Best Practices for Material and Substance Characterization

Version: 2020-12-17

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BACKGROUND

This document provides implementation details for two sections of the HPD Open Standard:

- 2.2.1.7 Material Type: A broad classification of a material based on chemical makeup and molecular structure
- 2.2.2.7 Substance Role: A term that captures the substance's purpose or function for inclusion in the material or product

In both cases, HPDC is providing a suggested list of terms that manufacturers are asked to choose from. The purpose of this is to support manufacturers in entering consistent, high-quality information on HPDs.

For each of these data fields, this document provides:

- Instructions
- Suggested terms.

HDPC has published this information in Emerging Best Practices so that HPDC and its Technical Committee can update these terms as needed to reflect manufacturing processes. As this document is updated, the HPD Builder and other tools compliant with the HPD Open Standard will synchronize with it.

2.2.1.7: MATERIAL TYPE – INSTRUCTIONS

In this data field, the Health Product Declaration (HPD) asks the manufacturer to enter "A broad classification of a material based on chemical makeup and molecular structure."

The options for this field are intended to be very broad. Manufacturers may choose the "best fit." If none of the options is a good fit, manufacturers may select "Other" and enter a short phrase as a description. Again, the intention is to offer a brief, clear, comprehensible description of the material.

Many materials in building products are composite, i.e., they are made up of various materials of different types. For the purposes of this HPD field, manufacturers should identify composite materials by denoting the main material type in the mixture. This may be identified by weight or volume, or another characteristic if relevant. If it is not a good fit to describe the material in this way, then "Other" may be selected, and a brief descriptive phrase provided.

This list of Material Types has been specifically developed for the HPD. HPDC consulted other sources to identify common terms and alignment where possible, including:

- HPD Special Conditions policies
- The Declare Manufacturers Guide
- Calrecycle
- The National Resource Center for Materials Technology Education

Material Type	Definitions
Metal	Any predominately metallic material, including metal alloys.
Ceramic	Any predominately ceramic material, i.e., made of clay and hardened by heat. Includes low- and high-heat materials.
Polymeric Material	A mixture of one or more polymer substance(s) or polymer mixture(s), all other functional additives (intentionally added substances), and unintentional impurities. Includes synthetic or naturally derived polymeric materials, as well as recycled material that is primarily polymeric.
Glass	Any predominately glass material, including float glass, fiberglass, or recycled glass.
Electronic Component	Any component that creates an electronic circuit with a particular function. It may be active, passive or electromechanical.
Paper or Cardboard	Any predominately thin (paper) or thick (cardboard) material manufactured in thin sheets from cellulose or other fibrous substances, whether from recycled or virgin content.
Wood or Lumber	Any predominately hard fibrous material made from trees or shrubs, or from woody plants such as bamboo, whether virgin or recycled.
Wood Dust, Fiber or Chips	Any predominately tree-derived dust, chip or fiber material, whether virgin or recycled.
Plant-Based Fiber	Any predominately fibrous material derived from an agricultural product such as jute, cotton, hemp, etc.
Animal-Derived Material	Any material predominately derived from an animal such as wool, leather, or silk.
Other Biological Material	Any material predominately derived from biological sources not described elsewhere, such as microbial tissue, fungal tissue, live plants, or microorganisms.
Geologically Derived Material	Any material predominately extracted as-is from the earth in rock or sediment form, including rock, gravel, quarried stone, clay, sand, aggregate, or industrial minerals, and including refined or transformed materials predominately resembling geological materials, such as gypsum, mineral wool, ash, or slag.
Other (fill in the blank)	Any material that cannot predominately characterized by another item on this list.

2.2.2.7 SUBSTANCE ROLE – INSTRUCTIONS

This document is provided to support the selection of the most appropriate Substance Role for each substance listed in the content inventory on a Health Product Declaration (HPD). The HPD calls for the manufacturer to enter “A term that captures the substance’s purpose or function for inclusion in the material or product.”

The list of possible substance roles in this document provides a thorough selection of options to describe the roles that substances may play in formulating and manufacturing building products and materials. This list has been assembled specifically for this purpose, but other sources such as the U.S. Environmental Protection Agency and the European Union were consulted, both to gather key terms and to harmonize definitions and synonyms. The level of specificity provided by this list is intended by HPDC to be balanced with identifying common usages.

