

GENERAL SPECIFICATION FOR THE ENVIRONMENT

1. Purpose

- 1.1. This specification establishes Agilent Technologies' (Agilent's) general requirements for purchased parts, components, materials and products that are incorporated into Agilent products.
- 1.2. The requirements described in this specification represent restrictions imposed on Agilent's end products, which need to be reflected in the materials that constitute those products. The restrictions related to Agilent products may be different than those imposed on the individual parts and components, and in some cases exceed regulatory requirements.

2. Scope

- 2.1. This specification provides Agilent's general requirements for restricting or prohibiting certain substances as constituents of parts, components, and materials in products and packaging purchased by Agilent worldwide.
- 2.2. If a supplier believes that components or assemblies they are supplying to Agilent do not conform to the General Specification for the Environment (GSE), they should send an e-mail to gse_inquiry@agilent.com and copy their Agilent Buyer. The e-mail should detail the specific non-conformity and the Agilent/manufacturer part numbers affected.
- 2.3. With the exception of Ozone Depleting Substances (ODS), this specification does not apply to substances used in the process of manufacturing parts, component materials, or products sold to Agilent.
- 2.4. This specification also provides Agilent's general requirements for transport or recycling/disposal marking and labeling, and classification or registration requirements for Agilent purchased parts, components, materials and products.
- 2.5. This specification is not intended to be a listing of all product content limitations or restrictions that may be established as a matter of law. Seller's compliance with this specification does not relieve or diminish Seller's obligation to comply with all applicable laws.
 - 2.5.1. Precedence: Should a conflict occur between this specification and an Agilent family or individual part specification, the Agilent family or individual part specification shall prevail.
 - 2.5.2. Exception: Legal and/or regulatory requirements for the countries where these purchased parts, components, and products are to be used take precedence over this specification.
- 2.6. This specification is in addition to, and does not in any way limit or supersede, any other product specifications that may be established by Agilent.

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| Initiated by: Harald Riempp | | Drawing No. | Rev. R |
| Approved by: Richard Gartman | | A-5951-1745-1 | |

3. Environmental Requirements

3.1. In this specification, environmental requirements are defined for the following:

- Product content and ODS use restrictions
- Battery content restrictions
- Packaging content restrictions
- Phytosanitary measures for solid wood packaging materials
- Product labeling and marking requirements
- Product end of life labeling requirements
- Chemical registration requirements

4. Product Content Restrictions

4.1. The following substances (see additional details in Appendix B) are *prohibited* or *restricted* for use in raw materials, parts, components, or products above the thresholds defined below. A GSE threshold is the maximum concentration level at which the presence of a substance can be tolerated per homogeneous material unless indicated otherwise. Restrictions are divided into two categories: General Restrictions and Specific Applications.

- For the category of General Restrictions, the substances are prohibited or restricted in any application.
- For the category of Specific Applications, substances are only prohibited or restricted for use in those applications listed in the table.

These product content restrictions do not apply to chemicals in calibration, analytical standards or bio reagents and other chemical supplies like pure substances and mixtures.

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4.2. General Restrictions

The following substances (see additional details in Appendix B) must not be used in any application above the threshold. Unless indicated otherwise, the thresholds are defined per homogeneous material.

| Substance | Example Uses | Threshold |
|---|--|-----------------------|
| [4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26) [with $\geq 0.1\%$ of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)] | Used in the formulation of inks, cleaners, and coatings, as well as for dyeing paper, packaging, textiles, plastic products, and other types of articles. It is also used in diagnostic and analytical applications. | < 0.1% by part weight |
| 1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters | Plasticizer, dye, pigment, paint, ink, adhesive, lubricant | < 0.1% by part weight |
| 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich | Plasticizer, dye, pigment, paint, ink, adhesive, lubricant | < 0.1% by part weight |
| 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters | Plasticizer, dye, pigment, paint, ink, adhesive, lubricant | < 0.1% by part weight |
| 1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear | Plasticizer, dye, pigment, paint, ink, adhesive, lubricant | < 0.1% by part weight |
| 1,2-Benzenedicarboxylic acid, dipentylester, branched and linear | Plasticizer, dye, pigment, paint, ink, adhesive, lubricant | < 0.1% by part weight |
| 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with $\geq 0.3\%$ of dihexyl phthalate | Plasticizer, dye, pigment, paint, ink, adhesive, lubricant | < 0.1% by part weight |
| 1,2-Diethoxyethane | Solvent for ester gum, shellac and some resins and oils, inks, adhesives, applications in the electronics industry | < 0.1% by part weight |

| Substance | Example Uses | Threshold |
|--|---|-----------------------|
| 1,3-propanesultone | Intermediate, but also used in lithium ion batteries | < 0.1% by part weight |
| 1,3,5-Tris(oxiran-2-ylmethyl)-1,3,5-triazinane-2,4,6-trione (TGIC) | Mainly used as a hardener in resins and coatings. Also used in inks for the printed circuit board industry, electrical insulation material, resin moulding systems, laminated sheeting, silk screen printing coatings, tools, adhesives, lining materials and stabilisers for plastics. | < 0.1% by part weight |
| 1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (β -TGIC) | Mainly used as a solder mask ink in the EU. Also used in electrical insulation material, resin moulding systems, laminated sheeting, silk screen printing, coatings, tools, adhesives, lining materials and stabilisers for plastics. See also TGIC | < 0.1% by part weight |
| 2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350) | UV-stabilizer in coatings, plastics | < 0.1% by part weight |
| 2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328) | UV-stabilizer in coatings, plastics | < 0.1% by part weight |
| 2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320) | UV-stabilizer in coatings, plastics | Must not be present |
| 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE); reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[[2-ethylhexyl]oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE) | Stabilizer in plastics | < 0.1% by part weight |



| Substance | Example Uses | Threshold |
|---|--|-------------------------|
| 2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327) | UV-stabilizer in coatings, plastics | < 0.1% by part weight |
| 2,4-Dinitrotoluene | Plasticizer, rubbers, dyes | < 0.1% by part weight |
| 4-(1,1,3,3-tetramethylbutyl)phenol, (4-tert-Octylphenol) | Mainly used to manufacture polymer preparations, other uses are: as a component in phenolic resins used in the formulation of adhesives, as a component in coatings, sealants and elastomers, printing inks and some sorts of paints | < 0.1% by part weight |
| 4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues] | See above | < 0.1% by part weight |
| 4,4'- Diaminodiphenylmethane and technical grade MDA/PMDA | Catalyst / intermediate hardener for epoxy resins, hardener in adhesives | < 0.1% by part weight |
| 4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)] | Used in the formulation of writing inks and potentially other inks, as well as for dyeing a variety of materials. | < 0.1% by part weight |
| 4,4'-bis(dimethylamino)benzophenone (Michler's ketone) | Process chemical in the production of electronic circuit boards, additive in dyes and pigments, intermediate | < 0.1% by part weight |
| 4-[4,4'-bis(dimethylamino)benzhydrylidene] cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Violet 3) | Used mainly for paper colouring and inks supplied in printer cartridges and ball pens. Further uses include staining of dried plants, use as a marker for increasing the visibility of liquids, staining in microbial and clinical laboratories. | < 0.1% by part weight |
| Ammonium pentadecafluorooctanoate (APFO) | Surfactant | < 0.1% by part weight |
| Arsenic acid | used to remove gas bubbles from ceramic glass melt and in the production of laminated printed circuit boards | < 0.1% by part weight |
| Asbestos/Asbestos Materials | Insulating material, plastic parts | Must not be present |
| Azocolorants and Azodyes | Azodyes | < 0.003% by part weight |



| Substance | Example Uses | Threshold |
|---|--|-----------------------|
| Benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-trimethylpentene | Lubricating agent; lubricant additive (antioxidant/corrosion inhibitor/tarnish inhibitor/scavenger/antiscaling agent), mould release agent; organic chemical for industrial use | Must not be present |
| Benzene | For styrene, which is used to make polymers and plastics; for phenol, which is used for resins and adhesives; for types of rubbers, lubricants, dyes | Must not be present |
| Benzo[def]chrysene | Normally not manufactured intentionally but may occur as a constituent or impurity in other substances, belongs to the substance group of Polycyclic Aromatic Hydrocarbons (PAHs). | < 0.1% by part weight |
| Benzyl butyl phthalate (BBP) | Plasticizer or encapsulation material | < 0.1% by part weight |
| Bis (2-ethyl(hexyl)phthalate) (DEHP) | Plasticizer, dielectric fluid or encapsulation material | < 0.1% by part weight |
| Bis(2-methoxyethyl) ether (Diglyme) | Solvent, minor uses in adhesives, sealants, paints and coatings, as battery electrolyte or in semiconductor manufacturing | < 0.1% by part weight |
| Bis(2-methoxyethyl) phthalate (DMEP) | Plasticizer, solvent, in in "enamelled wire, film, high-strength varnish and adhesive | < 0.1% by part weight |
| Bis(tributyltin)oxide (TBTO) | Antifungal agent, paint pigment, foaming agent or extinguishant | < 0.1% by part weight |
| Cyclic acid anhydrides | Manufacture of polyester and alkyd resins, plasticizers for thermoplastic polymers, hardeners for epoxy resins and chain cross-linkers for thermoplastic polymers. | < 0.1% by part weight |
| Cyclohexane-1,2-dicarboxylic anhydride (Hexahydrophthalic anhydride - HHPA) | Plasticizers e.g. for thermoplastic polymers, hardeners for epoxy resins | < 0.1% by part weight |
| Di-n-hexyl Phthalate (DnHP) | Plasticizer | < 0.1% by part weight |
| Diarsenic pentaoxide | Adhesion promoter in organic chip carriers or metal hardener | < 0.1% by part weight |
| Diarsenic trioxide | Fining agent in specialty glasses | < 0.1% by part weight |
| Diboron trioxide | Used in many applications, e.g. in glass and glass fibres, frits, ceramics, flame retardants, catalysts, industrial fluids, electrical equipment, adhesives, inks/paints. | < 0.1% by part weight |

| Substance | Example Uses | Threshold |
|--|---|---------------------------|
| Dibutylphthalate (DBP) | Plasticizer, additive in paints, inks, glass fiber or adhesive resins | < 0.1% by part weight |
| Dibutyltin (DBT) compounds | Stabilizer for PVC, curing catalyst for silicone resin and urethane resin ,vulcanisation sealants, paints, coatings | < 0.1% by part weight |
| Dibutyltin dichloride (DBT) | Additive in rubber, stabiliser in PVC plastics, use in insulations and coatings also for electronics and cables | < 0.1% by part weight |
| Diethyl phthalate | Plasticizer | < 0.1% by part weight |
| Diisobutyl phthalate (DIBP) | Plasticizer | < 0.1% by part weight |
| Diisodecyl phthalate (DIDP) | Plasticizer | < 0.1% by part weight |
| Diisononyl phthalate (DINP) | Plasticizer | < 0.1% by part weight |
| Diisopentylphthalate (DIPP) | Plasticizer | < 0.1% by part weight |
| Dimethylfumarate (DMFu) | Anti-mould agent and can be found in the articles or in sachets containing mouldproof substances | < 0.00001% by part weight |
| Dinoseb | Used in plastic products | < 0.1% by part weight |
| Dipentyl phthalate (DPP) | Plasticisers (softeners) in plastics and PVC products, cables and electronics | < 0.1% by part weight |
| Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28) | Colorant, inks, dyes, pigments | < 0.1% by part weight |
| Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38) | Colorant, inks, dyes, pigments | < 0.1% by part weight |
| Disodium tetraborate, anhydrous | Glass, ceramics, detergents, wood treatment, insulation fibreglass | < 0.1% by part weight |
| Di-μ-oxo-di-n-butylstanniohydroxyborane/ Dibutyltin hydrogen borate C ₈ H ₁₉ B ₀ 3Sn (DBB) | In paints, coatings for glass or stabilizer in PVC | < 0.1% by part weight |
| Formamide | The substance seems to also be used as a plasticiser. | < 0.1% by part weight |
| Furan | Not expected, as residue or impurity in paper and pulp or specialty chemicals | < 0.1% by part weight |

