

RESTRICTED SUBSTANCES FOR HARDWARE PRODUCTS

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| P | 2/20/2009 | - | - | Updated description of PAH restriction, updated regulatory basis for lead in Table A, updated phase out schedule, and added microphone controller and marketing or promotional items to Note A3 ECO C26688 | N/A |
| Q | 4/15/2009 | A, B, C | All | Updated PAH limits to apply only to GS marked products; updated substances in Table A and Table B to align with JIG Ed 2.0, delete section D (substance phase out), and reformat doc. | Joan Krajewski, Sr. Director of Compliance and Sustainability |

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| **Document Control**  **Standard Operating Procedure** | |
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| **Update Requirements:** The Director or its designee shall maintain this procedure. This procedure must be reviewed and approved annually. This document and its revisions shall remain current for no more than one year from the approval date. The Director must retain a log of document history with this procedure. | |
| **References** | |
| 1. Microsoft Environmental Documents   * H00642: Restricted Substance Control System * H02446: Microsoft Analytical Laboratory Approval Process and Testing Requirements * H02462: Environmental Statement and Marking Specification for Microsoft Hardware Products * H08224: Battery Specification for Environmental and Safety Requirements * S002689: General Specification for Vendor Conformance to Environmental Requirements for Packaging Materials  1. External Environmental Document  * Joint Industry Guide Edition 2.0(JIG 101 Ed 2.0) | |
| **Attachments** | |
| 1. N/A | |
| **Authorized Distribution List** | |
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# Document Scope

This document specifies restrictions on substances and materials used in the manufacture of Microsoft hardware products and equipment. This specification is applicable to all Microsoft hardware products and equipment unless specifically exempted by Microsoft or a product specific deviation is requested and granted through the [ecteam@microsoft.com](mailto:ecteam@microsoft.com) and documented in Microsoft’s Enterprise Product Information Management Program. The listed restrictions apply to all materials purchased for use in Microsoft hardware products and equipment, including all constituents of parts, components, and other materials. This specification also bans the use of certain ozone-depleting substances during the manufacture of parts, components, materials, and products purchased by Microsoft.

This specification does not apply to product packaging or shipping materials, which are covered by Microsoft specification *General Specification for Vendor Conformance to Environmental Requirements for Packaging Materials* (S002689). This specification also does not apply to optical media, CD-ROM, or DVD, as they are not regulated as either packaging or hardware. However, labels that are attached to Microsoft products, such as Certificates of Authenticity (COA), are considered to be part of the product and hence subject to the requirements of H00594 though they are not subject to the requirements of S002689. Labels attached to packaging (such as the COA) are conversely considered to be part of the packaging and are subject to the requirements of S002689 restricted substances and not subject to the requirements of H00594.

Microsoft will regularly update its environmental specifications, such as this one, *Restricted Substances for Hardware Products* (H00594) and its partner documents *Microsoft Restricted Substance Control System Specification* (H00642) and *Microsoft Analytical Laboratory Approval Process and Testing Requirements* (H02446) to reflect new material restrictions. H00642 outlines control system and documentation requirements in support of the restrictions in this document. H02446 details analytical test requirements. Please contact Microsoft to confirm the current version of this document.

**Figure 1: Relationship of Microsoft Environmental Specifications**

# Section A: Restricted Substances

This restricted substances section is based on the Joint Industry Guide (JIG)for Material Composition Declaration for Electrotechnical Products as well as additional regulatory requirements Microsoft deems applicable. Please refer to the internet or contact [ecteam@microsoft.com](mailto:ecteam@microsoft.com) for the current version of JIG. JIG Criteria rationale are referenced from JIG to categorize the regulatory rationale for restrictions, refer to Materials and Substances Section (4) of JIG for further definitions of their criteria rationale. Substances listed in *Table A* shall not be intentionally added to materials used in Microsoft hardware products and equipment in the restricted applications.In the case of ozone depleting substances and greenhouse gases,they shall not be used in the manufacture of Microsoft hardware products and equipment. Background limits in *Table A* provide for trace amounts of naturally occurring or unintentional impurities in materials only. See *Section C* for Battery Content Restrictions.

Microsoft may target products to go above and beyond the regulatory driven specifications outlined in this document (H00594). In these cases, Microsoft will provide the supplier with a product specification that outlines the restricted substances and/or designs that are more stringent than this specification. When product specification is more stringent than this document, the product specification takes precedence.

