

HPE Standard 011 General Specification for the Environment

Hewlett Packard's General Specification for the Environment (GSE) defines HPE's global product environmental requirements that include substances and materials restrictions; substance disclosures; packaging and labeling; product labeling, user documentation, declarations, registration, and product performance requirements.

Standards and specifications referenced in the GSE that are available on the [HPE Supplier Portal](#) (registration required):

- Hewlett Packard Enterprise Standard 011-01A GSE Substances and Materials Future Requirements
- Hewlett Packard Enterprise Standard 011-01B GSE Substances and Materials Business-Specified Requirements
- Hewlett Packard Enterprise Standard 011-02 GSE Packaging Requirements
- Hewlett Packard Enterprise Standard 011-04 GSE Product Requirements
- Hewlett Packard Enterprise Standard 011-05 GSE - Substance Disclosure Requirements
- Hewlett Packard Enterprise Standard 011-06 GSE - Manufacturing Process Substances Requirements
- Hewlett Packard Enterprise Standard 014-02 Supplier Requirements for Safe and Legal Products
- Hewlett Packard Enterprise Active Verification Materials Testing Specification
- Plastic Part Marking Algorithm Standard EX-EN729-02
- EN891-02, Energy-using Products - Standby and Off Mode Energy Efficiency Test Report
- EN891-03, Energy-using Products - Single Voltage External Power Supply Energy Efficiency Test
- EN891-07, Mexico Energy Labeling Regulation Worksheet for Hewlett-Packard
- MF877-00, Product End of Life Disassembly Instructions
- Label Artwork

HPE Standard 011-00 General Specification for the Environment (GSE) – Overview

Document Identifier	HX-00011-00
Revision and Date	H, 29-Jul-2022
Abstract	The General Specification for the Environment (GSE) defines HPE's environmental requirements for HPE brand and HPE owned brand products. The GSE is a series of standards that is comprised of this Standard (Standard 011-00) and the subsidiary standards referenced in the <i>References</i> section of this Standard.
Applicability	Compliance to HPE's General Specification for the Environment (GSE) must be included in all HPE contracts for design, manufacture, or purchase of HPE brand and HPE owned brand products. Non-HPE brand products must comply with applicable legal requirements in each country in which these third-party products will be sold, leased, or otherwise marketed.
Status	Approved

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1 Introduction

HPE's General Specification for the Environment (GSE) is a series of Standards that is comprised of this Standard (Standard 011-00) and the subsidiary standards (Standards 011-01 through 011-06, and 014-02) that are listed in the *References* section of this Standard. The subsidiary standards are incorporated by reference in this Standard. Accordingly, any reference to the GSE or HPE Standards 011 or 011-00 means and includes the specifications and requirements of this Standard and those set out in the subsidiary standards.

2 Scope

The GSE defines HPE's global environmental requirements for all HPE brand and HPE owned brand products, including parts, materials, components, and packaging that are incorporated into HPE brand and HPE owned brand products. All further references to "HPE brand products" in the GSE include HPE owned brand products. Non-HPE brand products and all parts, components, materials, and packaging incorporated into non-HPE brand products, or which are included in any HPE delivered solution, must meet or exceed the applicable legal requirements in each country in which these third-party products will be sold, leased, or marketed.

HPE Standard 011-00 applies to all such products and to all HPE business units involved in their design, manufacture, or purchase worldwide.

HPE Standard 011 is not intended to be a listing of all environmentally related product design requirements that may be established by HPE's business units or by law. Supplier's compliance with this standard does not relieve or diminish the supplier's obligation to comply with any other HPE product specification or its obligation to comply with all applicable laws.

3 Supplier Verification

The supplier shall be responsible for verifying compliance to the GSE. Suppliers shall provide compliance verification test reports and other supporting data for HPE products and/or subcomponents sold to HPE. Suppliers must keep data and test reports on file for at least 10 years following the end of production for applicable products and/or subcomponents. Test Reports and other supplier data shall meet the following requirements:

- Demonstrate the specific actions that have been taken by supplier to verify compliance. This includes requirements set forth in the Supplier Verification Sections 7 and 8 of the GSE Substances and Materials Standard ([HPE Standard 001-01](#)), documentation and data collected by the supplier from the supplier's supply chain and supplier's own records on the substance or material content of design of products.
- Be traceable such that test data and supplier attestations originating from supplier's downstream supply chain demonstrate a clear relationship between downstream supplier information and the specific part number purchased by HPE.
- Verification testing shall be risk-based and comply with requirements for sampling and testing specified in HPE EN876-00 (External version is on the [HPE Supplier Portal](#); registration required). Verification testing of parts, components, materials and products should focus on components and suppliers based on supplier's assessment of risks for non-conformance.

4 Substances and Materials Requirements

Table 1 is a complete list of all substances and materials requirements in all four of the following Standards:

- HPE Standard 011-01 General Specification for the Environment - Substances and Materials Requirements
- HPE Standard 011-01A General Specification for the Environment - Substances and Materials Future Requirements
- HPE Standard 011-01B General Specification for the Environment - Substances and Materials Business-Specified Requirements
- HPE Standard 011-06 GSE – Manufacturing Process Substances Requirements

Table 1. Complete List of Substances and Materials for HPE-011-01, HPE-011-01A, HPE-011-01B, and HPE-011-06

Substances and Materials	Standard	Table or section
Antimony	HPE-011-01B	Table 1
Arsenic	HPE-011-01	Table 1
Asbestos	HPE-011-01	Table 1
Batteries – Mercury	HPE-011-01	Table 3
Batteries – Cadmium	HPE-011-01	Table 3
Batteries – Lead	HPE-011-01	Table 3
Batteries – Non-rechargeable Alkaline and Carbon-Zinc Batteries	HPE-011-01	Table 3
Batteries - Classification for Transportation	HPE-011-01	Table 3
Benzene	HPE-011-06	Table 1
Benzidine-based Dyes	HPE-011-01	Table 1
Beryllium	HPE-011-01	Table 1
	HPE-011-01B	Table 1
Beryllium Oxide	HPE-011-01	Table 1
Bis (chloromethyl) ether	HPE-011-06	Table 1
Bis(pentabromophenyl) ether (DecaBDE)	HPE-011-01A	Table 1
Brominated Flame Retardants (BFRs) and Chlorinated Flame Retardants (CFRs)	HPE-011-01	Table 1
Brominated Flame Retardants (Tetrabromodiphenyl ether and pentabromodiphenyl ether)	HPE-011-01	Table 2
Brominated Flame Retardants (PBBs, PBDEs)	HPE-011-01	Table 1
1,2,5,6,9,10-Hexabromocyclododecane (HBCDD or HBCD)	HPE-011-01	Table 1
Brominated Flame Retardants (all BFRs in external case plastic parts) and Chlorinated Flame Retardants (CFRs)	HPE-011-01	Table 1
Bromine and/or chlorine found in compounds	HPE-011-01B	Table 1
Bromine and/or chlorine found in compounds in the form of flame retardants	HPE-011-01B	Table 1
Cadmium and its compounds	HPE-011-01	Table 1
	HPE-011-01A	Table 1
Chlorinated Hydrocarbons	HPE-011-01	Table 1
Chlorinated Hydrocarbons (trichlorethylene and tetrachloroethylene)	HPE-011-01	Table 2

Table 1. Complete List of Substances and Materials for HPE-011-01, HPE-011-01A, HPE-011-01B, and HPE-011-06

Substances and Materials	Standard	Table or section
Chlorinated Paraffins (SCCPs, MCCPs)	HPE-011-01	Table 1
	HPE-011-01A	Table 1
Conflict Minerals	HPE-011-01	Table 1
Dibutyltin (DBT)	HPE-011-01	Table 1
	HPE-011-01	Table 2
1,1-Dichloroethylene	HPE-011-06	Table 1
Dimethylfumarate (DMF)	HPE-011-01	Table 1
	HPE-011-01	Table 2
Di- μ -oxo-di-n-butylstanniohydroxyborane (DBB) [also known as dibutyltin hydrogen borate]	HPE-011-01	Table 2
Flame retardants and plasticizers with halogenated substances	HPE-011-01B	Table 1
Flame retardants non-halogenated	HPE-011-01B	Table 1
Fluorinated Greenhouse Gases	HPE-011-01	Table 2
	HPE-011-06	Table 1
Formaldehyde – emissions	HPE-011-01	Table 2
Gold (Conflict Minerals)	HPE-011-01	Table 1
Halogenated Diphenyl Methanes	HPE-011-01	Table 1
	HPE-011-01	Table 2
Halogenated Flame Retardants (BFRs and CFRs), Polyvinyl Chloride (PVC), and Antimony Trioxide	HPE-011-01B	Table 1
Chlorine compounds in the form of polyvinyl chloride (PVC) , PVC congeners, PVC block polymers, PVC copolymers or polymer alloys containing PVC	HPE-011-01A	Table 1
	HPE-011-01B	Table 1
Chlorine in printed circuit boards	HPE-011-01B	Table 1
Antimony trioxide	HPE-011-01A	Table 1
	HPE-011-01B	Table 1
Hexane, branched and linear	HPE-011-06	Table 1
Hexavalent Chromium and its compounds in metallic applications	HPE-011-01	Table 1
Hexavalent Chromium and its compounds in non-metallic applications	HPE-011-01	Table 2
Indium Phosphide	HPE-011-01A	Table 1
Lead and its compounds	HPE-011-01	Table 1

Table 1. Complete List of Substances and Materials for HPE-011-01, HPE-011-01A, HPE-011-01B, and HPE-011-06

Substances and Materials	Standard	Table or section
	HPE-011-01A	Table 1
Lead in graphic inks	HPE-011-01	Table 2
Lead in paint	HPE-011-01	Table 2
Lead in Polyvinyl Chloride (PVC) coating of external cables, wires and cords	HPE-011-01	Table 1
Methylene chloride	HPE-011-01	Table 8
Mercury and its compounds	HPE-011-01	Table 1
	HPE-011-01A	Table 1
Mercury in display (panel + glass)	HPE-011-01B	Table 1
Methanol	HPE-011-06	Table 1
N-hexane	HPE-01-06	Table 1
Natural latex rubber	HPE-011-01B	Table 1
Nickel on external surfaces	HPE-011-01	Table 1
Nonylphenol, branched and linear, ethoxylated	HPE-011-01A	Table 1
Organostannic (organotin) Compounds (DBT, DOT, TBT, TBTO, TPT)	HPE-011-01	Table 1
Organostannic (organotin) Compounds (DBT, DOT, TBT, TBTO, TPT)	HPE-011-01	Table 2
	HPE-011-01	Table 1
Ozone Depleting Substances (ODS)	HPE-011-01	Table 1
Ozone Depleting Substances (ODS)	HPE-011-01	Table 1
	HPE-011-06	Table 1
	HPE-011-06	Table 1
Pentachloroethane	HPE-011-06	Table 1
Pentachlorophenol	HPE-011-06	Table 1
Pentachlorothiophenol (PCTP)	HPE-011-01	Table 1
Perfluorooctane Sulfonates (PFOS)	HPE-011-01	Table 1
Perfluorooctanic Acid (PFOA)	HPE-011-01	Table 1
Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)	HPE-011-01	Table 1
Phenol, isopropylated phosphate (3:1) (PIP (3:1))	HPE-011-01	Table 1
Phenylmercury compounds	HPE-011-01	Table 1
Plasticizers	HPE-011-01B	Table 1

Table 1. Complete List of Substances and Materials for HPE-011-01, HPE-011-01A, HPE-011-01B, and HPE-011-06

