

Epson Group

Green Purchasing Standard for Production Materials

Rev. 5

Established: January 15, 2003

Revised: July 1, 2018

Enacted: October 1, 2018

SEIKO EPSON CORPORATION

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STANDARDS

1. Purpose

This Green Purchasing Standard sets forth the principles, specific criteria for, and use of a product substance assurance system that can ensure that certain hazardous substances are not present in products. The purpose is to avoid causing substance-related problems to the Epson Group (“Epson” hereafter) and its customers.

2. Basic Principles of Product Substance Assurance

- Comply with applicable laws and regulations.
- Procure materials from suppliers that can comply with conditions specified in this standard regarding banned substances (e.g., thresholds, parts and locations where substances are present, uses).
- Procure materials from suppliers who can guarantee that banned substances are not present in their products.
- Procure materials from suppliers who can provide data on target substances present in their products.
- Accept goods that have been guaranteed by the supplier.

3. Scope

This Green Purchasing Standard applies to production materials delivered to the Epson Group. “Production materials” includes all finished products, semi-finished products, units, components, raw materials, accessories, options, packaging materials* and other goods comprising Epson products.

* Examples of packaging materials that fall within the scope of this standard: individual boxes, outer boxes (carton boxes), carrying cases, cushioning material, internal and external partitions, fixtures, adhesives, coating materials, staples, OPP tape, ink, and transport pallets (Epson specification).

4. Supplier Agreements

Epson will ask you to provide a declaration (“Actions Relating to Assurance Against Chemical Substance Inclusion in Products,” hereafter called “Supplier Agreement”) pledging to ensure that certain hazardous substances are not present in unacceptable levels in products you deliver to Epson. The Supplier Agreement requires that you:

- (1) Build and maintain a product substance assurance system.
- (2) Ensure that banned substances are not present in your products. (See Appendix 1 for substance handling standards.)
- (3) Provide information about product substance content.
- (4) Cooperate in verification of your assurance system.
- (5) Promptly address nonconformance issues and institute preventive action.

If it becomes necessary to amend the content of a Supplier Agreement, the agreements may be amended and enacted on a case-by-case basis pursuant to discussions between the parties.

5. Principles for Component Substance Assurance

The requirements for part approval are (1) submission of a Supplier Agreement, and (2) reporting information about substances in products.

Table 1. Documents to Be Submitted

Submitted by/for	Documents to Be Submitted
Each supplier	“Actions Relating to Assurance Against Chemical Substance Inclusion in Products” (Supplier Agreement) URL: https://global.epson.com/SR/supply_chain_csr/green_purchasing/green_agreement.html
Each production material	Information about product substance content (1) chemSHERPA-AI file URL: https://chemsherpa.net/english (2) Other: Forms specified by Epson (surveys/materials that Epson business units ask suppliers to submit) URL: https://global.epson.com/SR/supply_chain_csr/green_purchasing/green_standards.html

(1) Submission of a Supplier Agreement

To provide reliable product substance assurance, you need to build and maintain a system for doing so. Epson will ask you to submit a Supplier Agreement wherein you agree to implement a product substance assurance system based on this Green Purchasing Standard. One Supplier Agreement is required per supplier.

(2) Reporting information about substances in products

Information about substances present in products must be accurately communicated to guarantee that restricted substances are not present in products in the supply chain. Use either (1) the chemSHERPA-AI file or (2) a format specified by Epson to report substances in production materials delivered to Epson. Please notify Epson if an SVHC on the Candidate List is found to be present in concentrations greater than 0.1% w/w in articles as delivered.

chemSHERPA-AI file

Please use the data entry support tool provided by chemSHERPA when filling out the chemSHERPA-AI file. Compliance assessment information is mandatory. Composition information is optional. For detailed information and instructions about chemSHERPA, please see the website below.

URL: <https://chemsherpa.net/english>

The old survey format (substance content information/elimination information) and the new REACH SVHC format may be used until March 31, 2019.

Format specified by Epson

Surveys/materials that Epson business units ask you to submit

URL: https://global.epson.com/SR/supply_chain_csr/green_purchasing/green_standards.html

Epson may ask you to provide information by other means if necessary to respond to our customers' requirements or business, industry, or legal and regulatory needs. Please provide information using the method specified by Epson.

