OMNICLASS™

A Strategy for Classifying the Built Environment

Table 41 – Materials

Table 41 - Materials

Definition

Materials are basic substances used in construction or to manufacture products and other items used in construction. These substances may be raw materials or refined compounds, and are presented entirely without reference to their form.

Discussion

This table classifies the substances from which construction resources are made. The entries describe and classify these substances without regard to the form the material may take in the resulting construction resource. Because some material names imply a certain form, apparent overlap between this table and Table 23 - *Products* should be understood in light of the intended content and use of the two tables. The entries in this table are names that can be applied as values for a property describing material content of an object, but do not have expressed forms because they are not intended to represent the object itself. This table is not intended to be an exhaustive list of possible material names.

Any composition that can be described without implicitly or explicitly defining the form would be included in this table. Forms are characteristics like "board," "bar," "sheet," "block," etc. An example of this is Aluminum -- aluminum is a chemical composition. Although aluminum products come in bars, sheets, and other forms, the term aluminum describes the material from which each of those products is made.

Material names in this table include both formal chemical compound names and more well-known, occasionally informal material names. Some materials included in this table are raw material names that may include both chemical composition and some type of form, because they are typically encountered in nature in that form. For example, the chemical composition of "sand" is silicon dioxide, but because sand is a naturally occurring form of silicon dioxide and because we use sand as a constituent material of other products, it is included in this table. Because sand is also a commodity in its natural form, it will also show up in Table 23 - *Products*.

Examples

Metals, Igneous Rocks, Coal Tar Pitch, Timber, Glass, Plastics, Butyl Rubber

Table Uses

Material names can be thought of as modifiers and can be combined with a product classification from Table 23 to enrich a product classification by the material from which it is made. For example, Aluminum-Framed Entrances is a product classification in Table 23, which can be associated with the material Aluminum from Table 41.

Table Users

Because materials are a fundamental property of many construction resources, anyone having need to define the requirements for or the properties of those resources would be a potential user of the Materials Table.

References

CI/SfB Construction Indexing Manual
ISO 12006-2, Table 4.17 Properties and characteristics (by type)
Uniclass Table P – Materials
Periodic Table of the Elements

