.

the ability of a process or a treatment, including bleaching, bonding, dyeing, irradiating, oiling, staining, tinting and waxing, to retain its appearance in pearls and cultured pearls, under normal wear, repair, cleaning and/or display conditions, and after re-cutting.

NOTE: Some pearls that are not subjected to the processes mentioned above may change in appearance over a period of time.

5.177. Tahiti cultured pearl

see Tahitian cultured pearl (5.178).

5.178. Tahitian cultured pearl

a naturally coloured cultured pearl resulting from grafting and breeding in a natural environment, in French Polynesia, of the pearl oyster *Pinctada margaritifera* (10.49) var. *cumingii*. It results from the secretion of nacre by a grafted (5.80) cultured pearl sac (5.52) piece of epithelium of the mantle (5.106) collected from the donor oyster from French Polynesia) around a bead (5.16) inserted in the gonad of this pearl oyster.

5.179. Tahitian Keshi cultured pearl

a trade term for a keshi cultured pearl grown in *Pinctada margaritifera* in French Polynesia. The Tahiti keshi cultured pearl (see also 5.98) or Tahiti non-beaded cultured pearl (5.127), is formed accidentally in *Pinctada margaritifera* in French Polynesia and is a by-product of the culturing process. The creation results from the formation of a cultured pearl sac (5.52) either following injury of the mantle rim upon handling, from a partial piece of the inserted (transplanted) mantle tissue (5.106) or the whole inserted piece (5.150) following the rejection of a bead (5.16). Some Tahiti keshi cultured pearls are hollow or contain relatively large amounts of organic matter.

5.180. Tahitian natural pearl

a natural pearl secreted in the interior of the pearl oyster *Pinctada margaritifera* (10.49) var. *cumingii* native to French Polynesia.

5.181. Thawash

an Arabian name given to the pearl merchant.

5.182. Three-quarter composite cultured pearl

See clause 5.47.

5.183. Three quarter cultured blister

see 5.54.

5.184. Three quarter cultured pearl

See 5.55.

5.185. Tinting

a treatment which causes a subtle change in colour and/or appearance (Often associated with bleaching).

5.186. Tissue nucleated cultured pearl

a term used in the trade for a non-beaded cultured pearl.

5.187. Trade codes

a list used within the trade, consisting of one or more letters, for labelling treated gemstones and organic substances. (See Clause 7)

5.188. Treated pearls or treated cultured pearls

pearls or cultured pearls which have been altered by methods other than normal procedures (5.131) to change their colour, composition and or appearance and / or durability that requires specific information.

5.189. Waxing

the application of a colourless wax or similar products to, or near, the surface of a pearl.

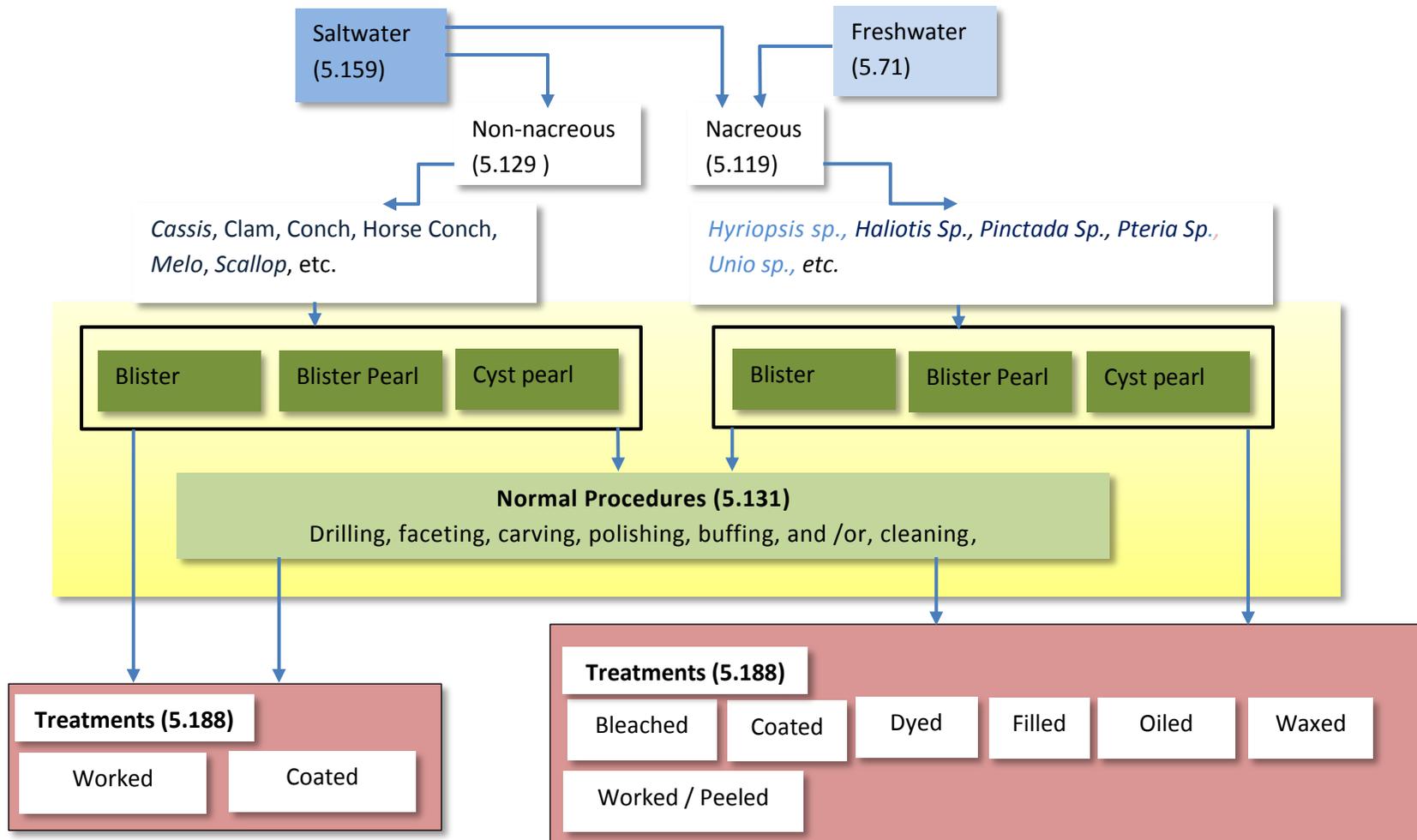
5.190. Weight

mass of a pearl cultured pearl, diamond, gemstone or synthetic stone. see Clause 5.82, 5.83, 5.96, and 5.114.

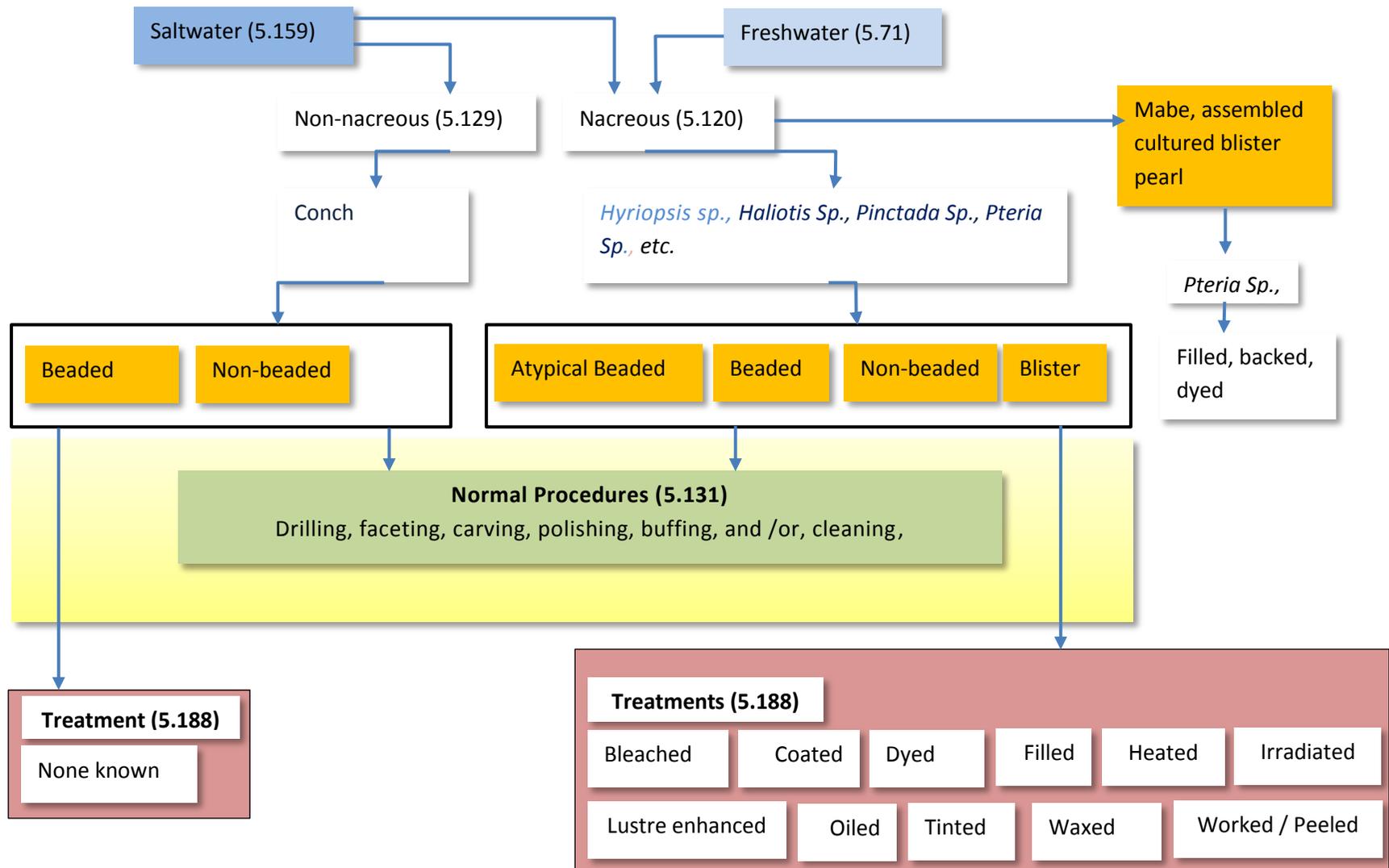
NOTE: The SI (Système International) generally uses the term *mass* instead of *weight*. Mass is a measure of an object's inertial property, or the amount of matter it contains. Weight is a measure of the force exerted on an object by gravity or the force needed to support it.

6. Annex A (informative) Natural and Cultured Pearl Flow Charts

6.1. Natural Pearl (5.125) Chart



6.2. Cultured Pearl (5.53) Chart



7. Annex B (normative) Trade codes

7.1. Trade codes and care requirements for treated natural and cultured pearls

Trade codes shall only be used within the industry

Code	Treatment	Comments
B	Bleaching	Using a bleaching agent to remove or alter color. This treatment may not be permanent regardless of special care requirements
C (sc)	Coating	The application of a coating to the surface. This treatment is not permanent regardless of special care requirements
CA	Chemically altered	Changes the colour appearance without the use of a dye.
D (sc)	Dyeing	Altering colour appearance by using dyes. This treatment is not permanent regardless of special care requirements
F (sc)	Filling	Filling of cavities, both surface and internal. This treatment is not permanent regardless of special care requirements
H	Heating	Heating to enhance colour
R (sc)	Irradiation	Using radiation of various wavelengths to alter the colour appearance
L (sc)	Lustre enhancement	The use of chemicals and /or special polishing techniques to improve lustre. This treatment is not permanent regardless of special care requirements
O (sc)	Oil/Resin	The application of oils or resins usually used to disguise fractures in the pearl. This treatment is not permanent regardless of special care requirements.
T	Tinted	
W (sc)	Waxing	The application of a wax to disguise fractures and/or improve lustre. This treatment is not permanent regardless of special care requirements
Wk	Working / peeling	To alter the shape of a pearl by grinding and polishing or remove blemishes.

7.2. Other Trade codes

N the "N" code is for pearls and cultured pearls that have not been treated

SC the SC code is for pearls and cultured pearls that require special care (4.3.1)

8. Annex C (normative) Care requirements for natural and cultured pearls

8.1. Normal care

With all natural and cultured pearls avoid rough handling and when not wearing items of jewellery keep them separated from each other to avoid scratches. In addition, cosmetics should be applied before and not after any natural or cultured pearls are put on. Following wear, natural and cultured pearls require cleaning with a soft cloth that has been dampened in clean water and they should not be wrapped in moisture absorbing materials, such as cotton wool. When not worn for extended periods; at regular intervals natural and cultured pearls should be wiped, with a soft cloth that has been dampened in clean water. For special care see Clauses 8.2.

8.2. Special Care

In addition to normal care, natural and cultured pearls shall have special care requirements that include instructions that they should not be worn while carrying out heavy work, should be kept away from all solvents or subjected to high temperatures as well as ultrasonic cleaning and should be kept away from acids.

This care advice should be regarded as normal for natural and cultured pearls across the product range and should be conveyed to the purchaser.

8.2.1. Special care for Abalone pearls, natural and some cultured blisters

Abalone (10.1) as well as natural and cultured blisters (5.123 and 5.54) are prone to fracture easily and shall have special care advice that includes instructions that they are not for everyday wear and should not be worn while carrying out heavy work.

NOTE – Natural abalone pearl (sc), is often hollow and therefore fragile

8.2.2. Fading and other colour changes

The colour of some natural and cultured pearls may fade when exposed to natural sunlight, artificial light or strong display lights. Some natural and cultured pearls that have been colour treated may fade or revert to their original colour when exposed to natural sunlight, artificial light or strong display lights. In these cases, special care advice shall include instructions that these natural or cultured pearls should not be exposed to strong natural or artificial light or to strong display lighting for an extended period of time.

NOTE - Natural Conch Pearl, (SC). – Colour may fade or change if exposed to long periods of sunlight or short exposures to x-rays

NOTE - Cultured Conch Pearl (SC) – Colour may fade or change if exposed to long periods of sunlight or short exposures to x-rays

9. Annex D – (informative) Trade names of natural and cultured pearls

9.1. Trade names for natural pearls

Pearl type, growth instigation and environment.	Trade term	Colour	Treatments			Care advice (see Clause 8 Annex C for all clauses referred to in this column)
			Treatment type and (trade code).	Frequency (5.70)	Requires Specific or No Information	
Mollusc (Genus and species)						
Natural Non-Nacreous Saltwater Pearl from various molluscs including;						
the Queen Conch (<i>Strombus gigas</i>) (10.67), Horse Conch (<i>Pleuroploca gigantea</i>) (10.54), and the Emperor Helmet (<i>Cassis madagasgerensis</i>) (10.8).	Conch Pearl (5.48)	All colours	Oiled 5.134 (O)	Rarely	4.4.2.3	8.1, 8.2 and 8.2.2
Natural Nacreous Saltwater Pearl from						
various <i>Haliotis</i> (10.24) - about 100 named species.	Abalone Pearl (5.2)	All colours	Oiled 5.134 (O)	Rarely	4.4.2.3	8.1 and 8.2
			Filled 5.65 (F)	Occasionally	4.4.2.3	8.2 and 8.2.1
Natural Nacreous Saltwater Pearl from;						
	Blister Pearl (5.24)	All colours	Oiled 5.134 (O)	Rarely	4.4.2.3	8.1 and 8.2

Pearl type, growth instigation and environment.	Trade term	Colour	Treatments			Care advice (see Clause 8 Annex C for all clauses referred to in this column)
			Treatment type and (trade code).	Frequency (5.70)	Requires Specific or No Information	
Mollusc (Genus and species)			Dyed 5.60 (D)	Rarely	4.4.2.3	8.2 and 8.2.2
			Filled 5.65 (F)	Commonly	Error! Reference source not found.	8.2 and 8.2.1
<hr/>						
Natural Nacreous Saltwater Pearl from	Saltwater Pearl (5.161)	All colours	Oiled 5.134 (O)	Rarely	4.4.2.3	8.1 and 8.2
Pinctada fucata (10.45), Pinctada imbricata (10.46), Pinctada maculata (10.47), Pinctada margaritifera (10.49), Pinctada maxima (10.50), Pinctada mazatlanica (10.51), or Pinctada radiata (10.52).			Dyed 5.60 (D)	Rarely	4.4.2.3	8.2 and 8.2.2
			Filled 5.65 (F)	Rarely	4.4.2.3	8.2 and 8.2.1
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Natural Nacreous Freshwater Pearl from;	Blister Pearl (5.24)	White, pink to purple	Oiled 5.134 (O)	Rarely	4.4.2.3	8.1 and 8.2
Amblema plicata (10.4), Cyrtonaias tampicoensis (10.15), Potamilis purpuratus (10.55), Margaritifera						

Pearl type, growth instigation and environment.	Trade term	Colour		Treatments		Care advice (see Clause 8 Annex C for all clauses referred to in this column)
			Treatment type and (trade code).	Frequency (5.70)	Requires Specific or No Information	
margaritifera (10.34).						
Natural Nacreous Freshwater Pearl from; Amblema plicata (10.4), Cyrtornaias tampicoensis (10.15), Potamilis purpuratus (10.55), Margaritifera margaritifera (10.34).	Freshwater Pearl (5.73)	White, pink to purple	Oiled 5.134 (O)	Rarely	4.4.2.3	8.1 and 8.2
		All colours	Dyed 5.60 (D)	Rarely	4.4.2.3	8.2 and 8.2.2
		Grey to black	Irradiated, 5.95 (R)	Rarely	4.4.2.3	8.1 and 8.2
Natural Nacreous Freshwater Blister Pearl from; Amblema plicata (10.4), Cyrtornaias tampicoensis (10.15), Potamilis purpuratus (10.55), Margaritifera margaritifera (10.34).	Freshwater Blister Pearl.	White, pink to purple	Oiled 5.134 (O)	Rarely	4.4.2.3	8.1 and 8.2
		All colours	Dyed 5.60 (D)	Rarely	4.4.2.3	8.2 and 8.2.2
		Grey to black	Irradiated, 5.95 (R)	Rarely	4.4.2.3	8.1 and 8.2

Pearl type, growth instigation and environment.	Trade term	Colour		Treatments		Care advice (see Clause 8 Annex C for all clauses referred to in this column)
			Treatment type and (trade code).	Frequency (5.70)	Requires Specific or No Information	
Mollusc (Genus and species)		All colours	Filled 5.65 (F)	Rarely	4.4.2.3	8.2 and 8.2.1

9.2. Trade names for cultured pearls

Pearl type, growth instigation and environment.	Trade term	Colour		Treatments		Care advice (see Clause 8 Annex C for all clauses referred to in this column)
			Treatment type and (trade code).	Frequency (5.70)	Requires Specific or No Information	
Assembled Nacreous Saltwater Cultured Blister from;	Mabe (from Pteria species) or Saltwater Cultured Blister (5.11 and 5.12)	White	Bleached 5.22(B)	Commonly	4.5.2.2	8.2 and 8.2.1
Pinctada maxima (10.50) Pinctada margaritifera (10.49) the Abalone (Haliotis species 10.1 and 10.24) and Pteria Penguin (10.58) Pteria sterna (10.59)		All colours	Dyed 5.60 (D)	Commonly	4.5.2.3	8.2 and 8.2.2

Pearl type, growth instigation and environment.	Trade term	Colour	Treatments			Care advice (see Clause 8 Annex C for all clauses referred to in this column)
			Treatment type and (trade code).	Frequency (5.70)	Requires Specific or No Information	
Mollusc (Genus and species)						
Freshwater beaded Nacreous Cultured Pearl from; Hyriopsis cumingii (10.26), Hyriopsis schlegeli (10.27), Cristaria plicata (10.12).	Freshwater Cultured Pearl (5.72)	White	Coated 5.43 (C)	Rarely	4.5.2.3	8.1 and 8.2
Freshwater non-beaded Nacreous Cultured Pearl from; Hyriopsis cumingii (10.26), Hyriopsis schlegeli (10.27), Cristaria plicata (10.12).	Freshwater Cultured Pearl (5.72)	White	Bleached 5.22 (B)	Commonly	4.5.2.2	8.2
		All colours	Dyed 5.60 (D)	Commonly	4.5.2.3	7.2 and 8.2.2
		Grey to black	Irradiated 5.95 (R)	Occasionally	4.5.2.3	8.1 and 8.2
Saltwater non-beaded Nacreous Cultured Pearl from; Pinctada fucata (10.45), Pinctada margaritifera (10.49), Pinctada maxima (10.50)	Keshi Saltwater Cultured Pearl (5.99)	White to yellow and grey to black	Dyed 5.60 (D)	Rarely	4.5.2.3	8.2 and 8.2.2

Pearl type, growth instigation and environment.	Trade term	Colour	Treatments		Care advice (see Clause 8 Annex C for all clauses referred to in this column)		
			Treatment type and (trade code).	Frequency (5.70) Requires Specific or No Information			
Mollusc (Genus and species) Saltwater Beaded Nacreous Cultured Pearl from; Pinctada fucata (10.45), Pinctada imbricata (10.46), Pinctada maculata (10.47), Pinctada margaritifera (10.49), Pinctada maxima (10.50), Pinctada mazatlanica (10.51), or Pinctada radiata (10.52). Pteria sterna (10.59)	Saltwater Cultured Pearl (5.160), Akoya Cultured Pearl (5.6) or South Sea Cultured Pearl (5.171) Tahitian Cultured Pearl (5.178)	All colours		Commonly P. fucata,	8.1 and 8.2		
		White	Bleached 5.22 (B)	uncommon P. maxima	4.5.2.3 4.5.2.2	8.1 and 8.2	
				Rarely P. Margaritifera		8.1 and 8.2	
				Dyed 5.60 (D)	Occasionally P. fucata	4.5.2.3	8.2 and 8.2.2
		All colours	Coated 5.60 (C)	Rarely	4.5.2.3	8.2 and 8.2.2	
			Oiled 5.60 (O)	Occasionally	4.5.2.3	8.1 and 8.2	
		Grey to black	Irradiated, 5.95 (R)	Occasionally P. fucata	4.5.2.3	8.1 and 8.2	
		All colours	Filled 5.65 (F)	Rarely	4.5.2.3	8.2 and 8.2.1	

10. Annex E - Pearl producing mollusc descriptions and definitions

For the purposes of these CIBJO Standard/rules, the following terms and definitions apply;

10.1. Abalone

ear-shaped marine gastropod (10.21) of the genus *Haliotis* (10.24), with nacre in multi-hues of blue, green, cream, red and purple; the meat is edible; produces distinctive natural pearls (5.125), blisters (5.123) and cultured blisters are produced in several regions (e.g., California, New Zealand); also known as paua (New Zealand) and awabi (Japan).

10.2. *Actinonaias pectorosa*

Actinonaias pectorosa (Conrad, 1834) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known the Pheasant shell and the Cumberland Mucket. It is a large roughly elliptical, thick-shelled mussel. The periostracum is golden brown with broken green rays; older individuals may become brown or black. The nacre may be bluish to creamy or silvery white with iridescence along the margins. This species is found in the Tennessee and Cumberland River basins, and lives in sand and gravel in fast river currents.

10.3. Akoya pearl oyster

Pinctada fucata (martensii) (10.45) is used extensively for pearl culture in Japan, China and other areas. Akoya is the Japanese name for this pearl oyster.

10.4. *Amblema plicata*

Amblema plicata (Say, 1817) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as the three ridge mussel, Blue-point, purple-tip, or flutter. The shell is elongated or rounded shell with ridges or folds on the posterior half. No sculpturing on the anterior end. Nacre pearly white, frequently stained, iridescent. Some individuals have a purple tint. *Amblema plicata* live in small to large rivers and impoundments in mud, sand, or gravel.

10.5. *Argopecten purpuratus*

the pectinid bivalve *Argopecten purpuratus* (Lamarck, 1819) or Chilean scallop, inhabits the Pacific Ocean, between the northern coast of Peru and central Chile, and has become an important commercial species. It is distributed along the Pacific coast between Arica (18°25"S) and Valparaiso. This species lives on sedimentary grounds in sheltered areas. Produces scallop pearls similar to those from the Lion's Paw (10.31)

10.6. Atlantic Pearl Oyster

Pinctada imbricata (10.46); the pearl oyster native to the Caribbean and southeastern North America, which was exploited by Spanish pearl gatherers in the 16th and 17th centuries.

10.7. Black-lipped Pearl Oyster

Pinctada margaritifera (10.49), used extensively for pearl culturing in French Polynesia. The widest-ranging pearl oyster, it has a history of natural pearl gathering in the Red Sea, the Indian Ocean, throughout the Indo-Pacific islands, Mexico and Japan (Okinawa). Also *Pinctada mazatlanica* (10.51), Mexico and Panama.

10.8. **Cassis madagascarensis**

of the family Cassidae, *Cassis madagascarensis* also known as the Emperor Helmet (10.18), is a large species with an almost flat spire, the body whorl has three rows of spiral blunted knobs and fine rounded axial ridges. The underside is peachy orange – reflecting the colour of some pearls produced by this mollusc. The lip bears about 10 strong denticles and the columella bears strong white spiral ribs and folds, tinged between the dark brown or black.

10.9. **Ceylon Pearl Oyster**

Pinctada radiata (10.52), the pearl oyster with the longest history of sustained harvesting, native to the Gulf of Mannar, the Persian Gulf, and the Red Sea.

10.10. **Chambered *nautilus***

a native of the tropical Pacific, a cousin of the octopus and is a living link with the past—little changed for more than 150 million years. The nautilus has more than 90 tentacles. These tentacles have grooves and ridges that grip food and pass it into the nautilus's mouth. A nautilus swims using jet propulsion—it expels water from its mantle cavity through a siphon located near its head. By adjusting the direction of the siphon, a nautilus can swim forward, backward or sideways. See also *Coque de perle* (5.50).

10.11. **Conch**

common name applied to some species of marine snails (i.e., gastropods 10.21) including the Queen Conch (*Strombus gigas*) (10.67), Horse Conch (*Pleuroploca gigantea*) (10.54), and the Emperor Helmet (*Cassis madagasgerensis*) (10.8) (see also 10.18).

Note: see Clause 2 Normative References; Convention on International Trade in Endangered Species of Wild Fauna and Flora

10.12. **Cristaria plicata**

or Cockscomb Pearl Mussel; the freshwater pearl mussel originally used for pearl culturing in both Japan and China. In Chinese, the name is zhou wen guan bang; in Japan, it is known as the Karasu mussel.

10.13. **Cumberlandia monodonta**

Cumberlandia monodonta (Say, 1829) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known Spectaclecase. It is an elongate shell, usually pinched in the middle, dark brown to black, with poorly developed teeth. Nacre is white, iridescent. Length to 8 inches (20.3 cm). It lives in large rivers with swiftly flowing water, among boulders in patches of sand, cobble, or gravel in areas where current is reduced.

10.14. **Cyclonaias tuberculata**

Cyclonaias tuberculata (Rafinesque, 1820) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as the Purple Wartyback, Missouri mapleleaf, purple pimpleback, or deerhorn. It has a rounded shell with a fairly prominent wing, beak covered with fine wavy sculpturing, no green stripe on the umbo, purple nacre and a deep and compressed beak cavity. The nacre is usually deep purple, or occasionally white with a purple tinge. *Cyclonaias tuberculata* lives in medium to large rivers in gravel or mixed sand and gravel.

10.15. **Cyrtonaias tampicoensis**

Cyrtornaias tampicoensis or the Tampico pearly mussel has no significant external shell sculpturing and may reach over 130mm in shell length. Colouration varies from yellowish-brown to dark brown and black. Internally, nacre is typically purple, but may be multi coloured. Pearls are the same colours as the nacre. Their habitat ranges from relatively small streams to large reservoirs in waters less than 20 feet deep in Texas USA.

10.16. Ellipsaria lineolata

Ellipsaria lineolata (Rafinesque, 1820) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as the Butterfly. It has a triangular, flattened shell, sharply angled posterior ridge, yellowish brown, with broken brown rays, the nacre is white and iridescent. *Ellipsaria lineolata* live in large rivers in sand or gravel. Length to 4 inches (10.2 cm).

10.17. Elliptio crassidens

Elliptio crassidens (Lamarck, 1819) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as the Elephant-ear, Mule's ear, or blue ham. It is a heavy, solid, and triangular shell with dark brown to black periostracum. The nacre colour is variable, usually purple or occasionally pink or white. *Elliptio crassidens* live in large rivers in mud, sand, or fine gravel. Length to 6 inches (15.2 cm).

10.18. Emperor Helmet

see *Cassis madagasgarensis* (10.8).

10.19. Fusconaia ebena

Fusconaia ebena (Lea, 1831) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as Ebonyshell; It is a round, heavy, thick, brown or black shell without rays or pustules its beak cavity is very deep. *Fusconaia ebena* live in large rivers in sand and gravel, the nacre is pearly white and iridescent. Length to 10.2 cm (4 inches).

10.20. Fusconaia flava

Fusconaia flava (Rafinesque, 1820) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as the Wabash Pigtoe or just Pigtoe; it is a triangular shell with a shallow sulcus usually present on the side with rough clothlike periostracum, and deep beak cavity. The nacre is white or tinged with salmon and iridescent. *Fusconaia flava* lives in creeks to large rivers in mud, sand, or gravel.

10.21. Gastropod

a univalve mollusc that often has a head with eyes; Gastropods includes land and sea snails. (See e.g., 5.48 and 5.111).

10.22. Giant Clam

See 10.69

Note: see Clause 2 Normative References; Convention on International Trade in Endangered Species of Wild Fauna and Flora

10.23. Gold-lipped Pearl Oyster

a variety of *Pinctada maxima* (10.50), used extensively for pearl culturing in Australia, Myanmar, Indonesia, the Philippines and Thailand; see also Silver-lipped Pearl Oyster (10.66).

10.24. Haliotis

Haliotidae or abalones (10.1) are a large family of gastropods that are also known as ormers or sea ears in various localities. The shape is consistently flat with little evidence of a spire; they are either oval or round and possess a series of holes on the body whorl. The interiors are iridescent and can be very colourful, their habitat ranges from low tide zones to some hundreds of feet depth.

10.25. Horse Conch

see *Pleuroploca gigantea* (10.54).

10.26. Hyriopsis cumingii

Hyriopsis cumingii (Lea, 1852) or triangleshell pearl mussel ranges naturally in China. It has a thicker shell than the Cockscomb (*Cristaria plicata* 10.12), with pink to peach-coloured nacre. Both natural and cultured Triangleshell pearls occur in a wide range of colours, from white to pink, lavender and deep rose.

10.27. Hyriopsis schlegeli

or Biwa pearly mussel used to produce non-beaded cultured pearls in Lake Biwa Japan.

10.28. La Paz Pearl Oyster

Pinctada mazatlanica (10.51), from the eastern Pacific Ocean, presently cultured in the Gulf of California for blister and cultured pearls (5.53).

10.29. Lasmigona complanata

Lasmigona complanata (Barnes, 1823) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as the White Heelsplitter, the Pancake, razorback, elephant-ear, or hackle-back. It is a large, rounded, compressed, relatively thin shell, bluntly pointed at the posterior end; dark brown or black periostracum, double-looped beak sculpture. The nacre is bluish white or white and iridescent. *Lasmigona complanata* lives in pools or sluggish streams with a mud, sand, or fine gravel bottom.

10.30. Ligumia recta

Ligumia recta (Lamarck, 1819) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as the Black sandshell, Black sand mussel, long John, honest John, sow's ear, or lady's slipper. It is an elongated shell, pointed on the posterior end, smooth surface, usually dark brown to black. The nacre is variable from white, pink, and salmon to deep purple and iridescent. Length to 8 inches (20.3 cm).

10.31. Lion's Paw

of the many scallops there are three bearing the common name Lion's Paw, one of these is the exceedingly rare *Nodipecten magnificus* (Sowerby, 1835) which is largely restricted to the Galapagos Islands. The other two are *Nodipecten (Lyropecten) nodosus* (Atlantic Lion's Paw) L. 1758 and *Nodipecten (Lyropecten) subnodosus* (Pacific Lion's Paw also known as *Mano de Leon*) Sowerby 1835,

the largest pectinid in tropical waters. *N. nodosus* is found in the seas of South-eastern USA to Brazil and *N. subnodosus* in the seas of Western Central America at depths that vary from 25 to 150 meters. Together the shell colours are exceptional in both their variety and depth. The outer surface of the shell may be several shades of brown, sometimes described as chocolate brown and yellow to orange while the interior varies from pearly white to shades of purple and brown. The outer surface of the *N. nodosus* shell most often displays several rows of rounded nodular protuberances running down about eight rounded ribs (although many from the southern Caribbean are smooth, potentially differentiating it from *N. subnodosus* which have no such protuberances). Both the Atlantic and Pacific Lion's Paws have fan-shaped (typical of scallops in general) equal valves with unequal ears. Lion's Paw scallops may produce distinctive natural non-nacreous pearls.

10.32. Mabe pearl oyster

See *Pteria penguin* (10.58)

10.33. Margaritifera

the taxonomic name applied to one of two entities: (1) the current genus-name applied to one group of freshwater pearl mussels, including the common pearl-producing mussel of Europe and North America, *Margaritifera margaritifera* (10.34); (2) as a species-name, that for the Black-lipped Pearl Oyster (*Pinctada margaritifera*) (10.49). Margarita is the Latin term for pearl, it derives from the Greek *margaros* pearl oyster.

10.34. Margaritifera margaritifera

the freshwater pearl mussel *Margaritifera margaritifera* grows to 140 mm in length, and burrows into sandy substrates, often between boulders and pebbles, in fast-flowing rivers and streams. It requires cool, well-oxygenated soft water free of pollution or turbidity. The mussel spends its larval, or glochidial, stage attached to the gills of salmonid fishes. The larvae attach themselves during mid to late summer and drop off the following spring to settle in the riverbed gravel where they grow to adulthood. *Margaritifera margaritifera* can be found throughout Europe and North America.

10.35. Megaloniaias nervosa

Megaloniaias nervosa (Rafinesque, 1820) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as the Washboard, Bald-pate, or board. It is a large, black shell, heavily sculptured with V-shaped ridges in the front and large folds on the sides and back, particularly in smaller shells. The nacre is white, often with purple or copper-coloured blotches and iridescent. *Megaloniaias nervosa* lives primarily in large rivers with a good current, and occasionally in medium-sized streams in mud, sand, or gravel. *Megaloniaias nervosa* has been used for the manufacture of shell beads that form the nucleus of beaded cultured pearls (5.17).

10.36. Melo aethiopica

a marine gastropod (5.108) and one of the melo volutes; this species lives principally in Indonesian waters but is generally distributed from Java in the west to Papua New Guinea in the east. Their habitat is reportedly thick volcanic sand in shallow waters. Dimensions are between 200 and 250mm in length, with a largest reported size of 348mm. The protoconch is usually bright yellow in colour, but generally the shell is a light brown or mahogany it has 14 to 18 subsutural spines per whorl and three columella plaits. Sometimes *Melo aethiopica* have a creamy yellow spiral band in the middle of the whorls, and

young shells may have a pattern of small dark blotches. There is no regular fishing. *Melo aethiopica* is the bailer shell used in Papua New Guinea to make the traditional jewellery. See also *Melo* pearl (5.111).

10.37. Melo amphora

a marine gastropod (5.108) and one of the melo volutes; this species lives all along the northern coast of Australia and the southern coast of New Guinea. Their habitat is on the sand and sand-mud bottoms from the shore and down to 10m., deep. Dimensions are between 300 and 468mm in length, with the largest registered size of 524mm. The protoconch is wide and cream coloured, the spines are long and straight but only on the first 2.5 whorls. The best distinguishing character is the absence of spines on the last adult whorl, and they have three strong columella plaits. The range of *Melo amphora* and *Melo aethiopica* coincide with each other, it may be that *Melo amphora* is a southern variant of *Melo aethiopica*. See also *Melo* pearl (5.111).

10.38. Melo broderipii

a marine gastropod (5.108) and one of the melo volutes; this species lives mainly in the Philippines but is also recorded for New Guinea. Their habitat is on sand and mud bottoms from the shore to about 10 metres deep. Dimensions are between 250 and 350mm in length, and the registered largest size is 371mm. *Melo broderipii*'s have 20 to 25 spines per whorl and the columella has four plaits. The base colour is pale cream brown and most shells have dark chocolate brown flecks that become scarcer in the last whorl. See also *Melo* pearl (5.111).

10.39. Melo georginae

a marine gastropod (5.108) and one of the melo volutes; this species is limited to the coast of southern Queensland, Australia. Their habitat is on sand bottoms between 2 and 90 meters deep, and their dimensions are between 200 and 300mm in length. The protoconch is pink and the shell has a pinkish white or cream background and, wide areas of vivid orange which form thick irregular reticulations which outline white triangles. Two dark spiral bands stand out against the yellow-orange colour of the last adult whorl. This species lives deeper than any other member of the genus. See also *Melo* pearl (5.111).

10.40. Melo melo

a marine gastropod (5.108) and one of the melo volutes; this species lives from the South China Sea, south and west to Singapore and the Andaman Sea. Their habitat is from the shore down to 70 metres deep on mud bottoms. Dimensions are between 150 and 275mm in length with a reported record size of 362mm. The protoconch is covered by the last whorl; they have no spines and three columella plaits. Generally they have two or three bands of dispersed dark flecks, which are rarer and more loosely spaced on the last whorl. See also *Melo* pearl (5.111).

10.41. Mercenaria mercenaria

clam species *Mercenaria mercenaria* (Linnaeus, 1758) or *Venus mercenaria*, (class; bivalvia, order; Veneroida, family; Veneridae, genus; *Mercenaria*) is variously known as the northern quahog (its Indian name pronounced CO hawg), hardshell, littleneck, cherrystone, or chowder clam, is common, commercially important and found on the east coast of North America where it lives in soft sediments in shallow water. Produces clam pearls (5.40) in various shades of purple. It burrows shallowly in sediments of either mud or sand and is among the most commercially important species of invertebrate. Like other clams, it is a filter feeder. *Mercenaria mercenaria* has a large, heavy shell that ranges from being a pale brownish colour to shades of grey and white. The exterior of the shell, except nearest the umbo is

covered with a series of growth rings. The interior of the shell is coloured a deep purple around the posterior edge and hinge.

10.42. Nodipecten (Lyropecten) nodosus

see scallop (10.65) and Lion's paw.

10.43. Nodipecten (Lyropecten) subnodosus

see scallop and Lion's paw, (10.65 and 10.31).

10.44. Obliquaria reflexa

Obliquaria reflexaria (Rafinesque, 1820) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as Threehorn Wartyback, just Three Horned or Hornyback, three dot, or three knot. It has large knobs that alternate from side to side that will distinguish this mussel from all other species found in the Midwest. *Obliquaria reflexaria* lives in large rivers in sand or gravel; it may be locally abundant in impoundments.

10.45. Pinctada fucata

Pinctada fucata (Gould, 1857) is the Akoya (5.5) pearl oyster (10.3), known in Japan as *Pinctada martensii* (10.48). It is sometimes considered a subspecies of *Pinctada imbricata* (10.46). The shell is of a medium size and is rather inflated and fragile. The exterior is rough and is covered with layers of greyish purple lamellae which extend over the margins. The byssal notch lies below a small winged projection of the hinge line. Its habitat ranges from Japan to China and Vietnam.