Examples:

Report on the results of analyses or tests of substances specified by Epson

(Use the method of analysis, testing, or measurement specified by Epson, if any. See Table 2.1-5 for analysis standards.)

Survey data on the amount of substances banned in products, non-controlled substances in products, or a certificate declaring that a product does not contain banned substances

6. Requests Regarding Product Substance Assurance

We ask that you build and maintain systems as described below to ensure that restricted substances are not present in your products. Epson will ask to verify these

6.1 Establishment of policies and plans

6.1.1 Preparation of policies

Establish and maintain policies that incorporate actions relating to product substance control.

6.1.2 Identification of requirements

(1) Identification of legal, regulatory, and customer requirements

Control documents describing laws, regulations, and customer requirements relating to products. Keep this information up-to-date. Communicate information relating to product substance control to other internal departments that need it.

Key points

- Exercise close internal management of substance groups specified by laws, regulations, and Epson. Make information about these substance groups readily available for viewing by all departments that need access to such information.

(2) Definition of the scope of control

Specify the processes and substances to which product substance control applies.

6.1.3 Drafting targets and plans

Define the scope of control, and set clear internal targets and plans in line with the scope of control.

Key points

- Prepare plans to eliminate any substances that are scheduled for a ban in the future, and monitor progress. This should result in meeting the legal, regulatory, and Epson requirements.

6.1.4 Definition of the system, roles, authority

Establish a system (responsible person and organization) for product substance control.

Key points

- Establish a shipping assurance system, and clearly identify the responsible departments and persons [when launching new products, in mass production, when there is a 4M change (a change in man, machine, material, and manufacturing method), in supplier management, etc.].
- If using alternative goods, decide what departments are to be responsible for selecting and evaluating alternatives, and ensure that quality, legal, regulatory, and Epson requirements are met.

6.1.5 Document control

Prepare documents (including records) relating to product substance control and have in place a system for maintaining and controlling the documents.

Key points

- Document the specific procedures based on the shipping assurance system described above in item 6.1.4. Control all forms that are used.

6.1.6 Training

Identify your training needs and establish a curriculum that suits those needs and that is useful in enabling people to acquire sufficient knowledge about chemicals and other substances themselves and about their control. Provide systematic training to all employees who need it.

Key points

Prepare and implement a plan that follows a training curriculum so that legal, regulatory and Epson requirements are understood and so that operations are carried out by people who have the required knowledge and skills.

6.2 Implementation and operation

6.2.1 Design and development

Identify and implement the things that should be done in the product design and development process (design and verification) in order to avoid using substances banned in products.

Key points

- Specify materials in specifications, drawings, and other documentation, and clearly note requirements regarding the avoidance of banned substances.
- Communicate legal, regulatory, and Epson requirements to your suppliers.
- Check that the production materials used conform to all legal, regulatory, and Epson requirements.

6.2.2 Obtaining and checking substance content information

Check that all product substance information obtained from suppliers is complete and proper. Carefully check the information against the requirements.

Key points

- Establish a form that allows you to check that all legal, regulatory and Epson requirements are met. Check whether the production materials procured with this form conform to all legal, regulatory, and Epson requirements.

6.2.3 Procurement management

Check whether the suppliers of the components and raw materials that comprise your products are properly controlling substances contained in products. You should have a system for urging and implementing improvements.

Key points

- Require suppliers to build and maintain a product substance assurance system based on this Green Purchasing Standard.
- Procure goods from suppliers that conform to the requirements of this Green Purchasing Standard.
- Confirm and instruct suppliers on the things they need to do based on this Green

Purchasing Standard, and rectify any problems.

- Ask suppliers to request that secondary suppliers and other suppliers all the way down the supply chain build and maintain a product substance assurance system.

6.2.4 Manufacturing process

(1) Incoming checks

Clearly specify and implement inspection methods and criteria for substances contained in products within your own incoming checks. Check physical goods by using the proper analytical measurement methods.