2012 DRAFT OmniClass Table 41 - Materials

Number	Level 1 Title	Level 2 Title	Level 3 Title	Level 4 Title	Level 5 Title	Level 6 Title	Definition
41-10 00 00	**Chemical Elements**						A pure chemical substance consisting of one type of atom distinguished by its atomic number.
41-10 10 00		**Metals**					An element, compound or alloy that is a good conductor of both electricity and heat.
41-10 10 10			**Alkali Metals**				Group 1 elements of the periodic table, most of which occur in nature, highly reactive.
41-10 10 10 10				Potassium			Atomic Number 19; primarily used as a fertilizer.
41-10 10 20			**Alkaline Earth Metals**				Group 2 elements, somewhat reactive. Not commonly used in construction.
41-10 10 30			**Lanthanoids**				A series of the fifteen metallic chemical elements with atomic numbers 57 through 71.
41-10 10 30 10				Neodymium			Atomic Number 60; primarily found in rare earth magnets.
41-10 10 40			**Actinoids**				Includes elements such as uranium and plutonium and are not commonly used in construction.
41-10 10 50			**Transition Metals**				Any element in the d-block of the periodic table.
41-10 10 50 11				Scandium			Atomic Number 21; aluminum alloy material.
41-10 10 50 13				Titanium			Atomic Number 22; primarily used as a pigment and a component of stainless steel; occasionally used as a cladding material.
41-10 10 50 15				Vanadium			Atomic Number 23; primarily used as an alloy in steel.
41-10 10 50 17				Chromium			Atomic Number 24; primarily used as a coating/finish and a component of stainless steel; still sometimes used as a pigment; used as a wood preservative in CCA.
41-10 10 50 19				Manganese			Atomic Number 25; primarily used as an alloy material in steel and aluminum.
41-10 10 50 21				Iron			Atomic Number 26; primarily used in steel, wrought and cast iron.
41-10 10 50 23				Nickel			Atomic Number 28; primarily used as an alloy material in steel.
41-10 10 50 25				Copper			Atomic Number 29; primarily used in electric wires, roofing and plumbing; also used as a fungicide.
41-10 10 50 27				Zinc			Atomic Number 30; primarily used for galvanizing iron and steel, as an alloy in brass, and as a cladding material.
41-10 10 50 29				Niobium			Atomic Number 41; primarily used as an alloy material in steel.
41-10 10 50 31				Molybdenum			Atomic Number 42; primarily used as an alloy material in steel.
41-10 10 50 33				Silver			Atomic Number 47; primarily used in construction as a plating material.
41-10 10 50 35				Cadmium			Atomic Number 48; primarily used as a pigment and as a stabilizer in PVC. Also for plating steel.
41-10 10 50 37				Gold			Atomic Number 79; primarily used in construction as a plating material.
41-10 10 60			**Post-Transition Metals**				The category of metallic elements to the right of the transition elements on the periodic table.
41-10 10 60 11				Aluminum			Atomic Number 13; alloys are used primarily in windows, doors, cladding.
41-10 10 60 13				Tin			Atomic Number 50; used with lead as solder and in historic restorations.
41-10 10 60 15				Lead			Atomic Number 82; used in radiation shielding, stained glass, sound deadening, roofing materials, cladding, flashings.
41-10 10 60 17				Bismuth			Atomic number 83; used in solder as well as fire detection systems.
41-10 20 00		**Metalloids**					A chemical element with properties that are in-between or a mixture of metals and nonmetals.
41-10 20 11			**Boron**				Atomic Number 5; primarily used in glass, cleaning products, semiconductors, magnets, and fiberglass insulation.
41-10 20 13			**Silicon**				Atomic Number 14; used in elemental form for semiconductors and in manufacture of steel, aluminum casting.
41-10 20 15			**Germanium**				Atomic Number 32; primarily used as germanium dioxide as a catalyst for PET; usually alloyed with silicon for use as a semiconductor; also alloyed with some metals.
41-10 20 17			**Arsenic**				Atomic Number 33; used as a wood preservative in CCA and in alloys for use in batteries and semiconductors.
41-10 20 19			**Antimony**				Atomic Number 51; used primarily as a flame retardant and in alloys.
41-10 20 21			**Tellurium**				Atomic Number 52; used in production of cadmium telluride (for solar panels) and in semiconductors.
41-10 20 23			**Polonium**				Atomic Number 84; used in devices to eliminate static charges (for example in textile mills).
41-10 30 00		**Non-Metals**					Chemical Group of elements that are generally defined by their contrast to metals.
41-10 30 10			**Halogens**				Non-metals family showing propensity for being highly reactive (due to being highly electronegative).
41-10 30 10 11				Fluorine			Atomic Number 9; primarily used in the production of steel and cast iron, as well as ceramics, glass, and cement.
41-10 30 10 13				Chlorine			Atomic Number 17; primarily used in the production of plastics, cleaning products, and water purification.

