

UNITED STATES OF AMERICA  
BEFORE THE FEDERAL TRADE COMMISSION  
OFFICE OF THE ADMINISTRATIVE LAW JUDGES  
Washington, D.C.



In the Matter of

ECM BioFilms, Inc.,  
a corporation, also d/b/a  
Enviroplastics International,

Respondent.

Docket No. 9358

PUBLIC DOCUMENT

**JOINT STIPULATION OF THE PARTIES CONCERNING SCIENTIFIC DEFINITIONS**

Pursuant to Rule 3.21(c)(2), 3.22(f), 3.46(d), and his Honor's rulings from the bench, Respondent ECM BioFilms ("ECM") and Complaint Counsel hereby supply the following joint definitions of scientific and technical terminology. The parties have agreed that the following terms and corresponding definitions are not in dispute:

- Abiotic:** A physical process, rather than biological; something that is not derived from, or caused by, living organisms.
- Aerobic:** Relating to, involving, or requiring free oxygen. Also used to describe an environment with oxygen.
- Anaerobic Digester:** A vessel where decomposition of organic matter takes place in an environment without oxygen.
- Anaerobic:** Relating to, involving, or requiring an absence of free oxygen. Also used to describe an environment lacking oxygen.
- ASTM D5511 (or D5511):** The ASTM's Standard Test Method for Determining Anaerobic Biodegradation of Plastic Materials Under High-Solids Anaerobic Digestion Conditions.
- ASTM D5526 (or D5526):** The ASTM's Standard Test Method for Determining Anaerobic Biodegradation of Plastic Materials Under Accelerated Landfill Conditions.

<b>ASTM:</b>	Abbreviation for ASTM International formerly known as the American Society for Testing and Materials, a voluntary membership organization that develops standard test methods and specifications.
<b>Biochemical Methane Potential (or BMP) Test:</b>	A laboratory-scale reactor test that evaluates the biodegradation of materials under a high-liquid (usually anaerobic) environment.
<b>Biofilm:</b>	Any group of microorganisms in which cells stick to each other on a surface. These adherent cells may be embedded within a self-produced matrix of extracellular polymeric substance (EPS), a slimy, glue-like substance that can anchor them to all kinds of material – such as metals, plastics, soil particles, medical implant materials, and human or animal tissue.
<b>Biogas:</b>	The gas generated as a result of anaerobic biodegradation, usually in the form of methane and carbon dioxide.
<b>Biomass:</b>	Organic matter derived from living organisms including plants, animals, and microorganisms.
<b>Bioplastic:</b>	A type of plastic derived from biological substances rather than petroleum, generally said to be biodegradable.
<b>Biota:</b>	The microorganisms, animals, or plants in a particular region or area, to wit, within a landfill or test environment.
<b>BPI:</b>	An abbreviation for the Biodegradable Products Institute.
<b>Buswell equation:</b>	An equation that calculates the maximum biogas potential of a material. The equation determines, based on principles of stoichiometry, the moles of methane and carbon dioxide that can possibly be produced from a mole of substrate or material.
<b>Carbon dioxide:</b>	A colorless, odorless gas produced by microorganisms during aerobic and anaerobic respiration.
<b>Carbon-14:</b>	A radioactive isotope of carbon, having six protons and eight neutrons in the nucleus.
<b>Chloride ion:</b>	The negatively charged ion ( $\text{Cl}^-$ ) of Chlorine. Chlorine has a molar mass of about 35 AMU. The chloride ion is a part of the polymer PVC (polyvinyl chloride).
<b>Colorant:</b>	A compound, added during the manufacturing process to plastic resins, which contains sufficient pigment to be blended in appropriate amounts to achieve a uniform final color.

<b>Compost:</b>	Organic matter that has been degraded under an oxygen rich environment.
<b>Conventional Plastic:</b>	A generalization for polyolefin plastics that are untreated and not intended to be biodegradable.
<b>Copolymer:</b>	A copolymer is made when two different types of molecules (monomers) are joined through polymerization in the same polymer chain.
<b>Decay Rate:</b>	The rate at which organic matter is degraded to more stable forms.
<b>Ductile:</b>	A mechanical property that describes the extent in which solid materials can be plastically deformed without fracture.
<b>Dwell time:</b>	In plastics manufacturing, the residence time of a resin or additive in the mold or injection cylinders, during which time the material is exposed to heat.
<b>ECM Additive:</b>	The ECM technology, including “MasterBatch Pellets” that ECM manufactures and sells to plastic manufacturers and distributors.
<b>ECM Plastic(s):</b>	Plastics and/or plastic products that contain an ECM additive.
<b>Enzyme:</b>	A substance produced by a living organism that acts as a catalyst to bring about a specific biochemical reaction.
<b>EPA LMOP:</b>	Abbreviation for the Environmental Protection Agency’s Landfill Methane Outreach Program, a program that helps to reduce the methane emissions from landfills by encouraging the recovery and beneficial use of landfill gas as an energy resource.
<b>Erlenmeyer flask:</b>	A conical laboratory flask with a flat bottom, conical body, and cylindrical neck, which can be used in closed-system laboratory-scale reactor tests to measure biodegradation. The flask becomes the anaerobic (or aerobic) digester for testing purposes.
<b>Extrusion Molding:</b>	The process of forming continuous plastic shapes by forcing a molten plastic material through a die cast.
<b>Feedstock:</b>	A raw material supplied to a machine or processing plant in the making of plastics.
<b>First Order Decay Rate:</b>	The rate at which a chemical reaction takes place that follows first order kinetics or exponential decay.