Manufacturers are asked to select the "best fit," referring to definitions and synonyms to help, even if the term is not a perfect fit. If a manufacturer thinks that there is not an adequate fit on this list for the role of their substance, they may contact the HPDC Technical Director at support@hpd-collaborative.org to suggest a new entry or modification. In consultation with its Technical Committee, HPDC may add to or modify this list of substance roles and synonyms regularly, as requested by manufacturers or as suggested by researchers and others.

Notes on Residuals and Impurities:

- Before selecting "Residual," try to identify a more specific role that describes why the substance is present, e.g., if the residual content is the result of a substance being added as an accelerator, select "Accelerator."
- Select "Impurity" for substances present in the raw material that have not been removed during the manufacturing process.

Substance Role	Definition	Synonyms
Abrasion resistance	Increases the strength or hardness of a material.	reinforcing agent, scratch resistance
Abrasive	Used to abrade, smooth, scour, scrub, clean, wear down, or polish a surface by rubbing; usually fine powders of hard substances.	polishing agent, honing agent, grinding agent
Absorbent	Retains other substances by assimilation.	
Accelerator	Increases the rate at which a process occurs; usually refers to the cure process in thermosetting resins.	curing agent
Activator	Stimulates or initiates a chemical process.	hardener
Adhesive	Joins opposite surfaces to each other, promotes bonding between other substances, promotes adhesion of surfaces, or fastens materials together. Generally applied from a solvent solution and allowed to dry on the two facing surfaces.	glue, paste, coupling agent, gum, adhesive cement, bonding agent, inner coating, anchor coating
Adsorbent	Retains other substances by accumulation on their surface or by assimilation.	
Alloy element	Metallic or non-metallic elements such as aluminum, boron, chromium, cobalt, copper, manganese, nickel, silicon, titanium, tungsten, vanadium, zirconium, added in specified or standard amounts to a base metal to make an alloy.	
Anti-adhesive agent	Prevent bondings between other substances by discouraging surface attachment.	anti-adherents, antiblock agents, detackifiers, dusting agents, mould release agents, parting agents
Antimicrobial pesticide	Intended to disinfect, sanitize, reduce, or mitigate growth or development of microbiological organisms or protect inanimate objects, industrial processes or systems, surfaces, water, or other chemical substances from contamination, fouling, or deterioration caused by bacteria, viruses, fungi, protozoa, algae, or slime.	antibacterial, antiviral, antifouling, biocide, disinfectant, pesticide, antifungal, preservative

Substance Role	Definition	Synonyms
Anti-freeze	Added to fluids, especially water, to reduce the freezing point of the mixture, or applied to surfaces to melt or prevent the buildup of ice.	deicer, freeze/thaw stabilizer
Anti-static	Reduces or eliminates surface electrical charges and hence prevents dust pick-up on polymer surfaces.	
Antioxidant	Used to maintain the quality, integrity, and safety of finished products by inhibiting the oxidative degradation of the ingredients in the formulation.	oxidation inhibitor, antiskinning agent, antifouling, deoxidizer
Antistain	Provides stain blocking and soil resistance to soft surface cleaners and protectors.	stain repellant, soil release agent
Bacteriostatic	A biological or chemical agent that stops bacteria from reproducing, while not necessarily killing them otherwise. Depending on their application, bacteriostatic antibiotics, disinfectants, antiseptics and preservatives can be distinguished.	
Binder	Any material that is blended with other solids or liquids to hold ingredients together.	binding agent, cement, pozzolan, resin
Biological material	A naturally occurring material containing genetic information and capable of reproducing itself or being produced within a biological system. NOTE: Most biological materials are made of multiple substances, not single-ingredient substances (see HPD definitions for homogeneous materials and substances). Therefore this substance role is seldom-used outside of natural materials such as whole plants, paper products, or wool that are not broken down into constituent substances on the HPD content inventory. (See HPD's Special Condition guidance for Biological Materials.)	plant species, live microorganism, fungi, live plants, face fiber, fibre, animal-based material, microbial tissue
Bleaching agent	Lightens or whitens a substrate through chemical reaction. The bleaching reactions usually involve oxidative or reductive processes that degrade color systems. Bleaching and decolorization can occur by destroying one or more of the double bonds in the conjugated chain, by cleaving the conjugated chain, or by oxidation of one of the other moieties in the conjugated chain.	
Blowing agent	Used to dissolve or suspend other substances and either to expel those substances from a container in the form of an aerosol or to impart a cellular structure to plastics, rubber, or thermoset resins.	propellant, foaming agent, expanding agent, frother, foam booster, air entraining, foam
Brightener	Used to brighten, whiten, or enhance the appearance of color of fabric and paper, usually by absorbing light in the ultraviolet and violet region of the electromagnetic spectrum, and re-emitting light in the blue region. This causes a "whitening" effect by increasing the overall amount of blue light reflected.	bleaching agent, whitening agent, optical brightener
Buffer	Maintains the desired pH range of a substance; used to alter, stabilize, or control the pH (hydrogen ion concentration).	buffering agent, pH adjuster, pH regulating