Table A: Restricted Substances

| **Restricted Substance** | **Legal and/ or Regulatory Basis** | **Restricted Applications** | **Background Limit Weight % (ppm)** | **JIG 2.0 Criteria Rationale R (Regulated) A (For Assessment) I (For Information)** |
| --- | --- | --- | --- | --- |
| **Asbestos and Asbestos materials** | EU Directive 76/769/EEC and 91/659/EEC; US TSCA; Swiss Ordinance on Reduction of Risk from Chemical Products | All Applications | 0.1000  (1000 ppm) | R |
| **Azocolourants and Azodyes which form certain Aromatic Amines** | EU Directive 76/769/EEC and 2002/61/EC; EU Directive 2003/03/EEC | All Applications | 0.0030  (30 ppm) | R |
| **Brominated Dioxins/Furans,**  **Chlorinated Dioxins/Furans** | Microsoft policy | All Applications | 0.0000005 (.005 ppm) | N/A |
| **Cadmium and cadmium compounds** | EU RoHS Directive 2002/95/EC; EU Directive 76/769/EEC; China MII Methods; Korea RoHS; Japan J-MOSS; US/CA SB-20/50 | All Applications  (See Note A1) | 0.0100  (100 ppm) | R |
| **Chromium VI compounds** | EU RoHS Directive 2002/95/EC; China MII Methods; Korea RoHS; Japan J-MOSS; US/CA SB-20/50 | All Applications  (See Notes A1 and A2) | 0.1000  (1000 ppm) | R |
| **Fluorinated greenhouse gases: Chlorofluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFC), Sulfur Hexafluoride (SF6)** | Montreal Protocol; Japanese Law; US Clean Air Act; 76/769/EEC and amendments; EU Reg. No 842/2006; Austria Ordinance by Federal Minister. | All manufacturing operations, including but not limited to solvents, cleaning agents, compressed gas packages, refrigerants, foam plastics | Intentionally Added | R |
| **Formaldehyde** | Austria – BGB I 1990/194 Formaldehydverordnung, §2, 12/2/1990; Lithuanian Hygiene Norm HN 96:2000 | Textiles | 0.0075 by weight (75 ppm) of textile product | R |
| **Lead and lead compounds**  **Lead and lead compounds (continued)** | EU RoHS Directive 2002/95/EC; China MII Methods; Korea RoHS; Japan J-MOSS; US/CA SB-20/50 | All Applications  (See Note A1) | In all other materials:  (See Notes A1 & A2 about RoHS exemptions)  0.1000  (1000 ppm) | R |
| California Proposition 65;US Consumer Product Safety Improvement Act of 2008 (CPSIA) | All external applications | 0.0300  (300 ppm) | R |
| US Consumer Product Safety Improvement Act of 2008 (CPSIA) | External pplications in certain products  (See Note A3) | 0.009% by weight of surface coating | R |
| **Mercury and mercury compounds** | EU RoHS Directive 2002/95/EC; EU Directive 76/769/EEC; China MII Methods; Korea RoHS; Japan J-MOSS; US/CA SB-20/50; Various US State regulations | All Applications (See Note A1), | 0.1000  (1000 ppm) | R |
| **Ozone Depleting Substances** | Montreal Protocol EU EC No. 2037/2000; US Clean Air Act | All manufacturing operations, including but not limited to solvents, cleaning agents, compressed gas packages, refrigerants, foam plastics | Intentionally Added | R |
| **Perfluorooctane sulfonates (PFOS)** | 2006/122/EC of the 30th amendment to 76/769/EEC; Canadian Env. Protection Act SOR/SOR/2008-178 | All Applications | 0.1000  (1000 ppm) | R |
| **Certain Phthalates:**  **di(2-ethylhexyl) phthalate (DEHP), dibutyl phthalate (DBP),**  **benzyl butyl phthalate (BBP)** | EU Phthalate Directive (Toys) (2005/84/EC) | All internal and external plasticized materials in certain products  (See Note A3 and See Note A4) | 0.1000  (1000 ppm) by weight of the product  Cumulative: Sum of three | R |
| CA Proposition 65: [Safe Drinking Water and Toxic Enforcement Act of 1986](http://www.oehha.org/prop65/law/P65law72003.html) |
| California Health and Safety Code, relating to product safety. Chapter 11, Part 3 of Division 104 |
| US Consumer Product Safety Improvement Act of 2008 (CPSIA) |
| **Certain Phthalates:**  **di-isononyl phthalate (DINP),**  **di-isodecyl phthalate (DIDP),**  **di-n-octyl phthalate (DNOP)** | EU Phthalate Directive (Toys) (2005/84/EC) | External plasticized materials in certain products  (See Note A3 and See Note A4) | 0.1000  (1000 ppm) by weight of plasticized material  Cumulative: Sum of three | R |