Substances and Materials	Standard	Table or section
Phthalates	HPE-011-01	Table 1
Phthalates Polychlorinated Biphenyls (PCBs)	HPE-011-01A	Table 1
	HPE-011-01B	Table 1
	HPE-011-01	Table 1
Polychlorinated Phenols and their salts	HPE-011-06	Table 1
Polychlorinated Terphenyls (PCTs)	HPE-011-01	Table 2
Polychlorinated Naphthalenes	HPE-011-01	Table 1
Polycyclic Aromatic Hydrocarbons (PAH)	HPE-011-01	Table 1
Polycyclic Aromatic Hydrocarbons (PAH)	HPE-011-01B	Table 1
Polyvinyl Chloride (PVC)	HPE-011-01	Table 1
Polyvinyl Chloride (PVC)	HPE-011-01B	Table 1
Radioactive Substances	HPE-011-01	Table1
Red Phosphorus	HPE-011-01	Table1
RoHS Compliance	HPE-011-01	Section 4.3 Table 1
Tantalum (Conflict Minerals)	HPE-011-01	Table 1
Tetrabromobis-phenol A, Additive (TBBPA)	HPE-011-01A	Table 1
Tetrabromobis-phenol A, Additive (TBBPA)	HPE-001-01B	Table 1
Tetrachloromethane (Carbon Tetrachloride)	HPE-011-06	Table 1
1,1,1,2-Tetrachloroethane	HPE-011-06	Table 1
1,1,2,2-Tetrachloroethane	HPE-011-06	Table 1
Tetrachloroethylene	HPE-011-06	Table 1
Trichloromethane (Chloroform)	HPE-011-06	Table 1
1,1,2-Trichloroethane	HPE-011-06	Table 1
Trichloroethylene	HPE-011-06	Table 1
1,1,1-Trichloroethane (TCA)	HPE-011-06	Table 1
Tin (Conflict Minerals)	HPE-011-01	Table 1
Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)	HPE-011-01	Table1
Toluene	HPE-011-06	Table 1
2,4,6-Tri-tert-butylphenol (2,4,6-TTBP)	HPE-011-01	Table 2

Table 1. Complete List of Substances and Materials for HPE-011-01, HPE-011-01A, HPE-011-01B, and HPE-011-06

Substances and Materials	Standard	Table or section
Tungsten (Conflict Minerals)	HPE-011-01	Table 1
Vinyl Chloride (monomer)	HPE-011-06	Table 1
Wood, Paper and Other Plant-based Products	HPE-011-01	Table 2

5 General

The most current revisions of the following standards must be used.

5.1 Environmental Requirements for Substances and Materials

The restrictions specified in HPE Standard 011-01 General Specification for the Environment - Substances and Materials Requirements apply globally to all HPE and HPE owned brand products and all parts, components, and materials incorporated into HPE brand and HPE owned brand products. The restrictions in Standard 011-01A apply globally to all HPE brand and HPE owned brand products and all parts, materials, and components that are incorporated into HPE brand and HPE owned brand products on the future effective date provided, unless an HPE business specifies in product and component specifications an earlier effective date. The restrictions in Standard 011-01B are applicable only when and as specified by an HPE business.

5.2 Environmental Requirements for Packaging

The requirements specified in HPE Standard 011-02 General Specification for the Environment - Packaging Requirements apply globally to all packaging used for selling or shipping HPE brand and HPE owned brand products.

5.3 Environmental Requirements for Products

The requirements specified in HPE Standard 011-04 General Specification for the Environment – Product Requirements apply globally to all HPE brand and HPE owned brand products, and include product labeling, user documentation, declarations, registration, and product performance requirements.

5.4 Environmental Requirements for Substance Disclosure

The requirements specified in HPE Standard 011-05 General Specification for the Environment – Substance Disclosure Requirements apply globally for disclosing certain substances and materials in HPE brand and HPE owned brand products only when and as specified by HPE or an HPE business.

5.5 Environmental Requirements for Manufacturing Process Substances

The requirements specified in HPE Standard 011-06 General Specification for the Environment – Manufacturing Process Substances Requirements apply globally for manufacturing processes used to produce HPE brand and HPE owned brand products and the manufacturing processes

for all parts, components, and materials incorporated into HPE brand and HPE owned brand products.

5.6 Environmental Management System for Products

The requirements specified in HPE Standard 014-02 Supplier Requirements for Safe and Legal Products apply globally to all HPE brand products.

6 References

Each of the following standards forms a part of HPE's GSE, and is incorporated herein by reference:

[HPE Standard 011-01 General Specification for the Environment - Substances and Materials Requirements](#)

[HPE Standard 011-01A General Specification for the Environment - Substances and Materials Future Requirements](#)

[HPE Standard 011-01B General Specification for the Environment - Substances and Materials Business-Specified Requirements](#)

[HPE Standard 011-02 General Specification for the Environment - Packaging Requirements](#)

[HPE Standard 011-04 General Specification for the Environment – Product Requirements](#)

[HPE Standard 011-05 General Specification for the Environment - Substance Disclosure Requirements](#)

[HPE Standard 011-06 GSE – Manufacturing Process Substances Requirements](#)

[HPE Standard 014-02 Supplier Requirements for Safe and Legal Products](#)

Revision History

Revision, Date, Change Number	Brief Description of change
H, 29-Jul-2022	Changed responsible group from "Product Compliance" to "Market Access" Table 1 added <ul style="list-style-type: none"> • flame retardants and plasticizers with halogenated substances • non-halogenated flame retardants • plasticizers

Revision, Date, Change Number	Brief Description of change
G, 01-Jul-2021	<p>Changed Responsible Group from "Product Compliance and Reliability" to "Product Compliance"</p> <p>Table 1 removed</p> <ul style="list-style-type: none"> • Nickel sulphate, nickel sulfamate • Perfluorooctane Sulfonates (PFOS) <p>Table 1 added</p> <ul style="list-style-type: none"> • Pentachlorothiophenol (PCTP) • Phenol, isopropylated phosphate (3:1) (PIP (3:1)) <p>Table 1 edited</p> <ul style="list-style-type: none"> • Perfluorooctanic Acid (PFOA) removed from HPE-011-01 • from „2,4,6 Tri tert butylphenol“ to „2,4,6 Tri tert butylphenol (2,4,6-TTBP)“
F, 14-Aug-2020	<p>Updated Document Owner; updated hyperlinks, Change wording of Verification Testing in Section 3 to require organized product level test reports to accommodate EAEU and UAE verification test report requirements.</p>
E, 14-Jun-2019	<p>Table 1 and Table 2 removed</p> <ul style="list-style-type: none"> • Benzenamine, N-phenyl-, Reaction Products with Styrene and 2,4,4-Trimethylpentene (BNST)
D, 15-Jun-2018	<p>Table 1 removed items</p> <ul style="list-style-type: none"> • Azo colorants and Aromatic amines • Bisphenol A • Dioctyltin (DOT) • Formaldehyde • Hexavalent Chromium and its compounds in leather applications • Lead in accessory bags, carrying cases, sleeves, and backpacks • Perfluorooctane Sulfonates (PFOS) in Table 2 • Perfluorooctanic Acid (PFOA) in Table 2 • Phthalates in Table 2 <p>Table 1 edited items</p> <ul style="list-style-type: none"> • Phenylmercury compounds, HPE-011-01, Table 1 <p>Table 1 added items</p> <ul style="list-style-type: none"> • Indium Phosphide • Nickel sulphate, nickel sulfamate
C, 10-Jul-2017	<p>Table 1 removed HBCDD from HPE-011-01A, Table 1</p> <p>Table 1 added bromine and/or chlorine found in compounds in HPE-011-01B, Table 1</p> <p>Table 1 added bromine and/or chlorine found in compounds in the form of flame retardants in HPE-011-01B, Table 1</p> <p>Table 1 removed Total bromine and chlorine in printed circuit boards from HPE-011-01B, Table 1</p> <p>Table 1 removed lead in glass from HPE-001-01B, Table 1</p>

Revision, Date, Change Number	Brief Description of change
B, 17-Jun-2016	Table 1 added Beryllium oxide Remove Chlorine in bleach paper, BBP, DEHP, and DBP for Table 1 reference in HPE-011-01B Edit Table 2 reference to Table 1 for HPE-011-01B
A, 01-Nov-2015	Initial release for HPE

HPE Standard 011-01 General Specification for the Environment – Substances and Materials Requirements

Document Identifier	HX-00011-01
Revision and Date	H, 29-Jul-2022
Abstract	This Standard defines HPE's global environmental requirements for restricting certain substances and materials in HPE brand and HPE owned brand products.
Applicability	All HPE design centers, HPE manufacturing facilities, and HPE's suppliers of HPE brand and HPE owned brand products must comply with HPE's General Specification for the Environment (GSE). Non-HPE brand products must comply with applicable legal requirements in each country in which these third-party products will be sold, leased, or otherwise marketed.
Status	Approved

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1 Purpose

This Standard defines HPE's global environmental requirements for restricting certain substances and materials in HPE brand and HPE owned brand products, including parts, components, and materials that are incorporated into HPE brand and HPE owned brand products.

2 Scope

The requirements specified in this Standard apply to all HPE brand and HPE owned brand products, including parts, components, and materials incorporated into HPE brand and HPE owned brand products. All further references to "HPE brand products" in this Standard include HPE owned brand products. Non-HPE brand products and all parts, components and materials incorporated into non-HPE brand products, or which are included in any HPE delivered solution, must meet or exceed the applicable legal requirements in each country in which these third-party products will be sold, leased, or marketed.

The ozone depleting substance restriction applies to all manufacturing processes used to produce HPE brand products, parts, components, and materials.

This Standard, HPE Standard 011-01 General Specification for the Environment (GSE) - Substances and Materials Requirements, is a component of HPE's General Specification for the Environment (GSE), along with the following GSE standards:

- HPE Standard 011-00 GSE - Overview
- HPE Standard 011-01A GSE - Substances and Materials Future Requirements ✎
- HPE Standard 011-01B GSE - Substances and Materials Business-Specified Requirements ✎
- HPE Standard 011-02 GSE - Packaging Requirements
- HPE Standard 011-04 GSE - Product Requirements
- HPE Standard 011-05 GSE - Substance Disclosure Requirements
- HPE Standard 011-06 GSE - Manufacturing Process Substances Requirements

✎ The restrictions in Standard 011-01A apply globally on the future effective date provided, unless an HPE business requires an earlier effective date. The restrictions in Standard 011-01B are applicable only when and as specified by an HPE business.

3 Substances and Materials Requirements

The restrictions and prohibitions specified in this Standard apply to substances at the homogeneous material¹ level, unless specified otherwise.

¹ "Homogeneous material" means a material that cannot be mechanically disjointed into different materials. The term "homogeneous" means "of uniform composition throughout" and refers to materials such as plastics, metals, solders, resins, coatings, plating material, and so forth. The term "mechanically disjointed" means that the materials can, in principle, be separated by mechanical actions such as unscrewing, cutting, crushing, grinding and abrasive processes. (Definitions taken from [BIS RoHS Regulations Government Guidance Notes](#))

When replacing substances, alternatives must have a lower potential impact to human health and the environment, and meet HPE Business performance and cost criteria. For example, when phasing out of GSE restricted phthalates, non-*ortho*-phthalate alternatives must be used. Refer to the HPE Procurement Guidance for Phthalate Replacements and HPE Procurement Guidance for Flame Retardants (both available at the [HPE Supplier Portal](#), registration required). There are several alternative assessment processes being used in the industry, such as the [Interstate Chemicals Clearinghouse \(IC2\) Alternatives Assessment Guide](#) and the [BizNGO Alternatives Assessment Working Group](#).

Table 2, Table 3, and Table 4 list the restricted substances covered by this Standard (011-01).