| Substance | Example Uses | Threshold |
|---|---|--|
| Henicosfluoroundecanoic acid | Paint and coatings industry, electronic coating, cleaner for solder flux residue, degreasing applications, paper packaging | < 0.1% by part weight |
| Heptacosfluorotetradecanoic acid | Paint and coatings industry, electronic coating, cleaner for solder flux residue, degreasing applications, paper packaging | < 0.1% by part weight |
| Hexabromocyclododecane (HBCDD) | Flame retardant in polystyrene | < 0.1% by part weight |
| Imidazolidine-2-thione (2-imidazoline-2-thiol) | catalyst in some acrylic adhesive glues, Vulcanisation agent (as such or in mixture) in the production of General Rubber Goods and tyres | < 0.1% by part weight |
| Lead(II) bis(methanesulfonate) | Mainly used in plating processes (both electrolytic and electroless) for electronic components (such as printed circuit boards). The substance seems to also be used for batteries in special applications. | < 0.1% by part weight |
| N,N-dimethylacetamide | used as solvent and in industrial coatings, polyimide films, paint strippers and ink removers, minor pharmaceutical and laboratory uses | < 0.1% by part weight |
| N,N-dimethylformamide; dimethyl formamide | paints, adhesives, coatings, cleaning solvent, in electronics, mainly in the manufacture of printed circuit boards | < 0.1% by part weight |
| Nonylphenol, branched and linear and its ethoxylates | Paints and printing inks, adhesives, may be used as antioxidants and plasticizers in plastic products, flux | < 0.1% by part weight |
| N-pentyl-isopentylphthalate | Plasticizer | < 0.1% by part weight |
| O-aminoazotoluene | Colorant | < 0.1% by part weight |
| Ozone Depleting Substances (ODS) | Class I: Coolant, propellant, refrigerants; Class II: Not expected, but historically HCFCs were used as substitutes for CFCs | Must not be present and none used in the production process. See Note 1 at end of table. |
| Pentadecafluorooctanoic acid (PFOA) and individual salts and esters of PFOA | Surfactant, used in coatings, metal plating/surfaces, used in Semiconductor industries | < 0.1% by part weight |



| Substance | Example Uses | Threshold |
|--|--|------------------------|
| Perfluorononan-1-oic-acid and its sodium and ammonium salts | Processing aid, but PFNA is also used as lubricating oil additive, surfactant for fire extinguishers, cleaning agent, textile antifouling finishing agent, polishing surfactant, waterproofing agents and in liquid crystal display panels | < 0.1% by part weight |
| Perfluorooctane sulfonate (PFOS) | Antistatic agent for films and plastics , photolithographic chemical in the semiconductor industries | Must not be present |
| Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl) | Adhesives, paints, printing inks, plastics, additive or sealing fillers | Must not be present |
| Polybrominated Biphenyls (PBB) and their ethers/oxides (PBDE) | Not expected, but historically used as flame retardant. OBDPO was found in ABS and other thermoplastics. DBDPO was found in HIPS and other thermoplastics. PeBDPO was used in polyurethane foams. | < 0.1% by part weight |
| Polychlorinated Biphenyls (PCBs) and Terphenyls (PCTs) and specific substituents | Not expected, but historically used in transformers, capacitors | Must not be present |
| Polychlorinated naphthalenes | Lubricant, paint, stabilizer (electric characteristic, flame-resistant, water-resistant) insulator, flame retardant | Must not be present |
| Propylene oxide; 1,2-epoxypropane; methyloxirane | Lubricants, greases, release products, coatings and paints, adhesives, sealants, functional fluids (e.g. Heat transfer fluids, Hydraulic fluids) | < 0.1% by part weight |
| Short Chain Chlorinated Paraffins (SCCP) | Softener in paints & coatings, oils, or flame retardant in plastic, rubber or textiles, use in metalworking | < 0.1% by part weight |
| Silicic acid, barium salt, lead-doped | Used for coating glass lamp bulbs, coatings and paints | < 0.1% by part weight |
| Tetraboron disodium heptaoxide, hydrate | Glass, ceramics, detergents, wood treatment, insulation fibreglass | < 0.1% by part weight |
| Trichlorobenzene | Intermediate, solvent, additive in high performance insulation of wire and cable products, additive in dielectric fluids | < 0.1% by part weight |
| Trichloroethylene | Degreaser, industrial solvent, in adhesives, Film Cleaner and Conditioner | < 0.1% by part weight |
| Tris(2-chloroethyl)phosphate (TCEP) | Plasticizer, flame retardant in foams and coatings, adhesives | < 0.1 % by part weight |



| Substance | Example Uses | Threshold |
|---|--|-----------------------|
| Tri-substituted Organnostannic Compounds | Stabilizer, antioxidant, antibacterial and antifungal agents, antifoulant, antiseptic, anti-fungal agent, paint, pigment, antistaining | < 0.1% by part weight |
| Trixylyl phosphate | Used as a plasticizer for vinyl resin, cellulose resin, natural and synthetic rubber. Also, used as a flame retardant. | < 0.1% by part weight |
| Zirconia Aluminosilicate Refractory Ceramic Fibres | Insulation material | < 0.1% by part weight |
| α,α -Bis[4-(dimethylamino)phenyl]-4 (phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4) | Mainly used in the formulation of printing and writing inks, for dyeing paper and in mixtures such as windscreen washing agents. | < 0.1% by part weight |

Note 1: The USA imposes an excise tax on inventories of ODCs and imported products manufactured with ODCs. If requested, Agilent requires suppliers to certify that ODCs are not used in manufacturing.

4.3. Specific Applications

The following substances (see additional details in Appendix B) must not be used in the applications listed below above the threshold except in listed application exemptions. Unless indicated otherwise, the thresholds are defined per homogeneous material. In case of a conflict, application specific thresholds prevail over the threshold from general restrictions only for the listed applications.

| Substances | Restricted Application | Threshold (Not to Exceed) | Allowed exemptions: |
|---|--|---|--|
| Aluminosilicate Refractory Ceramic Fibres | Insulation material and all other applications | < 0.1% by part weight | Insulation Material in oven assemblies for analytical instruments |
| Cadmium and its compounds | All applications, e.g. dyes, pigments, paints/enamels (excepting safety warnings), plastic stabilizer (e.g. electric cables), anti-corrosion coating finish and all other uses | <0.01% | see Appendix E |
| Chloroethene (vinyl chloride) | Propellant in aerosols | Must not be present | (none) |
| Chromium VI (Hexavalent Chromium) Compounds | Metallic coating and all other uses (e.g. in commercial off-the-shelf parts) | < 0.1% | (none) |
| | Custom mechanical parts fabricated to Agilent engineering drawings | Must not be present | (none) |
| Cobalt dichloride | All applications | < 0.1% by part weight | moisture indicator for chromatographic traps |
| Fluorinated Greenhouse Gases (F-Gases) | Non-refillable containers for service, non-confined direct evaporations systems, foams, fire protection equipment | Must not be present | use of R134a in refrigerating equipment integrated with analytical instruments (e.g. LC) |
| Hexachloroethane | Manufacturing or processing of non-ferrous metals | Must not be present and none used in the production process | (none) |

| Substances | Restricted Application | Threshold (Not to Exceed) | Allowed exemptions: |
|---------------------------|---|--------------------------------------|----------------------------|
| Inorganic ammonium salts | Cellulose insulation mixtures/articles | Must not be present | (none) |
| Lead and its compounds | Paints | < 0.01% | (none) |
| | PVC stabilizer in cable jackets | < 0.03% | (none) |
| | All other applications | < 0.1% | see Appendix E |
| Mercury and its compounds | All applications, e.g. contact point material, pigment, anti-corrosion, switches, high-efficiency phosphor, mercury-containing measuring devices, and all other uses (see also Labeling Requirements section 8.3) | Must not be present | see Appendix E |

5. Battery Content Restrictions

5.1. The following substances (see additional details in Appendix B) are prohibited or restricted for use in batteries. In case of a conflict, battery-specific thresholds from this section prevail over the thresholds from general restrictions or specific applications for the listed applicable battery types.

| Substance | Applicable Batteries | Threshold (Not to Exceed) |
|---------------------------|--|--|
| Cadmium | Alkaline, Zinc-manganese, Zinc-carbon, or Nickel Cadmium and all other batteries | 20 ppm by battery weight |
| Lead | Alkaline, Zinc-manganese, Zinc-carbon batteries | 0.004% by battery weight |
| Mercury and its compounds | Alkaline, Zinc-Manganese, Zinc-Carbon, Mercuric Oxide batteries | Must not be present |
| | All others | 5 ppm by weight in homogenous material |
| Perchlorates | Lithium batteries; coin cell batteries | 0.6 ppm by battery weight |

5.2. All lithium metal and lithium ion cells or batteries must meet the requirements of each test in the current UN Manual of Tests and Criteria, Part III, subsection 38.3, in addition to any additional requirements specified in the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR), the International Air Transport Association (IATA), the International Maritime Dangerous Good Code (IMDG), and the Hazardous Materials Regulations of the United States Department of Transportation (49CFR). Upon request vendor will provide a copy of the specific tests results should Agilent be required to supply it to local authorities.

6. Packaging Content Restrictions

6.1. The following substances (see additional details in Appendix B) are prohibited for use in packaging materials purchased by Agilent and used to package the products Agilent sells. In case of a conflict, packaging materials specific thresholds from this section prevail over the thresholds from general restrictions, specific applications or battery restrictions but only for the listed packaging applications.

| Substance | Restricted Application | Threshold (Not to Exceed) |
|--|---|---|
| Arsenic Compounds | In wooden packaging and packaging materials | Must not be present |
| Cadmium, Chromium VI (Hexavalent Chromium) Compounds, Lead and Mercury | Packaging, packaging materials and packaging inks | Must not be present. Incidental presence of these substances not to exceed a total sum concentration of 100 ppm |
| Cobalt dichloride | In packaging materials (e.g. as moisture indicator) | Must not be present |
| Ozone depleting substances CFCs and HFCs | Foaming agent | Must not be present |

7. Phytosanitary Measures for Solid Wood Packaging Materials

The following requirement applies to packaging materials purchased by Agilent and used to package the products Agilent sells.

Packaging wood shall be free from bark, insects and damage caused by them. Solid Wood Packaging Materials shall be heat treated or kiln dried to a minimum core temperature of 56°C for at least 30 minutes in a closed chamber or kiln, which has been tested, evaluated and approved officially for this purpose. In addition, the susceptible wood shall display an officially approved heat treated or kiln dried marking enabling the identification of where and by whom the above treatment has been carried out. A logo or mark, officially endorsed by the NPPO (National Plant Protection Organization) of the country from which the wood packaging materials originate must be permanently affixed to each unit of wood packaging material, and in a location that will remain visible and obvious when packaging is used for shipment of Agilent product(s). Fumigation, Chemical Pressure Impregnation (CPI) or other chemical means are not to be used.

8. Product Labeling and Marking Requirements

8.1. Battery Labeling Requirements: Batteries, rechargeable consumer products, and their packaging must have a durable label with the symbol(s) and wording according to the requirements specified in Appendix A. Information should be supplied with products containing a battery to identify the nature of the battery. Products with user-removable batteries should be supplied with information on the safe insertion and removal of the batteries.

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- 8.2. Battery Declaration of Conformity Requirements:** Batteries, including those contained in parts, components and products, must comply with the China battery registration requirements for no mercury content. A "Suppliers' Declaration of conformity" issued by the battery manufacturer and an MSDS must be provided when requested.
- 8.3. Mercury Product Labeling Requirements:** Removable mercury lamps, as well as products containing mercury lamps, must be labeled in accordance with local regulatory requirements.¹
- 8.4. Paper and Plastic Packaging Labeling Requirements:** All suppliers of paper and plastic packaging materials must ensure that the material is identified, marked and labeled. Refer to Appendix D.
- 8.5. Packaging Declaration of Conformity Requirements:** Packaging suppliers must provide a Declaration of Conformity regarding the requirements described in section 6.1 when requested.
- 8.6. Product Information and Labeling Requirements:** Agilent requires Suppliers to comply with the Chinese Administrative Measures for the Restriction of Hazardous Substances in Electrical and Electronic Products. Suppliers to Agilent are responsible for ensuring such goods sold and shipped to China meet the information and labeling requirements, including the following: (1) reflect the required product label (which in most cases will include an EFUP or Environmental Friendly Use Period number), (2) reflect the required toxic/hazardous substance table in the product manual or shipment insert which accompanies the product, and (3) reflect the date of manufacture. For further details or questions contact your Agilent representative.
- 8.7. Product End of Life Labeling Requirements:** All electrical and electronic products requiring the European CE marking must also have the crossed-out wheeled bin label with bar.



9. Chemical Registration Requirements

- 9.1.** Each chemical substance contained in parts, components, materials and products sold to Agilent must comply with chemical registration and pre-manufacture notification requirements in those countries that have enacted such requirements (including but not limited to: Australia, Canada, China, Japan, South Korea, Switzerland, the United States, and the countries of the European Union).