10.46. Pinctada imbricata

Pinctada imbricata (Röding, 1798) or the Atlantic Pearl Oyster, ranges naturally in the western Atlantic from Bermuda and Florida to northern South America. It is the source of Venezuelan pearls and also of Columbus's pearls.

10.47. Pinctada maculata

small pearl oyster or *pipi* is widespread throughout French Polynesia and the Cook Islands.

10.48. Pinctada martensii

see *Pinctada fucata* (10.45) and Akoya (5.5) oyster (10.3). Also referred to as Martins Pearl Oyster, the shell is of a medium size and is rather inflated and fragile. The exterior is rough and is covered with layers of greyish purple lamellae which extend over the margins. The byssal notch lies below a small winged projection of the hinge line. Its habitat ranges from Japan to China and Vietnam.

10.49. Pinctada margaritifera

a large oyster that has equal compressed valves with a rich silver grey nacreous interior edged with greyish black. The exterior is formed from concentric layers of flaky green and grey lamellae. The source of natural and cultured, naturally coloured, black pearls from French Polynesia (5.178, 5.179 and 5.180), the Cook Islands, Okinawa and other South Sea islands.

10.50. Pinctada maxima

the silver or golden lipped pearl oyster (*Pinctada maxima*) is the largest of the pearl oysters. Traditional South Sea pearling fleets dived for this pearl oyster in the quest for its valuable large natural pearls, and for its valuable high quality Mother of Pearl (5.115) which was sought after worldwide for the mother-of-pearl (5.115) industry. Today it is used extensively to produce cultured south sea pearls in Australia, Indonesia, Myanmar Philippines and elsewhere in the South Seas (5.170).

10.51. Pinctada mazatlanica

Pinctada mazatlanica (Hanley, 1855), the La Paz Pearl Oyster, or the Panamic Black-Lipped Pearl Oyster. A medium sized oyster (18 cm) with equally compressed valves with a rich silver grey nacreous interior edged with a green or golden sheen. The exterior is formed from concentric layers of flaky light-brown and green lamellae. Habitat ranges from inside the Gulf of California (also known as the sea of cortex), to Peru. Fisheries gave abundant supplies of naturally coloured pearls, from light-grey to black, with many intermediate tones of pink, gold and green. This species was the first one to be used farmed commercially for the production of natural pearls in La Paz, Baja California Sur, Mexico.

10.52. Pinctada radiata

Pinctada radiata (Leache, 1814), or the Ceylon Pearl Oyster (10.9), is sometimes considered a variety of *Pinctada imbricata*. Its habitat ranges through the eastern Mediterranean, Red Sea, Persian Gulf and the Indian Ocean.

10.53. Placopectin magellanicus

see scallop, (10.65).

10.54. Pleuroploca gigantea

also known as the Florida Horse Conch, the largest of the tulip shells. The spire is tall and the whorls, the shoulders of which have blunt rounded knobs, are angular. Its shells are generally beige to light brown with a pale orange aperture and the non-nacreous pearls it produces are similarly coloured. *Pleuroploca gigantean* lives in shallow sub tidal waters.

10.55. Potamilis purpuratus

is a natural pearl producing freshwater bivalve mollusc found in the USA. It has an elongate and rectangular shell, inflated, dark green to black, with purple or pink nacre. *Potamilis purpuratus* inhabits large rivers e.g., Mississippi, in mud or mixed mud and gravel; common names are; Bloofer, blue mucket, and purple pocketbook.

10.56. Proptera alata

Proptera alata (Say, 1817) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as the Pink Heelsplitter, Purple Heelsplitter, pancake, or hatchet-back. It has an elongated and rectangular shell, well-developed posterior wing, dark green to dark brown, with purple or pink nacre and a length to 8 inches (20.3 cm). It lives in medium to large rivers in mud or mixed mud, sand, and gravel.

10.57. Proptera purpurata

Proptera purpurata (Lamarck, 1819) (synonym) accepted scientific name *Potamilus purpuratus* (Lamarck, 1819) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as the bleufer or purple pocketbook.

10.58. Pteria penguin

also known as the Mabe (5.104) pearl oyster (10.32) or as black-winged pearl oyster. An ovate and fairly fragile shell, it has unequal valves, the upper or right valve being more inflated. The oyster has a characteristic extension to the hinge line.

10.59. Pteria sterna

the rainbow-lipped pearl oyster (*Pteria sterna*) also known as the western winged pearl oyster is a winged oyster with two unequal sized lateral extensions. The shell appears purplish-brown to silver grey and is moderately thin, usually growing to 14 cm in length. The exterior is formed from concentric layers of brown to black lamellae. Its habitat ranges from the eastern Pacific side of Baja California (Mexico), inside the Gulf of California (also known as the sea of cortez) and down to Peru. Fisheries gave abundant supplies of naturally coloured pearls, from light-grey to dark-purple, with many intermediate tones of pink, gold and green.

10.60. Quadrula metanevra

Quadrula metanevra (Rafinesque, 1820) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as Monkey face or Knobbed rock shell; Rounded or squared shell with large knobs along the posterior ridge and a distinct indentation on the posterior margin that looks like a chimpanzee in profile. It often has distinctive zigzag markings on the shell. The shell is thick, rounded or rectangular, and moderately inflated. Its length is up to 4 inches (10.2 cm). *Quadrula metanevra* live in medium to large rivers in gravel or mixed sand and gravel.

10.61. Quadrula nodulata

Quadrula nodulata (Rafinesque, 1822) is a natural pearl producing freshwater bivalve mollusc found in the USA otherwise known as Wartyback, or Two-horned pocketbook, winged pimpleback, pimpleback, nodule shell, winged orb shell. It is a rounded shell with two rows of paired knobs or pustules on the posterior half of the shell; no sulcus. The nacre is pearly white and iridescent. *Quadrula nodulata* live in large rivers or in the lower sections of medium-sized rivers in sand or fine gravel.

10.62. Quadrula pustulosa

Quadrula pustulosa (Lea, 1831) is a natural pearl producing freshwater bivalve mollusc found in the USA otherwise known as the Pimpleback, Wartyback, or Warty Pigtoe. It is a rounded shell, a green stripe on the umbo, usually densely covered with pustules. Beak cavity deep and open, not compressed as in the purple wartyback. Its length is up to 4 inches (10.2 cm), and the nacre is pearly white and iridescent.

10.63. Quadrula quadrula

Quadrula quadrula (Rafinesque, 1820) is a natural pearl producing freshwater bivalve mollusc found in the USA, otherwise known as Mapleleaf or Stranger; fairly thick shell with well-developed teeth. Squared in outline, lateral surface with two rows of pustules separated by a sulcus. Its length is up to 4 inches (10.2 cm). *Quadrula quadrula* lives in medium to large rivers and reservoirs with a mud, sand, or gravel bottom.

10.64. Queen Conch

see *Strombus gigas* (10.67).

10.65. Scallop

family *pectinidae*. The scallops or pectens are bivalves that have been a part of man's existence from the earliest of times, both as a source of food and adornment. Their characteristic fan shape remain fairly consistent but there is variation in the 'ears' and sculpturing. Their wide variety of colours and patterns have caused them to be a significant collector's item, to be the focus of scientific study and to serve as industrial symbols such as that of Shell Oil. Scallops known to produce pearls are *Nodipecten (Lyropecten) Nodosus* (Atlantic Lion's Paw) L. 1758., *Nodipecten (Lyropecten) subnodosus* (Pacific Lion's Paw) Sowerby 1835, the Atlantic Sea Scallop (*Placopecten magellanicus*) Gmelin 1791 and *Argopecten purpuratus*.

10.66. Silver-lipped Pearl Oyster

Pinctada maxima (10.50), is used extensively for pearl culturing in Australia, the Philippine Islands, Indonesia, and Myanmar; see also Gold-lipped Pearl Oyster (10.23).

10.67. Strombus gigas

also known as the Queen Conch may be found in areas of the Caribbean and Central America. One of the largest in its group, it has a large flaring lip and the shoulders of its whorls bear blunt protruding nodules which are particularly large for the body whorl. Produces the pink (and other colours) conch pearl.

Note: see Clause 2 Normative References; Convention on International Trade in Endangered Species of Wild Fauna and Flora

10.68. Triangleshell Pearl Mussel

Hyriopsis cumingii, (10.26) is the freshwater pearl mussel now used for pearl culturing in China.

10.69. Tridacna gigas

the largest and heaviest known mollusc, also known as the Giant Clam, with the two valves weighing as much as about 225kg (about 500lbs). The elongated oval with equal valves has about five undulating and rounded ribs. The *Tridacna gigas* interior is porcelaneous and white, as are the pearls it produces.

Note: see Clause 2 Normative References; Convention on International Trade in Endangered Species of Wild Fauna and Flora

11. Annex F – Natural & Cultured Pearls; Localities (informative)

11.1. Freshwater cultured pearl

Genus	Species	common name	Country/region	comments
Anodonta	elliptica		Vietnam	
Anodonta	jourdyi		Vietnam	
Anodonta	ssp.		Philippines	
Anodonta	woodiana		China Taiwan	
Chamberlainia	hainesiana		Thailand	
Cristaria	bialata		Vietnam	
Cristaria	plicata		China	1960s-1980s
Cristaria	plicata		Japan	Lake Biwa, originally
Cristaria	plicata		Korea	
Cristaria	plicata		Philippines	
Cucumerunio	novaehollandiae		Australia	proposed for culturing, 1961
Ferreysia	corrugata		India	
Hyriopsis	cumingii		China	tissue- and some beaded
Hyriopsis	cumingii		Vietnam	

Genus	Species	common name	Country/region	comments
Hyriopsis	desowitzi		Thailand	
Hyriopsis	myersiana		Thailand	
Hyriopsis	schlegelii		Japan	Lake Biwa
Hyriopsis	schlegelii x cumingii	hybrid	Japan	Lake Kasumigaura and near Lake Biwa
Lamellidens	corrianus		India	
Lamellidens	marginalis		India	
Lamprotula	mansuyi		China	
Lamprotula	ssp.		Vietnam	also used for nuclei

11.2. Saltwater cultured pearl

Genus	Species	common name	Country/region	comments
Haliotis	Iris	Rainbow Abalone/Paua	New Zealand	
Pinctada	fucata	Akoya	Australia	
Pinctada	fucata	Akoya	China	
Pinctada	fucata		Hawaii	Culturing being developed

Genus	Species	common name	Country/region	comments
Pinctada	fucata	Akoya	Indonesia	
Pinctada	fucata	Akoya	Japan	Since 1920s
Pinctada	fucata	Akoya	Vietnam	Production restarted after Vietnam war
Pinctada	margaritifera	Black lipped pearl oyster	Fiji	
Pinctada	margaritifera	Black lipped pearl oyster	Australia	Experimental farms
Pinctada	margaritifera	Black lipped pearl oyster	China	
Pinctada	margaritifera	Black lipped pearl oyster	Cook Islands	Producers
Pinctada	margaritifera	Black lipped pearl oyster	French Polynesia	Major producer Trade term: Tahiti cultured pearl
Pinctada	margaritifera	subspecies cumingii	French Polynesia	Tuamotu, Gambier, Society islands
Pinctada	margaritifera	Black lipped pearl oyster	Kiribati	Experimental farms as of 2001

Genus	Species	common name	Country/region	comments
Pinctada	margaritifera	Black lipped pearl oyster	Marshall Islands	Arno Atoll, 1994; a new venture 2001 also
Pinctada	margaritifera	Black lipped pearl oyster	Japan	Pearl culturing since 1914
Pinctada	margaritifera	Black lipped pearl oyster	Papua New Guinea	Experimental farms
Pinctada	margaritifera	Black lipped pearl oyster	Solomon Islands	
Pinctada	maxima	Silver and gold lipped pearl oyster	Australia	
Pinctada	maxima	Silver and gold lipped pearl oyster	Cambodia	
Pinctada	maxima	Silver and gold lipped pearl oyster	China	
Pinctada	maxima	Silver and gold lipped pearl oyster	Indonesia	1928-WW II
Pinctada	maxima	Silver and gold lipped pearl oyster	Indonesia	large "Dobo pearls" from Dobo Island, 1950-1960
Pinctada	maxima	Silver and gold lipped pearl oyster	Indonesia	
Pinctada	maxima	Silver and gold lipped	Japan	

Genus	Species	common name	Country/region	comments
		pearl oyster		
Pinctada	maxima	Silver and gold lipped pearl oyster	Korea	
Pinctada	maxima	Silver and gold lipped pearl oyster	Myanmar	since 1957; warmer in colour than south seas; some golden
Pinctada	maxima	Silver and gold lipped pearl oyster	Philippines	
Pinctada	maxima	Silver and gold lipped pearl oyster	Seychelles	production starting 1998 Experimental farms
Pinctada	maxima	Silver and gold lipped pearl oyster	Solomon Islands	
Pinctada	maxima	Silver and gold lipped pearl oyster	Thailand	
Pinctada	maxima	Silver and gold lipped pearl oyster	Vietnam	
Pinctada	mazatlanica	Panamic Black-Lip Oyster	Mexico	Culturing being developed
Pinctada	radiata		India	Culturing being developed
Pteria	penguin		Fiji	Spat being collected

Genus	Species	common name	Country/region	comments
Pteria	penguin	Mabe oyster	Japan	Pearl culturing since 1908
Pteria	penguin		Seychelles	Production starting 1998
Pteria	penguin		Solomon Islands	
Pteria	penguin		Thailand	
Pteria	penguin		Tonga	
Pteria	penguin		Vietnam	
Pteria	sterna	Rainbow Lipped Oyster	Guaymas, Mexico	Pearl culturing since 2000.

11.3. Freshwater natural pearl

Genus	Species	common name	Country/region	comments
Aetheria	ssp.		Egypt	Ancient times
Amblema	plicata	Three-ridge mussel, Bluepoint, Purple Tip, Fluter	USA	
Cyrtonaias	tampicoensis	Tampico pearly mussel	USA	
Ferreysia	ssp.		Bangladesh	
Fusconaia	Ebena	Ebony	USA	

Genus	Species	common name	Country/region	comments
Fusconaia	Flava	Pig Toe	USA	
Lamellidens	daccaensis		Bangladesh	Gold
Lamellidens	marginalis		Bangladesh	Culturing being investigated (pink)
Margaritifera	margaritifera		Europe	Historical; includes Austria, Czechoslovakia, Denmark, France, Germany, Great Britain, Norway, Russia, Scotland
Margaritifera	margaritifera		Canada	Newfoundland
Megalonaia	Nervosa	Washboard	USA	
Potamilis	purpuratus	Blooper, blue mucket, blue hen, purple pocketbook	USA	
Quadrula	Metanevra	Monkey face	USA	
Quadrula	Quadrula	Maple leaf	USA	
Unio	elongata		Great Britain	Historical
Unio	ssp.		Egypt	Ancient times
Various			US	Historic in Ohio River system; nuclei for cultured pearls now

11.4. Saltwater natural pearl

Genus	Species	common name	Country/region	comments
Argopecten	purpuratus	Chilian Scallop	Chile	
Cassis	madagascarensis	Emporor helmet		
Haliotis	australis	Silver Paua	New Zealand	
Haliotis	cracherodi	Black abalone	N.W. USA to Mexico	
Haliotis	fulgens	Green abalone	Southern California to Mexico	
Haliotis	Iris	Rainbow Abalone/Paua	New Zealand	
Haliotis	rufescens	Red abalone	Southern California to Mexico	
Haliotis	Sorenseni	White Abalone	USA to Mexico	
Melo	Aethiopica		Papua New Guinea	
Melo	Amphora		North East Australia	
Melo	Broderipii		Philippines	
Melo	Georginae		Southern Queensland Australia	
Melo	melo		Burma	

Genus	Species	common name	Country/region	comments
Melo	melo		Thailand	
Melo	melo		Vietnam	
Mercenaria	mercenaria	northern quahog, hardshell, littleneck, cherrystone or chowder clam		Also known as Venus mercenaria.
Nodipecten	magnificus		Galapagos	
Nodipecten	nodosus	Atlantic lion's paw	South Eastern USA	
Nodipecten	nodosus	Atlantic lion's paw	Brazil	
Nodipecten	subnodosus	Pacific lion's paw	Western Central America	
Pinctada	fucata	Akoya pearl oyster	Bangladesh	"Available"
Pinctada	fucata	Akoya pearl oyster	Hawaii	Historical
Pinctada	imbricata	Atlantic pearl oyster	Honduras	Pre-Columbian
Pinctada	imbricata	Atlantic pearl oyster	Venezuela	Historic; Caribbean pearls
Pinctada	maculata	golden Pipi	Cook Islands	Limited harvest
Pinctada	maculata	golden Pipi	French Polynesia	Grow with/on cultured pearl oysters

Genus	Species	common name	Country/region	comments
Pinctada	margaritifera	Black-lipped pearl oyster	Cook Islands	Historic; mainly prior to 1970s
Pinctada	margaritifera	Black-lipped pearl oyster	French Polynesia	Trade term: Tahiti pearl
Pinctada	margaritifera	Black-lipped pearl oyster	Hawaii	Historical
Pinctada	margaritifera	Black-lipped pearl oyster	Arabian Gulf (Persian Gulf)	
Pinctada	margaritifera	Black-lipped pearl oyster	Red Sea	Historic centre of pearling (for MOP)
Pinctada	margaritifera	Black-lipped pearl oyster	Sudan	For MOP
Pinctada	maxima	Golden and silver lipped	Australia	
Pinctada	maxima	Golden and silver lipped pearl oyster	Malaysia	Historical (early 1900s).
Pinctada	mazatlanica		Panama	Historic (1600s)
Pinctada	mazatlanica		Peru	
Pinctada	radiata	Ceylon pearl oyster	Ceylon	Historic; gulf of Mannar
Pinctada	radiata	Ceylon pearl oyster	India	Historically extensive

Genus	Species	common name	Country/region	comments
Pinctada	radiata	Ceylon pearl oyster	Kuwait	Commercial pearls larger than 3 mm
Pinctada	radiata	Ceylon pearl oyster	Bangladesh	
Pinctada	radiata	Ceylon pearl oyster	Arabian Gulf (Persian Gulf)	
Pinctada	radiata	Ceylon pearl oyster	Qatar	Used as pollution monitor
Pinctada	radiata	Ceylon pearl oyster	Red Sea	Historic centre of pearling
Placenta	placenta	small white pearls	Bangladesh	
Pleuroploca	gigantea	Horse conch	USA	
Pteria	sterna		Mexico	Historical (prior to 1900)
Pteria	sterna		Peru	Reference is 1916
Strombus	gigas	Queen conch	USA, Caribbean	
Tridacna	gigas	Giant clam	Pacific	

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**Statement of Linus L. Drogs III Regarding Hand-Cast Jewelry Making
May 20, 2016**

I, Linus Drogs, am the owner of Au Enterprises, a company that casts precious metal products for jewelers, including rings, bracelets, pendants and brooches.

Professional Background

For the last twenty-nine years I have been the owner and operator of Au Enterprises, a jewelry contract casting company. From 1987 to 1990 my company engaged in the hand casting of jewelry products, using the “lost-wax” method of casting, described below. Since 1990, Au Enterprises has engaged primarily in the production casting of jewelry products, while also continuing to hand cast articles using the lost-wax method, at a level of approximately 1,000 pieces a year. From 1983 to 1987, prior to owning and operating Au Enterprises, I worked as a production manager for Raymond Idzikowski, a company that provided hand modeling and hand casting services for jewelers. From 2008 to 2013, I was a production casting consultant, with the title of Technical Director, at Stillwater Mine in Billings Montana, the only palladium/platinum mine in the United States. I currently provide similar consulting services, as Technical Director, to Palladium Group Marketing, the marketing arm of Norilsk Nickel, a company located in Moscow, Russia, and the operator of the largest palladium mine in the world.

I studied at Henry Ford College in Dearborn, MI from '83 to '85.

In 2009, I received the Ambassador Award from the Santa Fe Jewelry Symposium on Jewelry Manufacturing Technology, an annual educational symposium considered the foremost in the world of jewelry manufacturing. I have attended the Symposium every year for the last 22 years, and on two occasions, in 2008 and 2011, I presented on the subject of hand glass casting and production casting, respectively. I am a member of the International Precious Metal Institute, the Manufacturing Jewelers and Supplier of America (MJSA), the Southern 24 Karat Club, and the Jewelers Board of Trade. Articles I have authored on jewelry manufacturing subjects, including casting, alloys, rapid burnout cycles, and investment materials, have been published in the MJSA *Journal*. My presentations at the Santa Fe Symposium were published in *Jewelry Manufacturing Technology* in 2008 and 2011.

This statement is based on my 32 years of experience in the casting industry as a hand and production caster, and as consultant and industry expert.

The Hand-Casting of Jewelry

The hand-casting of jewelry is accomplished by using the “lost-wax” casting method, a process that dates from the third millennium BCE and has sustained few changes since then.¹ Typically, a jeweler creates a model based on his or her design, then works with an experienced caster, who uses hand methods to turn the model into an article of jewelry or a jewelry component. The steps required to create a hand-cast article of jewelry, or jewelry component, using this method are as follows:

1. *Create a Model by Hand*

The jeweler shapes a small wax block using files, saws, other hand-cutting tools and/or fingers, and/or by shaping the wax with heat. The jeweler adds and subtracts wax as necessary to create the model. No two wax models will be identical, as they are created one at a time, by hand.

2. *Add a Sprue to the Model*

A sprue, also known as a gate, is a channel through which metal is poured into a mold. The jeweler attaches a wax sprue to the model created in Step One.

3. *Create a Plaster Mold*

The caster places the model with the attached sprue into a metal vessel or ring. The vessel is filled with plaster and gypsum, a bonding material. This dries at room temperature for one to two hours.

4. *Burn Out the Wax*

¹*Lost-wax process; Metal casting*, <http://www.britannica.com/technology/lost-wax-process>

The caster places the plaster mold, with the wax model encased within it, into an oven to melt the wax and harden the plaster. The sprue is at the bottom, allowing the melted wax to drip out of the mold. After about four to twelve hours the caster removes the mold from the oven.

5. *Cast the Jewelry*

Metal is melted by the caster to the point of being very fluid. The caster pours the liquid metal into the sprue, by hand, to fill the cavity left by the melted wax, and gives it time to harden.

6. *Remove the Mold*

The caster immerses the mold in water to destroy it, exposing the cast object. The caster then removes all the remaining plaster by slight abrasion.

7. *Remove the Sprue*

The caster removes the sprue by hand-sawing or hand filing.

8. *Polish the Jewelry or Jewelry Component*

Using fine abrasives and compounds, the jeweler or caster polishes the surface of the article to create luster and a reflective surface finish.

Thank you for the opportunity to share my expertise with the Commission.



Linus Drogs
Owner

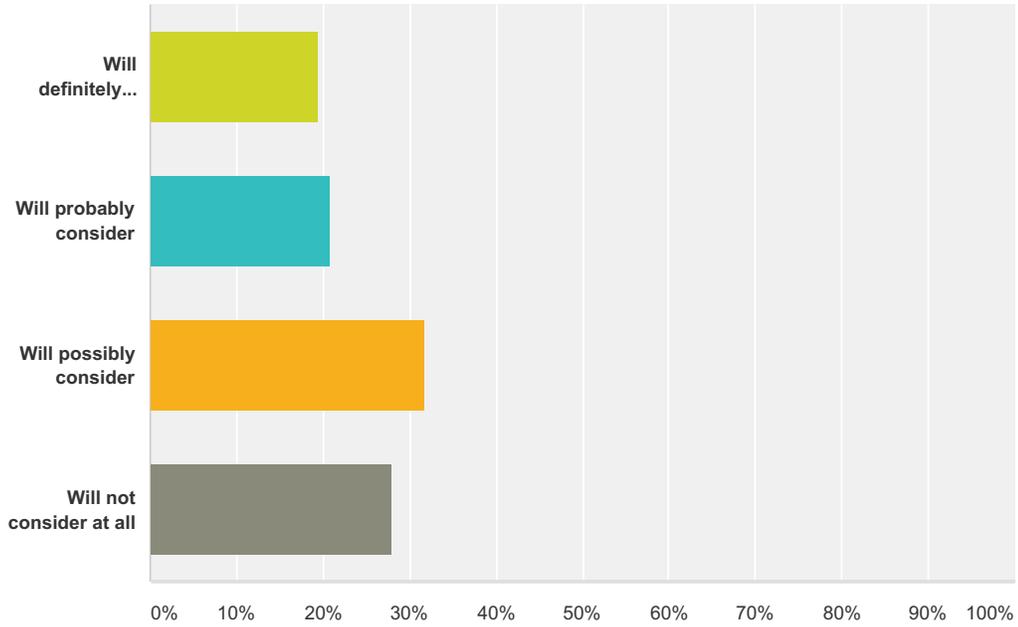
May 24, 2016

Date

Au Enterprises
3916 W Eleven Mile Rd, Berkley, MI

Q1 How likely are you to consider purchasing fine jewelry, either for yourself or someone else, in the future?

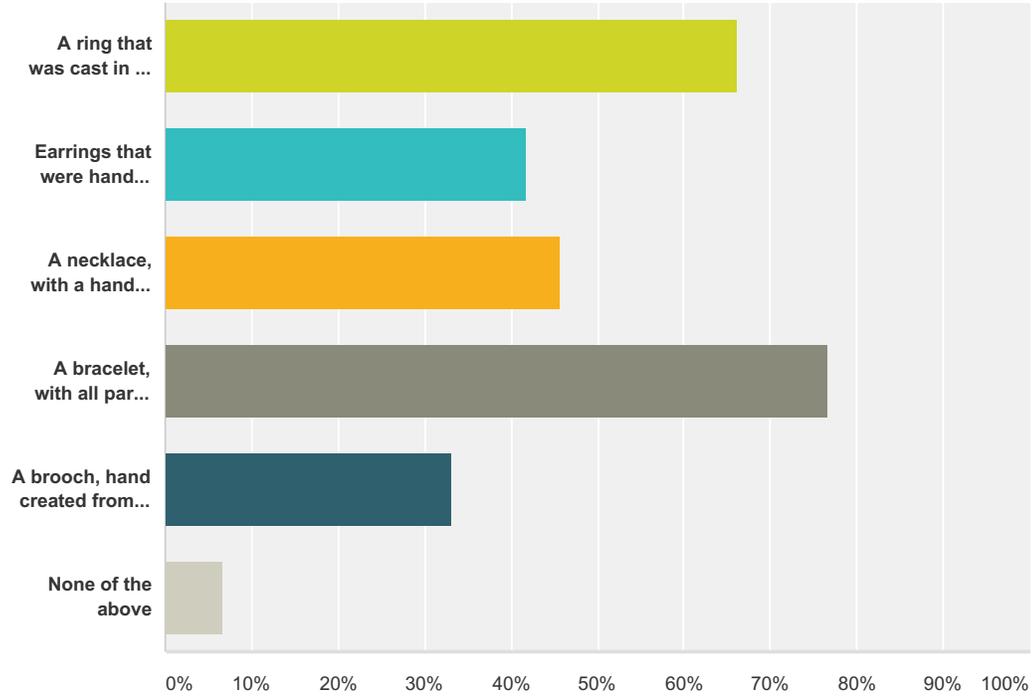
Answered: 616 Skipped: 0



Answer Choices	Responses
Will definitely consider	19.32% 119
Will probably consider	20.94% 129
Will possibly consider	31.82% 196
Will not consider at all	27.92% 172
Total	616

Q2 Some jewelry items are described as "handmade." Which items below should fall into that category?

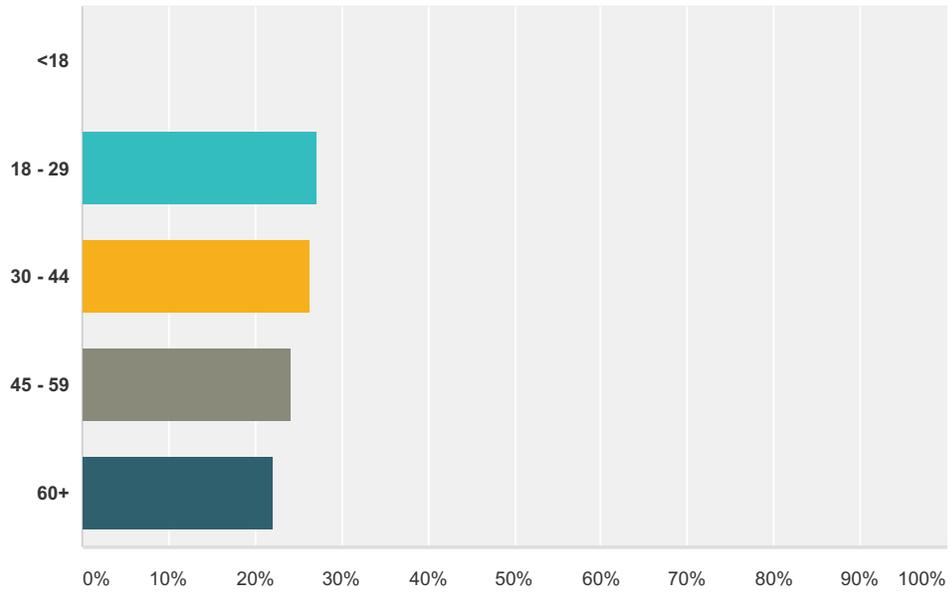
Answered: 435 Skipped: 181



Answer Choices	Responses
A ring that was cast in a hand-carved wax mold and then hand finished	66.21% 288
Earrings that were hand created from a sheet of gold, then completed with machine made posts and stoppers	41.84% 182
A necklace, with a hand created pendant and a machine made chain	45.75% 199
A bracelet, with all parts hand crafted and assembled	76.55% 333
A brooch, hand created from computer aided design	33.10% 144
None of the above	6.67% 29
Total Respondents: 435	

Q3 Age

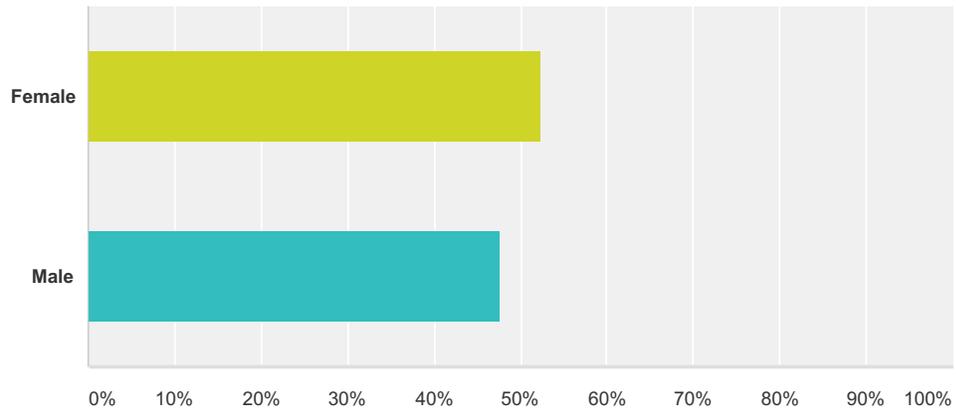
Answered: 606 Skipped: 10



Answer Choices	Responses
<18	0.00% 0
18 - 29	27.23% 165
30 - 44	26.40% 160
45 - 59	24.26% 147
60+	22.11% 134
Total	606

Q4 What is your gender?

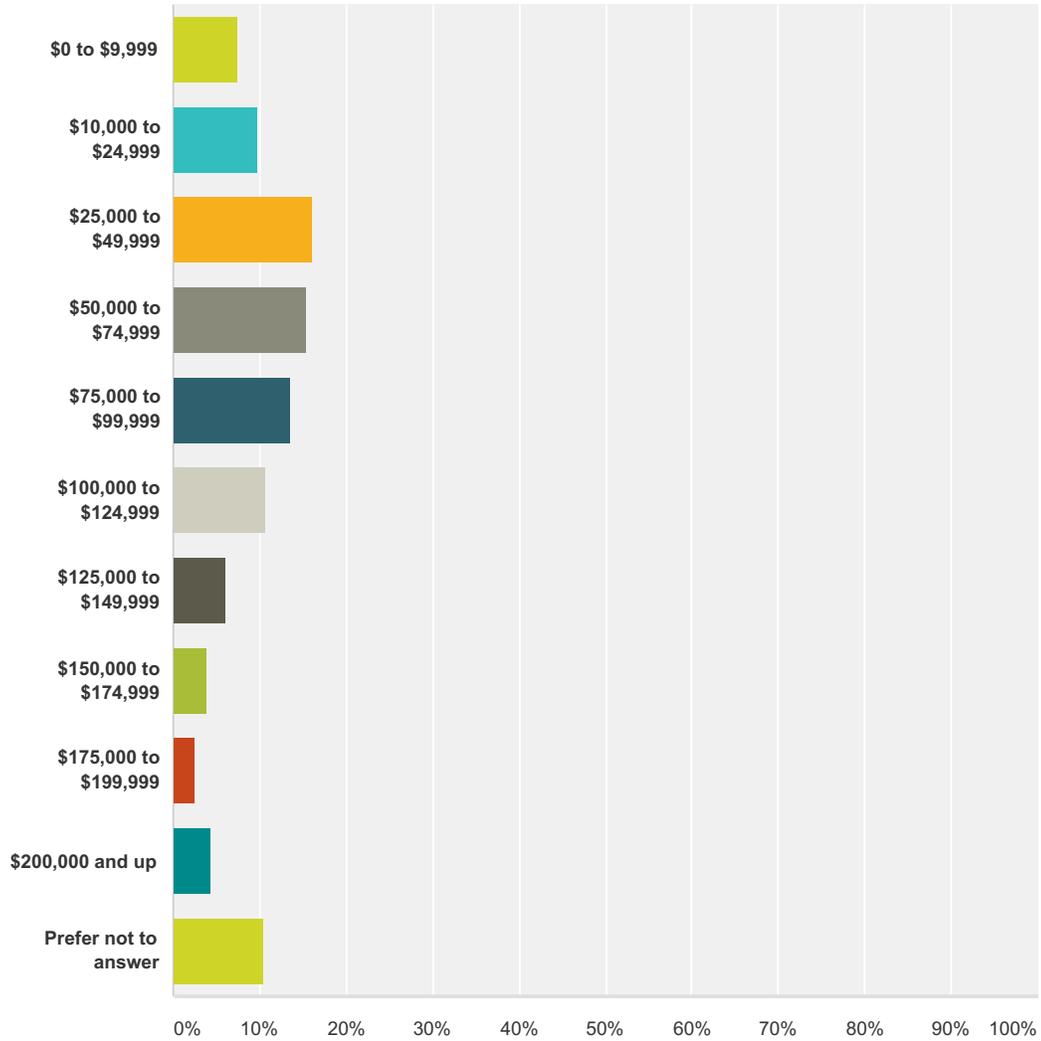
Answered: 606 Skipped: 10



Answer Choices	Responses
Female	52.31% 317
Male	47.69% 289
Total	606

Q5 How much total combined money did all members of your HOUSEHOLD earn last year?

Answered: 605 Skipped: 11

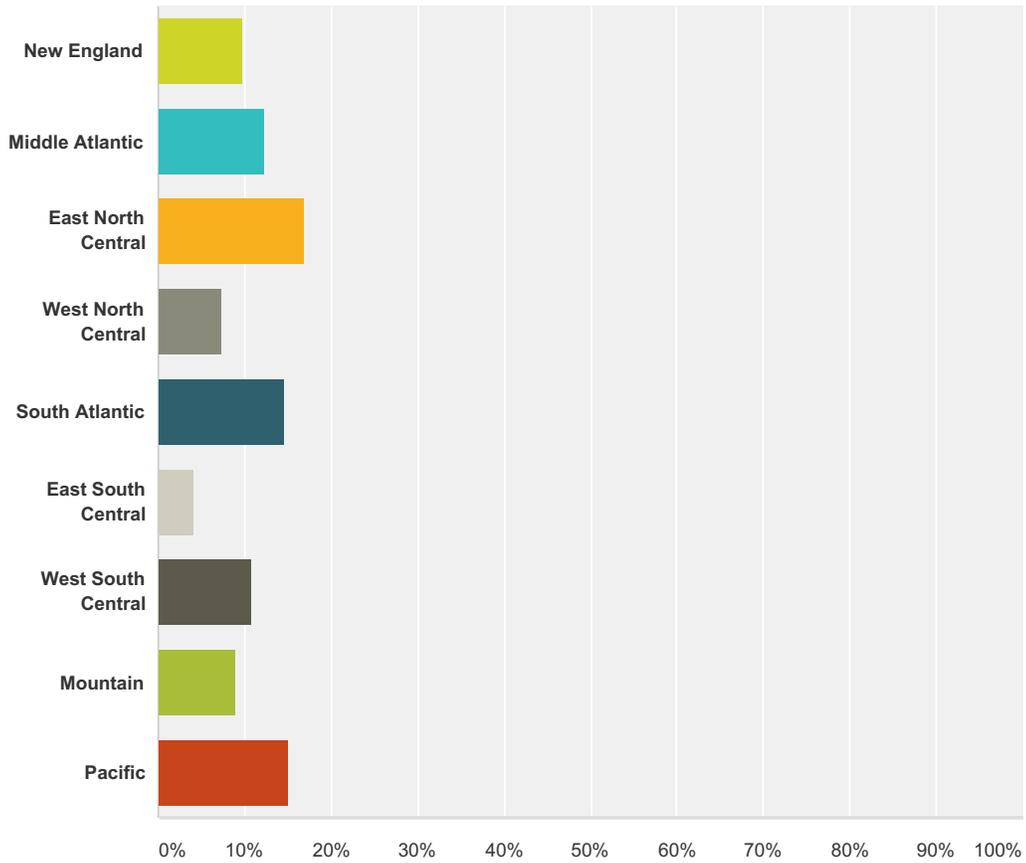


Answer Choices	Responses
\$0 to \$9,999	7.60% 46
\$10,000 to \$24,999	9.75% 59
\$25,000 to \$49,999	16.03% 97
\$50,000 to \$74,999	15.37% 93
\$75,000 to \$99,999	13.55% 82
\$100,000 to \$124,999	10.58% 64
\$125,000 to \$149,999	5.95% 36
\$150,000 to \$174,999	3.97% 24

\$175,000 to \$199,999	2.48%	15
\$200,000 and up	4.30%	26
Prefer not to answer	10.41%	63
Total		605

Q6 US Region

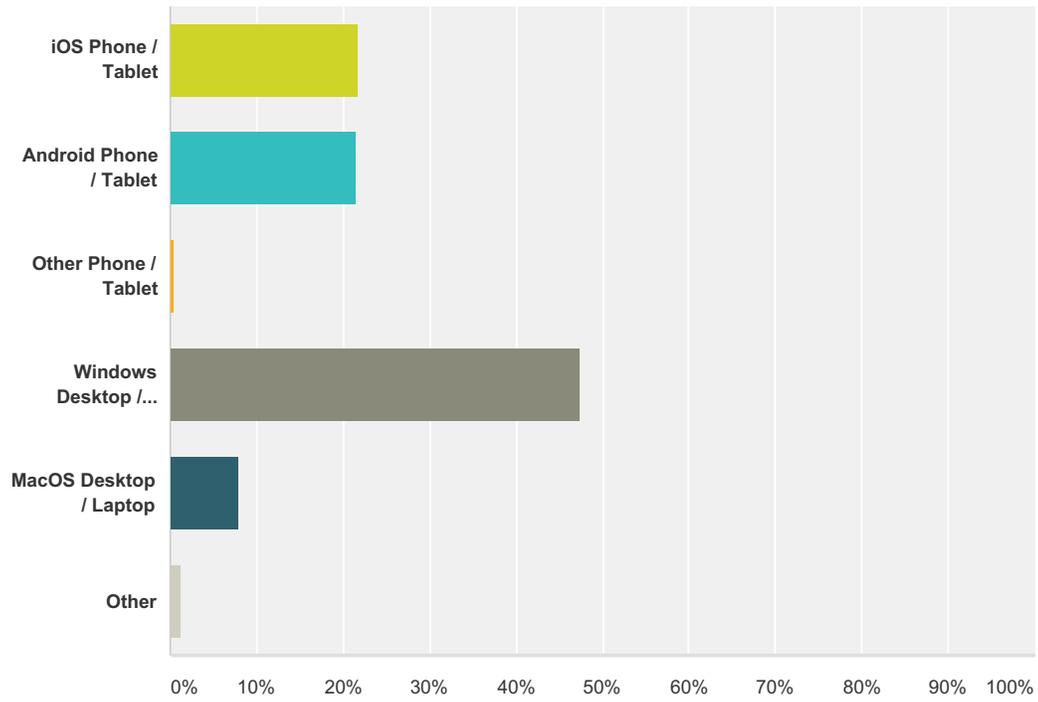
Answered: 596 Skipped: 20



Answer Choices	Responses	Count
New England	9.73%	58
Middle Atlantic	12.42%	74
East North Central	16.95%	101
West North Central	7.21%	43
South Atlantic	14.60%	87
East South Central	4.19%	25
West South Central	10.91%	65
Mountain	9.06%	54
Pacific	14.93%	89
Total		596

Q7 Device Types

Answered: 606 Skipped: 10



Answer Choices	Responses
iOS Phone / Tablet	21.62% 131
Android Phone / Tablet	21.45% 130
Other Phone / Tablet	0.33% 2
Windows Desktop / Laptop	47.36% 287
MacOS Desktop / Laptop	7.92% 48
Other	1.32% 8
Total	606

Synthetic Questions

General Population
in the United States on the
Google Consumer Surveys
publisher network.