- Table 2 lists restrictions applicable to all HPE brand products, including parts, components, and materials incorporated into HPE brand products. This includes non-EE and batteries.
- Table 3 lists restrictions specific to non-electric and non-electronic products, including preparations² and manufacturing processes.
- Table 4 lists restrictions specific to batteries.

² Preparations are a mixture or solution composed of two or more substances.

4 Pan-HPE Mandatory Restrictions for All Products

The following restrictions are applicable to **all parts, components, materials, and products** that are in scope for each restriction, except for the listed exemptions and apply globally across HPE. Some restrictions have further clarification at the end of Table 1. Note: all parts, components, materials and products include batteries and non-electric and non-electronic products.

For restrictions specific to non-electric and non-electronic products, see Section 5.

For restrictions specific to batteries, see Section 6.

For future restrictions and business specified restrictions, see HPE-011-01A and HPE-011-01B, respectively.

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope ⁴	Threshold Limit / Criteria ⁵	Exemptions	References ⁶	Identification Number
Arsenic and its compounds	Various	All products	1000 ppm	Semiconductor chips (die only) and copper foil for printed circuit boards Optical transceivers in the substrate material of laser elements	HPE Restriction	090807-98
Asbestos	CAS#: 1332-21-4	All products	Not present		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	980408-11
Benzidine-Based Dyes	See Table 13	All products	Not present		U.S. TSCA 40 CFR 721.1660	150309-30

³ For restrictions specific to non-electric and non-electronic products, see Section 5. For restrictions specific to batteries, see Section 6. For future and business-specified material restrictions, see HPE-011-1A and HPE-011-1B.

⁴ "All products" includes "parts, components, materials, and products"; "EE" – includes all Electric and Electronic products (or Equipment, as defined by EU RoHS (Directive 2011/65/EU as amended)); "Non-EE" includes products outside the scope of EU RoHS. Note: all parts, components, materials and products include batteries and non-electric and non-electronic products.

⁵ The threshold limit is the number listed, reported as ppm by weight in homogenous material, unless otherwise specified.

⁶ This column provides background on the source of the restriction. The reference list is not exhaustive and more than the listed reference may apply.

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope ⁴	Threshold Limit / Criteria ⁵	Exemptions	References ⁶	Identification Number
Beryllium and its compounds [†]	Various	All products	1000 ppm	Electrical bonding applications of beryllium-copper, such as connectors, springs, or EMI gaskets	HPE Restriction	101118-59
Beryllium Oxide	CAS#: 1304-56-9	All products	1000 ppm		HPE Restriction	160617-01
Bis(pentabromophenyl)ether ('DecaBDE')	CAS #: 1163-19-5	All electric and electronic products	1000 ppm		EU RoHS Directive 2011/65/EU as amended; K-RoHS	170617-01
		All products	No De Minimis limit specified by U.S. EPA under the Toxic Substances Control Act (TSCA)	Recycled plastic components, where no DecaBDE is added during production	U.S. EPA by TSCA, 86 FR 880 Effective October 31, 2024	
Butyl benzyl phthalate (BBP)	CAS#: 85-68-7	Electric and Electronic products	1000 ppm		EU Commission Delegated Directive 2015/863; K-RoHS	120621-20
Cadmium and its compounds ^{†, ‡}	Various	All products	100 ppm or as specified in claimed exemption	EU RoHS exemptions: 8(b)-I, 13(b)-III. See HPE-011-01A for exemption expirations.	EU RoHS Directive 2011/65/EU as amended; K-RoHS	980408-84

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope⁴	Threshold Limit / Criteria⁵	Exemptions	References⁶	Identification Number
Chlorinated hydrocarbons ⁷	See Table 8 except PCP 5 mg/kg (0,0005% by weight)	All products	1000 ppm		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	020221-79
Conflict minerals, gold (Au)	Various	All products	Disclosure requirement, see Section 4.1		Conflict Minerals section to the Dodd-Frank Wall Street Reform and Consumer Protection Act	110727-71
Conflict minerals, tantalum (Ta)	Various	All products	Disclosure requirement, see Section 4.1		Conflict Minerals section to the Dodd-Frank Wall Street Reform and Consumer Protection Act	110727-92
Conflict minerals, tin (Sn)	Various	All products	Disclosure requirement, see Section 4.1		Conflict Minerals section to the Dodd-Frank Wall Street Reform and Consumer Protection Act	110727-87
Conflict minerals, tungsten (W)	Various	All products	Disclosure requirement, see Section 4.1		Conflict Minerals section to the Dodd-Frank Wall Street Reform and Consumer Protection Act	110727-37

⁷ See Ozone Depleting Substances (ODS), and chlorinated hydrocarbons (tetrachloroethylene and trichloroethylene) in Table 3, of this Standard and in GSE Standard 011-06 Manufacturing Process Substances Requirements, Table 1 for more restrictive requirements.

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope⁴	Threshold Limit / Criteria⁵	Exemptions	References⁶	Identification Number
Dibutyltin (DBT) compounds	See Table 6: Organostannic (organotin) compounds	All products ⁸	1000 ppm by weight of tin		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	110727-77
Dimethylfumarate (DMF)	CAS#: 624-49-7	All products (such as leather and desiccant packs)	0.1 ppm		EU Decision 2009/251/EC	090807-44
Dibutyl phthalate (DBP)	CAS#: 84-74-2	Electronic and Electronic products	1000 ppm		EU Commission Delegated Directive 2015/863; K-RoHS	120621-13
Di-(2-ethylhexyl) phthalate (DEHP)	CAS#: 117-81-7	Electronic and Electronic products	1000 ppm		EU Commission Delegated Directive 2015/863; K-RoHS	120621-15
Diisobutyl phthalate (DIBP)	CAS#: 84-69-5	Electronic and Electronic products	1000 ppm		EU Commission Delegated Directive 2015/863; K-RoHS	120621-66
Flame retardant, polybrominated biphenyls (PBBs) [†]	See Table 7	All products	Not intentionally added and < 1000 ppm		EU RoHS Directive 2011/65/EU as amended; K-RoHS	980408-10
Flame retardant, polybrominated diphenyl ethers (PBDEs) [†]	See Table 7	All products	Not intentionally added and 1000 ppm		EU RoHS Directive 2011/65/EU as amended; K-RoHS	980408-50

⁸ See DBT restriction in Table 3 of this Standard.

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope⁴	Threshold Limit / Criteria⁵	Exemptions	References⁶	Identification Number
Flame retardants, brominated [†]	Various	External case plastic parts ⁹	1000 ppm	Printed circuit board base materials or printed circuit assemblies	HPE Restriction, ECMA 370 (The Eco Declaration, TED)	070905-88
1,2,5,6,9,10-Hexabromocyclododecane (HBCDD or HBCD)	CAS#: 25637-99-4, 3194-55-6, 134237-50-6, 134237-51-7, 134237-52-8	All products	100 ppm		EU 2019/1021	120621-60
Hexavalent chromium and its compounds	Various	All product applications (such as corrosion preventative coatings and conversion coatings)	Not a hexavalent chromium coating as determined by the latest IEC 62321 series of test standards ¹⁰		EU RoHS Directive 2011/65/EU as amended	061020-24

⁹ Parts visible to the customer in normal product operation.

¹⁰ HPE-approved test methods are discussed in Section 7 *Supplier Verification*.

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope ⁴	Threshold Limit / Criteria ⁵	Exemptions	References ⁶	Identification Number
Lead and its compounds ^{†, ‡}	Various	All products	< 1000 ppm ^{11, ∞, ‡} or as specified in claimed exemption	EU RoHS exemptions: 6(a)-I, 6(b)-II, 6(c), 7(a), 7(c)-I, 7(c)-II, 13(a), 13(b)-III, 15(a), 24, 34. See HPE-011-01A for exemption expirations.	EU RoHS Directive 2011/65/EU as amended; California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65); K-RoHS	061020-12
Lead and its compounds [†]	Various	Polyvinyl chloride (PVC) coating for external cables, wires, and cords, including connectors and plugs (For complete requirement see Section 4.2)	300 ppm		California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)	031126-37
Mercury and its compounds ^{†, ‡}	Various	All products	1000 ppm ^{∞, ‡}		EU RoHS Directive 2011/65/EU as amended; K-RoHS	980408-14
Monomethyl-dibromodiphenyl-methane ¹² (DBBT)	CAS#: 99688-47-8	All products	Not used		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH); 67/548/EEC Dangerous Substances Directive	020221-74

¹¹ Lead restrictions in PVC, paint and non-EE are more restrictive.

¹² Halogenated diphenyl methane.

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope⁴	Threshold Limit / Criteria⁵	Exemptions	References⁶	Identification Number
Monomethyl-dichlorodiphenyl-methane ¹² (Ugilec 121, Ugilec 21)	CAS#: 81161-70-8	All products	Not used		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH); 67/548/EEC Dangerous Substances Directive	020221-88
Monomethyl-tetrachloro-diphenyl-methane ¹² (Ugilec 141)	CAS#: 76253-60-6	All products	Not used		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH); 67/548/EEC Dangerous Substances Directive	020221-32
Nickel	Various	External surface of any product part designed to be frequently handled or touched while carrying the product (or intended to be in direct and prolonged skin contact)	0.5 µg/cm ² /week. Measurement to be performed using EN 1811:2011.		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	041210-58
Ozone Depleting Substances (ODS) ‡	Refer to Annexes A, B, C, E of Montreal Protocol	All products Manufacturing process	Not present Not used		Montreal Protocol, Clean Air Act	980408-15

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope ⁴	Threshold Limit / Criteria ⁵	Exemptions	References ⁶	Identification Number
Perfluorooctane sulfonates (PFOS) and PFOS salts	See Table 10	All products ¹³	Not used 1000 ppm if incidentally present ^{14, 15}		EU 2019/1021	070905-36
Nonylphenol ethoxylates ((C ₂ H ₄ O) _n C ₁₅ H ₂₄ O))		Textile products and parts such as textile accessories, bags, carrying cases	100 ppm		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	150601-01
Perfluorooctanoic acid (PFOA) and its salts, and substance known as PFOA-related substances	See Table 11	All products	PFOA and its salts: 25 ppb; Any single PFOA-related substances and the sum thereof: 1ppm		EU 2019/1021 [EU POP] and Stockholm Convention	160617-02
Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethyl-ethyl), 2-benzotriazol-2-yl-4,6-di-tert-butylphenol, (UV-320)	CAS#: 3846-71-7	All products	Not used		Japan Chemical Substance Control Law (CSCL, "Kashinho"), Law No. 117 of 1973; EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	090807-38

¹³ See PFOS restrictions in Table 3 of this Standard.

¹⁴ Incidentally present means occurring as trace contaminants or impurities and not intentionally added.

¹⁵ Calculated with reference to the mass of structurally or micro-structurally distinct parts that contain PFOS.