Key points

- Check the data for incoming components and raw materials or conduct screening analysis to confirm that they conform to all legal, regulatory, and Epson requirements.
- If you cannot ascertain the state of control exercised over incoming components and raw materials (because recycled materials were used, etc.), physically inspect the item to verify conformance to legal, regulatory and Epson requirements.

(2) Process control

Control processes in a way that prevents commingling and contamination in manufacturing processes and that prevents processes and goods from being affected by oxidation, vaporization, chemical reactions, changes in material concentrations, and so forth.

Key points

- Use separate production lines for products that have different legal, regulatory and customer requirements to prevent commingling and contamination. If lines cannot be separated, clearly specify and implement means to prevent the commingling of and contamination by substances banned in products in mixed product processes.
- Identify products according to legal, regulatory, and customer requirements.
- If you have inventory that includes substances banned in products, store goods that contain banned substances separately from those that do not. Keep records about goods that do and do not contain banned substances.
- Do not use banned substances in processes used to manufacture production materials destined for Epson (Appendix 1: 2.2).

Require contract manufacturers to comply with the requirements for controlling substances in products. Prepare and use a system for periodically checking, giving instructions on, and auditing the state of control at contract manufacturer sites.

Key points

- Require contract manufacturers to build and maintain a product substance assurance system based on this Green Purchasing Standard.
- Confirm and instruct contract manufacturers on the things they need to do based on this Green Purchasing Standard. Rectify any problems.
- Request that contract manufacturers and others down the supply chain build and maintain a product substance assurance system.
- Ask contract manufacturers not to use substances banned from use in manufacturing

processes (see item 2.2 in Appendix 1) in manufacturing processes for production materials destined for Epson.

6.2.5 Change control

Establish and strictly follow change control rules involving product substance control.

Key points

- Provide and follow clear procedures for 4M changes
 - Define as a 4M change any change that has the potential to affect substances present in products. This includes things such as a change in manufacturer or a change in raw materials.
 - Verify that the 4M change will not lead to problems.
 - Epson needs to verify any changes that have the potential to affect the substances present in products. Notify your point of contact at Epson before implementing changes.
 - Wait for Epson to check the situation before making a 4M change.
- Control changes in the same way for your own suppliers.

6.2.6 Shipping verification

Perform shipping verification in all processes relating to product substance control. Shipping decisions must be made on the basis of reliable data.

Key points

- Specify and implement a method for verifying that all legal, regulatory and Epson requirements have been met. Keep records of the results of verification.

6.2.7 Handling nonconformance

Nonconforming goods must be disposed of appropriately (including to prevent commingling with conforming products). Put in place a system for promptly reporting nonconformances to all stakeholders (officers, managers, relevant departments, suppliers, customers, etc.). Investigate the causes of accidents and take action to prevent recurrence.

Key points

- Establish who is to be responsible for reporting to Epson in the event of a nonconformance and establish the reporting procedure.
- Establish and implement a method (lot tracing) that enables you to identify nonconforming goods.
- Establish and implement clear corrective actions and preventive actions.

6.2.8 Providing information

Calculate data on specific substances contained in products so that you can provide accurate information to customers and third parties.

Key points

- Establish a route for providing information in response to inquiries from Epson.
- Submit a Supplier Agreement, data from product substance surveys, and other

requested information to Epson.

6.3 Inspection and issues needing correction

Conduct internal audits to assess product substance control practices.

Key points

- Check that procedures relating to product substance assurance are being observed. Rectify any problems.
- Conduct checks at supplier and contract manufacturer sites in accordance with “6.2.3 Procurement management” and “6.2.4 (2) Process control.”

6.4 Management review

When an internal audit shows that a problem exists, create targets, action plans, and/or other means to resolve the problem.

Key points

- Continuously improve your assurance system based on the results of checks described in “6.3 Inspection and issues needing correction.”

7. Additional Clauses

7.1 Revision and withdrawal

This Green Purchasing Standard shall be revised and withdrawn pursuant to the “Epson Group Product Substance Control Standard.”

