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UNITED STATES OF AMERICA
BEFORE THE FEDERAL TRADE COMMISSION

In the Matter of	)	
	)	**Docket No. 9327**
	)	
Polypore International, Inc.	)	**PUBLIC**
a corporation	)	
	)	

RESPONDENT'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

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I. EXHIBIT AND WITNESS INDICES

A. Exhibit Index

1. *See* Exhibit A hereto.

B. Witness Index

2. *See* Exhibit B hereto.

II. PROCEDURAL BACKGROUND

A. Transaction Background

3. On February 29, 2008, a subsidiary of Polypore International, Inc. ("Polypore")

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} (PX0162, *in camera*) Polypore acquired Microporous for approximately $72.5 million, $29 million in cash and $47 million in assumed debt. (RX01572 at ¶4; PX0800 at 002, *in camera*) Due to the small value of the transaction, the parties were not required to make a premerger notification filing under the Hart-Scott-Rodino Antitrust Act. (Toth, Tr. 1557, 1559; PX0800 at 2, *in camera*).

B. Pre-Hearing Background

4. On March 7, 2008, the FTC initiated a non-public investigation into the Acquisition. During its investigation, the FTC issued Civil Investigative Demands to Polypore, its Daramic subsidiary and various third parties, and conducted many investigational hearings. The FTC then proceeded to issue a Part 3 Complaint in this matter on September 9, 2008, alleging that the Acquisition violated Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. § 45 ("Section 5") and Section 7 of the Clayton Act, as amended, 15 U.S.C. §18, and that Polypore monopolized or attempted to monopolize certain product markets in North America. (RX01572

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at 8-9). On October 15, 2008, Polypore filed its Answer and Defenses, which denied the FTC's allegations and set forth its affirmative defenses. (RX01589).

5. An initial Scheduling Order was entered in the case on October 22, 2008, setting forth a discovery cut-off date of February 13, 2009 and a trial date of April 14, 2009. (RX01591). Due to extensive third party discovery issues, the Scheduling Order was amended to extend these and other remaining deadlines by four weeks. (ALJ Order dated Feb. 4, 2009).

C. Hearing Summary

6. The hearing commenced in this case on May 12, 2009 and concluded on June 12, 2009. During the 22 days of actual trial proceedings, live testimony was received into the hearing record from the following 30 witnesses:

Witnesses Related to Polypore/Daramic/Microporous

- Robert Toth, CEO and President of Polypore
- Pierre Hauswald, General Manager and VP of Daramic
- Sterling Tucker Roe, VP of Worldwide Sales and Marketing of Daramic
- Harry Seibert, VP and Business Director of Daramic
- Tim Riney, VP of Finance of Daramic
- Christopher Thuet, Business Director Asia-Pacific of Daramic
- Hans-Peter Gaugl, Managing Director Austrian Facility for Daramic Austria GmbH (also former Manager of Austrian facility for Microporous)
- John Kevin Whear, VP of Technology of Daramic
- Larry Trevathan, VP Operations of Daramic (also former VP Operations of Microporous)
- Steven McDonald, Sales Manager, North America of Daramic (also former Director of Sales of Microporous)
- Michael Gilchrist, formerly CEO and President of Microporous
- George Brilmyer, formerly Director of Research & Development of Microporous

- Michael Graff, Managing Director of Warburg Pincus (also Chairman of the Board of Directors of Polypore)

Witnesses Related to Battery Manufacturers

- Richard Godber, CEO and President of Trojan Battery
- Donald Wallace, Executive VP of Sales and Marketing of U.S. Battery Mfg. Co.
- Nawaz Qureshi, VP of Engineering and Technology of U.S. Battery Mfg. Co.
- Larry Axt, VP of Global Procurement of EnerSys
- Larry Burkert, Senior Procurement Manager of EnerSys
- John Gagge, Jr., Sr. Director Engineering and Quality Assurance for EnerSys
- John Craig, Chairman, CEO and President of EnerSys
- Rodger Hall, Global VP of Procurement for Johnson Controls Battery
- Mitchell Bregman, Exide Technologies (former procurement council)
- Melvin Gillespie, Jr., VP of Global Procurement for Exide Technologies
- Norman Benjamin, President of Bulldog Battery Corporation
- Dale Leister, Director Procurement Strategy & Supplier Dev., East Penn Mfg.
- James Douglas, Executive VP of Douglas Battery Mfg. Co.
- Arthur Balcerzak, Director of Purchasing for Crown Battery (as consultant)
- Daniel Weerts, Vice President of Sales and Marketing of Entek Holding Company