41-10 30 10 15		Bromine			Atomic Number 35; primarily used in the manufacture of flame retardants, and water and air purification.
41-10 30 10 17		Iodine			Atomic Number 53; primarily used as a disinfectant.
41-10 30 30	**Noble Gases**				Non-metal inert gases, odorless, colorless, with very low chemical reactivity.
41-10 30 30 11		Helium			Atomic Number 2; primarily used in welding with some use in leak detection, lasers (like those for bar-code readers) and as a refrigerant.
41-10 30 30 13		Neon			Atomic Number 10; primarily used in lighting, lightning arrestors, wave meter tubes, television tubes, and helium-neon lasers.
41-10 30 30 15		Argon			Atomic Number 18; mostly used as an inert shielding gas in welding and other high-temperature industrial processes; also has uses in incandescent and fluorescent lighting, and other types of gas discharge tubes.
41-10 30 30 17		Krypton			Atomic Number 36; primarily used with argon in energy saving fluorescent lamps and "neon" lighting.
41-10 30 30 19		Xenon			Atomic Number 54; primarily used as a starter gas in high pressure sodium lamps.
41-10 30 50	**Other Non-Metals**				Non-Metallic elements which are not previously classified.
41-10 30 50 11		Hydrogen			Atomic Number 1; found naturally as an element; typically used in processes (primarily as a reactant) but also as a coolant and for use in specialty welding.
41-10 30 50 13		Carbon			Atomic Number 6; found naturally as an element with three naturally occurring isotopes (two stable and one radioactive); typically used in lubricants, pigments, and in alloys and other compounds in the built environment.
41-10 30 50 15		Nitrogen			Atomic Number 7; found naturally as an element; primarily occurring in the built environment in incandescent bulbs.
41-10 30 50 17		Oxygen			Atomic Number 8; found naturally as an element; primarily used in the production of steel but also used as a reactant for chemicals and in welding.
41-10 30 50 19		Phosphorus			Atomic Number 15; primarily used as a fertilizer but also used for water softening, as a plasticizer, and as a reactant in metal purification.
41-10 30 50 21		Sulfur			Atomic Number 16; found naturally as an element; primarily used as a fertilizer but also used for water softening, as a plasticizer, and as a reactant in metal purification.
41-10 30 50 23		Selenium			Atomic Number 15; primarily used in the production of fertilizer but also in the vulcanization of rubber.
41-30 00 00	**Solid Compounds**				Compounds defined as solids when observed at normal room temperature.
41-30 10 00	**Mineral Compounds**				Compounds which are laden with mineral deposits.
41-30 10 11	**Igneous Rocks**				Rocks formed from the cooling of magma or lava.
41-30 10 11 11		Granite			A naturally occurring type of coarse-grained igneous rock.
41-30 10 11 21		Quartz			An abundant mineral made up of silicon and oxygen crystals.
41-30 10 11 21 11			Onyx		A rock made up of colored bands of silica, quartz and moganite.
41-30 10 13	**Sedimentary Rocks**				Rocks formed from the accumulated deposits of materials often in or around bodies of water.
41-30 10 13 11		Limestone			A naturally occurring rock produced through layering and sedimentary collection of calcite and aragonite typically produced from skeletal fragments of marine life.
41-30 10 13 11 11			Chalk		A compound rock formed from limestone and calcite
41-30 10 13 11 13			Lime		A general term used for calcium-containing inorganic materials extracted in the process of excessive heat application.
41-30 10 13 11 13 11				Hydrated Lime	The compound of traditional lime materials and water.
41-30 10 13 11 13 13				Quicklime	The heating of lime to remove Carbon dioxide leaving Calcium oxide.
41-30 10 13 11 13 15				Slaked Lime	The compound created when Quicklime and water are mixed.
41-30 10 13 11 15			Travertine		A form of limestone deposited by mineral (geothermally heated) springs through a rapid accumulation of calcium carbonate.
41-30 10 13 11 17			Tufa		A form of limestone deposited by mineral (ambient temperature) springs through a rapid accumulation of calcium carbonate.
41-30 10 13 11 19			Barite		A concentrated amount of barium sulfate often found in lead-zinc veins of limestone.
41-30 10 13 13		Sandstone			A traditionally porous rock composed of sand-sized quartz and feldspar minerals.
41-30 10 13 15		Shale			A rock composed of mud and clay materials typically in long, thin parallel layers.
41-30 10 13 15 11			Expanded Shale		Shale that has been heated to expand past its normal size.
41-30 10 15	**Metamorphic Rocks**				Rocks formed from the transformation of existing rock types through change in physical and chemical conditions.
41-30 10 15 11		Graphite			The residual rock formed by the reduction of sedimentary carbon compounds.
41-30 10 15 13		Marble			A naturally occurring metamorphic rock composed of carbonite minerals (typically calcite or dolomite) in a recrystallized state.