7.2 Revision history

Rev.	Date of Revision	Revised Content
1	January 15, 2003	Rev. 1.0
2	August 15, 2003	Added information on things such as groups of controlled substances in products added by Epson
3	April 15, 2005	Added information regarding an assurance system relating to substances included in products, etc.
3.1	December 15, 2006	Added information to Appendix 1 Substance Handling Standards, including the addition of cobalt chloride to conditionally banned substances and exceptions to substances to be eliminated.
3.2	April 1, 2008	Appendix 1: Substance Handling Standards <ul style="list-style-type: none"> - Added 3 substances to unconditionally banned substances (subject to the Chemical Substance Control Law) - Added perfluorooctane sulfonate (PFOS) and its salts to conditionally banned substances Updated Appendix 3: List of Epson Group Companies
3.3	January 20, 2009	Added "Compliance documents for California Formaldehyde Regulation for Composite Wood Products" to Documents to Be Submitted Appendix 1: Substance Handling Standards <ul style="list-style-type: none"> - Added conditions to conditionally banned substances (formaldehyde) - Added conditions to conditionally banned substances (cadmium, mercury, lead) Added transport pallets (SEG specifications) to examples of packing materials
3.4	August 20, 2009	Appendix 1: Substance Handling Standards <ul style="list-style-type: none"> - Added dimethyl fumarate to unconditionally banned substances - Added examples of general use to unconditionally banned substances - Added conditions to conditionally banned substances (formaldehyde) - Added exempted applications to conditionally banned substances (cadmium and cadmium compounds) - Revised conditions for conditionally banned substances (lead and lead compounds) - Added exempted application to three substances to be eliminated from products (cadmium and cadmium compounds, mercury and mercury compounds, lead and lead compounds) - Revised analytical standards for four substances to be eliminated from products (cadmium and cadmium compounds, hexavalent chromium and its compounds, mercury and mercury compounds, lead and lead compounds) - Added phthalate to level 2 substances to be eliminated from products Updated Appendix 3: List of Epson Group Companies
3.5	May 21, 2010	Appendix 1: Substance Handling Standards < Unconditionally banned substances > Added 6 substances to the "Group subject to the Law Concerning the Examination and Regulation of Manufacture etc. of Chemical Substances (Japan)" < Conditionally banned substances > <ul style="list-style-type: none"> - Added tri-substituted organostannic compounds (tributyltin (TBT)/ triphenyltin (TPT) / other tri-substituted organostannic compounds) - Added dioctyltin (DOT) compounds - Revised condition of prohibitions for mercury and its compounds - Revised condition of prohibitions and exemptions for perfluorooctane sulfonates (PFOS) and its salts <Substances to be eliminated from products> <ul style="list-style-type: none"> - Added dibutyltin (DBT) compounds to level 2 substances <p style="text-align: right;"><i>(Continued on the next page...)</i></p>