Expert Witnesses

- John Simpson, FTC Economist (Complaint Counsel's expert witness)
- Henry J. Kahwaty, Ph.D., Director of LECG (Respondent's expert witness)

7. In addition, for certain witnesses who were unavailable to attend trial proceedings, testimony was received into the record through admission of certain deposition transcripts and investigational hearings, subject to any lodged objections. See JX3, JX8, JX9.

8. The hearing record in this case was closed by Order dated June 22, 2009. Concurrent reply briefs and replies to findings of fact are due to be filed by the FTC and Respondent on July 31, 2009. Closing arguments are scheduled for August 20, 2009.

III. THE BATTERY SEPARATOR INDUSTRY

A. Terminology

9. The following provides a glossary of some of the recurring terms and separator product names referred to in the testimony, documents and deposition/investigational hearing transcripts:

10. **AGM** – initials which refer to "absorbptive glass mat" battery separators. The liquid in the battery is absorbed like a sponge into the glass mat part of the separator and there is no free liquid electrolyte. AGM batteries are sealed and do not need maintenance. (Godber, Tr. 147; Hauswald, Tr. 994-95; Qureshi, Tr. 2055-56).

11. **ACE-SIL®**– product name of a hard rubber battery separator developed by Microporous (and now sold by Daramic) that is made from rubber silicon. This pure rubber product is very stiff and typically used in very high end stationary applications such as telecommunications, back up power for nuclear plants, and military products. (Gilchrist, Tr. 300; Hauswald, Tr. 992; Roe, Tr. 1748; McDonald, Tr. 3786; RX01638 (physical product sample)).

12. **Aftermarket** – refers to the market for replacement batteries for products (in contrast to original equipment batteries). (Godber, Tr. 143-44; Gillespie, Tr. 2932).

13. **Antimony** – refers to an antimony alloy that is sometimes included in the composition of the positive plate of a battery used for deep-cycle applications in order to improve battery performance. Antimony can have a tendency to travel from the positive plate to the negative plate during usage, which could eventually lead to reduced battery performance. The addition of rubber to a battery separator can help reduce the rate of antimony transfer. (Godber, Tr. 138-40, 149-50; Whear, Tr. 4667-68, 4683-84; PX1791 at 001).

14. **Backweb Thickness** – a primary measurement of a battery separator that is the thickness of the substrate in space between membranes of a rib. Simply put, it is the thickness of the separator that is measured between the ribs. The backweb thickness serves to create a wall of insulation in the battery between plates. (Hauswald, Tr. 966-67, 979; Leister, Tr. 4044; Whear, Tr. 4685, 4688; PX0669, *in camera*).

15. **Battery Separators** – products of various composition that are porous insulators placed between positively and negatively charged plates in batteries to prevent electrical short circuits while allowing ionic current to flow through the separators. (Gilchrist, Tr. 314; Hauswald, Tr. 968-69; Benjamin, Tr. 3504; Whear, Tr. 4665-66).

16. **Black Scum** – refers to a dark-colored residue that can gather on the liquid surface inside a polyethylene or polyethylene-based flooded lead-acid battery during usage. The black scum can result from the interaction of various chemicals and the oil component of a separator through a process of oxidation. (Hauswald, Tr. 1096-98; Brilmyer, Tr. 1834-35; Whear, Tr. 4707-08).

17. **CellForce** – product name for a polyethylene battery separator developed by Microporous (and now sold by Daramic) for deep-cycle applications that includes ground up ACE-SIL® rubber product as an additive in the polyethylene matrix of the separator to improve performance. (Gilchrist, Tr. 337-38, 340; Hauswald, Tr. 672-73, 993; RX01640 (physical product sample)).