¹ Localization requirements are applicable to items in this section and will be communicated in the purchase contract, in accordance with Section 2.5 of this specification.

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This is in order to permit import and sale of the parts, components, materials and products sold to Agilent in all of these countries.

10. Reportable Substances

10.1. The substances listed in Appendix C must be actively reported to Agilent as material content for products directly supplied to Agilent.

| | | | |
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Definitions

ABS – Acrylonitrile Butadiene Styrene

CFC – Chlorinated Fluorocarbons

DBDPO - decabromodiphenyl oxide (a flame retardant)

European CE Marking – a product marking that specifies compliance to specific European Union Directives

HFC – Halogenated Fluorocarbons

HIPS – High Impact Polystyrene

Homogeneous Material – a material that cannot be mechanically disjoined into different materials

Localization Issues - compliance strategies that require “local” marking, labeling or documentation will generally be applied to the final product, not to the direct material purchase.

MSDS – Materials Safety Data Sheet

Must Not Be Present - the material shall not be intentionally added.

OBDPO - octabromodiphenyl oxide (a flame retardant)

ODS/ODC – Ozone Depleting Substance, synonym to ODC; Ozone Depleting Compounds, synonym to ODS

Packaging Systems – consists of all packaging components including cushioning material, plastic materials, paperboard, corrugated containers and wood crate systems, as well as inks, dyes and labels used for marking.

Parts per Million (ppm) - used to express concentration. The ppm is $1,000,000 \times \text{mass substance} / \text{mass of the homogeneous material}$. Concentrations are unit-less, for example $100 \text{ ppm} = 0.01\% = 100 \text{ mg/kg}$.

PeBDPO - pentabromodiphenyl oxide (a flame retardant)

Prohibited - not allowed

PVC – Polyvinyl Chloride

Restricted – allowed in limited quantities
















Suppliers’ Declaration of Conformity – a declaration made by an Agilent supplier that the product purchased by Agilent complies with an established list of requirements and standards.

| | | | |
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APPENDIX A

Labeling Requirements for Batteries, Consumer Products Containing Batteries, and their Packaging

As defined in Section 8.1, all Batteries, rechargeable consumer products, and their packaging must have the markings defined in the following table and subsequent requirements.

| PRODUCT TYPE | WORLDWIDE SYMBOL ² | WORDING ON LABEL ² |
|---|---|--|
| Alkaline batteries |  廢電池請回收 无 Low Mercury  | <ul style="list-style-type: none"> - Manufacture's name and address - Either Chinese Low Mercury or Mercury Free character - 无汞碱性电池 |
| Lead-acid (sealed) batteries and their packaging |  廢電池請回收  Pb  Pb | <ul style="list-style-type: none"> - Manufacturer's name and address - "BATTERY MUST BE RECYCLED" - "NON-SPILLABLE" OR "NON-SPILLABLE BATTERY" - "Pb" see Note 1 |
| Lithium Metal cells and batteries |  廢電池請回收  | <ul style="list-style-type: none"> - Manufacturer's name and address - Lithium or , Lithium Metal - Watt Hr |
| Lithium Ion cells and batteries |  廢電池請回收  Li-ion  | <ul style="list-style-type: none"> - Manufacturer's name and address - Lithium Ion - Watt Hr - See Notes 2, 3 4 |
| Nickel metal hydride batteries |  廢電池請回收  NI-MH  | <ul style="list-style-type: none"> - Manufacture's names and address - "CONTAINS NICKEL METAL HYDRIDE (NiMH) BATTERY" - Must be recycled or disposed of properly. |
| Rechargeable consumer products containing not easily removable sealed lead acid batteries |  Pb  Pb | <ul style="list-style-type: none"> - Manufacturer's name and address - "CONTAINS SEALED LEAD BATTERY. BATTERY MUST BE RECYCLED." - "Pb" see Note 1. |

Note 1 - The chemical symbol "Pb" under the crossed-out wheeled bin is required on all batteries, accumulators and button cells containing more than 0.004% lead by weight.

Note 2 - Lithium ion cells Watt-hour (Wh) rating must be 20 Wh or less.

Note 3 - Lithium ion batteries or battery packs Watt-hour (Wh) rating must be 100 Wh or less.

Note 4 – Lithium ion batteries or battery packs must be marked with the Watt-hour (Wh) rating on the outside case.

² Localization requirements are applicable to items in this section and will be communicated in the purchase contract, in accordance with Section 2.5 of this specification.

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Additional marking requirements for rechargeable - EU Capacity Labeling

All portable rechargeable batteries intended to be replaced by the end user, either standalone cells or battery packs, except for lead-acid, must have their capacity in milliamp hours on the label expressed as an integer using the abbreviation 'mAh'. Lead-acid batteries intended to be replaced by the end user must have their capacity in amp hours on the label expressed as a decimal number with one digit using the abbreviation 'Ah'.

Text size for battery packs:

- For battery packs where the largest side is below 70 cm², the text shall have a minimum size of 1,0 × 5,0 mm (H × L).
- For battery packs where the largest side is equal to or above 70 cm², the text shall have a minimum size of 2,0 × 5,0 mm (H × L).
- The label shall be located only on the external housing, not on each individual cell inside the housing.
- Text size for individual cells, except button cells:
- The text shall have a minimum size of 1,0 × 5,0 mm (H × L).
- Applies to batteries and accumulators sold without packaging
- The label shall be located on the battery or accumulator itself.

For batteries sold with packaging, the capacity labels must also be located on the packaging.

Additional marking requirements for non-rechargeable batteries (all chemistries)

- Battery manufacturer brand name
- Model designation
- Expiration date (month / yr)
- Country of origin

Product End of Life Labeling Size Requirements

Square batteries

- Crossed-out wheeled bin label must cover 3% of the batteries largest side area, maximum size of 5cm X 5cm

Cylindrical Batteries

- Crossed-out wheeled bin label must cover 3% or half of each battery's side area, maximum size of 5cm X 5cm

Small Batteries (sold separately)

- Where the crossed-out wheeled bin label applied to the package must be smaller than 0.5cm X 0.5cm, a separate 1cm X 1cm mark must be printed on the battery package or shipping package

Battery Indication Type Marks below the Wheeled Bin

- Marks must be at least one-quarter the size of the crossed-out wheeled bin label

Symbol Color

- Color shall be as displayed in the table above or black and white

Durability

All marks and labels must be clear and durable.

| | | | |
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APPENDIX B

Chemical List with additional details on substances which are restricted or reportable in the GSE

| Anthracene oils | CAS Numbers |
|---|-------------|
| Anthracene oil | 90640-80-5 |
| Anthracene oil, anthracene paste | 90640-81-6 |
| Anthracene oil, anthracene paste, anthracene fraction | 91995-15-2 |
| Anthracene oil, anthracene paste, distn. Lights | 91995-17-4 |
| Anthracene oil, anthracene-low | 90640-82-7 |

| Arsen and its compounds | CAS Numbers |
|--------------------------------------|-------------|
| Arsen | 7440-38-2 |
| Examples of Arsenic compounds | |
| Arsenic acid | 7778-39-4 |
| Calcium arsenate | 7778-44-1 |

| Asbestos/Asbestos Materials | CAS Numbers |
|---------------------------------|---------------------------|
| Actinolite | 77536-66-4 |
| Amosite (Grunerite) | 12172-73-5 |
| Anthophyllite | 77536-67-5 |
| Asbestos and Asbestos Materials | 1332-21-4 |
| Chrysotile | 12001-29-5 132207-32-0 |
| Crocidolite | 12001-28-4 |
| Tremolite | 77536-68-6 |

| Azocolorants and Azodyes | CAS Numbers |
|--|-------------|
| Examples of Azocolorants and Azodyes (including Naphthylamine and its salts, Benzidine and its salts, Aminobiphenyl and its salts, Nitrobiphenyl) which form certain Aromatic Amines (see note 1) | |
| 4-nitrobiphenyl | 92-93-3 |
| 2,4,5-trimethylaniline | 137-17-7 |
| 2-naphthylamine | 91-59-8 |
| 3,3'-dichlorobenzidine | 91-94-1 |
| 3,3'-dimethoxybenzidine | 119-90-4 |
| 3,3'-dimethylbenzidine | 119-93-7 |
| 4,4'-methylene-bis(2-chloroaniline) | 101-14-4 |
| 4,4'-methylenedianiline | 101-77-9 |

| | |
|------------------------------|----------|
| 4,4'-methylenedi-o-toluidine | 838-88-0 |
| 4,4'-oxydianiline | 101-80-4 |
| 4,4'-thiodianiline | 139-65-1 |
| 4-amino azobenzene | 60-09-3 |
| 4-chloroaniline | 106-47-8 |
| 4-chloro-o-toluidine | 95-69-2 |
| 4-methoxy-m-phenylenediamine | 615-05-4 |
| 4-methyl-m-phenylenediamine | 95-80-7 |
| 5-nitro-o-toluidine | 99-55-8 |
| 6-methoxy-m-toluidine | 120-71-8 |
| Benzidine | 92-87-5 |
| Biphenyl-4-ylamine | 92-67-1 |
| o-aminoazotoluene | 97-56-3 |
| o-anisidine | 90-04-0 |
| o-toluidine | 95-53-4 |

| Cadmium and its Compounds | CAS Numbers |
|---|--------------------------|
| Cadmium | 7440-43-9 |
| Examples of Common Cadmium Compounds | |
| Cadmium oxide | 1306-19-0 |
| Cadmium chloride | 10108-64-2 |
| Cadmium fluoride | 7790-79-6 |
| Cadmium sulfate | 10124-36-4 31119-53-6 |
| Cadmium sulfide | 1306-23-6 |

| Chromium VI (Hexavalent Chromium) Compounds | CAS Numbers |
|---|-------------|
| Chromium VI (Hexavalent Chromium) compounds | - |
| Examples of Common Chromium Compounds | |
| Ammonium dichromate | 7789-09-5 |
| Barium chromate | 10294-40-3 |
| Calcium chromate | 13765-19-0 |
| Chromic acetate | 1066-30-4 |
| Chromic acid, Dichromic acid and Oligomers of chromic acid and dichromic acid | 7738-94-5 |

| | |
|--|------------|
| | 13530-68-2 |
| Chromium trioxide | 1333-82-0 |
| Chromium trioxide and Acids generated from chromium trioxide and their oligomers | 1333-82-0 |
| Dichromium tris(chromate) | 24613-89-6 |
| Lead chromate | 7758-97-6 |
| Lead chromate molybdate sulfate red (C.I. Pigment Red 104) | 12656-85-8 |
| Lead sulfochromate yellow (C.I. Pigment Yellow 34) | 1344-37-2 |
| Pentazinc chromate octahydroxide | 49663-84-5 |
| Potassium chromate | 7789-00-6 |
| Potassium dichromate | 7778-50-9 |
| Potassium hydroxyoctaoxidizincatedichromate | 11103-86-9 |
| Sodium chromate | 7775-11-3 |
| Sodium dichromate | 10588-01-9 |
| (sodium dichromate, hydrate) | 7789-12-0 |
| Strontium chromate | 7789-06-2 |
| Zinc chromate | 13530-65-9 |

Cyclic acid anhydrides **CAS Numbers**

| | |
|--------------------------------------|------------|
| Hexahydromethylphthalic anhydride | 25550-51-0 |
| Hexahydro-4-methylphthalic anhydride | 19438-60-9 |
| Hexahydro-1-methylphthalic anhydride | 48122-14-1 |
| Hexahydro-3-methylphthalic anhydride | 57110-29-9 |

Dibutyltin (DBT) compounds **CAS Numbers**

| | |
|----------------------------------|-----------|
| Dibutyltin oxide | 818-08-6 |
| Dibutyltin diacetate | 1067-33-0 |
| Dibutyltin dilaurate | 77-58-7 |
| Dibutyltin maleate | 78-04-6 |
| other Dibutyltin (DBT) compounds | - |

Fluorinated Greenhouse Gases (F-Gases) **CAS Numbers**

| | |
|----------------------------|-------------|
| Sulphur hexafluoride | 2551-62-4 |
| Hydrofluorocarbons (HFCs): | |
| HFC-23 | 75-46-7 |
| HFC-32 | 75-10-5 |
| HFC-41 | 593-53-3 |
| HFC-43-10mee | 138495-42-8 |
| HFC-125 | 354-33-6 |

| | |
|------------|----------|
| HFC-134 | 359-35-3 |
| HFC-134a | 811-97-2 |
| HFC-152a | 75-37-6 |
| HFC-143 | 430-66-0 |
| HFC-143a | 420-46-2 |
| HFC-227ea | 431-89-0 |
| HFC-236cb | 677-56-5 |
| HFC-236ea | 431-63-0 |
| HFC-236fa | 690-39-1 |
| HFC-245ca | 679-86-7 |
| HFC-245fa | 460-73-1 |
| HFC-365mfc | 406-58-6 |