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope⁴	Threshold Limit / Criteria⁵	Exemptions	References⁶	Identification Number
Phenol, isopropylated phosphate (3:1) (PIP (3:1))	CAS #: 68937-41-7	All products	No De minimis limit listed by U.S. EPA	Recycled plastic components, where no PIP (3:1) is added during production Use in adhesives and sealants until 01/06/2025	U.S. EPA by TSCA, 86 FR 894 Effective October 31, 2024	2120429-01
Phenylmercury and its compounds	CAS#: 62-38-4, 103-27-5, 13302-00-6, 13864-38-5, 26545-49-3	All products	100 ppm Hg by weight		EU Com Regulation 848/2012	140615-84
Polychlorinated biphenyls (PCBs)	Various	All products	Not used Less than 50 ppm if incidentally present ¹⁵		EU 2019/1021	150216-03
Polychlorinated naphthalenes (more than 3 chlorine atoms)	Various	All products	Not used		Japan Chemical Substance Control Law (CSCL, "Kashinho"), Law No. 117 of 1973	041210-90

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope ⁴	Threshold Limit / Criteria ⁵	Exemptions	References ⁶	Identification Number
Polycyclic Aromatic Hydrocarbons (PAH)	See Table 14	Rubber or plastic material on the external or regularly user accessed surfaces of class B EMC product ¹⁶	1ppm per PAH	Surfaces of internal parts that are not regularly user-accessed such as ceramics in electronic components, connectors, resistors, integrated circuit packaging, lubricants, internal cables, internal fans and printed circuit assemblies. ¹⁷	EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	130604-79
Polyvinyl Chloride (PVC) ^{†, ‡}	Various & CAS#: 9002-86-2	External case plastic parts of products ¹⁸	Not used	Sheathing of wires and cables, plastic parts <25 g, fabrics, and protective product covers	HPE restriction; EPEAT	041210-80
Radioactive substances	See Table 12	All products	Not detected (above background levels)		Laws for the Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors, 1986 (Japanese law)	041210-96

¹⁶ External or regularly user accessed surfaces include but are not limited to black or grey rubber or plastic materials such as case parts, control panels, switches, cables, and screens.

¹⁷ Products out of scope are: Large scale stationary industrial tools and fixed installations as defined in EU RoHS Directive.

¹⁸ Parts visible to the customer in normal product operation.

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope ⁴	Threshold Limit / Criteria ⁵	Exemptions	References ⁶	Identification Number
Red phosphorus	FR52 (ISO 1043-4) CAS#: 7723-14-0	Plastics (such as epoxy resins, polyamides, polypropylene) that contact, or are in close proximity to, two or more conductors of differing voltages	Not present	Phos-bronze alloys (used in electrical contacts contain elemental phosphorus as part of the alloy makeup) Parts tested in accordance with HPE Standard " <u>Red Phosphorus Approval Method</u> " (EX-MF862-16)	HPE Restriction, Red Phosphorus Alert	140615-20
Short chain chlorinated paraffins (SCCPs) [†]	CAS#: 85535-84-8 ¹⁹	All products	Not used		Singapore Environmental Protection and Management Act (S782/2017)	020221-48
Tributyltin compounds (TBT)	See Table 5	All products	Not used		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	041210-74
Tributyltin oxide (TBTO)	See Table 5	All products	Not used		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	041210-36

¹⁹ Any chlorinated alkane with a carbon length of 10 to 13 atoms and containing at least 48% by mass of chlorine, includes, but is not limited to the following CAS number: 85535-84-8. See GSE 011-01B for business-specified restriction for medium chain chlorinated paraffins (MCCPs).

Table 2: Pan-HPE Mandatory Restrictions for All Products³

Substances and Materials	Substance Identifier	Scope⁴	Threshold Limit / Criteria⁵	Exemptions	References⁶	Identification Number
Triphenyltin compounds (TPT)	See Table 5	All products	Not used		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	041210-86

† Restrictions for these substances are also listed in HPE GSE Standards 011-01A and/or 011-01B.

‡ Restrictions for these substances are also listed in the HPE Standard 011-02 GSE - Packaging Requirements.

∞ More restrictive limits apply when this substance is used in batteries. See Table 4 in this Standard.

The following sub-sections (4.1 – 4.3) are further information about the corresponding restriction in Table 2.

4.1 Responsible Minerals Sourcing

Suppliers must establish and maintain a publicly-available policy on responsible minerals sourcing that aligns with the OECD Guidance*. Suppliers must establish due diligence frameworks and management systems consistent with the OECD Guidance. Suppliers must extend these expectations to their suppliers.

Suppliers must exercise due diligence on tin, tantalum, tungsten, and gold necessary to the functionality or production of materials, parts, components, or products supplied to HPE.

Supplier must survey its supply chain and report HPE-product-specific information to HPE annually or upon request using the [Conflict Minerals Reporting Template](#).

HPE prefers that its Suppliers source from smelters and refiners (SORs) that participate in the RMAP** or another OECD-aligned independent assessment program, and are Conformant or Active with such a program. If Supplier sources from an SOR that does not meet this standard, Supplier must conduct enhanced due diligence and directly engage with the SOR to encourage participation in a program and progress toward Conformant or Active status. If an SOR does not demonstrate progress toward this standard, chooses to discontinue participation in a program, or becomes Non-Conformant and does not demonstrate public commitment to improve, Supplier should transition away from that SOR.

From time to time, based on HPE's assessment of risk, HPE may require the removal of an SOR from its supply chain. When this occurs, Supplier must provide a work plan for eliminating the SOR and transition to another on the [RMI Lists of Conformant and Active SORs](#) by the date specified by HPE. By the end of each calendar year, any SOR used in the production of materials, parts, components, or products supplied to HPE must be included on the RMI Lists as soon as reasonably practicable, and in any event, no later than six months.

***“OECD Guidance” refers to the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (Third Edition, OECD 2016) and the related Supplements, available here.*

****“RMAP” refers to the Responsible Minerals Assurance Process, an RMI program that uses an independent third-party audit of SOR management systems and sourcing practices to validate conformance with RMAP protocols and current global standards. The audit employs a risk-based approach to validate SORs' company level management processes for responsible mineral procurement. RMAP has a cross-recognition policy with other OECD-aligned independent assessment programs in order to reduce audit duplication and support the implementation of the OECD Due Diligence Guidance.*

4.2 [Lead in Polyvinyl Chloride \(PVC\) Coating for External Cables, Wires and Cords.](#)

The concentration of lead (Pb) in the PVC coating (outer jacket) of external PVC coated cables, wires or cords must not exceed 0.03% (300 ppm) by weight in any homogeneous material. This requirement applies to the PVC coating (outer jacket) of external PVC coated cables, wires or cords, including connectors and plugs. RoHS Compliance

4.3 RoHS Compliance

EU RoHS exemptions that are currently in force can be found in Annex III of RoHS Directive 2011/65/EU as amended. For information about future substance restrictions and exemption dates, see HPE-011-01A.

Any parts, components, and materials used in electrical and electronic products must comply with the European Union's RoHS Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment, as amended from time to time, and similar regulations that apply in other countries, states or regions including, but not limited to, China, Taiwan, India, Korea, Vietnam, Turkey, Ukraine, California, and New Jersey. Suppliers are responsible for complying with the current RoHS requirements in applicable jurisdictions. This Standard specifies HPE requirements for the substances covered by the RoHS laws:

- Cadmium and its compounds
- Brominated flame retardants
 - Flame retardant, polybrominated biphenyls (PBBs)
 - Flame retardant, polybrominated diphenyl ethers (PBDEs)
- Hexavalent chromium and its compounds
 - All product applications (such as corrosion preventative coatings and conversion coatings)
 - Non-metallic applications
- Lead and its compounds
- Mercury and its compounds

Supplier verification requirements are in Section 7 of this Standard.

5 Pan-HPE Mandatory Restrictions for Non-Electric and Non-Electronic Products

In addition to the requirements of Section 4, the following restrictions are applicable to **non-electric and non-electronic products (non-EE)** that are in scope for each restriction, except for the listed exemptions and apply globally across HPE.

For restrictions specific to batteries, see Section 6.

Table 3: Pan-HPE Mandatory Restrictions for Non-EE Products

Substances and Materials	Substance Identifier	Scope ²⁰	Threshold Limit / Criteria ²¹	Exemptions	References ²²	Identification Number
2,4,6-tri-tert-butylphenol (2,4,6-TTBP)	CAS#: 732-26-3	Lubricating oils	Not used		Japan Chemical Substance Control Law (CSCL, "Kashinho"), Law No. 117 of 1973	101118-14
			Concentrations below 0.3% by weight		U.S. EPA by TSCA, 86 FR 866 Effective October 31, 2024	
Dibutyltin (DBT) compounds	See Table 6: Organostannic (organotin) compounds	Mixtures ²³	1000 ppm by weight of tin		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	110727-55

²⁰ "All products" includes "parts, components, materials, and products"; "EE" – includes all Electric and Electronic products (or Equipment, as defined by EU RoHS (Directive 2011/65/EU as amended)); "Non-EE" includes products outside the scope of EU RoHS.

²¹ The restriction limit is the number listed, reported as ppm by weight in homogenous material, unless otherwise specified.

²² This column provides background on the source of the restriction. The reference list is not exhaustive and more than the listed reference may apply.

²³ See DBT restrictions in Table 2 of this Standard.

Table 3: Pan-HPE Mandatory Restrictions for Non-EE Products

Substances and Materials	Substance Identifier	Scope²⁰	Threshold Limit / Criteria²¹	Exemptions	References²²	Identification Number
Diisobutyl phthalate (DIBP)	CAS#: 84-69-5	All products	1000 ppm		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	120621-45
Dimethylfumarate (DMF)	CAS#: 624-49-7	All products (desiccant packs)	0.1 ppm		EU Decision 2009/251/EC	090807-44
Di-m-oxo-di-n-butylstanniohydroxyborane (DBB)	CAS#: 75113-37-0	Preparations	1000 ppm		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	090807-41
Fluorinated greenhouse gases	See Table 9	Refrigeration equipment	Not used	Must meet requirements in Annex III of EU/517/2014	EU/517/2014	160617-08
Formaldehyde emissions	CAS#: 50-00-0	Wooden materials made of plywood, pressed wood, and fiber board	See Section 5.1	Pallets and wood packaging	Sections 93120-93120.12, title 17, California Code of Regulations	080715-69
Hexavalent chromium and its compounds ^{†, ‡}	Various	Non-metallic applications (such as paints, pigments, and plastics)	< 1000 ppm		EU RoHS Directive 2011/65/EU as amended	061020-79
Lead and its compounds ^{†, ‡}	Various	Graphic inks	600 ppm nonvolatile content		Uruguay Decree 69-011 and Argentina 453/2010	110727-85

Table 3: Pan-HPE Mandatory Restrictions for Non-EE Products

Substances and Materials	Substance Identifier	Scope ²⁰	Threshold Limit / Criteria ²¹	Exemptions	References ²²	Identification Number
Monomethyldibromo-diphenylmethane ²⁴ (DBBT)	CAS#: 99688-47-8	Preparations	Not used		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH); 67/548/EEC Dangerous Substances Directive	020221-33
Monomethyldichloro-diphenylmethane ²⁴ (Ugilec 121, Ugilec 21)	CAS#: 81161-70-8	Preparations	Not used		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH); 67/548/EEC Dangerous Substances Directive	020221-18
Monomethyltetra-chlorodiphenyl-methane ²⁴ (Ugilec 141)	CAS#: 76253-60-6	Preparations	Not used		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH); 67/548/EEC Dangerous Substances Directive	020221-55
Pentabromodiphenyl ether [†]	CAS#: 32534-81-9	Adhesives	Not used		Japan Chemical Substance Control Law (CSCL, "Kashinho"), Law No. 117 of 1973	101118-95

²⁴ Halogenated diphenyl methane.

