



DOCUMENT TITLE:
[HQ/X3/EV/MFN/DS/DSF/SA/PH-B/KOREA/CHINA/SINGAPORE/TAIWAN] Control of Banned and Restricted Environmental Substances

DOC ID # 10-0131

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EFFECTIVE DATE: 07/27/12

ORIGINATOR: KIAM I ROGERS

MOST RECENT CHANGES

| FROM | TO |
|---|---|
| Include HF, REACH, GADSL, and reportable metals in Substance List. Add reference table. Add 3 rd party test and SDOC requirements. | Include additional REACH, changes in GADSL, SNURs, internet address for EMMI, and material content substance weights within 14-days of request. |

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1. **TITLE: [HQ/X3/EV/MFN/DS/DSF/SA/PH-B/KOREA/CHINA/SINGAPORE/TAIWAN] Control of Banned and Restricted Environmental Substances**

2. **PURPOSE:**

2.1. The purpose of this document is to describe the policy and procedures of Maxim Integrated Products, Inc. ("Maxim") with respect to banned and restricted substances.

3. **SCOPE:**

3.1. This policy applies to all business activities, including design/assembly/test/wafer fabrication processes, purchasing, receiving, storage, and shipping activities. These activities need to provide:

3.2. An end product compliant to customer specified requirements, with Maxim's requested waivers and exceptions, and relevant country and/or regional regulations in regards to hazardous substances.

4. **TERMS AND DEFINITIONS:**

4.1. The following terms and definitions are used throughout this policy:

4.1.1. **AAS** - Atomic Absorption Spectroscopy

4.1.2. **Banned Substances** - Substances that must not be contained in end products. Substances that may not be used in processing of products (when stated as such in this document.)

4.1.2.1. Substances are subject to:

4.1.2.1.1. Currently enacted legislation (as referenced in 5.0), which prohibits or restricts its use or sale, requires reporting or subjects it to other regulatory requirements; or

4.1.2.1.2. Customer prohibitions or restrictions (as a result of the referenced documents in 5.0).

4.1.3. **Direct Material**

4.1.3.1. Any material utilized in final product/end product.

4.1.3.2. Any material used to process a final product/end product.

4.1.4. **GC/MS (Gas chromatography with Mass spectrometry)** - Gas Chromatography–Mass Spectrometry (GC-MS) is an analytical technique involving the use of both Gas Chromatography (GC) and Mass Spectrometry (MS), the former to separate a complex mixture into its components and the latter to deduce the atomic weights of those components. It is particularly useful in identifying organic compounds. (LRGC/MS = Low Resolution GC/MS, HRGC/MS = High Resolution GC/MS).

4.1.5. **Homogeneous Material** - Material comprised entirely of uniformly dispersed constituents throughout. For example, a plated leadframe consists of two homogeneous materials, the leadframe and plating material. A Maxim product consists of multiple homogeneous materials.

4.1.6. **IC (Ion Chromatography)** - Ion Chromatography (IC) is the separation and quantification of anions and cations using Liquid Chromatography (LC). LC is an analytical technique based on the separation of the components of a mixture in solution by selective absorption. There are basically three modes of separation: liquid/liquid, liquid/solid, and molecular size. Once the components have been separated they are measured by a conductivity detector.

4.1.7. **ICP (Inductively Coupled Plasma) Analysis** - ICP is a method of atomic emission spectrometry for analysis of heavy metals in a given sample. When plasma energy, generated by Argon gas, is given to an analysis sample, the atoms are excited. When the excited atoms return to low energy position, emission rays (spectrum rays) are released and the emission rays that correspond to the photon wavelength are measured. The element type is determined by the position of the photon rays, and the content of each element is determined by the ray's intensity. There can be errors in

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results depending on the type of acid used and the pre-treatment method. It is therefore necessary to check the recommended pre-treatment method for the substance classification of the sample.

- 4.1.8. **Inductively Coupled Plasma-Optical Emission Spectrometry** - ICP-AES and ICP-OES are the same analytical instrument. "ICP" normally refers to ICP-AES and ICP-OES.
- 4.1.9. **ICP-MS** - Inductively Coupled Plasma Mass Spectrometry
- 4.1.10. **Intentionally Added** - Deliberate use of a substance in the formulation of a material or product where its continued presence is desired to provide a specific characteristic, appearance or quality. If banned or restricted substances are contained in materials or products purchased by suppliers or subcontractors, such substances must be disclosed if the supplier or subcontractor has knowledge of the presence of such substances.
- 4.1.11. **MSDS, Material Safety Databsheet** - Provides workers and emergency personnel with the proper procedures for handling or working with a particular substance. MSDS's include information such as physical data (melting point, boiling point, flash point etc.), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill/leak procedures.
- 4.1.12. **Not Intentionally Added (NIA)** - *Non* use of a substance in the formulation of a material or product where its continued presence is desired to provide a specific characteristic, appearance or quality.
- 4.1.13. **Packing Materials** - Materials used to contain and protect a product during distribution to Maxim's customer. Examples include, trays, tubes, bags, tapes and reels. The term "*packing materials*" means *packing materials* used to contain and protect Maxim products and **does not** apply to *packing materials* used by suppliers to ship materials, chemicals, equipment, and other items used by Maxim or it's subcontractors.
- 4.1.14. **Product / End Product** - A product is a tangible item, including subparts such as silicon, plastic, metal, and ink that is sold or provided as a sample to the customer.
- 4.1.15. **Reportable Substances** - Substances of which content in homogeneous materials must be reported. These substances are typically subject to reporting to customers for waste and recycling management and may be subject to a phase out date (when listed) due to pending legislation or risk assessments.
- 4.1.16. **SDOC** – Supplier's declaration of conformance.
- 4.1.17. **Spot Test** - Spot test is a simple method for the presence of hexavalent chromium without a machine. It is a qualitative analysis method in which a coloring reaction between hexavalent chromium and coloring reagent is used in the test.
- 4.1.18. **Subpart** - A subpart is a named unit within the product. Subparts of an integrated circuit include leadframes, plastics, plating compounds (i.e. lead finishes), bonding wire, molding compounds, silicon chips, etc.
- 4.1.19. **Substance** - A substance is a chemical element and its compounds that occur in the natural state or as produced by industry. Elements and compounds are assigned specific CAS (Chemical Abstract Service) numbers (i.e. copper, lead, tin, silver, etc.).
- 4.1.20. **UV-VIS (UV/VIS) Spectrometry** - UV-VIS spectrometry is a tool that measures the wavelength-dependant absorption of light in the visible or ultraviolet region. It is usually applied to identify molecules and inorganic ions or complexes in solution. The UV-VIS spectra have broad bands that are of limited use for sample identification but are very useful for the quantitative measurements. Measuring the transmittance at some wavelengths, and applying the Beer-Lambert law equations, the concentration of the solvent in the solution can be determined.
- 4.1.21. **Zero Concentration** - The concentration of a substance is zero if it is below the detection limit of an internationally recognized analytical method. The concentration of a substance for which analytical data are not required is considered to be zero if the substance *is not intentionally added*.