Rev.	Date of Revision	Revised Content
3.5	May 21, 2010	<ul style="list-style-type: none"> - Added exempted application for cadmium and cadmium compounds, mercury and mercury compounds, lead and lead compounds - Limit the scope of Phthalate to DEHP, DBP, BBP - Deleted conditions of prohibitions already controlled in accordance with those of conditionally banned substances (e.g. batteries, packaging materials) - Updated Appendix 3 List of Epson Group Companies *1 dioctyltin (DOT)/ tributyltin (TBT)/ triphenyltin (TPT) / other Tri-substituted organostannic compounds
3.6	July 1, 2011	<p>Appendix 1: Substance Handling Standards</p> <p>< Unconditionally banned substances ></p> <ul style="list-style-type: none"> - Added two substances to the “Group subject to the Law Concerning the Examination and Regulation of Manufacture etc. of Chemical Substances (Japan)” <p>< Conditionally banned substances ></p> <ul style="list-style-type: none"> - Revised the conditions for prohibitions on cadmium and cadmium compounds, mercury and mercury compounds, lead and lead compounds - Added "Treatment of Substances Regulated by REACH Regulation No. 1907 / 2006" <p><Substances to be eliminated from products></p> <ul style="list-style-type: none"> - Revised exempted applications for cadmium and cadmium compounds, mercury and mercury compounds, lead and lead compounds - Added diisobutyl phthalate (DIBP) and hexabromocyclododecane (HBCDD) to level 2 substances to be eliminated from products
3.7	August 1, 2012	<p>Deleted “PREFACE”, “QUALITY PHILOSOPHY”</p> <p>Appendix 1: Substance Handling Standards</p> <p>< Conditionally banned substances ></p> <ul style="list-style-type: none"> - Deleted one of the exemptions from Formaldehyde. - Revised conditions for mercury and mercury compounds. - Revised conditions for Tri-substituted organostannic compounds and Dioctyltin (DOT) compounds. - Added (Di(2-ethylhexyl) phthalate(DEHP), Dibutyl phthalate(DBP), Benzyl butyl phthalate(BBP), Diisobutyl phthalate(DIBP), Dibutyltin (DBT) compounds, Hexabromocyclododecane (HBCDD) * moved from level 2 substances to be eliminated from products - Added “until December 31, 2014” to the exemption of Dioctyltin (DOT) compounds - Added URL of European Chemical Agency’s website to “Treatment of Substances Regulated by REACH Regulation No. 1907/2006” - Revised the organization names. - Added “for information on production materials used for products to which EU RoHS Directive (2011/65/EU) applies” to Note A. <p><Substances to be eliminated from products></p> <ul style="list-style-type: none"> - Deleted “(e.g. Projector lamp) from Hg-4 of Mercury And Mercury Compounds. - Regarding exempted application of Lead and Lead Compounds “Pb-7”, added “7(c)-IV” to the No. of application exempted from amended RoHS Directive and added “Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors” to the comment. - Deleted (Di(2-ethylhexyl) phthalate(DEHP), Dibutyl phthalate(DBP), Benzyl butyl phthalate(BBP), Diisobutyl phthalate(DIBP), Dibutyltin (DBT) compounds, Hexabromocyclododecane (HBCDD) from level 2 substances to be eliminated from products. * moved to conditionally banned substances. - Added Perfluorooctanoic acid (PFOA) and its salt, Musk xylene, 4,4’-Diaminodiphenylmethane (MDA), Diarsenic pentaoxide, Diarsenic trioxide, 2,4 - Dinitrotoluene (2,4-DNT), Tris(2-chloroethyl)phosphate (TCEP) to level2 Substances to be eliminated from products. - Updated Appendix 3 List of Epson Group Companies
3.7.1	April 1, 2013	Updated Appendix 3 List of Epson Group Companies

Rev.	Date of Revision	Revised Content
3.7.2	August 1, 2013	<ul style="list-style-type: none"> - Updated Appendix 3 List of Epson Group Companies - Revised the organization name from “Visual Device Business Unit (the former TFT Operations Division) of the Visual Products Operations Division” to “the TFT liquid crystal panels business of the Visual Products Operations Division”
3.8	July 1,2014	<p>Deleted “APPROACH TO ASSURANCE AGAINST CHEMICAL SUBSTANCE INCLUSION IN PRODUCTS” STANDARDS</p> <ul style="list-style-type: none"> - Added 2. Basic rules for assuring that banned substances are not contained in products <p>Appendix 1: Substance Handling Standards</p> <ul style="list-style-type: none"> - Revised the explanation in 2.Substance group handling standards partially <p>< Unconditionally banned substances ></p> <ul style="list-style-type: none"> - Added Endosulfan, Hexabromocyclododecane (HBCDD) - Polychlorinated naphthalene: (Cl: 3 or more) => (Cl: 1 or more) <p>< Conditionally banned substances ></p> <ul style="list-style-type: none"> - Cadmium and its compounds, lead and its compounds, Mercury and its compounds: For use in batteries, see Appendix 2 - Added a condition for jewelry to Lead and its compounds - Added a condition for azodyes to azo compounds - Moved HBCDD to unconditionally banned substances - Moved musk xylene, MDA, diarsenic pentaoxide, diarsenic trioxide, 2,4-DNT, TCEP from level2 Substances to be eliminated from products <p><Notes regarding substances></p> <ul style="list-style-type: none"> - *A: Moved “Products to which EU RoHS Directive (2011/65/EU) applies” from Notes regarding laws <p><Notes regarding laws></p> <ul style="list-style-type: none"> - Added *1 According to Annex XVII of REACH Regulation No. 1907/2006, revised the name of the law of *7 - Added list of azodyes <p><Substances to be eliminated from products ></p> <ul style="list-style-type: none"> - Added the following explanations <p>As of July 2014, applications exempted from the RoHS Directive are being reviewed.</p> <p>The dates provided in the "Effective date of the prohibition" column in the tables on pages 21-25 are the dates that Epson has independently set as the final dates for accepting goods containing substances that are being phased out. Exempted applications and effective dates of the prohibition may change, depending on the results of reviews of applications exempted from the RoHS Directive.</p> <ul style="list-style-type: none"> - Deleted “Analytical standards for substances to be eliminated from products are also shown below. Analytical methods have not been established for all test samples.” - Added “Effective date of the prohibition” for exempted applications and the following explanation. <p>Exempted applications and effective dates of the prohibition may change, depending on the results of reviews of applications exempted from the RoHS Directive.</p> <ul style="list-style-type: none"> - Analytical standards: Added the following explanation. <p>*Use the method of analysis, testing, or measurement specified by Epson, if any.</p> <ul style="list-style-type: none"> - Moved musk xylene, MDA, diarsenic pentaoxide, diarsenic trioxide, 2,4-DNT, TCEP to Conditionally banned substances - Hexavalent Chromium and Its Compounds => Hexavalent Chromium Compounds - Added the following condition to level 2 of Hexavalent Chromium Compounds. Hexavalent Chromium Compounds must not be present in leather articles and articles containing leather parts that come into contact with the skin in concentrations equal to or greater than 3 ppm of the total dry weight of the leather or leather part