04/20/2016

One-time

Question	Answer	Insights	Responses
1. How likely are you to consider purchasing fine jewelry, either for yourself or someone else, in the future?	Will not consider at all 47.2%	1	543
2. Which of these terms accurately describes a man-made gemstone that has the same optical, physical and chemical properties as a natural gemstone?	Too close to call Trending towards: synthetic gemstone	None	512
3. Please select all of the terms which indicate that a gemstone is not real.	Too close to call Trending towards: imitation	None	501 / 500

How likely are you to consider purchasing fine jewelry, either for yourself or someone else, in the future?

Results for respondents with demographics. Weighted by Age, Region. (437 responses)

Winner statistically significant.



Metrics only apply to the topline results for this question. Filters and weighting do not apply.

Impressions

4,112

Responses

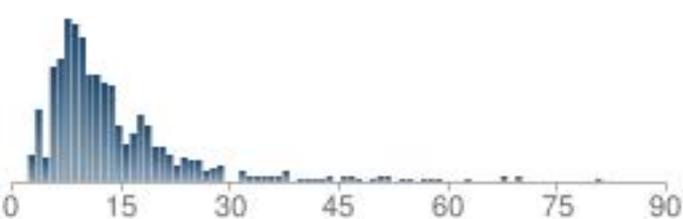
543

Response Rate

13.2%

Response Times

Median response time is 10.1 seconds



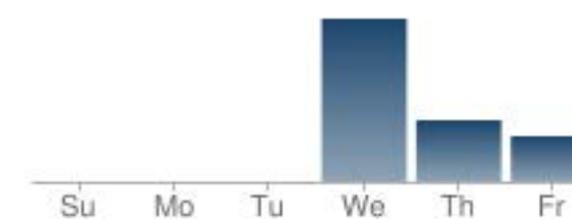
Responses by hour of day

Local times of respondents



Responses by day of week

Local times of respondents



All (437)

Will not consider at all 47.2% (+4.6 / -4.5)

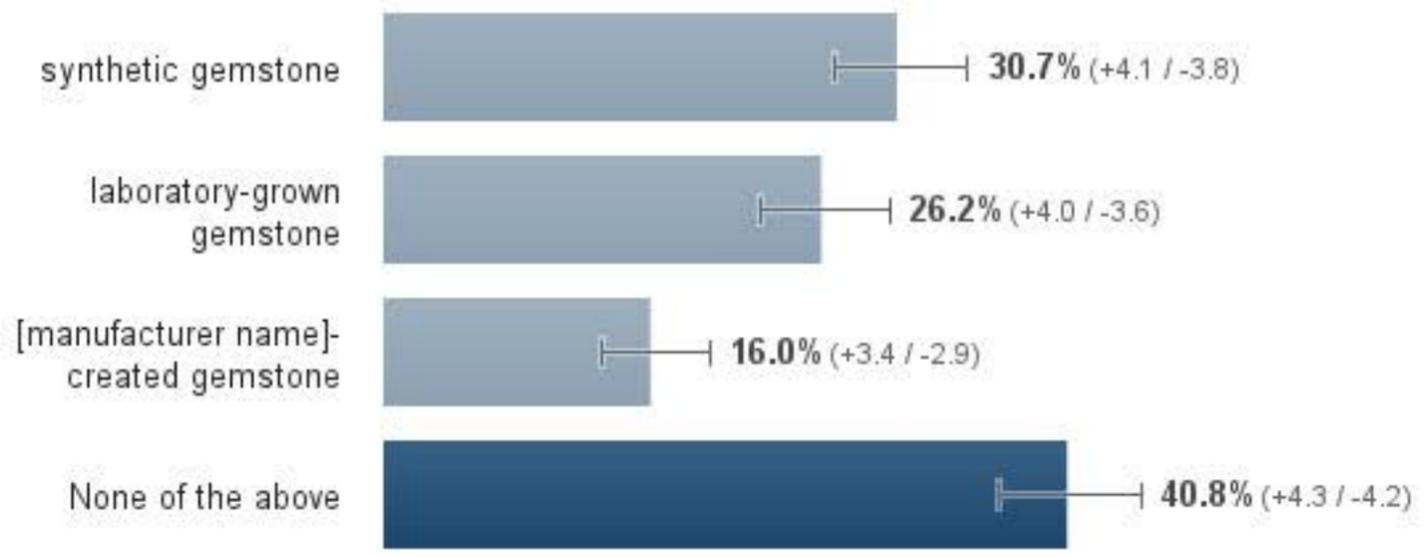
Will possibly consider 22.2% (+4.2 / -3.7)

Will probably consider 16.0% (+4.0 / -3.3)

Will definitely consider 14.6% (+3.9 / -3.2)

Which of these terms accurately describes a man-made gemstone that has the same optical, physical and chemical properties as a natural gemstone?

Results for all respondents. Weighted data unavailable for this view. (512 responses)
 Confidence too close to call.



Answers	Unduplicated reach	# of answers
synthetic gemstone laboratory-grown gemstone [manufacturer name]-created gemstone	59.2% of respondents	3
synthetic gemstone laboratory-grown gemstone	50.2% of respondents	2
synthetic gemstone	30.7% of respondents	1

Metrics only apply to the topline results for this question. Filters and weighting do not apply.

Impressions
617

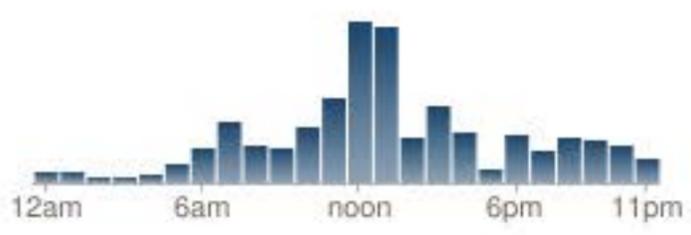
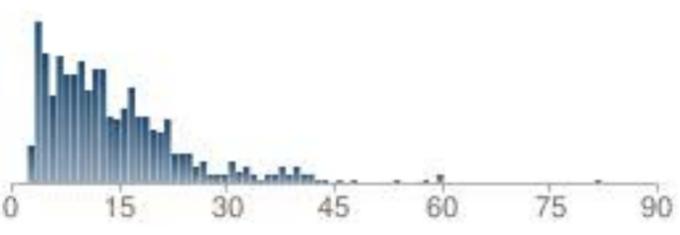
Responses
512

Response Rate
83.0%

Response Times
 Median response time is 10.8 seconds

Responses by hour of day
 Local times of respondents

Responses by day of week
 Local times of respondents



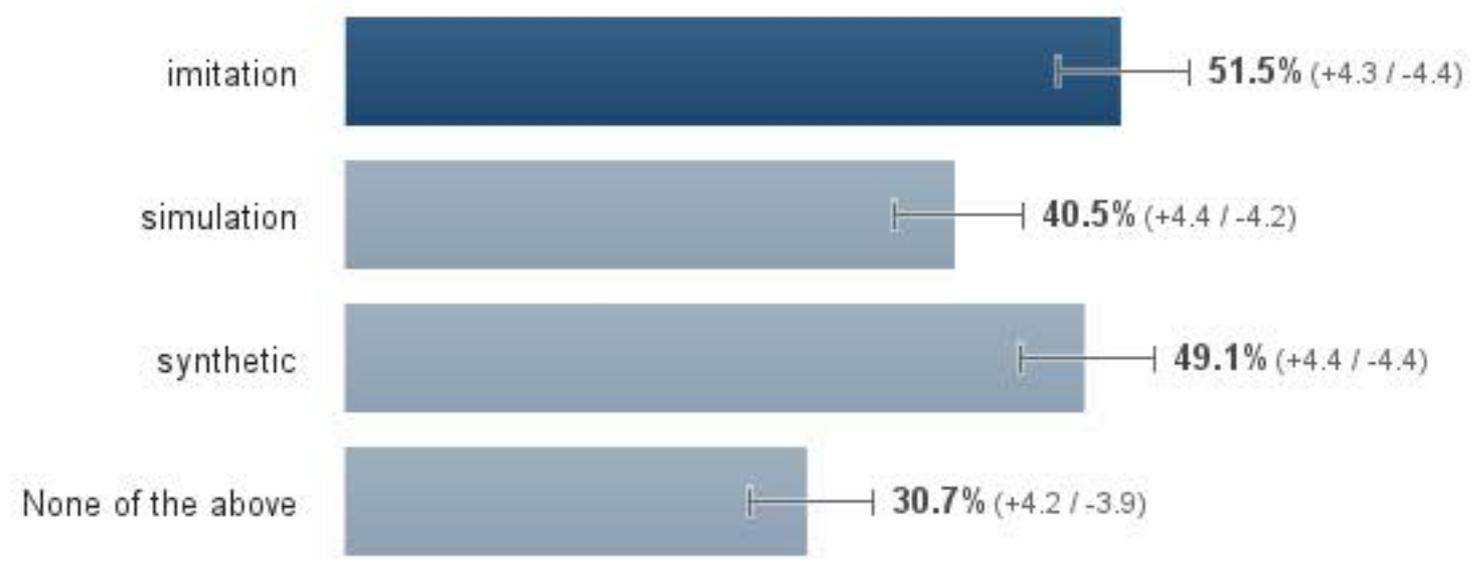
All (512)

synthetic gemstone	30.7% (+4.1 / -3.8)
laboratory-grown gemstone	26.2% (+4.0 / -3.6)
[manufacturer name]-created gemstone	16.0% (+3.4 / -2.9)
None of the above	40.8% (+4.3 / -4.2)

Please select all of the terms which indicate that a gemstone is not real.

Results for all respondents. Weighted data unavailable for this view. (501 responses)

Confidence too close to call.



Answers	Unduplicated reach	# of answers
imitation simulation synthetic	69.3% of respondents	3
imitation synthetic	64.1% of respondents	2
imitation	51.5% of respondents	1

Metrics only apply to the topline results for this question. Filters and weighting do not apply.

Impressions

536

Responses

501

Response Rate

93.5%

Response Times

Median response time is 7.0 seconds

Responses by hour of day

Local times of respondents

Responses by day of week

Local times of respondents

imitation	51.5% (+4.3 / -4.4)
simulation	40.5% (+4.4 / -4.2)
synthetic	49.1% (+4.4 / -4.4)
None of the above	30.7% (+4.2 / -3.9)

Survey ID	Question n	Question t	Winning ar	Response count
d2tk5aamç	1	How likely	Will not coi	543
d2tk5aamç	2	Which of these terms :		512
d2tk5aamç	3	Please select all of the		501

Survey ID	Question n	Question t	Answer	Answer by	Reweighting
d2tk5aamç 1		How likely	Will definit	14.55%	weighted by Age, Region
d2tk5aamç 1		How likely	Will probat	15.98%	weighted by Age, Region
d2tk5aamç 1		How likely	Will possib	22.22%	weighted by Age, Region
d2tk5aamç 1		How likely	Will not coi	47.24%	weighted by Age, Region
d2tk5aamç 2		Which of th	synthetic g	30.66%	not weighted
d2tk5aamç 2		Which of th	laboratory-	26.17%	not weighted
d2tk5aamç 2		Which of th	[manufactu	16.02%	not weighted
d2tk5aamç 3		Please sek	imitation	51.50%	not weighted
d2tk5aamç 3		Please sek	simulation	40.52%	not weighted
d2tk5aamç 3		Please sek	synthetic	49.10%	not weighted

User ID	Time (UTC)	Publisher (C)	Gender	Age	Geography	Urban Den	Income	Parental St	Weight
100197879	2016-04-27	Mobile App	Female	18-24	US-WEST	Suburban	I prefer not	Unknown	0.939
100223480	2016-04-27	News	Female	35-44	US-WEST	Urban	\$0-\$24,999	Unknown	0.744
100588424	2016-04-27	Reference	Female	35-44	US-WEST	Urban	\$50,000-\$75,000	Unknown	0.744
100721560	2016-04-27	Reference	Male	35-44	US-NORTH	Suburban	\$50,000-\$75,000	Unknown	2.023
100758068	2016-04-27	News	Male	25-34	US-WEST	Urban	\$25,000-\$49,999	Unknown	1.052
100914517	2016-04-27	Arts & Entertainment	Female	65+	US-WEST	Unknown	\$50,000-\$75,000	Unknown	2.023
101059216	2016-04-27	Mobile App	Male	25-34	US-WEST	Urban	\$25,000-\$49,999	Unknown	1.052
101240243	2016-04-27	News	Female	25-34	US-MIDWEST	Urban	\$50,000-\$75,000	Unknown	0.585
101504972	2016-04-27	Arts & Entertainment	Male	55-64	US-NORTH	Rural	\$25,000-\$49,999	Unknown	1.016
102050034	2016-04-27	News	Male	35-44	US-WEST	Urban	\$25,000-\$49,999	Unknown	0.744
102693463	2016-04-27	News	Female	45-54	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown	1.222
103132298	2016-04-27	News	Unknown	Unknown	US-SOUTH	Urban	\$0-\$24,999	Unknown	
103224702	2016-04-27	Reference	Male	Unknown	US-WEST	Urban	\$25,000-\$49,999	Unknown	
103277164	2016-04-27	News	Unknown	Unknown	US-WEST	Suburban	\$50,000-\$75,000	Unknown	
103452798	2016-04-27	Arts & Entertainment	Female	45-54	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown	1.222
103979604	2016-04-27	News	Male	35-44	US-MIDWEST	Suburban	\$50,000-\$75,000	Unknown	0.879
104144771	2016-04-27	News	Female	55-64	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown	0.717
104240878	2016-04-27	News	Male	35-44	US-SOUTH	Rural	\$25,000-\$49,999	Unknown	0.847
104341053	2016-04-27	Mobile App	Female	25-34	US-WEST	Rural	\$25,000-\$49,999	Unknown	1.052
104823748	2016-04-27	News	Unknown	Unknown	US-SOUTH	Suburban	\$0-\$24,999	Unknown	
104845378	2016-04-27	Reference	Male	18-24	US-WEST	Rural	\$25,000-\$49,999	Unknown	0.939
106385753	2016-04-27	Mobile App	Male	18-24	US-MIDWEST	Urban	\$0-\$24,999	Unknown	0.523
106420418	2016-04-27	Other	Male	45-54	US-SOUTH	Urban	\$50,000-\$75,000	Unknown	1.962
108600628	2016-04-27	News	Female	35-44	US-SOUTH	Unknown	Unknown	Unknown	0.847
109014472	2016-04-27	News	Female	35-44	US-SOUTH	Suburban	\$50,000-\$75,000	Unknown	0.847
109113748	2016-04-27	Reference	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$49,999	Unknown	
109500834	2016-04-27	News	Female	45-54	US-WEST	Urban	\$50,000-\$75,000	Unknown	0.799
10977793	2016-04-27	News	Male	18-24	US-WEST	Urban	\$25,000-\$49,999	Unknown	0.939
109938188	2016-04-27	Reference	Male	55-64	US-WEST	Urban	\$25,000-\$49,999	Unknown	0.855
110131057	2016-04-27	News	Male	25-34	US-MIDWEST	Suburban	\$50,000-\$75,000	Unknown	0.585
110204648	2016-04-27	Mobile App	Female	25-34	US-WEST	Suburban	\$0-\$24,999	Unknown	1.052
110615148	2016-04-27	Reference	Unknown	Unknown	US-NORTH	Urban	\$0-\$24,999	Unknown	
111329868	2016-04-27	News	Male	35-44	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown	0.879
111468638	2016-04-27	News	Female	25-34	US-WEST	Suburban	\$25,000-\$49,999	Unknown	1.052
111587898	2016-04-27	News	Male	65+	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown	1.428
112314117	2016-04-27	Mobile App	Male	18-24	US-WEST	Suburban	\$0-\$24,999	Unknown	0.939
112325023	2016-04-27	News	Female	55-64	US-NORTH	Urban	\$25,000-\$49,999	Unknown	1.016
114007860	2016-04-27	Mobile App	Female	25-34	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown	0.585
114752643	2016-04-27	News	Unknown	Unknown	US-SOUTH	Urban	\$25,000-\$49,999	Unknown	
114981260	2016-04-27	News	Female	45-54	US-WEST	Rural	\$25,000-\$49,999	Unknown	0.799
115092671	2016-04-27	News	Female	45-54	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown	1.962
116271098	2016-04-27	News	Male	55-64	US-NORTH	Rural	\$25,000-\$49,999	Unknown	1.016
116703947	2016-04-27	Mobile App	Male	25-34	US-SOUTH	Suburban	\$50,000-\$75,000	Unknown	1.116
116791628	2016-04-27	Mobile App	Female	55-64	US-MIDWEST	Rural	\$75,000-\$99,999	Unknown	0.717
117350868	2016-04-27	News	Female	55-64	US-WEST	Urban	\$25,000-\$49,999	Unknown	0.855
117661498	2016-04-27	News	Female	45-54	US-NORTH	Suburban	\$50,000-\$75,000	Unknown	1.186
117814061	2016-04-27	News	Male	45-54	US-WEST	Suburban	\$25,000-\$49,999	Unknown	0.799
119275411	2016-04-27	News	Male	45-54	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown	1.962
119624258	2016-04-27	News	Male	35-44	US-SOUTH	Urban	\$25,000-\$49,999	Unknown	0.847
120514863	2016-04-27	News	Unknown	Unknown	US-WEST	Suburban	\$50,000-\$75,000	Unknown	
120637257	2016-04-27	Other	Female	45-54	US-WEST	Urban	\$50,000-\$75,000	Unknown	0.799
120777082	2016-04-27	News	Female	45-54	US-NORTH	Suburban	\$50,000-\$75,000	Unknown	1.186
121250088	2016-04-27	Other	Male	35-44	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown	0.879
121979898	2016-04-27	News	Male	25-34	US-WEST	Urban	\$25,000-\$49,999	Unknown	1.052
122686640	2016-04-27	News	Unknown	Unknown	US-MIDWEST	Urban	\$75,000-\$99,999	Unknown	
123069020	2016-04-27	News	Female	18-24	US-NORTH	Urban	\$25,000-\$49,999	Unknown	1.094
123423804	2016-04-27	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$49,999	Unknown	
124103280	2016-04-27	News	Unknown	Unknown	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown	
124626504	2016-04-27	News	Unknown	Unknown	US-NORTH	Rural	\$25,000-\$49,999	Unknown	
124840574	2016-04-27	News	Male	45-54	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown	1.222
126999274	2016-04-27	Reference	Unknown	Unknown	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown	

Question #	Question #	Question #	Question #	Question #	Question #	Question #	Question #	Question #	Response
Will possibly consider synthetic gemstone	laboratory-grown gemstone	[manufacturer name]-created gemstone	imitation	simulation	synthetic				6107ms
Will possibly consider			None of the above						None of the 8715ms
Will possibly consider			None of the above						None of the 1945ms
Will possibly consider			None of the above	imitation	simulation	synthetic			67164ms
Will not consider at all	synthetic gemstone			imitation					7211ms
Will not consider at all	synthetic gemstone			imitation	simulation	synthetic			8829ms
Will definitely consider	synthetic gemstone	laboratory-grown gemstone	[manufacturer name]-created gemstone	imitation	simulation	synthetic			38583ms
Will probably consider			None of the above						None of the 6560ms
Will possibly consider			None of the above						None of the 2334ms
Will probably consider	laboratory-grown gemstone					synthetic			5633ms
Will not consider at all			None of the above	imitation	simulation	synthetic			7386ms
Will definitely consider		[manufacturer name]-created gemstone	imitation						12516ms
Will definitely consider	synthetic gemstone				simulation				11412ms
Will not consider at all	laboratory-grown gemstone			imitation					11118ms
Will not consider at all			None of the above						None of the 20019ms
Will definitely consider	laboratory-grown gemstone				simulation				13035ms
Will not consider at all			None of the above	imitation					8277ms
Will possibly consider			None of the above						None of the 5660ms
Will definitely consider	synthetic gemstone			imitation		synthetic			6225ms
Will not consider at all	laboratory-grown gemstone								None of the 11457ms
Will probably consider	laboratory-grown gemstone				simulation	synthetic			12188ms
Will possibly consider		[manufacturer name]-created gemstone	imitation		simulation				6509ms
Will definitely consider	laboratory-grown gemstone					synthetic			20679ms
Will probably consider	synthetic gemstone								None of the 21055ms
Will not consider at all			None of the above						None of the 5226ms
Will not consider at all			None of the above						None of the 5873ms
Will not consider at all			None of the above			synthetic			16153ms
Will not consider at all			None of the above						None of the 5726ms
Will possibly consider		[manufacturer name]-created gemstone	imitation						2425ms
Will not consider at all	laboratory-grown gemstone				simulation				8017ms
Will probably consider	synthetic gemstone					synthetic			7614ms
Will not consider at all	laboratory-grown gemstone					synthetic			14718ms
Will not consider at all		[manufacturer name]-created gemstone	imitation						11813ms
Will possibly consider	synthetic gemstone			imitation		synthetic			12256ms
Will not consider at all			None of the above						None of the 24487ms
Will probably consider	synthetic gemstone	laboratory-grown gemstone	[manufacturer name]-created gemstone	imitation					11343ms
Will not consider at all			[manufacturer name]-created gemstone			synthetic			28219ms
Will probably consider			[manufacturer name]-created gemstone	simulation					14637ms
Will not consider at all			None of the above						None of the 7393ms
Will possibly consider	laboratory-grown gemstone		imitation	simulation	synthetic				25528ms
Will probably consider			None of the above						None of the 2705ms
Will not consider at all			None of the above	imitation					13906ms
Will definitely consider	synthetic gemstone	laboratory-grown gemstone	[manufacturer name]-created gemstone	imitation	simulation				17095ms
Will possibly consider	synthetic gemstone					synthetic			10824ms
Will not consider at all	laboratory-grown gemstone					synthetic			11346ms
Will not consider at all	synthetic gemstone			imitation		synthetic			10594ms
Will not consider at all	synthetic gemstone								None of the 7947ms
Will probably consider			None of the above		simulation				2750ms
Will not consider at all	synthetic gemstone					synthetic			10518ms
Will not consider at all		[manufacturer name]-created gemstone	imitation						120365ms
Will not consider at all			None of the above						None of the 6101ms
Will not consider at all			None of the above						None of the 5250ms
Will not consider at all			None of the above						None of the 2522ms
Will not consider at all	synthetic gemstone			imitation	simulation	synthetic			8943ms
Will not consider at all	laboratory-grown gemstone				simulation				2272ms
Will not consider at all			None of the above						None of the 8932ms
Will not consider at all			None of the above						None of the 258363ms
Will possibly consider	synthetic gemstone			imitation	simulation	synthetic			18004ms
Will definitely consider		[manufacturer name]-created gemstone			simulation				8941ms
Will not consider at all			None of the above						None of the 16416ms
Will possibly consider			None of the above						None of the 12602ms

Response	Response Time #3
6950ms	2894ms
4387ms	1870ms
2440ms	1592ms
6285ms	7088ms
14877ms	8918ms
23077ms	16335ms
11388ms	4764ms
12412ms	5457ms
6029ms	2421ms
3402ms	2462ms
12349ms	6012ms
9318ms	2202ms
4235ms	2993ms
10363ms	2230ms
6743ms	1693ms
3918ms	2615ms
8254ms	6664ms
10618ms	3495ms
15527ms	7428ms
7662ms	2365ms
22243ms	18326ms
17168ms	9892ms
3741ms	6853ms
17100ms	13239ms
2564ms	2293ms
3221ms	1393ms
19299ms	6872ms
3939ms	1681ms
3271ms	3424ms
3490ms	2749ms
2192ms	1840ms
10681ms	5741ms
4035ms	2436ms
13559ms	8122ms
19783ms	8442ms
7889ms	5528ms
16258ms	21330ms
20989ms	6086ms
5286ms	3434ms
29999ms	16132ms
12361ms	3706ms
11820ms	10302ms
31528ms	12842ms
13921ms	8137ms
10115ms	10943ms
15261ms	21315ms
5958ms	3631ms
2575ms	1707ms
17008ms	6486ms
6942ms	3494ms
13192ms	4953ms
4019ms	7762ms
2047ms	2127ms
13806ms	5492ms
2131ms	2432ms
10051ms	2061ms
4288ms	2342ms
17636ms	19220ms
58541ms	26795ms
5807ms	2872ms
19929ms	7964ms

12716698	2016-04-21	Mobile App	Male	25-34	US-WEST	Rural	I prefer not	Unknown	1.052
127367201	2016-04-21	Mobile App	Male	25-34	US-NORT	Suburban	\$75,000-\$	Unknown	0.768
12839519	2016-04-21	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$	Unknown	
128763394	2016-04-21	News	Unknown	Unknown	US-MIDW	Rural	\$25,000-\$	Unknown	
129231907	2016-04-21	News	Unknown	Unknown	US-WEST	Rural	\$25,000-\$	Unknown	
129296361	2016-04-21	Mobile App	Female	25-34	US-WEST	Suburban	\$100,000-\$	Unknown	1.052
12936843	2016-04-21	Reference	Unknown	Unknown	US-SOUTH	Suburban	\$25,000-\$	Unknown	
12944865	2016-04-21	News	Unknown	Unknown	US-SOUTH	Urban	\$25,000-\$	Unknown	
12975868	2016-04-21	Reference	Unknown	Unknown	US-MIDW	Rural	\$25,000-\$	Unknown	
13072546	2016-04-21	News	Male	25-34	US-NORT	Suburban	\$25,000-\$	Unknown	0.768
13146682	2016-04-21	Mobile App	Male	25-34	US-SOUTH	Rural	\$25,000-\$	Unknown	1.116
131708571	2016-04-21	News	Male	25-34	US-MIDW	Suburban	\$50,000-\$	Unknown	0.585
13173077	2016-04-21	Mobile App	Male	35-44	US-NORT	Suburban	\$25,000-\$	Unknown	2.023
13180091	2016-04-21	Other	Female	Unknown	US-NORT	Urban	\$50,000-\$	Unknown	
131906511	2016-04-21	Reference	Unknown	Unknown	US-MIDW	Urban	\$25,000-\$	Unknown	
132443454	2016-04-21	News	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$	Unknown	
132717747	2016-04-21	News	Female	55-64	US-SOUTH	Rural	\$25,000-\$	Unknown	1.493
13357563	2016-04-21	Reference	Unknown	Unknown	US-WEST	Rural	\$25,000-\$	Unknown	
134391184	2016-04-21	News	Female	45-54	US-MIDW	Suburban	\$50,000-\$	Unknown	1.222
134596354	2016-04-21	Mobile App	Female	18-24	US-MIDW	Urban	\$0-\$24,99	Unknown	0.523
134620712	2016-04-21	Reference	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$	Unknown	
134761814	2016-04-21	News	Female	45-54	US-SOUTH	Urban	\$25,000-\$	Unknown	1.962
13516522	2016-04-21	Mobile App	Male	18-24	US-WEST	Suburban	\$0-\$24,99	Unknown	0.939
13519920	2016-04-21	News	Female	35-44	US-WEST	Suburban	\$25,000-\$	Unknown	0.744
13577323	2016-04-21	Reference	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$	Unknown	
13584104	2016-04-21	News	Female	35-44	US-SOUTH	Urban	\$25,000-\$	Unknown	0.847
135940401	2016-04-21	Mobile App	Male	25-34	US-NORT	Urban	\$0-\$24,99	Unknown	0.768
13650448	2016-04-21	Reference	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$	Unknown	
13674626	2016-04-21	Mobile App	Female	18-24	US-MIDW	Urban	\$25,000-\$	Unknown	0.523
13714664	2016-04-21	Mobile App	Female	18-24	US-SOUTH	Suburban	\$25,000-\$	Unknown	1.138
13731612	2016-04-21	News	Male	25-34	US-SOUTH	Suburban	\$50,000-\$	Unknown	1.116
137540074	2016-04-21	News	Male	35-44	US-SOUTH	Urban	\$0-\$24,99	Unknown	0.847
13820629	2016-04-21	Mobile App	Female	25-34	US-SOUTH	Rural	\$50,000-\$	Unknown	1.116
13821967	2016-04-21	News	Female	35-44	US-WEST	Suburban	\$75,000-\$	Unknown	0.744
13888107	2016-04-21	News	Male	45-54	US-WEST	Suburban	\$25,000-\$	Unknown	0.799
139702374	2016-04-21	News	Male	45-54	US-WEST	Suburban	\$25,000-\$	Unknown	0.799
13970813	2016-04-21	News	Male	55-64	US-WEST	Suburban	\$25,000-\$	Unknown	0.855
140507091	2016-04-21	News	Male	55-64	US-SOUTH	Urban	\$50,000-\$	Unknown	1.493
140873121	2016-04-21	News	Female	45-54	US-MIDW	Urban	\$0-\$24,99	Unknown	1.222
14137856	2016-04-21	News	Male	25-34	US-WEST	Urban	\$25,000-\$	Unknown	1.052
14233874	2016-04-21	Mobile App	Female	18-24	US-SOUTH	Suburban	\$0-\$24,99	Unknown	1.138
14254468	2016-04-21	News	Male	18-24	US-WEST	Urban	\$75,000-\$	Unknown	0.939
143143484	2016-04-21	News	Male	35-44	US-MIDW	Suburban	\$50,000-\$	Unknown	0.879
143610711	2016-04-21	News	Male	35-44	US-WEST	Suburban	\$25,000-\$	Unknown	0.744
14401701	2016-04-21	News	Male	65+	US-MIDW	Suburban	\$50,000-\$	Unknown	1.09
144110767	2016-04-21	News	Female	65+	US-MIDW	Urban	\$25,000-\$	Unknown	1.09
14473029	2016-04-21	News	Male	35-44	US-SOUTH	Suburban	\$25,000-\$	Unknown	0.847
14571871	2016-04-21	Mobile App	Male	25-34	US-SOUTH	Rural	\$50,000-\$	Unknown	1.116
145776244	2016-04-21	News	Male	55-64	US-SOUTH	Rural	\$25,000-\$	Unknown	1.493
14596549	2016-04-21	News	Male	55-64	US-WEST	Urban	\$50,000-\$	Unknown	0.855
14633103	2016-04-21	Other	Male	18-24	US-SOUTH	Urban	\$50,000-\$	Unknown	1.138
14647839	2016-04-21	News	Male	25-34	US-SOUTH	Urban	\$25,000-\$	Unknown	1.116
146961724	2016-04-21	News	Male	55-64	US-SOUTH	Suburban	\$50,000-\$	Unknown	1.493
14710392	2016-04-21	News	Male	35-44	US-MIDW	Urban	\$0-\$24,99	Unknown	0.879
147260397	2016-04-21	News	Female	45-54	US-NORT	Rural	\$25,000-\$	Unknown	1.186
147750492	2016-04-21	News	Unknown	Unknown	US-SOUTH	Rural	\$0-\$24,99	Unknown	
14807459	2016-04-21	Other	Female	45-54	US-WEST	Urban	\$25,000-\$	Unknown	0.799
149024712	2016-04-21	News	Female	25-34	US-MIDW	Suburban	\$25,000-\$	Unknown	0.585
149080521	2016-04-21	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$	Unknown	
14964265	2016-04-21	Reference	Unknown	Unknown	US-WEST	Suburban	\$50,000-\$	Unknown	
14976983	2016-04-21	News	Male	65+	US-SOUTH	Suburban	\$25,000-\$	Unknown	1.428
14990282	2016-04-21	News	Female	55-64	US-WEST	Suburban	\$25,000-\$	Unknown	0.855

Will possibly consider synthetic gemstone	imitation	simulation	synthetic	10175ms
Will possibly consider synthetic gemstone	imitation		synthetic	15880ms
Will not consider at all	None of the above		synthetic	10268ms
Will not consider at all	None of the above		None of the above	14762ms
Will not consider at all	None of the above		None of the above	8678ms
Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic	7576ms
Will possibly consider synthetic gemstone			synthetic	270716ms
Will not consider at all	None of the above		None of the above	6039ms
Will not consider at all	None of the above		None of the above	12706ms
Will possibly consider	None of the above	imitation		3343ms
Will definitely consider synthetic gemstone	imitation	simulation	synthetic	9999ms
Will possibly consider laboratory-grown gemstone				None of the above
Will definitely consider	None of the above			13321ms
Will possibly consider synthetic gemstone	imitation			10014ms
Will not consider at all laboratory-grown gemstone	imitation			31298ms
Will not consider at all synthetic gemstone	imitation	simulation	synthetic	37175ms
Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic	15687ms
Will not consider at all	None of the above		synthetic	144654ms
Will not consider at all	None of the above		None of the above	10218ms
Will probably consider synthetic gemstone	imitation	simulation	synthetic	8934ms
Will not consider at all	None of the above		None of the above	22212ms
Will probably consider	None of the above	imitation	simulation	synthetic
Will definitely consider synthetic gemstone	imitation	simulation	synthetic	18526ms
Will not consider at all	None of the above	imitation		20774ms
Will possibly consider synthetic gemstone			synthetic	32182ms
Will not consider at all synthetic gemstone	imitation	simulation	synthetic	10055ms
Will possibly consider	None of the above	imitation	simulation	synthetic
Will definitely consider	None of the above	simulation		5734ms
Will possibly consider laboratory-grown gemstone	imitation	simulation		8771ms
Will definitely consider [manufacturer name]-created gemstone	imitation		synthetic	8594ms
Will probably consider	None of the above			None of the above
Will not consider at all laboratory-grown gemstone				None of the above
Will definitely consider synthetic gemstone	imitation	simulation		36617ms
Will not consider at all	None of the above		None of the above	16667ms
Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic	17847ms
Will probably consider laboratory-grown gemstone	imitation			5110ms
Will not consider at all synthetic gemstone	imitation	simulation	synthetic	6273ms
Will not consider at all	None of the above		None of the above	17690ms
Will not consider at all	None of the above		None of the above	67329ms
Will not consider at all synthetic gemstone			synthetic	18068ms
Will probably consider laboratory-grown gemstone	imitation		synthetic	68757ms
Will possibly consider	None of the above	imitation		35042ms
Will possibly consider [manufacturer name]-created gemstone	imitation	simulation	synthetic	10330ms
Will not consider at all	None of the above		synthetic	13139ms
Will possibly consider [manufacturer name]-created gemstone	imitation	simulation	synthetic	16456ms
Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic	51494ms
Will possibly consider laboratory-grown gemstone	imitation			7232ms
Will definitely consider [manufacturer name]-created gemstone	imitation	simulation	synthetic	9189ms
Will not consider at all	None of the above		synthetic	10438ms
Will not consider at all laboratory-grown gemstone			synthetic	4427ms
Will not consider at all	None of the above		None of the above	6371ms
Will definitely consider [manufacturer name]-created gemstone	created gemstone		synthetic	24086ms
Will possibly consider synthetic gemstone	imitation	simulation	synthetic	28004ms
Will not consider at all	None of the above		None of the above	8353ms
Will not consider at all	None of the above	imitation	simulation	synthetic
Will not consider at all	None of the above	imitation	synthetic	13373ms
Will not consider at all synthetic gemstone	imitation	simulation	synthetic	131549ms
Will not consider at all laboratory-grown gemstone				None of the above
Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic	9713ms
Will not consider at all	None of the above	imitation		8905ms
Will possibly consider	None of the above	imitation	simulation	synthetic
Will not consider at all	None of the above			20858ms

23306ms	13565ms
31783ms	29696ms
21227ms	8928ms
6291ms	6291ms
4667ms	7045ms
10893ms	7976ms
2543ms	1809ms
2575ms	2273ms
8034ms	6552ms
2124ms	5892ms
16208ms	14631ms
2310ms	2067ms
16207ms	15643ms
7500ms	7235ms
7402ms	2745ms
16976ms	14928ms
19517ms	8470ms
17078ms	15539ms
4010ms	2931ms
58741ms	6956ms
7656ms	6072ms
9475ms	7045ms
17413ms	10580ms
20756ms	8207ms
13436ms	2499ms
15408ms	7012ms
18840ms	8201ms
7804ms	3373ms
29219ms	21492ms
20377ms	6402ms
3770ms	1504ms
11667ms	10500ms
12677ms	6705ms
8689ms	7372ms
17526ms	13348ms
3046ms	2498ms
7516ms	8306ms
11903ms	5652ms
3497ms	4267ms
6417ms	3689ms
41091ms	11931ms
7020ms	4732ms
9347ms	6244ms
11328ms	5900ms
18351ms	22043ms
39385ms	12980ms
5955ms	5763ms
25342ms	7925ms
8691ms	24568ms
10072ms	5161ms
3026ms	1942ms
10381ms	3683ms
39102ms	19052ms
2646ms	2623ms
20715ms	14125ms
8730ms	7152ms
23635ms	5824ms
4196ms	2138ms
15753ms	7846ms
8207ms	7172ms
10997ms	13015ms
33693ms	11855ms