Table 3: Pan-HPE Mandatory Restrictions for Non-EE Products

Substances and Materials	Substance Identifier	Scope ²⁰	Threshold Limit / Criteria ²¹	Exemptions	References ²²	Identification Number
Pentachlorothiophenol (PCTP)	CAS #: 133-49-3	Rubber	At or below 1% by weight		U.S. EPA by TSCA, 86 FR 911 Effective October 31, 2024	2120429-02
Polychlorinated terphenyls (PCTs)	Various	Lubricating oils and adhesives	Not used		Japan Chemical Substance Control Law (CSCL, "Kashinho"), Law No. 117 of 1973	980408-54
Polychlorinated terphenyls (PCTs)	Various	Preparations (excluding lubricating oils and adhesives)	50 ppm		EU Regulation (EC) 1907/2006, Annex XVII (EU REACH)	980408-94
Tetrabromodiphenyl ether [†]	CAS#: 40088-47-9	Adhesives	Not used		Japan Chemical Substance Control Law (CSCL, "Kashinho"), Law No. 117 of 1973	101118-69
Tetrachloroethylene ²⁵	CAS#: 127-18-4	Cleaning agents and adhesives	Not used		Japan Chemical Substance Control Law (CSCL, "Kashinho"), Law No. 117 of 1973	020221-53

²⁵ Chlorinated hydrocarbon, ozone depleting substance (ODS).

Table 3: Pan-HPE Mandatory Restrictions for Non-EE Products

Substances and Materials	Substance Identifier	Scope ²⁰	Threshold Limit / Criteria ²¹	Exemptions	References ²²	Identification Number
Trichlorethylene ²⁵	CAS#: 79-01-6	Cleaning agents and adhesives	Not used		Japan Chemical Substance Control Law (CSCL, "Kashinho"), Law No. 117 of 1973	020221-64
Bis(pentabromophenyl) ether ('DecaBDE')	CAS #: 1163-19-5	Non-electric and non-electronic products	500 ppm		EU 2019/1021	170617-01
Wood, paper, and other plant-based products	N/A		See Section 5.2		2008 United States Lacey Act amendments (codified at 16 U.S.C. §§ 3371-3378) EU Timber Regulation (EU) No 995/2010 Australian Government's Illegal Logging Prohibition Act 2012; Convention on International Trade in Endangered Species (CITES)	090807-43

† Restrictions for these substances are also listed in HPE GSE Standards 011-01A and/or 011-01B.

‡ Restrictions for these substances are also listed in the HPE Standard 011-02 GSE - Packaging Requirements.

The following sub-sections (5.1 and 5.2) are further information about the corresponding restriction in Table 3.

5.1 Formaldehyde in wooden materials

Formaldehyde must not exceed the emissions requirements as defined in Table 2 and Table 3 in the [*Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products*](#), sections 93120-93120.12, title 17, California Code of Regulations. This requirement applies to wooden materials (excluding pallets and wood packaging) made of plywood, pressed wood, and fiber board.

5.2 Wood, paper, and other plant based products

Parts, components, materials, and products must not contain any wood material or other wild plant material that was illegally sourced from its country of origin. Examples of illegally sourced materials include, but are not limited to: wood or wild plant materials stolen from parks, reserves, or other protected areas; materials harvested without permission or contrary to applicable harvesting regulations; materials for which the applicable royalties, taxes or fees were not paid; materials covered by the Convention on International Trade in Endangered Species (CITES) that are traded without required permits or documentations; and materials exported in violation of log or other export bans. Suppliers must have a due diligence process to verify compliance of products with the material restrictions that wood and plant products are legally sourced, including obtaining the country of origin and genus and species of plant or wood material and maintaining records that verify the legal origin of plant materials used to produce products and packaging.

See the “Wood, Paper, and other Plant-based Packaging Restrictions” in HPE Standard 011-02 GSE - Packaging Requirements and the “Lacey Act and Australian Illegal Logging Prohibition Act” sections concerning import declaration requirements in HPE Standard 011-04 GSE - Product Requirements.

6 Pan-HPE Mandatory Restrictions for Batteries

The following restrictions apply across HPE and are applicable to the batteries that are in scope for each restriction, notwithstanding the listed exemptions. For restrictions that are applicable to all parts, components, materials, and products see Section 4. For restrictions specific to non-electronic and non-electrical products, see Section 5.

For additional battery requirements, including labeling, refer to the HPE Standard 011-04 GSE - Product Requirements.

Table 4: Pan-HPE Mandatory Restrictions for Batteries

Substances and Materials	Substance Identifier	Scope ²⁶	Threshold Limit / Criteria ²⁷	Exemptions	References ²⁸	Identification Number
Cadmium and its compounds ^{†, ‡}	Various	Batteries	20 ppm by weight of battery		EU Directive 2006/66/EC, Taiwan Battery Regulation	080715-36
Cadmium and its compounds ^{†, ‡}	Various	Non- lead acid batteries, including packs and coin cell	1000 ppm		India e-waste rules 2011	140615-68
Lead and its compounds ^{†, ‡}	Various	Batteries, nonrechargeable and built-in (such as soldered or glued)	1000 ppm by weight of battery		Brazil 401/08 battery regulation	080715-92
Lead and its compounds ^{†, ‡}	Various	Batteries, alkaline zinc manganese dioxide	40 ppm by weight of battery		China Standard GB24427-2009	110727-25

²⁶ "All products" includes "parts, components, materials, and products"; EEE – includes all Electric and Electronic Equipment as defined by EU RoHS (Directive 2011/65/EU as amended); Non-EE includes products outside the scope of EU RoHS.

²⁷ The restriction limit is the number listed, reported as ppm by weight in homogenous material, unless otherwise specified.

²⁸ This column provides background on the source of the restriction. The reference list is not exhaustive and more than the listed reference may apply.

Table 4: Pan-HPE Mandatory Restrictions for Batteries

Substances and Materials	Substance Identifier	Scope²⁶	Threshold Limit / Criteria²⁷	Exemptions	References²⁸	Identification Number
Lead and its compounds ^{†, ‡}	Various	Non- lead acid batteries, including packs and coin cell	1000 ppm		India e-waste rules 2011	140615-74
Mercury and its compounds ^{†, ‡}	Various	Batteries, including coin cell	1 ppm by weight of battery, not intentionally added		Thailand Hazardous Substance Act, Taiwan Battery Regulation, and others	080715-63
Mercury and its compounds ^{†, ‡}	Various	Batteries, including coin cell	5 ppm		Canada Products Containing Mercury Regulations & , EU Battery Directive, 2013/56/EU	150601-06
Mercury and its compounds ^{†, ‡}	Various	Non-lead acid batteries, including packs	1000 ppm		India e-waste rules 2011	140615-61
Hexavalent Chromium and its compounds ^{†, ‡}	Various	Non-lead acid batteries, including packs and coin cell	1000 ppm		India e-waste rules 2011	140615-95

Table 4: Pan-HPE Mandatory Restrictions for Batteries

Substances and Materials	Substance Identifier	Scope²⁶	Threshold Limit / Criteria²⁷	Exemptions	References²⁸	Identification Number
Non-rechargeable batteries	N/A	Batteries non-rechargeable alkaline and carbon-zinc	Hermetically sealed, see Section 6.1; 0,0005% by weight of mercury; 0,015% by weight of cadmium; 0,200% by weight of lead.		Argentina Battery Bill, S-14/06, Ley 26.184 and Resolution 443/20	080715-81
Polybrominated Biphenyls (PBB)	See Table 7	Non-lead acid batteries, including packs and coin cell	1000 ppm		India e-waste rules 2011	140615-87
Polybrominated Diphenyl Ethers (PBDE)	See Table 7	Non-lead acid batteries, including packs and coin cell	1000 ppm		India e-waste rules 2011	140615-81
N/A	N/A	Battery Transportation Classification for All Batteries	See Section 6.2		See Section 6.2	080715-70
N/A	N/A	Rechargeable sealed lead-acid batteries	See Section 6.3		See Section 6.3	080715-60
N/A	N/A	Lithium batteries	See Section 6.4		See Section 6.4	080715-54

† Restrictions for these substances are also listed in HPE GSE Standards 011-01A and/or 011-01B.

‡ Restrictions for these substances are also listed in the HPE Standard 011-02 GSE - Packaging Requirements.

The following sub-sections (6.1-6.4) are further information about the corresponding restriction in Table 4.

6.1 Non-rechargeable Alkaline and Carbon-Zinc Batteries

Non-rechargeable alkaline and carbon-zinc batteries must be hermetically sealed.

6.2 Batteries Not Classified as Dangerous Goods for Transportation

All batteries must meet all applicable design, manufacture, marking, testing, and other battery-specific requirements necessary to avoid classification as a dangerous good for purposes of transport for all modes of transportation, as defined in the following documents when shipped standalone installed in, or with equipment:

- United States, "Hazardous Materials Regulations," Title 49, Code of Federal Regulations, US Department of Transportation (DOT)
- International Civil Aviation Organization (ICAO), "Technical Instructions for the Safe Transport of Dangerous Goods by Air"
- International Air Transport Association (IATA), "Dangerous Goods Regulations"
- International Carriage of Dangerous Goods by Road (ADR)
- International Maritime Dangerous Goods Code (IMDG)
- Additional country specific requirements that may apply

Documentation that demonstrates compliance to these regulations, such as a Safety Data Sheet (SDS) or Product Data Sheet (PDS), UN 38.3 Test Report, UN 38.3.5 Test Summary, and Certification of Safe Transport of Chemical Goods must be supplied to HPE upon request.

6.3 Lead-Acid Batteries

Rechargeable sealed lead-acid batteries must comply with dangerous goods transport criteria for non-spillable batteries as specified in ICAO/IATA Packaging Instruction 872 and Special Provision A67, including testing at 13°C (55°F) to ensure no free liquid flows from the case when it is cracked or ruptured and the requirement that the batteries contain no free or unabsorbed liquid.

6.4 Lithium Batteries

Each lithium battery must be of a type that has been demonstrated to meet the lithium metal or lithium ion battery testing requirements in the most recent version of the United Nations Manual of Tests and Criteria, Part III, Subsection 38.3 (including any revisions, amendments, addenda, or other changes to those testing requirements that are effective as of the date on which the lithium battery is supplied to HPE). Batteries and battery packs are subject to these tests without regard to whether the cells of which they are composed have been tested.

7 Supplier Verification

See the *Supplier Verification* Section 3 of the *Overview* Standard (HPE Standard 011-00).

Analytical Testing: Where the measurement of materials content is made to verify compliance or is specifically requested by HPE, the supplier will use HPE-approved test methodologies (see Test Methodologies, below) to perform the testing. Samples tested must be of a homogeneous material. (See Footnote 1 for a definition of *homogeneous material*.)

Test Methodologies: Recognized HPE-approved sample preparations, test standards, and quality control must be used. The HPE-approved test methods are listed in Table 4. The sample size and number of samples tested must adhere to the standard being applied. Test reports must be kept on file and made available to HPE on request.

Parts Test Scheme: Suppliers must comply with the requirements in the *HPE Active Verification Material Testing Specification*. (External version EX-EN876-00 is on the [HPE Supplier Portal](#); registration required).