Rev.	Date of Revision	Revised Content
3.8	July 1,2014	<ul style="list-style-type: none"> - Mercury And Mercury Compounds: Revised the name of Hg-3 from “Mercury in straight fluorescent lamps for special purposes” to “Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes” - Lead and Lead Compounds: Revised the name of Pb-7 from Lead in ceramic for piezoelectronic devices to Lead in ceramic for electrical and electronic components - Lead and Lead Compounds: Revised the comment of Pb-7 - Lead and Lead Compounds: Added *See Pb-4 for high melting temperature type solders to the comment of Pb-14 - Added PAH, Trichloroethylene to level 2 <Substances Banned From Use In Manufacturing Processes> - Added Montreal Protocol Annex III and Bromochloromethane Appendix 2 - Deleted Appendix 2 “System Check Sheet for Assurance Against Chemical Substance Inclusion in Products” - Added Appendix 2 “Conditionally banned substances for battery” Appendix 3 - Updated Appendix 3 “List of Epson Group Companies”
3.9	July 1,2015	<ul style="list-style-type: none"> < Conditionally banned substances > - Moved “Leather articles and articles containing leather parts that come into contact with the skin shall not contain in concentrations equal to or greater than 3 ppm of the total dry weight of the leather” from level 2 Substances to be eliminated from products - Dibutyltin (DBT) compounds: Deleted “Adhesives are exempt until December 31, 2014.” - Moved Trichloroethylene from level 2 Substances to be eliminated from products - Added Benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-Trimethylpentene (BNST), and Polyvinyl chloride (PVC) <Substances to be eliminated from products> - Lead and Lead Compounds: Revised effective date of the prohibition for Pb-2 and Pb-3 from July 21, 2015 to April 21, 2016 - Added Arsenic acid, technical MDA, Diglyme, EDC to level 2 Appendix 2 “Conditionally banned substances for battery” - Mercury and its compounds : Revised threshold for button cell battery from 20,000ppm to 5ppm - Updated Appendix 3 “List of Epson Group Companies”
4	July 1, 2016	<ul style="list-style-type: none"> <Unconditionally banned substances> Revised “DBBTs: Pentachlorophenol (87-86-5)” to “Group subject to the Law Concerning the Examination and Regulation of the Manufacture etc. of Chemical Substances (Japan): Pentachlorophenol or its salts and esters” <Conditionally banned substances> - Changed the ban conditions for chlorinated paraffin to "Prohibited in amounts exceeding 1000 ppm per delivery configuration." - Added red phosphorus - Moved "Perfluorooctanoic acid (PFOS) and its salt" and "PAH" from "Substances to Be Eliminated From Products (Level 2) <Substances to Be Eliminated From Products> - Mercury and its compounds: The effective date of the prohibition was changed from July 21, 2015 to "Immediate" for Hg-1 and Hg-3 used in exempted applications. <p style="text-align: right;"><i>(Continued on the next page...)</i></p>