15102140	2016-04-2	News	Male	65+	US-NORT	Urban	\$50,000-\$7	Unknown	1.141
15233419	2016-04-2	Mobile App	Male	18-24	US-MIDW	Suburban	\$100,000-\$	Unknown	0.523
15238402	2016-04-2	News	Male	Unknown	US-WEST	Urban	\$25,000-\$	Unknown	
152813387	2016-04-2	News	Male	65+	US-SOUT	Suburban	\$50,000-\$7	Unknown	1.428
15310620	2016-04-2	Reference	Female	Unknown	US-WEST	Urban	\$25,000-\$	Unknown	
153257327	2016-04-2	News	Male	55-64	US-NORT	Urban	\$0-\$24,99	Unknown	1.016
15370286	2016-04-2	Other	Unknown	Unknown	US-SOUT	Rural	\$25,000-\$	Unknown	
15373075	2016-04-2	News	Male	45-54	US-MIDW	Suburban	\$25,000-\$	Unknown	1.222
153828147	2016-04-2	Other	Unknown	Unknown	US-SOUT	Rural	\$25,000-\$	Unknown	
15393465	2016-04-2	Other	Male	35-44	US-SOUT	Suburban	\$25,000-\$	Unknown	0.847
15465877	2016-04-2	News	Female	35-44	US-WEST	Suburban	\$25,000-\$	Unknown	0.744
15509739	2016-04-2	Other	Unknown	Unknown	US-MIDW	Suburban	\$25,000-\$	Unknown	
155302554	2016-04-2	Mobile App	Male	25-34	US-WEST	Suburban	\$75,000-\$	Unknown	1.052
15545601	2016-04-2	Other	Male	Unknown	US-SOUT	Rural	\$25,000-\$	Unknown	
15609251	2016-04-2	News	Male	45-54	US-WEST	Suburban	\$50,000-\$7	Unknown	0.799
15645544	2016-04-2	Mobile App	Female	18-24	US-SOUT	Urban	\$0-\$24,99	Unknown	1.138
15683920	2016-04-2	Other	Male	45-54	US-WEST	Suburban	\$25,000-\$	Unknown	0.799
15695086	2016-04-2	News	Male	55-64	US-MIDW	Rural	\$25,000-\$	Unknown	0.717
15695556	2016-04-2	News	Female	25-34	US-SOUT	Rural	\$25,000-\$	Unknown	1.116
157690707	2016-04-2	Arts & Ent	Unknown	Unknown	US-WEST	Suburban	\$75,000-\$	Unknown	
15778522	2016-04-2	News	Female	18-24	US-WEST	Urban	\$25,000-\$	Unknown	0.939
15784409	2016-04-2	News	Male	55-64	US-NORT	Urban	\$50,000-\$7	Unknown	1.016
158445851	2016-04-2	Mobile App	Female	25-34	US-MIDW	Rural	\$25,000-\$	Unknown	0.585
15893844	2016-04-2	Mobile App	Male	25-34	US-MIDW	Suburban	\$50,000-\$7	Unknown	0.585
159152854	2016-04-2	Mobile App	Male	18-24	US-MIDW	Rural	\$75,000-\$	Unknown	0.523
16004963	2016-04-2	Mobile App	Female	18-24	US-MIDW	Suburban	I prefer not	Unknown	0.523
16007967	2016-04-2	News	Unknown	Unknown	US-MIDW	Suburban	\$25,000-\$	Unknown	
16039623	2016-04-2	News	Female	25-34	US-NORT	Urban	\$75,000-\$	Unknown	0.768
16040857	2016-04-2	Other	Male	25-34	US-WEST	Suburban	\$25,000-\$	Unknown	1.052
16046980	2016-04-2	News	Male	45-54	US-NORT	Urban	\$75,000-\$	Unknown	1.186
160714007	2016-04-2	News	Male	18-24	US-WEST	Urban	\$25,000-\$	Unknown	0.939
16080792	2016-04-2	News	Female	55-64	US-WEST	Suburban	\$25,000-\$	Unknown	0.855
16092257	2016-04-2	News	Male	25-34	US-SOUT	Suburban	\$25,000-\$	Unknown	1.116
16122253	2016-04-2	News	Unknown	Unknown	US-SOUT	Urban	\$50,000-\$7	Unknown	
161375277	2016-04-2	Other	Male	18-24	US-NORT	Urban	\$0-\$24,99	Unknown	1.094
16156426	2016-04-2	News	Female	35-44	US-SOUT	Suburban	\$25,000-\$	Unknown	0.847
162527064	2016-04-2	News	Unknown	Unknown	US-SOUT	Rural	\$25,000-\$	Unknown	
16301993	2016-04-2	News	Male	65+	US-SOUT	Urban	\$50,000-\$7	Unknown	1.428
16314882	2016-04-2	Mobile App	Female	35-44	US-MIDW	Urban	\$25,000-\$	Unknown	0.879
16325160	2016-04-2	News	Female	25-34	US-SOUT	Suburban	\$25,000-\$	Unknown	1.116
16355113	2016-04-2	Mobile App	Female	35-44	US-MIDW	Rural	\$0-\$24,99	Unknown	0.879
16394397	2016-04-2	Other	Male	55-64	US-NORT	Rural	\$25,000-\$	Unknown	1.016
16421107	2016-04-2	News	Female	45-54	US-NORT	Rural	\$25,000-\$	Unknown	1.186
164578187	2016-04-2	News	Male	45-54	US-WEST	Rural	\$50,000-\$7	Unknown	0.799
164829174	2016-04-2	News	Male	18-24	US-NORT	Suburban	\$50,000-\$7	Unknown	1.094
16487089	2016-04-2	News	Female	25-34	US-SOUT	Urban	\$25,000-\$	Unknown	1.116
16488815	2016-04-2	Mobile App	Female	35-44	US-WEST	Suburban	\$25,000-\$	Unknown	0.744
16569972	2016-04-2	News	Male	25-34	US-MIDW	Suburban	\$100,000-\$	Unknown	0.585
16584091	2016-04-2	News	Male	45-54	US-WEST	Urban	\$25,000-\$	Unknown	0.799
16621501	2016-04-2	News	Male	55-64	US-WEST	Urban	\$50,000-\$7	Unknown	0.855
16631826	2016-04-2	News	Male	65+	US-NORT	Suburban	\$25,000-\$	Unknown	1.141
16685359	2016-04-2	News	Female	18-24	US-SOUT	Suburban	\$25,000-\$	Unknown	1.138
166960844	2016-04-2	Other	Female	Unknown	US-WEST	Suburban	\$75,000-\$	Unknown	
16770176	2016-04-2	Mobile App	Female	25-34	US-NORT	Suburban	\$25,000-\$	Unknown	0.768
167742181	2016-04-2	Other	Male	25-34	US-SOUT	Urban	\$25,000-\$	Unknown	1.116
16815571	2016-04-2	News	Female	55-64	US-SOUT	Urban	\$50,000-\$7	Unknown	1.493
168372994	2016-04-2	News	Female	25-34	US-NORT	Suburban	\$50,000-\$7	Unknown	0.768
16906723	2016-04-2	Mobile App	Male	35-44	US-SOUT	Urban	\$50,000-\$7	Unknown	0.847
16930267	2016-04-2	Mobile App	Male	18-24	US-MIDW	Suburban	\$100,000-\$	Unknown	0.523
169883727	2016-04-2	News	Male	45-54	US-WEST	Urban	\$25,000-\$	Unknown	0.799
17002027	2016-04-2	News	Unknown	Unknown	US-MIDW	Urban	\$25,000-\$	Unknown	
170189641	2016-04-2	News	Male	18-24	US-MIDW	Urban	\$25,000-\$	Unknown	0.523

Will possibly consider synthetic gemstone	imitation		synthetic	46069ms
Will possibly consider synthetic gemstone laboratory- [manufacturer name]-created gemstone	imitation	simulation	synthetic	13870ms
Will not consider at all	None of the above			None of the above
Will not consider at all synthetic gemstone laboratory- [manufacturer name]-created gemstone	imitation	simulation	synthetic	15948ms
Will not consider at all	None of the above			None of the above
Will not consider at all synthetic gemstone laboratory- [manufacturer name]-created gemstone	imitation			12871ms
Will not consider at all synthetic gemstone laboratory- [manufacturer name]-created gemstone	imitation	simulation	synthetic	12265ms
Will not consider at all	None of the above			None of the above
Will not consider at all synthetic gemstone				None of the above
Will not consider at all	None of the above	imitation	simulation	synthetic
Will possibly consider	None of the above	imitation	simulation	synthetic
Will not consider at all synthetic gemstone			synthetic	6137ms
Will possibly consider synthetic gemstone laboratory- [manufacturer name]-created gemstone		simulation	synthetic	27312ms
Will possibly consider [manufacturer name]-created gemstone			synthetic	8822ms
Will definitely consider synthetic gemstone	imitation	simulation	synthetic	8245ms
Will possibly consider synthetic gemstone	imitation	simulation	synthetic	32245ms
Will not consider at all	None of the above	imitation	simulation	synthetic
Will not consider at all	None of the above			None of the above
Will not consider at all synthetic gemstone laboratory- [manufacturer name]-created gemstone	imitation	simulation	synthetic	14517ms
Will not consider at all	None of the above			None of the above
Will not consider at all	None of the above			None of the above
Will not consider at all synthetic gemstone			synthetic	4655ms
Will probably consider synthetic gemstone	imitation	simulation	synthetic	7794ms
Will probably consider synthetic gemstone laboratory-grown gemstone	imitation			12315ms
Will not consider at all synthetic gemstone				None of the above
Will possibly consider synthetic gemstone laboratory-grown gemstone	imitation	simulation	synthetic	19954ms
Will not consider at all	None of the above			None of the above
Will probably consider synthetic gemstone	imitation	simulation	synthetic	50749ms
Will definitely consider	None of the above			None of the above
Will definitely consider synthetic gemstone laboratory-grown gemstone	imitation	simulation	synthetic	13024ms
Will probably consider	None of the above		synthetic	12508ms
Will not consider at all synthetic gemstone	imitation	simulation	synthetic	17175ms
Will not consider at all	None of the above			None of the above
Will not consider at all synthetic gemstone laboratory-grown gemstone				None of the above
Will definitely consider	None of the above	imitation	simulation	synthetic
Will not consider at all synthetic gemstone laboratory- [manufacturer name]-created gemstone	imitation			15886ms
Will not consider at all	None of the above			None of the above
Will not consider at all	None of the above			None of the above
Will possibly consider synthetic gemstone	imitation	simulation		6531ms
Will not consider at all synthetic gemstone	imitation	simulation	synthetic	7201ms
Will possibly consider [manufacturer name]-created gemstone	imitation	simulation	synthetic	28068ms
Will possibly consider synthetic gemstone	imitation	simulation	synthetic	17315ms
Will not consider at all	None of the above			None of the above
Will not consider at all synthetic gemstone	imitation			16663ms
Will not consider at all synthetic gemstone laboratory-grown gemstone	imitation	simulation		7985ms
Will not consider at all synthetic gemstone laboratory-grown gemstone	imitation	simulation	synthetic	11049ms
Will probably consider synthetic gemstone laboratory- [manufacturer name]-created gemstone	imitation	simulation	synthetic	13654ms
Will possibly consider synthetic gemstone laboratory-grown gemstone			synthetic	8651ms
Will not consider at all synthetic gemstone				None of the above
Will not consider at all	None of the above			None of the above
Will not consider at all	None of the above			None of the above
Will possibly consider synthetic gemstone	imitation	simulation		14674ms
Will not consider at all synthetic gemstone	imitation	simulation	synthetic	19985ms
Will probably consider [manufacturer name]-created gemstone	imitation	simulation		12491ms
Will not consider at all	None of the above			None of the above
Will possibly consider synthetic gemstone				None of the above
Will probably consider synthetic gemstone laboratory-grown gemstone				None of the above
Will definitely consider synthetic gemstone	imitation	simulation	synthetic	9269ms
Will not consider at all synthetic gemstone [manufacturer name]-created gemstone			synthetic	3946ms
Will not consider at all	None of the above			None of the above
Will not consider at all synthetic gemstone	imitation	simulation	synthetic	26720ms
Will not consider at all	None of the above		synthetic	3479ms

53340ms	34537ms
25744ms	10524ms
27902ms	5981ms
37060ms	11861ms
4380ms	2982ms
23270ms	10346ms
16745ms	7214ms
13100ms	5698ms
11766ms	8725ms
27211ms	13325ms
13779ms	8630ms
14342ms	5527ms
24444ms	7715ms
3520ms	1660ms
11889ms	13903ms
12160ms	9388ms
3352ms	10275ms
7675ms	6116ms
15271ms	7318ms
2897ms	2348ms
7377ms	3014ms
8603ms	6829ms
15000ms	8337ms
12650ms	28362ms
2179ms	1910ms
25087ms	12463ms
10638ms	3207ms
6979ms	16542ms
11569ms	5964ms
6349ms	9011ms
15113ms	8693ms
21906ms	10931ms
3085ms	1545ms
5967ms	7692ms
18450ms	9027ms
17203ms	16636ms
9725ms	6635ms
7375ms	3176ms
24461ms	10817ms
26341ms	12063ms
41770ms	9027ms
21661ms	17611ms
7804ms	3852ms
14000ms	8197ms
18971ms	21509ms
11169ms	6256ms
9232ms	8801ms
2829ms	1439ms
16106ms	19934ms
13188ms	3774ms
13649ms	9284ms
9024ms	8902ms
11106ms	8628ms
24913ms	6514ms
8536ms	4096ms
2912ms	1869ms
2553ms	1514ms
11428ms	6919ms
10723ms	2519ms
6051ms	2120ms
13861ms	9916ms
3425ms	1172ms

170199280	2016-04-20	News	Unknown	Unknown	US-WEST- Suburban	\$25,000-\$40,000	Unknown	
170917449	2016-04-20	News	Male	45-54	US-WEST- Suburban	\$25,000-\$40,000	Unknown	0.799
170939102	2016-04-20	News	Male	65+	US-NORT- Urban	\$50,000-\$75,000	Unknown	1.141
173233513	2016-04-20	Other	Male	55-64	US-NORT- Urban	\$75,000-\$99,999	Unknown	1.016
173544546	2016-04-20	Reference	Female	Unknown	US-MIDW- Urban	\$100,000-\$149,999	Unknown	
174122526	2016-04-20	News	Unknown	Unknown	US-WEST- Suburban	\$0-\$24,999	Unknown	
174464270	2016-04-20	News	Female	25-34	US-SOUTH- Urban	\$25,000-\$40,000	Unknown	1.116
174969914	2016-04-20	News	Male	65+	US-NORT- Urban	\$25,000-\$40,000	Unknown	1.141
175116874	2016-04-20	Other	Female	45-54	US-NORT- Suburban	\$75,000-\$99,999	Unknown	1.186
175174258	2016-04-20	Mobile App	Male	25-34	US-WEST- Suburban	\$25,000-\$40,000	Unknown	1.052
175471219	2016-04-20	Mobile App	Female	35-44	US-MIDW- Rural	\$0-\$24,999	Unknown	0.879
176479602	2016-04-20	Mobile App	Female	35-44	US-SOUTH- Rural	\$0-\$24,999	Unknown	0.847
176625234	2016-04-20	News	Male	65+	US-NORT- Suburban	\$25,000-\$40,000	Unknown	1.141
177157547	2016-04-20	News	Male	35-44	US-SOUTH- Suburban	\$25,000-\$40,000	Unknown	0.847
177306721	2016-04-20	Mobile App	Female	55-64	US-WEST- Urban	\$75,000-\$99,999	Unknown	0.855
177700592	2016-04-20	Mobile App	Female	18-24	US-WEST- Suburban	\$25,000-\$40,000	Unknown	0.939
177943238	2016-04-20	News	Unknown	Unknown	US-MIDW- Rural	\$25,000-\$40,000	Unknown	
178084382	2016-04-20	Mobile App	Female	25-34	US-SOUTH- Rural	\$50,000-\$75,000	Unknown	1.116
178241641	2016-04-20	News	Unknown	Unknown	US-MIDW- Suburban	\$25,000-\$40,000	Unknown	
178593924	2016-04-20	News	Male	45-54	US-WEST- Suburban	\$25,000-\$40,000	Unknown	0.799
180201948	2016-04-20	News	Female	25-34	US-WEST- Urban	\$25,000-\$40,000	Unknown	1.052
180308816	2016-04-20	News	Male	45-54	US-NORT- Suburban	\$25,000-\$40,000	Unknown	1.186
180347165	2016-04-20	News	Male	65+	US-MIDW- Unknown	\$50,000-\$75,000	Unknown	1.09
180439353	2016-04-20	Mobile App	Female	35-44	US-MIDW- Urban	\$50,000-\$75,000	Unknown	0.879
181044246	2016-04-20	News	Male	65+	US-SOUTH- Urban	\$25,000-\$40,000	Unknown	1.428
181121567	2016-04-20	Mobile App	Female	45-54	US-MIDW- Suburban	\$25,000-\$40,000	Unknown	1.222
181301991	2016-04-20	Arts & Ent	Male	55-64	US-MIDW- Suburban	\$50,000-\$75,000	Unknown	0.717
181560726	2016-04-20	Mobile App	Male	25-34	US-SOUTH- Suburban	\$50,000-\$75,000	Unknown	1.116
182099795	2016-04-20	News	Female	55-64	US-SOUTH- Rural	\$25,000-\$40,000	Unknown	1.493
182305320	2016-04-20	News	Female	18-24	US-MIDW- Suburban	\$25,000-\$40,000	Unknown	0.523
182504916	2016-04-20	News	Female	65+	US-SOUTH- Urban	\$25,000-\$40,000	Unknown	1.428
182527817	2016-04-20	News	Male	35-44	US-WEST- Suburban	\$25,000-\$40,000	Unknown	0.744
183508100	2016-04-20	Arts & Ent	Female	55-64	US-NORT- Rural	\$75,000-\$99,999	Unknown	1.016
183546086	2016-04-20	Other	Male	35-44	US-NORT- Urban	\$75,000-\$99,999	Unknown	2.023
183672501	2016-04-20	Mobile App	Female	35-44	US-SOUTH- Suburban	\$50,000-\$75,000	Unknown	0.847
184656044	2016-04-20	Reference	Unknown	Unknown	US-SOUTH- Urban	\$25,000-\$40,000	Unknown	
184934829	2016-04-20	Other	Male	45-54	US-WEST- Urban	\$25,000-\$40,000	Unknown	0.799
186069385	2016-04-20	Mobile App	Female	18-24	US-MIDW- Urban	\$0-\$24,999	Unknown	0.523
186349580	2016-04-20	Reference	Female	18-24	US-NORT- Urban	\$75,000-\$99,999	Unknown	1.094
187186335	2016-04-20	Arts & Ent	Male	65+	US-MIDW- Rural	\$50,000-\$75,000	Unknown	1.09
187562183	2016-04-20	News	Female	35-44	US-MIDW- Suburban	\$50,000-\$75,000	Unknown	0.879
187876687	2016-04-20	News	Male	65+	US-NORT- Rural	\$50,000-\$75,000	Unknown	1.141
187905356	2016-04-20	News	Unknown	Unknown	US-SOUTH- Suburban	\$25,000-\$40,000	Unknown	
188350522	2016-04-20	News	Female	65+	US-MIDW- Suburban	\$25,000-\$40,000	Unknown	1.09
188717395	2016-04-20	Other	Unknown	Unknown	US-WEST- Suburban	\$0-\$24,999	Unknown	
188783778	2016-04-20	News	Female	65+	US-WEST- Suburban	\$50,000-\$75,000	Unknown	2.023
18894940	2016-04-20	Mobile App	Female	35-44	US-SOUTH- Rural	\$100,000-\$149,999	Unknown	0.847
189170805	2016-04-20	News	Unknown	Unknown	US-SOUTH- Urban	\$50,000-\$75,000	Unknown	
189277487	2016-04-20	News	Female	45-54	US-MIDW- Suburban	\$25,000-\$40,000	Unknown	1.222
190000837	2016-04-20	News	Female	35-44	US-WEST- Rural	\$25,000-\$40,000	Unknown	0.744
190433993	2016-04-20	News	Female	25-34	US-NORT- Suburban	\$25,000-\$40,000	Unknown	0.768
190695088	2016-04-20	News	Female	55-64	US-MIDW- Suburban	\$50,000-\$75,000	Unknown	0.717
190843131	2016-04-20	Mobile App	Female	Unknown	US-NORT- Urban	\$75,000-\$99,999	Unknown	
191032152	2016-04-20	Mobile App	Male	25-34	US-MIDW- Suburban	\$25,000-\$40,000	Unknown	0.585
191686840	2016-04-20	News	Male	45-54	US-MIDW- Suburban	\$25,000-\$40,000	Unknown	1.222
192416566	2016-04-20	Mobile App	Female	25-34	US-WEST- Suburban	\$75,000-\$99,999	Unknown	1.052
192460774	2016-04-20	News	Unknown	Unknown	US-MIDW- Urban	\$0-\$24,999	Unknown	
192559477	2016-04-20	Mobile App	Male	25-34	US-MIDW- Suburban	\$75,000-\$99,999	Unknown	0.585
192674208	2016-04-20	News	Female	45-54	US-SOUTH- Suburban	\$50,000-\$75,000	Unknown	1.962
192913753	2016-04-20	News	Unknown	Unknown	US-SOUTH- Suburban	\$25,000-\$40,000	Unknown	
193035340	2016-04-20	News	Female	35-44	US-SOUTH- Suburban	\$75,000-\$99,999	Unknown	0.847
193925790	2016-04-20	News	Female	35-44	US-WEST- Urban	\$25,000-\$40,000	Unknown	0.744

Will not consider at all	None of the above		None of the	17288ms	
Will probat synthetic gemstone		simulation		14420ms	
Will possibly consider laboratory-grown gemstone	imitation			10899ms	
Will not consider at all	None of the	imitation		7313ms	
Will not consider at all	None of the above		None of the	14401ms	
Will not coi synthetic gemstone	[manufacturer name]-	imitation	simulation	synthetic	5061ms
Will probably consider laboratory-grown gemstone			simulation		8932ms
Will not consider at all	None of the above		None of the	17737ms	
Will probably consider laboratory-grown gemstone	imitation	simulation	synthetic	6761ms	
Will probat synthetic gemstone	imitation			445561ms	
Will possib synthetic g laboratory-	[manufacturer name]-	imitation		synthetic	7504ms
Will probably consider	None of the above		None of the	13529ms	
Will not consider at all	None of the above		None of the	21715ms	
Will not coi synthetic gemstone	imitation	simulation	synthetic	5793ms	
Will definit synthetic g laboratory-	[manufacturer name]-	imitation	simulation	synthetic	10720ms
Will probat synthetic gemstone	[manufacturer name]-	imitation		synthetic	14836ms
Will probably consider	None of the above		None of the	12290ms	
Will probably consider laboratory-grown gemstone	imitation	simulation	synthetic	7077ms	
Will probably consider laboratory-grown gemstone	imitation	simulation	synthetic	18519ms	
Will not consider at all	None of the	imitation	simulation	synthetic	8127ms
Will definitely consider laboratory-grown gemstone		simulation		2533ms	
Will not consider at all	None of the above		None of the	22915ms	
Will not consider at all	None of the	imitation	simulation	synthetic	12819ms
Will not coi synthetic gemstone			None of the	7427ms	
Will possib synthetic gemstone			synthetic	28465ms	
Will possib synthetic g laboratory-	[manufacturer name]-	created gen	simulation		8383ms
Will not coi synthetic g laboratory-	[manufacturer name]-	imitation		synthetic	7904ms
Will probat synthetic g laboratory-	[manufacturer name]-	imitation	simulation	synthetic	24282ms
Will not coi synthetic gemstone	imitation			46703ms	
Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic	11619ms	
Will not consider at all	None of the above		synthetic	34634ms	
Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic	23259ms	
Will possibly consider	None of the	imitation	simulation	synthetic	8589ms
Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic	4605ms	
Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic	12217ms	
Will not consider at all	[manufacturer name]-	imitation		1787ms	
Will probat synthetic gemstone	imitation			13882ms	
Will definit synthetic g laboratory-	[manufacturer name]-	imitation	simulation		10452ms
Will not consider at all	None of the	imitation		3158ms	
Will possibly consider	None of the above		None of the	10524ms	
Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic	12908ms	
Will not consider at all	None of the above		None of the	9626ms	
Will possibly consider	[manufacturer name]-	imitation		3546ms	
Will probably consider	None of the	imitation	simulation	synthetic	8801ms
Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic	8869ms	
Will not consider at all	None of the	imitation	simulation	synthetic	33151ms
Will probably consider	[manufacturer name]-	imitation	simulation	synthetic	17297ms
Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic	16613ms	
Will not consider at all laboratory-grown gemstone	imitation			10728ms	
Will possibly consider laboratory-grown gemstone		simulation		297773ms	
Will not consider at all	None of the	imitation	simulation	synthetic	11511ms
Will not consider at all	None of the	imitation		7823ms	
Will possibly consider	None of the	imitation		9419ms	
Will possib synthetic gemstone	imitation		synthetic	18538ms	
Will not consider at all	None of the above		None of the	16596ms	
Will probably consider	None of the above		synthetic	44742ms	
Will not coi synthetic gemstone		simulation		897462ms	
Will definitely consider laboratory-grown gemstone	imitation	simulation		6965ms	
Will probat synthetic gemstone	imitation			12689ms	
Will possib synthetic gemstone	imitation			9271ms	
Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic	7010ms	
Will possibly consider laboratory-grown gemstone		simulation		10170ms	

3218ms	2276ms
5788ms	2420ms
8947ms	12014ms
4004ms	3142ms
7032ms	2192ms
26382ms	16493ms
17375ms	7976ms
3966ms	2704ms
34743ms	9958ms
15148ms	11664ms
7168ms	12670ms
8961ms	6280ms
6472ms	6054ms
12240ms	15163ms
43340ms	10314ms
30615ms	9639ms
9845ms	5214ms
13003ms	20047ms
47100ms	7210ms
10783ms	12169ms
5154ms	1750ms
12980ms	7998ms
11942ms	16195ms
6982ms	4704ms
17605ms	9062ms
22173ms	11228ms
14746ms	9949ms
37774ms	11480ms
30489ms	11057ms
21336ms	12366ms
14693ms	13713ms
16269ms	9833ms
19094ms	9344ms
9783ms	7865ms
18249ms	5859ms
3569ms	1667ms
14252ms	16598ms
21435ms	37879ms
3629ms	1924ms
8293ms	3411ms
14325ms	15408ms
9355ms	3825ms
2908ms	2670ms
6604ms	10441ms
27494ms	9733ms
37809ms	9708ms
34500ms	16780ms
17641ms	9046ms
24564ms	13369ms
9369ms	4020ms
3686ms	6009ms
15892ms	6286ms
3701ms	1239ms
339810ms	6827ms
7692ms	2545ms
31552ms	55839ms
10951ms	3821ms
21080ms	7698ms
4268ms	3764ms
14355ms	21316ms
11245ms	8204ms
4764ms	2339ms

19446374	2016-04-21	Mobile App	Female	18-24	US-SOUTH	Suburban	\$50,000-\$75	Unknown	1.138
19519563	2016-04-21	Mobile App	Male	25-34	US-NORTH	Suburban	I prefer not	Unknown	0.768
19530066	2016-04-21	News	Male	45-54	US-MIDWEST	Rural	\$25,000-\$40	Unknown	1.222
19563648	2016-04-21	News	Female	65+	US-WEST	Suburban	\$25,000-\$40	Unknown	2.023
19633764	2016-04-21	Arts & Ent	Female	65+	US-NORTH	Urban	\$25,000-\$40	Unknown	1.141
19655961	2016-04-21	Other	Female	55-64	US-MIDWEST	Suburban	\$25,000-\$40	Unknown	0.717
19774553	2016-04-21	Arts & Ent	Unknown	Unknown	US-SOUTH	Suburban	\$25,000-\$40	Unknown	
19775126	2016-04-21	News	Male	65+	US-SOUTH	Suburban	\$25,000-\$40	Unknown	1.428
20007435	2016-04-21	Arts & Ent	Female	65+	US-SOUTH	Suburban	\$50,000-\$75	Unknown	1.428
20033349	2016-04-21	News	Male	45-54	US-WEST	Suburban	\$25,000-\$40	Unknown	0.799
20078912	2016-04-21	Mobile App	Female	35-44	US-MIDWEST	Suburban	\$25,000-\$40	Unknown	0.879
20171295	2016-04-21	News	Male	25-34	US-SOUTH	Urban	\$25,000-\$40	Unknown	1.116
20180198	2016-04-21	News	Unknown	Unknown	US-MIDWEST	Rural	\$25,000-\$40	Unknown	
20182198	2016-04-21	News	Female	25-34	US-NORTH	Rural	\$25,000-\$40	Unknown	0.768
20248922	2016-04-21	News	Male	25-34	US-NORTH	Urban	\$25,000-\$40	Unknown	0.768
20285533	2016-04-21	News	Male	25-34	US-SOUTH	Rural	\$0-\$24,999	Unknown	1.116
20305022	2016-04-21	Other	Female	55-64	US-MIDWEST	Urban	\$25,000-\$40	Unknown	0.717
20338724	2016-04-21	Other	Male	18-24	US-WEST	Suburban	\$50,000-\$75	Unknown	0.939
20381742	2016-04-21	News	Male	35-44	US-SOUTH	Suburban	\$25,000-\$40	Unknown	0.847
20451202	2016-04-21	News	Female	45-54	US-WEST	Suburban	\$25,000-\$40	Unknown	0.799
20471122	2016-04-21	Mobile App	Male	18-24	US-SOUTH	Urban	\$25,000-\$40	Unknown	1.138
20508354	2016-04-21	News	Male	65+	US-SOUTH	Suburban	\$75,000-\$90	Unknown	1.428
20595322	2016-04-21	News	Male	25-34	US-NORTH	Urban	\$0-\$24,999	Unknown	0.768
20850507	2016-04-21	News	Unknown	Unknown	US-WEST	Rural	\$25,000-\$40	Unknown	
20870613	2016-04-21	Other	Male	35-44	US-WEST	Urban	\$25,000-\$40	Unknown	0.744
20895768	2016-04-21	News	Male	45-54	US-WEST	Suburban	\$50,000-\$75	Unknown	0.799
20925517	2016-04-21	News	Unknown	Unknown	US-MIDWEST	Rural	\$25,000-\$40	Unknown	
20968910	2016-04-21	Mobile App	Male	35-44	US-SOUTH	Suburban	\$50,000-\$75	Unknown	0.847
21012090	2016-04-21	Arts & Ent	Unknown	Unknown	US-NORTH	Urban	\$25,000-\$40	Unknown	
21211588	2016-04-21	News	Male	25-34	US-SOUTH	Suburban	\$25,000-\$40	Unknown	1.116
21270425	2016-04-21	News	Male	18-24	US-SOUTH	Urban	\$0-\$24,999	Unknown	1.138
21304787	2016-04-21	News	Male	25-34	US-MIDWEST	Suburban	\$50,000-\$75	Unknown	0.585
21375858	2016-04-21	Arts & Ent	Male	65+	US-MIDWEST	Suburban	\$25,000-\$40	Unknown	1.09
21398058	2016-04-21	Mobile App	Female	18-24	US-MIDWEST	Urban	\$0-\$24,999	Unknown	0.523
21438359	2016-04-21	News	Female	55-64	US-MIDWEST	Suburban	\$25,000-\$40	Unknown	0.717
21517002	2016-04-21	News	Female	55-64	US-MIDWEST	Urban	\$25,000-\$40	Unknown	0.717
21648950	2016-04-21	Arts & Ent	Female	25-34	US-SOUTH	Suburban	\$50,000-\$75	Unknown	1.116
22125430	2016-04-21	Mobile App	Female	55-64	US-SOUTH	Suburban	\$0-\$24,999	Unknown	1.493
22354842	2016-04-21	Reference	Male	Unknown	US-WEST	Urban	\$25,000-\$40	Unknown	
22510472	2016-04-21	News	Female	25-34	US-MIDWEST	Suburban	\$25,000-\$40	Unknown	0.585
23014072	2016-04-21	News	Male	45-54	US-NORTH	Suburban	\$25,000-\$40	Unknown	1.186
23394421	2016-04-21	News	Female	35-44	US-WEST	Suburban	\$25,000-\$40	Unknown	0.744
24115247	2016-04-21	News	Female	25-34	US-WEST	Suburban	\$25,000-\$40	Unknown	1.052
25591803	2016-04-21	News	Male	25-34	US-MIDWEST	Urban	\$25,000-\$40	Unknown	0.585
26752063	2016-04-21	Reference	Male	55-64	US-WEST	Suburban	\$25,000-\$40	Unknown	0.855
26791596	2016-04-21	Mobile App	Female	45-54	US-SOUTH	Urban	\$25,000-\$40	Unknown	1.962
27749748	2016-04-21	News	Male	55-64	US-MIDWEST	Unknown	\$50,000-\$75	Unknown	0.717
28207452	2016-04-21	Mobile App	Female	18-24	US-WEST	Suburban	\$0-\$24,999	Unknown	0.939
28520686	2016-04-21	Other	Female	35-44	US-SOUTH	Rural	\$25,000-\$40	Unknown	0.847
28960127	2016-04-21	News	Male	18-24	US-WEST	Suburban	\$25,000-\$40	Unknown	0.939
29310888	2016-04-21	Arts & Ent	Male	18-24	US-WEST	Urban	\$25,000-\$40	Unknown	0.939
29476926	2016-04-21	News	Female	55-64	US-MIDWEST	Suburban	\$100,000-\$150	Unknown	0.717
29553808	2016-04-21	News	Male	55-64	US-SOUTH	Suburban	\$25,000-\$40	Unknown	1.493
29637486	2016-04-21	Mobile App	Male	18-24	US-SOUTH	Rural	\$25,000-\$40	Unknown	1.138
29681657	2016-04-21	Arts & Ent	Female	65+	US-SOUTH	Suburban	\$75,000-\$90	Unknown	1.428
29977825	2016-04-21	News	Male	35-44	US-WEST	Urban	\$25,000-\$40	Unknown	0.744
30151675	2016-04-21	Mobile App	Female	18-24	US-MIDWEST	Rural	\$25,000-\$40	Unknown	0.523
30527219	2016-04-21	Mobile App	Female	25-34	US-SOUTH	Suburban	\$75,000-\$90	Unknown	1.116
30554998	2016-04-21	News	Female	25-34	US-WEST	Suburban	\$25,000-\$40	Unknown	1.052
30964665	2016-04-21	Mobile App	Female	25-34	US-MIDWEST	Rural	\$50,000-\$75	Unknown	0.585
31455541	2016-04-21	Mobile App	Female	18-24	US-SOUTH	Suburban	\$0-\$24,999	Unknown	1.138
31651178	2016-04-21	News	Unknown	Unknown	US-MIDWEST	Suburban	\$25,000-\$40	Unknown	

Will possibly consider synthetic gemstone	imitation	simulation	synthetic	9424ms
Will possibly consider synthetic g laboratory-grown gemstone			synthetic	9307ms
Will possibly consider [manufacturer name]-created gemstone			synthetic	31316ms
Will probably consider None of the above			None of the	33788ms
Will not consider synthetic gemstone	imitation		synthetic	4728ms
Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic	34214ms
Will definitely consider None of the	imitation	simulation	synthetic	18234ms
Will not consider synthetic gemstone	imitation	simulation	synthetic	19270ms
Will probably consider laboratory-grown gemstone	imitation	simulation	synthetic	9089ms
Will not consider synthetic gemstone			synthetic	9391ms
Will definitely consider synthetic gemstone	imitation	simulation	synthetic	13585ms
Will probably consider synthetic gemstone	imitation			4935ms
Will not consider synthetic gemstone			synthetic	5466ms
Will definitely consider synthetic g laboratory- [manufacturer name]-	imitation	simulation	synthetic	8417ms
Will not consider at all [manufacturer name]-	imitation			15772ms
Will probably consider synthetic gemstone	imitation		synthetic	8451ms
Will not consider at all None of the above			None of the	10380ms
Will definitely consider synthetic gemstone			synthetic	3465ms
Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic	12085ms
Will possibly consider None of the	imitation	simulation	synthetic	9574ms
Will possibly consider synthetic gemstone	imitation	simulation	synthetic	6382ms
Will definitely consider synthetic gemstone	imitation	simulation	synthetic	10285ms
Will not consider synthetic gemstone		simulation		7545ms
Will definitely consider None of the above			None of the	6028ms
Will not consider synthetic gemstone	imitation		synthetic	41434ms
Will definitely consider None of the above			synthetic	12817ms
Will probably consider None of the	imitation	simulation	synthetic	20280ms
Will probably consider synthetic gemstone	imitation	simulation	synthetic	6660ms
Will not consider at all [manufacturer name]-created gemstone			synthetic	305281ms
Will possibly consider None of the above			None of the	5114ms
Will not consider at all None of the above			None of the	3215ms
Will definitely consider None of the above			None of the	2076ms
Will not consider synthetic gemstone			synthetic	14779ms
Will possibly consider synthetic g laboratory- [manufacturer name]-	imitation		synthetic	8248ms
Will not consider synthetic gemstone	imitation	simulation	synthetic	32945ms
Will not consider at all None of the above			None of the	7229ms
Will not consider at all laboratory-grown gemstone	imitation		synthetic	8675ms
Will probably consider None of the	imitation		synthetic	14547ms
Will probably consider [manufacturer name]-	imitation			4967ms
Will definitely consider synthetic g laboratory- [manufacturer name]-created gemstone			synthetic	26580ms
Will not consider synthetic gemstone	imitation		synthetic	12441ms
Will not consider at all None of the above			None of the	6981ms
Will possibly consider [manufacturer name]-	imitation	simulation		5175ms
Will not consider at all None of the above			synthetic	35805ms
Will possibly consider None of the	imitation			9806ms
Will probably consider synthetic gemstone	imitation		synthetic	7083ms
Will not consider at all None of the above			None of the	9300ms
Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic	13426ms
Will not consider at all None of the	imitation			12355ms
Will definitely consider None of the above			None of the	18656ms
Will not consider at all None of the above			None of the	9091ms
Will not consider at all None of the above			None of the	11527ms
Will probably consider synthetic gemstone	imitation	simulation	synthetic	10455ms
Will probably consider synthetic gemstone	imitation	simulation	synthetic	48574ms
Will possibly consider synthetic g laboratory- [manufacturer name]-	imitation			8913ms
Will probably consider synthetic gemstone			synthetic	7686ms
Will definitely consider synthetic gemstone		simulation		23049ms
Will probably consider laboratory-grown gemstone	imitation		synthetic	7341ms
Will definitely consider [manufacturer name]-created gem	imitation	simulation	synthetic	7115ms
Will possibly consider synthetic gemstone	imitation			4892ms
Will definitely consider synthetic g laboratory- [manufacturer name]-	imitation	simulation		7043ms
Will not consider at all None of the above			None of the	11574ms

22154ms 8983ms
15461ms 12739ms
7179ms 10304ms
30481ms 34088ms
12395ms 7640ms
24355ms 15974ms
17066ms 9528ms
13243ms 10419ms
21090ms 11194ms
11106ms 3594ms
9923ms 136715ms
2565ms 2420ms
11770ms 7586ms
13923ms 7979ms
6049ms 2069ms
11888ms 758343ms
10299ms 4336ms
5929ms 2979ms
22930ms 10194ms
847863ms 9616ms
4585ms 10866ms
23041ms 10278ms
4890ms 2767ms
15979ms 6892ms
36915ms 19713ms
4349ms 2998ms
7029ms 8485ms
20819ms 10042ms
6792ms 1414ms
6185ms 4336ms
8819ms 3121ms
3532ms 2215ms
114185ms 28309ms
14037ms 10116ms
16932ms 9364ms
4348ms 7575ms
15630ms 6477ms
32839ms 14881ms
3077ms 1441ms
15106ms 6280ms
17545ms 21274ms
5605ms 4135ms
21157ms 10990ms
4760ms 4647ms
19092ms 7908ms
19295ms 8858ms
7577ms 7958ms
16062ms 9130ms
17303ms 6560ms
11485ms 7809ms
5238ms 1461ms
8600ms 3832ms
10927ms 10051ms
56950ms 22828ms
24396ms 10137ms
11627ms 3703ms
19798ms 13917ms
10521ms 8706ms
9736ms 8863ms
10022ms 4257ms
12641ms 8409ms
8383ms 5425ms