18. **Daramic HD** – product name of a Daramic polyethylene battery separator made with a liquid latex additive for deep-cycle applications. (Hauswald, Tr. 671-72; PX0949 at 004, *in camera*; PX0319 at 007).

19. **Darak** – product name of a non-PE Daramic battery separator made with cross-linked phenolic resin for more porosity. The separator is made only in Germany and is typically used in gel type batteries. (Hauswald, Tr. 989-90; Whear, Tr. 4681; PX0582 at 051).

20. **Deep-cycle** – refers to certain end use applications for batteries where the batteries are placed in products having a lower amperage draw over a longer duration of time. These batteries are repeatedly discharged deeply to a low state of charge prior to recharging. Example applications include golf carts, floor scrubbers, scissor lifts, utilities, and marine boat applications. (Godber, Tr. 137-38; Gillespie, Tr. 2931; Whear, Tr. 4682, 4694; PX0319 at 007-008).

21. **FLEX-SIL®** - product name of a premium battery separator product developed by Microporous (and now sold by Daramic) that is made of pure rubber (no polyethylene) for use in deep cycle applications such as golf carts, floor scrubbers and aerial lifts. FLEX-SIL® product is sold only in "leaf" cut-piece form. (Roe, Tr. 1737, 1749; Hauswald, Tr. 992-93, McDonald, Tr. 3787; RX01639 (physical product sample)).

22. **Flooded Lead-Acid Battery** – a battery that has liquid acid in it up to a level above the positive and negative lead plates. Due to repeated charging and discharging, especially in deep-cycle applications, liquid will have a tendency to evaporate and the battery will need to be watered at certain intervals (except in a sealed, no maintenance automotive battery). (Godber, Tr. 147; Brilmyer, Tr. 1841; Qureshi, Tr. 2053-54; Whear, Tr. 4682)

23. **Enveloping** – instead of having the battery separator material cut into separate smaller "leaf" pieces, the battery manufacturer will purchase the material in roll form and itself fold the separator material around the plates of the batteries and seal it on the side (thus "enveloping" the plate like it is in a pouch). (Roe, Tr. 1748-49; Qureshi, Tr. 2036; PX1791 at 002) This process also can be referred to by a battery manufacturer as "sleeving". (Benjamin, Tr. 3508).

24. **Gel (Non-Flooded) Battery** – instead of having a liquid lead-acid like flooded batteries, these batteries (such as an AGM battery) have a gel silica that interacts with the positive and

negative plates of the battery to allow for ionic transfer. (Godber, Tr. 147; Gaugl, Tr. 4557; Whear, Tr. 4681).

25. **Industrial Separators** – refers to separators for all industrial applications for batteries, including industrial motive power or industrial stationary batteries. (Roe, Tr. 1815; Whear, Tr. 4682-83).

26. **Leaf Separator** – refers to battery separator material that has been cut into pieces (i.e., "leafs"), and many of these pieces will be stacked together in between plates and used in a single battery. (Roe, Tr. 1748-49; PX1791 at 2).

27. **Motive Power** – refers to an end use application of batteries for certain industrial products that move, such as forklifts and mine equipment. (Gilchrist, Tr. 306; Roe, Tr. 1197; Balcerzak, Tr. 4092; Whear, Tr. 4694).

28. **OE/OEM** – generally synonymous terms for original equipment or original equipment manufacturer. These types of batteries are installed as original equipment on a product (in contrast to batteries for the "aftermarket" which are replacement batteries). (Roe, Tr. 1762-63; Gillespie, Tr. 2932).

29. **Overall Thickness** – a primary measurement of a battery separator that measures the overall thickness of the product including the ribs (e.g., thickness of substrate and height of ribs together). Overall thickness serves to provide the space between electrodes and make a reservoir for the liquid. (Hauswald, Tr. 966-67, 979; Leister, Tr. 4044; Whear, Tr. 4688-89). (For demonstrative purposes see PX0669, *in camera*).