Perfluorocarbons (PFCs):

| | |
|--|----------|
| Perfluoromethane | 75-73-0 |
| Perfluoroethane | 76-16-4 |
| Perfluoropropane | 76-19-7 |
| Perfluorobutane | 355-25-9 |
| Perfluoropentane | 678-26-2 |
| Perfluorohexane | 355-42-0 |
| Perfluorocyclobutane | 115-25-3 |
| PFC preparations or HFC preparations or mixtures | - |

Glycol Ethers (Selected) **CAS Numbers**

| | |
|---|----------|
| 1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme) | 112-49-2 |
| 1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME) | 110-71-4 |
| 1,2-Diethoxyethane | 629-14-1 |
| 2-Ethoxyethanol | 110-80-5 |
| 2-Ethoxyethyl acetate | 111-15-9 |
| 2-Methoxyethanol | 109-86-4 |
| 2-Methoxyethyl acetate | 110-49-6 |
| Bis(2-methoxyethyl) ether (Diglyme) | 111-96-6 |

Hexabromocyclododecane (HBCDD) **CAS Numbers**

| | |
|--------------------------------|-------------|
| Hexabromocyclododecane (HBCDD) | 25637-99-4 |
| | 3194-55-6 |
| alpha-hexabromocyclododecane | 134237-50-6 |
| beta-hexabromocyclododecane | 134237-51-7 |
| gamma-hexabromocyclododecane | 134237-52-8 |

| Lead and its Compounds | CAS Numbers |
|--|--------------------|
| Lead | 7439-92-1 |
| Examples of Common Lead Compounds | |
| Lead (II) sulfate | 7446-14-2 |
| Lead (II) acetate, trihydrate | 6080-56-4 |
| Lead(II) bis(methanesulfonate) | 17570-76-2 |
| Lead (II) carbonate | 598-63-0 |
| Lead (II) carbonate basic | 1319-46-6 |
| Lead (II) chromate | 7758-97-6 |
| Lead (II) oxide (lead monoxide) | 1317-36-8 |
| Lead (II) phosphate | 7446-27-7 |
| Lead (II) sulfide | 1314-87-0 |
| Lead (II) titanate (Lead titanium trioxide) | 12060-00-3 |
| Lead (II,IV) oxide (Lead tetroxide (orange lead)) | 1314-41-6 |
| Lead (IV) oxide | 1309-60-0 |
| Lead acetate | 301-04-2 |
| Lead diazide, Lead azide | 13424-46-9 |
| Lead dipicrate | 6477-64-1 |
| Lead hydrocarbonate (Basic lead carbonate (trilead bis(carbonate)dihydroxide)) | 1319-46-6 |
| Lead hydroxidcarbonate | 1344-36-1 |
| Lead molybdate | 10190-55-3 |
| Lead phosphate | 7446-27-7 |
| Lead selenide | 12069-00-0 |
| Lead stearate | 1072-35-1 |
| Lead styphnate | 15245-44-0 |
| Lead sulfate, sulphuric acid, lead salt | 15739-80-7 |
| Lead sulphate, tribasic (Tetralead trioxide sulphate) | 12202-17-4 |
| Trilead diarsenate | 3687-31-8 |
| [Phthalato(2-)]dioxotrilead (dibasic lead phthalate) | 69011-06-9 |
| Acetic acid, lead salt, basic | 51404-69-4 |
| Dioxobis(stearato)trilead | 12578-12-0 |
| Fatty acids, C16-18, lead salts | 91031-62-8 |
| Lead bis(tetrafluoroborate) | 13814-96-5 |
| Lead cyanamidate | 20837-86-9 |
| Lead dinitrate | 10099-74-8 |

| | |
|---|------------|
| Lead oxide sulfate (basic lead sulfate) | 12036-76-9 |
| Lead Titanium Zirconium Oxide | 12626-81-2 |
| Pentalead tetraoxide sulphate | 12065-90-6 |
| Pyrochlore, antimony lead yellow | 8012-00-8 |
| Silicic acid, lead salt | 11120-22-2 |
| Sulfurous acid, lead salt, dibasic | 62229-08-7 |
| Tetraethyllead | 78-00-2 |
| Trilead dioxide phosphonate | 12141-20-7 |

| Mercury and its Compounds | CAS Numbers |
|--------------------------------------|--------------------|
| Mercury | 7439-97-6 |
| Examples of Mercury Compounds | |
| Mercuric chloride | 33631-63-9 |
| Mercuric nitrate | 10045-94-0 |
| Mercuric oxide | 21908-53-2 |
| Mercuric sulfate | 7783-35-9 |
| Mercuric sulfide | 1344-48-5 |
| Mercury bichloride | 7487-94-7 |
| Phenylmercury acetate | 62-38-4 |
| Phenylmercury propionate | 103-27-5 |
| Phenylmercury 2-ethylhexanoate | 13302-00-6 |
| Phenylmercury octanoate | 13864-38-5 |
| Phenylmercury neodecanoate | 26545-49-3 |

| Nonylphenol, branched and linear and its ethoxylates | CAS Numbers |
|---|--------------------|
| Nonylphenol | 25154-52-3 |
| poly(oxy-1,2-ethanediyl)α(isononylphenyl)-ωhydroxy | 84852-15-3 |
| 4-Nonylphenol | 104-40-5 |
| 4-Nonylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof | - |
| Nonylphenol ethoxylates | 9016-45-9 |
| Polyoxyethylene (9) nonylphenylether, branched | 68412-54-4 |
| Poly(oxy-1,2-ethanediyl), α-(4-nonylphenyl)-ω-hydroxy-, branched | 127087-87-0 |



| | |
|--|-------------|
| 4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof, see examples below | - |
| poly(oxy-1,2-ethanediyl)α(isononylphenyl)-ωhydroxy or Isononylphenol ethoxylate | 37225-87-1 |
| Poly(oxy-1,2-ethanediyl), α-(4-nonylphenyl)-ωhydroxy- | 26027-38-3 |
| Ethanol, 2-(4-nonylphenoxy)- | 104-35-8 |
| Ethanol, 2-[2-[2-(4-nonylphenoxy)ethoxy]ethoxy]ethoxy]- | 7311-27-5 |
| Ethanol, 2-[2-(4-nonylphenoxy)ethoxy]- | 20427-84-3 |
| 3,6,9,12,15-Pentaoxaheptadecan-1-ol,17-(4-nonylphenoxy)- | 34166-38-6 |
| 3,6,9,12,15,18-Hexaoxaicosan-1-ol, 20-(4-nonylphenoxy)- | 27942-27-4 |
| 3,6,9,12,15,18,21,24-Octaoxahexacosan-1-ol,26-(4-nonylphenoxy)- | 14409-72-4 |
| 4-tert-Nonylphenol diethoxylate | 156609-10-8 |

Ozone Depleting Substances (ODS) CAS Numbers

| Ozone Depleting Substances/Isomers - Class 1 (see note 2) | |
|--|-------------------------------------|
| Trichlorofluoromethane (CFC 11) | 75-69-4 |
| Dichlorodifluoromethane (CFC12) | 75-71-8 |
| Chlorotrifluoromethane (CFC 13) | 75-72-9 |
| Pentachlorofluoroethane (CFC 111) | 354-56-3 |
| Tetrachlorodifluoroethane (CFC 112) | 76-12-0 76-11-9 |
| Trichlorotrifluoroethane (CFC 113) | 354-58-5 |
| 1,1,2 Trichlorotrifluoroethane | 76-13-1 |
| Dichlorotetrafluoroethane (CFC 114) | 76-14-2 |
| Monochloropentafluoroethane (CFC 115) | 76-15-3 |
| Heptachlorofluoropropane (CFC 211) | 422-78-6 422-81-1 135401-87-5 |
| Hexachlorodifluoropropane (CFC 212) | 3182-26-1 |
| Pentachlorotrifluoropropane (CFC 213) | 2354-06-5 134237-31-3 |
| Tetrachlorotetrafluoropropane (CFC 214) | 29255-31-0 |
| 1,1,1,3-Tetrachlorotetrafluoropropane | 2268-46-4 |

| | |
|---|-----------|
| Trichloropentafluoropropane (CFC 215) | 1599-41-3 |
| 1,1,1-Trichloropentafluoropropane | 4259-43-2 |
| 1,2,3-Trichloropentafluoropropane | 76-17-5 |
| Dichlorohexafluoropropane (CFC 216) | 661-97-2 |
| Monochloroheptafluoropropane (CFC 217) | 422-86-6 |
| Bromochloromethane (Halon-1011) | 74-97-5 |
| Bromochlorodifluoromethane (Halon 1211) | 353-59-3 |
| Bromotrifluoromethane (Halon 1301) | 75-63-8 |
| Dibromodifluoromethane (Halon-1202) | 75-61-6 |
| Dibromotetrafluoroethane (Halon 2402) | 124-73-2 |
| Carbon Tetrachloride (Tetrachloromethane) | 56-23-5 |
| 1,1,1, - Trichloroethane (methyl chloroform) and its isomers except 1,1,2-trichloroethane | 71-55-6 |
| Trifluoroiodomethane | 2314-97-8 |
| Chloromethane | 74-87-3 |
| Bromomethane | 74-83-9 |
| Bromoethane | 74-96-4 |
| 1-bromopropane; n-propyl bromide | 106-94-5 |
| Dibromofluoromethane (HBFC-21 B2) | 1868-53-7 |
| Bromodifluoromethane (HBFC-22 B1) | 1511-62-2 |
| Bromofluoromethane (HBFC-31 B1) | 373-52-4 |
| Tetrabromofluoroethane (HBFC-121 B4) | 306-80-9 |
| Tribromodifluoroethane (HBFC-122 B3) | - |
| Dibromotrifluoroethane (HBFC-123 B2) | 354-04-1 |
| Bromotetrafluoroethane (HBFC-124 B1) | 124-72-1 |
| Tribromofluoroethane (HBFC-131 B3) | - |
| Dibromodifluoroethane (HBFC-132 B2) | 75-82-1 |
| Bromotrifluoroethane (HBFC-133 B1) | 421-06-7 |
| Dibromofluoroethane (HBFC-141 B2) | 358-97-4 |
| Bromodifluoroethane (HBFC-142 B1) | 420-47-3 |
| Bromofluoroethane (HBFC-151 B1) | 762-49-2 |
| Hexabromofluoropropane (HBFC-221 B6) | - |
| Pentabromodifluoropropane (HBFC-222 B5) | - |
| Tetrabromotrifluoropropane (HBFC-223 B4) | - |
| Tribromotetrafluoropropane (HBFC-224 B3) | - |
| Dibromopentafluoropropane (HBFC-225 B2) | 431-78-7 |
| Bromohexafluoropropane (HBFC-226 B1) | 2252-78-0 |



| | |
|--|-------------|
| Pentabromofluoropropane (HBFC-231 B5) | - |
| Tetrabromodifluoropropane (HBFC-232 B4) | - |
| Tribromotrifluoropropane (HBFC-233 B3) | - |
| Dibromotetrafluoropropane (HBFC-234 B2) | - |
| Bromopentafluoropropane (HBFC-235 B1) | 460-88-8 |
| Tetrabromofluoropropane (HBFC-241 B4) | - |
| Tribromodifluoropropane (HBFC-242 B3) | 70192-80-2 |
| Dibromotrifluoropropane (HBFC-243 B2) | 431-21-0 |
| Bromotetrafluoropropane (HBFC-244 B1) | 679-84-5 |
| Tribromofluoropropane (HBFC-251 B3) | 75372-14-4 |
| Dibromodifluoropropane (HBFC-252 B2) | 460-25-3 |
| Bromotrifluoropropane (HBFC-253 B1) | 421-46-5 |
| Dibromofluoropropane (HBFC-261 B2) | 51584-26-0 |
| Bromodifluoropropane (HBFC-262 B1) | - |
| Bromofluoropropane (HBFC-271 B1) | 1871-72-3 |
| Ozone Depleting Substances/Isomers - Class II Hydrochlorofluorocarbons (see note 2) | |
| Dichlorofluoromethane (HCFC 21) | 75-43-4 |
| Chlorodifluoromethane (HCFC 22) | 75-45-6 |
| Chlorofluoromethane (HCFC 31) | 593-70-4 |
| Tetrachlorofluoroethane (HCFC 121) | 134237-32-4 |
| 1,1,1,2-tetrachloro-2-fluoroethane (HCFC 121a) | 354-11-0 |
| 1,1,2,2-tetracloro-1-fluoroethane | 354-14-3 |
| Trichlorodifluoroethane (HCFC 122) | 41834-16-6 |
| 1,2,2-trichloro-1,1-difluoroethane | 354-21-2 |
| 1,1,2-Trichloro-1,2-difluoroethane | 354-15-4 |
| 1,1,1-Trichloro-2,2-difluoroethane | 354-12-1 |
| Dichlorotrifluoroethane(HCFC 123) | 34077-87-7 |
| Dichloro-1,1,2-trifluoroethane | 90454-18-5 |
| 2,2-dichloro-1,1,1-trifluoroethane | 306-83-2 |
| 1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a) | 354-23-4 |
| 1,1-dichloro-1,2,2-trifluoroethane (HCFC-123b) | 812-04-4 |
| 2,2-dichloro-1,1,2-trifluoroethane (HCFC-123b) | 812-04-4 |
| Chlorotetrafluoroethane (HCFC 124) | 63938-10-3 |
| 2-chloro-1,1,1,2-tetrafluoroethane | 2837-89-0 |
| 1-chloro-1,1,2,2-tetrafluoroethane (HCFC 124a) | 354-25-6 |
| Trichlorofluoroethane (HCFC 131) | 27154-33-2 |