Table 5: HPE-Approved Test Methods and IEC Global Standard Testing Methodologies

Substance	Polymer Materials	Metal Materials	Electronics (PWBs/ Components)
PBB/PBDE	GC/MS	Not applicable	GC/MS
Cr VI	Alkaline Digestion / Colorimetric Method	Boiling-water-extraction procedure (Note: EPA 3060A is not an acceptable test method)	Alkaline Digestion / Colorimetric Method
Hg	CV-AAS, AFS, ICP-OES, ICP-MS		
Pb/Cd	ICP-OES, ICP-MS, AAS (Note: Procedures vary for each material type, see IEC Standard)		

(Reference: The latest IEC 62321 series of test standards – Determination of Certain Substances in Electrotechnical Products, available through <http://www.iec.ch>)

Definitions and References for Table 4:

AAS	Atomic Absorption Spectroscopy
AFS	Atomic Fluorescence Spectrometry
CV-AAS	Cold Vapor Atomic Absorption Spectrometry
GC/MS	Gas Chromatography/Mass Spectrometry
ICP-OES	Inductively Coupled Plasma Optical Emission Spectrometry
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry

8 Additional Substance Requirements

This section defines substance information availability requirements, including for substances in products that are subject to current or enacted legal requirements regulating their import, export, offer, sale, distribution or related needs. Any documents and information requested by HPE to confirm details of those substances present in products must be obtained, supplied, and updated to HPE in the form and within the time frames set by HPE. The documents and information may consist of the following:

- Identity and quantity of substances
- Human health or environmental hazards or risks associated with the substances, including any physicochemical, toxicological, and eco-toxicological testing information and any other information required for HPE to comply with data submission requirements for a substance or products that contain the substance
- Any precautions necessary for safe use
- Intended use and any risk management measures taken or recommended including, but not limited to, applications involving direct and indirect food contact
- Their intended use and any risk management measures taken or recommended
- Any other information required for HPE to comply with classification, packaging or labeling issues or requirements in respect of any substances present, either as intentionally-added or known impurities/by-products, often referred to as “Not Intentionally Added Substances” (NIAS)

Such documents and information must be kept on file for 10 years from the end of production and provided to HPE on request. HPE may request this information in the form of a certification of analysis (CoA) and/or quantitative impurity profile.

Substances present in the products, parts, mixtures, preparations or other materials supplied to HPE must be registered or notified (including pre-manufacture notification) with confirmation to HPE and must conform to any related chemical inventory or registration requirements where necessary to allow HPE or its customers to import, place on the market, supply or use the HPE products in any jurisdiction, market, or region.

Jurisdictions that require or will require such registrations and notifications include, but are not limited to, Australia, Canada, the Canadian Province of Ontario, People’s Republic of China, Japan, Malaysia, New Zealand, Philippines, South Korea, Switzerland, Taiwan, Turkey, United States, and Member States of the European Union and European Economic Area.

9 Substance Tables

* CAS = Chemical Abstract Service. Chemical classes do not have CAS numbers, but examples have been included when possible.

Table 6: Organostannic (organotin) compounds

Name	CAS* Numbers
Dibutyltin oxide (TBTO)	818-08-6
Dibutyltin diacetate	1067-33-0
Dibutyltin dilaurate	77-58-7
Dibutyltin maleate	78-04-6
Other dibutyltin compounds	-
Diocetyl tin oxide	870-08-6
Diocetyl tin dilaurate	3648-18-8
Other dioctyltin compounds	-
Bis(tri-n-butyltin) oxide	56-35-9
Triphenyltin N,N'-dimethyldithiocarbamate	1803-12-9
Triphenyltin fluoride	379-52-2
Triphenyltin acetate	900-95-8
Triphenyltin chloride	639-58-7
Triphenyltin hydroxide	76-87-9
Triphenyltin fattyacid ((9-11) salt)	18380-71-7, 18380-72-8, 47672-31-1; 94850-90-5
Triphenyltin chloroacetate	7094-94-2
Tributyltin methacrylate	2155-70-6
Bis(tributyltin) fumarate	6454-35-9
Tributyltin fluoride	1983-10-4
Bis(tributyltin) 2,3-dibromosuccinate	31732-71-5
Tributyltin acetate	56-36-0
Tributyltin laurate	3090-36-6
Bis(tributyltin) phthalate	4782-29-0
Copolymer of alkyl acrylate, methyl methacrylate and tributyltin methacrylate(alkyl; C=8)	67772-01-4
Tributyltin sulfamate	6517-25-5
Bis(tributyltin) maleate	14275-57-1

Table 6: Organostannic (organotin) compounds

Name	CAS* Numbers
Tributyltin chloride	1461-22-9
Mixture of tributyltin cyclopentanecarboxylate and its analogs (tributyltin naphthenate)	5409-17-2
Mixture of tributyltin 1,2,3,4,4a, 4b, 5,6,10,10a-decahydro-7-isopropyl-1, 4a-dimethyl-1-phenanthlenecarboxylate and its analogs (tributyltin rosin salt)	26239-64-5
Other tributyltins and triphenyltins	Chemical class; No CAS number assigned

Table 7: Intentionally Left Blank**Table 8: PBBs and PBDEs**

Name	CAS* Numbers
Bromobiphenyl	2052-07-5, 2113-57-7, 92-66-0
Bromobiphenyl Ether	101-55-3
Decabromobiphenyl	13654-09-06
Decabromobiphenyl Ether	1163-19-5
Dibromobiphenyl	92-86-4
Dibromobiphenyl Ether	2050-47-7
Heptabromobiphenyl	6355-01-8
Heptabromobiphenyl Ether	68928-80-3
Hexabromobiphenyl	59080-40-9, 36355-01-8, 67774-32-7
Hexabromobiphenyl Ether	36483-60-0
Nonabromobiphenyl	27753-52-2
Nonabromobiphenyl Ether	63936-56-1
Octabromobiphenyl	61288-13-9
Octabromobiphenyl Ether	32536-52-0
Pentabromobiphenyl	56307-79-0
Pentabromobiphenyl Ether	32534-81-9
Polybrominated Biphenyl	59536-65-1
Polybromobiphenyl(s), Polybromodiphenyl(s)	Chemical class; no CAS number assigned
Polybrominated Biphenyl Ether(s), Polybrominated Biphenyl Oxide(s)	Chemical class; no CAS number assigned
Tetrabromobiphenyl	40088-45-7
Tetrabromobiphenyl Ether	40088-47-9
Tribromobiphenyl	51202-79-0
Tribromobiphenyl Ether	49690-94-0

Table 9: Chlorinated Hydrocarbons

Name	CAS* Number
1,1 Dichloroethylene	75-35-4
Pentachloroethane	76-01-7
Methylene chloride	75-09-2
Tetrachloromethane (Carbon Tetrachloride)	56-23-5
1,1,1,2 Tetrachloroethane	630-20-6
1,1,2,2 Tetrachloroethane	79-34-5
Tetrachloroethylene	127-18-4
Trichloromethane (Chloroform)	67-66-3
1,1,2 Trichloroethane	79-00-5
Trichloroethylene	79-01-6
1,1,1-Trichloroethane (TCA)	71-55-6
Bis (chloromethyl) ether	542-88-1
Pentachlorophenol	87-86-5
Polychlorinated Phenols and their salts	Chemical class; no CAS number assigned
Vinyl Chloride (monomer)	75-01-4

Table 10: Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur Hexafluoride (SF₆)

Name	CAS* Numbers
Trifluoromethane - (HFC-23)	75-46-7
Difluoromethane - (HFC-32)	75-10-5
Methyl fluoride – (HFC-41)	593-53-3
2H,3H-Decafluoropentane – (HFC-43-10mee)	138495-42-8
Pentafluoroethane (HFC-125)	354-33-6
1,1,2,2-Tetrafluoroethane – (HFC-134)	359-35-3
1,1,1,2-Tetrafluoroethane – (HFC-134a)	811-97-2
1,2-difluoroethane (HFC-152)	624-72-6
1,1-Difluoroethane – (HFC-152a)	75-37-6
1,1,2-Trifluoroethane–(HFC-143)	430-66-0
1,1,1-Trifluoroethane – (HFC-143a)	420-46-2
Fluoroethane or Ethylfluoride (HFC-161)	353-36-6
2H-Heptafluoropropane– (HFC-227ea)	431-89-0
1,1,1,2,2,3-hexafluoro-propane (HFC-236cb)	677-56-5
1,1,1,2,3,3-Hexafluoropropane – (HFC-236ea)	431-63-0
1,1,1,3,3,3-Hexafluoropropane – (HFC-236fa)	690-39-1
1,1,2,2,3-Pentafluoropropane – (HFC-245ca)	679-86-7
1,1,1,3,3-Pentafluoropropane – (HFC-245fa)	460-73-1
1,1,1,3,3-Pentafluorobutane – (HFC-365mfc)	406-58-6
Carbon tetrafluoride (Perfluoromethane)	75-73-0
Perfluoroethane (Hexafluoroethane)	76-16-4
Perfluoropropane (Octafluoropropane)	76-19-7
Perfluorobutane (Decafluorobutane)	355-25-9
Perfluoropentane (Dodecafluoropentane)	678-26-2
Perfluorohexane (Tetradecafluorohexane)	355-42-0
Perfluorocyclobutane	115-25-3
Sulphur hexafluoride (SF ₆)	2551-62-4

Table 11: PFOS and PFOS salts

Name	CAS* Numbers
PFOS	1763-23-1
PFOS Ion	45298-90-6
PFOS Potassium Salt	2795-39-3
PFOS Lithium Salt	29457-72-5
PFOS Tetraethylammonium Salt	56773-42-3
PFOS Triphenylsulfonium Salt	144089-15-6
PFOS Sodium Salt	4021-47-0
PFOS Ammonium Salt	29081-56-9
PFOS Amide	754-91-6
Perfluorooctanesulfonyl fluoride	307-35-7
C ₈ F ₁₇ SO ₂ X (X=OH, metal salt, halide, amide and other derivatives including polymers)	Various
Compounds that contain C ₈ F ₁₇ SO ₂ , C ₈ F ₁₇ SO ₃ or C ₈ F ₁₇ SO ₂ N moieties	Various

Table 12: PFOA, PFOA Salts and PFOA Esters

Name	CAS* Numbers
PFOA	335-67-1
PFOA Ammonium Salt	3825-26-1
PFOA Sodium Salt	335-95-5
PFOA Potassium Salt	2395-00-8
PFOA Silver Salt	335-93-3
Perfluorooctanoyl fluoride	335-66-0
Methyl PFOA	376-27-2
Ethyl PFOA	3108-24-5

Table 13: Radioactive Substances (Radioactive Isotopes)

Name	CAS* Numbers
Uranium-238	7440-61-6
Radon	10043-92-2
Americium-241	14596-10-2
Thorium-232	7440-29-1
Cesium-137	10045-97-3
Strontium-90	10098-97-2

Table 14: Benzidine-based Substances

Name	CAS* Numbers
1,3-Naphthalenedi-sulfonic acid, 7-hydroxy-8-[2-[4'-[2-(4-hydroxyphenyl)diazenyl]][1,1'-biphenyl]-4-yl]diazenyl]-	117-33-9
1,3,6-Naphthalenetri-sulfonic acid, 8-hydroxy-7-[2-[4'-[2-(2-hydroxy-1-naphthalenyl)diazenyl]][1,1'-biphenyl]-4-yl]diazenyl]-, lithium salt (1:3)	65150-87-0
2,7-Naphthalenedi-sulfonic acid, 5-amino-3-[2-[4'-[2-(7-amino-1-hydroxy-3-sulfo-2-naphthalenyl)diazenyl]][1,1'-biphenyl]-4-yl]diazenyl]-4-hydroxy-, sodium salt (1:2)	68214-82-4
2,7-Naphthalenedi-sulfonic acid, 4-amino-5-hydroxy-3-[2-[4'-[2-[2-hydroxy-4-[(2-methylphenyl)amino]phenyl]diazenyl]][1,1'-biphenyl]-4-yl]diazenyl]-6-(2-phenyldiazenyl)-	72379-45-4
2,7-Naphthalenedi-sulfonic acid, 4-amino-5-hydroxy [[[substituted phenylamino]] substituted phenylazo] diphenyl]azo-, phenylazo-, disodium salt.	Accession No. 21808 CAS No. CBI (NA)
4-(Substituted naphthalenyl)azo diphenyl azo-substituted carbopolycycle azo benzene-sulfonic acid, sodium salt	Accession No. 24921 CAS No. CBI (NA)
4-(Substituted phenyl)azo biphenyl azo-substituted carbopolycycloazo benzene-sulfonic acid, sodium salt	Accession No. 26256 CAS No. CBI (NA)
4-(Substituted phenyl)azo biphenyl azo—substituted carbo-polycycle azo benzene-sulfonic acid, sodium salt	Accession No. 26267 CAS No. CBI (NA)
Phenylazoamino-hydroxynaphthalenylazobiphenylazo substituted benzene sodium sulfonate	Accession No. 26701 CAS No. CBI (NA)
[1,1'-Biphenyl]-4,4'-diamine	92-87-5
[1,1'-Biphenyl]-4,4'-diamine, dihydrochloride	531-85-1
1-Naphthalenesulfonic acid, 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis[4-amino-, disodium salt (C.I. Direct Red 28)	573-58-0
2,7-Naphthalenedisulfonic acid, 4-amino-3-[[4'-[(2,4-diaminophenyl) azo]][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)-, disodium salt (C.I. Direct Black 38)	1937-37-7
1-Naphthalenesulfonic acid, 8,8'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis[7-hydroxy-, disodium salt (C.I. Direct Red 44)	2302-97-8
2,7-Naphthalenedisulfonic acid, 5-amino-3-[[4'-[(7-amino-1-hydroxy-3-sulfo-2-naphthalenyl)azo]][1,1'-biphenyl]-4-yl]azo]-4-hydroxy-, trisodium salt (C.I. Direct Blue 2)	2429-73-4