| CA Proposition 65: [Safe Drinking Water and Toxic Enforcement Act of 1986](http://www.oehha.org/prop65/law/P65law72003.html) |
| US Consumer Product Safety Improvement Act of 2008 (CPSIA) |
| **Certain Phthalates: Dimethoxyethyl phthalate (DMEP), Di-n-hexyl phthalate (DnHP)** | CA Proposition 65: [Safe Drinking Water and Toxic Enforcement Act of 1986](http://www.oehha.org/prop65/law/P65law72003.html) | External plasticized materials in certain products  (See Note A3 and See Note A4) | 0.1000  (1000 ppm)  Cumulative: Sum of two | N/A |
| **Polycyclic Aromatic Hydrocarbon (PAH): Benzo[a]pyrene** | Central Experience Exchange Office (ZEK), Central Authority of Federal States for Safety (ZLS). German committee ”Technische Arbeitsmittel und Verbraucherprodukte (AtAV)  Document: ZEK 01-08 | External applications in certain products that are GS marked.  (See Note A3) | 0.000020  (0.2 ppm) | N/A |
| External plasticized and rubberized materials in all other GS marked products not listed in Note A3 (above) | 0.00010  (1.0 ppm) |
| **16 PAHs:**   1. **Acenaphthene** 2. **Acenaphthylene** 3. **Anthracene** 4. **Benzo[a]anthracene** 5. **Benzo[b]fluoranthene** 6. **Benzo[k]fluoranthene** 7. **Benzo[g,h,i]perylene** 8. **Benzo[a]pyrene** 9. **Chrysene** 10. **Dibenzo[a,h]anthrancene** 11. **Fluoranthene** 12. **Fluorene** 13. **Indeno[c,d]pyrene** 14. **Naphthalene** 15. **Phenanthrene** 16. **Pyrene** | Central Experience Exchange Office (ZEK), Central Authority of Federal States for Safety (ZLS). German committee ”Technische Arbeitsmittel und Verbraucherprodukte (AtAV)  Document: ZEK 01-08 | External plasticized and rubberized materials in certain products  (See Note A3) that are GS marked. | 0.000020  (0.2 ppm)  Cumulative sum of 16 | N/A |
| External plasticized and rubberized materials in all other GS marked products not listed in Note A3 | 0.0010  (10 ppm)  Cumulative sum of 16 |
| **Polybrominated biphenyls (PBB)s** | EU RoHS Directive 2002/95/EC; China MII Methods; Korea RoHS; Japan J-MOSS | All Applications  (See Note A1) | 0.1000  (1000 ppm) Cumulative sum (mono through deca) | R |
| **Polybrominated diphenyl ethers (PBDEs) including Deca-brominated diphenyl-ethers (deca-BDE)** | EU RoHS Directive 2002/95/EC; China MII Methods; Korea RoHS; Japan J-MOSS | All Applications  (See Note A1) | 0.1000  (1000 ppm)  Cumulative sum (mono through deca) | R |
| **Polychlorinated Biphenyls (PCBs), Polychlorinated Terphenyls (PCTs)** | EU Directive 76/769/EEC; Japanese Law Concerning the Evaluation of Chemical Substances; US TSCA | All Applications | 0.0050  (50 ppm) | R |
| **Radioactive materials** | Laws for the Regulation of Nuclear Source Material, Fuel Material, and Reactors 1986 (Japanese Law); EU-D 96/29/Euratom; US NRC | All Applications | Intentionally Added | R |
| **Shortchain Chloroparaffins with chain length 10-13 C atoms, chlorine content**  **> 50% by weight** | Article 33 of REACH; EU Directive 76/769/EEC; Norway Product Regulations FOR-2004-06-01-922; Swiss Ordinance on Reduction of Risk from Chemical Products | All Applications | 0.1000  (1000 ppm) | R |
| **Bioavailability Metals** | **Legal and/ or Regulatory Basis** | **Restricted Applications** | **Limit of element migration from toy materials** | **JIG 2.0 Criteria Rationale** |
| **Antimony** | Toy Safety Directive (88/378/EEC) | External Applications in certain products  (See Note A3) | 0.0060  (60 ppm) | N/A |
| **Arsenic** | 0.0025  (25 ppm) | N/A |
| **Barium** | 0.1000  (1000 ppm) | N/A |
| **Cadmium** | 0.0075  (75 ppm) | N/A |
| **Bioavailability Metals Cont.** | **Limit of element migration from toy materials** | **JIG 2.0 Criteria Rationale** |
| **Chromium** | 0.0060  (60 ppm) | N/A |
| **Lead** | 0.0090  (90 ppm) | N/A |
| **Mercury** | 0.0060  (60 ppm) | N/A |
| **Selenium** | 0.05  (500 ppm) | N/A |