41-30 10 15 13 11			Marble Stone	Marble which is used in products that benefit from a polished appearance.
41-30 10 15 13 15			Limestone Marble	Marble which is used in less demanding ways such as walls and columns.
41-30 10 15 13 17			Periclase (Magnesia)	Naturally occurring rock usually found in marble produced by metamorphism of limestones.
41-30 10 15 15		Quartzite		Sandstone that has been heated through pressure often as a result of tectonic compression.
41-30 10 15 17		Slate		A rock derived originally derived from shale or other clay like materials.
41-30 10 25	**Binding Compounds**			A mixture of substances that forms an adhesive.
41-30 10 25 11		Clay		A malleable substance resulting from the weathering of rocks and other substances over long periods of time.
41-30 10 25 11 11			Fire Clay	A type of clay used in creation of ceramics and fire brick.
41-30 10 25 11 13			Bentonite	A type of clay formed from volcanic ash, used in industrial purposes.
41-30 10 25 11 15			Expanded Clay	Clay that has been heated to make it more permeable, durable and better at thermal insulation.
41-30 10 25 11 17			Vermiculite	A type of clay that expands when heat is applied. Typically used in automotive brake linings, soil conditioning, and roofing.
41-30 10 25 11 17 11			Expanded Vermiculite	Vermiculite to which heat has been applied and has expanded past its normal volume.
41-30 10 25 13		Ceramic		A substance made solid by heating and then cooling, typically used in the application of pottery and other decorative means, but has gained popularity as a binding agent for other materials in recent years. Also used in semiconductors.
41-30 10 25 13 11			Brick	Typically bound with mortar, brick blocks are a common building product used to construct nearly every type of vertical structure.
41-30 10 25 13 13			Earthenware	A common ceramic material, which is used extensively for pottery tableware and decorative objects. May also be glazed in order to become watertight.
41-30 10 25 13 15			Terracotta	Historically used for sculpture and pottery, as well as shingles and brick, this substance is one of the earliest ceramics still in use. Typically not watertight and porous, but can be glazed to ensure watertightness.
41-30 10 25 13 17			Fired Shale	Shale that has been fired and hardened into a specific shape.
41-30 10 25 13 19			Porcelain	Primarily formed from Kaolin, this material originated in China and is recognized by its white color. Very resistant to thermal shock and considerably strong.
41-30 10 25 13 21			Vitreous China	A compound composed of clay and other compounds, the material is fired and then coated with ceramic to ensure watertightness.
41-30 10 25 15		Soil		A compound composed of organic and inorganic materials, this substance is typically used for planting and vegetation purposes.
41-30 10 25 17		Gypsum		A unique material that is moderately water-soluble but becomes less soluble at higher temperatures. Typically used in finishes such as gypsum board and plaster.
41-30 10 25 19		Silicate		A compound containing a silicon earing anion. Typical silicates include sand and Portland Cement, as well as thousands of other minerals.
41-30 10 25 19 11			Asbestos	A compound composed of six naturally occurring silicate minerals. Historically used for its sound absorption, tensile strength and resistance to fire, heat and electrical damage, this substance has been found to be highly toxic and is no longer as extensively used.
41-30 10 25 19 13			Calcium Silicate	A compound used as a safer solution to asbestos. Typically used for insulation and fire protection.
41-30 10 25 19 15			Cement	A binding compound that, when set and hardened, binds two or more materials together. Typically used in mortar and concrete.
41-30 10 25 19 15 11			Portland Cement	The most common type of cement in use worldwide. Typically used in concrete.
41-30 10 25 19 17			Mica	A compound classified as one or more of 37 phyllosilicate minerals that have a layered or platy texture.
41-30 10 25 19 17 11			Expanded Mica	Mica that has been heated to expand past its original volume.
41-30 10 25 19 19			Sand	A naturally occurring compound made of rock and mineral particles.
41-30 10 27	**Manufactured Mineral Compounds**			Compounds which are man made but whose primary sources are normally naturally occurring.
41-30 10 27 11		Carbon Fiber		A material consisting of thin crystalline carbon filaments. Typically used for its surprising strength to weight ratio.
41-30 10 27 13		Cermet		A compound with materials of both ceramic and metal. Typically used in manufacturing of capacitors, resistors and other electrical components.
41-30 10 27 15		Fly Ash		Ash that rises with other gases from combustion. Typically used in products such as Portland Cement, Roller-compacted Concrete and applications such as soil stabilization as well as waste treatment.
41-30 10 27 17		Glasses and Glass-Like Materials		Compounds contain glass or primarily formed from glass materials.
41-30 10 27 17 11			Glass	A typically brittle and transparent compound with a variety of uses.