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| | 134237-34-6 |
| | 2366-36-1 |
| 1-Fluoro-1,2,2-trichloroethane | 359-28-4 |
| 1,1,1-trichloro-2-fluoroethane (HCFC131b) | 811-95-0 |
| Dichlorodifluoroethane (HCFC 132) | 25915-78-0 |
| 1,2-dichloro-1,1-difluoroethane (HCFC 132b) | 1649-08-7 |
| 1,1-dichloro-1,2-difluoroethane (HCFC 132c) | 1842-05-3 |
| 1,1-dichloro-2,2-difluoroethane | 471-43-2 |
| 1,2-dichloro-1,2-difluoroethane | 431-06-1 |
| Chlorotrifluoroethane (HCFC 133) | 1330-45-6 |
| | 421-04-5 |
| | 431-07-2 |
| 1-chloro-1,2,2-trifluoroethane | 1330-45-6 |
| 2-chloro-1,1,1-trifluoroethane (HCFC-133a) | 75-88-7 |
| Dichlorofluoroethane(HCFC 141) | 1717-00-6 |
| | 430-53-5 |
| | 25167-88-8 |
| 1,1-dichloro-1-fluoroethane (HCFC-141b) | 1717-00-6 |
| 1,2-dichloro-1-fluoroethane | 430-57-9 |
| Chlorodifluoroethane (HCFC 142) | 25497-29-4 |
| 2-Chloro-1,1-Difluoroethane | 338-65-8 |
| 1-chloro-1,1-difluoroethane (HCFC142b) | 75-68-3 |
| 1-chloro-1,2-difluoroethane (HCFC142a) | 338-64-7 |
| Chlorofluoroethane (HCFC-151) | 110587-14-9 |
| 1-Chloro-2-fluoroethane (HCFC-151) | 762-50-5 |
| 1-Chloro-1-fluoroethane (HCFC-151a) | 1615-75-4 |
| Hexachlorofluoropropane (HCFC 221) | 134237-35-7 |
| 1,1,1,2,2,3-Hexachloro-3-fluoropropane (HCFC-221ab) | 29470-94-8 |
| | 422-26-4 |
| Pentachlorodifluoropropane (HCFC 222) | 134237-36-8 |
| 1,1,1,3,3-pentachloro-2,2-difluoropropane (HCFC-222ca) | 422-49-1 |
| 1,2,2,3,3-pentachloro-1,1-difluoropropane (HCFC-222aa) | 422-30-0 |
| Tetrachlorotrifluoropropane (HCFC 223) | 134237-37-9 |
| 1,1,3,3-Tetrachloro-1,2,2-trifluoropropane (HCFC-223ca) | 422-52-6 |
| 1,1,1,3-Tetrachloro-2,2,3-trifluoropropane (HCFC-223cb) | 422-50-4 |



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| Trichlorotetrafluoropropane (HCFC 224) | 134237-38-0 |
| 1,3,3-Trichloro-1,1,2,2-tetrafluoropropane (HCFC-224ca) | 422-54-8 |
| 1,1,3-Trichloro-1,2,2,3-tetrafluoropropane (HCFC-224cb) | 422-53-7 |
| 1,1,1-Trichloro-2,2,3,3-tetrafluoropropane (HCFC-224cc) | 422-51-7 |
| Dichloropentafluoropropane, (Ethyne, fluoro-) (HCFC 225) | 127564-92-5 2713-09-9 |
| 2,2-Dichloro-1,1,1,3,3-pentafluoropropane (HCFC 225aa) | 128903-21-9 |
| 2,3-Dichloro-1,1,1,2,3-pentafluoropropane (HCFC 225ba) | 422-48-0 |
| 1,2-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC 225bb) | 422-44-6 |
| 3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC 225ca) | 422-56-0 |
| 1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC 225cb) | 507-55-1 |
| 1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC 225cc) | 13474-88-9 |
| 1,2-Dichloro-1,1,3,3,3-pentafluoropropane (HCFC 225da) | 431-86-7 |
| 1,3-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC 225ea) | 136013-79-1 |
| 1,1-Dichloro-1,2,3,3,3-pentafluoropropane (HCFC 225eb) | 111512-56-2 |
| Chlorohexafluoropropane (HCFC 226) | 134308-72-8 |
| 2-Chloro-1,1,1,3,3,3-hexafluoro-propane (HCFC-226da) | 431-87-8 |
| Pentachlorofluoropropane (HCFC 231) | 134190-48-0 |
| 1,1,1,2,3-pentachloro-2-fluoro-propane (HCFC-231bb) | 421-94-3 |
| Tetrachlorodifluoropropane (HCFC 232) | 134237-39-1 |
| 1,1,1,3-Tetrachloro-3,3-difluoropropane (HCFC-232fc) | 460-89-9 |
| Trichlorotrifluoropropane (HCFC 233) | 134237-40-4 |
| 1,1,1-Trichloro-3,3,3-trifluoropropane | 7125-83-9 |
| Dichlorotetrafluoropropane (HCFC 234) | 127564-83-4 |
| 1,2-Dichloro-1,2,3,3-tetrafluoropropane (HCFC-234db) | 425-94-5 |
| Chloropentafluoropropane (HCFC 235) | 134237-41-5 |
| 1-Chloro-1,1,3,3,3-pentafluoropropane | 460-92-4 |
| Tetrachlorofluoropropane (HCFC 241) | 134190-49-1 |
| 1,1,2,3-Tetrachloro-1-fluoropropane (HCFC-241db) | 666-27-3 |
| Trichlorodifluoropropane (HCFC 242) | 134237-42-6 |
| 1,3,3,Trichloro-1,1-difluoropropane (HCFC-242fa) | 460-63-9 |

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| Dichlorotrifluoropropane (HCFC 243) | 134237-43-7 |
| 1,1-dichloro-1,2,2-trifluoropropane | 7125-99-7 |
| 2,3-dichloro-1,1,1-trifluoropropane | 338-75-0 |
| 3,3-Dichloro-1,1,1-trifluoropropane | 460-69-5 |
| Chlorotetrafluoropropane (HCFC 244) | 134190-50-4 |
| 3-chloro-1,1,2,2-tetrafluoropropane (HCFC-244ca) | 679-85-6 |
| 1-Chloro-1,1,2,2-tetrafluoropropane (HCFC-244cc) | 421-75-0 |
| Trichlorofluoropropane (HCFC 251) | 134190-51-5 |
| 1,1,3-trichloro-1-fluoropropane (HCFC-251fb) | 818-99-5 |
| 1,1,2-Trichloro-1-fluoropropane (HCFC-251dc) | 421-41-0 |
| Dichlorodifluoropropane (HCFC 252) | 134190-52-6 |
| 1,3-Dicloro-1,1-difluoropropane (HCFC-252fb) | 819-00-1 |
| Chlorotrifluoropropane (HCFC 253) | 134237-44-8 |
| 3-chloro-1,1,1-trifluoropropane (HCFC 253fb) | 460-35-5 |
| Dichlorofluoropropane (HCFC 261) | 134237-45-9 |
| 1,1-dichloro-1-fluoropropane (HCFC-261fc) | 7799-56-6 |
| 1,2-Dichloro-2-fluoro-propane (HCFC-261ba) | 420-97-3 |
| Chlorodifluoropropane (HCFC 262) | 134190-53-7 |
| 1-Chloro-2,2-difluoropropane (HCFC-262ca) | 420-99-5 |
| 2-chloro-1,3-difluoropropane (HCFC-262da) | 102738-79-4 |
| 1-Chloro-1,1-difluoropropane (HCFC-262fc) | 421-02-3 |
| Chlorofluoropropane (HCFC 271) | 134190-54-8 |
| 2-chloro-2-fluoropropane | 420-44-0 |
| 1-Chloro-1-fluoropropane | 430-55-7 |

| Perchlorates | CAS Numbers |
|---|-------------|
| Lithium perchlorate | 7791-03-9 |
| Ammonium perchlorate | 7790-98-9 |
| Barium perchlorate | 13465-95-7 |
| Lead perchlorate | 13637-76-8 |
| Magnesium Perchlorate | 10034-81-8 |
| Perchloric acid, cobalt (2+) salt | 13455-31-7 |
| Perchloric acid, mercury(2+) salt | 7616-83-3 |
| Perchloric acid, nickel(2+) salt, hexahydrate | 13520-61-1 |
| Nickel perchlorate | 13637-71-3 |
| Potassium Perchlorate | 7778-74-7 |
| Sodium Perchlorate | 7601-89-0 |

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|--------------------------|------------|
| Thallium(3+) perchlorate | 15596-83-5 |
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Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA **CAS Numbers**

| | |
|------------------------------------|-----------|
| Pentadecafluorooctanoic acid | 335-67-1 |
| Ammonium pentadecafluorooctanoate | 3825-26-1 |
| Sodium pentadecafluorooctanoate | 335-95-5 |
| Potassium pentadecafluorooctanoate | 2395-00-8 |
| Silver pentadecafluorooctanoate | 335-93-3 |
| Pentadecafluorooctanoyl fluoride | 335-66-0 |
| Methyl pentadecafluorooctanoate | 376-27-2 |
| Ethyl pentadecafluorooctanoate | 3108-24-5 |

Perfluorononan-1-oic-acid and its sodium and ammonium salts **CAS Numbers**

| | |
|---|------------|
| Perfluorononan-1-oic-acid | 375-95-1 |
| Ammonium salts of perfluorononan-1-oic-acid | 4149-60-4 |
| Sodium salts of perfluorononan-1-oic-acid | 21049-39-8 |

Perfluorooctane sulfonate (PFOS) **CAS Numbers**

| | |
|--|-------------|
| Perfluorooctane sulfonates (PFOS) [C8F17SO2X where X = OH, Metal salt (O-M+), halide, amide, and other derivatives including polymers] | - |
| 2-Propenoic acid, 2-methyl-, dodecyl ester, polymers with 2-[methyl[(perfluoro-C4-8-alkyl)-sulfonyl]amino]ethyl acrylate and vinylidene chloride | 306975-62-2 |
| Glycine, N-ethyl-N-[(heptadecafluorooctyl)sulfonyl]-, potassium salt | 2991-51-7 |
| Perfluorooctanoic acid sodium salt | 335-95-5 |

Phthalates **CAS Numbers**

| | |
|---|------------|
| 1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters | 68515-51-5 |
| 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich | 71888-89-6 |
| 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters | 68515-42-4 |
| 1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear | 68515-50-4 |
| 1,2-Benzenedicarboxylic acid, dipentylester, branched and linear | 84777-06-0 |
| 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate | 68648-93-1 |
| Benzyl butyl phthalate (BBP) | 85-68-7 |
| Bis (2-ethyl(hexyl)phthalate) (DEHP) | 117-81-7 |
| Bis(2-methoxyethyl) phthalate (DMEP) | 117-82-8 |