30. **PE Separators** – abbreviation for a polyethylene battery separator. Daramic's polyethylene battery separators are formulated from ultra high molecular weight polyethylene, as well as other ingredients such as silica and oil. (Toth, Tr. 1501, 1549; PX0582 at 041, 043). Certain PE separators include additional additives as well. (PX0582 at 043-050; PX0949 at 003-

4, *in camera*). These products are sold under trade names/trademarks that include Daramic Standard, Daramic HP, Daramic V, Daramic HD, Daramic HPR, Daramic HP-S, Daramic HPO, Daramic Duralife, Daramic W and Daramic CL. (PX0582 at 043-050; PX0949 at 003-004, *in camera*).

31. **Profile** – profile refers to the specifications of a separator and includes the thickness of the backweb as well as the shape of the ribs, i.e., whether they are vertical, diagonal, or S-shaped, along with the height and density of the ribs. Daramic offers a choice of approximately 80 profiles with its battery separators (Whear, Tr.4675-76).

32. **Reserve Power** – an end use application for batteries where the batteries are used to provide back-up or reserve power to a system. (Gilchrist, Tr. 306; Axt. Tr. 2099; Douglas Tr. 4052-53).

33. **Ribs** – protrusions on the separator. The ribs, which vary in height, thickness or shape from separator to separator, help fix the physical spacing in the battery to make sure there is an appropriate amount of acid between the plates. The shapes and sizes of these ribs make up part of the "profile" of the separator. (Hauswald, Tr. 966-67; Whear, Tr. 4665-67, 4675-76; PX1791 at 002).

34. **SLI** – abbreviation refers to an end use application for batteries known as "starter, lighting, and ignition," which is generally synonymous with an automotive-type application for batteries. Examples of SLI batteries include those placed in automobiles, trucks, buses, boats, snowmobiles, jet skis and recreational vehicles. (Brilmyer, Tr. 1831-32; Gillespie, Tr. 2390, *in camera*; Leister, Tr. 3976-77).

35. **Stationary** - refers to an end use application for a battery where the product is stationary, such as large back-up batteries for telecommunications, emergency lighting, UPS or other reserve power application. (Roe, Tr. 1736, 1816-17; Whear, Tr. 4692).

36. **Traction** – refers to an end use application for batteries in certain industrial products (e.g., electric forklifts). Term generally synonymous with "motive power" applications. "Motive power" is typically referred to in U.S., while "traction" is typically referred to globally. (Roe, Tr. 1250; Balcerzak, Tr. 4092).

37. **UPS** – refers to an end use application for batteries known as "uninterruptible power supply" or "uninterruptible power source" products. These are batteries for emergency power use in case of a power outage/stoppage. Examples include back-up stationary batteries for computer systems, telecommunications systems, and cell phone towers. UPS batteries are generally considered to be a type of reserve power batteries. (Gilchrist, Tr. 306; Roe, Tr. 1736-37; Brilmyer, Tr. 1832-33; Douglas Tr. 4052-53).

38. **VRLA** – abbreviation refers to valve-regulated lead-acid battery. VRLA is simply another name for an AGM battery. (Godber, Tr. 366; Douglas, Tr. 4052).

B. The Product and The Relevant Product Market

a. The Role of a Battery Separator

(a) Physical Characteristics

39. Lead acid batteries are made up of three primary components: a positive electrode, a negative electrode, and an electrolyte. (PX2110 at 010). The cells of a battery are made up of electrodes which are lead plates that are positively and negatively charged. (PX2110 at 010). The plates are stored in the electrolyte, which is a solution of sulphuric acid. (PX2110 at 010). The cell discharges electrons as the acid slowly changes the lead in the plates into lead sulphate. (PX2110 at 010). An electric current then flows if the terminals are connected through a conductor. (PX2110 at 010). When an electric current is being drawn from a battery it is being discharged. (PX2110 at 010).

40. A battery separator is a porous insulator placed between two plates of opposing polarity to prevent electrical short circuits while allowing ionic current to flow through the separator. (PX2110 at 010). From this standpoint, a battery separator is a passive element in a lead-acid battery. (Whear, Tr. 4666).

41. { } (PX2110 at 010; Douglas, Tr. 4072, *in camera;* Craig, Tr. 2553 (3-4%)).