41-30 10 27 17 13				Perlite	A compound made of volcanic glass with a high water content. Typically used for plasters, mortars, insulation and tiling. Also useful in filtration and to prevent soil compaction.
41-30 10 27 17 13 11				Expanded Perlite	Perlite that has been heated to expand past its original volume.
41-30 10 27 17 15				Porcelain Enamel	A compound created by fusing powdered glass to a substrate by firing.
41-30 10 27 19			Rock Fibers		Small parts of rock used to form various items for construction.
41-30 10 27 21			Silicon Carbide		A compound consisting of silicon and carbon. Naturally occurs in an extremely rare mineral called moissanite, however most is man made due to its rare nature.
41-30 10 27 23			Unrefined Salt (Sodium Chloride)		Sodium Chloride which has not been altered or manufactured synthetically. Typically used as a food flavoring or preservative, but also in cosmetic applications.
41-30 20 00	**Metallic Alloys**				Compounds laden with metallic deposits or derived primarily from metal.
41-30 20 11		**Ferrous Alloys**			Compounds laden with iron deposits.
41-30 20 11 11			Carbon Steel		A compound used in steel applications, this is typically less ductile or malleable than stainless steel. Typical term used to denote any steel which is not stainless.
41-30 20 11 14			Stainless Steel		Corrosion, stain and rust resistant steel. Typically more ductile and malleable than traditional carbon steel.
41-30 20 11 17			Cast Iron		Iron which has been heated to liquefaction and then poured into a mold to solidify.
41-30 20 11 21			Wrought Iron		Iron alloy with a grain texture.
41-30 20 11 25			Ductile Iron		Iron which is more flexible and elastic than traditional iron. Typically used in piping.
41-30 20 11 29			Malleable Iron		Iron which is more malleable or able to bend than traditional iron. Often used for casting that require tensile strength and flexibility.
41-30 20 14		**Aluminum Alloys**			Compounds laden with aluminum deposits.
41-30 20 17		**Copper Alloys**			Compounds laden with copper deposits.
41-30 20 17 11			Brass		Composed of copper and zinc. Typically used in a variety of metallic purposes where low friction is required.
41-30 20 17 14			Bronze		Composed of copper and tin. Typically used in sculpture, weather-stripping and bronze wool for woodworking applications.
41-30 20 21		**Zinc Alloys**			Compounds laden with zinc deposits.
41-30 20 21 11			Zamak		A collection of alloys whose primary base metal is zinc but is alloyed with aluminum, magnesium and/or copper.
41-30 20 21 14			Mazac		Developed in answer to Zamak where pure zinc was not available. This employed a manufactured zinc.
41-30 20 24		**Lead Alloys**			Compounds laden with lead deposits.
41-30 20 24 11			Solder		Compound which is heated and applied as a binding agent to two or more items that have a higher melting point than the solder.
41-30 20 24 14			Terne		Used to inhibit corrosion, typically on steel, this coating was historically comprised of lead and tin. In recent years, lead has been replaced by zinc.
41-30 30 00	**Organic Compounds**				Compounds laden with plant and/or animal deposits or derived primarily from plants or animals.
41-30 30 11		**Plant Materials**			Compounds which are laden with plant deposits or derived generally from plants.
41-30 30 11 11			Sap		Compound that appears as a fluid that circulates in the cellular structure of plants.
41-30 30 11 11 11				Combustion Residues	Compounds that are remnants of the firing or burning of another material.
41-30 30 11 11 13				Natural Rubber	A compound derived from latex and refined into useable rubber.
41-30 30 11 13			Fibers		Compounds that make up filaments typically woven into other stronger substances.
41-30 30 11 13 11				Cellulose	A compound found in the cell walls of green plants, this is the most common organic compound found on Earth.
41-30 30 11 13 13				Coir	A compound extracted from coconut husks.
41-30 30 11 13 15				Cotton	A compound which originates from the cotton plant. Typically used in yarn, thread, and other textiles.
41-30 30 11 13 17				Jute	A compound made of vegetable fiber usually spun into coarse long threads.
41-30 30 11 13 19				Linen	A compound identified as a textile which is made from the fibers of flax.
41-30 30 11 13 21				Reeds	A compound which is actually a tall plant similar to grass that typically grows in wet places.
41-30 30 11 13 23				Straw	A compound made from the dry stalks of cereal plants.
41-30 30 11 13 25				Textiles	A compound which is a flexible woven material consisting of natural or artificial fibers.
41-30 30 11 15			Pulp		Plant material leftover after some type of extraction process. Typically formless and faceless but malleable.