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| Di-n-hexyl Phthalate (DnHP) | 84-75-3 |
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| Di-n-octyl phthalate (DNOP) | 117-84-0 |
| Dibutylphthalate (DBP) | 84-74-2 |
| Dihexyl phthalate | 84-75-3 |
| Diisobutyl phthalate (DIBP) | 84-69-5 |
| Diisodecyl phthalate (DIDP) | 26761-40-0 68515-49-1 |
| Diisononyl phthalate (DINP) | 28553-12-0 68515-48-0 |
| Diisopentylphthalate (DIPP) | 605-50-5 |
| Dipentyl phthalate (DPP) | 131-18-0 |
| N-pentyl-isopentylphthalate | 776297-69-9 |

Polybrominated Biphenyls (PBB) and their ethers/oxides (PBDE) **CAS Numbers**

Examples of Common PBB/PBDE Compounds (see note 3)

| | |
|-----------------------------|------------|
| Polybrominated Biphenyls[4] | 59536-65-1 |
| Dibromobiphenyl | 92-86-4 |
| 2-Bromobiphenyl | 2052-07-5 |
| 3-Bromobiphenyl | 2113-57-7 |
| 4-Bromobiphenyl | 92-66-0 |
| Tribromobiphenyl | 59080-34-1 |
| Tetrabromobiphenyl | 40088-45-7 |
| Pentabromobiphenyl | 56307-79-0 |
| Hexabromobiphenyl | 59080-40-9 |
| hexabromo-1,1-biphenyl | 36355-01-8 |
| Firemaster FF-1 | 67774-32-7 |
| Heptabromobiphenyl | 35194-78-6 |
| Octabromobiphenyl | 61288-13-9 |
| Nonabiphenyl | 27753-52-2 |
| Decabromobiphenyl | 13654-09-6 |
| Bromodiphenyl ether | 101-55-3 |
| Dibromodiphenyl ethers | 2050-47-7 |
| Tribromodiphenyl ether | 49690-94-0 |
| Tetrabromodiphenyl ethers | 40088-47-9 |
| Pentabromodiphenyl ether | 32534-81-9 |
| Hexabromodiphenyl ether | 36483-60-0 |



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| Heptabromodiphenylether | 68928-80-3 |
| Octabromodiphenyl ether | 32536-52-0 |
| Nonabromodiphenylether | 63936-56-1 |
| Decabromodiphenyl ether (DecaBDE) | 1163-19-5 |

Polychlorinated Naphthalenes (PCNs) CAS Numbers

| | |
|--------------------------------------|-------------|
| Naphthalene, chloro derivatives | 70776-03-3 |
| Examples of Common PCNs | |
| 1,2,3,4,5,6,7-Heptachloronaphthalene | 58863-14-2 |
| 1,2,3,4,5,6,8-Heptachloronaphthalene | 58863-15-3 |
| 1,2,3,4,5,6-Hexachloronaphthalene | 58877-88-6 |
| 1,2,3,4,5,7-Hexachloronaphthalene | 67922-27-4 |
| 1,2,3,4,5,8-Hexachloronaphthalene | 103426-93-3 |
| 1,2,3,4,5-Pentachloronaphthalene | 67922-25-2 |
| 1,2,3,4,6,7-Hexachloronaphthalene | 103426-96-6 |
| 1,2,3,4,6-Pentachloronaphthalene | 67922-26-3 |
| 1,2,3,4-Tetrachloronaphthalene | 20020-02-4 |
| 1,2,3,5,6,7-Hexachloronaphthalene | 103426-97-7 |
| 1,2,3,5,6,8-Hexachloronaphthalene | 103426-95-5 |
| 1,2,3,5,6-Pentachloronaphthalene | 150224-18-3 |
| 1,2,3,5,7,8-Hexachloronaphthalene | 103426-94-4 |
| 1,2,3,5,7-Pentachloronaphthalene | 53555-65-0 |
| 1,2,3,5,8-Pentachloronaphthalene | 150224-24-1 |
| 1,2,3,5-Tetrachloronaphthalene | 53555-63-8 |
| 1,2,3,6,7,8-Hexachloronaphthalene | 17062-87-2 |
| 1,2,3,6,7-Pentachloronaphthalene | 150224-16-1 |
| 1,2,3,6,8-Pentachloronaphthalene | 150224-23-0 |
| 1,2,3,6-Tetrachloronaphthalene | 149864-78-8 |
| 1,2,3,7,8-Pentachloronaphthalene | 150205-21-3 |
| 1,2,3,7-Tetrachloronaphthalene | 55720-41-7 |
| 1,2,3,8-Tetrachloronaphthalene | 149864-81-3 |
| 1,2,3-Trichloronaphthalene | 50402-52-3 |
| 1,2,4,5,6,8-Hexachloronaphthalene | 90948-28-0 |
| 1,2,4,5,6-Pentachloronaphthalene | 150224-20-7 |
| 1,2,4,5,7,8-Hexachloronaphthalene | 103426-92-2 |
| 1,2,4,5,7-Pentachloronaphthalene | 150224-19-4 |
| 1,2,4,5,8-Pentachloronaphthalene | 150224-25-2 |

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| 1,2,4,5-Tetrachloronaphthalene | 6733-54-6 |
| 1,2,4,6,7-Pentachloronaphthalene | 150224-17-2 |
| 1,2,4,6,8-Pentachloronaphthalene | 150224-22-9 |
| 1,2,4,6-Tetrachloronaphthalene | 51570-45-7 |
| 1,2,4,7,8-Pentachloronaphthalene | 150224-21-8 |
| 1,2,4,7-Tetrachloronaphthalene | 67922-21-8 |
| 1,2,4,8-Tetrachloronaphthalene | 6529-87-9 |
| 1,2,4-Trichloronaphthalene | 50402-51-2 |
| 1,2,5,6-Tetrachloronaphthalene | 67922-22-9 |
| 1,2,5,7-Tetrachloronaphthalene | 67922-23-0 |
| 1,2,5,8-Tetrachloronaphthalene | 149864-80-2 |
| 1,2,5-Trichloronaphthalene | 55720-33-7 |
| 1,2,6,7-Tetrachloronaphthalene | 149864-79-9 |
| 1,2,6,8-Tetrachloronaphthalene | 67922-24-1 |
| 1,2,6-Trichloronaphthalene | 51570-44-6 |
| 1,2,7,8-Tetrachloronaphthalene | 149864-82-4 |
| 1,2,7-Trichloronaphthalene | 55720-34-8 |
| 1,2,8-Trichloronaphthalene | 55720-35-9 |
| 1,2-Dichloronaphthalene | 2050-69-3 |
| 1,3,5,7-Tetrachloronaphthalene | 53555-64-9 |
| 1,3,5,8-Tetrachloronaphthalene | 31604-28-1 |
| 1,3,5-Trichloronaphthalene | 51570-43-5 |
| 1,3,6,7-Tetrachloronaphthalene | 55720-42-8 |
| 1,3,6,8-Tetrachloronaphthalene | 150224-15-0 |
| 1,3,6-Trichloronaphthalene | 55720-36-0 |
| 1,3,7-Trichloronaphthalene | 55720-37-1 |
| 1,3,8-Trichloronaphthalene | 55720-38-2 |
| 1,3-Dichloronaphthalene | 2198-75-6 |
| 1,4,5,8-Tetrachloronaphthalene | 3432-57-3 |
| 1,4,5-Trichloronaphthalene | 2437-55-0 |
| 1,4,6,7-Tetrachloronaphthalene | 55720-43-9 |
| 1,4,6-Trichloronaphthalene | 2437-54-9 |
| 1,4-Dichloronaphthalene | 1825-31-6 |
| 1,5-Dichloronaphthalene | 1825-30-5 |
| 1,6,7-Trichloronaphthalene | 55720-39-3 |
| 1,6-Dichloronaphthalene | 2050-72-8 |

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|--------------------------------|------------|
| 1,7-Dichloronaphthalene | 2050-73-9 |
| 1,8-Dichloronaphthalene | 2050-74-0 |
| 1-Chloronaphthalene | 90-13-1 |
| 2,3,6,7-Tetrachloronaphthalene | 34588-40-4 |
| 2,3,6-Trichloronaphthalene | 55720-40-6 |
| 2,3-Dichloronaphthalene | 2050-75-1 |
| 2,6-Dichloronaphthalene | 2065-70-5 |
| 2,7-Dichloronaphthalene | 2198-77-8 |
| 2-Chloronaphthalene | 91-58-7 |
| Chloronaphthalene | 25586-43-0 |
| Dichloronaphthalene | 28699-88-9 |
| Heptachloronaphthalene | 32241-08-0 |
| Hexachloronaphthalene | 1335-87-1 |
| Pentachloronaphthalene | 1321-64-8 |
| Perchloronaphthalene | 2234-13-1 |
| Tetrachloronaphthalene | 1335-88-2 |
| Trichloronaphthalene | 1321-65-9 |

Polychlorinated Biphenyls (PCBs) and Terphenyls (PCTs) and specific substitutes **CAS Numbers**

| Examples of Common PCB/PCT Compounds | |
|--|------------|
| Polychlorinated Biphenyls(all isomers and congeners) | 1336-36-3 |
| Aroclor | 12767-79-2 |
| Aroclor 1254 | 11097-69-1 |
| Chlorodiphenyl (Aroclor 1260) | 11096-82-5 |
| Kanechlor 500 | 27323-18-8 |
| Polychlorinated Terphenyls (all isomers and congeners) | 61788-33-8 |
| Terphenyls | 26140-60-3 |

Halogenated Diphenyl Methanes

| | |
|--|------------|
| Monomethyl-tetrachloro-diphenyl methane (Ugilec 141) | 76253-60-6 |
| Monomethyl-dichloro-diphenyl methane (Ugilec 121, Ugilec 21) | 81161-70-8 |
| Monomethyl-dibromo-diphenyl methane (DBBT) | 99688-47-8 |

Refractory Ceramic Fibers **CAS Numbers**

| | |
|---|-----|
| Aluminosilicate Refractory Ceramic Fibres | n/a |
|---|-----|

| | |
|---|-----|
| are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and fulfil the three following conditions: a) oxides of aluminium and silicon are the main components present (in the fibres) within variable concentration ranges b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm) c) alkaline oxide and alkali earth oxide (Na ₂ O+K ₂ O+CaO+MgO+BaO) content less or equal to 18% by weight | |
| Zirconia Aluminosilicate Refractory Ceramic Fibres | n/a |
| are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and fulfil the three following conditions: a) oxides of aluminium, silicon and zirconium are the main components present (in the fibres) within variable concentration ranges b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm). c) alkaline oxide and alkali earth oxide (Na ₂ O+K ₂ O+CaO+MgO+BaO) content less or equal to 18% by weight | |

Short Chain Chlorinated Paraffins (SCCP) **CAS Numbers**

| Examples of Short Chain Chlorinated Paraffins | |
|---|-------------|
| Chlorinated Paraffin | 63449-39-8 |
| Alkanes, C10-13, chloro (Chlorinated Paraffin) | 85535-84-8 |
| Alkanes, C10-12, chloro | 108171-26-2 |
| Alkanes, C12-13, chloro | 71011-12-6 |
| Alkanes, chloro | 61788-76-9 |
| Other Short Chain Chlorinated Paraffins (Chlorinated alkanes that have the molecular formula C _n H _x Cl(2n+2-x) in which 10 ≤ n ≤ 13) | - |

Tri-substituted Organnostannic Compounds **CAS Numbers**

| | |
|---|--------------------------|
| Triphenyltin-N, N-dimethyldithiocarbamate | 1803-12-9 |
| Triphenyltinfluoride | 379-52-2 |
| Triphenyltinacetate | 900-95-8 |
| Triphenyltinchloride | 639-58-7 |
| Triphenyltinhydroxide | 76-87-9 |
| Triphenyltin fattyacid((9-11)salt) | 18380-71-7 18380-72-8 |

| | |
|---|--------------------------|
| | 47672-31-1 94850-90-5 |
| Triphenyltinchloroacetate | 7094-94-2 |
| Tributyltinmethacrylate | 2155-70-6 |
| Bis(tributyltin)fumarate | 6454-35-9 |
| Tributyltinfluoride | 1983-10-4 |
| Bis(tributyltin)2,3-dibromosuccinate | 31732-71-5 |
| Tributyltinacetate | 56-36-0 |
| Tributyltinlaurate | 3090-36-6 |
| Bis(tributyltin)phthalate | 4782-29-0 |
| Copolymer of alkyl(c=8) acrylate, methyl methacrylate and tributyltin methacrylate | 67772-01-4 |
| Tributyltinsulfamate | 6517-25-5 |
| Bis(tributyltin)maleate | 14275-57-1 |
| Tributyltinchloride | 1461-22-9 7342-38-3 |
| Tributyltin cyclopentane carbonate = mixture | 85409-17-2 |
| Tributyltin-1,2,3,4,4a,4b,5,6,10,10a-decahydro-7-isopropyl-1,4a-dimethyl-1-phenanthrenecarboxylatemix | 26239-64-5 |
| Other tri-substituted organostannic compounds | - |