42. A battery separator serves two primary functions. (Whear, Tr. 4666).

43. First, it prevents the positive and negative electrodes from having contact. If the positive and negative electrodes come into physical contact with each other, the cell will short out with no voltage or energy. While a separator needs to prevent physical contact, it must allow ions or electrolytes to flow back and forth within the battery which is why separators are porous. This function is performed primarily by the microporous backweb of a battery separator. (Whear, Tr. 4666).

44. The second function of a battery separator is to provide physical spacing. The separator fixes a physical spacing between the electrodes. The function is performed primarily by the ribs of a battery separator. A battery separator may have taller and shorter ribs depending upon the desired amount of acid between the plates. (Whear, Tr. 4666; Hauswald, Tr. 966-69).

45. Separators are characterized by their backweb thickness and their overall thickness. Backweb thickness denotes the thickness of the substrate between the ribs. Overall thickness is the height of the ribs, including the substrate thickness. Both thicknesses are measured in the unit mils or thousandths of an inch. (Whear, Tr. 4688-89)(For illustrative purposes see RX00945 at 167, *in camera*).

46. Battery manufacturers who purchase separators target a certain overall and backweb thickness in the separators they purchase, but a certain degree of tolerance is accepted within the industry. The typical tolerance for the backweb thickness is plus or minus one and one-half mils. The typical tolerance for the overall thickness is plus or minus three mils (or plus or minus four mils if the separator has a glass mat laminate). (Whear, Tr. 4689-90).

47. Battery separators can be made out of glass, paper, polyvinyl chloride ("PVC"), rubber, polyethylene, cellulosic and polypropylene. (Whear, Tr. 4666; Hauswald, Tr. 960; PX2110 at 010).

48. The main variables in a battery separator are the backweb thickness, the shape and/or height of the ribs, whether or not a laminate is used (a glass mat for instance), and whether an additive is used. (Whear, Tr. 4667).

49. An additive can serve a variety of functions in a battery separator such as serving as a wetting agent, improving oxidation resistance, improving water loss, and/or suppressing antimony. (Whear, Tr. 4668).

50. The most common types of additive are ones intended to suppress antimony. These additives include rubber, lignin, and various other organic chemicals. (Whear, Tr. 4668).

51. Various additives which may be used in battery separators to suppress antimony poisoning are commercially available. (Whear, Tr. 4668).

52. For example, Daramic uses a rubber additive which is commercially available from BASF. (Whear, Tr. 4668).

53. Additionally, the company Ensci, Inc., which was founded by Thomas Clough, has produced and patented organic chemical additives, in conjunction with Trojan Battery, which could be used in battery separators to suppress antimony. (Whear, Tr. 4670-75; RX00674; RX00675; RX00676).

54. In 2005, Ensci, Inc. offered to sell these additives to Daramic for use in Daramic's battery separators, but Daramic declined as it was already using a different additive to suppress antimony. (Whear, Tr. 4675, 4771).

55. A battery separator "profile" refers to the thickness of the backweb along with the shape of the separator's ribs (whether they are vertical, diagonal, or S-shaped), the density of these ribs, and the height of these ribs. (Whear, Tr. 4675).

56. Daramic produces approximately 80 different separator profiles. (Whear, Tr. 4675-76).

57. Daramic works with its customers to develop separator profiles which are suitable for the customer's batteries. (Whear, Tr. 4677).

58. A separator profile can be further differentiated by its backweb thickness (the thickness between the ribs), its overall thickness, and the formula used. (Whear, Tr. 4685). Considering these variables, Daramic offers over 5000 different product offerings or SKU's. (Whear, Tr. 4685-86).

59. Some separator profiles have become standardized or widely accepted by customers. This is most common in separators that are used in SLI end-use applications. (Whear, Tr. 4686).

60. Non-standard profiles are designed through collaboration with individual customers whereby a separator profile is prototyped, tested, and verified, and then once approved a calender roll will be grooved for that particular profile. (Whear, Tr. 4686).

(b) End-Uses

61. Polyethylene based separators are manufactured for myriad end-uses, including starting, lighting, and ignition batteries, stationary batteries, batteries that provide backup power, batteries that provide emergency power, and batteries that are deeply discharged. (Whear, Tr. 4679).