Substance Role	Definition	Synonyms
		agent, neutralizing agent, neutralizer
Carrier	Acts as a neutral material and supports the active ingredients as they initiate chemical reactions.	vehicle
Catalyst	Increases the rate of a chemical reaction without itself undergoing any permanent chemical change.	
Ceramic body	Used to form the body of a ceramic material (including earthenware, porcelain, or brick).	clay body
Chelating agent	Used to change the properties of metal ions, help to transport metal ions, and prevent scale formation, usually by forming two or more coordination bonds with a central metal ion.	chelant, sequestrant, sequestering agent, complexing agent
Coalescent	Decrease the minimum film-forming temperature (MFT) and, upon evaporation, yield a hard film.	
Coating	Provides a thin protective layer or covering, typically harder and more durable than the substrate.	sealant, surface treatment, finish, wear layer
Conductor	Conducts or transmits heat, electricity, or sound.	
Corrosion inhibitor	Used to prevent or retard corrosion or the formation of scale (including rust) on metallic materials. Needed in many products packaged in metal containers (such as aerosol products) and also used in such products as lubricants and other metal treatment products to provide protection to the substrates or surfaces on which the lubricants are used.	antiscaling agent, corrosion-inhibiting additive, rust preventive, anticorrosion agent, antirust agent
Curing agent	Promotes crosslinking in polymers, e.g. peroxides in polyesters, or amines in epoxy formulations.	cross linking agent, vulcanizing agent
Cushioning	Softens impact. NOTE: Cushioning is typically provided by materials made of multiple substances, not single-ingredient substances (see HPD definitions for homogeneous materials and substances). Therefore this substance role is seldom-used outside of natural materials such as wool or cotton that are not broken down into constituent substances on the HPD content inventory.	padding
Dedusting	Removes excessively fine particles of the same material or another material.	dedust oil, dusting agent
Defoamer	Used to control foam; prevents foam from forming; breaks down any foam that does form; or reduces foaming from proteins, gases, or nitrogenous materials. Reduces the tendency of finished products to generate foam on shaking or agitation. The ability of a material to act as a defoamer depends on its tendency to concentrate on the surface of existing or forming bubbles and to disrupt the continuous films of liquid surrounding them. As process aid, it improves filtration, dewatering, washing, and drainage of many types of suspensions, mixtures, and slurries.	antifoaming agent, air release, foam control agent
Degreaser	Used to dissolve oils, greases and similar materials from textiles, glassware, metal surfaces, and other articles.	

Substance Role	Definition	Synonyms
Desiccant	Used to provide drying, usually a hygroscopic substance.	drier, siccative, drying additive, drying agent
Desulfurizer	Removes sulfur or sulfur compounds.	
Detergent	Cleans by lowering surface tension, wetting, emulsifying, or dispersing grease and dirt. When incorporated into formulations, detergents give them the property of keeping insoluble material in suspension. They often refer to a combination of materials along with surfactants that act collectively to provide effective cleaning. They can be derived from natural fats and oils (like soap) or may be synthetic. Synthetic formulation will typically include hydrophilic (water soluble) and hydrophobic (oil soluble) groups. May also refer to surfactants, builders, chelators, and other ingredients with specific functions.	builder, emulsifier
Diluent	Serves primarily to reduce the concentration of the other ingredients in a formulation, usually liquid (whereas fillers are used in solid or powder formulations).	thinner, mineral spirits, dilutant, dilutent
Dispersant	Added to a suspending medium or suspension to improve the separation of particles; to ensure proper dispersion; to prevent settling or clumping; to encourage uniform and maximum separation of individual, extremely fine solid particles or liquid droplets, often of colloidal size. A typical use is dispersal of dyes to ensure uniform coloration.	antisettling agent, solids separation agent, suspending agent, dispersent, dispersing agent
Dye	Imparts color to other materials or mixtures by penetrating into the surface of the substrate.	colorant
Electronic component	Any component that creates an electronic circuit with a particular function. May be active, passive or electromechanical. NOTE: An electronic component is made of materials, and is not a single-ingredient substance (see HPD definitions for homogeneous materials and substances). Therefore this substance role is intended for use only when electronic components are being entered on the HPD as substances, as may happen in compliance with HPDC's Special Condition for Electronic Components.	semiconductor, wiring, cabling
Emulsifier	Stabilizes a mixture of two or more liquids (which do not normally mix with each other) that are held in suspension. The emulsifier stabilizes this suspension by modifying the surface tension to prevent coalescense.	
Enzyme	Catalysts for the chemical reactions of biological processes, such as digestion.	
Filler	Adds to the bulk of a dry product formulation (solid or powder) and to lower the concentration of other ingredients; used to provide bulk, increase strength, increase hardness, or improve resistance to impact; used to extend a material and to reduce its cost by minimizing the amount of more expensive substances used in the production of articles; used to fill cavities or tighten joints; relatively inert and normally non-fibrous, finely divided substance added usually to extend volume while sometimes also improving desired properties, such as whiteness, consistency, lubricity, density or tensile strength.	bulking agent, extender, inert filler, aggregate, weight
Film former	Provides a pliable, cohesive, and continuous covering.	