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5. APPLICABLE DOCUMENTS:

- 5.1. Referenced Documents : Table 1 in Appendix 1 lists the referenced regulations, legislation, or standards.
- 5.1.1. The contents of the legislation or standards shown below may be amended periodically. Therefore, it is necessary to confirm the latest versions of relevant laws, regulations and standards. This listing is subject to change in the event that new legislation or standards regarding banned or restricted environmental substances are implemented.
- 5.1.2. NOTE: References shown in Table 2 are based those shown in Table 1. Not all possible references for substances are necessarily shown in Tables 1 and 2.
- 5.1.3. [Documentation about the content of hazardous substances can be found at: maxim-ic.com/emmi](http://maxim-ic.com/emmi)

6. EQUIPMENT AND MATERIALS:


- 6.1. **TABLE 2 in Appendix 2** summarizes the listing of substances by group of and their implementation status. Threshold limits apply to each homogenous material used in the product. When Zero is shown, this is equivalent to “Not Detectable” by the best analytical method practices.
- 6.2. [Suppliers will provide the materials and substance weights of assemblies within 14 days of the request.](#)

7. GENERAL REQUIREMENTS:

- 7.1. *BANNED* substances shall not be intentionally added to the direct materials and packing materials of Maxim’s products unless an applicable exemption applies and is cited.
- 7.2. The PVC (polyvinyl chloride) in shipping tubes and RFID tags are the only exempted use of PVC.
- 7.3. Concentrations of *BANNED* substances shall not exceed the concentrations listed in Table 2 be it intentionally added or an impurity.
- 7.4. Certificate of Compliance Requirements - For all deliveries of raw materials and subcontracted/foundry wafer fabrication (including uCSP/WLP), assembled and/or tested products a Certificate of Compliance (C of C) signed by the supplier’s QA is required.
- 7.4.1. The C of C must explicitly state that the material in the shipment complies with this Maxim specification (10-0131, most current revision) rather than a generic statement of only being ROHS compliant.
- 7.4.2. Maxim reserves the right to challenge the validity of any C of C at any time. If the C of C is challenged by Maxim, the supplier must be able to provide an analytical test report per paragraph 7.6 which is less than 1 year old within 5 calendar days of the request. Failure to support this requirement in a timely fashion can result in a reduction or cessation of new orders.
- 7.5. Each box or bag in a delivery of products, any containers of direct materials or packing materials covered in the scope of this document must be labeled by stamp or sticker as “ROHS COMPLIANT”. Such markings must remain affixed to the material during storage at any Maxim facility.
- 7.6. Analytical Testing Requirements
- 7.6.1. Analytical test reports are required, as a minimum, for the following substances [in packages classified as lead-free:](#)
- 7.6.1.1. Lead
- 7.6.1.2. Cadmium
- 7.6.1.3. Mercury
- 7.6.1.4. Hexavalent Chromium
- 7.6.1.5. PBB/PBDE (including deca-series)
- 7.6.2. Analytical test reports are required, as a minimum, for the following substances [in packages classified as low-halogen:](#)

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- 7.6.2.1. Chlorine – in mold compounds and substrates
 - 7.6.2.2. Bromine – in mold compounds and substrates
 - 7.6.3. Test Lab Requirements - Laboratories used for testing must be ISO 17025 certified. A current (not expired) copy of this certificate must be supplied to the Maxim RoHS Compliance Manager.
 - 7.6.4. Testing Method Requirements
 - 7.6.4.1. Test methods used shall be those that are *internationally* recognized in the industry. Suggested methods and specifications are as follows:
 - 7.6.4.1.1. Bromine and Chlorine - BS EN 14582
 - 7.6.4.1.1.1. Preprocessing: O2 bomb
 - 7.6.4.1.1.2. Analytical instruments: IC or ICP. Titration methods can give false readings.
 - 7.6.4.1.2. CrVI - Procedures vary based on material type. EPA 3060A, EPA 7196A, IEC 6231, ISO 3613.
 - 7.6.4.1.2.1. Preprocessing: DIN 53314 or IEC 62321. Alkaline digestions/Colorimetric Method Spot-test procedure/boiling water extraction procedure.
 - 7.6.4.1.2.2. For metals, spot testing/hot water extraction is preferred.
 - 7.6.4.1.2.3. Analytical instruments: UV-VIS, CV-AAS, ICP-OES, ICP-MS, HPLC
 - 7.6.4.1.3. Cadmium - Procedures vary based on material type. EPA 3052, EPA 3050B, EN1122, ASTM E 351.
 - 7.6.4.1.3.1. Preprocessing: Wet decomposition method (BSEN 1122; 2001), acid decomposition (ECA 3050B Rev 2:1996, Dry ashing, Microwave decomposition method (EPA 3052:1996 or EN 13346:2000). Precipitates must be completely dissolved.
 - 7.6.4.1.3.2. Analytical instruments: ICP-AES (ICP-OES), ICP-MS, AAS
 - 7.6.4.1.4. Mercury - Procedures vary based on material type. EPA 3053, ISO 3856-7, EN12497, IEC 62321.
 - 7.6.4.1.4.1. Preprocessing: EPA 3052
 - 7.6.4.1.4.2. Analytical instruments: ICP-AES (ICP-OES), AAS
 - 7.6.4.1.5. Lead - Procedures vary based on material type. EPA 3052, EPA 3050B, ASTM E 350, IEC 62321.
 - 7.6.4.1.5.1. Preprocessing: Incineration under the existence of sulfuric acid, Dry ashing, Microwave decomposition method (EPA 3052:1996 or EN 13346:2000) , Acid decomposition method (EPA 3050B Rev 2:1996), Wet decomposition method under the existence of nitric acid and hydrogen-peroxide water. Precipitates must be completely dissolved.
 - 7.6.4.1.5.2. Analytical instruments: ICP-AES(ICP-OES), ICP-MS, AAS
 - 7.6.4.1.6. PBB/PBDE -
 - 7.6.4.1.6.1. Preprocessing: Soxhlet extraction is carried out with organic solvents.
 - 7.6.4.1.6.2. Analytical instruments: GC-MS, HPLC or LC-MS
- 7.6.5. Test Report Format Requirements