32568060	2016-04-2	Reference	Female	18-24	US-SOUTH	Urban	\$50,000-\$7	Unknown	1.138
329504464	2016-04-2	News	Male	45-54	US-SOUTH	Suburban	\$25,000-\$4	Unknown	1.962
335829761	2016-04-2	Reference	Female	55-64	US-MIDWEST	Urban	\$50,000-\$7	Unknown	0.717
33792402	2016-04-2	Arts & Ent	Unknown	Unknown	US-SOUTH	Urban	\$25,000-\$4	Unknown	
338790264	2016-04-2	Mobile App	Male	35-44	US-MIDWEST	Suburban	\$25,000-\$4	Unknown	0.879
33888051	2016-04-2	News	Male	55-64	US-WEST	Suburban	\$50,000-\$7	Unknown	0.855
34064299	2016-04-2	News	Female	45-54	US-NORTH	Suburban	\$25,000-\$4	Unknown	1.186
34616253	2016-04-2	Mobile App	Female	25-34	US-SOUTH	Suburban	\$25,000-\$4	Unknown	1.116
34816607	2016-04-2	Mobile App	Female	35-44	US-SOUTH	Rural	I prefer not	Unknown	0.847
35122645	2016-04-2	Mobile App	Female	25-34	US-NORTH	Urban	\$0-\$24,99	Unknown	0.768
35459281	2016-04-2	News	Male	25-34	US-MIDWEST	Urban	\$0-\$24,99	Unknown	0.585
35608591	2016-04-2	News	Female	35-44	US-WEST	Suburban	\$25,000-\$4	Unknown	0.744
35635745	2016-04-2	News	Male	35-44	US-SOUTH	Rural	\$50,000-\$7	Unknown	0.847
35723159	2016-04-2	News	Female	45-54	US-WEST	Rural	\$50,000-\$7	Unknown	0.799
36773857	2016-04-2	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$4	Unknown	
37331591	2016-04-2	Arts & Ent	Female	45-54	US-WEST	Urban	\$50,000-\$7	Unknown	0.799
37882665	2016-04-2	Mobile App	Male	35-44	US-SOUTH	Urban	\$75,000-\$	Unknown	0.847
38037922	2016-04-2	News	Male	55-64	US-SOUTH	Rural	\$25,000-\$4	Unknown	1.493
38255625	2016-04-2	News	Female	35-44	US-NORTH	Unknown	\$25,000-\$4	Unknown	2.023
38376300	2016-04-2	News	Female	55-64	US-MIDWEST	Rural	\$25,000-\$4	Unknown	0.717
38709454	2016-04-2	Mobile App	Male	35-44	US-SOUTH	Suburban	I prefer not	Unknown	0.847
38980116	2016-04-2	Mobile App	Female	35-44	US-SOUTH	Rural	\$75,000-\$	Unknown	0.847
39190552	2016-04-2	News	Unknown	Unknown	US-NORTH	Suburban	\$25,000-\$4	Unknown	
39235590	2016-04-2	News	Female	35-44	US-WEST	Suburban	\$25,000-\$4	Unknown	0.744
39297501	2016-04-2	News	Unknown	Unknown	US-MIDWEST	Suburban	\$50,000-\$7	Unknown	
39802989	2016-04-2	News	Male	45-54	US-MIDWEST	Suburban	\$50,000-\$7	Unknown	1.222
39927135	2016-04-2	News	Male	35-44	US-WEST	Urban	\$25,000-\$4	Unknown	0.744
40649826	2016-04-2	News	Female	55-64	US-NORTH	Suburban	\$50,000-\$7	Unknown	1.016
40716269	2016-04-2	Mobile App	Female	35-44	US-SOUTH	Rural	\$25,000-\$4	Unknown	0.847
41037497	2016-04-2	Mobile App	Female	25-34	US-NORTH	Suburban	\$100,000-\$	Unknown	0.768
41140258	2016-04-2	Mobile App	Female	18-24	US-SOUTH	Suburban	\$50,000-\$7	Unknown	1.138
41330780	2016-04-2	Other	Female	35-44	US-SOUTH	Suburban	\$25,000-\$4	Unknown	0.847
41790509	2016-04-2	Other	Female	18-24	US-NORTH	Urban	\$0-\$24,99	Unknown	1.094
42047407	2016-04-2	News	Male	65+	US-MIDWEST	Rural	\$25,000-\$4	Unknown	1.09
42677083	2016-04-2	News	Male	65+	US-NORTH	Suburban	\$50,000-\$7	Unknown	1.141
43697739	2016-04-2	Other	Unknown	Unknown	US-NORTH	Urban	\$50,000-\$7	Unknown	
44309443	2016-04-2	News	Unknown	Unknown	US-WEST	Urban	\$25,000-\$4	Unknown	
44411015	2016-04-2	Other	Female	18-24	US-SOUTH	Urban	\$0-\$24,99	Unknown	1.138
44690653	2016-04-2	Arts & Ent	Female	55-64	US-MIDWEST	Suburban	\$25,000-\$4	Unknown	0.717
45797892	2016-04-2	News	Female	35-44	US-WEST	Suburban	\$25,000-\$4	Unknown	0.744
47026114	2016-04-2	Mobile App	Male	35-44	US-NORTH	Urban	I prefer not	Unknown	2.023
47148792	2016-04-2	News	Unknown	Unknown	US-MIDWEST	Rural	\$25,000-\$4	Unknown	
48166479	2016-04-2	Other	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$4	Unknown	
48292311	2016-04-2	Reference	Female	65+	US-WEST	Urban	\$25,000-\$4	Unknown	2.023
48372955	2016-04-2	Mobile App	Female	18-24	US-MIDWEST	Urban	I prefer not	Unknown	0.523
48719008	2016-04-2	News	Male	25-34	US-MIDWEST	Suburban	\$25,000-\$4	Unknown	0.585
48897085	2016-04-2	News	Male	55-64	US-MIDWEST	Suburban	\$25,000-\$4	Unknown	0.717
49165186	2016-04-2	News	Unknown	Unknown	US-WEST	Urban	\$25,000-\$4	Unknown	
49613227	2016-04-2	Mobile App	Female	25-34	US-MIDWEST	Rural	\$0-\$24,99	Unknown	0.585
49725005	2016-04-2	News	Female	35-44	US-SOUTH	Suburban	\$25,000-\$4	Unknown	0.847
50406182	2016-04-2	News	Male	55-64	US-NORTH	Urban	\$50,000-\$7	Unknown	1.016
50414173	2016-04-2	News	Male	55-64	US-NORTH	Rural	\$100,000-\$	Unknown	1.016
50452010	2016-04-2	News	Male	18-24	US-NORTH	Suburban	\$25,000-\$4	Unknown	1.094
50663248	2016-04-2	News	Male	35-44	US-MIDWEST	Suburban	\$25,000-\$4	Unknown	0.879
51061064	2016-04-2	News	Unknown	Unknown	US-MIDWEST	Suburban	\$25,000-\$4	Unknown	
51326439	2016-04-2	News	Female	35-44	US-SOUTH	Urban	\$50,000-\$7	Unknown	0.847
51371604	2016-04-2	News	Female	45-54	US-MIDWEST	Urban	\$25,000-\$4	Unknown	1.222
51435073	2016-04-2	News	Male	35-44	US-MIDWEST	Urban	\$25,000-\$4	Unknown	0.879
51825257	2016-04-2	News	Unknown	Unknown	US-SOUTH	Urban	\$25,000-\$4	Unknown	
52280522	2016-04-2	Mobile App	Male	25-34	US-SOUTH	Suburban	\$50,000-\$7	Unknown	1.116
52576589	2016-04-2	Mobile App	Female	18-24	US-MIDWEST	Suburban	\$0-\$24,99	Unknown	0.523
52716403	2016-04-2	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$4	Unknown	

Will not consider at all	None of the above			None of the	3318ms
Will not consider at all	None of the above			None of the	12473ms
Will probably consider laboratory-grown gemstone	imitation	simulation	synthetic		68542ms
Will definitely consider synthetic g laboratory- [manufacturer name]-	imitation	simulation	synthetic		15880ms
Will probably consider	None of the	imitation	simulation	synthetic	6572ms
Will not coi synthetic gemstone	imitation	simulation	synthetic		17895ms
Will not consider at all	None of the above			None of the	6303ms
Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic		8042ms
Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic		11693ms
Will possibly consider [manufacturer name]-	imitation	simulation			7154ms
Will not consider at all	None of the above			None of the	4609ms
Will not consider at all	None of the above			None of the	7383ms
Will not consider at all	None of the	imitation			3685ms
Will not coi synthetic gemstone	imitation	simulation	synthetic		13448ms
Will not consider at all [manufacturer name]-	imitation	simulation	synthetic		7552ms
Will definitely consider	None of the above			None of the	1897ms
Will probably consider laboratory-grown gemstone	imitation	simulation	synthetic		15034ms
Will not consider at all	None of the above			None of the	31263ms
Will possibly consider laboratory-grown gemstone	imitation		synthetic		9397ms
Will possib synthetic gemstone			synthetic		53474ms
Will probably consider	None of the above		synthetic		39836ms
Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic		18697ms
Will probably consider	None of the above			None of the	5231ms
Will probably consider laboratory-grown gemstone	imitation	simulation			7654ms
Will possibly consider [manufacturer name]-	imitation	simulation	synthetic		9285ms
Will definitely consider synthetic g laboratory-grown gemstone	imitation	simulation	synthetic		14160ms
Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic		12174ms
Will not consider at all [manufacturer name]-	imitation	simulation	synthetic		9086ms
Will probat synthetic gemstone	imitation		synthetic		1320479m
Will definitely consider laboratory-grown gemstone		simulation	synthetic		5258ms
Will not coi synthetic gemstone	imitation	simulation	synthetic		14320ms
Will not consider at all	None of the above		synthetic		2445ms
Will not consider at all	None of the above			None of the	9801ms
Will not consider at all laboratory-grown gemstone		simulation			18850ms
Will not coi synthetic gemstone				None of the	41853ms
Will not consider at all [manufacturer name]-	imitation	simulation	synthetic		5765ms
Will not consider at all	None of the above			None of the	16624ms
Will possibly consider	None of the	imitation	simulation	synthetic	4699ms
Will not coi synthetic gemstone	imitation	simulation	synthetic		6250ms
Will not consider at all	None of the above			None of the	19132ms
Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic		98966ms
Will not consider at all	None of the above			None of the	20131ms
Will not consider at all	None of the above	simulation			11359ms
Will possibly consider laboratory-grown gemstone				None of the	10427ms
Will probably consider laboratory-grown gemstone			synthetic		54084ms
Will not consider at all	None of the above			None of the	17271ms
Will not consider at all [manufacturer name]-	imitation	simulation	synthetic		7337ms
Will probat synthetic gemstone	imitation				3215ms
Will probat synthetic gemstone	imitation	simulation			17565ms
Will not coi synthetic gemstone	imitation	simulation	synthetic		9501ms
Will not consider at all	None of the above			None of the	11197ms
Will not consider at all	None of the above			None of the	9971ms
Will not consider at all	None of the above			None of the	12914ms
Will not consider at all laboratory-grown gemstone		simulation			12631ms
Will possib synthetic gemstone	imitation	simulation	synthetic		23227ms
Will not consider at all	None of the above			None of the	4543ms
Will not consider at all	None of the above			None of the	5547ms
Will not coi synthetic gemstone	imitation	simulation	synthetic		6301ms
Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic		6799ms
Will possibly consider laboratory-grown gemstone	imitation	simulation			5335ms
Will possib synthetic g laboratory- [manufacturer name]-	imitation		synthetic		17134ms
Will not consider at all	None of the above		synthetic		8313ms

3181ms	1824ms
6775ms	6655ms
15663ms	9772ms
30998ms	23884ms
5223ms	12674ms
20505ms	15209ms
5315ms	2673ms
17877ms	13435ms
7982ms	10631ms
6986ms	14918ms
2914ms	2474ms
11776ms	4252ms
8750ms	3451ms
22406ms	9531ms
36034ms	12667ms
2840ms	1958ms
45115ms	26710ms
15523ms	6348ms
17752ms	10467ms
3487ms	2321ms
39210ms	9296ms
28393ms	14177ms
6669ms	3365ms
15509ms	32913ms
15114ms	8128ms
11082ms	9293ms
19961ms	19606ms
15177ms	9736ms
7731ms	66373ms
8802ms	10397ms
17801ms	12585ms
4112ms	8681ms
4464ms	2565ms
10216ms	9850ms
13461ms	13589ms
14842ms	7986ms
4850ms	1475ms
5415ms	10565ms
18406ms	6888ms
10678ms	4823ms
20459ms	54914ms
9618ms	5347ms
11348ms	8897ms
11549ms	12605ms
7866ms	5949ms
11652ms	4955ms
9240ms	8922ms
9266ms	2478ms
16702ms	11039ms
13271ms	11259ms
6082ms	2886ms
5148ms	4188ms
6008ms	1817ms
8676ms	2928ms
18066ms	15980ms
2664ms	2994ms
5497ms	4765ms
10083ms	10241ms
12738ms	7008ms
20159ms	17852ms
32609ms	12967ms
11848ms	10358ms

52770479	2016-04-2	News	Male	25-34	US-NORT	Rural	\$25,000-\$	Unknown	0.768
530103447	2016-04-2	News	Female	65+	US-MIDW	Suburban	\$25,000-\$	Unknown	1.09
530111422	2016-04-2	News	Male	25-34	US-MIDW	Urban	\$75,000-\$	Unknown	0.585
53199768	2016-04-2	News	Female	35-44	US-MIDW	Urban	\$0-\$24,99	Unknown	0.879
53487681	2016-04-2	News	Male	35-44	US-MIDW	Suburban	\$25,000-\$	Unknown	0.879
53529326	2016-04-2	News	Female	55-64	US-SOUT	Suburban	\$25,000-\$	Unknown	1.493
54205899	2016-04-2	News	Female	55-64	US-WEST	Urban	\$25,000-\$	Unknown	0.855
54998289	2016-04-2	Arts & Ent	Female	55-64	US-WEST	Rural	\$50,000-\$	Unknown	0.855
55259330	2016-04-2	Mobile App	Female	35-44	US-SOUT	Rural	\$0-\$24,99	Unknown	0.847
55302273	2016-04-2	Mobile App	Female	45-54	US-SOUT	Urban	\$50,000-\$	Unknown	1.962
555546247	2016-04-2	News	Male	45-54	US-MIDW	Suburban	\$25,000-\$	Unknown	1.222
56569678	2016-04-2	Mobile App	Unknown	Unknown	US-NORT	Rural	\$25,000-\$	Unknown	
56774273	2016-04-2	News	Female	55-64	US-WEST	Urban	\$25,000-\$	Unknown	0.855
571723074	2016-04-2	Mobile App	Male	18-24	US-MIDW	Urban	\$75,000-\$	Unknown	0.523
57838286	2016-04-2	News	Male	35-44	US-WEST	Suburban	\$75,000-\$	Unknown	0.744
58353708	2016-04-2	News	Male	45-54	US-SOUT	Urban	\$50,000-\$	Unknown	1.962
592030587	2016-04-2	Mobile App	Male	18-24	US-MIDW	Urban	\$25,000-\$	Unknown	0.523
59210130	2016-04-2	News	Unknown	Unknown	US-WEST	Suburban	\$0-\$24,99	Unknown	
592802884	2016-04-2	Mobile App	Male	25-34	US-MIDW	Rural	\$100,000-\$	Unknown	0.585
59351580	2016-04-2	News	Male	65+	US-MIDW	Urban	\$0-\$24,99	Unknown	1.09
59719817	2016-04-2	News	Female	45-54	US-WEST	Suburban	\$25,000-\$	Unknown	0.799
60721351	2016-04-2	News	Female	25-34	US-MIDW	Rural	\$25,000-\$	Unknown	0.585
60931673	2016-04-2	Mobile App	Female	18-24	US-MIDW	Suburban	\$75,000-\$	Unknown	0.523
610093457	2016-04-2	News	Male	55-64	US-MIDW	Rural	\$25,000-\$	Unknown	0.717
61052714	2016-04-2	News	Male	35-44	US-WEST	Suburban	\$25,000-\$	Unknown	0.744
61127154	2016-04-2	Reference	Unknown	Unknown	US-SOUT	Rural	\$25,000-\$	Unknown	
61322389	2016-04-2	News	Male	55-64	US-SOUT	Rural	\$25,000-\$	Unknown	1.493
62203684	2016-04-2	Mobile App	Male	18-24	US-NORT	Urban	\$0-\$24,99	Unknown	1.094
62210446	2016-04-2	News	Female	55-64	US-SOUT	Urban	\$25,000-\$	Unknown	1.493
623535787	2016-04-2	News	Unknown	Unknown	US-MIDW	Suburban	\$25,000-\$	Unknown	
626167011	2016-04-2	Other	Female	18-24	US-NORT	Rural	\$25,000-\$	Unknown	1.094
62647915	2016-04-2	News	Female	55-64	US-MIDW	Rural	\$25,000-\$	Unknown	0.717
62846115	2016-04-2	News	Male	45-54	US-NORT	Rural	\$25,000-\$	Unknown	1.186
62928656	2016-04-2	News	Male	45-54	US-NORT	Rural	\$25,000-\$	Unknown	1.186
63136570	2016-04-2	News	Male	35-44	US-MIDW	Suburban	\$25,000-\$	Unknown	0.879
637005627	2016-04-2	Other	Male	25-34	US-NORT	Urban	\$0-\$24,99	Unknown	0.768
63956762	2016-04-2	News	Female	45-54	US-NORT	Urban	\$75,000-\$	Unknown	1.186
65788683	2016-04-2	News	Male	55-64	US-MIDW	Rural	\$25,000-\$	Unknown	0.717
66447479	2016-04-2	Other	Female	45-54	US-SOUT	Urban	\$50,000-\$	Unknown	1.962
685013077	2016-04-2	News	Unknown	Unknown	US-MIDW	Suburban	\$25,000-\$	Unknown	
68864953	2016-04-2	News	Female	25-34	US-WEST	Rural	\$25,000-\$	Unknown	1.052
698520511	2016-04-2	News	Unknown	Unknown	US-SOUT	Suburban	\$25,000-\$	Unknown	
69935713	2016-04-2	Mobile App	Male	35-44	US-NORT	Urban	\$75,000-\$	Unknown	2.023
699604222	2016-04-2	Mobile App	Female	25-34	US-SOUT	Suburban	\$25,000-\$	Unknown	1.116
705555757	2016-04-2	News	Female	25-34	US-MIDW	Urban	\$0-\$24,99	Unknown	0.585
70595709	2016-04-2	News	Female	55-64	US-MIDW	Urban	\$25,000-\$	Unknown	0.717
717312707	2016-04-2	Mobile App	Female	18-24	US-WEST	Urban	\$25,000-\$	Unknown	0.939
71941749	2016-04-2	Arts & Ent	Male	25-34	US-MIDW	Rural	\$25,000-\$	Unknown	0.585
72890105	2016-04-2	Mobile App	Female	55-64	US-MIDW	Urban	\$25,000-\$	Unknown	0.717
72909221	2016-04-2	News	Female	65+	US-WEST	Rural	\$25,000-\$	Unknown	2.023
73663700	2016-04-2	Reference	Unknown	Unknown	US-SOUT	Urban	\$0-\$24,99	Unknown	
73820100	2016-04-2	Reference	Unknown	Unknown	US-MIDW	Urban	\$0-\$24,99	Unknown	
73971413	2016-04-2	Mobile App	Female	25-34	US-MIDW	Suburban	\$0-\$24,99	Unknown	0.585
74692243	2016-04-2	News	Male	55-64	US-WEST	Urban	\$25,000-\$	Unknown	0.855
7524875	2016-04-2	Reference	Unknown	Unknown	US-SOUT	Rural	\$25,000-\$	Unknown	
753338651	2016-04-2	News	Female	25-34	US-NORT	Urban	\$50,000-\$	Unknown	0.768
75557601	2016-04-2	News	Female	25-34	US-WEST	Urban	\$0-\$24,99	Unknown	1.052
75942456	2016-04-2	News	Male	65+	US-WEST	Unknown	\$50,000-\$	Unknown	2.023
76577542	2016-04-2	News	Unknown	Unknown	US-SOUT	Urban	\$50,000-\$	Unknown	
76668672	2016-04-2	Arts & Ent	Male	45-54	US-SOUT	Suburban	\$0-\$24,99	Unknown	1.962
768746301	2016-04-2	Mobile App	Male	35-44	US-SOUT	Rural	\$25,000-\$	Unknown	0.847
77063637	2016-04-2	News	Female	55-64	US-NORT	Urban	\$0-\$24,99	Unknown	1.016

Will not consider at all	imitation			6159ms
Will not consider at all	None of the above			18141ms
Will not consider at all	None of the above			624318ms
Will possibly consider	laboratory-grown gemstone imitation	simulation	synthetic	17635ms
Will probably consider	None of the above	imitation	simulation synthetic	24978ms
Will not consider at all	None of the above			135043ms
Will not consider at all	None of the above	imitation	simulation synthetic	6738ms
Will definitely consider	synthetic g laboratory- [manufacturer name]-created gemstone	imitation	simulation synthetic	11215ms
Will possibly consider	laboratory-grown gemstone imitation	simulation	synthetic	8259ms
Will definitely consider	None of the above			24305ms
Will not consider at all	None of the above			2681ms
Will not consider at all	None of the above	imitation		6515ms
Will not consider at all	None of the above			19080ms
Will possibly consider	None of the above	imitation	simulation synthetic	7963ms
Will definitely consider	[manufacturer name]-created gemstone		synthetic	6982ms
Will not consider at all	None of the above			62279ms
Will probably consider	laboratory-grown gemstone imitation	simulation	synthetic	9913ms
Will not consider at all	laboratory-grown gemstone	simulation		7061ms
Will definitely consider	synthetic g laboratory- [manufacturer name]-created gemstone	imitation	simulation synthetic	6924ms
Will not consider at all	laboratory- [manufacturer name]-created gemstone	imitation	simulation synthetic	16760ms
Will not consider at all	None of the above			24750ms
Will not consider at all	None of the above			4675ms
Will possibly consider	synthetic gemstone imitation	simulation	synthetic	7346ms
Will not consider at all	None of the above			12202ms
Will possibly consider	[manufacturer name]-created gemstone			4639ms
Will not consider at all	laboratory-grown gemstone			3045ms
Will not consider at all	laboratory-grown gemstone imitation	simulation	synthetic	19561ms
Will not consider at all	synthetic gemstone imitation	simulation	synthetic	6884ms
Will not consider at all	synthetic gemstone			3159ms
Will not consider at all	[manufacturer name]-created gemstone	imitation	simulation	5330ms
Will not consider at all	[manufacturer name]-created gemstone	imitation	synthetic	6836ms
Will not consider at all	synthetic gemstone imitation	simulation	synthetic	25283ms
Will probably consider	synthetic gemstone		synthetic	7808ms
Will probably consider	laboratory-grown gemstone imitation	simulation	synthetic	7056ms
Will not consider at all	None of the above	imitation		17524ms
Will not consider at all	None of the above	imitation		7799ms
Will not consider at all	synthetic gemstone imitation		synthetic	49754ms
Will not consider at all	None of the above			11374ms
Will probably consider	laboratory-grown gemstone imitation	simulation	synthetic	16500ms
Will not consider at all	None of the above			10274ms
Will not consider at all	synthetic g laboratory- [manufacturer name]-created gemstone	imitation	simulation synthetic	16018ms
Will definitely consider	[manufacturer name]-created gemstone		synthetic	2566ms
Will definitely consider	synthetic gemstone imitation	simulation	synthetic	23197ms
Will possibly consider	synthetic gemstone imitation	simulation	synthetic	7649ms
Will definitely consider	None of the above			8496ms
Will not consider at all	None of the above			13955ms
Will probably consider	synthetic gemstone imitation	simulation	synthetic	57693ms
Will possibly consider	None of the above			2700ms
Will not consider at all	synthetic gemstone imitation	simulation	synthetic	12371ms
Will not consider at all	None of the above			13670ms
Will probably consider	laboratory-grown gemstone	simulation		5952ms
Will not consider at all	None of the above			7350ms
Will possibly consider	laboratory-grown gemstone		synthetic	42964ms
Will definitely consider	synthetic gemstone imitation			3083ms
Will possibly consider	synthetic gemstone		synthetic	57000ms
Will not consider at all	None of the above			6416ms
Will not consider at all	None of the above			8684ms
Will not consider at all	None of the above			5222ms
Will not consider at all	None of the above			8848ms
Will not consider at all	[manufacturer name]-created gemstone		synthetic	5600ms
Will probably consider	synthetic g laboratory-grown gemstone imitation	simulation	synthetic	8181ms
Will not consider at all	None of the above			12323ms

10648ms	9425ms
6363ms	2811ms
4130ms	3705ms
16433ms	9289ms
12452ms	6968ms
14956ms	10871ms
4888ms	16391ms
22098ms	11500ms
9710ms	13095ms
19099ms	10808ms
5044ms	4783ms
5018ms	2170ms
17756ms	23011ms
8335ms	9524ms
3313ms	1648ms
30764ms	5464ms
39509ms	15580ms
6831ms	1412ms
25645ms	12232ms
15687ms	17041ms
10633ms	3464ms
7222ms	2682ms
12655ms	9810ms
16343ms	11471ms
3366ms	1792ms
2975ms	2752ms
14665ms	11428ms
17004ms	12393ms
3933ms	2804ms
17426ms	12599ms
10998ms	7030ms
9155ms	7489ms
40347ms	9537ms
8427ms	12259ms
20921ms	7951ms
9838ms	6693ms
6468ms	3193ms
6924ms	6134ms
9328ms	15234ms
3648ms	1515ms
16089ms	9141ms
5933ms	2141ms
29226ms	18046ms
9477ms	6452ms
6614ms	2640ms
36864ms	10327ms
3731ms	9694ms
3313ms	1847ms
38651ms	12670ms
15769ms	5089ms
2955ms	1336ms
2802ms	1307ms
36147ms	4546ms
6156ms	2043ms
22700ms	8700ms
8381ms	1259ms
6161ms	2551ms
5644ms	2336ms
7896ms	2166ms
11749ms	5124ms
16383ms	7677ms
8508ms	4979ms

77180852	2016-04-2	News	Unknown	Unknown	US-MIDW	Rural	\$25,000-\$	Unknown	
77427482	2016-04-2	News	Male	18-24	US-SOUT	Suburban	\$0-\$24,99	Unknown	1.138
77565658	2016-04-2	Other	Unknown	Unknown	US-SOUT	Suburban	\$75,000-\$	Unknown	
78508961	2016-04-2	News	Male	55-64	US-WEST	Urban	\$25,000-\$	Unknown	0.855
78549497	2016-04-2	News	Unknown	Unknown	US-NORT	Rural	\$25,000-\$	Unknown	
79262546	2016-04-2	Other	Male	55-64	US-SOUT	Suburban	\$50,000-\$	Unknown	1.493
79963385	2016-04-2	Mobile App	Female	25-34	US-NORT	Urban	I prefer not	Unknown	0.768
80526378	2016-04-2	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$	Unknown	
80556770	2016-04-2	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$	Unknown	
80723092	2016-04-2	News	Male	55-64	US-WEST	Suburban	\$25,000-\$	Unknown	0.855
80840543	2016-04-2	News	Female	35-44	US-WEST	Rural	\$25,000-\$	Unknown	0.744
81681349	2016-04-2	Mobile App	Female	25-34	US-SOUT	Urban	\$25,000-\$	Unknown	1.116
81975468	2016-04-2	News	Male	45-54	US-MIDW	Suburban	\$25,000-\$	Unknown	1.222
82074517	2016-04-2	News	Female	55-64	US-MIDW	Suburban	\$25,000-\$	Unknown	0.717
82309810	2016-04-2	Reference	Female	Unknown	US-NORT	Suburban	\$75,000-\$	Unknown	
82679253	2016-04-2	News	Male	35-44	US-WEST	Rural	\$0-\$24,99	Unknown	0.744
82776858	2016-04-2	Other	Unknown	Unknown	US-MIDW	Suburban	\$25,000-\$	Unknown	
82808082	2016-04-2	Arts & Ent	Male	18-24	US-NORT	Urban	\$75,000-\$	Unknown	1.094
82964220	2016-04-2	News	Unknown	Unknown	US-MIDW	Rural	\$50,000-\$	Unknown	
83126892	2016-04-2	News	Female	45-54	US-NORT	Suburban	\$25,000-\$	Unknown	1.186
83197922	2016-04-2	News	Male	25-34	US-MIDW	Urban	\$25,000-\$	Unknown	0.585
83644596	2016-04-2	Reference	Unknown	Unknown	US-MIDW	Urban	\$50,000-\$	Unknown	
84181985	2016-04-2	News	Female	18-24	US-WEST	Rural	\$50,000-\$	Unknown	0.939
84255965	2016-04-2	News	Female	18-24	US-MIDW	Suburban	\$25,000-\$	Unknown	0.523
85628319	2016-04-2	News	Unknown	Unknown	US-MIDW	Suburban	\$25,000-\$	Unknown	
86245834	2016-04-2	News	Male	25-34	US-MIDW	Urban	\$50,000-\$	Unknown	0.585
86552082	2016-04-2	News	Male	25-34	US-MIDW	Urban	\$25,000-\$	Unknown	0.585
86720845	2016-04-2	News	Unknown	Unknown	US-SOUT	Suburban	\$50,000-\$	Unknown	
87200164	2016-04-2	News	Unknown	Unknown	US-SOUT	Suburban	\$50,000-\$	Unknown	
87693851	2016-04-2	Mobile App	Female	25-34	US-MIDW	Suburban	\$0-\$24,99	Unknown	0.585
87873308	2016-04-2	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$	Unknown	
88179565	2016-04-2	Other	Unknown	Unknown	US-MIDW	Suburban	\$25,000-\$	Unknown	
88189307	2016-04-2	News	Female	45-54	US-WEST	Urban	\$50,000-\$	Unknown	0.799
88279050	2016-04-2	News	Female	35-44	US-SOUT	Urban	\$25,000-\$	Unknown	0.847
89030708	2016-04-2	Arts & Ent	Male	65+	US-MIDW	Rural	\$25,000-\$	Unknown	1.09
89077060	2016-04-2	Other	Unknown	Unknown	US-SOUT	Suburban	\$25,000-\$	Unknown	
89250822	2016-04-2	News	Male	35-44	US-NORT	Urban	\$25,000-\$	Unknown	2.023
89445529	2016-04-2	News	Female	55-64	US-SOUT	Suburban	\$25,000-\$	Unknown	1.493
89591196	2016-04-2	Arts & Ent	Male	65+	US-SOUT	Rural	\$25,000-\$	Unknown	1.428
90086670	2016-04-2	News	Female	25-34	US-MIDW	Urban	\$25,000-\$	Unknown	0.585
90214692	2016-04-2	News	Male	25-34	US-NORT	Urban	\$25,000-\$	Unknown	0.768
90487476	2016-04-2	Mobile App	Female	18-24	US-SOUT	Urban	I prefer not	Unknown	1.138
90677714	2016-04-2	News	Male	35-44	US-SOUT	Suburban	\$75,000-\$	Unknown	0.847
90714451	2016-04-2	Mobile App	Female	18-24	US-MIDW	Suburban	I prefer not	Unknown	0.523
91454262	2016-04-2	News	Male	18-24	US-NORT	Suburban	\$75,000-\$	Unknown	1.094
91588064	2016-04-2	Mobile App	Female	18-24	US-MIDW	Urban	I prefer not	Unknown	0.523
91627479	2016-04-2	News	Female	25-34	US-SOUT	Urban	\$100,000-\$	Unknown	1.116
91718480	2016-04-2	Other	Female	25-34	US-SOUT	Urban	\$25,000-\$	Unknown	1.116
91748009	2016-04-2	Mobile App	Female	18-24	US-MIDW	Suburban	\$100,000-\$	Unknown	0.523
92105787	2016-04-2	News	Female	Unknown	US-MIDW	Suburban	\$25,000-\$	Unknown	
93005439	2016-04-2	Mobile App	Female	18-24	US-MIDW	Rural	I prefer not	Unknown	0.523
93479244	2016-04-2	News	Unknown	Unknown	US-WEST	Suburban	\$50,000-\$	Unknown	
93614925	2016-04-2	News	Male	55-64	US-WEST	Suburban	\$25,000-\$	Unknown	0.855
93792528	2016-04-2	Mobile App	Female	18-24	US-SOUT	Suburban	\$0-\$24,99	Unknown	1.138
95128605	2016-04-2	News	Male	45-54	US-SOUT	Unknown	Unknown	Unknown	1.962
95593684	2016-04-2	News	Male	35-44	US-SOUT	Suburban	\$75,000-\$	Unknown	0.847
95987394	2016-04-2	News	Male	45-54	US-SOUT	Rural	\$50,000-\$	Unknown	1.962
96097203	2016-04-2	News	Female	25-34	US-MIDW	Urban	\$0-\$24,99	Unknown	0.585
96460441	2016-04-2	Mobile App	Male	18-24	US-MIDW	Suburban	\$50,000-\$	Unknown	0.523
96755859	2016-04-2	Arts & Ent	Female	55-64	US-SOUT	Rural	\$25,000-\$	Unknown	1.493
96881985	2016-04-2	News	Male	45-54	US-SOUT	Urban	\$25,000-\$	Unknown	1.962
96967557	2016-04-2	News	Male	35-44	US-WEST	Urban	\$25,000-\$	Unknown	0.744

Will possibly consider	None of the above		None of the	5245ms	
Will not consider synthetic gemstone	imitation	simulation	synthetic	7344ms	
Will possibly consider	None of the above		None of the	5202ms	
Will not consider synthetic gemstone	imitation	simulation	synthetic	12754ms	
Will possibly consider	None of the above		synthetic	21307ms	
Will possibly consider	None of the	imitation	simulation	synthetic	25169ms
Will possibly consider synthetic g laboratory-grown gemstone	imitation		synthetic	3358ms	
Will not consider at all	None of the	imitation		23373ms	
Will possibly consider synthetic gemstone	imitation	simulation	synthetic	11154ms	
Will definitely consider	None of the above		synthetic	5964ms	
Will not consider at all	None of the above		None of the	17791ms	
Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic	12979ms	
Will probably consider	None of the	imitation		11118ms	
Will not consider at all	None of the above		None of the	16565ms	
Will probably consider	None of the above		None of the	10343ms	
Will not consider at all	None of the above		None of the	11056ms	
Will probably consider	None of the above		None of the	23140ms	
Will not consider at all	None of the above		None of the	5075ms	
Will probably consider [manufacturer name]-	imitation			5451ms	
Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic	4992ms	
Will not consider at all	None of the above		None of the	20524ms	
Will not consider at all	None of the	imitation		4440ms	
Will possibly consider	None of the above		synthetic	16776ms	
Will not consider at all	None of the above		None of the	6229ms	
Will not consider synthetic gemstone			None of the	19312ms	
Will not consider at all laboratory-grown gemstone		simulation		20269ms	
Will possibly consider synthetic gemstone	imitation	simulation	synthetic	9384ms	
Will not consider synthetic gemstone			synthetic	8339ms	
Will not consider at all [manufacturer name]-	imitation		synthetic	16159ms	
Will possibly consider laboratory-grown gemstone		simulation	synthetic	5524ms	
Will probably consider synthetic gemstone			synthetic	6748ms	
Will not consider at all	None of the above		None of the	4087ms	
Will not consider at all	None of the above		None of the	10016ms	
Will not consider synthetic gemstone			synthetic	14351ms	
Will not consider at all	None of the	imitation		45031ms	
Will not consider at all laboratory-grown gemstone		simulation		12944ms	
Will not consider synthetic gemstone	imitation	simulation	synthetic	17529ms	
Will possibly consider synthetic gemstone			None of the	13562ms	
Will possibly consider synthetic gemstone	imitation	simulation	synthetic	16900ms	
Will not consider synthetic gemstone		simulation		28077ms	
Will probably consider	None of the above		None of the	12020ms	
Will possibly consider synthetic gemstone [manufacturer name]-	imitation		synthetic	10785ms	
Will not consider synthetic gemstone	imitation		synthetic	5603ms	
Will probably consider synthetic g laboratory- [manufacturer name]-	imitation	simulation	synthetic	7663ms	
Will not consider synthetic gemstone	imitation	simulation		7268ms	
Will possibly consider synthetic gemstone [manufacturer name]-created gemstone			synthetic	17919ms	
Will definitely consider	None of the above		None of the	11492ms	
Will not consider at all	None of the above		None of the	7602ms	
Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic	10643ms	
Will not consider at all [manufacturer name]-	imitation			11237ms	
Will probably consider laboratory-grown gemstone			None of the	11153ms	
Will not consider at all	None of the above		None of the	8229ms	
Will possibly consider [manufacturer name]-	imitation	simulation	synthetic	9922ms	
Will possibly consider	None of the above		None of the	10673ms	
Will possibly consider	None of the above		None of the	13411ms	
Will possibly consider	None of the	imitation	simulation	synthetic	8000ms
Will definitely consider [manufacturer name]-created gemstone			synthetic	8065ms	
Will not consider at all	None of the above		None of the	16015ms	
Will definitely consider synthetic gemstone	imitation			7365ms	
Will possibly consider laboratory- [manufacturer name]-	imitation	simulation	synthetic	14159ms	
Will not consider at all	None of the above		None of the	3258ms	
Will not consider at all	None of the	imitation	simulation	synthetic	7776ms

6503ms	3337ms
11319ms	7783ms
7023ms	2777ms
15096ms	7567ms
11585ms	8012ms
19715ms	18711ms
7057ms	8893ms
13784ms	3748ms
19160ms	14091ms
6267ms	5365ms
7947ms	6063ms
23680ms	16347ms
29860ms	10037ms
20975ms	23832ms
14525ms	6166ms
6066ms	1638ms
16491ms	2295ms
3535ms	3476ms
2308ms	2400ms
9977ms	6965ms
2916ms	25994ms
8595ms	8636ms
5448ms	1727ms
3254ms	2022ms
4660ms	2424ms
2412ms	2929ms
11825ms	18027ms
18022ms	5665ms
31615ms	7626ms
7508ms	8878ms
19659ms	4597ms
3972ms	2017ms
6416ms	5696ms
8962ms	6220ms
19201ms	9408ms
21109ms	14795ms
13341ms	8717ms
9648ms	32179ms
18830ms	10714ms
24051ms	17283ms
5299ms	4761ms
19258ms	14176ms
12665ms	6166ms
30031ms	5527ms
6984ms	8542ms
36826ms	9787ms
8747ms	2390ms
5573ms	5354ms
19607ms	6597ms
8981ms	39914ms
26225ms	17733ms
12409ms	3363ms
10356ms	11798ms
9675ms	14586ms
11532ms	9469ms
10964ms	8330ms
2646ms	2056ms
6091ms	7139ms
19669ms	10740ms
80881ms	9833ms
2777ms	2587ms
9941ms	5207ms