Substance Role	Definition	Synonyms
Fixing agent	Interacts with a dye on fibers to improve fastness.	dye transfer inhibitor
Flame retardant	Alters the normal degradation or combustion processes of a material, usually polymeric. Substances may be used on the surface of tor incorporated into combustible materials to reduce or eliminate their tendency to ignite when exposed to heat or a flame for a short period of time; used to raise its ignition point; or used to slow down or prevent combustion.	charring agent, fire retardant, FR
Flux	Lowers the melting point of a solid, especially in soldering and brazing metals or to promote vitrification in glass or ceramics.	fluxing agent
Fungicide	Kills or prevents the growth of fungi and their spores.	
Galvanizing	Coats iron or steel with a protective layer.	
Glass component	Glass, or used in the manufacturing of glass.	glazing, glass
Glaze	Vitreous substance fused on to the surface of pottery to form an impervious decorative coating.	
Hardware	Specialized fittings or fasteners, often made of metal alloys. NOTE: Most hardware is made of multiple substances, not single substance ingredients (see HPD definitions for homogeneous materials and substances). Therefore this substance role is seldom-used outside of product ingredients applying the HPD Special Conditions guidance for Hardware.	fastener, bearing
Heat or UV stabilizer	Protects polymers from the chemical degrading effects of heat or UV irradiation. These additives include a wide variety of chemical substances, ranging from purely organic chemicals to metallic soaps to complex organometallic compounds.	
Herbicide	Used to control unwanted plants.	
Humectant	Used to retard moisture loss from the product during use. This function is generally performed by hygroscopic materials. The efficacy of humectants depends to a large extent on the ambient relative humidity.	dewatering, dehumidifier, dehydrating agent, hydrophilic, water absorber
Hydraulic fluid	Provides the medium the transfer power in hydraulic machinery, usually using mineral oil or water.	hydraulic oil
Impact modifier	Uses up the energy of crack propagation and hence increases resistance to impact.	
Impurity	An unintentionally included constituent which impairs the purity of the material, especially substances present in the raw material that have not been removed during the manufacturing process.	contaminant, pollutant
Initiator	Reacts with a monomer to form an intermediate compound capable of linking successively with a large number of other monomers into a polymeric compound.	
Ink	Used for writing or printing.	