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Each test report shall include the following information as a minimum:

- 7.6.5.1. Supplier name (supplier of the sample for testing)
- 7.6.5.2. Sample description (name, color, vendor, vendor material type/formula, etc.).
- 7.6.5.3. Photo(s) of the sample being tested.
- 7.6.5.4. Date(s) of testing and report date.
- 7.6.5.5. Substance being tested for and test method used for testing of it.
- 7.6.5.6. Measurement flow chart (simple schematic or step listing).
- 7.6.5.7. Sample preparation method(s) prior to testing
- 7.6.5.8. Detection limit of the method and measuring equipment.
- 7.6.5.9. Measurement results (ppm/weight) of substance.
- 7.6.5.10. Lab Information
 - 7.6.5.10.1. Lab Name
 - 7.6.5.10.2. Lab Address
 - 7.6.5.10.3. Lab Report Number
 - 7.6.5.10.4. Person(s) performing the testing
 - 7.6.5.10.5. Signature, written name and title of the responsible person for the test report and it's results.

7.6.6. Testing Frequency

Unless otherwise specified, testing shall be performed on an annual basis.

8. ACCEPTANCE:

All Maxim products, direct materials and packing materials included in the scope of this specification that meet the threshold limits of Table 2 are acceptable and suitable for production usage and sale to our customers for EU RoHS compliant, with the appropriate exemption identified, and lead-free end products.

9. DISPOSITION OF MATERIAL:

Any Maxim products, direct materials and packing materials included within the scope of this document that do **not** meet or are questionable as to meeting the threshold limits of Table 2 shall be placed on QA HOLD until lab test results or suitable documentation from the supplier is provided proving compliance to this specification.

10. DATA RECORDING:

10.1 C of C documents are to be archived with the PO Receiver or lot traveler as appropriate by the IQC department for a minimum of 5 years or as required by overriding applicable local, Federal or international regulations.

10.2 Test Reports, MSDSs, SDOCs and related documents are quality records and are to be maintained for a minimum of 5 years or as required by overriding applicable local, Federal or international regulations.

11. MAINTENANCE: N/A

12. APPENDIXES:


12.1. APPENDIX 1 – Table1 Regulatory and Standards References

12.2. APPENDIX 2 - Table 2 Substance List

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12.1 APPENDIX 1 - TABLE 1 : Regulatory and Standards References

| Organization | Title | Reference Code |
|--------------|--|----------------|
| EU | COMMISSION DIRECTIVE 1999/77/EC of 26 July 1999 adapting to technical progress for the sixth time Annex I to Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (asbestos) | 10 |
| EU | Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of life vehicles (EU ELV) | 11 |
| EU | DIRECTIVE 2002/61/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 July 2002 amending for the nineteenth time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (azocolourants) | 17 |
| EU | DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. | 19 |
| EU | DIRECTIVE 2003/11/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 February 2003 amending for the 24th time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (pentabromodiphenyl ether, octabromo- octabromodiphenyl ether) | 21 |
| EU | DIRECTIVE 2005/69/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 November 2005 amending for the 27th time Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (polycyclic aromatic hydrocarbons in extender oils and tyres) | 35 |
| EU | DIRECTIVE 2006/122/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 December 2006 amending for the 30th time Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations. | 39 |
| EU | REGULATION (EC) No 2037/2000 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 29 June 2000 on substances that deplete the ozone layer | 46 |
| EU | Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labeling of dangerous substances | 47 |
| EU | COUNCIL DIRECTIVE of 27 July 1976 on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (76/769/EEC) | 48 |
| EU | Council Directive 83/478/EEC of 19 September 1983 amending for the fifth time (asbestos) Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations | 50 |
| EU | Council Directive 85/467/EEC of 1 October 1985 amending for the sixth time (PCBs/PCTs) Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations | 51 |