41-30 30 11 15 11			Paper		A thin compound used for writing, printing, drawing or packaging.
41-30 30 11 17		Bark, Stem or Root			Plant materials that typically constitute the outside of a plant or the exterior edge.
41-30 30 11 17 11			Cork		An impermeable, buoyant material typically made of bark tissue from the Cork Oak.
41-30 30 11 17 13			Grass		A compound common to most domestic yards. Typically a green substance with narrow leaves that grow from the base.
41-30 30 11 17 13 11			Bamboo		A perennial evergreen thought to be the fastest growing plant in the world. Typically grows in long, hollow chutes.
41-30 30 11 19		Timber			Wood which has been designated for use and extracted from its original form in some manner.
41-30 30 11 19 11			Softwood Timber		A type of timber from the family of trees known as gymnosperms and also used to describe evergreens.
41-30 30 11 19 11 11				Southern Pine	A collection of pine trees that grow in the southern United States. Loblolly is one of the most prevalent in the US.
41-30 30 11 19 11 13				Douglas Fir-Larch	An evergreen coniferous tree of the Pseudotsuga genus.
41-30 30 11 19 11 15				Spruce-Pine-Fir	A type of Canadian wood with moderate strength that holds nails well and takes paint readily.
41-30 30 11 19 11 17				Redwood	A type of giant conifer tree characterized by a thick fibrous bark. Sequoias belong to this family. Typically found in California and Oregon.
41-30 30 11 19 11 19				Western Red Cedar	A species of evergreen coniferous tree in the Cupressaceae family. Typically found in western North America.
41-30 30 11 19 13			Hardwood Timber		A type of timber often from deciduous trees.
41-30 30 11 19 13 11				White Oak	One of the most pre-eminent hardwoods of eastern North America.
41-30 30 11 19 13 13				Red Oak	A high quality, durable wood typically found in North, Central & South America. There are a wide variety of Red Oaks prevalent in the Americas.
41-30 30 11 19 13 15				Maple	Over 128 species of trees, most of which are native to Asia, characterized by their pointed leaves. Typically used for syrup, timber and pulpwood.
41-30 30 11 19 13 17				Cherry	Comprising the Prunus genus of tree, this is particularly useful for furniture and for it's fruit-bearing nature.
41-30 30 21	**Animal Materials**				Compounds which are laden with animal deposits or derived from animals.
41-30 30 21 11		Hair and Skin			Hair and flesh of animals used by humans to achieve a desired purpose.
41-30 30 21 11 11			Leather		A durable and flexible material created by tanning of animal hide.
41-30 30 21 11 13			Horsehair		Long coarse hair grown on the manes and tails of horses.
41-30 30 21 11 15			Wool		A fiber used in textiles, sourced from sheep and other animals such as goats (cashmere).
41-30 30 21 13		Food or Fuel			Compounds that constitute something that, when consumed in a system, provides energy to power that system.
41-30 30 21 13 11			Tallow		A compound rendered from the fat of beef or mutton. Typically used in high-end soaps, candles and as a lubricant.
41-30 30 21 13 13			Beeswax		A natural compound produced by bees. Typically used in food, cosmetics and pharmaceuticals.
41-30 30 21 15		Silk			Produced primarily by spiders, this is typically used in the creation and manufacturing of textiles.
41-30 50 00	**Synthetic Compounds**				Compounds which are laden with human-made deposits or created by humans.
41-30 50 11	**Acids**				Compounds with a low pH.
41-30 50 14	**Bases (Alkalis)**				Compounds with a high pH.
41-30 50 17	**Salts**				Composed primarily of sodium chloride, this crystallized compound is typically used in food consumption and preservation.
41-30 50 21	**Plastics**				Man made moldable compounds used in a wide variety of purposes.
41-30 50 21 11		Acrylonitrile-Butadiene-Styrene (ABS)			A compound known as a copolymer made by polymerizing styrene and acrylonitrile.
41-30 50 21 14		Acrylic, Polymethyl Methacrylate			An acrylic with high-quality clarity which is often used as a glass substitute.
41-30 50 21 17		Epoxy			A thermosetting polymer formed from reaction of a resin with a hardener.
41-30 50 21 21		Polyamide			A polymer containing monomers of amides joined by peptide bonds.
41-30 50 21 24		Polybutylene (PB)			A polyolefin which, when applied as a pure or reinforced resin, can replace materials like metal, rubber and engineering polymers.
41-30 50 21 27		Phenolic			A class of chemical compounds consisting of a hydroxyl group bonded directly to an aromatic hydrocarbon group.
41-30 50 21 31		Polycarbonate			A group of thermoplastic polymers that are easily worked, molded and thermoformed.
41-30 50 21 34		Polyester			A category of polymers which contain the ester functional group in their main chain.