Substance Role	Definition	Synonyms
Insecticide	Used to kill insects, including use of ovicides and larvicides against insect eggs and larvae.	
Insulator	Used to prevent or inhibit the flow of electrical current, heat and light and the transmission of sound.	insulation, thermal insulation, acoustic insulation, electric insulation, radiation barrier, foil
Intermediate	Consumed in a reaction to produce other chemical substances. A residual of the intermediate chemical substance which has no separate function may remain in the reaction product.	prepolymer
Intumescent	Swells up when heated, thus protecting the material underneath or sealing a gap in the event of a fire.	passive fire protection
Lubricant	Prevents or reduces the adhesion of a material to itself or to another material; prevents bonding between other substances by discouraging surface attachment; functions as the antithesis of adhesive. May be introduced between two moving surfaces or adjacent solid surface to reduce the friction between them, improve efficiency, reduce wear, reduce heat generation; or enhance the lubricity of other substances.	abherent, antiadhesive, release agent, parting agent, antiblocking agent, slip aid, antisetoff agent, cutting fluid, anti-blocking, nonstick, fiber lubricant, mold release agent
Matting agent	Used to achieve a matte finish.	
Monomer	A molecule that can be bonded to other identical molecules to form a polymer.	prepolymer, initiator, reactive monomer
Nucleating agent	Promotes or controls the formation of solids.	crystallizing agent, gypsum crystallization
Odor agent	Used to control odors, remove odors, mask odors, or impart odors.	deodorant, deodorizing agent, fragrance
Opacifier	Renders solutions opaque; reduces transparency or the ability of light to pass through solution; added to finished products to reduce their clear or transparent appearance.	opacifying agent
Oxidizing agent	Used to alter the valence state of another substance by donating or accepting electrons or by the addition or removal of hydrogen to a substance; gains electrons during their reaction with a reducing agent; commonly contributes oxygen to other substances; gives up oxygen easily, removes hydrogen from other compounds, or accepts electrons in chemical reactions, and is used for such purposes.	reducing agent, oxidizer
Photoinitiator	Undergoes a photoreaction on absorption of light, producing reactive species.	
Pigment	Imparts color to another substance or mixture by attaching itself to the surface of the substrate through binding or adhesion, usually as a dry powder; may contribute towards opacity, durability, and corrosion resistance. Must have positive colorant value; larger than molecular particle size and held in place by corresponding low mobility; scatter and absorb light.	toner, colorant, reprographic agent
Plasticizer	Softens synthetic polymers; added to a high polymer to facilitate processing and to increase flexibility, plasticity, fluidity and toughness of	ductility

Substance Role	Definition	Synonyms
	the final product by internal modification (soluation) of the polymer molecule. Plasticizers may be added internally or externally. A rigid polymer can also be externally plasticized by addition of a plasticizer, which imparts the desired flexibility but is not chemically changed by reaction with the polymer.	
Plating agent	Applied to metal, plastic, or other surfaces to alter physical or chemical properties of the surface. Examples include metal surface treating agents, strippers, etchants, rust and tarnish removers, and descaling agents.	
Polymer	Molecules characterized by the sequence of one or more types of monomer units. Such molecules must be distributed over a range of molecular weights wherein differences in the molecular weight are primarily attributable to differences in the number of monomer units. Polymer species comprise the following: (a) a simple weight majority (i.e., 50%) of molecules containing at least three monomer units which are covalently bound to at least one other monomer unit or other reactant; or (b) less than a simple weight majority of molecules of the same molecular weight." In the context of this definition a "monomer unit" means the reacted form of a monomer in a polymer." (REACH, Article 3(5); http://www.reachonline.eu/REACH/EN/REACH_EN/article3.html, accessed 10/14/17)	polymer species, polymer substance, polymer mixture
Powder coating	Forms a protective layer, usually with a polyester or epoxy powder.	
Processing regulator	Used to change the rate of a chemical reaction, start or stop the reaction, or otherwise influence the course of the reaction. May be consumed or become part of the reaction product. NOTE: "Processing regulator" is a general term. Some more specific substance roles that may fall under this term are listed on their own in this guide. When possible, use a more specific substance role.	inhibitor, enzyme, lytic agent, polymer, rubber accelerator activator, open time extender, reaction agent, working time adjuster, retarder, processing aid
Propellant	Used for expelling products from pressurized containers (aerosol products); used to dissolve or suspend other substances and either to expel those substances from a container in the form of an aerosol or to impart a cellular structure to plastics, rubber, or thermoset resins; provides the force necessary to expel the contents of aerosol containers; liquefied or compressed gas within which substances are dissolved or suspended and expelled from a container upon discharge of the internal pressure through expansion of the gas. The formulated product in the pressurized container may be solution, emulsion, or suspension.	
Reagent	Used in chemical analysis or other reactions.	
Reducing agent	During reactions with oxidizing agents will lose electrons; commonly contributes hydrogen to other substances; used to remove oxygen, hydrogenate or, in general, acts as electron donor in chemical reactions.	
Reflectance	Imparts light reflection to the material.	foil
Refrigerant	Used in a heat pump and refrigeration cycle.	