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| Organization | Title | Reference Code |
|--|--|----------------|
| EU | Council Directive 85/610/EEC of 20 December 1985 amending for the seventh time (asbestos) Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations | 52 |
| EU | Commission Directive 91/659/EEC of 3 December 1991 adapting to technical progress Annex I to Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (asbestos) | 58 |
| EU | Commission Directive 97/64/EC of 10 November 1997 adapting to technical progress for the fourth time Annex I to Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (lamp oils) (Text with EEA relevance) | 67 |
| EU | European Parliament and Council Directive 94/60/EC of 20 December 1994 amending for the 14th time Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations | 69 |
| Germany | Chemical Substances Prohibition Law (ChemVerbotsV) | 72 |
| Japan | Law concerning the examination of regulation of manufacture of chemical substances (Class 1 substances) | 79 |
| International Electronics Manufacturing Initiative | Joint Industry Guide 101 | 84 |
| Norway | PoHS | 86 |
| USA | Toxic Substances Control Act | 89 |
| USA | Clean Air Act (1990 revision of article 611) reference http://www.epa.gov/Ozone/defns.html | 93 |
| USA, Canada, United Kingdom, Norway | OSPAR List of Chemicals for Priority Action, OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, 2004 | 95 |
| UN | The Montreal Protocol on Substances that Deplete the Ozone Layer | 97 |
| UN | ROTTERDAM CONVENTION on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade | 99 |
| EU | COMMISSION REGULATION (EC) No 2032/2003 of 4 November 2003 on the second phase of the 10-year work programme referred to in Article 16(2) of Directive 98/8/EC of the European Parliament and of the Council concerning the placing of biocidal products on the market, and amending Regulation (EC) No 1896/2000 | 102 |
| EU | Council Regulation (EEC) No 594/91 of 4 March 1991 on substances that deplete the ozone layer | 104 |
| USA-California | Assembly Bill 826 The Perchlorate Contamination Prevention Act | 105 |
| EU | Council Directive 79/663/EEC of 24 July 1979 supplementing the Annex to Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to the restrictions on the marketing and use of certain dangerous substances and preparations | 106 |
| EU | Council Directive 91/689/EEC of 12 December 1991 on hazardous waste | 107 |
| Japan | Waste Management and Public Cleansing Law | 109 |
| Canada | Prohibition of Certain Toxic Substances Regulations, 2005 (SOR/SOR/2005-41) | 111 |
| EU | Hazardous Substances Ordinance (Gefahrstoffverordnung - GefStoffV) of 23 December 2004 (BGBl. I p. 3758) as amended by Article 2 of the Ordinance of 23 December 2004 (BGBl. I p. 3855) | 112 |
| Sweden | The Chemical Products (Handling, Import, and Export Prohibitions) Ordinance (1998:944) | 113 |
| EU | REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC | 114 |

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| Organization | Title | Reference Code |
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| EU | Council Directive 83/264/EEC of 16 May 1983 amending for the fourth time Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations | 115 |
| Germany | TRGS 552 N-nitrosamines Technische Regeln für Gefahrstoffe (TRGS) Technical standards for hazardous substances | 116 |
| Germany | TRGS 615 Restrictions on the use of anticorrosion agents whose use can lead to the formation of N-nitrosamines | 118 |
| EU | 1272/2008/EEC Directive on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labeling of preparations made from dangerous substances. | 123 |
| Americas, Europe/Africa/Middle East, and Asia/Pacific | Global Automotive Declarable Substance List (GADSL) | 124 |
| Canada | Part 7, Division 3, of the Canadian , Environmental Protection Act, 1999 (CEPA, 1999) | 125 |
| Norway | Norway Bestillingsnr. 463 (Risk of N-nitroso compound formation in coolant admixtures) | 126 |
| EU | European Union (EU) Directive (2009/251/EC) OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL published 17th March 2009 on the substance Dimethyl Fumarate (DMF). | 127 |
| EU | COMMISSION REGULATION (EC) No 552/2009 of 22 June 2009 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards Annex XVII | 128 |
| Norway | Regulations relating to restrictions on the manufacture, import, export, sale and use of chemicals and other products hazardous to health and the environment (Product Regulations), November 2006 | 139 |
| Environmental Protection Agency | Certain Polybrominated Diphenylethers: Significant New Use Rule and Test Rule | 140 |
| EU | Council Directive 83/264/EEC of 16 May 1983 amending for the fourth time Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations | 115 |
| Germany | TRGS 552 N-nitrosamines Technische Regeln für Gefahrstoffe (TRGS) Technical standards for hazardous substances | 116 |

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12.2 APPENDIX 2 - TABLE 2 : Substance List

| Group | Regulation Reference Code | Maxim implementation date | Status | Requirement |
|--|---------------------------|-------------------------------|------------|---|
| Acetaldehyde | 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Acetamide | 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Acetamide, N-Methyl- | 123, 124 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Acetonitrile | 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Acrylamide | 114, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Acrylonitrile | 123, 124 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Alpha-hexabromocyclododecane | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Aluminosilicate Refractory Ceramic Fibres | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Aluminum (Al) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) | 114, 128 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 1000 ppm |
| Amines carcinogenic, which are formed from Azo-dyes | 17, 48, 118, 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 30 ppm |
| Amines, which can form carcinogenic Nitrosamines | 17, 48, 118, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| 4-Aminobiphenyl xenylamine | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 1000 ppm |
| 4-Aminodiphenyl and its salts, all members | 17, 48, 84, 123, 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 100 ppm |
| Ammonium Perchlorate | 105, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| [4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene] cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I.Basic Blue 26) [with D 0.1% of Michler's ketone or Michler's base | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Aniline and its salts | 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Anthracene and its oils | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Anthracene fraction | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Anthracene low | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Anthracene paste | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| 9,10-Anthracenedione, 1-[(5,7-dichloro-1,9-dihydro-2-methyl-9-oxopyrazolo[5,1-b]quinazolin-3-yl)azo]- (Pigment Red 251) | 123, 124, 125 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000 ppm |
| 9,10-Anthracenedione, 1,8-dihydroxy-4-nitro-5-(phenylamino)-(Disperse Blue 77) | 124, 125 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000 ppm |
| Antimony | 84 | By May 19 2005 | Reportable | Threshold impurity of 1000 ppm |
| Antimonytrioxide | 84, 123, 124 | By May 19 2005 | Reportable | Threshold impurity of 1000 ppm |
| Aromatic amines | 47, 118, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Arsenic and its compounds, all members | 48, 123, 124 | By May 19 2005 | Reportable | Threshold impurity of 100 ppm (unless present in metals & alloys, then the declaration limit is 500 ppm). |
| Asbestos, all members | 114, 128 | By or before February 1, 2012 | Reportable | NIA - Threshold impurity of 1000 ppm |
| Azocolorants and Axodyes | 118, 128 | By May 19 1993 | Banned | NIA - Threshold impurity of 0 ppm |