41-30 50 21 37			Polyethylene, Polythene (PE)		The most common type of plastic.
41-30 50 21 41			Polyisocyanurate		An improvement on polyurethane. Typically produced as a foam and used in rigid thermal insulation.
41-30 50 21 51			Polypropylene		A thermoplastic polymer used in packaging, labeling, textiles, stationery and a wide variety of other uses.
41-30 50 21 54			Polystyrene		An aromatic polymer made from the monomer styrene.
41-30 50 21 61			Polyurethane		A polymer composed of a chain of organic units joined by carbamate links.
41-30 50 21 64			Polyvinyl Chloride, Plasticized (PVC)		A PVC with plasticizers; more flexible than standard PVC and can be used for wire insulation.
41-30 50 21 71			Polyvinyl Chloride, Unplasticised (PVC-U)		A cheap, strong compound typically used in manufacturing pipes.
41-30 50 21 74			Polyvinylidene Fluoride		A highly non-reactive and pure thermoplastic fluoropolymer produced by the polymerization of vinylidene difluoride.
41-30 50 21 81			Urea Formaldehyde		A non-transparent thermosetting resin or plastic made from urea and formaldehyde heated in the presence of a mild base such as ammonia or pyridine.
41-30 50 21 84			Vinyl		Any organic compound that contains a vinyl group, which are derivatives of ethene.
41-30 50 24		**Rubbers**			Any type of artificial elastomer, invariably a polymer.
41-30 50 24 11			Butyl Rubber		Impermeable to air and used in many applications requiring an airtight rubber.
41-30 50 24 14			Neoprene		Good chemical stability and maintains flexibility over a wide temperature range.
41-30 50 24 17			Silicone		Typically heat-resistant, used in sealants, adhesives, lubricants, medical applications and insulation.
41-30 50 24 21			Polysulfide		A class of chemical compound containing chains of sulfur atoms.
41-30 50 27		**Petrochemical Compounds**			Compounds originating from Petroleum-based substances mixed with other sources.
41-30 50 27 11			Asphalts		Compounds consisting of a sticky, black and highly viscous liquid or semi-solid present in most petroleums and natural deposits.
41-30 50 27 11 11				Asphalt	Primarily used in road construction.
41-30 50 27 11 13				Polymer Modified Asphalt	An asphalt with greater elastic and durability properties and greater temperature stability.
41-30 50 27 13			Coal Tars		Compound that occurs when coal is carbonized. Typically a brown or black liquid which is highly viscous.
41-30 50 27 13 11				Carbon Black	A compound produced by incomplete combustion of petroleum products. Typically used as a pigment and heat transfer agent for automobile tires.
41-30 50 27 13 13				Coal Tar Pitch	A compound found as residue from coal firing. Typically used in waterproofing.
41-30 50 27 15			Paraffin		Compound typically used in fuels, waxes and paints, as well as some medical applications in liquid form.
41-30 50 27 17			Waxes		Compounds that are malleable in normal ambient temperatures. Typically used as a sealer and to make candles.
41-50 00 00	**Liquids**				Compounds defined as fluids when observed at normal room temperature.
41-50 10 00	**Normal**				Liquids with a neutral pH.
41-50 10 11		**Distilled Water**			Water which has had many of its impurities removed through distillation (boiling).
41-50 10 15		**Deionized Water**			Water which has had the ions removed.
41-50 30 00	**Acid**				Liquids with a low pH.
41-50 30 11		**Rain Water**			Water that falls from the sky, generally considered unfit for human consumption.
41-50 50 00	**Alkali**				Liquids with a high pH.
41-50 50 11		**Ammonia**			Typically used as a fertilizer, cleaning agent, and refrigerant.
41-50 50 15		**Sea Water**			Water which occurs in nature, typically in oceans, lakes, and most other bodies of water that connect to an ocean.
41-50 70 00	**Other Liquids**				Liquids with varying pH.
41-50 70 11		**Ground Water**			Water harvested or collected using subsurface means.
41-50 70 15		**Petroleum Products**			Fuels and other applications such as lubricants.
41-50 70 19		**Alcohols**			Cleaning agents, fuels, and recreational drugs. Various types of alcohol abound, with varying levels of toxicity.
41-50 70 23		**Lubricants**			Used to prevent wear on moving parts that touch or move closely together.
41-70 00 00	**Gases**				Compounds defined as gases when observed at normal room temperature.
41-70 10 00	**Non-Toxic Gases**				Gases which are not inherently harmful to humans.
41-70 10 11		**Air**			A mixture of oxygen and other gases in the atmosphere.
41-70 10 19		**Helium**			Typically used in cryogenic applications for its cooling capabilities and as a shielding gas for arc welding.