Substance Role	Definition	Synonyms
Residual	May be present in the final material/mixture but is not intended as a constituent. For example, this may refer to substances included in a manufacturing process to aid processing, as well as inputs to a reaction process such as reagents, catalysts, monomers. NOTE: Before selecting "Residual," try to identify a more specific role that describes why the substance is present, e.g., if the residual content is the result of a substance being added as an accelerator, select "Accelerator."	byproduct, reactant
Rodenticide	Kills rodents.	
Scavenger	Reacts with and removes particular molecules.	chelant, sequestrant, sequestering agent, complexing agent
Sealant	Designed only to fill up a space, prevent seepage of moisture or air, passage of liquid or gas. The spaces can be joints, gaps or cavities that occur between two substrates.	putty, caulk, barrier, finish, moisture resistance, protective layer, gasket
Sequestering agent	Forms coordination complexes with ions in solution so that the usual precipitation reactions of the latter are prevented. Functions to prevent redeposition of dirt and grease on cleaned surfaces.	sequestrant
Sizing agent	For papers and textiles, acts as a protective filler or glaze to change the absorption and wear characteristics.	
Smoke suppressant	Suppresses the formation of smoke in case of combustion.	smoke retardant
Soap	Used to remove dirt or impurities from surfaces; acts to loosen and remove dirt and grease from surfaces.	cleaning agent, soap scum remover, descaler
Softener	Used for softening materials to improve feel, to facilitate finishing process, or to impart flexibility or workability; used in textile finishing to impart superior "hand" to the fabric and facilitate mechanical processing; has the capability of imparting softness and pliability to washable textile fabrics.	softening agent, finishing agent
Solids separation agents	Used to promote the separation of suspended solids from a liquid.	flotation aids, flocculants, coagulants, dewatering aid, drainage aid
Solubizer	Prevents chemicals or materials from separating or falling out of solution, often used in concentrated formulations.	solubility enhancer, hydrotope
Solvent	Used to dissolve another substance (solute) to form a uniformly dispersed mixture (solution) at the molecular level.	
Stabilizer	Keeps a compound, solution, or mixture from changing its form or chemical nature; renders or maintains a solution, mixture, suspension, or state resistant to chemical change; or prevents or slows down spontaneous changes in and aging of materials.	stabilizing agent
Structure component	Adds structure, backing, or substrate to the product.	backing, substrate, core, reinforcement, structure, edge banding, core material,

Substance Role	Definition	Synonyms
		honeycomb, paper backing, foil backing
Surface modifier	May be added to other ingredients to adjust the optical properties associated with the surface of a material. These substances are designed to affect the luster, increase gloss, and alter the reflectance exhibited by a surface.	lustrant, leveling agent, polishing agent, refractive index modifier, surface coating agent, flatting agent, paint additives, gloss agent, gloss control, delustrant, delustring agent, delustrant, delusterant, optical additive, optical modifier
Surfactant	Used to modify surface tension when dissolved in water or water solutions, or reduce interfacial tension between two liquids or between a liquid and a solid or between liquid and air.	wetting agent, penetrant, surface active agent, water absorbent, dispersant
Tackifier	Promotes stickiness, while not providing full adhesion.	friction agent
Tensile strength additive	Increases the tensile strength of the material, i.e., the measurement of the force required to pull something such as rope, wire, or a structural beam to the point where it breaks.	hardener
Textile component	A textile is a flexible material consisting of a network of natural or artificial fibers. NOTE: Most textile components are materials made of multiple substances, not single-ingredient substances (see HPD definitions for homogeneous materials and substances). Therefore this substance role is seldom-used outside of natural materials such as wool or cotton that are not broken down into constituent substances on the HPD content inventory.	yarn, warp, weft, fabric, cloth, fiber, fibre
Viscosity modifier	Used to alter the viscosity of another substance; used to decrease or increase the viscosity of finished products; used to modify the flow characteristics of other substances, or mixtures, to which they are added; controls the deformation or flow ability of a wax product. Resins generally lower viscosity while thickeners (e.g., gums and hydroxyethyl cellulose) increase viscosity.	thickener, rheology modifier, flow modifier, pour point depressent, thixotopic agent, thixotrope, turbulence suppressor
Water resistance	Reduces perviousness to water, or slows vapor movement.	water beading agents, water repellent, water resisting agents, hydrophobic, vapor retarder, waterproofing
Water softener	Lessens the hardness of water, usually by precipitating or absorbing calcium and magnesium ions.	

VERSION CONTROL

Changes from Version 2020-08-06 to 2020-12-17:

- Edit “Polymer species” to “Polymer”
- Remove “Biocide”
- Add “Antimicrobial pesticide,” with “Biocide” as synonym
- Add “Fungicide”
- Add “Herbicide”
- Add “Insecticide”
- Add “Rodenticide”

Changes from 2019-06-20 to 2020-08-06:

- Add “Ceramic body”
- Add “Refrigerant”
- Edit definition of “Binder” to go beyond cementitious applications
- Added “fibre” as a synonym for “fiber”