Other substances
CAS Numbers

| | |
|---|------------|
| α,α -Bis[4-(dimethylamino)phenyl]-4(phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4) | 6786-83-0 |
| [4-[[4-anilino-1-naphthyl]]4-(dimethylamino)phenyl] methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26) [with \geq 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)] | 2580-56-5 |
| 1,2,3-Trichloropropane | 96-18-4 |
| 1,2-dichloroethane | 107-06-2 |
| 1,3-propanesultone | 1120-71-4 |
| 1,3,5-Tris(oxiran-2-ylmethyl)-1,3,5-triazinane-2,4,6-trione (TGIC) | 2451-62-9 |
| 1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (β -TGIC) | 59653-74-6 |
| 1-Methyl-2-pyrrolidone | 872-50-4 |
| 2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350) | 36437-37-3 |
| 2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328) | 25973-55-1 |
| 2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320) | 3846-71-7 |

| | |
|--|---|
| 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE) | 15571-58-1 |
| reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE) | - |
| 2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327) | 3864-99-1 |
| 2,4-Dinitrotoluene | 121-14-2 |
| 3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine | 143860-04-2 |
| 4-Aminoazobenzene; 4-Phenylazoaniline | 60-09-3 |
| 4-methyl-m-phenylenediamine (2,4-toluenediamine) | 95-80-7 |
| 4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol [with \geq 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)] | 561-41-1 |
| 4,4'-bis(dimethylamino)benzophenone (Michler's ketone) | 90-94-8 |
| 4,4'- Diaminodiphenylmethane and technical grade MDA/PMDA | 101-77-9 25214-70-4 |
| 4,4'-methylenedi-o-toluidine | 838-88-0 |
| 4,4'-oxydianiline and its salts | 101-80-4 |
| 4-(1,1,3,3-tetramethylbutyl)phenol, (4-tert-Octylphenol) | 140-66-9 |
| 4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues] (examples) | - 2497-59-8 2315-67-5 2315-61-9 9002-93-1 |
| 4-[4,4'-bis(dimethylamino) benzhydrylidene] cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Violet 3) | 548-62-9 |
| 5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual stereoisomers of [1] and [2] or any combination thereof] | - |
| 5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene) | 81-15-2 |
| 6-methoxy-m-toluidine (p-cresidine) | 120-71-8 |
| Acrylamide | 79-06-1 |
| Ammonium pentadecafluorooctanoate (APFO) | 3825-26-1 |
| Anthracene | 120-12-7 |

| | |
|--|--------------------------------------|
| Biphenyl-4-ylamine | 92-67-1 |
| Benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-trimethylpentene | 68921-45-9 |
| Benzene | 71-43-2 |
| Benzo[def]chrysene | 50-32-8 |
| Bis(tributyltin)oxide (TBTO) | 56-35-9 |
| Boric acid | 10043-35-3 11113-50-1 |
| Chloroethene (vinyl chloride) | 75-01-4 |
| Cobalt dichloride | 7646-79-9 |
| Cobalt(II) carbonate | 513-79-1 |
| Cobalt(II) diacetate | 71-48-7 |
| Cobalt(II) dinitrate | 10141-05-6 |
| Cobalt(II) sulphate | 10124-43-3 |
| Cyclohexane-1,2-dicarboxylic anhydride (Hexahydrophthalic anhydride - HHPA) | 85-42-7 13149-00-3 14166-21-3 |
| Di- μ -oxo-di-n-butylstanniohydroxyborane/Dibutyltin hydrogen borate C ₈ H ₁₉ B ₀₃ Sn (DBB) | 75113-37-0 |
| Diarsenic pentaoxide | 1303-28-2 |
| Diarsenic trioxide | 1327-53-3 |
| Diazene-1,2-dicarboxamide (C,C'-azodi(formamide)) | 123-77-3 |
| Diboron trioxide | 1303-86-2 |
| Dibutyltin dichloride (DBT) | 683-18-1 |
| Diethyl sulphate | 64-67-5 |
| Dimethyl sulphate | 77-78-1 |
| Dimethylfumarate (DMFu) | 624-49-7 |
| Dinoseb | 88-85-7 |
| Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28) | 573-58-0 |
| Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38) | 1937-37-7 |
| Disodium tetraborate, anhydrous | 1303-96-4 1330-43-4 12179-04-3 |
| Formamide | 75-12-7 |
| Furan | 110-00-9 |

| | |
|--|-----------------------|
| Henicosafuoroundecanoic acid | 2058-94-8 |
| Heptacosafuorotetradecanoic acid | 376-06-7 |
| Hexachloroethane | 67-72-1 |
| Hydrazine | 302-01-2 7803-57-8 |
| Imidazolidine-2-thione (2-imidazoline-2-thiol) | 96-45-7 |
| Inorganic ammonium salts | - |
| Lead hydrogen arsenate | 7784-40-9 |
| Methoxy acetic acid | 625-45-6 |
| N,N-dimethylacetamide | 127-19-5 |
| N,N-dimethylformamide; dimethyl formamide | 68-12-2 |
| N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base) | 101-61-1 |
| N-methylacetamide | 79-16-3 |
| Nitrobenzene | 98-95-3 |
| o-aminoazotoluene | 97-56-3 |
| o-Toluidine; 2-Aminotoluene | 95-53-4 |
| Pentacosafuorotridecanoic acid | 72629-94-8 |
| Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl) | 3846-71-7 |
| Phenolphthalein | 77-09-8 |
| Pitch, coal tar, high temp (EC# 266-028-2) | 65996-93-2 |
| Propylene oxide; 1,2-epoxypropane; methyloxirane | 75-56-9 |
| Silicic acid, barium salt, lead-doped | 68784-75-8 |
| Sodium perborate; perboric acid, sodium salt | - |
| Sodium peroxometaborate | 7632-04-4 |
| Tetraboron disodium heptaoxide, hydrate | 12267-73-1 |
| Trichlorobenzene | 120-82-1 |
| Trichloroethylene | 79-01-6 |
| Tricosafuorododecanoic acid | 307-55-1 |
| Triethyl arsenate | 15606-95-8 |
| Tris(2-chloroethyl)phosphate (TCEP) | 115-96-8 |
| Trixylyl phosphate | 25155-23-1 |

Note 1: the European Community's ban applies to azocolorants and azodyes that by reductive cleavage of azo groups may release one of the above aromatic amines.

Note 2: These materials may contain isomers that are not listed here. Isomers with CAS numbers have been included when available. Refer to <http://www.epa.gov/ozone/ods.html> for chemical names and updates.



Note 3: Polybrominated

Biphenyl(s)=Polybromobiphenyl(s)=Polybromodiphenyl(s)

| | | | |
|------------------------------|---|---------------|--------|
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| Initiated by: Harald Riempp | | Drawing No. | Rev. R |
| Approved by: Richard Gartman | | A-5951-1745-1 | |

APPENDIX C

Reportable Substances

The concentration or amount of the following substances (see additional details in Appendix B) in material may be requested for reporting compliance³ to Agilent restrictions defined in this document:

| Table1: Reportable Substance or compound | Prohibited or Restricted |
|--|--------------------------|
| [4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl] methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26) [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)] | Yes |
| 1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters | Yes |
| 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich | Yes |
| 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters | Yes |
| 1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear | Yes |
| 1,2-Benzenedicarboxylic acid, dipentylester, branched and linear | Yes |
| 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate | Yes |
| 1,2-Diethoxyethane | Yes |
| 1,3-propanesultone | Yes |
| 1,3,5-Tris(oxiran-2-ylmethyl)-1,3,5-triazinane-2,4,6-trione (TGIC) | Yes |
| 1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (β-TGIC) | Yes |
| 2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350) | Yes |
| 2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328) | Yes |
| 2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320) | Yes |
| 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE) | Yes |
| reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE) | Yes |
| 2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327) | Yes |
| 2,4-Dinitrotoluene | Yes |
| 4-(1,1,3,3-tetramethylbutyl)phenol, (4-tert-Octylphenol) | Yes |
| 4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues] | yes |
| 4,4'- Diaminodiphenylmethane and technical grade MDA/PMMA | Yes |

³ A < 5ppm reporting limit accounts for unintentional impurities.



| Table1: Reportable Substance or compound | Prohibited or Restricted |
|---|---------------------------------|
| 4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)] | Yes |
| 4,4'-bis(dimethylamino)benzophenone (Michler's ketone) | Yes |
| 4-[4,4'-bis(dimethylamino) benzhydrylidene] cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Violet 3) | Yes |
| Aluminosilicate Refractory Ceramic Fibres | Yes |
| Ammonium pentadecafluorooctanoate (APFO) | Yes |
| Arsen and its compounds | Yes |
| Arsenic acid | Yes |
| Asbestos/Asbestos Materials | Yes |
| Azocolorants and Azodyes | Yes |
| Benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-trimethylpentene | Yes |
| Benzene | Yes |
| Benzo[def]chrysene | Yes |
| Benzyl butyl phthalate (BBP) | Yes |
| Bis (2-ethyl(hexyl)phthalate) (DEHP) | Yes |
| Bis(2-methoxyethyl) ether (Diglyme) | Yes |
| Bis(2-methoxyethyl) phthalate (DMEP) | Yes |
| Bis(tributyltin)oxide (TBTO) | Yes |
| Cadmium and its Compounds | Yes |
| Chloroethene (vinyl chloride) | Yes |
| Chromium VI (Hexavalent Chromium) Compounds | Yes |
| Cobalt dichloride | Yes |
| Cyclic acid anhydrides | Yes |
| Cyclohexane-1,2-dicarboxylic anhydride (Hexahydrophthalic anhydride - HHPA) | Yes |
| Di-n-hexyl Phthalate (DnHP) | Yes |
| Diarsenic pentaoxide | Yes |
| Diarsenic trioxide | Yes |
| Diboron trioxide | Yes |
| Dibutylphthalate (DBP) | Yes |
| Dibutyltin (DBT) compounds | Yes |
| Dibutyltin dichloride (DBT) | Yes |
| Dihexyl phthalate | Yes |
| Diisobutyl phthalate (DIBP) | Yes |



| Table1: Reportable Substance or compound | Prohibited or Restricted |
|--|---------------------------------|
| Diisodecyl phthalate (DIDP) | Yes |
| Diisononyl phthalate (DINP) | Yes |
| Diisopentylphthalate (DIPP) | Yes |
| Dimethylfumarate (DMFu) | Yes |
| Dinoseb | Yes |
| Dipentyl phthalate (DPP) | Yes |
| Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28) | Yes |
| Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38) | Yes |
| Disodium tetraborate, anhydrous | Yes |
| Di- μ -oxo-di-n-butylstanniohydroxyborane/ Dibutyltin hydrogen borate C ₈ H ₁₉ B ₀₃ Sn (DBB) | Yes |
| Fluorinated Greenhouse Gases (F-Gases) | Yes |
| Formamide | Yes |
| Furan | Yes |
| Halogenated Diphenyl Methanes | Yes |
| Henicosafuoroundecanoic acid | Yes |
| Heptacosafuorotetradecanoic acid | Yes |
| Hexabromocyclododecane (HBCDD) | Yes |
| Hexachloroethane | Yes |
| Imidazolidine-2-thione (2-imidazoline-2-thiol) | Yes |
| Inorganic ammonium salts | Yes |
| Lead and its Compounds | Yes |
| Mercury and its Compounds | Yes |
| N,N-dimethylacetamide | Yes |
| N,N-dimethylformamide; dimethyl formamide | Yes |
| Nonylphenol, branched and linear and its ethoxylates | Yes |
| N-pentyl-isopentylphthalate | Yes |
| O-aminoazotoluene | Yes |
| Ozone Depleting Substances (ODS) | Yes |
| Perchlorates | Yes |
| Perfluorononan-1-oic-acid and its sodium and ammonium salts | Yes |
| Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA | Yes |
| Perfluorooctane sulfonate (PFOS) | Yes |



| Table1: Reportable Substance or compound | Prohibited or Restricted |
|--|---------------------------------|
| Phenol,2-(2H-benzotriazol-2-yl)- 4,6-bis(1,1-dimethylethyl) | Yes |
| Polybrominated Biphenyls (PBB) and their ethers/oxides (PBDE) | Yes |
| Polychlorinated Biphenyls (PCBs) and Terphenyls (PCTs) and specific substituents | Yes |
| Polychlorinated naphthalenes | Yes |
| Propylene oxide; 1,2-epoxypropane; methyloxirane | Yes |
| Short Chain Chlorinated Paraffins (SCCP) | Yes |
| Silicic acid, barium salt, lead-doped | Yes |
| Tetraboron disodium heptaoxide, hydrate | Yes |
| Trichlorobenzene | Yes |
| Trichloroethylene | Yes |
| Tris(2-chloroethyl)phosphate (TCEP) | Yes |
| Tri-substituted Organnostannic Compounds | Yes |
| Trixylyl phosphate | Yes |
| Zirconia Aluminosilicate Refractory Ceramic Fibres | Yes |
| α,α-Bis[4-(dimethylamino)phenyl]-4-(phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4) | Yes |