41-70 10 23		**Neon**		Typically used in signage, this gas emits a bright reddish-orange light. Though still referred to as "neon" all other colors are produced by noble gases or fluorescent lighting.
41-70 10 27		**Water Vapor**		Occurs when water is heated to the point of evaporation, this is simply water heated to its gaseous state.
41-70 30 00	**Toxic or Harmful Gases**			Gases which are inherently harmful to humans.
41-70 30 10		**Flammable Gases**		Gases which can ignite.
41-70 30 10 11			Acetylene	Typically used in welding and while not especially toxic, it can contain toxic impurities when generated from calcium carbide.
41-70 30 10 15			Butane	A fuel typically used for pocket cigar/cigarette lighters and torches.
41-70 30 10 19			Ethylene	Used in polymerization, oxidation and other applications.
41-70 30 10 23			Propane	Used as a fuel for both furnaces and stoves, this gas is naturally odorless but manufactured (purchased) propane has a human-added odor for safety.
41-70 30 10 27			Hydrogen	Used in the petroleum and chemical industries and for the production of ammonia, as well as a coolant.
41-70 30 10 31			Isobutan	Flammable gas, typically used as a refrigerant and propellant for aerosol cans and foam products.
41-70 30 10 35			Methane	A relatively potent greenhouse gas used in industrial chemical processes.
41-70 30 30		**Toxic Gases**		Gases which can cause injury or death when encountered.
41-70 30 30 11			Arsine	Used in the semiconductor industry and for the synthesis of organoarsenic compounds.
41-70 30 30 15			Carbon Dioxide	Emitted naturally by humans, plants convert this gas into oxygen. May cause Carbon dioxide poisoning.
41-70 30 30 19			Carbon Monoxide	This gas is the result of a single carbon and single oxygen molecular bond.
41-70 30 30 23			Ethyl Chloride	Commonly used to produce tetraethyllead (TEL), an anti-knock additive for gasoline, it has also been used as a refrigerant, aerosol spray propellant, an anesthetic and a blowing agent for foam packaging.
41-70 30 30 27			Methyl Chloride	A widely used refrigerant in the past, it is no longer in use due to its toxicity and flammability.
41-70 30 30 31			Nitrogen Dioxide	Typically a byproduct of internal combustion engines and thermal power stations.
41-70 30 30 35			Oxygen	Toxic at high concentration, this gas comprises most of the mass of living organisms.
41-70 30 50		**Other Harmful Gases**		Gases which may or may not be inherently combustible or toxic but may still cause harm.
41-70 30 50 11			Refrigerant	Used for cooling purposes, these gases are non-toxic but may cause suffocation.