97071739	2016-04-27	Other	Male	65+	US-SOUTH	Rural	\$50,000-\$75,000	Unknown	1.428
970763711	2016-04-27	Mobile App	Male	35-44	US-WEST	Suburban	\$25,000-\$50,000	Unknown	0.744
992333553	2016-04-27	News	Male	35-44	US-MIDWEST	Suburban	\$50,000-\$75,000	Unknown	0.879
997161973	2016-04-27	Mobile App	Female	18-24	US-SOUTH	Urban	\$25,000-\$50,000	Unknown	1.138
998417387	2016-04-27	Arts & Entertainment	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$50,000	Unknown	
998517027	2016-04-27	Arts & Entertainment	Unknown	Unknown	US-SOUTH	Unknown	Unknown	Unknown	

Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic	23657ms
Will definitely consider laboratory-grown gemstone		simulation	synthetic	24905ms
Will possibly consider	None of the	imitation	simulation	13157ms
Will possibly consider laboratory-grown gemstone		simulation		9195ms
Will not consider at all	None of the	imitation		9226ms
Will not consider at all	None of the above		None of the	10488ms

16382ms	7354ms
17837ms	9500ms
41380ms	9960ms
15169ms	9706ms
16630ms	8642ms
14338ms	6614ms

User ID	Time (UTC)	Survey Co	Publisher (Gender	Age	Geography	Urban Den	Income	Parental Si
100197879	2016-04-21	Complete	Mobile App	Female	18-24	US-WEST	Suburban	I prefer not	Unknown
100223480	2016-04-21	Complete	News	Female	35-44	US-WEST	Urban	\$0-\$24,999	Unknown
100588424	2016-04-21	Complete	Reference	Female	35-44	US-WEST	Urban	\$50,000-\$75,000	Unknown
100721560	2016-04-21	Complete	Reference	Male	35-44	US-NORTH	Suburban	\$50,000-\$75,000	Unknown
100758069	2016-04-21	Complete	News	Male	25-34	US-WEST	Urban	\$25,000-\$49,999	Unknown
100850021	2016-04-21	Partial	News	Male	55-64	US-NORTH	Suburban	\$25,000-\$49,999	Unknown
100914517	2016-04-21	Complete	Arts & Entertainment	Female	65+	US-WEST	Unknown	\$50,000-\$75,000	Unknown
101059216	2016-04-21	Complete	Mobile App	Male	25-34	US-WEST	Urban	\$25,000-\$49,999	Unknown
101240243	2016-04-21	Complete	News	Female	25-34	US-MIDWEST	Urban	\$50,000-\$75,000	Unknown
101504972	2016-04-21	Complete	Arts & Entertainment	Male	55-64	US-NORTH	Rural	\$25,000-\$49,999	Unknown
102050034	2016-04-21	Complete	News	Male	35-44	US-WEST	Urban	\$25,000-\$49,999	Unknown
102664957	2016-04-21	Partial	News	Female	Unknown	US-MIDWEST	Rural	\$50,000-\$75,000	Unknown
102693463	2016-04-21	Complete	News	Female	45-54	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
103132299	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH	Urban	\$0-\$24,999	Unknown
103224702	2016-04-21	Complete	Reference	Male	Unknown	US-WEST	Urban	\$25,000-\$49,999	Unknown
103277164	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Suburban	\$50,000-\$75,000	Unknown
103452799	2016-04-21	Complete	Arts & Entertainment	Female	45-54	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
103979604	2016-04-21	Complete	News	Male	35-44	US-MIDWEST	Suburban	\$50,000-\$75,000	Unknown
104144771	2016-04-21	Complete	News	Female	55-64	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
104240879	2016-04-21	Complete	News	Male	35-44	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
104341053	2016-04-21	Complete	Mobile App	Female	25-34	US-WEST	Rural	\$25,000-\$49,999	Unknown
104823749	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH	Suburban	\$0-\$24,999	Unknown
104845379	2016-04-21	Complete	Reference	Male	18-24	US-WEST	Rural	\$25,000-\$49,999	Unknown
106385753	2016-04-21	Complete	Mobile App	Male	18-24	US-MIDWEST	Urban	\$0-\$24,999	Unknown
106420419	2016-04-21	Complete	Other	Male	45-54	US-SOUTH	Urban	\$50,000-\$75,000	Unknown
108600629	2016-04-21	Complete	News	Female	35-44	US-SOUTH	Unknown	Unknown	Unknown
109014472	2016-04-21	Complete	News	Female	35-44	US-SOUTH	Suburban	\$50,000-\$75,000	Unknown
109113749	2016-04-21	Complete	Reference	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
109500834	2016-04-21	Complete	News	Female	45-54	US-WEST	Urban	\$50,000-\$75,000	Unknown
109759647	2016-04-21	Partial	News	Female	Unknown	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
10977793	2016-04-21	Complete	News	Male	18-24	US-WEST	Urban	\$25,000-\$49,999	Unknown
109938189	2016-04-21	Complete	Reference	Male	55-64	US-WEST	Urban	\$25,000-\$49,999	Unknown
110131057	2016-04-21	Complete	News	Male	25-34	US-MIDWEST	Suburban	\$50,000-\$75,000	Unknown
110204649	2016-04-21	Complete	Mobile App	Female	25-34	US-WEST	Suburban	\$0-\$24,999	Unknown
110615149	2016-04-21	Complete	Reference	Unknown	Unknown	US-NORTH	Urban	\$0-\$24,999	Unknown
111329869	2016-04-21	Complete	News	Male	35-44	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown
111468639	2016-04-21	Complete	News	Female	25-34	US-WEST	Suburban	\$25,000-\$49,999	Unknown
111587899	2016-04-21	Complete	News	Male	65+	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
112314117	2016-04-21	Complete	Mobile App	Male	18-24	US-WEST	Suburban	\$0-\$24,999	Unknown
112325023	2016-04-21	Complete	News	Female	55-64	US-NORTH	Urban	\$25,000-\$49,999	Unknown
112906719	2016-04-21	Partial	News	Female	55-64	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown
114007860	2016-04-21	Complete	Mobile App	Female	25-34	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
114752643	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH	Urban	\$25,000-\$49,999	Unknown
114981260	2016-04-21	Complete	News	Female	45-54	US-WEST	Rural	\$25,000-\$49,999	Unknown
115092671	2016-04-21	Complete	News	Female	45-54	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
116271099	2016-04-21	Complete	News	Male	55-64	US-NORTH	Rural	\$25,000-\$49,999	Unknown
116703947	2016-04-21	Complete	Mobile App	Male	25-34	US-SOUTH	Suburban	\$50,000-\$75,000	Unknown
116791629	2016-04-21	Complete	Mobile App	Female	55-64	US-MIDWEST	Rural	\$75,000-\$99,999	Unknown
117350869	2016-04-21	Complete	News	Female	55-64	US-WEST	Urban	\$25,000-\$49,999	Unknown
117661499	2016-04-21	Complete	News	Female	45-54	US-NORTH	Suburban	\$50,000-\$75,000	Unknown
117814061	2016-04-21	Complete	News	Male	45-54	US-WEST	Suburban	\$25,000-\$49,999	Unknown
118471409	2016-04-21	Partial	News	Male	55-64	US-MIDWEST	Urban	\$0-\$24,999	Unknown
119275411	2016-04-21	Complete	News	Male	45-54	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
119624259	2016-04-21	Complete	News	Male	35-44	US-SOUTH	Urban	\$25,000-\$49,999	Unknown
120514863	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Suburban	\$50,000-\$75,000	Unknown
120637257	2016-04-21	Complete	Other	Female	45-54	US-WEST	Urban	\$50,000-\$75,000	Unknown
120777082	2016-04-21	Complete	News	Female	45-54	US-NORTH	Suburban	\$50,000-\$75,000	Unknown
121250089	2016-04-21	Complete	Other	Male	35-44	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown
121979899	2016-04-21	Complete	News	Male	25-34	US-WEST	Urban	\$25,000-\$49,999	Unknown
122686640	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWEST	Urban	\$75,000-\$99,999	Unknown
123069020	2016-04-21	Complete	News	Female	18-24	US-NORTH	Urban	\$25,000-\$49,999	Unknown

Weight	Question #	Question #	Question #	Question #	Question #	Question #	Question #	Question #	Question #
0.939	Will possibly consider	synthetic	laboratory-grown gemstone	[manufacturer name]-created gemstone	imitation	simulation	synthetic		
0.744	Will possibly consider				None of the above				None of the above
0.744	Will possibly consider				None of the above				None of the above
2.023	Will possibly consider				None of the above	imitation	simulation	synthetic	
1.052	Will not consider at all	synthetic gemstone				imitation			
	Will possibly consider		laboratory-grown gemstone						
2.023	Will not consider at all	synthetic gemstone				imitation	simulation	synthetic	
1.052	Will definitely consider	synthetic gemstone				imitation	simulation	synthetic	
0.585	Will probably consider				None of the above				None of the above
1.016	Will possibly consider				None of the above				None of the above
0.744	Will probably consider	laboratory-grown gemstone						synthetic	
	Will possibly consider								
1.222	Will not consider at all				None of the above	imitation	simulation	synthetic	
	Will definitely consider		laboratory-grown gemstone		[manufacturer name]-created gemstone	imitation			
	Will definitely consider	synthetic gemstone					simulation		
	Will not consider at all	laboratory-grown gemstone				imitation			
1.222	Will not consider at all				None of the above				None of the above
0.879	Will definitely consider	laboratory-grown gemstone					simulation		
0.717	Will not consider at all				None of the above	imitation			
0.847	Will possibly consider				None of the above				None of the above
1.052	Will definitely consider	synthetic gemstone				imitation		synthetic	
	Will not consider at all	laboratory-grown gemstone							None of the above
0.939	Will probably consider	laboratory-grown gemstone					simulation	synthetic	
0.523	Will possibly consider				[manufacturer name]-created gemstone	imitation	simulation		
1.962	Will definitely consider	laboratory-grown gemstone						synthetic	
0.847	Will probably consider	synthetic gemstone							None of the above
0.847	Will not consider at all				None of the above				None of the above
	Will not consider at all				None of the above				None of the above
0.799	Will not consider at all				None of the above			synthetic	
	Will definitely consider								
0.939	Will not consider at all				None of the above				None of the above
0.855	Will possibly consider				[manufacturer name]-created gemstone	imitation			
0.585	Will not consider at all	laboratory-grown gemstone					simulation		
1.052	Will probably consider	synthetic gemstone						synthetic	
	Will not consider at all	laboratory-grown gemstone						synthetic	
0.879	Will not consider at all				[manufacturer name]-created gemstone	imitation			
1.052	Will possibly consider	synthetic gemstone				imitation		synthetic	
1.428	Will not consider at all				None of the above				None of the above
0.939	Will probably consider	synthetic gemstone							
1.016	Will not consider at all	laboratory-grown gemstone			[manufacturer name]-created gemstone			synthetic	
	Will not consider at all								
0.585	Will probably consider				[manufacturer name]-created gemstone		simulation		
	Will not consider at all				None of the above				None of the above
0.799	Will possibly consider	laboratory-grown gemstone				imitation	simulation	synthetic	
1.962	Will probably consider				None of the above				None of the above
1.016	Will not consider at all				None of the above	imitation			None of the above
1.116	Will definitely consider	synthetic gemstone				imitation	simulation		
0.717	Will possibly consider	synthetic gemstone						synthetic	
0.855	Will not consider at all	laboratory-grown gemstone						synthetic	
1.186	Will not consider at all	synthetic gemstone				imitation		synthetic	
0.799	Will not consider at all	synthetic gemstone							None of the above
	Will not consider at all								
1.962	Will probably consider				None of the above		simulation		
0.847	Will not consider at all	synthetic gemstone						synthetic	
	Will not consider at all				[manufacturer name]-created gemstone	imitation			
0.799	Will not consider at all				None of the above				None of the above
1.186	Will not consider at all				None of the above				None of the above
0.879	Will not consider at all				None of the above				None of the above
1.052	Will not consider at all	synthetic gemstone				imitation	simulation	synthetic	
	Will not consider at all	laboratory-grown gemstone					simulation		
1.094	Will not consider at all				None of the above				None of the above

Response	Response	Response	Time #3
6107ms	6950ms	2894ms	
8715ms	4387ms	1870ms	
1945ms	2440ms	1592ms	
67164ms	6285ms	7088ms	
7211ms	14877ms	8918ms	
12265ms	11738ms		
8829ms	23077ms	16335ms	
38583ms	11388ms	4764ms	
6560ms	12412ms	5457ms	
2334ms	6029ms	2421ms	
5633ms	3402ms	2462ms	
7929ms			
7386ms	12349ms	6012ms	
12516ms	9318ms	2202ms	
11412ms	4235ms	2993ms	
11118ms	10363ms	2230ms	
20019ms	6743ms	1693ms	
13035ms	3918ms	2615ms	
8277ms	8254ms	6664ms	
5660ms	10618ms	3495ms	
6225ms	15527ms	7428ms	
11457ms	7662ms	2365ms	
12188ms	22243ms	18326ms	
6509ms	17168ms	9892ms	
20679ms	3741ms	6853ms	
21055ms	17100ms	13239ms	
5226ms	2564ms	2293ms	
5873ms	3221ms	1393ms	
16153ms	19299ms	6872ms	
3020ms			
5726ms	3939ms	1681ms	
2425ms	3271ms	3424ms	
8017ms	3490ms	2749ms	
7614ms	2192ms	1840ms	
14718ms	10681ms	5741ms	
11813ms	4035ms	2436ms	
12256ms	13559ms	8122ms	
24487ms	19783ms	8442ms	
11343ms	7889ms	5528ms	
28219ms	16258ms	21330ms	
19785ms			
14637ms	20989ms	6086ms	
7393ms	5286ms	3434ms	
25528ms	29999ms	16132ms	
2705ms	12361ms	3706ms	
13906ms	11820ms	10302ms	
17095ms	31528ms	12842ms	
10824ms	13921ms	8137ms	
11346ms	10115ms	10943ms	
10594ms	15261ms	21315ms	
7947ms	5958ms	3631ms	
19736ms			
2750ms	2575ms	1707ms	
10518ms	17008ms	6486ms	
120365ms	6942ms	3494ms	
6101ms	13192ms	4953ms	
5250ms	4019ms	7762ms	
2522ms	2047ms	2127ms	
8943ms	13806ms	5492ms	
2272ms	2131ms	2432ms	
8932ms	10051ms	2061ms	

123423804	2016-04-21	Complete	News	Unknown	Unknown	US-WEST-Suburban	\$25,000-\$49,999	Unknown
124103280	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH-Suburban	\$25,000-\$49,999	Unknown
124626504	2016-04-21	Complete	News	Unknown	Unknown	US-NORTH-Rural	\$25,000-\$49,999	Unknown
124840574	2016-04-21	Complete	News	Male	45-54	US-MIDWEST-Suburban	\$25,000-\$49,999	Unknown
126999274	2016-04-21	Complete	Reference	Unknown	Unknown	US-MIDWEST-Urban	\$25,000-\$49,999	Unknown
127166986	2016-04-21	Complete	Mobile App	Male	25-34	US-WEST-Rural	I prefer not to disclose	Unknown
127367201	2016-04-21	Complete	Mobile App	Male	25-34	US-NORTH-Suburban	\$75,000-\$99,999	Unknown
128395196	2016-04-21	Complete	News	Unknown	Unknown	US-WEST-Suburban	\$25,000-\$49,999	Unknown
128763394	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWEST-Rural	\$25,000-\$49,999	Unknown
129231907	2016-04-21	Complete	News	Unknown	Unknown	US-WEST-Rural	\$25,000-\$49,999	Unknown
129296361	2016-04-21	Complete	Mobile App	Female	25-34	US-WEST-Suburban	\$100,000-\$149,999	Unknown
129368433	2016-04-21	Complete	Reference	Unknown	Unknown	US-SOUTH-Suburban	\$25,000-\$49,999	Unknown
129448656	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH-Urban	\$25,000-\$49,999	Unknown
129758686	2016-04-21	Complete	Reference	Unknown	Unknown	US-MIDWEST-Rural	\$25,000-\$49,999	Unknown
130725463	2016-04-21	Complete	News	Male	25-34	US-NORTH-Suburban	\$25,000-\$49,999	Unknown
131466829	2016-04-21	Complete	Mobile App	Male	25-34	US-SOUTH-Rural	\$25,000-\$49,999	Unknown
131708571	2016-04-21	Complete	News	Male	25-34	US-MIDWEST-Suburban	\$50,000-\$74,999	Unknown
131730776	2016-04-21	Complete	Mobile App	Male	35-44	US-NORTH-Suburban	\$25,000-\$49,999	Unknown
131800910	2016-04-21	Complete	Other	Female	Unknown	US-NORTH-Urban	\$50,000-\$74,999	Unknown
131906511	2016-04-21	Complete	Reference	Unknown	Unknown	US-MIDWEST-Urban	\$25,000-\$49,999	Unknown
132443454	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH-Rural	\$25,000-\$49,999	Unknown
132717747	2016-04-21	Complete	News	Female	55-64	US-SOUTH-Rural	\$25,000-\$49,999	Unknown
133575636	2016-04-21	Complete	Reference	Unknown	Unknown	US-WEST-Rural	\$25,000-\$49,999	Unknown
134391184	2016-04-21	Complete	News	Female	45-54	US-MIDWEST-Suburban	\$50,000-\$74,999	Unknown
134596354	2016-04-21	Complete	Mobile App	Female	18-24	US-MIDWEST-Urban	\$0-\$24,999	Unknown
134620712	2016-04-21	Complete	Reference	Unknown	Unknown	US-SOUTH-Rural	\$25,000-\$49,999	Unknown
134761814	2016-04-21	Complete	News	Female	45-54	US-SOUTH-Urban	\$25,000-\$49,999	Unknown
135165226	2016-04-21	Complete	Mobile App	Male	18-24	US-WEST-Suburban	\$0-\$24,999	Unknown
135199206	2016-04-21	Complete	News	Female	35-44	US-WEST-Suburban	\$25,000-\$49,999	Unknown
13577323	2016-04-21	Complete	Reference	Unknown	Unknown	US-WEST-Suburban	\$25,000-\$49,999	Unknown
135841043	2016-04-21	Complete	News	Female	35-44	US-SOUTH-Urban	\$25,000-\$49,999	Unknown
135904863	2016-04-21	Partial	News	Male	45-54	US-MIDWEST-Rural	\$25,000-\$49,999	Unknown
135940401	2016-04-21	Complete	Mobile App	Male	25-34	US-NORTH-Urban	\$0-\$24,999	Unknown
136504486	2016-04-21	Complete	Reference	Unknown	Unknown	US-SOUTH-Rural	\$25,000-\$49,999	Unknown
136746266	2016-04-21	Complete	Mobile App	Female	18-24	US-MIDWEST-Urban	\$25,000-\$49,999	Unknown
137146646	2016-04-21	Complete	Mobile App	Female	18-24	US-SOUTH-Suburban	\$25,000-\$49,999	Unknown
137316126	2016-04-21	Complete	News	Male	25-34	US-SOUTH-Suburban	\$50,000-\$74,999	Unknown
137540074	2016-04-21	Complete	News	Male	35-44	US-SOUTH-Urban	\$0-\$24,999	Unknown
138206296	2016-04-21	Complete	Mobile App	Female	25-34	US-SOUTH-Rural	\$50,000-\$74,999	Unknown
138219676	2016-04-21	Complete	News	Female	35-44	US-WEST-Suburban	\$75,000-\$99,999	Unknown
138881076	2016-04-21	Complete	News	Male	45-54	US-WEST-Suburban	\$25,000-\$49,999	Unknown
139652971	2016-04-21	Partial	News	Female	25-34	US-NORTH-Suburban	\$50,000-\$74,999	Unknown
139702374	2016-04-21	Complete	News	Male	45-54	US-WEST-Suburban	\$25,000-\$49,999	Unknown
139708136	2016-04-21	Complete	News	Male	55-64	US-WEST-Suburban	\$25,000-\$49,999	Unknown
140507091	2016-04-21	Complete	News	Male	55-64	US-SOUTH-Urban	\$50,000-\$74,999	Unknown
140873121	2016-04-21	Complete	News	Female	45-54	US-MIDWEST-Urban	\$0-\$24,999	Unknown
141378566	2016-04-21	Complete	News	Male	25-34	US-WEST-Urban	\$25,000-\$49,999	Unknown
142338746	2016-04-21	Complete	Mobile App	Female	18-24	US-SOUTH-Suburban	\$0-\$24,999	Unknown
142544686	2016-04-21	Complete	News	Male	18-24	US-WEST-Urban	\$75,000-\$99,999	Unknown
143143484	2016-04-21	Complete	News	Male	35-44	US-MIDWEST-Suburban	\$50,000-\$74,999	Unknown
143610711	2016-04-21	Complete	News	Male	35-44	US-WEST-Suburban	\$25,000-\$49,999	Unknown
144017016	2016-04-21	Complete	News	Male	65+	US-MIDWEST-Suburban	\$50,000-\$74,999	Unknown
144110767	2016-04-21	Complete	News	Female	65+	US-MIDWEST-Urban	\$25,000-\$49,999	Unknown
144730290	2016-04-21	Complete	News	Male	35-44	US-SOUTH-Suburban	\$25,000-\$49,999	Unknown
145718710	2016-04-21	Complete	Mobile App	Male	25-34	US-SOUTH-Rural	\$50,000-\$74,999	Unknown
145776244	2016-04-21	Complete	News	Male	55-64	US-SOUTH-Rural	\$25,000-\$49,999	Unknown
145965493	2016-04-21	Complete	News	Male	55-64	US-WEST-Urban	\$50,000-\$74,999	Unknown
146331036	2016-04-21	Complete	Other	Male	18-24	US-SOUTH-Urban	\$50,000-\$74,999	Unknown
146478396	2016-04-21	Complete	News	Male	25-34	US-SOUTH-Urban	\$25,000-\$49,999	Unknown
146961724	2016-04-21	Complete	News	Male	55-64	US-SOUTH-Suburban	\$50,000-\$74,999	Unknown
147103923	2016-04-21	Complete	News	Male	35-44	US-MIDWEST-Urban	\$0-\$24,999	Unknown
147260397	2016-04-21	Complete	News	Female	45-54	US-NORTH-Rural	\$25,000-\$49,999	Unknown

	Will not consider at all	None of the above			None of the
	Will possibly consider synthetic gemstone	imitation	simulation	synthetic	
	Will definitely consider	[manufacturer name]-created gemstone	simulation		
1.222	Will not consider at all	None of the above			None of the
	Will possibly consider	None of the above			None of the
1.052	Will possibly consider synthetic laboratory-grown gemstone	imitation	simulation	synthetic	
0.768	Will possibly consider synthetic gemstone	imitation		synthetic	
	Will not consider at all	None of the above			None of the
	Will not consider at all	None of the above			None of the
1.052	Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic	
	Will possibly consider synthetic gemstone			synthetic	
	Will not consider at all	None of the above			None of the
	Will not consider at all	None of the above			None of the
0.768	Will possibly consider	None of the imitation			
1.116	Will definitely consider synthetic laboratory-	[manufacturer name]-imitation	simulation	synthetic	
0.585	Will possibly consider laboratory-grown gemstone				None of the
2.023	Will definitely consider	None of the above			None of the
	Will possibly consider synthetic gemstone	imitation			
	Will not consider at all laboratory-grown gemstone	imitation			
	Will not consider synthetic gemstone	imitation	simulation	synthetic	
1.493	Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic	
	Will not consider at all	None of the above		synthetic	
1.222	Will not consider at all	None of the above			None of the
0.523	Will probably consider synthetic laboratory-grown gemstone	imitation	simulation	synthetic	
	Will not consider at all	None of the above			None of the
1.962	Will probably consider	None of the imitation	simulation	synthetic	
0.939	Will definitely consider synthetic laboratory-	[manufacturer name]-imitation	simulation	synthetic	
0.744	Will not consider at all	None of the imitation			
	Will possibly consider synthetic gemstone			synthetic	
0.847	Will not consider synthetic gemstone	imitation	simulation	synthetic	
	Will definitely consider				
0.768	Will possibly consider	None of the imitation	simulation	synthetic	
	Will definitely consider	None of the above	simulation		
0.523	Will possibly consider laboratory-grown gemstone	imitation	simulation		
1.138	Will definitely consider	[manufacturer name]-imitation		synthetic	
1.116	Will probably consider	None of the above			None of the
0.847	Will not consider at all laboratory-grown gemstone				None of the
1.116	Will definitely consider synthetic gemstone	imitation	simulation		
0.744	Will not consider at all	None of the above			None of the
0.799	Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic	
	Will not consider at all				
0.799	Will probably consider laboratory-grown gemstone	imitation			
0.855	Will not consider synthetic gemstone	imitation	simulation	synthetic	
1.493	Will not consider at all	None of the above			None of the
1.222	Will not consider at all	None of the above			None of the
1.052	Will not consider synthetic gemstone			synthetic	
1.138	Will probably consider laboratory-grown gemstone	imitation		synthetic	
0.939	Will possibly consider	None of the imitation			
0.879	Will possibly consider	[manufacturer name]-imitation	simulation	synthetic	
0.744	Will not consider at all	None of the above		synthetic	
1.09	Will possibly consider	[manufacturer name]-imitation	simulation	synthetic	
1.09	Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic	
0.847	Will possibly consider laboratory-grown gemstone	imitation			
1.116	Will definitely consider	[manufacturer name]-imitation	simulation	synthetic	
1.493	Will not consider at all	None of the imitation		synthetic	
0.855	Will not consider at all laboratory-grown gemstone			synthetic	
1.138	Will not consider at all	None of the above			None of the
1.116	Will definitely consider	[manufacturer name]-created gemstone		synthetic	
1.493	Will possibly consider synthetic gemstone	imitation	simulation	synthetic	
0.879	Will not consider at all	None of the above			None of the
1.186	Will not consider at all	None of the imitation	simulation	synthetic	

258363ms	4288ms	2342ms
18004ms	17636ms	19220ms
8941ms	58541ms	26795ms
16416ms	5807ms	2872ms
12602ms	19929ms	7964ms
10175ms	23306ms	13565ms
15880ms	31783ms	29696ms
10268ms	21227ms	8928ms
14762ms	6291ms	6291ms
8678ms	4667ms	7045ms
7576ms	10893ms	7976ms
270716ms	2543ms	1809ms
6039ms	2575ms	2273ms
12706ms	8034ms	6552ms
3343ms	2124ms	5892ms
9999ms	16208ms	14631ms
11428ms	2310ms	2067ms
13321ms	16207ms	15643ms
10014ms	7500ms	7235ms
31298ms	7402ms	2745ms
37175ms	16976ms	14928ms
15687ms	19517ms	8470ms
144654ms	17078ms	15539ms
10218ms	4010ms	2931ms
8934ms	58741ms	6956ms
22212ms	7656ms	6072ms
5323ms	9475ms	7045ms
18526ms	17413ms	10580ms
20774ms	20756ms	8207ms
32182ms	13436ms	2499ms
10055ms	15408ms	7012ms
13349ms		
12272ms	18840ms	8201ms
5734ms	7804ms	3373ms
8771ms	29219ms	21492ms
8594ms	20377ms	6402ms
5349ms	3770ms	1504ms
15099ms	11667ms	10500ms
36617ms	12677ms	6705ms
16667ms	8689ms	7372ms
17847ms	17526ms	13348ms
13646ms		
5110ms	3046ms	2498ms
6273ms	7516ms	8306ms
17690ms	11903ms	5652ms
67329ms	3497ms	4267ms
18068ms	6417ms	3689ms
68757ms	41091ms	11931ms
35042ms	7020ms	4732ms
10330ms	9347ms	6244ms
13139ms	11328ms	5900ms
16456ms	18351ms	22043ms
51494ms	39385ms	12980ms
7232ms	5955ms	5763ms
9189ms	25342ms	7925ms
10438ms	8691ms	24568ms
4427ms	10072ms	5161ms
6371ms	3026ms	1942ms
24086ms	10381ms	3683ms
28004ms	39102ms	19052ms
8353ms	2646ms	2623ms
20456ms	20715ms	14125ms

147750492	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH	Rural	\$0-\$24,999	Unknown
148074596	2016-04-21	Complete	Other	Female	45-54	US-WEST	Urban	\$25,000-\$49,999	Unknown
149024712	2016-04-21	Complete	News	Female	25-34	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
149080521	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$49,999	Unknown
149642656	2016-04-21	Complete	Reference	Unknown	Unknown	US-WEST	Suburban	\$50,000-\$74,999	Unknown
149769830	2016-04-21	Complete	News	Male	65+	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
149902823	2016-04-21	Complete	News	Female	55-64	US-WEST	Suburban	\$25,000-\$49,999	Unknown
151021400	2016-04-21	Complete	News	Male	65+	US-NORTH	Urban	\$50,000-\$74,999	Unknown
151126478	2016-04-21	Partial	News	Female	18-24	US-NORTH	Urban	\$50,000-\$74,999	Unknown
152334190	2016-04-21	Complete	Mobile App	Male	18-24	US-MIDWEST	Suburban	\$100,000-\$149,999	Unknown
152384029	2016-04-21	Complete	News	Male	Unknown	US-WEST	Urban	\$25,000-\$49,999	Unknown
152813387	2016-04-21	Complete	News	Male	65+	US-SOUTH	Suburban	\$50,000-\$74,999	Unknown
153106203	2016-04-21	Complete	Reference	Female	Unknown	US-WEST	Urban	\$25,000-\$49,999	Unknown
153257327	2016-04-21	Complete	News	Male	55-64	US-NORTH	Urban	\$0-\$24,999	Unknown
153702862	2016-04-21	Complete	Other	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
153730755	2016-04-21	Complete	News	Male	45-54	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
153828147	2016-04-21	Complete	Other	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
153934659	2016-04-21	Complete	Other	Male	35-44	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
154658773	2016-04-21	Complete	News	Female	35-44	US-WEST	Suburban	\$25,000-\$49,999	Unknown
155097396	2016-04-21	Complete	Other	Unknown	Unknown	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
155302554	2016-04-21	Complete	Mobile App	Male	25-34	US-WEST	Suburban	\$75,000-\$99,999	Unknown
155456015	2016-04-21	Complete	Other	Male	Unknown	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
156092516	2016-04-21	Complete	News	Male	45-54	US-WEST	Suburban	\$50,000-\$74,999	Unknown
15645544	2016-04-21	Complete	Mobile App	Female	18-24	US-SOUTH	Urban	\$0-\$24,999	Unknown
156839206	2016-04-21	Complete	Other	Male	45-54	US-WEST	Suburban	\$25,000-\$49,999	Unknown
156950868	2016-04-21	Complete	News	Male	55-64	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
156955566	2016-04-21	Complete	News	Female	25-34	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
157690707	2016-04-21	Complete	Arts & Entertainment	Unknown	Unknown	US-WEST	Suburban	\$75,000-\$99,999	Unknown
157785222	2016-04-21	Complete	News	Female	18-24	US-WEST	Urban	\$25,000-\$49,999	Unknown
157844096	2016-04-21	Complete	News	Male	55-64	US-NORTH	Urban	\$50,000-\$74,999	Unknown
158445851	2016-04-21	Complete	Mobile App	Female	25-34	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
158938443	2016-04-21	Complete	Mobile App	Male	25-34	US-MIDWEST	Suburban	\$50,000-\$74,999	Unknown
159152854	2016-04-21	Complete	Mobile App	Male	18-24	US-MIDWEST	Rural	\$75,000-\$99,999	Unknown
160049630	2016-04-21	Complete	Mobile App	Female	18-24	US-MIDWEST	Suburban	I prefer not to disclose	Unknown
160079676	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
160396235	2016-04-21	Complete	News	Female	25-34	US-NORTH	Urban	\$75,000-\$99,999	Unknown
160408573	2016-04-21	Complete	Other	Male	25-34	US-WEST	Suburban	\$25,000-\$49,999	Unknown
160469806	2016-04-21	Complete	News	Male	45-54	US-NORTH	Urban	\$75,000-\$99,999	Unknown
160714007	2016-04-21	Complete	News	Male	18-24	US-WEST	Urban	\$25,000-\$49,999	Unknown
160807920	2016-04-21	Complete	News	Female	55-64	US-WEST	Suburban	\$25,000-\$49,999	Unknown
160922576	2016-04-21	Complete	News	Male	25-34	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
161222532	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH	Urban	\$50,000-\$74,999	Unknown
161375277	2016-04-21	Complete	Other	Male	18-24	US-NORTH	Urban	\$0-\$24,999	Unknown
161564266	2016-04-21	Complete	News	Female	35-44	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
162527064	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
163019939	2016-04-21	Complete	News	Male	65+	US-SOUTH	Urban	\$50,000-\$74,999	Unknown
163142983	2016-04-21	Partial	News	Male	65+	US-SOUTH	Urban	\$25,000-\$49,999	Unknown
163148822	2016-04-21	Complete	Mobile App	Female	35-44	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown
163251609	2016-04-21	Complete	News	Female	25-34	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
163551133	2016-04-21	Complete	Mobile App	Female	35-44	US-MIDWEST	Rural	\$0-\$24,999	Unknown
163943973	2016-04-21	Complete	Other	Male	55-64	US-NORTH	Rural	\$25,000-\$49,999	Unknown
164211070	2016-04-21	Complete	News	Female	45-54	US-NORTH	Rural	\$25,000-\$49,999	Unknown
164497705	2016-04-21	Partial	Other	Male	35-44	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
164578187	2016-04-21	Complete	News	Male	45-54	US-WEST	Rural	\$50,000-\$74,999	Unknown
164829174	2016-04-21	Complete	News	Male	18-24	US-NORTH	Suburban	\$50,000-\$74,999	Unknown
164870898	2016-04-21	Complete	News	Female	25-34	US-SOUTH	Urban	\$25,000-\$49,999	Unknown
164888156	2016-04-21	Complete	Mobile App	Female	35-44	US-WEST	Suburban	\$25,000-\$49,999	Unknown
165699728	2016-04-21	Complete	News	Male	25-34	US-MIDWEST	Suburban	\$100,000-\$149,999	Unknown
165840919	2016-04-21	Complete	News	Male	45-54	US-WEST	Urban	\$25,000-\$49,999	Unknown
166215016	2016-04-21	Complete	News	Male	55-64	US-WEST	Urban	\$50,000-\$74,999	Unknown
166318266	2016-04-21	Complete	News	Male	65+	US-NORTH	Suburban	\$25,000-\$49,999	Unknown
166853596	2016-04-21	Complete	News	Female	18-24	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown

0.799	Will not consider at all	None of the imitation	simulation	synthetic	
0.585	Will not consider at all laboratory-grown gemstone		simulation	synthetic	None of the
1.428	Will possibly consider	imitation	simulation	synthetic	
0.855	Will not consider at all	None of the imitation			None of the
1.141	Will possibly consider synthetic gemstone	imitation		synthetic	
0.523	Will not consider at all	None of the imitation	simulation	synthetic	
1.428	Will not consider at all laboratory-grown gemstone		simulation	synthetic	None of the
1.016	Will not consider at all [manufacturer name]-created gemstone				None of the
1.222	Will not consider at all laboratory-grown gemstone		simulation	synthetic	
0.847	Will not consider at all	None of the imitation	simulation	synthetic	None of the
0.744	Will possibly consider	None of the imitation	simulation	synthetic	
1.052	Will possibly consider synthetic gemstone			synthetic	
0.799	Will possibly consider [manufacturer name]-created gemstone		simulation	synthetic	
1.138	Will definitely consider synthetic gemstone	imitation	simulation	synthetic	
0.799	Will possibly consider synthetic gemstone	imitation	simulation	synthetic	
0.717	Will not consider at all	None of the imitation	simulation	synthetic	
1.116	Will not consider at all	None of the above			None of the
0.939	Will not consider at all [manufacturer name]-created gemstone		simulation	synthetic	
1.016	Will not consider at all	None of the above			None of the
0.585	Will not consider at all laboratory-grown gemstone			synthetic	
0.585	Will probably consider synthetic gemstone	imitation	simulation	synthetic	
0.523	Will probably consider laboratory-grown gemstone	imitation			
0.523	Will not consider at all laboratory-grown gemstone		simulation	synthetic	None of the
0.768	Will possibly consider synthetic gemstone	imitation	simulation	synthetic	None of the
1.052	Will not consider at all	None of the above			None of the
1.186	Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic	
0.939	Will probably consider	None of the above		synthetic	
0.855	Will not consider at all synthetic gemstone	imitation	simulation	synthetic	
1.116	Will not consider at all	None of the above			None of the
1.094	Will not consider at all laboratory-grown gemstone				None of the
0.847	Will definitely consider	None of the imitation	simulation	synthetic	
1.428	Will not consider at all [manufacturer name]-created gemstone				None of the
0.879	Will not consider at all	None of the above			None of the
1.116	Will possibly consider synthetic gemstone	imitation	simulation		
0.879	Will not consider at all laboratory-grown gemstone		simulation	synthetic	
1.016	Will possibly consider [manufacturer name]-created gemstone		simulation	synthetic	
1.186	Will possibly consider synthetic gemstone	imitation	simulation	synthetic	
0.799	Will not consider at all	None of the above			None of the
1.094	Will not consider at all	None of the imitation	simulation		
1.116	Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic	
0.744	Will probably consider laboratory-grown gemstone	[manufacturer name]-created gemstone	simulation	synthetic	
0.585	Will possibly consider laboratory-grown gemstone			synthetic	
0.799	Will not consider at all synthetic gemstone				None of the
0.855	Will not consider at all	None of the above			None of the
1.141	Will not consider at all	None of the above			None of the
1.138	Will possibly consider synthetic gemstone	imitation	simulation		

13373ms	8730ms	7152ms
131549ms	23635ms	5824ms
7122ms	4196ms	2138ms
9713ms	15753ms	7846ms
8905ms	8207ms	7172ms
8676ms	10997ms	13015ms
20858ms	33693ms	11855ms
46069ms	53340ms	34537ms
5611ms		
13870ms	25744ms	10524ms
13044ms	27902ms	5981ms
15948ms	37060ms	11861ms
6463ms	4380ms	2982ms
12871ms	23270ms	10346ms
12265ms	16745ms	7214ms
26220ms	13100ms	5698ms
21994ms	11766ms	8725ms
12720ms	27211ms	13325ms
12410ms	13779ms	8630ms
6137ms	14342ms	5527ms
27312ms	24444ms	7715ms
8822ms	3520ms	1660ms
8245ms	11889ms	13903ms
32245ms	12160ms	9388ms
7165ms	3352ms	10275ms
558607ms	7675ms	6116ms
14517ms	15271ms	7318ms
11112ms	2897ms	2348ms
10731ms	7377ms	3014ms
4655ms	8603ms	6829ms
7794ms	15000ms	8337ms
12315ms	12650ms	28362ms
16444ms	2179ms	1910ms
19954ms	25087ms	12463ms
20753ms	10638ms	3207ms
50749ms	6979ms	16542ms
7428ms	11569ms	5964ms
13024ms	6349ms	9011ms
12508ms	15113ms	8693ms
17175ms	21906ms	10931ms
15097ms	3085ms	1545ms
7909ms	5967ms	7692ms
9060ms	18450ms	9027ms
15886ms	17203ms	16636ms
21534ms	9725ms	6635ms
7950ms	7375ms	3176ms
7153ms		
6531ms	24461ms	10817ms
7201ms	26341ms	12063ms
28068ms	41770ms	9027ms
17315ms	21661ms	17611ms
10370ms	7804ms	3852ms
5180ms		
16663ms	14000ms	8197ms
7985ms	18971ms	21509ms
11049ms	11169ms	6256ms
13654ms	9232ms	8801ms
8651ms	2829ms	1439ms
10367ms	16106ms	19934ms
11265ms	13188ms	3774ms
17851ms	13649ms	9284ms
14674ms	9024ms	8902ms