Table A Notes:

1. RoHS Substances:

These substances shall not be present above trace background levels in homogeneous materials used in Microsoft hardware products, except as permitted by exemptions allowed per EU Directive 2002/95/EC “Use of Certain Hazardous Substances In Electrical and Electronic Equipment” (“RoHS Directive”). Since July 1, 2008 deca-BDE, is no longer an exempt application under EU RoHS, and is restricted in the same manner as other PBDEs.

1. Regarding test equipment manufactured for Microsoft:

Lead use is permitted in category 9 equipment (Monitoring and control instruments) due to their exclusion from the RoHS regulation, except for restrictions on lead use in PVC and plastics. Hexavalent chromium use is also permitted in category 9 equipment.

1. The following is a list of Products and Accessories that Microsoft policy requires to comply with Toy Safety, EU Phthalate Directive testing, CPSIA and California Proposition 65. Microsoft may exercise its discretion to require that other products must comply with such testing requirements in addition to those outlined below:
   1. XBOX 360 wired video game controllers
   2. XBOX 360 wireless video game controllers
   3. XBOX 360 racing game wheels
   4. XBOX 360 wireless trivia game controllers
   5. XBOX 360 instant Messaging (IM) Pad for connecting to video game controllers
   6. Microphone controllers
   7. Marketing or promotional items such as game figurines and other similar game accessories (electronic or not)
   8. Items that Microsoft believes are likely to be deemed “toys”, “children’s toys” or “children’s products” under applicable regulations
2. New headset and earphone products developed and introduced since April 30, 2008 shall be phthalate free.
   1. Headsets
   2. Earphones

# Section B: Reportable Substances

As of February 20, 2009, H00642 requires IPC 1752-2 Class 6 form to disclose full material composition of products and parts to the homogenous material level. Therefore complete material declaration is mandatory and shall include the appropriate CAS numbers for all Substances listed in *Table B,* if present.

Full material disclosures will be used by Microsoft to comply with EU REACH (Registration Evaluation and Authorization of Chemicals), China Management Method and EU Waste Electrical and Electronic Equipment declarations.