Table 14: Benzidine-based Substances

Name	CAS* Numbers
Benzoic acid, 5-[[4'-[(1-amino-4-sulfo-2-naphthalenyl)azo][1,1'-biphenyl]-4-yl]azo]-2-hydroxy-, disodium salt (C.I. Direct Orange 8)	2429-79-0
Benzoic acid, 5-[[4'-[[2,6-diamino-3-[[8-hydroxy-3,6-disulfo-7-(4-sulfo-1-naphthalenyl)azo]-2-naphthalenyl]azo]-5-methylphenyl]azo][1,1'-biphenyl]-4-yl]azo]-2-hydroxy-, tetrasodium salt (C.I. Direct Brown 31)	2429-81-4
Benzoic acid, 5-[[4'-[(7-amino-1-hydroxy-3-sulfo-2-naphthalenyl)azo][1,1'-biphenyl]-4-yl]azo]-2-hydroxy-, disodium salt (C.I. Direct Brown 2)	2429-82-5
2,7-Naphthalenedisulfonic acid, 4-amino-3-[[4'-[(2,4-diamino-5-methylphenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)-, disodium salt (Direct Black 4)	2429-83-6
Benzoic acid, 5-[[4'-[(2-amino-8-hydroxy-6-sulfo-1-naphthalenyl)azo][1,1'-biphenyl]-4-yl]azo]-2-hydroxy-, disodium salt (C.I. Direct Red 1)	2429-84-7
Benzoic acid, 5-[[4'-[[2,6-diamino-3-methyl-5-[(4-sulfophenyl)azo]phenyl]azo][1,1'-biphenyl]-4-yl]azo]-2-hydroxy-, disodium salt (C.I. Direct Brown 1:2)	2586-58-5
2,7-Naphthalenedisulfonic acid, 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis[5-amino-4-hydroxy-, tetrasodium salt (C.I. Direct Blue 6)]	2602-46-2
Benzoic acid, 5-[[4'-[[2,4-dihydroxy-3-[(4-sulfophenyl)azo]phenyl]azo][1,1'-biphenyl]-4-yl]azo]-2-hydroxy-, disodium salt (C.I. Direct Brown 6)	2893-80-3
1,3-Naphthalenedisulfonic acid, 8-[[4'-[(4-ethoxyphenyl)azo][1,1'-biphenyl]-4-yl]azo]-7-hydroxy-, disodium salt (C.I. Direct Red 37)	3530-19-6
1,3-Naphthalenedisulfonic acid, 7-hydroxy-8-[[4'-[[4'-[[4-methylphenyl)sulfonyl]oxy]phenyl]azo][1,1'-biphenyl]-4-yl]azo]-, disodium salt (C.I. Acid Red 85)	3567-65-5
2,7-Naphthalenedisulfonic acid, 4-amino-5-hydroxy-3-[[4'-[(4-hydroxyphenyl)azo][1,1'-biphenyl]-4-yl]azo]-6-(phenylazo)-, disodium salt (C.I. Direct Green 1)	3626-28-6
Benzoic acid, 5-[[4'-[[2,4-diamino-5-[(4-sulfophenyl)azo]phenyl]azo][1,1'-biphenyl]-4-yl]azo]-2-hydroxy-, disodium salt (C.I. Direct Brown 1)	3811-71-0
2,7-Naphthalenedisulfonic acid, 4-amino-5-hydroxy-6-[[4'-[(4-hydroxyphenyl)azo][1,1'-biphenyl]-4-yl]azo]-3-[(4-nitrophenyl)azo]-, disodium salt (C.I. Direct Green 6)	4335-09-5

Table 14: Benzidine-based Substances

Name	CAS* Numbers
2,7-Naphthalenedisulfonic acid, 4-amino-5-hydroxy-3-[[4'-[[4-hydroxy-2-[(2-methylphenyl)amino]phenyl]azo] [1,1'-biphenyl]-4-yl]azo]-6-[(4-sulfophenyl)azo]-, trisodium salt (C.I. Acid Black 94)	6358-80-1
Benzoic acid, 5-[[4'-[[4-[(4-amino-7-sulfo-1-naphthalenyl)azo]-6-sulfo-1-naphthalenyl]azo][1,1'-biphenyl]-4-yl]azo]-2-hydroxy-, trisodium salt (C.I. Direct Brown 27)	6360-29-8
Benzoic acid, 5-[[4'-[[2,6-diamino-3-methyl-5-[(4-sulfophenyl)azo]phenyl]azo][1,1'-biphenyl]-4-yl]azo]-2-hydroxy-3-methyl-, disodium salt (C.I. Direct Brown 154)	6360-54-9
Benzoic acid, 3,3'-[(3,7-disulfo-1,5-naphthalenediyl)bis[azo(6-hydroxy-3,1-phenylene)azo[6(or7)-sulfo-4,1-naphthalenediyl]azo[1,1'-biphenyl]-4,4'-diylazo]]bis[6-hydroxy-, hexasodium salt (C.I. Direct Brown 74)	8014-91-3
Cuprate(2-), [5-[[4'-[[2,6-dihydroxy-3-[(2-hydroxy-5-sulfophenyl)azo]phenyl]azo][1,1'-biphenyl]-4-yl]azo]-2-hydroxybenzoato(4-)]-, disodium salt (C.I. Direct Brown 95)	16071-86-6

Table 15: Polycyclic Aromatic Hydrocarbons (PAHs)

Name	CAS* Numbers
Benz[a]anthracene (BaA)	56-55-3
Benzo[b]fluoranthene (BbFA)	205-99-2
Benzo[j]fluoranthene (BjFA)	205-82-3
Benzo[k]fluorathene (BkFA)	207-08-9
Benzo[a]pyrene (BaP)	50-32-8
Benzo[e]pyrene (BeP)	192-97-2
Chrysene (CHR)	218-01-9
Dibenz[a,h]anthracene (DBAhA)	53-70-3

10 References

CAS# = Chemical Abstract Service Number

[HPE Standard 011-00 General Specification for the Environment - Overview](#)[HPE Standard 011-01A General Specification for the Environment - Substances and Materials Future Requirements](#)

[HPE Standard 011-01B General Specification for the Environment - Substances and Materials Business-Specified Requirements](#)

[HPE Standard 011-02 General Specification for the Environment - Packaging Requirements](#)

[HPE Standard 011-04 General Specification for the Environment - Product Requirement](#)

[HPE Standard 011-05 General Specification for the Environment – Substance Disclosure Requirements](#)

[HPE Standard 011-06 General Specification for the Environment – Manufacturing Process Substances Requirements](#)

[HPE Standard 014-02 Supplier Requirements for Safe and Legal Products](#)

EN876-00, *HPE Active Verification Material Testing Specification* (External version EX-EN876-00, is on the [HPE Supplier Portal](#); registration required)

[EU RoHS Directive 2011/65/EU](#)

[Commission Delegated Directive \(EU\) 2015/863 of 31 March 2015 amending Annex II to Directive 2011/65/EU regards the list of restricted substances](#)

[BIS RoHS Regulations Government Guidance Notes](#)

[Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products](#)

[Regulation\(EU\) 2019/1021 of the European Parliament and of the council of 20 June 2019 on persistent organic pollutants \(recast\)](#)

EN 1811:2011 European Standard specifying a reference test method for release of nickel from products intended to come into direct and prolonged contact with skin which was approved by the European Committee for Standardisation

Testing and Validation of Polycyclic Aromatic Hydrocarbons (PAH) in the course of GS-Mark Certification, ZEK 01-08

United States, "Hazardous Materials Regulations," Title 49, Code of Federal Regulations, US Department of Transportation (DOT)

International Civil Aviation Organization (ICAO), "Technical Instructions for the Safe Transport of Dangerous Goods by Air"

International Air Transport Association (IATA), "Dangerous Goods Regulations"

European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR)

International Maritime Dangerous Goods Code (IMDG)

The latest IEC 62321 series – Determination of Certain Substances in Electrotechnical Products, available through <http://www.iec.ch>)

[Joint JEDEC/ECA Standard: Defining “Low Halogen” Electronic Products \(Removal of BFR/CFR/PVC\)](#)

[2008 United States Lacey Act amendments \(codified at 16 U.S.C. §§ 3371-3378\)](#)

[EU Timber Regulation \(EU\) No 995/2010](#)

[Australian Government's Illegal Logging Prohibition Act 2012](#)

11 Revision History

Revision, Date, Change Number	Brief Description of change
H, 29-July-2022	<p>Changed Organization from “Product Compliance” to “Market Access”</p> <p>Table 1 Pan-HPE Mandatory Restrictions for All Products:</p> <ul style="list-style-type: none"> • Updated Chlorinated hydrocarbons (ID Num 020221-79): added text “except PCP 5 mg/kg (0,0005% by weight)” under Substance Identifier • Updated DecaBDE (ID Num 170617-01) and PIP (3:1) (ID Num 2120429-01) with new date “Effective October 31, 2024” • Added K-RoHS as a reference to ID Num 170617-01, 120621-20, 980408-84, 120621-13, 120621-15, 120621-66, 980408-10, 980408-50, 061020-12, 980408-14 • Updated PVC (ID Num 041210-80) by deleting “and Korean eco label KOECO” <p>Table 2 Pan-HPE Mandatory Restrictions for Non-EE Products</p> <ul style="list-style-type: none"> • Updated 2,4,6-TTBP (ID Num 101118-14) and PCTP (ID Num 2120429-02) with new date “Effective October 31, 2024”
G, 01-Jul-2021	<p>Changed Organization from “Product Compliance and Reliability” to “Product Compliance”</p> <p>Table 1 Pan-HPE Mandatory Restrictions for All Products</p> <ul style="list-style-type: none"> • Updated ID Num 061020-12: removed exemptions 37 and 7c-IV • Updated ID Num 170617-01: new entries for All products under Threshold Limit / Criteria, Exemptions and References • DecaBDE under U.S. EPA by TSCA: new entries for All products under Threshold Limit / Criteria and exemptions • Added ID Num 2120429-01: new row for Phenol, isopropylated phosphate (3:1) (PIP (3:1)) • Updated ID Number 160617-02: deleted the reference to the EU Regulations (EC) 2017/1000, Annex XVII (EU REACH) 1907/2006 and EU 2020/784 <p>Table 2 Pan-HPE Mandatory Restrictions for Non-EE Products</p> <ul style="list-style-type: none"> • Updated ID Num 101118-14: added text “(2,4,6-TTBP)” to “2,4,6-tri-tert-butylphenol” under Substances and Materials; added new cell under Threshold Limit / Criteria, text “Concentrations below 0.3% by weight”; added new cell under References, text “U.S. EPA by TSCA, 86 FR 866” • Added ID Num 2120429-02: new row for Pentachlorothiophenol (PCTP) • Deleted ID Num 070905-82 • Deleted ID Num 130604-77