<b>Gas Chromatograph:</b>	A chemical analysis instrument for separating and identifying chemicals in a complex sample.
<b>Gas evolution (or respirometric) test:</b>	A test that evaluates the generation of gas from a closed system laboratory reactor.
<b>Glass Transition Temperature (or Tg):</b>	The temperature at which a solid undergoes a reversible transition from a hard and relatively brittle state into a molten or rubber-like state.
<b>Half-life:</b>	The amount of time it takes material to decompose to have of its original value.
<b>Humus:</b>	Stable soil organic matter derived from materials of plant or animal origin.
<b>Hydrolysis:</b>	The chemical breakdown of a compound due to reaction with water. A “hydrolytic” reaction is one of, producing, or resulting in hydrolysis.
<b>Injection Molding:</b>	A method of forming plastics from granular or powdered materials, wherein the ingredients or components are fed through a hopper into a heated chamber, after which the melted materials are pressed into molds or die casts.
<b>Inoculum:</b>	A source material used to introduce microorganisms to an environment. As used in anaerobic test methods, an anaerobically digested organic waste that includes all groups of microorganisms required to convert a substrate to methane and carbon dioxide.
<b>In-situ Testing:</b>	Refers to testing or evaluations conducted in the natural environment where the scientific phenomena generally occur. In context with landfill biodegradation studies, “in-situ” testing refers to tests conducted on or within MSW landfills.
<b>ISO:</b>	An abbreviation for the International Organization for Standardization, an independent, non-governmental membership organization that develops voluntary international standards.
<b>Landfill:</b>	A disposal site where solid waste is buried between containment layers consisting of soil and other materials to eliminate contamination of the surrounding land.
<b>LandGEM:</b>	Landfill Gas Emissions Model.
<b>Leachate recirculation:</b>	The practice of returning leachate to the landfill from which it has been abstracted.

<b>Leachate:</b>	A liquid that percolates through waste material in a landfill.
<b>Lignin:</b>	A complex polymer of aromatic alcohols that is an abundant organic polymer in nature.
<b>Load rating (or load rate):</b>	With respect to plastic additives, the percent of additive introduced into the final plastic by weight. Concerning the ECM Additive specifically, the “load rate” refers to the amount of the additive pellet by total weight.
<b>Masterbatch:</b>	A concentrate of additives dispersed within a carrier polymer, which is then blended into the base polymer or resin intended to be modified.
<b>Melting point:</b>	The temperature at which a solid and liquid phase may coexist in equilibrium or, put simply, the point at which a solid material turns to a liquid, if applicable.
<b>Mesophilic microorganism (or mesophile):</b>	Bacteria that functions best under moderate temperatures, generally (but not exclusively) between 20°C and 40°C (68°F-104°F).
<b>Methane:</b>	A gas composed of one atom of carbon, and four atoms of hydrogen, produced as an end product of anaerobic biodegradation.
<b>Methanogen:</b>	Bacteria that generate methane in the process of breaking down matter.
<b>Molecular weight:</b>	The sum of the atomic weights of the atoms in a molecule.
<b>Monomer:</b>	A small molecule that can be bonded with identical small molecules to form a chain or a network (polymer).
<b>Municipal Solid Waste (MSW):</b>	Waste consisting of everyday items discarded by the public, including, e.g., product packaging, grass clippings, furniture, clothing, food scraps, newspapers, etc., but excluding hazardous and commercial waste.
<b>Municipal Solid Waste (or MSW) Landfill:</b>	A landfill that accepts municipal solid waste, which includes, e.g., waste generated from residential, commercial, and institutional sectors, including wastes from households, offices, stores, and non-manufacturing activities.
<b>Negative Control:</b>	A test control used in a well-designed scientific experiment, wherein no response is expected. Concerning biodegradation testing, the negative control is frequently polyethylene or a conventional plastic not treated for biodegradability.