166960844	2016-04-2	Complete	Other	Female	Unknown	US-WEST-Suburban	\$75,000-\$99,999	Unknown
167701769	2016-04-2	Complete	Mobile App	Female	25-34	US-NORTH-Suburban	\$25,000-\$49,999	Unknown
167742181	2016-04-2	Complete	Other	Male	25-34	US-SOUTH-Urban	\$25,000-\$49,999	Unknown
168155710	2016-04-2	Complete	News	Female	55-64	US-SOUTH-Urban	\$50,000-\$74,999	Unknown
168372994	2016-04-2	Complete	News	Female	25-34	US-NORTH-Suburban	\$50,000-\$74,999	Unknown
169067235	2016-04-2	Complete	Mobile App	Male	35-44	US-SOUTH-Urban	\$50,000-\$74,999	Unknown
169302672	2016-04-2	Complete	Mobile App	Male	18-24	US-MIDWEST-Suburban	\$100,000-\$149,999	Unknown
169883727	2016-04-2	Complete	News	Male	45-54	US-WEST-Urban	\$25,000-\$49,999	Unknown
170020273	2016-04-2	Complete	News	Unknown	Unknown	US-MIDWEST-Urban	\$25,000-\$49,999	Unknown
170189641	2016-04-2	Complete	News	Male	18-24	US-MIDWEST-Urban	\$25,000-\$49,999	Unknown
170199280	2016-04-2	Complete	News	Unknown	Unknown	US-WEST-Suburban	\$25,000-\$49,999	Unknown
170917449	2016-04-2	Complete	News	Male	45-54	US-WEST-Suburban	\$25,000-\$49,999	Unknown
170939102	2016-04-2	Complete	News	Male	65+	US-NORTH-Urban	\$50,000-\$74,999	Unknown
172952329	2016-04-2	Partial	News	Unknown	Unknown	US-WEST-Suburban	\$25,000-\$49,999	Unknown
173233513	2016-04-2	Complete	Other	Male	55-64	US-NORTH-Urban	\$75,000-\$99,999	Unknown
173533450	2016-04-2	Partial	News	Male	55-64	US-MIDWEST-Urban	\$50,000-\$74,999	Unknown
173544546	2016-04-2	Complete	Reference	Female	Unknown	US-MIDWEST-Urban	\$100,000-\$149,999	Unknown
174122526	2016-04-2	Complete	News	Unknown	Unknown	US-WEST-Suburban	\$0-\$24,999	Unknown
174464270	2016-04-2	Complete	News	Female	25-34	US-SOUTH-Urban	\$25,000-\$49,999	Unknown
174969914	2016-04-2	Complete	News	Male	65+	US-NORTH-Urban	\$25,000-\$49,999	Unknown
175116874	2016-04-2	Complete	Other	Female	45-54	US-NORTH-Suburban	\$75,000-\$99,999	Unknown
175174258	2016-04-2	Complete	Mobile App	Male	25-34	US-WEST-Suburban	\$25,000-\$49,999	Unknown
175471219	2016-04-2	Complete	Mobile App	Female	35-44	US-MIDWEST-Rural	\$0-\$24,999	Unknown
176479602	2016-04-2	Complete	Mobile App	Female	35-44	US-SOUTH-Rural	\$0-\$24,999	Unknown
176625234	2016-04-2	Complete	News	Male	65+	US-NORTH-Suburban	\$25,000-\$49,999	Unknown
177157547	2016-04-2	Complete	News	Male	35-44	US-SOUTH-Suburban	\$25,000-\$49,999	Unknown
177306721	2016-04-2	Complete	Mobile App	Female	55-64	US-WEST-Urban	\$75,000-\$99,999	Unknown
177700592	2016-04-2	Complete	Mobile App	Female	18-24	US-WEST-Suburban	\$25,000-\$49,999	Unknown
177943238	2016-04-2	Complete	News	Unknown	Unknown	US-MIDWEST-Rural	\$25,000-\$49,999	Unknown
178050686	2016-04-2	Partial	News	Male	65+	US-MIDWEST-Suburban	\$25,000-\$49,999	Unknown
178084382	2016-04-2	Complete	Mobile App	Female	25-34	US-SOUTH-Rural	\$50,000-\$74,999	Unknown
178241641	2016-04-2	Complete	News	Unknown	Unknown	US-MIDWEST-Suburban	\$25,000-\$49,999	Unknown
178593924	2016-04-2	Complete	News	Male	45-54	US-WEST-Suburban	\$25,000-\$49,999	Unknown
180201948	2016-04-2	Complete	News	Female	25-34	US-WEST-Urban	\$25,000-\$49,999	Unknown
180308816	2016-04-2	Complete	News	Male	45-54	US-NORTH-Suburban	\$25,000-\$49,999	Unknown
180347165	2016-04-2	Complete	News	Male	65+	US-MIDWEST-Unknown	\$50,000-\$74,999	Unknown
180439353	2016-04-2	Complete	Mobile App	Female	35-44	US-MIDWEST-Urban	\$50,000-\$74,999	Unknown
181044246	2016-04-2	Complete	News	Male	65+	US-SOUTH-Urban	\$25,000-\$49,999	Unknown
181121567	2016-04-2	Complete	Mobile App	Female	45-54	US-MIDWEST-Suburban	\$25,000-\$49,999	Unknown
181301991	2016-04-2	Complete	Arts & Ent	Male	55-64	US-MIDWEST-Suburban	\$50,000-\$74,999	Unknown
181560726	2016-04-2	Complete	Mobile App	Male	25-34	US-SOUTH-Suburban	\$50,000-\$74,999	Unknown
182099795	2016-04-2	Complete	News	Female	55-64	US-SOUTH-Rural	\$25,000-\$49,999	Unknown
182305320	2016-04-2	Complete	News	Female	18-24	US-MIDWEST-Suburban	\$25,000-\$49,999	Unknown
182504916	2016-04-2	Complete	News	Female	65+	US-SOUTH-Urban	\$25,000-\$49,999	Unknown
182527817	2016-04-2	Complete	News	Male	35-44	US-WEST-Suburban	\$25,000-\$49,999	Unknown
183508100	2016-04-2	Complete	Arts & Ent	Female	55-64	US-NORTH-Rural	\$75,000-\$99,999	Unknown
183546086	2016-04-2	Complete	Other	Male	35-44	US-NORTH-Urban	\$75,000-\$99,999	Unknown
183672501	2016-04-2	Complete	Mobile App	Female	35-44	US-SOUTH-Suburban	\$50,000-\$74,999	Unknown
184340372	2016-04-2	Partial	News	Male	55-64	US-SOUTH-Urban	\$0-\$24,999	Unknown
184656044	2016-04-2	Complete	Reference	Unknown	Unknown	US-SOUTH-Urban	\$25,000-\$49,999	Unknown
184934829	2016-04-2	Complete	Other	Male	45-54	US-WEST-Urban	\$25,000-\$49,999	Unknown
186069385	2016-04-2	Complete	Mobile App	Female	18-24	US-MIDWEST-Urban	\$0-\$24,999	Unknown
186349580	2016-04-2	Complete	Reference	Female	18-24	US-NORTH-Urban	\$75,000-\$99,999	Unknown
187186335	2016-04-2	Complete	Arts & Ent	Male	65+	US-MIDWEST-Rural	\$50,000-\$74,999	Unknown
187562183	2016-04-2	Complete	News	Female	35-44	US-MIDWEST-Suburban	\$50,000-\$74,999	Unknown
187876687	2016-04-2	Complete	News	Male	65+	US-NORTH-Rural	\$50,000-\$74,999	Unknown
187878845	2016-04-2	Partial	Arts & Ent	Male	65+	US-NORTH-Suburban	\$50,000-\$74,999	Unknown
187905356	2016-04-2	Complete	News	Unknown	Unknown	US-SOUTH-Suburban	\$25,000-\$49,999	Unknown
188350522	2016-04-2	Complete	News	Female	65+	US-MIDWEST-Suburban	\$25,000-\$49,999	Unknown
188717395	2016-04-2	Complete	Other	Unknown	Unknown	US-WEST-Suburban	\$0-\$24,999	Unknown
188783778	2016-04-2	Complete	News	Female	65+	US-WEST-Suburban	\$50,000-\$74,999	Unknown
18894940	2016-04-2	Complete	Mobile App	Female	35-44	US-SOUTH-Rural	\$100,000-\$149,999	Unknown

0.768	Will not consider synthetic gemstone		imitation	simulation	synthetic	
1.116	Will probably consider	[manufacturer name]-	imitation	simulation		
1.493	Will not consider at all		None of the above			None of the
0.768	Will probably consider synthetic gemstone					None of the
0.847	Will probably consider laboratory-grown gemstone					None of the
0.523	Will definitely consider synthetic gemstone		imitation	simulation	synthetic	
0.799	Will not consider synthetic gemstone	[manufacturer name]-	created gemstone		synthetic	
0.799	Will not consider at all		None of the above			None of the
0.523	Will not consider synthetic gemstone		imitation	simulation	synthetic	
0.799	Will not consider at all		None of the above		synthetic	
0.799	Will not consider at all		None of the above			None of the
1.141	Will probably consider synthetic gemstone			simulation		
1.141	Will possibly consider laboratory-grown gemstone		imitation			
1.016	Will not consider at all		None of the	imitation		
1.016	Will possibly consider synthetic gemstone					
1.016	Will not consider at all		None of the above			None of the
1.116	Will not consider synthetic gemstone	[manufacturer name]-	imitation	simulation	synthetic	
1.116	Will probably consider laboratory-grown gemstone			simulation		
1.141	Will not consider at all		None of the above			None of the
1.186	Will probably consider laboratory-grown gemstone		imitation	simulation	synthetic	
1.052	Will probably consider synthetic gemstone		imitation			
0.879	Will possibly consider synthetic g laboratory-	[manufacturer name]-	imitation		synthetic	
0.847	Will probably consider		None of the above			None of the
1.141	Will not consider at all		None of the above			None of the
0.847	Will not consider synthetic gemstone		imitation	simulation	synthetic	
0.855	Will definitely consider synthetic g laboratory-	[manufacturer name]-	imitation	simulation	synthetic	
0.939	Will probably consider synthetic gemstone	[manufacturer name]-	imitation		synthetic	
1.116	Will probably consider		None of the above			None of the
1.116	Will probably consider laboratory-grown gemstone		imitation	simulation	synthetic	
0.799	Will not consider at all		None of the	imitation	simulation	synthetic
1.052	Will definitely consider laboratory-grown gemstone			simulation		
1.186	Will not consider at all		None of the above			None of the
1.09	Will not consider at all		None of the	imitation	simulation	synthetic
0.879	Will not consider synthetic gemstone					None of the
1.428	Will possibly consider synthetic gemstone				synthetic	
1.222	Will possibly consider synthetic g laboratory-	[manufacturer name]-	created gem	simulation		
0.717	Will not consider synthetic g laboratory-	[manufacturer name]-	imitation		synthetic	
1.116	Will probably consider synthetic g laboratory-	[manufacturer name]-	imitation	simulation	synthetic	
1.493	Will not consider synthetic gemstone		imitation			
0.523	Will not consider at all laboratory-grown gemstone		imitation	simulation	synthetic	
1.428	Will not consider at all		None of the above		synthetic	
0.744	Will possibly consider laboratory-grown gemstone		imitation	simulation	synthetic	
1.016	Will possibly consider		None of the	imitation	simulation	synthetic
2.023	Will possibly consider laboratory-grown gemstone		imitation	simulation	synthetic	
0.847	Will definitely consider laboratory-grown gemstone		imitation	simulation	synthetic	
0.799	Will probably consider		None of the above			None of the
0.799	Will probably consider synthetic gemstone	[manufacturer name]-	imitation			
0.523	Will definitely consider synthetic g laboratory-	[manufacturer name]-	imitation	simulation		
1.094	Will not consider at all		None of the	imitation		
1.09	Will possibly consider		None of the above			None of the
0.879	Will not consider at all laboratory-grown gemstone		imitation	simulation	synthetic	
1.141	Will not consider at all		None of the above			None of the
1.09	Will possibly consider	[manufacturer name]-	imitation			
1.09	Will probably consider		None of the	imitation	simulation	synthetic
2.023	Will not consider at all laboratory-grown gemstone		imitation	simulation	synthetic	
0.847	Will probably consider	[manufacturer name]-	imitation	simulation	synthetic	

19985ms	11106ms	8628ms
12491ms	24913ms	6514ms
4506ms	8536ms	4096ms
8011ms	2912ms	1869ms
5951ms	2553ms	1514ms
9269ms	11428ms	6919ms
3946ms	10723ms	2519ms
7990ms	6051ms	2120ms
26720ms	13861ms	9916ms
3479ms	3425ms	1172ms
17288ms	3218ms	2276ms
14420ms	5788ms	2420ms
10899ms	8947ms	12014ms
79757ms		
7313ms	4004ms	3142ms
46037ms	23244ms	
14401ms	7032ms	2192ms
5061ms	26382ms	16493ms
8932ms	17375ms	7976ms
17737ms	3966ms	2704ms
6761ms	34743ms	9958ms
445561ms	15148ms	11664ms
7504ms	7168ms	12670ms
13529ms	8961ms	6280ms
21715ms	6472ms	6054ms
5793ms	12240ms	15163ms
10720ms	43340ms	10314ms
14836ms	30615ms	9639ms
12290ms	9845ms	5214ms
21845ms		
7077ms	13003ms	20047ms
18519ms	47100ms	7210ms
8127ms	10783ms	12169ms
2533ms	5154ms	1750ms
22915ms	12980ms	7998ms
12819ms	11942ms	16195ms
7427ms	6982ms	4704ms
28465ms	17605ms	9062ms
8383ms	22173ms	11228ms
7904ms	14746ms	9949ms
24282ms	37774ms	11480ms
46703ms	30489ms	11057ms
11619ms	21336ms	12366ms
34634ms	14693ms	13713ms
23259ms	16269ms	9833ms
8589ms	19094ms	9344ms
4605ms	9783ms	7865ms
12217ms	18249ms	5859ms
21227ms		
1787ms	3569ms	1667ms
13882ms	14252ms	16598ms
10452ms	21435ms	37879ms
3158ms	3629ms	1924ms
10524ms	8293ms	3411ms
12908ms	14325ms	15408ms
9626ms	9355ms	3825ms
3945ms		
3546ms	2908ms	2670ms
8801ms	6604ms	10441ms
8869ms	27494ms	9733ms
33151ms	37809ms	9708ms
17297ms	34500ms	16780ms

18917080	2016-04-2	Complete	News	Unknown	Unknown	US-SOUTH	Urban	\$50,000-\$7	Unknown
189277487	2016-04-2	Complete	News	Female	45-54	US-MIDWEST	Suburban	\$25,000-\$2	Unknown
189911387	2016-04-2	Partial	News	Female	25-34	US-NORTH	Urban	\$50,000-\$7	Unknown
190000837	2016-04-2	Complete	News	Female	35-44	US-WEST	Rural	\$25,000-\$2	Unknown
19043399	2016-04-2	Complete	News	Female	25-34	US-NORTH	Suburban	\$25,000-\$2	Unknown
19069508	2016-04-2	Complete	News	Female	55-64	US-MIDWEST	Suburban	\$50,000-\$7	Unknown
190843131	2016-04-2	Complete	Mobile App	Female	Unknown	US-NORTH	Urban	\$75,000-\$9	Unknown
19103215	2016-04-2	Complete	Mobile App	Male	25-34	US-MIDWEST	Suburban	\$25,000-\$2	Unknown
19168684	2016-04-2	Complete	News	Male	45-54	US-MIDWEST	Suburban	\$25,000-\$2	Unknown
19241656	2016-04-2	Complete	Mobile App	Female	25-34	US-WEST	Suburban	\$75,000-\$9	Unknown
19246077	2016-04-2	Complete	News	Unknown	Unknown	US-MIDWEST	Urban	\$0-\$24,99	Unknown
19255947	2016-04-2	Complete	Mobile App	Male	25-34	US-MIDWEST	Suburban	\$75,000-\$9	Unknown
19267420	2016-04-2	Complete	News	Female	45-54	US-SOUTH	Suburban	\$50,000-\$7	Unknown
19291375	2016-04-2	Complete	News	Unknown	Unknown	US-SOUTH	Suburban	\$25,000-\$2	Unknown
19303534	2016-04-2	Complete	News	Female	35-44	US-SOUTH	Suburban	\$75,000-\$9	Unknown
193870321	2016-04-2	Partial	News	Female	25-34	US-MIDWEST	Suburban	\$25,000-\$2	Unknown
19392579	2016-04-2	Complete	News	Female	35-44	US-WEST	Urban	\$25,000-\$2	Unknown
19446374	2016-04-2	Complete	Mobile App	Female	18-24	US-SOUTH	Suburban	\$50,000-\$7	Unknown
19519563	2016-04-2	Complete	Mobile App	Male	25-34	US-NORTH	Suburban	I prefer not	Unknown
19530066	2016-04-2	Complete	News	Male	45-54	US-MIDWEST	Rural	\$25,000-\$2	Unknown
19563648	2016-04-2	Complete	News	Female	65+	US-WEST	Suburban	\$25,000-\$2	Unknown
19633764	2016-04-2	Complete	Arts & Ent	Female	65+	US-NORTH	Urban	\$25,000-\$2	Unknown
19655961	2016-04-2	Complete	Other	Female	55-64	US-MIDWEST	Suburban	\$25,000-\$2	Unknown
19774553	2016-04-2	Complete	Arts & Ent	Unknown	Unknown	US-SOUTH	Suburban	\$25,000-\$2	Unknown
19775126	2016-04-2	Complete	News	Male	65+	US-SOUTH	Suburban	\$25,000-\$2	Unknown
19800152	2016-04-2	Partial	Other	Male	35-44	US-SOUTH	Suburban	\$50,000-\$7	Unknown
20007435	2016-04-2	Complete	Arts & Ent	Female	65+	US-SOUTH	Suburban	\$50,000-\$7	Unknown
20033349	2016-04-2	Complete	News	Male	45-54	US-WEST	Suburban	\$25,000-\$2	Unknown
20078912	2016-04-2	Complete	Mobile App	Female	35-44	US-MIDWEST	Suburban	\$25,000-\$2	Unknown
20096537	2016-04-2	Partial	News	Male	55-64	US-WEST	Suburban	\$75,000-\$9	Unknown
20161097	2016-04-2	Partial	News	Unknown	Unknown	US-SOUTH	Suburban	\$25,000-\$2	Unknown
20171295	2016-04-2	Complete	News	Male	25-34	US-SOUTH	Urban	\$25,000-\$2	Unknown
20180198	2016-04-2	Complete	News	Unknown	Unknown	US-MIDWEST	Rural	\$25,000-\$2	Unknown
20182198	2016-04-2	Complete	News	Female	25-34	US-NORTH	Rural	\$25,000-\$2	Unknown
20226502	2016-04-2	Partial	News	Female	55-64	US-NORTH	Urban	\$75,000-\$9	Unknown
20248922	2016-04-2	Complete	News	Male	25-34	US-NORTH	Urban	\$25,000-\$2	Unknown
20285533	2016-04-2	Complete	News	Male	25-34	US-SOUTH	Rural	\$0-\$24,99	Unknown
20305022	2016-04-2	Complete	Other	Female	55-64	US-MIDWEST	Urban	\$25,000-\$2	Unknown
20338724	2016-04-2	Complete	Other	Male	18-24	US-WEST	Suburban	\$50,000-\$7	Unknown
20381742	2016-04-2	Complete	News	Male	35-44	US-SOUTH	Suburban	\$25,000-\$2	Unknown
20451202	2016-04-2	Complete	News	Female	45-54	US-WEST	Suburban	\$25,000-\$2	Unknown
20471122	2016-04-2	Complete	Mobile App	Male	18-24	US-SOUTH	Urban	\$25,000-\$2	Unknown
20508354	2016-04-2	Complete	News	Male	65+	US-SOUTH	Suburban	\$75,000-\$9	Unknown
20595322	2016-04-2	Complete	News	Male	25-34	US-NORTH	Urban	\$0-\$24,99	Unknown
20782691	2016-04-2	Partial	News	Female	45-54	US-SOUTH	Urban	\$50,000-\$7	Unknown
20850507	2016-04-2	Complete	News	Unknown	Unknown	US-WEST	Rural	\$25,000-\$2	Unknown
20870613	2016-04-2	Complete	Other	Male	35-44	US-WEST	Urban	\$25,000-\$2	Unknown
20895768	2016-04-2	Complete	News	Male	45-54	US-WEST	Suburban	\$50,000-\$7	Unknown
20925517	2016-04-2	Complete	News	Unknown	Unknown	US-MIDWEST	Rural	\$25,000-\$2	Unknown
20968910	2016-04-2	Complete	Mobile App	Male	35-44	US-SOUTH	Suburban	\$50,000-\$7	Unknown
21012090	2016-04-2	Complete	Arts & Ent	Unknown	Unknown	US-NORTH	Urban	\$25,000-\$2	Unknown
21104267	2016-04-2	Partial	News	Male	45-54	US-MIDWEST	Suburban	\$50,000-\$7	Unknown
21211588	2016-04-2	Complete	News	Male	25-34	US-SOUTH	Suburban	\$25,000-\$2	Unknown
21270425	2016-04-2	Complete	News	Male	18-24	US-SOUTH	Urban	\$0-\$24,99	Unknown
21304787	2016-04-2	Complete	News	Male	25-34	US-MIDWEST	Suburban	\$50,000-\$7	Unknown
21321017	2016-04-2	Partial	News	Female	45-54	US-SOUTH	Suburban	\$25,000-\$2	Unknown
21375858	2016-04-2	Complete	Arts & Ent	Male	65+	US-MIDWEST	Suburban	\$25,000-\$2	Unknown
21398058	2016-04-2	Complete	Mobile App	Female	18-24	US-MIDWEST	Urban	\$0-\$24,99	Unknown
21438359	2016-04-2	Complete	News	Female	55-64	US-MIDWEST	Suburban	\$25,000-\$2	Unknown
21517002	2016-04-2	Complete	News	Female	55-64	US-MIDWEST	Urban	\$25,000-\$2	Unknown
21648950	2016-04-2	Complete	Arts & Ent	Female	25-34	US-SOUTH	Suburban	\$50,000-\$7	Unknown
22125430	2016-04-2	Complete	Mobile App	Female	55-64	US-SOUTH	Suburban	\$0-\$24,99	Unknown

	Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic	
1.222	Will not consider at all laboratory-grown gemstone	imitation			
	Will not consider at all				
0.744	Will possibly consider laboratory-grown gemstone		simulation		
0.768	Will not consider at all	None of the	imitation	simulation	synthetic
0.717	Will not consider at all	None of the	imitation		
	Will possibly consider	None of the	imitation		
0.585	Will possibly consider synthetic gemstone		imitation		synthetic
1.222	Will not consider at all	None of the above			None of the
1.052	Will probably consider	None of the above			synthetic
	Will not consider synthetic gemstone			simulation	
0.585	Will definitely consider laboratory-grown gemstone	imitation	simulation		
1.962	Will probably consider synthetic gemstone		imitation		
	Will possibly consider synthetic gemstone		imitation		
0.847	Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic	
	Will possibly consider	None of the above			
0.744	Will possibly consider laboratory-grown gemstone		simulation		
1.138	Will possibly consider synthetic gemstone		imitation	simulation	synthetic
0.768	Will possibly consider synthetic gemstone				synthetic
1.222	Will possibly consider [manufacturer name]-created gemstone				synthetic
2.023	Will probably consider	None of the above			None of the
1.141	Will not consider synthetic gemstone		imitation		synthetic
0.717	Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic	
	Will definitely consider	None of the	imitation	simulation	synthetic
1.428	Will not consider synthetic gemstone		imitation	simulation	synthetic
	Will not consider at all				
1.428	Will probably consider laboratory-grown gemstone	imitation	simulation	synthetic	
0.799	Will not consider synthetic gemstone				synthetic
0.879	Will definitely consider synthetic gemstone		imitation	simulation	synthetic
	Will not consider at all				
	Will not consider at all				
1.116	Will probably consider synthetic gemstone		imitation		
	Will not consider synthetic gemstone				synthetic
0.768	Will definitely consider synthetic gemstone	[manufacturer name]-	imitation	simulation	synthetic
	Will not consider at all				
0.768	Will not consider at all	[manufacturer name]-	imitation		
1.116	Will probably consider synthetic gemstone		imitation		synthetic
0.717	Will not consider at all	None of the above			None of the
0.939	Will definitely consider synthetic gemstone				synthetic
0.847	Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic	
0.799	Will possibly consider	None of the	imitation	simulation	synthetic
1.138	Will possibly consider synthetic gemstone		imitation	simulation	synthetic
1.428	Will definitely consider synthetic gemstone		imitation	simulation	synthetic
0.768	Will not consider synthetic gemstone			simulation	
	Will definitely consider	None of the above			
	Will definitely consider	None of the above			None of the
0.744	Will not consider synthetic gemstone		imitation		synthetic
0.799	Will definitely consider	None of the above			synthetic
	Will probably consider	None of the	imitation	simulation	synthetic
0.847	Will probably consider synthetic gemstone		imitation	simulation	synthetic
	Will not consider at all	[manufacturer name]-	created gemstone		synthetic
	Will not consider at all				
1.116	Will possibly consider	None of the above			None of the
1.138	Will not consider at all	None of the above			None of the
0.585	Will definitely consider	None of the above			None of the
	Will not consider at all	None of the above			
1.09	Will not consider synthetic gemstone				synthetic
0.523	Will possibly consider synthetic gemstone	[manufacturer name]-	imitation		synthetic
0.717	Will not consider synthetic gemstone		imitation	simulation	synthetic
0.717	Will not consider at all	None of the above			None of the
1.116	Will not consider at all laboratory-grown gemstone	imitation			synthetic
1.493	Will probably consider	None of the	imitation		synthetic

16613ms 17641ms 9046ms
 10728ms 24564ms 13369ms
 8900ms
 297773ms 9369ms 4020ms
 11511ms 3686ms 6009ms
 7823ms 15892ms 6286ms
 9419ms 3701ms 1239ms
 18538ms 339810ms 6827ms
 16596ms 7692ms 2545ms
 44742ms 31552ms 55839ms
 897462ms 10951ms 3821ms
 6965ms 21080ms 7698ms
 12689ms 4268ms 3764ms
 9271ms 14355ms 21316ms
 7010ms 11245ms 8204ms
 12207ms 5740ms
 10170ms 4764ms 2339ms
 9424ms 22154ms 8983ms
 9307ms 15461ms 12739ms
 31316ms 7179ms 10304ms
 33788ms 30481ms 34088ms
 4728ms 12395ms 7640ms
 34214ms 24355ms 15974ms
 18234ms 17066ms 9528ms
 19270ms 13243ms 10419ms
 10186ms
 9089ms 21090ms 11194ms
 9391ms 11106ms 3594ms
 13585ms 9923ms 136715ms
 15993ms
 6617ms
 4935ms 2565ms 2420ms
 5466ms 11770ms 7586ms
 8417ms 13923ms 7979ms
 16793ms
 15772ms 6049ms 2069ms
 8451ms 11888ms 758343ms
 10380ms 10299ms 4336ms
 3465ms 5929ms 2979ms
 12085ms 22930ms 10194ms
 9574ms 847863ms 9616ms
 6382ms 4585ms 10866ms
 10285ms 23041ms 10278ms
 7545ms 4890ms 2767ms
 7522ms 5203ms
 6028ms 15979ms 6892ms
 41434ms 36915ms 19713ms
 12817ms 4349ms 2998ms
 20280ms 7029ms 8485ms
 6660ms 20819ms 10042ms
 305281ms 6792ms 1414ms
 27308ms
 5114ms 6185ms 4336ms
 3215ms 8819ms 3121ms
 2076ms 3532ms 2215ms
 23533ms 16053ms
 14779ms 114185ms 28309ms
 8248ms 14037ms 10116ms
 32945ms 16932ms 9364ms
 7229ms 4348ms 7575ms
 8675ms 15630ms 6477ms
 14547ms 32839ms 14881ms

223548422	2016-04-21	Complete	Reference	Male	Unknown	US-WEST	Urban	\$25,000-\$4	Unknown
225104723	2016-04-21	Complete	News	Female	25-34	US-MIDWE	Suburban	\$25,000-\$4	Unknown
230140724	2016-04-21	Complete	News	Male	45-54	US-NORTH	Suburban	\$25,000-\$4	Unknown
233944211	2016-04-21	Complete	News	Female	35-44	US-WEST	Suburban	\$25,000-\$4	Unknown
241152477	2016-04-21	Complete	News	Female	25-34	US-WEST	Suburban	\$25,000-\$4	Unknown
255918038	2016-04-21	Complete	News	Male	25-34	US-MIDWE	Urban	\$25,000-\$4	Unknown
266316044	2016-04-21	Partial	News	Male	65+	US-MIDWE	Suburban	\$25,000-\$4	Unknown
267520634	2016-04-21	Complete	Reference	Male	55-64	US-WEST	Suburban	\$25,000-\$4	Unknown
267915961	2016-04-21	Complete	Mobile App	Female	45-54	US-SOUTH	Urban	\$25,000-\$4	Unknown
269032515	2016-04-21	Partial	News	Male	65+	US-NORTH	Suburban	\$25,000-\$4	Unknown
277497489	2016-04-21	Complete	News	Male	55-64	US-MIDWE	Unknown	\$50,000-\$7	Unknown
282074528	2016-04-21	Complete	Mobile App	Female	18-24	US-WEST	Suburban	\$0-\$24,999	Unknown
28520686	2016-04-21	Complete	Other	Female	35-44	US-SOUTH	Rural	\$25,000-\$4	Unknown
289601275	2016-04-21	Complete	News	Male	18-24	US-WEST	Suburban	\$25,000-\$4	Unknown
29310888	2016-04-21	Complete	Arts & Ent	Male	18-24	US-WEST	Urban	\$25,000-\$4	Unknown
294769260	2016-04-21	Complete	News	Female	55-64	US-MIDWE	Suburban	\$100,000-\$1	Unknown
295538084	2016-04-21	Complete	News	Male	55-64	US-SOUTH	Suburban	\$25,000-\$4	Unknown
296374868	2016-04-21	Complete	Mobile App	Male	18-24	US-SOUTH	Rural	\$25,000-\$4	Unknown
296816575	2016-04-21	Complete	Arts & Ent	Female	65+	US-SOUTH	Suburban	\$75,000-\$9	Unknown
299778255	2016-04-21	Complete	News	Male	35-44	US-WEST	Urban	\$25,000-\$4	Unknown
301516759	2016-04-21	Complete	Mobile App	Female	18-24	US-MIDWE	Rural	\$25,000-\$4	Unknown
305272193	2016-04-21	Complete	Mobile App	Female	25-34	US-SOUTH	Suburban	\$75,000-\$9	Unknown
305549983	2016-04-21	Complete	News	Female	25-34	US-WEST	Suburban	\$25,000-\$4	Unknown
309646659	2016-04-21	Complete	Mobile App	Female	25-34	US-MIDWE	Rural	\$50,000-\$7	Unknown
314555416	2016-04-21	Complete	Mobile App	Female	18-24	US-SOUTH	Suburban	\$0-\$24,999	Unknown
316511780	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWE	Suburban	\$25,000-\$4	Unknown
325680605	2016-04-21	Complete	Reference	Female	18-24	US-SOUTH	Urban	\$50,000-\$7	Unknown
329504464	2016-04-21	Complete	News	Male	45-54	US-SOUTH	Suburban	\$25,000-\$4	Unknown
335829761	2016-04-21	Complete	Reference	Female	55-64	US-MIDWE	Urban	\$50,000-\$7	Unknown
33792402	2016-04-21	Complete	Arts & Ent	Unknown	Unknown	US-SOUTH	Urban	\$25,000-\$4	Unknown
338790264	2016-04-21	Complete	Mobile App	Male	35-44	US-MIDWE	Suburban	\$25,000-\$4	Unknown
33888051	2016-04-21	Complete	News	Male	55-64	US-WEST	Suburban	\$50,000-\$7	Unknown
340642995	2016-04-21	Complete	News	Female	45-54	US-NORTH	Suburban	\$25,000-\$4	Unknown
34616253	2016-04-21	Complete	Mobile App	Female	25-34	US-SOUTH	Suburban	\$25,000-\$4	Unknown
348166076	2016-04-21	Complete	Mobile App	Female	35-44	US-SOUTH	Rural	I prefer not	Unknown
351226458	2016-04-21	Complete	Mobile App	Female	25-34	US-NORTH	Urban	\$0-\$24,999	Unknown
35459281	2016-04-21	Complete	News	Male	25-34	US-MIDWE	Urban	\$0-\$24,999	Unknown
356085910	2016-04-21	Complete	News	Female	35-44	US-WEST	Suburban	\$25,000-\$4	Unknown
356357459	2016-04-21	Complete	News	Male	35-44	US-SOUTH	Rural	\$50,000-\$7	Unknown
357231595	2016-04-21	Complete	News	Female	45-54	US-WEST	Rural	\$50,000-\$7	Unknown
357993630	2016-04-21	Partial	News	Female	65+	US-SOUTH	Rural	\$25,000-\$4	Unknown
36552364	2016-04-21	Partial	Other	Male	25-34	US-SOUTH	Suburban	\$75,000-\$9	Unknown
367738572	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$4	Unknown
373315912	2016-04-21	Complete	Arts & Ent	Female	45-54	US-WEST	Urban	\$50,000-\$7	Unknown
37882665	2016-04-21	Complete	Mobile App	Male	35-44	US-SOUTH	Urban	\$75,000-\$9	Unknown
380379220	2016-04-21	Complete	News	Male	55-64	US-SOUTH	Rural	\$25,000-\$4	Unknown
381139601	2016-04-21	Partial	News	Male	45-54	US-MIDWE	Suburban	\$25,000-\$4	Unknown
382556257	2016-04-21	Complete	News	Female	35-44	US-NORTH	Unknown	\$25,000-\$4	Unknown
383763000	2016-04-21	Complete	News	Female	55-64	US-MIDWE	Rural	\$25,000-\$4	Unknown
387094543	2016-04-21	Complete	Mobile App	Male	35-44	US-SOUTH	Suburban	I prefer not	Unknown
389801169	2016-04-21	Complete	Mobile App	Female	35-44	US-SOUTH	Rural	\$75,000-\$9	Unknown
391905524	2016-04-21	Complete	News	Unknown	Unknown	US-NORTH	Suburban	\$25,000-\$4	Unknown
392355901	2016-04-21	Complete	News	Female	35-44	US-WEST	Suburban	\$25,000-\$4	Unknown
392975010	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWE	Suburban	\$50,000-\$7	Unknown
398029899	2016-04-21	Complete	News	Male	45-54	US-MIDWE	Suburban	\$50,000-\$7	Unknown
399271350	2016-04-21	Complete	News	Male	35-44	US-WEST	Urban	\$25,000-\$4	Unknown
406498269	2016-04-21	Complete	News	Female	55-64	US-NORTH	Suburban	\$50,000-\$7	Unknown
407162693	2016-04-21	Complete	Mobile App	Female	35-44	US-SOUTH	Rural	\$25,000-\$4	Unknown
410374976	2016-04-21	Complete	Mobile App	Female	25-34	US-NORTH	Suburban	\$100,000-\$1	Unknown
411402586	2016-04-21	Complete	Mobile App	Female	18-24	US-SOUTH	Suburban	\$50,000-\$7	Unknown
413307806	2016-04-21	Complete	Other	Female	35-44	US-SOUTH	Suburban	\$25,000-\$4	Unknown
415756888	2016-04-21	Partial	Other	Female	55-64	US-WEST	Rural	\$25,000-\$4	Unknown

	Will probably consider	[manufacturer name]-created gemstone			
0.585	Will definitely consider	laboratory-grown gemstone	imitation	simulation	synthetic
1.186	Will not consider at all		imitation		synthetic
0.744	Will not consider at all		None of the above		None of the above
1.052	Will possibly consider	[manufacturer name]-created gemstone	imitation	simulation	
0.585	Will not consider at all		None of the above		synthetic
	Will definitely consider	laboratory-grown gemstone			
0.855	Will possibly consider		None of the above		imitation
1.962	Will probably consider		imitation		synthetic
	Will not consider at all		None of the above		None of the above
0.717	Will not consider at all		None of the above		None of the above
0.939	Will definitely consider	laboratory-grown gemstone	imitation	simulation	synthetic
0.847	Will not consider at all		None of the above		imitation
0.939	Will definitely consider		None of the above		None of the above
0.939	Will not consider at all		None of the above		None of the above
0.717	Will not consider at all		None of the above		None of the above
1.493	Will probably consider		imitation	simulation	synthetic
1.138	Will probably consider		imitation	simulation	synthetic
1.428	Will possibly consider	laboratory-grown gemstone	[manufacturer name]-created gemstone	imitation	
0.744	Will probably consider				synthetic
0.523	Will definitely consider			simulation	
1.116	Will probably consider	laboratory-grown gemstone	imitation		synthetic
1.052	Will definitely consider	[manufacturer name]-created gemstone	imitation	simulation	synthetic
0.585	Will possibly consider	laboratory-grown gemstone	imitation		
1.138	Will definitely consider	laboratory-grown gemstone	[manufacturer name]-created gemstone	imitation	simulation
	Will not consider at all		None of the above		None of the above
1.138	Will not consider at all		None of the above		None of the above
1.962	Will not consider at all		None of the above		None of the above
0.717	Will probably consider	laboratory-grown gemstone	imitation	simulation	synthetic
	Will definitely consider	laboratory-grown gemstone	[manufacturer name]-created gemstone	imitation	simulation
0.879	Will probably consider		None of the above	imitation	simulation
0.855	Will not consider at all		imitation	simulation	synthetic
1.186	Will not consider at all		None of the above		None of the above
1.116	Will possibly consider	laboratory-grown gemstone	imitation	simulation	synthetic
0.847	Will definitely consider	laboratory-grown gemstone	imitation	simulation	synthetic
0.768	Will possibly consider	[manufacturer name]-created gemstone	imitation	simulation	
0.585	Will not consider at all		None of the above		None of the above
0.744	Will not consider at all		None of the above		None of the above
0.847	Will not consider at all		None of the above		imitation
0.799	Will not consider at all		imitation	simulation	synthetic
	Will not consider at all				
	Will definitely consider	[manufacturer name]-created gemstone			
	Will not consider at all	[manufacturer name]-created gemstone	imitation	simulation	synthetic
0.799	Will definitely consider		None of the above		None of the above
0.847	Will probably consider	laboratory-grown gemstone	imitation	simulation	synthetic
1.493	Will not consider at all		None of the above		None of the above
	Will not consider at all		None of the above		None of the above
2.023	Will possibly consider	laboratory-grown gemstone	imitation		synthetic
0.717	Will possibly consider				synthetic
0.847	Will probably consider		None of the above		synthetic
0.847	Will definitely consider	laboratory-grown gemstone	imitation	simulation	synthetic
	Will probably consider		None of the above		None of the above
0.744	Will probably consider	laboratory-grown gemstone	imitation	simulation	
	Will possibly consider	[manufacturer name]-created gemstone	imitation	simulation	synthetic
1.222	Will definitely consider	laboratory-grown gemstone	imitation	simulation	synthetic
0.744	Will not consider at all	laboratory-grown gemstone	imitation	simulation	synthetic
1.016	Will not consider at all	[manufacturer name]-created gemstone	imitation	simulation	synthetic
0.847	Will probably consider		imitation		synthetic
0.768	Will definitely consider	laboratory-grown gemstone		simulation	synthetic
1.138	Will not consider at all		imitation	simulation	synthetic
0.847	Will not consider at all		None of the above		synthetic
	Will not consider at all				