The following list is addition to the list of restricted substances in products. Use of these substances is allowed, but the occurrence above the threshold must be reported⁴.

| Table 2: Reportable Substance or compound | Reporting required if intentionally added or >= 0.1% by part weight |
|--|---|
| 1,2,3-Trichloropropane | Yes |
| 1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme) | Yes |
| 1,2-dichloroethane | Yes |
| 3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine | Yes |
| 4,4'-methylenedi-o-toluidine | Yes |
| 4,4'-oxydianiline and its salts | Yes |
| 4-Aminoazobenzene; 4-Phenylazoaniline | Yes |
| 4-methyl-m-phenylenediamine (2,4-toluene-diamine) | Yes |

⁴ A < 5ppm reporting limit accounts for unintentional impurities.



| Table 2: Reportable Substance or compound | Reporting required if intentionally added or $\geq 0.1\%$ by part weight |
|---|--|
| 5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual stereoisomers of [1] and [2] or any combination thereof] | Yes |
| 5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene) | Yes |
| 6-methoxy-m-toluidine (p-cresidine) | Yes |
| Acrylamide | Yes |
| Anthracene | Yes |
| Anthracene oils | Yes |
| Biphenyl-4-ylamine | Yes |
| Boric acid | Yes |
| Calcium arsenate | Yes |
| Cobalt(II) carbonate | Yes |
| Cobalt(II) diacetate | Yes |
| Cobalt(II) dinitrate | Yes |
| Cobalt(II) sulphate | Yes |
| Di-n-octyl phthalate (DNOP) | Yes |
| Diazene-1,2-dicarboxamide (C,C'-azodi(formamide)) | Yes |
| Diethyl sulphate | Yes |
| Dimethyl sulphate | Yes |
| Glycol Ethers (Selected) | Yes |
| Hydrazine | Yes |
| Lead hydrogen arsenate | Yes |
| Methoxy acetic acid | Yes |
| N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base) | Yes |
| N-methylacetamide | Yes |
| Nitrobenzene | Yes |
| O-Toluidine; 2-Aminotoluene | Yes |
| Pentacosafuorotridecanoic acid | Yes |
| Phenolphthalein | Yes |
| Pitch, coal tar, high temp (EC# 266-028-2) | Yes |
| Refractory Ceramic Fibers, Aluminiumsilicate | Yes |
| Sodium perborate; perboric acid, sodium salt | Yes |



| Table 2: Reportable Substance or compound | Reporting required if intentionally added or $\geq 0.1\%$ by part weight |
|--|--|
| Sodium peroxometaborate | Yes |
| Tricosafuorododecanoic acid | Yes |
| Triethyl arsenate | Yes |

APPENDIX D
Packaging Materials Requirements

Packaging and packaging materials shall be marked in accordance with the following guidance. Additional restrictions identified in the GSE are also applicable to Agilent Packaging Materials including but not limited to Restrictions in Packaging Section 6.0 and applicable requirements for wood packaging identified in Section 7.0. This requirement applies to all primary, secondary and tertiary packaging for products, parts, subassemblies, materials and supplies obtained by Agilent Technologies for incorporation or distribution to Agilent customers.

The objective of these stated requirements is to ensure that the choice of packaging materials used is recyclable, including cushioning material, plastic materials, corrugated containers and wood crate systems. Suppliers are discouraged from using permanent glues or adhesives to attach various materials. This applies to molded and fabricated cushioning material, plastic film, bagging materials, paperboard/corrugated fiberboard and wooden crates.

Plastic Material Coding Identification: For materials that are commonly used in packaging systems, the table below provides the applicable coding that is required to be permanently embossed, marked or labeled on all components of the packaging system. Symbols must meet minimum sizing requirements. Smaller identification symbols are permitted when the part or unit size does not allow the minimum size to be placed on the unit or part. The identification marking and symbol must be placed on the item either on the bottom or other conspicuous location and must be durable, legible and clearly visible. Capital letters must be used for all text.

Plastic codes and corresponding abbreviation code names

| Name of plastic | Polyester | High-Density Polyethylene | Polyvinyl Chloride | Low-Density Polyethylene | Polypropylene | Polystyrene | Others |
|------------------------|-----------|---------------------------|--------------------|--------------------------|---------------|-------------|--------|
| Plastic code | 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Abbreviation code name | PET | HDPE | PVC | LDPE | PP | PS | Others |



Example of the marking for plastic recyclable packaging

Paperboard and Corrugated Fiberboard: Regarding the Paper Packaging Material Codes according to National Standard of the People’s Republic of China, GB/ T 18455-2010: Use of the Chinese mark with other internationally required marks⁵ is acceptable as long as equivalence to the Chinese requirements are guaranteed. The mark can be used in conjunction with the international alphanumeric paper designation.

| Paper Packaging Material | Initials | Packaging Type |
|---------------------------------|----------|---|
| Fiberboard, Corrugated | CFB | Shipping cartons, layer pads, dividers and over packs |
| Corrugated Cardboard | CB | Stiffeners, corner guards and edge guards |
| Paperboard | PB | Chipboard cartons |
| Paper | WPP | Tissue and molded pulp |
| Non Corrugated solid Fiberboard | NCFB | Stiffeners, corner guards and edge guards |

Size requirements for the Chinese mark:

The mark size is to be 40 mm by 40 mm. For especially large or small package component sizes the mark may be appropriately enlarged or reduced, or as identified in the National Standard of the People’s Republic of China, GB/ T 18455-2010.

Components of the Chinese mark:


The Chinese mark for paper-based packaging materials consists of the chasing arrows triangle with the appropriate alpha designators centered below the arrow. See the example. Placing the alpha designators inside the triangle is also acceptable. Recycling marks are required in accordance with Chinese Standard GB 18455-2001 or equivalent international standard

Graphic Example for Chinese Mark



Packaging made of Wood, including Wooden Crates

As per Section 7.0 of the GSE, all wooden crates, packaging made of wood and pallets made of wood must be treated and marked in accordance with the provisions of the International Standard for Phytosanitary Measures (ISPM) #15: *Guidelines for Regulating Wood Packaging Material in International Trade*. Please note that as stated in section 7.0 that Fumigation, Chemical Pressure Impregnation (CPI) or other chemical means are not to be used.

⁵ E.g. 

APPENDIX E

Allowed Exemptions for application specific restrictions

When using the exemptions any concentrations $\geq 0.1\%$ by part weight must be actively reported.

| Substance | Index | Allowed exemptions |
|---------------------------|--------------|---|
| Cadmium | AIII 8(b) | Cadmium and its compounds in electrical contacts. |
| Cadmium | AIII 38 | Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide. |
| Cadmium, Lead, Mercury | AIV 1(c) | Lead, cadmium and mercury in infra-red light detectors. |
| Lead | AIII 6(a) | Lead as an alloying element in steel for machining purposes and in galvanised steel containing up to 0,35 % lead by weight. |
| Lead | AIII 6(b) | Lead as an alloying element in aluminium containing up to 0,4 % lead by weight. |
| Lead | AIII 6(c) | Copper alloy containing up to 4 % lead by weight. |
| Lead | AIII 7(a) | Lead in high melting temperature type solders (i.e. lead- based alloys containing 85 % by weight or more lead). |
| Lead | AIII 7(c)-I | Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound. |
| Lead | AIII 7(c)-II | Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher. |
| Lead | AIII 13(a) | Lead in white glasses used for optical applications. |
| Cadmium, Lead | AIII 13(b) | Cadmium and lead in filter glasses and glasses used for reflectance standards. |
| Lead | AIII 21 | Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses. |
| Lead | AIII 24 | Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors. |
| Lead | AIII 34 | Lead in cermet-based trimmer potentiometer elements. |
| Lead | AIV 3 | Lead in electromagnetic radiation amplification devices: micro-channel plate and capillary plate. |
| Cadmium, Lead | AIV 10 | Lead and cadmium in atomic absorption spectroscopy lamps. |
| Lead | AIV 15 | Lead in solders for bonding to ultrasonic transducers. |
| Lead | AIV 18 | Lead in solders of high performance infrared imaging modules to detect in the range 8-14 μm . |
| Mercury | AIII 4(f) | Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex. |

SPECIFICATION REVISION HISTORY

| Revision | Changes | Approval | Date |
|----------|---|-----------------|-------------|
| P | <p>Formatting, sorting and cleanup of App B, section 4.2, 4.3, App C table 1&2; changes for consistency of chemical names and their spelling used in different sections of this document. In section 4.3 detailed restricted and exempted applications for F-Gases, In section 4.2 and App B combined nonylphenols and its ethoxylates to one group., added in section 4.2 Dibutyltin compounds, created in App B a group for DBT and provided examples adjusted App C on DBT. In section 4.2, app B and C added Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo] -5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38), Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo] -5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38), Dihexyl phthalate, Imidazolidine-2-thione (2-imidazoline-2-thiol), Trixylyl phosphate, 1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear, Diisononyl phthalate (DINP), Diisodecyl phthalate (DIDP), Di-n-hexyl Phthalate (DnHP). In section 4.3: added Aluminosilicate Refractory Ceramic Fibres, added CoCl₂ specific application, only allow in moisture indicator for chromatographic traps. In App B: added CAS# 59080-34-1, 56307-79-0, 35194-78-6, 27753-52-2 to examples of common PBB/PBDE Compounds; added chemical names for SCCP, cleanup of names and CAS for HCFC141/b, created group for PFOS and added more examples CAS#s; added group of DBT compounds (to group and provide examples); added CAS for Pitch, coal tar, high temp; added CAS number examples to ODS; added additional CAS numbers to HHPA. In App B and C: added Sodium peroxometaborate; Sodium perborate; perboric acid, sodium salt; added Hydrazine, Cobalt(II) carbonate, Cobalt(II) diacetate, Cobalt(II) dinitrate, Cobalt(II) sulphate, 1-Methyl-2-pyrrolidone, Di-n-octyl phthalate (DNOP). Moved from reportable to restricted: Trichloroethylene, Bis(2-methoxyethyl) ether (Diglyme). Clean up of revision revision log.</p> | Richard Gartman | 31-Oct-2014 |
| Q | <p>Minor wording changes in section 8.6. Added references to Appendix B in sections 4, 5, 6 and Appendix C, enhanced description in headline in Appendix B to increase intelligibility. In section 4.1, Appendix B and C added 2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320); 2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328); 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE); reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE); 1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate, Benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-trimethylpentene.</p> <p>Added in Appendix B under examples of Cadmium compounds Cadmium fluoride and additional CAS for Cadmium sulphate. Extended PFOA to a group of chemicals in section 4.1, Appendix B and C. In Appendix B and C added 5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual stereoisomers of [1] and [2] or any combination thereof]. In section 5 batteries, Appendix B and C added perchlorates, in same section updated restrictions on cadmium lead and mercury.</p> | Richard Gartman | 31-Oct-2015 |
| R | <p>Minor wording, spelling or formatting changes; removed RoHS clause in section 2.5.1; changed wording in section 8.6 for China RoHS. Added in section 4.2, App B and C: Benzo[def]chrysene; Perfluorononan-1-oic-acid and its sodium and ammonium salts; 1,3-propanesultone; 2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350); 2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327). Added in section 4.3, App B and C: Inorganic ammonium salts. Added in App B and C: Nitrobenzene. Added in App B Polychlorinated Naphthalenes (PCNs) as a new group, provided more examples with CAS, removed the entry of Polychlorinated Naphtalenes under other substances. In App B added two more CAS for group of nonylphenol ethoxylates and corrected one CAS. In section 4.3, for RFC add all applications, for Cadmium and compounds, Lead and its compounds and Mercury and compounds: add all applications and reference to Appendix E for exemptions. Added Appendix E. Section 4.2 changed 2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320) concentration value to must not be present. Updated date issued, revision number and this revision log.</p> | Richard Gartman | 31-Oct-2016 |