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| Barium (Ba) compounds (organic or water soluble) | 47, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 10000 ppm |
| Benzene | 48, 124, 128, 140 | By or before May 31, 2010 | Banned | NIA – Report any amount contained |
| Benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-trimethylpentene | 124, 125 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000 ppm |
| 1,4-Benzenediamine, N,N' -mixed phenyl and tolyl derivs | 124, 125 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000 ppm |
| 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, di-C7-11-branched and linear alkyl esters | 114 | By or before July 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters | 114 | By or before July 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Benzyl butyl phthalate (BBP) | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm. |
| Benzidine | 47, 48, 111, 123, 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 100 ppm |
| 2-Benzothiazolesulphenamide, N, Ndicyclohexyl- | 79, 124 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000 ppm |
| Benzyl butyl phthalate | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Beryllium (Be) and its compounds, all members | 67, 84, 123, 124 | By May 19 2005 | Reportable | Threshold impurity of 1000 ppm |
| Beta-hexabromocyclododecane | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Biocidal coatings / biocidal additives | 102, 124 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Bis(chloromethyl) ether (BCME) | 111, 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 0 ppm |
| [4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Violet 3) [with 0.1% of Michler's ketone or Michler's base | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 4,4'-bis(dimethylamino) benzophenone (Michler's ketone) | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol [with 0.1% of Michler's ketone or Michler's base | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| [[,]-Bis[4-(dimethylamino)phenyl]-4(phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4) [with 0.1% of Michler's ketone or Michler's base | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Bis (2-ethyl(hexyl)phthalate) (DEHP) | 114, 128 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Bis(2-methoxyethyl) phthalate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Bismuth (Bi) | 84 | By May 19 2005 | Reportable | Threshold impurity of 1000 ppm. |
| Bisphenol A (BPA) | 86 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 1000 ppm Bromine |
| Bis(tributyltin)oxide (TBTO) | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Boric acid, Orthoboric acid | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Brominated (BFR) or Chlorinated (CFR) Flame Retardants | 84 | By May 19 2005 | Reportable | NIA - Threshold impurity of 1000 ppm Bromine 1000 ppm Chlorine |
| Bromine (Br) | 84 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm in IC mold compounds only. |
| Butadiene | 47, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |



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| Cadmium (Cd) | 11, 19, 48, 123, 124, 128 | By May 19 2005 | Cadmium (Cd) | 11, 19, 48, 123, 124, 128 |
| Calcium arsenate | 114 | By or before February 1, 2012 | Calcium arsenate | 114 |
| Carcinogens, Mutagens and Reproductive Toxins | 47, 48 | By May 19 2005 | Banned | NIA |
| Chlorinated hydrocarbons | 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Chlorinated or Brominated Dioxins or Furans | 72, 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 10 ppb |
| Chlorinated Paraffins (CP) – Short & Medium Chain | 48, 84, 124 | By May 19 2005 | Banned | NIA - Threshold impurity of 1000 ppm |
| Chlorine (Cl) | | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm in IC mold compounds only. |
| Chloroaniline | 47, 123, 124 | By May 19 2005 | Reportable | NIA - Threshold impurity of 0 ppm |
| Chloroethene (vinyl chloride) | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 0 ppm |
| Chloro-fluoro-carbons (CFC) and other Ozone depleting substances, all members | 93, 97, 124 | By or before July 1, 2012 | Banned | NIA- Threshold impurity of 1000 ppm |
| Chloroform | 47, 128 | By May 19 2005 | Banned | NIA - Threshold impurity of 0 ppm |
| Chloromethyl methyl ether (CMME) | 111, 124 | By or before May 31, 2010 | Banned | NIA- Threshold impurity of 0 ppm |
| Chromic acid, Oligomers of chromic acid and dichromic acid | 114 | By or before July 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Chromium - Hexavalent (CrIV) | 11, 19, 47, 84, 123, 124, 128 | By May 19 2005 | Banned | NIA - Direct materials threshold impurity 1000 ppm. Packing materials threshold impurity 100 ppm cumulative with Hg, CrVI and Pb. Report any intentional amount contained. |
| Chromium trioxide | 114 | By or before July 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Coal tar pitch, high temperature | 114, 128 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000 ppm |
| Cobalt (Co) and its compounds, all members | 47, 123, 123 | By May 19 2005 | Reportable | Threshold impurity of 1000 ppm |
| Cobalt dichloride | 114 | By Dec 31 2008 | Reportable | NIA - Threshold impurity of 1000 ppm |
| Cobalt(II) carbonate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Cobalt(II) diacetate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Cobalt(II) dinitrate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Cobalt(II) sulfate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Colophony (Rosin) | 124 | By or before Dec 31, 2009 | Reportable | Threshold impurity of 1000 ppm |
| Copper (Cu) | 124 | By May 19 2005 | Reportable | Report any amount contained |
| Chrysotile | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Cyanide/ Cyanogen Compounds (CCC) | 46 | By May 19 2005 | Reportable | Report any amount contained |
| Cyclododecane, hexabromo (HBCD) | 114, 124 | By May 19 2005 | Banned | NIA - Threshold impurity of Bromine 1000 ppm |
| Cyclohexasiloxane, dodecamethyl- | 124, 125 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000 ppm |
| 2-Cyclohexen-1-one, 3,5,5-trimethyl- | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |



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| Cyclopentasiloxane, decamethyl- | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Cyclotetrasiloxane, heptamethylphenyl- | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Cyclotetrasiloxane, octamethyl- | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Decabromodiphenyl Ether (decaBDE) | 84, 124, 140 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl)ester | 95, 124 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Di- μ -oxo-di-n-butylstanniohydroxyborane/ Dibutyltin hydrogen borate (DBB) | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 1000 ppm |
| 4,4'- Diaminodiphenylmethane (MDA) | 114, 123, 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 1000 ppm |
| Diarsenic pentaoxide | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Diarsenic trioxide | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Diboron trioxide | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Dibutyl phthalate (DBP) | 114, 128 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Dibutyltin Compounds, All members | 114, 124 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 1,2-Dichloroethane | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 2,2'-Dichloro-4,4'-methylenedianiline | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 1,1-Dichloroethene | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 1000 ppm |
| Dichloropropanol (1,3-Dichloro-2-propanol) | 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Dichromic acid | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Dichromium tris(chromate) | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Diisobutyl phthalate (DIIBP) | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Diisodecyl phthalate (DIDP) | 128 | By or before August 31, 2009 | Reportable | Threshold impurity 1000 ppm |
| Diisononyl phthalate (DINP) | 128 | By or before August 31, 2009 | Reportable | Threshold impurity 1000 ppm |
| 1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME) | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Diocetyl Compounds, All members | 114, 124 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Dioctyl phthalate (DNOP) | 128 | By or before August 31, 2009 | Reportable | Threshold impurity 1000 ppm |
| N,N-dimethylacetamide | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 2,4-Dinitrotoluene | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Diocetyl Compounds, All members | 114, 124 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |



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| Diorganotin compounds | 47, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Diphenylether | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 1000 ppm |
| Disodium tetraborate, anhydrous | 114, 124 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Dodecachloropentacyclo 1, 3, 4-Metheno-1H-cyclobuta(cd)pentalene, Mirex | 111, 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 0 ppm |
| Epichlorohydrin (1-Chloro-2,3-epoxy-propane) | 47, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Ethanol, 2-(2-methoxyethoxy)- | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Ethanol, 2,2',2"-nitritoltris-(Triethanolamine) | 124, 126 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000 ppm |
| 2-Ethoxyethanol | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 1-ethenylpyrrolidin-2-one (2-Pyrrolidione, 1-ethenyl-) | 124, 126 | By or before February 1, 2012 | Reportable | Report any amount contained |
| 2-Ethoxyethyl acetate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Ethyl/Methyl Glycol Ethers (EGE) | 47, 123, 124 | By or before May 31, 2010 | Banned | Report any amount contained |
| Fatty acids, C6-19-branched, Zinc Salts | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Fluorotelomers | 93, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Formaldehyde | 47, 123, 124 | By or before May 31, 2010 | Banned | For all wood products (including packing and shipping materials) - NIA. All other materials - Report any amount contained |
| Formamide | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 2-Furancarboxaldehyde | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Gamma-hexabromocyclododecane | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Gold (Au) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Halogenated Dioxins and Furans (HD&F) | 72, 104, 124 | By or before May 31, 2010 | Banned | NIA |
| Halons, all members | 104, 124 | By or before February 1, 2012 | Banned | NIA - Threshold impurity of 1000 ppm |
| Hexabromocyclododecane (HBCDD) | 114, 140 | By or before May 31, 2010 | Reportable | NIA - Report any amount contained |
| Hexachlorobenzene | 89, 124 | By or before May 31, 2010 | Banned Reportable | NIA - Threshold impurity of 10 ppb |
| Hexachloro-1,3-butadiene (HCBD) | 89, 124 | By or before May 31, 2010 | Banned | NIA - 0 ppm |
| Hexachlorocyclohexane, gamma isomer, Lindane | 112, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Hexachloroethane | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 1000 ppm |
| Hexanedioic acid, bis(2-ethylhexyl) ester | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Hexanoic acid, 2-ethyl- | 11, 47, 48, 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Hydrazine | 47, 114, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |



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| Hydrobromofluorocarbons; HBFC's | 72, 97, 104, 124 | By May 19 2005 | Banned | NIA- Threshold impurity of 1000 ppm |
| Hydrochlorofluorocarbons; HCFC's | 46, 93, 97, 124 | By May 19 2005 | Banned | NIA- Threshold impurity of 1000 ppm |
| Hydrofluorocarbons; HFC's | 98, 124 | By May 19 2005 | Banned | NIA- Threshold impurity of 1000 ppm |
| Iron (Fe) | | By May 19 2005 | Reportable | Report any amount contained |
| Lead (Pb) | 11, 19, 47, 123, 124, 139 | By May 19 2005 | Banned | Report any amount contained. Direct materials threshold impurity 100 ppm . Packing materials threshold impurity of 100 ppm cumulative with Hg, Cd, CrVI. Exception: Per Maxim requirement for Tin-Lead plating. |
| Lead(II) bis(methanesulfonate) | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Lead chromate | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Lead chromate molybdate sulphate red (C.I. Pigment Red 104) | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Lead diazide, Lead azide | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Lead dipricate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Lead hydrogen arsenate | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Lead styphnate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Lead sulfochromate yellow (C.I. Pigment Yellow 34) | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Lithium (Li) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Magnesium (Mg) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Manganese (Mn) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Medium chain chlorinated paraffins (MCCP) | 139 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Mercury (Hg) | 11, 19, 47, 48, 84, 124 | By May 19 2005 | Banned | NIA - Report any amount contained. Direct materials threshold impurity 1000 ppm. Packing materials threshold impurity of 100 ppm cumulative with Pb, Cd, CrVI. |
| Methanol | 113, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| 1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme) | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 2-Methoxyethanol | 114, 124 | By or before May 31, 2010 | Banned | Report any amount contained |
| Methylacrylamidomethoxy-acetate | 47, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| 1-Methyl- 2-Pyrrolidinone | 114, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Mineral Fibers (Natural or Synthetic) | 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Monomethyldibromodiphenylmethane | 116, 124, 128 | By or before May 31, 2010 | Banned | NIU - Threshold impurity of 0 ppm |
| Monomethyldichlorodiphenylmethane | 116, 124, 128 | By or before May 31, 2010 | Banned | NIU - Threshold impurity of 0 ppm |
| Monomethyltetrachlorodiphenylmethane | 116, 124, 128 | By or before May 31, 2010 | Banned | NIU - Threshold impurity of 0 ppm |
| Naphthalene | 123, 124 | By or before May 31, 2010 | Reportable | Report any amount contained |
| 2-Naphthalenecarboxamide, N-(5-chloro-2,4-dimethoxyphenyl)-4-[[5-[(diethylamino)sulfonyl]-2-methoxyphenyl]azo]-3-hydroxy-(Pigment Red 5 | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |



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| 2-Naphthalenecarboxamide,4-[[5-[[[4-(aminocarbonyl)phenyl]amino]carbonyl]-2-methoxyphenyl]azo]-N-(5-chloro-2,4-dimethoxyphenyl)-3-hydroxy-(Pigment Red 187) | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| 2-Naphthalenol, 1-[[2,4-dinitrophenyl]azo]- (Pigment Orange 5) | 124, 125 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000 ppm |
| 2-Naphthalenol, 1-[[2-chloro-4-nitrophenyl]azo]- (Pigment Red 4) | 124, 125 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000 ppm |
| 2-Naphthalenol, 1-[[4-methyl-2-nitrophenyl]azo]- (Pigment Red 3) | 124, 125 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000 ppm |
| 2-Naphthylamine and its salts | 48, 123, 124, 128 | By or before May 31, 2010 | Banned | NIA- Threshold impurity 100 ppm |
| Nickel (Ni) and its compounds, all members | 48, 124, 128 | By May 19 2005 | Reportable | Report any amount contained |
| 4-Nitrobiphenyl and its salts | 47, 48, 123, 124, 128 | By or before May 31, 2010 | Banned | NIA- Threshold impurity 100 ppm |
| Nitrocellulose | 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| N-Nitrosamines | 116, 124 | By or before May 31, 2010 | Banned | NIA- Threshold impurity 1000 ppm |
| Nonylphenol | 48, 123, 124, 128 | By or before May 31, 2010 | Reportable | Threshold impurity 1000 ppm |
| Nonylphenol ethoxylates | 26, 124 | By or before May 31, 2010 | Reportable | Threshold impurity 1000 ppm |
| Octabromodiphenyl Ether (octaBDE) | 140 | By or before December 1, 2012 | Banned | Report any amount contained |
| Organic Tin Compound (OTC) | 84, 128 | By May 19 2005 | Banned | Report any amount contained |
| 7-Oxa-3,20-diazadispiro[5.1.11.2]-heneicosan-21-one, 2,2,4,4-tetramethyl- | 95, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Ozone Depleting Substance (ODS) | 46, 84, 93, 104, 124 | By May 19 2005 | Banned | NIA; shall not be used. |
| Palladium (Pd) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Pentabromodiphenyl Ether (pentaBDE) | 140 | By or before December 1, 2012 | Banned | Report any amount contained |
| Pentachlorobenzene | 111, 124 | By or before May 31, 2010 | Banned | Report any amount contained |
| Pentachloroethane | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 1000 ppm |
| Pentachlorophenol (PCP) | 47, 48, 123, 124, 128, 139 | By or before May 31, 2010 | Banned | NIA - Threshold impurity 1000 ppm |
| Pentazinc chromate octahydroxide | 124 | By or before July 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Perchlorates | 105, 124 | By or before May 31, 2010 | Reportable | Threshold impurity 1000 ppm |
| PerFluoroOctane Sulfonates (PFOS) | 39, 48, 124, 128 | By or before May 31, 2010 | Banned | NIA -Threshold impurity of 1000 ppm |
| Perfluorooctanoic acids (PFOA) | 86, 124, 139 | By or before May 31, 2010 | Reportable | Threshold impurity 1000 ppm |
| Phenol | 47, 79, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity 1000 ppm |
| Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)- | 79, 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity 1000 ppm |
| Phenol, 2,4,6-tris(1,1-dimethylethyl)- | 79, 124 | By or before May 31, 2010 | Reportable | Threshold impurity 1000 ppm |
| Phenol, 2-(5-chloro-2H-benzotriazol-2-yl)-4,6-bis(1,1'-dimethylethyl)- | 79, 124 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Phenolphthalein | 124 | By or before July 1, 2012 | Reportable | Threshold impurity of 1000 ppm |

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| Phenylendiamines and its salts | 47, 48, 79, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Phosphonium,triphenyl(phenylmethyl)-, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1) | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Phosphoric acid tributylester | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Phosphoric acid, tris(2-methylphenyl) Ester | 124, 125 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Phthalates | 124 | By May 19 2005 | Reportable | Threshold impurity of 1000 ppm |
| Phosphorous (P) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Pitch, coal tar, high temp. | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Polyamine Curing Agents | 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Polybromobiphenyls; Polybrominatedbiphenyls (PBB) (PBDE) | 19, 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 0 ppm |
| Polychlorinated terphenyls (PCTs) | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 0 ppm |
| Potassium chromate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Potassium hydroxyoctaoxidizincatedichromate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Propanol, 2-methoxy- | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| 2-Pyrrolidinone, 1-ethenyl- | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Radioactive Substances | 84, 124 | By Sep 11 2006 | Reportable | Threshold impurity of 1000 ppm |
| Selenium (Se) | 84, 109, 124 | By May 19 2005 | Banned | Threshold impurity of 1000 ppm |
| Silica, Crystalline | 124 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, reaction products with ammonia, octamethylcyclotetrasiloxane and Silica | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Siloxanes and Silicones, di-Me, hydrogen-terminated | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Siloxanes and Silicones, Me 3,3,3-trifluoropropyl, Me vinyl, hydroxy terminated | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Silver (Ag) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Sodium azide | 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Sodium chromate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Sodium dichromate, dehydrate | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Strontium chromate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Styrene (Vinyl benzene) | 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Styrene oxide (Epoxy styrene) | 47, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Sulfur (S) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Sulfur Hexafluoride | 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 1000 ppm |
| Tantalum (Ta) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Tellurium (Te) | | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| 5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene) | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |



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| Tetraboron disodium heptaoxide, hydrate | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Tetrabromobisphenol A (TBBPA) | 86, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of Bromine 1000 ppm |
| Tetrachlorobenzene | 111, 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 0 ppm |
| 1,1,1, 2-Tetrachloroethane | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 1000 ppm |
| 1,1,2,2-Tetrachloroethane | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 1000 ppm |
| 1,1,1 Trichloroethane | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 1,1,2-Trichloroethane | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 1000 ppm |
| Tetrachloromethane (Tetrachlorocarbon) | 46, 93, 97, 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 1000 ppm |
| Tetrafluoromethane | 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 1000 ppm |
| 4-(1,1,3,3-tetramethylbutyl)phenol | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base) | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Thallium (Th) | 47, 48, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Thioperoxydicarbonic diamide(((H2N)C(S))2S2), tetramethy | 109, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Tin (Sn) | | By or before May 31, 2010 | Reportable | For substances other than Organic Tin Group - report any amount contained |
| Titanium (Ti) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Toluene | 48, 114, 123, 124, 128 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Toluidine | 17, 48, 84, 123, 124 | By or before May 31, 2010 | Reportable | NIA - Threshold impurity of 1000ppm |
| Tributyl tin (TBT) or Triphenyl Tin (TPT) | 47, 48, 79, 84 | By May 19 2005 | Banned | NIA- Threshold impurity of 0 ppm |
| Tributyl Tin Oxide (TBTO) | 47, 48, 79, 84 | By May 19 2005 | Banned | NIA- Threshold impurity of 0 ppm |
| Trichlorobenzene | 128 | By or before August 31, 2009 | Banned | NIA - Threshold impurity 1000 ppm |
| 1,1,1 Trichloroethane | 46, 124 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 1000 ppm |
| Trichloroethylene | 114 | By or before February 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Tetrachloromethane (Tetrachlorocarbon) | 124 | By or before July 1, 2012 | Banned | NIA - Threshold impurity of 1000 ppm |
| Trichlorophenol and its salts | 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Trichloropropane (1,2,3 - Trichloropropane) | 114, 123, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Triethyl arsenate | 114 | By Dec 31 2008 | Reportable | NIA - Threshold impurity of 1000 ppm |
| Trimethylphosphate | 48, 116, 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Triorganotin compounds (trialkyl- and triaryl tin compounds) | 48, 116, 123, 124 | By or before July 1, 2012 | Banned | NIA - Threshold impurity of 1000 ppm |
| Triphenylphosphate | 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |



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| Triphenylphosphate | 124 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Tris-(1-aziridinyl) phosphine oxide | 115, 124, 128 | By or before May 31, 2010 | Banned | NIA - Threshold impurity of 1000 ppm |
| Tris(2-chloroethyl)phosphate | 114, 128 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |
| Tris(2,3-dibromopropyl)phosphate | 48, 106, 124, 128 | By or before May 31, 2010 | Banned | Threshold impurity of 1000 ppm |
| Tris(1,3-dichloro-2-propyl)phosphate | 124 | By or before July 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (L-TGIC) | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| 1,3,5-tris(oxiranylmethyl)-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (TGIC) | 114 | By or before August 1, 2012 | Reportable | Threshold impurity of 1000 ppm |
| Tungsten (W) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Vanadium (V) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Vanadium(V) oxide | 124, 125 | By or before May 31, 2010 | Reportable | Report any amount contained |
| Vinyl Chloride | 123, 124 | By or before July 1, 2012 | Banned | Threshold impurity of 5 ppm |
| Zinc (Zn) | | By or before May 31, 2010 | Reportable | Report any amount contained |
| Zirconia Aluminosilicate, Refractory Ceramic Fibres | 114 | By or before May 31, 2010 | Reportable | Threshold impurity of 1000 ppm |



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REVISION HISTORY

| REV | CHANGES MADE | DATE | INIT. |
|-----|---|--------------------------|--------------------|
| A | ECN # HQ-05-3536. INITIAL RELEASE. | 05/19/05 | JD |
| B | ECN MFN-06-1264 Identify material as 10-0131 compliant by C of C with each delivery to aide IQC. Require marking on each inner box or bag saying " ROHS compliant" to keep ROHS material identified in raw material stores. Simplify the long chemical name listing in current rev to the shorter generic and standardized listing established by iNEMI's/EIA Joint Industry Guide 101 (JIG A & B) | 9/11/06 | RG |
| C | ECN#EV-08-0510: CANCELED | 8/20/09 | DD |
| D | CANCELED | 8/20/09 | PP |
| E | ECN#EV-09-2092: CANCELED. | 1/19/10 | KR |
| F | EV-10-0239: Include HF, REACH, GADSL, and reportable metals in Substance List. Add reference table. Add 3rd party test and SDOC requirements | 5/17/11 | KR |
| G | ECN#EV-11-2901: REACH has been updated to include additional substances. Benchmarking of competitors' and customers' definition of lead free. | 8/22/11 | KR |
| H | CANCELED | | |
| I | ECN#EV-12-1449: Regulations and requirements are updated throughout the year. | 07/27/12 | KR |