4967ms	3077ms	1441ms
26580ms	15106ms	6280ms
12441ms	17545ms	21274ms
6981ms	5605ms	4135ms
5175ms	21157ms	10990ms
35805ms	4760ms	4647ms
13186ms	11196ms	
9806ms	19092ms	7908ms
7083ms	19295ms	8858ms
5518ms		
9300ms	7577ms	7958ms
13426ms	16062ms	9130ms
12355ms	17303ms	6560ms
18656ms	11485ms	7809ms
9091ms	5238ms	1461ms
11527ms	8600ms	3832ms
10455ms	10927ms	10051ms
48574ms	56950ms	22828ms
8913ms	24396ms	10137ms
7686ms	11627ms	3703ms
23049ms	19798ms	13917ms
7341ms	10521ms	8706ms
7115ms	9736ms	8863ms
4892ms	10022ms	4257ms
7043ms	12641ms	8409ms
11574ms	8383ms	5425ms
3318ms	3181ms	1824ms
12473ms	6775ms	6655ms
68542ms	15663ms	9772ms
15880ms	30998ms	23884ms
6572ms	5223ms	12674ms
17895ms	20505ms	15209ms
6303ms	5315ms	2673ms
8042ms	17877ms	13435ms
11693ms	7982ms	10631ms
7154ms	6986ms	14918ms
4609ms	2914ms	2474ms
7383ms	11776ms	4252ms
3685ms	8750ms	3451ms
13448ms	22406ms	9531ms
13414ms		
55624ms	8354ms	
7552ms	36034ms	12667ms
1897ms	2840ms	1958ms
15034ms	45115ms	26710ms
31263ms	15523ms	6348ms
17361ms	7846ms	
9397ms	17752ms	10467ms
53474ms	3487ms	2321ms
39836ms	39210ms	9296ms
18697ms	28393ms	14177ms
5231ms	6669ms	3365ms
7654ms	15509ms	32913ms
9285ms	15114ms	8128ms
14160ms	11082ms	9293ms
12174ms	19961ms	19606ms
9086ms	15177ms	9736ms
1320479m	7731ms	66373ms
5258ms	8802ms	10397ms
14320ms	17801ms	12585ms
2445ms	4112ms	8681ms
50056ms	18979ms	

41790509	2016-04-21	Complete	Other	Female	18-24	US-NORTH	Urban	\$0-\$24,999	Unknown
42047407	2016-04-21	Complete	News	Male	65+	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
42677083	2016-04-21	Complete	News	Male	65+	US-NORTH	Suburban	\$50,000-\$74,999	Unknown
43697739	2016-04-21	Complete	Other	Unknown	Unknown	US-NORTH	Urban	\$50,000-\$74,999	Unknown
44309443	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Urban	\$25,000-\$49,999	Unknown
44411015	2016-04-21	Complete	Other	Female	18-24	US-SOUTH	Urban	\$0-\$24,999	Unknown
44690653	2016-04-21	Complete	Arts & Entertainment	Female	55-64	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
45797892	2016-04-21	Complete	News	Female	35-44	US-WEST	Suburban	\$25,000-\$49,999	Unknown
47026114	2016-04-21	Complete	Mobile App	Male	35-44	US-NORTH	Urban	I prefer not to answer	Unknown
47148792	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
48166479	2016-04-21	Complete	Other	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
48292311	2016-04-21	Complete	Reference	Female	65+	US-WEST	Urban	\$25,000-\$49,999	Unknown
48372955	2016-04-21	Complete	Mobile App	Female	18-24	US-MIDWEST	Urban	I prefer not to answer	Unknown
48719008	2016-04-21	Complete	News	Male	25-34	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
48897085	2016-04-21	Complete	News	Male	55-64	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
49165186	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Urban	\$25,000-\$49,999	Unknown
49613227	2016-04-21	Complete	Mobile App	Female	25-34	US-MIDWEST	Rural	\$0-\$24,999	Unknown
49725005	2016-04-21	Complete	News	Female	35-44	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
50406182	2016-04-21	Complete	News	Male	55-64	US-NORTH	Urban	\$50,000-\$74,999	Unknown
50414173	2016-04-21	Complete	News	Male	55-64	US-NORTH	Rural	\$100,000-\$149,999	Unknown
50452010	2016-04-21	Complete	News	Male	18-24	US-NORTH	Suburban	\$25,000-\$49,999	Unknown
50663248	2016-04-21	Complete	News	Male	35-44	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
51061064	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
51326439	2016-04-21	Complete	News	Female	35-44	US-SOUTH	Urban	\$50,000-\$74,999	Unknown
51371604	2016-04-21	Complete	News	Female	45-54	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown
51435073	2016-04-21	Complete	News	Male	35-44	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown
51825257	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH	Urban	\$25,000-\$49,999	Unknown
52280522	2016-04-21	Complete	Mobile App	Male	25-34	US-SOUTH	Suburban	\$50,000-\$74,999	Unknown
52576589	2016-04-21	Complete	Mobile App	Female	18-24	US-MIDWEST	Suburban	\$0-\$24,999	Unknown
52716403	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$49,999	Unknown
52770479	2016-04-21	Complete	News	Male	25-34	US-NORTH	Rural	\$25,000-\$49,999	Unknown
53010344	2016-04-21	Complete	News	Female	65+	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
53011142	2016-04-21	Complete	News	Male	25-34	US-MIDWEST	Urban	\$75,000-\$99,999	Unknown
53199768	2016-04-21	Complete	News	Female	35-44	US-MIDWEST	Urban	\$0-\$24,999	Unknown
53487681	2016-04-21	Complete	News	Male	35-44	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
53529326	2016-04-21	Complete	News	Female	55-64	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
54205899	2016-04-21	Complete	News	Female	55-64	US-WEST	Urban	\$25,000-\$49,999	Unknown
54998289	2016-04-21	Complete	Arts & Entertainment	Female	55-64	US-WEST	Rural	\$50,000-\$74,999	Unknown
55254446	2016-04-21	Partial	News	Male	55-64	US-WEST	Rural	\$50,000-\$74,999	Unknown
55259330	2016-04-21	Complete	Mobile App	Female	35-44	US-SOUTH	Rural	\$0-\$24,999	Unknown
55302273	2016-04-21	Complete	Mobile App	Female	45-54	US-SOUTH	Urban	\$50,000-\$74,999	Unknown
55554624	2016-04-21	Complete	News	Male	45-54	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
56569678	2016-04-21	Complete	Mobile App	Unknown	Unknown	US-NORTH	Rural	\$25,000-\$49,999	Unknown
56774273	2016-04-21	Complete	News	Female	55-64	US-WEST	Urban	\$25,000-\$49,999	Unknown
57172307	2016-04-21	Complete	Mobile App	Male	18-24	US-MIDWEST	Urban	\$75,000-\$99,999	Unknown
57838286	2016-04-21	Complete	News	Male	35-44	US-WEST	Suburban	\$75,000-\$99,999	Unknown
58040807	2016-04-21	Partial	News	Female	55-64	US-WEST	Suburban	\$25,000-\$49,999	Unknown
58353708	2016-04-21	Complete	News	Male	45-54	US-SOUTH	Urban	\$50,000-\$74,999	Unknown
59203058	2016-04-21	Complete	Mobile App	Male	18-24	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown
59210130	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Suburban	\$0-\$24,999	Unknown
59280288	2016-04-21	Complete	Mobile App	Male	25-34	US-MIDWEST	Rural	\$100,000-\$149,999	Unknown
59351580	2016-04-21	Complete	News	Male	65+	US-MIDWEST	Urban	\$0-\$24,999	Unknown
59719817	2016-04-21	Complete	News	Female	45-54	US-WEST	Suburban	\$25,000-\$49,999	Unknown
60721351	2016-04-21	Complete	News	Female	25-34	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
60931673	2016-04-21	Complete	Mobile App	Female	18-24	US-MIDWEST	Suburban	\$75,000-\$99,999	Unknown
61009345	2016-04-21	Complete	News	Male	55-64	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
61052714	2016-04-21	Complete	News	Male	35-44	US-WEST	Suburban	\$25,000-\$49,999	Unknown
61127154	2016-04-21	Complete	Reference	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
61322389	2016-04-21	Complete	News	Male	55-64	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
62203684	2016-04-21	Complete	Mobile App	Male	18-24	US-NORTH	Urban	\$0-\$24,999	Unknown
62210446	2016-04-21	Complete	News	Female	55-64	US-SOUTH	Urban	\$25,000-\$49,999	Unknown
62353578	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown

1.094	Will not consider at all	None of the above		None of the
1.09	Will not consider at all laboratory-grown gemstone		simulation	
1.141	Will not consider at all synthetic gemstone			None of the
	Will not consider at all	[manufacturer name]-imitation	simulation	synthetic
	Will not consider at all	None of the above		None of the
1.138	Will possibly consider	None of the above	simulation	synthetic
0.717	Will not consider at all synthetic gemstone	imitation	simulation	synthetic
0.744	Will not consider at all	None of the above		None of the
2.023	Will definitely consider laboratory-grown gemstone	imitation	simulation	synthetic
	Will not consider at all	None of the above		None of the
	Will not consider at all	None of the above	simulation	
2.023	Will possibly consider laboratory-grown gemstone			None of the
0.523	Will probably consider laboratory-grown gemstone			synthetic
0.585	Will not consider at all	None of the above		None of the
0.717	Will not consider at all	[manufacturer name]-imitation	simulation	synthetic
	Will probat synthetic gemstone	imitation		
0.585	Will probat synthetic gemstone	imitation	simulation	
0.847	Will not consider at all synthetic gemstone	imitation	simulation	synthetic
1.016	Will not consider at all	None of the above		None of the
1.016	Will not consider at all	None of the above		None of the
1.094	Will not consider at all	None of the above		None of the
0.879	Will not consider at all laboratory-grown gemstone		simulation	
	Will possibly consider synthetic gemstone	imitation	simulation	synthetic
0.847	Will not consider at all	None of the above		None of the
1.222	Will not consider at all	None of the above		None of the
0.879	Will not consider at all synthetic gemstone	imitation	simulation	synthetic
	Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic
1.116	Will possibly consider laboratory-grown gemstone	imitation	simulation	
0.523	Will possibly consider synthetic laboratory-grown gemstone	[manufacturer name]-imitation		synthetic
	Will not consider at all	None of the above		synthetic
0.768	Will not consider at all synthetic gemstone	imitation		
1.09	Will not consider at all	None of the above		None of the
0.585	Will not consider at all	None of the above		None of the
0.879	Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic
0.879	Will probably consider	None of the above	simulation	synthetic
1.493	Will not consider at all	None of the above		None of the
0.855	Will not consider at all	None of the above	simulation	synthetic
0.855	Will definitely consider synthetic laboratory-grown gemstone	[manufacturer name]-imitation	simulation	synthetic
	Will not consider at all laboratory-grown gemstone			
0.847	Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic
1.962	Will definitely consider	None of the above		None of the
1.222	Will not consider at all	None of the above		None of the
	Will not consider at all	None of the above	imitation	
0.855	Will not consider at all	None of the above		None of the
0.523	Will possibly consider	None of the above	simulation	synthetic
0.744	Will definitely consider	[manufacturer name]-created gemstone		synthetic
	Will not consider at all			
1.962	Will not consider at all	None of the above		None of the
0.523	Will probably consider laboratory-grown gemstone	imitation	simulation	synthetic
	Will not consider at all laboratory-grown gemstone		simulation	
0.585	Will definitely consider synthetic laboratory-grown gemstone	[manufacturer name]-imitation	simulation	synthetic
1.09	Will not consider at all laboratory-grown gemstone	[manufacturer name]-imitation	simulation	synthetic
0.799	Will not consider at all	None of the above		None of the
0.585	Will not consider at all	None of the above		None of the
0.523	Will possibly consider synthetic gemstone	imitation	simulation	synthetic
0.717	Will not consider at all	None of the above		None of the
0.744	Will possibly consider	[manufacturer name]-created gemstone		None of the
	Will not consider at all laboratory-grown gemstone			None of the
1.493	Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic
1.094	Will not consider at all synthetic gemstone	imitation	simulation	synthetic
1.493	Will not consider at all synthetic gemstone			None of the
	Will not consider at all	[manufacturer name]-imitation	simulation	

9801ms	4464ms	2565ms
18850ms	10216ms	9850ms
41853ms	13461ms	13589ms
5765ms	14842ms	7986ms
16624ms	4850ms	1475ms
4699ms	5415ms	10565ms
6250ms	18406ms	6888ms
19132ms	10678ms	4823ms
98966ms	20459ms	54914ms
20131ms	9618ms	5347ms
11359ms	11348ms	8897ms
10427ms	11549ms	12605ms
54084ms	7866ms	5949ms
17271ms	11652ms	4955ms
7337ms	9240ms	8922ms
3215ms	9266ms	2478ms
17565ms	16702ms	11039ms
9501ms	13271ms	11259ms
11197ms	6082ms	2886ms
9971ms	5148ms	4188ms
12914ms	6008ms	1817ms
12631ms	8676ms	2928ms
23227ms	18066ms	15980ms
4543ms	2664ms	2994ms
5547ms	5497ms	4765ms
6301ms	10083ms	10241ms
6799ms	12738ms	7008ms
5335ms	20159ms	17852ms
17134ms	32609ms	12967ms
8313ms	11848ms	10358ms
6159ms	10648ms	9425ms
18141ms	6363ms	2811ms
624318ms	4130ms	3705ms
17635ms	16433ms	9289ms
24978ms	12452ms	6968ms
135043ms	14956ms	10871ms
6738ms	4888ms	16391ms
11215ms	22098ms	11500ms
9478ms	20744ms	
8259ms	9710ms	13095ms
24305ms	19099ms	10808ms
2681ms	5044ms	4783ms
6515ms	5018ms	2170ms
19080ms	17756ms	23011ms
7963ms	8335ms	9524ms
6982ms	3313ms	1648ms
24659ms		
62279ms	30764ms	5464ms
9913ms	39509ms	15580ms
7061ms	6831ms	1412ms
6924ms	25645ms	12232ms
16760ms	15687ms	17041ms
24750ms	10633ms	3464ms
4675ms	7222ms	2682ms
7346ms	12655ms	9810ms
12202ms	16343ms	11471ms
4639ms	3366ms	1792ms
3045ms	2975ms	2752ms
19561ms	14665ms	11428ms
6884ms	17004ms	12393ms
3159ms	3933ms	2804ms
5330ms	17426ms	12599ms

626167011	2016-04-21	Complete	Other	Female	18-24	US-NORTH	Rural	\$25,000-\$49,999	Unknown
626479155	2016-04-21	Complete	News	Female	55-64	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
628461153	2016-04-21	Complete	News	Male	45-54	US-NORTH	Rural	\$25,000-\$49,999	Unknown
629286565	2016-04-21	Complete	News	Male	45-54	US-NORTH	Rural	\$25,000-\$49,999	Unknown
631365706	2016-04-21	Complete	News	Male	35-44	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
633495837	2016-04-21	Partial	News	Female	35-44	US-NORTH	Urban	\$25,000-\$49,999	Unknown
637005627	2016-04-21	Complete	Other	Male	25-34	US-NORTH	Urban	\$0-\$24,999	Unknown
639567626	2016-04-21	Complete	News	Female	45-54	US-NORTH	Urban	\$75,000-\$99,999	Unknown
657886830	2016-04-21	Complete	News	Male	55-64	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
664474792	2016-04-21	Complete	Other	Female	45-54	US-SOUTH	Urban	\$50,000-\$74,999	Unknown
66900566	2016-04-21	Partial	Reference	Male	45-54	US-WEST	Urban	\$25,000-\$49,999	Unknown
685013077	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
68864953	2016-04-21	Complete	News	Female	25-34	US-WEST	Rural	\$25,000-\$49,999	Unknown
698520511	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
699037683	2016-04-21	Partial	News	Unknown	Unknown	US-MIDWEST	Suburban	\$50,000-\$74,999	Unknown
699357136	2016-04-21	Complete	Mobile App	Male	35-44	US-NORTH	Urban	\$75,000-\$99,999	Unknown
699604222	2016-04-21	Complete	Mobile App	Female	25-34	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown
705555757	2016-04-21	Complete	News	Female	25-34	US-MIDWEST	Urban	\$0-\$24,999	Unknown
705957092	2016-04-21	Complete	News	Female	55-64	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown
717312707	2016-04-21	Complete	Mobile App	Female	18-24	US-WEST	Urban	\$25,000-\$49,999	Unknown
718023503	2016-04-21	Partial	News	Female	25-34	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown
719417495	2016-04-21	Complete	Arts & Entertainment	Male	25-34	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
728901055	2016-04-21	Complete	Mobile App	Female	55-64	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown
729092212	2016-04-21	Complete	News	Female	65+	US-WEST	Rural	\$25,000-\$49,999	Unknown
736637000	2016-04-21	Complete	Reference	Unknown	Unknown	US-SOUTH	Urban	\$0-\$24,999	Unknown
738201000	2016-04-21	Complete	Reference	Unknown	Unknown	US-MIDWEST	Urban	\$0-\$24,999	Unknown
739714135	2016-04-21	Complete	Mobile App	Female	25-34	US-MIDWEST	Suburban	\$0-\$24,999	Unknown
746922432	2016-04-21	Complete	News	Male	55-64	US-WEST	Urban	\$25,000-\$49,999	Unknown
7524875	2016-04-21	Complete	Reference	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
753338651	2016-04-21	Complete	News	Female	25-34	US-NORTH	Urban	\$50,000-\$74,999	Unknown
755576015	2016-04-21	Complete	News	Female	25-34	US-WEST	Urban	\$0-\$24,999	Unknown
759424565	2016-04-21	Complete	News	Male	65+	US-WEST	Unknown	\$50,000-\$74,999	Unknown
765775425	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH	Urban	\$50,000-\$74,999	Unknown
766686725	2016-04-21	Complete	Arts & Entertainment	Male	45-54	US-SOUTH	Suburban	\$0-\$24,999	Unknown
768746301	2016-04-21	Complete	Mobile App	Male	35-44	US-SOUTH	Rural	\$25,000-\$49,999	Unknown
770636372	2016-04-21	Complete	News	Female	55-64	US-NORTH	Urban	\$0-\$24,999	Unknown
771808520	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
774274820	2016-04-21	Complete	News	Male	18-24	US-SOUTH	Suburban	\$0-\$24,999	Unknown
775656586	2016-04-21	Complete	Other	Unknown	Unknown	US-SOUTH	Suburban	\$75,000-\$99,999	Unknown
785089617	2016-04-21	Complete	News	Male	55-64	US-WEST	Urban	\$25,000-\$49,999	Unknown
785494972	2016-04-21	Complete	News	Unknown	Unknown	US-NORTH	Rural	\$25,000-\$49,999	Unknown
792625466	2016-04-21	Complete	Other	Male	55-64	US-SOUTH	Suburban	\$50,000-\$74,999	Unknown
799633852	2016-04-21	Complete	Mobile App	Female	25-34	US-NORTH	Urban	I prefer not to answer	Unknown
805263781	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$49,999	Unknown
805567704	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$49,999	Unknown
807230920	2016-04-21	Complete	News	Male	55-64	US-WEST	Suburban	\$25,000-\$49,999	Unknown
808405437	2016-04-21	Complete	News	Female	35-44	US-WEST	Rural	\$25,000-\$49,999	Unknown
816813494	2016-04-21	Complete	Mobile App	Female	25-34	US-SOUTH	Urban	\$25,000-\$49,999	Unknown
819754683	2016-04-21	Complete	News	Male	45-54	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
820745177	2016-04-21	Complete	News	Female	55-64	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
823098107	2016-04-21	Complete	Reference	Female	Unknown	US-NORTH	Suburban	\$75,000-\$99,999	Unknown
826792537	2016-04-21	Complete	News	Male	35-44	US-WEST	Rural	\$0-\$24,999	Unknown
82776858	2016-04-21	Complete	Other	Unknown	Unknown	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown
828080824	2016-04-21	Complete	Arts & Entertainment	Male	18-24	US-NORTH	Urban	\$75,000-\$99,999	Unknown
829642201	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWEST	Rural	\$50,000-\$74,999	Unknown
831268924	2016-04-21	Complete	News	Female	45-54	US-NORTH	Suburban	\$25,000-\$49,999	Unknown
831979225	2016-04-21	Complete	News	Male	25-34	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown
832426425	2016-04-21	Partial	News	Female	45-54	US-NORTH	Suburban	\$25,000-\$49,999	Unknown
835541877	2016-04-21	Partial	News	Female	65+	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown
836445964	2016-04-21	Complete	Reference	Unknown	Unknown	US-MIDWEST	Urban	\$50,000-\$74,999	Unknown
841819851	2016-04-21	Complete	News	Female	18-24	US-WEST	Rural	\$50,000-\$74,999	Unknown
842559655	2016-04-21	Complete	News	Female	18-24	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown

1.094	Will not consider at all	[manufacturer name]-c	imitation		synthetic	
0.717	Will not consider at all		imitation	simulation	synthetic	
1.186	Will probably consider				synthetic	
1.186	Will probably consider	laboratory-grown gemstone	imitation	simulation	synthetic	
0.879	Will not consider at all		None of the above			
	Will probably consider					
0.768	Will not consider at all		None of the above			
1.186	Will not consider at all		imitation		synthetic	
0.717	Will not consider at all		None of the above			None of the above
1.962	Will probably consider	laboratory-grown gemstone	imitation	simulation	synthetic	
	Will not consider at all					
	Will not consider at all		None of the above			None of the above
1.052	Will not consider at all	laboratory-grown gemstone	[manufacturer name]-c	imitation	simulation	synthetic
	Will definitely consider		[manufacturer name]-created	gemstone	synthetic	
	Will not consider at all					
2.023	Will definitely consider		imitation	simulation	synthetic	
1.116	Will possibly consider		imitation	simulation	synthetic	
0.585	Will definitely consider		None of the above			None of the above
0.717	Will not consider at all		None of the above			None of the above
0.939	Will probably consider		imitation	simulation	synthetic	
	Will not consider at all					
0.585	Will possibly consider		None of the above			None of the above
0.717	Will not consider at all		imitation	simulation	synthetic	
2.023	Will not consider at all		None of the above			None of the above
	Will probably consider	laboratory-grown gemstone		simulation		
	Will not consider at all		None of the above			None of the above
0.585	Will possibly consider	laboratory-grown gemstone			synthetic	
0.855	Will definitely consider		imitation			
	Will possibly consider				synthetic	
0.768	Will not consider at all		None of the above			None of the above
1.052	Will not consider at all		None of the above			None of the above
2.023	Will not consider at all		None of the above			None of the above
	Will not consider at all		None of the above			None of the above
1.962	Will not consider at all		[manufacturer name]-created	gemstone	synthetic	
0.847	Will probably consider	laboratory-grown gemstone	imitation	simulation	synthetic	
1.016	Will not consider at all		None of the above			None of the above
	Will possibly consider		None of the above			None of the above
1.138	Will not consider at all		imitation	simulation	synthetic	
	Will possibly consider		None of the above			None of the above
0.855	Will not consider at all		imitation	simulation	synthetic	
	Will possibly consider		None of the above		synthetic	
1.493	Will possibly consider		None of the above	simulation	synthetic	
0.768	Will possibly consider	laboratory-grown gemstone	imitation		synthetic	
	Will not consider at all		None of the above			
	Will possibly consider	synthetic gemstone	imitation	simulation	synthetic	
0.855	Will definitely consider		None of the above		synthetic	
0.744	Will not consider at all		None of the above			None of the above
1.116	Will definitely consider	laboratory-grown gemstone	imitation	simulation	synthetic	
1.222	Will probably consider		None of the above			
0.717	Will not consider at all		None of the above			None of the above
	Will probably consider		None of the above			None of the above
0.744	Will not consider at all		None of the above			None of the above
	Will probably consider		None of the above			None of the above
1.094	Will not consider at all		None of the above			None of the above
	Will probably consider		[manufacturer name]-c	imitation		
1.186	Will possibly consider	laboratory-grown gemstone	imitation	simulation	synthetic	
0.585	Will not consider at all		None of the above			None of the above
	Will definitely consider					
	Will probably consider	laboratory-grown gemstone				
	Will not consider at all		None of the above			
0.939	Will possibly consider		None of the above		synthetic	
0.523	Will not consider at all		None of the above			None of the above

6836ms	10998ms	7030ms
25283ms	9155ms	7489ms
7808ms	40347ms	9537ms
7056ms	8427ms	12259ms
17524ms	20921ms	7951ms
5835ms		
7799ms	9838ms	6693ms
49754ms	6468ms	3193ms
11374ms	6924ms	6134ms
16500ms	9328ms	15234ms
18205ms		
10274ms	3648ms	1515ms
16018ms	16089ms	9141ms
2566ms	5933ms	2141ms
7868ms		
23197ms	29226ms	18046ms
7649ms	9477ms	6452ms
8496ms	6614ms	2640ms
13955ms	36864ms	10327ms
57693ms	3731ms	9694ms
35962ms		
2700ms	3313ms	1847ms
12371ms	38651ms	12670ms
13670ms	15769ms	5089ms
5952ms	2955ms	1336ms
7350ms	2802ms	1307ms
42964ms	36147ms	4546ms
3083ms	6156ms	2043ms
57000ms	22700ms	8700ms
6416ms	8381ms	1259ms
8684ms	6161ms	2551ms
5222ms	5644ms	2336ms
8848ms	7896ms	2166ms
5600ms	11749ms	5124ms
8181ms	16383ms	7677ms
12323ms	8508ms	4979ms
5245ms	6503ms	3337ms
7344ms	11319ms	7783ms
5202ms	7023ms	2777ms
12754ms	15096ms	7567ms
21307ms	11585ms	8012ms
25169ms	19715ms	18711ms
3358ms	7057ms	8893ms
23373ms	13784ms	3748ms
11154ms	19160ms	14091ms
5964ms	6267ms	5365ms
17791ms	7947ms	6063ms
12979ms	23680ms	16347ms
11118ms	29860ms	10037ms
16565ms	20975ms	23832ms
10343ms	14525ms	6166ms
11056ms	6066ms	1638ms
23140ms	16491ms	2295ms
5075ms	3535ms	3476ms
5451ms	2308ms	2400ms
4992ms	9977ms	6965ms
20524ms	2916ms	25994ms
6184ms		
12229ms	19266ms	
4440ms	8595ms	8636ms
16776ms	5448ms	1727ms
6229ms	3254ms	2022ms

856283197	2016-04-21	Complete	News	Unknown	Unknown	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown	Unknown
862458348	2016-04-21	Complete	News	Male	25-34	US-MIDWEST	Urban	\$50,000-\$74,999	Unknown	Unknown
86552082	2016-04-21	Complete	News	Male	25-34	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown	Unknown
867208458	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH	Suburban	\$50,000-\$74,999	Unknown	Unknown
867572383	2016-04-21	Partial	News	Female	25-34	US-MIDWEST	Urban	\$0-\$24,999	Unknown	Unknown
872001648	2016-04-21	Complete	News	Unknown	Unknown	US-SOUTH	Suburban	\$50,000-\$74,999	Unknown	Unknown
876938517	2016-04-21	Complete	Mobile App	Female	25-34	US-MIDWEST	Suburban	\$0-\$24,999	Unknown	Unknown
878733088	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Suburban	\$25,000-\$49,999	Unknown	Unknown
881795653	2016-04-21	Complete	Other	Unknown	Unknown	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown	Unknown
881893073	2016-04-21	Complete	News	Female	45-54	US-WEST	Urban	\$50,000-\$74,999	Unknown	Unknown
882790503	2016-04-21	Complete	News	Female	35-44	US-SOUTH	Urban	\$25,000-\$49,999	Unknown	Unknown
89030708	2016-04-21	Complete	Arts & Entertainment	Male	65+	US-MIDWEST	Rural	\$25,000-\$49,999	Unknown	Unknown
890770604	2016-04-21	Complete	Other	Unknown	Unknown	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown	Unknown
892508224	2016-04-21	Complete	News	Male	35-44	US-NORTH	Urban	\$25,000-\$49,999	Unknown	Unknown
894455298	2016-04-21	Complete	News	Female	55-64	US-SOUTH	Suburban	\$25,000-\$49,999	Unknown	Unknown
895911964	2016-04-21	Complete	Arts & Entertainment	Male	65+	US-SOUTH	Rural	\$25,000-\$49,999	Unknown	Unknown
900866707	2016-04-21	Complete	News	Female	25-34	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown	Unknown
902146923	2016-04-21	Complete	News	Male	25-34	US-NORTH	Urban	\$25,000-\$49,999	Unknown	Unknown
904874768	2016-04-21	Complete	Mobile App	Female	18-24	US-SOUTH	Urban	I prefer not to answer	Unknown	Unknown
906777148	2016-04-21	Complete	News	Male	35-44	US-SOUTH	Suburban	\$75,000-\$99,999	Unknown	Unknown
907144518	2016-04-21	Complete	Mobile App	Female	18-24	US-MIDWEST	Suburban	I prefer not to answer	Unknown	Unknown
914542628	2016-04-21	Complete	News	Male	18-24	US-NORTH	Suburban	\$75,000-\$99,999	Unknown	Unknown
91588064	2016-04-21	Complete	Mobile App	Female	18-24	US-MIDWEST	Urban	I prefer not to answer	Unknown	Unknown
916274794	2016-04-21	Complete	News	Female	25-34	US-SOUTH	Urban	\$100,000-\$149,999	Unknown	Unknown
917184808	2016-04-21	Complete	Other	Female	25-34	US-SOUTH	Urban	\$25,000-\$49,999	Unknown	Unknown
917480094	2016-04-21	Complete	Mobile App	Female	18-24	US-MIDWEST	Suburban	\$100,000-\$149,999	Unknown	Unknown
921057872	2016-04-21	Complete	News	Female	Unknown	US-MIDWEST	Suburban	\$25,000-\$49,999	Unknown	Unknown
924452208	2016-04-21	Partial	News	Male	45-54	US-SOUTH	Rural	\$50,000-\$74,999	Unknown	Unknown
928127368	2016-04-21	Partial	News	Male	45-54	US-NORTH	Rural	\$25,000-\$49,999	Unknown	Unknown
930054398	2016-04-21	Complete	Mobile App	Female	18-24	US-MIDWEST	Rural	I prefer not to answer	Unknown	Unknown
934792443	2016-04-21	Complete	News	Unknown	Unknown	US-WEST	Suburban	\$50,000-\$74,999	Unknown	Unknown
936149252	2016-04-21	Complete	News	Male	55-64	US-WEST	Suburban	\$25,000-\$49,999	Unknown	Unknown
937925284	2016-04-21	Complete	Mobile App	Female	18-24	US-SOUTH	Suburban	\$0-\$24,999	Unknown	Unknown
951286058	2016-04-21	Complete	News	Male	45-54	US-SOUTH	Unknown	Unknown	Unknown	Unknown
95593684	2016-04-21	Complete	News	Male	35-44	US-SOUTH	Suburban	\$75,000-\$99,999	Unknown	Unknown
959873948	2016-04-21	Complete	News	Male	45-54	US-SOUTH	Rural	\$50,000-\$74,999	Unknown	Unknown
960972038	2016-04-21	Complete	News	Female	25-34	US-MIDWEST	Urban	\$0-\$24,999	Unknown	Unknown
964604418	2016-04-21	Complete	Mobile App	Male	18-24	US-MIDWEST	Suburban	\$50,000-\$74,999	Unknown	Unknown
965227917	2016-04-21	Partial	News	Male	45-54	US-MIDWEST	Urban	\$25,000-\$49,999	Unknown	Unknown
967558598	2016-04-21	Complete	Arts & Entertainment	Female	55-64	US-SOUTH	Rural	\$25,000-\$49,999	Unknown	Unknown
968819857	2016-04-21	Complete	News	Male	45-54	US-SOUTH	Urban	\$25,000-\$49,999	Unknown	Unknown
969675578	2016-04-21	Complete	News	Male	35-44	US-WEST	Urban	\$25,000-\$49,999	Unknown	Unknown
97071739	2016-04-21	Complete	Other	Male	65+	US-SOUTH	Rural	\$50,000-\$74,999	Unknown	Unknown
9707637112	2016-04-21	Complete	Mobile App	Male	35-44	US-WEST	Suburban	\$25,000-\$49,999	Unknown	Unknown
992333553	2016-04-21	Complete	News	Male	35-44	US-MIDWEST	Suburban	\$50,000-\$74,999	Unknown	Unknown
997161973	2016-04-21	Complete	Mobile App	Female	18-24	US-SOUTH	Urban	\$25,000-\$49,999	Unknown	Unknown
998417387	2016-04-21	Complete	Arts & Entertainment	Unknown	Unknown	US-SOUTH	Rural	\$25,000-\$49,999	Unknown	Unknown
998517027	2016-04-21	Complete	Arts & Entertainment	Unknown	Unknown	US-SOUTH	Unknown	Unknown	Unknown	Unknown

	Will not consider synthetic gemstone			None of the above
0.585	Will not consider at all laboratory-grown gemstone		simulation	
0.585	Will possibly consider synthetic gemstone	imitation	simulation	synthetic
	Will not consider synthetic gemstone			synthetic
	Will not consider at all			
	Will not consider at all [manufacturer name]-created gemstone			synthetic
0.585	Will possibly consider laboratory-grown gemstone		simulation	synthetic
	Will probably consider synthetic gemstone			synthetic
	Will not consider at all	None of the above		None of the above
0.799	Will not consider at all	None of the above		None of the above
0.847	Will not consider synthetic gemstone			synthetic
1.09	Will not consider at all	None of the above	imitation	
	Will not consider at all laboratory-grown gemstone		simulation	
2.023	Will not consider synthetic gemstone	imitation	simulation	synthetic
1.493	Will possibly consider synthetic gemstone			None of the above
1.428	Will possibly consider synthetic gemstone	imitation	simulation	synthetic
0.585	Will not consider synthetic gemstone		simulation	
0.768	Will probably consider	None of the above		None of the above
1.138	Will possibly consider synthetic gemstone	[manufacturer name]-created gemstone		synthetic
0.847	Will not consider synthetic gemstone	imitation		synthetic
0.523	Will probably consider synthetic gemstone	[manufacturer name]-created gemstone	simulation	synthetic
1.094	Will not consider synthetic gemstone	imitation	simulation	
0.523	Will possibly consider synthetic gemstone	[manufacturer name]-created gemstone		synthetic
1.116	Will definitely consider	None of the above		None of the above
1.116	Will not consider at all	None of the above		None of the above
0.523	Will not consider at all laboratory-grown gemstone	imitation	simulation	synthetic
	Will not consider at all [manufacturer name]-created gemstone			
	Will not consider at all			
0.523	Will probably consider laboratory-grown gemstone			None of the above
	Will not consider at all	None of the above		None of the above
0.855	Will possibly consider [manufacturer name]-created gemstone	imitation	simulation	synthetic
1.138	Will possibly consider	None of the above		None of the above
1.962	Will possibly consider	None of the above		None of the above
0.847	Will possibly consider	None of the above	imitation	simulation
1.962	Will definitely consider [manufacturer name]-created gemstone			synthetic
0.585	Will not consider at all	None of the above		None of the above
0.523	Will definitely consider synthetic gemstone	imitation		
	Will not consider at all			
1.493	Will possibly consider laboratory-grown gemstone	[manufacturer name]-created gemstone	simulation	synthetic
1.962	Will not consider at all	None of the above		None of the above
0.744	Will not consider at all	None of the above	imitation	simulation
1.428	Will possibly consider laboratory-grown gemstone	imitation	simulation	synthetic
0.744	Will definitely consider laboratory-grown gemstone		simulation	synthetic
0.879	Will possibly consider	None of the above	imitation	simulation
1.138	Will possibly consider laboratory-grown gemstone		simulation	
	Will not consider at all	None of the above	imitation	
	Will not consider at all	None of the above		None of the above

19312ms	4660ms	2424ms
20269ms	2412ms	2929ms
9384ms	11825ms	18027ms
8339ms	18022ms	5665ms
43190ms		
16159ms	31615ms	7626ms
5524ms	7508ms	8878ms
6748ms	19659ms	4597ms
4087ms	3972ms	2017ms
10016ms	6416ms	5696ms
14351ms	8962ms	6220ms
45031ms	19201ms	9408ms
12944ms	21109ms	14795ms
17529ms	13341ms	8717ms
13562ms	9648ms	32179ms
16900ms	18830ms	10714ms
28077ms	24051ms	17283ms
12020ms	5299ms	4761ms
10785ms	19258ms	14176ms
5603ms	12665ms	6166ms
7663ms	30031ms	5527ms
7268ms	6984ms	8542ms
17919ms	36826ms	9787ms
11492ms	8747ms	2390ms
7602ms	5573ms	5354ms
10643ms	19607ms	6597ms
11237ms	8981ms	39914ms
11780ms		
26303ms		
11153ms	26225ms	17733ms
8229ms	12409ms	3363ms
9922ms	10356ms	11798ms
10673ms	9675ms	14586ms
13411ms	11532ms	9469ms
8000ms	10964ms	8330ms
8065ms	2646ms	2056ms
16015ms	6091ms	7139ms
7365ms	19669ms	10740ms
36626ms		
14159ms	80881ms	9833ms
3258ms	2777ms	2587ms
7776ms	9941ms	5207ms
23657ms	16382ms	7354ms
24905ms	17837ms	9500ms
13157ms	41380ms	9960ms
9195ms	15169ms	9706ms
9226ms	16630ms	8642ms
10488ms	14338ms	6614ms

2. Which of these terms accurately describes a man-made gemstone that has the same optical, physic

1. How like synthetic g laboratory- [manufactu None of the TOTAL

Will definit	25	28	21	14	88
Will probat	27	27	10	21	85
Will possib	42	39	24	29	134
Will not coi	60	37	26	141	264
TOTAL	154	131	81	205	571

3. Please select all of the terms which indicate that a gemstone is not real.

1. How like imitation simulation synthetic None of the TOTAL

Will definit	36	40	40	9	125
Will probat	47	35	43	13	138
Will possib	75	59	71	17	222
Will not coi	100	69	92	115	376
TOTAL	258	203	246	154	861

3. Please select all of the terms which indicate that a gemstone is not real.

2. Which o imitation simulation synthetic None of the TOTAL

synthetic g	112	84	113	11	320
laboratory-	91	93	90	9	283
[manufactu	63	45	55	1	164
None of the	53	31	46	133	263
TOTAL	319	253	304	154	1030

cal and chemical properties as a natural gemstone?