Table B: Reportable Substances

| **Reportable Substance (See note B1)** | **Reportable Applications** | **Reportable Limit Weight % (ppm)** | **JIG 2.0 Criteria Rationale R (Regulated) A (For Assessment) I (For Information)** |
| --- | --- | --- | --- |
| **Antimony/antimony compounds** | All Applications | 0.1000  (1000 ppm) | N/A |
| **Arsenic/Arsenic compounds** | All Applications | 0.1000  (1000 ppm) | N/A |
| **Beryllium Oxide** | All Applications | 0.1000  (1000 ppm) | I |
| **All other Beryllium/Beryllium Compounds** | All Applications | 0.1000  (1000 ppm) | N/A |
| **Bismuth/bismuth compounds** | All Applications | 0.1000  (1000 ppm) | N/A |
| **Bisphenol-A** | All Applications | 0.1000  (1000 ppm) | N/A |
| **Brominated Flame Retardants (other than PBBs or PBDEs which are banned in Table A)** | All Applications | 0.1000  (1000 ppm) | I |
| **Perfluorooctanoic Acid (PFOA)** | All Applications | 0.1000  (1000 ppm) | N/A |
| **Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis (1,1-dimethylethyl)** | All Applications | Intentionally Added | R |
| **Certain Phthalates: DEHP, DBP, BBP, DINP, DIDP, DNOP** | All Applications | 0.1000  (1000 ppm) | R |
| **Certain Phthalates: Dimethoxyethyl phthalate (DMEP), Di-n-hexyl phthalate (DnHP)** | All Applications | 0.1000  (1000 ppm) | N/A |
| **Polychlorinated Naphthalenes (more than 3 chlorine atoms)** | All Applications | Intentionally Added | R |
| **Polyvinyl Chloride (PVC)** | All Applications | 0.1000  (1000 ppm) | I |
| **Nickel (See note B2)** | All External Applications | 0.1000  (1000 ppm) | R |
| **Selenium/selenium compounds** | All Applications | 0.1000  (1000 ppm) | N/A |
| **Tributyl tin (TBT) and, Triphenyl tin (TPT) compounds** | All Applications | Intentionally Added | R |
| **Dibutyltin hydrogen borate (DBB)** | 0.01 (100 ppm) | N/A |
| **Tris (2-chloroethyl) phosphate (TCEP)** | All Applications | 0.1000  (1000 ppm) | A |
| **PAHs:**   1. **Acenaphthene** 2. **Acenaphthylene** 3. **Anthracene** 4. **Benzo[a]anthracene** 5. **Benzo[b]fluoranthene** 6. **Benzo[k]fluoranthene** 7. **Benzo[g,h,i]perylene** 8. **Benzo[a]pyrene** 9. **Chrysene** 10. **Dibenzo[a,h]anthrancene** 11. **Fluoranthene** 12. **Fluorene** 13. **Indeno[c,d]pyrene** 14. **Naphthalene** 15. **Phenanthrene** 16. **Pyrene** | All Applications | Intentionally Added | N/A |
| **REACH SVHCs:**   1. **Triethyl arsenate** 2. **Anthracene** 3. **4,4'- Diaminodiphenylmethane (MDA)** 4. **Dibutyl phthalate (DBP)** 5. **Cobalt dichloride** 6. **Diarsenic pentaoxide** 7. **Diarsenic trioxide** 8. **Sodium dichromate** 9. **5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)** 10. **Bis (2-ethylhexyl)phthalate** 11. **(DEHP)** 12. **Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified:** 13. **Alpha-hexabromocyclododecane** 14. **Beta-hexabromocyclododecane** 15. **Gamma-hexabromocyclododecane** 16. **Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)** 17. **Bis(tributyltin)oxide (TBTO)** 18. **Lead hydrogen arsenate** 19. **Benzyl butyl phthalate (BBP)** | **All Applications**  **(See note B3)** | 0.1000  (1000 ppm) | R |
| **Reportable Substance Thickness** | **Reportable Applications** | Reportable Limit in Microns (µm) | JIG 2.0 Criteria Rationale |
| **Chromium and Chromium VI plating thickness (See note B4)** | **All Applications** | Intentionally added | N/A |

Table B Notes:

B1. Please refer to the Joint Industry Guide (JIG), Annex B for the detailed chemical lists with CAS-Numbers.

Reference JIG on the Internet or email ecteam@microsoft.com.

B2. Nickel must be reported when used in applications where nickel compounds are likely to result in prolonged skin exposure (e.g., an outer enclosure for a portable electronic product designed to be carried). Use of nickel or nickel compounds in components and parts designed to be located inside the outer enclosure of a product need not be reported.

B3. Please Reference [echa.europa.eu/chem\_data/candidate\_list\_table\_en.asp](http://echa.europa.eu/chem_data/candidate_list_table_en.asp) for the most updated list of REACH SVHCs. In case of conflict, this list supersedes SVHC provided in Table B.

B4. Chromium and Chromium VI plating thicknesses are necessary to determine concentrations.

# Section C: BATTERIES

Table C specifies material restrictions for batteries supplied to Microsoft. Background weight percentage limits in Table C provide for trace amounts of naturally occurring or unintentional impurities in materials only. Please reference the Microsoft Battery Specification H08224 for comprehensive battery information.

Table C: Battery Content Restrictions

| **Battery Material** | **Background Limit Weight % (ppm)** | **Battery Chemistry** |
| --- | --- | --- |
| **Cadmium and its compounds** | 0.0005% (5 ppm) | All |
| **Lead and its compounds** | 0.00400% (40 ppm) | All |
| **Mercury and its compounds** | 0.0001% (1 ppm) | All |
| **Perchlorates** | Label if > 0.0000006% (0.006 ppm) | Coin cell batteries |