	<p>Table 3 Pan-HPE Mandatory Restrictions for Batteries</p> <ul style="list-style-type: none"> Updated ID Num 080715-81: added text “; 0,0005% by weight of mercury; 0,015% by weight of cadmium; 0,200% by weight of lead.” under Threshold Limit / Criteria; added text “and Resolution 443/20” under References <p>Table 4 HPE-Approved Test Methods and IEC Global Standard Testing Methodologies</p> <ul style="list-style-type: none"> Azodyes entry deleted
F, 14-Aug-2020	<p>Updated hyperlinks; changed document owner; changed DEHP, BBP, DBP, DIBP from <1000 ppm threshold to 1000 ppm; added Nonylphenol ethoxylates restriction; updated PFOA restriction, added Taiwan in Section 4.3, Altered references for DecaBDE, HBCDD, PFOS, PCBs to reflect EU 2019/1021 regulation. Added new wording in Section 4.1, “Responsible Minerals Sourcing” reflecting changes to “Conflict Minerals” management.</p>
E, 14-Jun-2019	<p>Table 1 remove</p> <ul style="list-style-type: none"> BNST (ID Num: 140615-46) Lead carbonates, lead sulfates (ID Num: 980408-27) <p>Table 1 add</p> <ul style="list-style-type: none"> Exemption 13(b)-III to Cadmium and its compounds (ID Num: 980408-84) and Lead and its compounds (ID Num: 061020-12) <p>Table 1 update threshold for following substances</p> <ul style="list-style-type: none"> Butyl benzyl phthalate (BBP) (ID Num: 120621-20) less than 1000 ppm Cadmium and its compounds (ID Num: 980408-84) less than 100 ppm or as specified in claimed exemption Dibutyl phthalate (DBP) (ID Num: 120621-13) less than 1000 ppm Di-(2-ethylhexyl) phthalate (DEHP) (ID Num: 120621-15) less than 1000 ppm Diisobutyl phthalate (DIBP) (ID Num: 120621-66) Flame retardant, polybrominated biphenyls (PBBs) (ID Num: 980408-10) less than 1000 ppm Lead and its compounds (ID Num: 061020-12) less than 1000 ppm or as specified in claimed exemption <p>Edits to Section 4.1 Conflict Minerals – “HPE-product-specific information...”</p> <p>Table 2 remove</p> <ul style="list-style-type: none"> BNST (ID Num: 140615-46) <p>Table 2 update threshold for following substance</p> <ul style="list-style-type: none"> Hexavalent chromium and its compounds (ID Num: 061020-79) less than 1000 ppm <p>Edits to Section 6.2 Batteries Not Classified as Dangerous Goods for Transportation</p> <ul style="list-style-type: none"> First paragraph, add “...standalone...” Add additional bullet item, “Additional country specific requirements that may apply”

	<ul style="list-style-type: none"> Second paragraph, add, "...UN 38.3 Test Report, UN 38.3.5 Test Summary, and Certification of Safe Transport of Chemical Goods..."
D1, 25-Jul-2018	<p>Table 1 Cadmium and its compounds (ID Num: 980408-84) – removed exemption 13(b) and added exemption 8(b)-I</p> <p>Table 1 Lead and its compounds (ID Num: 061020-12) – removed exemption 5(b) and updated 6(a) to 6(a)-I, 6(b) to 6(b)-II and 15 to 15(a). Added exemption 24, 34, and 37.</p> <p>Table 1 Mercury and its compounds (ID Num: 980408-14) – removed exemption 4f.</p>
D, 15-Jun-2018	<p>Table 1 Arsenic and its compounds (ID Num: 090807-98) – added exemption for "Optical transceivers in the substrate material of laser elements"</p> <p>Table 1 Arsenic and its compounds (ID Num: 101118-42) in computer display glass – removed, not applicable to HPE</p> <p>Table 1 Red Phosphorus – added the testing standard number (EX-MF862-16)</p> <p>Table 1 SCCPs (ID Num: 020221-48) change threshold from 1000 ppm to Not used</p> <p>Table 1 Substances Added</p> <ul style="list-style-type: none"> Bis(pentabromophenyl)ether ('DecaBDE') (ID Num: 170617-01) (Effective 1-Mar-2019) Phenylmercury and its compounds (ID Num: 140615-84) (Effective 10-Oct-2017) Butyl benzyl phthalate (BBP) (ID Num: 120621-20) (Effective Date: 21-Jul-2019) Dibutyl phthalate (DBP) (ID Num: 120621-13) (Effective Date: 21-Jul-2019) Di-(2-ethylhexyl) phthalate (DEHP) (ID Num: 120621-15) (Effective Date: 21-Jul-2019) Diisobutyl phthalate (DIBP) (ID Num: 120621-66) (Effective Date: 21-Jul-2019) <p>Table 2 Pan-HPE Mandatory Restrictions for Non-EE Products</p> <ul style="list-style-type: none"> Removed Azo colorants and Azodyes (ID Num: 041210-46) in textiles, not applicable to HPE Removed Bisphenol A (ID Num: 110727-78) in thermal paper, not applicable to HPE Removed wording in Scope "such as leather and" in DMF (ID Num: 090807-44) Removed Dioctyltin (DOT) (ID Num: 110727-17) in textiles, not applicable to HPE Removed Formaldehyde (ID Num: 041210-48) in textiles, not applicable to HPE

	<ul style="list-style-type: none"> • Removed Hexavalent chromium and its compounds (ID Num: 130604-45) in leather articles, not applicable HPE • Removed Lead and its compounds (ID Number: 110727-62) in accessory bags, not applicable to HPE • Removed Perfluorooctane Sulfonates (PFOS) and PFOS salts (ID Num: 070905-13) in textiles, not applicable to HPE • Removed Perfluorooctanic acid (PFOA) and individual salts and esters (ID Num:130604-77) in coatings of textiles, not applicable to HPE • Removed Bis (2-ethylhexyl) phthalate (DEHP) (ID Num: 110727-51) in textiles, not applicable to HPE • Removed Butyl benzyl phthalate (BBP) (ID Num: 110727-46) in textiles, not applicable to HPE • Removed Dibutyl phthalate (DBP) (ID Num: 110727-73) in textiles, not applicable to HPE • Removed Diisodecyl phthalate (DIDP) (ID Num: 110727-54) in textiles, not applicable to HPE • Removed Di-n-hexyl phthalate (DnHP) (ID Num: 110727-58) in textiles, not applicable to HPE <p>Removed Table 6 Aromatic Amines, related removal of Azo colorants and Azodyes (ID Num: 041210-46)</p>
C1, 23-Mar-2018	<p>Table 1 Red Phosphorus, update to address scope (voltage bias) and exemption (HPE Standard - "<u><i>Red Phosphorus Approval Method</i></u>")</p> <p>Section 4.1 Conflict Minerals, removed specific date 31-Dec-2016 and added general timeline.</p>
C, 10-Jul-2017	<p>Table 1 removed ID # 110727-18, DecaBDE in replacement external housing parts of computer and televisions</p> <p>Table 1 for HBCDD (ID # 120621-60), added "Canadian Environmental Protection Act, 1999" in Reference</p> <p>Table 1 Hexavalent chromium and its compounds (ID # 061020-24) edited scope to include "All product" applications</p> <p>Table 1 removed exemption for Ozone Depleting Substances (ODS) (ID # 980408-15) – "Refrigeration units used in manufacturing facilities or in data center facilities" & added "Clean Air Act" Reference</p> <p>Table 1 add specific scope to PAH (ID # 130604-79) "...surfaces of class B EMC products."</p> <p>Footnote 17 – removed reference to "...paper trays, feeders, printer lids, printer cartridge body and carriage, and optical drives"</p> <p>Footnote 18 – edit, removed - Servers, storage and storage array systems, network infrastructure equipment for switching, signaling, transmission, and network management for telecommunications meeting Class A EMC requirements</p> <p>Table 1 removed exemption for Radioactive substances (ID # 041210-96) – "Thorium in UV lamps"</p> <p>Section 4.2 removed reference to computer and portable device references</p>

	<p>Section 4.3 added “Suppliers are responsible for complying with the current RoHS requirements in applicable jurisdictions.”</p> <p>Table 2 updated substance identification number 090807-43 with reference, Convention on International Trade in Endangered Species (CITES)</p> <p>Section 5.2 added legal reference to the Convention on International Trade in Endangered Species (CITES)</p>
B, 17-Jun-2016	<p>Table 1 removed exemption “ceramics in electronic components and” from Beryllium and its compounds (ID Number 101118-59)</p> <p>Table 1 added Beryllium Oxide (ID Number 160617-01)</p> <p>Table 1 remove exemption EU RoHS exemption 8b, 39a, and 39b for Cadmium and its compounds (ID Number 980408-84)</p> <p>Table 1 Chlorinated hydrocarbons (ID Number 020221-79) correct to Table 8 from Table 9</p> <p>Table 1 remove EU RoHS exemption 7b, 9b,13b, and 25 for Lead and its compounds (ID Number 061020-12)</p> <p>Table 1 remove EU RoHS exemption 1, 2a, 2b, 2b2, 2b3, 2b4, 3, 4a, 4b, 4c, and 4e for Mercury and its compounds and remove EU REACH reference (ID Number 980408-14)</p> <p>Table 1 PBBs (ID Number 980408-10) and PBDEs (ID Number 980408-50) correct to Table 7 from Table 8</p> <p>Table 1 Hexabromocyclododecane (ID Number 120621-60) changed threshold to 100 ppm; removed recycled materials exemption; and updated reference to EU Regulation 850/2004 (POP)</p> <p>Table 1 Hexavalent chromium (ID Number 061020-24) added “the latest” before “IEC 62321...”</p> <p>Table 1 removed “550, 2013” in References and removed adhesive foil or tape exemption for PFOA ID Number 130604-16 & 130604-48</p> <p>Table 1 added “individual salts and” to PFOA ID Number 130604-16 & 130604-48</p> <p>Update Section 4.1 Conflict Minerals</p> <p>Table 2 added Fluorinated greenhouse gases (ID Number – 160617-08), scope is refrigeration equipment (EU/517/2014)</p> <p>Table 2 removed Fluorinated greenhouse gases (ID Numbers – 090807-91, 090807-17; and 090807-36)</p>

	<p>Table 1 and Table 2 remove “Adhesive foil or tape in semiconductors and photographic coatings for film, paper or screen. (expires 1-Jan-2016)” for PFOA ID Numbers: 130604-16, 130604-48, 130604-77, and 130604-49</p> <p>Table 2 removed “Preparations” and added “Mixtures” in Scope; and removed “550, 2013” in References for PFOA ID Number 130604-77</p> <p>Table 2 removed “550, 2013” in References for PFOA ID Number 130604-49</p> <p>Table 2 added “individual salts and” to PFOA ID Number 130604-77 & 130604-49</p> <p>Table 4 added “The latest” before “IEC 62321...” and removed “1-5 and Ed.1 where applicable”</p> <p>Table 9 added 1,2-difluoroethane (HFC-152) (CAS 624-72-6) & Fluoroethane or Ethylfluoride (HFC-161) (CAS 353-36-6)</p>
A, 01-Nov-2015	Initial document for HPE.