<b>NSF:</b>	An abbreviation for the National Sanitation Foundation International, or NSF International, which is an independent and accredited organization that develops standards, and tests products and systems.
<b>Olefin:</b>	An unsaturated chemical compound derived from petroleum containing at least one carbon–carbon double bond, and includes ethylene and propylene.
<b>pH:</b>	A measure of the acidity or basicity of an aqueous solution. Solutions with a pH less than 7 are said to be acidic and solutions with a pH greater than 7 are basic or alkaline. Pure water has a pH very close to 7.
<b>Plastic additive:</b>	Materials added to a plastic polymer to produce a desired change in material properties or characteristics.
<b>Plasticizer:</b>	A substance, material, or compound incorporated in a material to increase flexibility, workability, or extensibility.
<b>Poly(lactic acid) (or PLA):</b>	A biodegradable thermoplastic aliphatic polyester derived from renewable resources, such as corn starch (in the United States), tapioca roots, chips or starch (mostly in Asia), or sugarcane (in the rest of the world).
<b>Polycaprolactone (or PCL):</b>	A biodegradable polyester with a low melting point of around 60°C and a glass transition temperature of about –60 °C.
<b>Polyethylene (or PE) (also LLDPE, HDPE):</b>	A type of thermoplastic polymer, generally manufactured by polymerizing ethylene.
<b>Polyethylene terephthalate (PET or PETE):</b>	A type of thermoplastic polymer resin of the polyester family.
<b>Polymer:</b>	A substance that has a molecular structure consisting chiefly or entirely of a large number of similar units (monomers) bonded together.
<b>Polymerization:</b>	A chemical reaction whereby the molecules of similar or identical monomers are linked together to form larger chain molecules with molecular weights that are multiples of the monomer.
<b>Polyolefin</b>	A term for petrochemical-based plastics including, e.g., PE, LDPE, LLDPE, HDPE, and PP.
<b>Polypropylene (or PP):</b>	A type of thermoplastic polymer.

<b>Polystyrene (or PS):</b>	A type of thermoplastic polymer, generally manufactured by polymerizing styrene. Expanded Polystyrene (EPS) is used as a white rigid foam, otherwise known as Styrofoam.
<b>Polyvinyl Chloride (PVC):</b>	A type of plastic.
<b>Positive Control:</b>	A test control used in a well-designed scientific experiment, wherein a known response is expected. Concerning biodegradation testing, the positive control is frequently cellulose, i.e., filter paper or similar.
<b>Prokaryote:</b>	A microscopic single-celled organism that lacks a distinct nucleus with a membrane or other specialized organelles. Prokaryotes include bacteria and cyanobacteria.
<b>Radiolabel:</b>	To label with a radioactive atom or substance.
<b>RCRA:</b>	Resource Conservation and Recovery Act, the federal law that governs the management and disposal of solid and hazardous waste.
<b>Resin:</b>	A term used to designate a polymer used as a base material for plastics.
<b>Sludge:</b>	Refers to the residual, semi-solid material left from industrial wastewater, or sewage treatment processes.
<b>Stoichiometry:</b>	The branch of chemistry that deals with the application of the laws of definite proportions and the conservation of mass and energy to chemical activity. Stoichiometry involves the examination of ratios between two or more substances undergoing a physical or chemical change.
<b>Tensile strength:</b>	The amount of force required to elongate the plastic by a defined amount.
<b>Thermophilic microorganism (or thermophile):</b>	Bacteria that functions best under higher temperatures, generally (but not exclusively) above 45 degrees Celsius.
<b>Thermoplastic:</b>	A plastic polymer that becomes pliable or moldable above a specific temperature but returns to a solid state after cooling.
<b>Thermoset:</b>	A plastic polymer (or resin) that is initially pliable or moldable, but irreversibly cures upon cooling.

**Volatile Solids:**

As used in biodegradation testing, the amount of solids in the test inoculum, calculated by the mass of material that is lost on combustion at 550 Celsius.

Respectfully submitted,

/s/ Katherine Johnson\*

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*Counsel for Respondent, ECM Biofilms*

Dated: September 4, 2014.

\* Signed electronically on Ms. Johnson's behalf with her permission.

**CERTIFICATE OF SERVICE**

I hereby certify that on September 4, 2014, I caused a true and correct copy of the foregoing to be served as follows:

One electronic copy to the **Office of the Secretary** through the e-filing system:

Donald S. Clark, Secretary  
Federal Trade Commission  
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One electronic courtesy copy to the **Office of the Administrative Law Judge**:

The Honorable D. Michael Chappell  
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One electronic copy to **Counsel for Complainant**:

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I certify that I retain a paper copy of the signed original of the foregoing document that is available for review by the parties and adjudicator consistent with the Commission's Rules.

DATED: September 4, 2014

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