Rev.	Date of Revision	Revised Content
4	July 1,2016	<p>- Lead and its compounds: The effective date of the prohibition was changed from July 21, 2015 to "Immediate" for Pb-5, Pb-14, Pb-27, and Pb-33 used in exempted applications.</p> <p>The effective date of the prohibition of Pb-2 and Pb-3 used in exempted applications was changed from April 21, 2016 to "One year prior to the legally mandated exemption expiration date."</p> <p>- Moved "Perfluorooctanoic acid (PFOS) and its salt" and "PAH" to "Conditionally banned substances."</p>
5	July 1,2018	<p>STANDARDS</p> <ul style="list-style-type: none"> - Added “(2) Ensure that banned substances are not present in your products. (See Appendix 1 for substance handling standards.)” to 4. Supplier Agreements - In accordance with the introduction of chemSHERPA, revised requirements in 5. (2) Reporting information about substances in products <p>Appendix 1: Substance Handling Standards</p> <p>1. Definitions</p> <p>(1) substance banned in products</p> <p>Consolidated conditionally banned substances, unconditionally banned substances, and substances to be eliminated from products to “substances banned in products” and regulated “Level 1 banned substances (currently banned)” and “Level 2 banned substances (substances scheduled to be banned)”</p> <ul style="list-style-type: none"> - In accordance with the introduction of chemSHERPA, revised the definition of (3) controlled substances - Added the following definitions: (4) present, (5) presence banned, (6) intentional inclusion, (7) intentional inclusion prohibited, (8) impurity, (9) homogeneous material, (10) threshold, (11) concentration, (12) article - Added the following tables: <ul style="list-style-type: none"> Table 2.1-2 EU RoHS Directive Exemptions Table 2.1-3 Examples of Banned Substances & Substance Groups Table 2.1-4 Regulations Referenced Table 2.1-5 Analysis Standards <p>2.1 Substances Banned in Products</p> <ul style="list-style-type: none"> - Consolidated conditionally banned substances, unconditionally banned substances, and substances to be eliminated from products to “substances banned in products” and specified “Regulation (Threshold)” and “Referenced Regulation” - In accordance with the introduction of chemSHERPA, revised the substance (group) names - Revised regulations (thresholds) of the following substances: <ul style="list-style-type: none"> No.43 SCCPs (short-chain chlorinated paraffin: 10-13 carbon atoms) are prohibited in amounts exceeding 1000 ppm per delivery configuration (Parts, units, finished products, etc.) => Presence banned No.44 Perfluorooctane sulfonates (PFOS) and its salt: deleted exemptions No.46 Formaldehyde: Composite wood products below that do not meet the requirements of sections 93120-92130.12, title 17, California Code of Regulations => Composite wood products below that do not meet the requirements of sections 93120-92130.12, title 17, California Code of Regulations and TSCA Title VI No. 49 Lead and lead compounds: <ul style="list-style-type: none"> - Cord and cable jackets/sheathing that contain 300 ppm lead or lead compounds must be labeled => Thermoset and thermoplastic-sheathed electrical wires, cables and cords: Prohibited in surface coating material in concentrations exceeding 300 ppm, unless the amount has been reported and approved by Epson.

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5	July 1,2018	<ul style="list-style-type: none"> - In jewelry products (including watch bands), shall not exceed 200ppm. Crystal glass, glass, stainless steel, and natural jewelry not treated with lead additives are exempt. - Jewelry (including watch bands) glass and stainless steel shall not contain more than 500 ppm. This does not apply, however, to internal watch parts that consumers do not touch. => Jewelry (including watch bands): Prohibited in individual parts in amounts of 500 ppm or more. This does not apply, however, to internal watch parts that consumers do not touch, crystal glass, and natural gems that have not been treated with a lead additive. No.68 Polyvinyl chloride (PVC): Shall not intentionally be added to packing materials. Packing materials used for industrial products and TFT liquid crystal panels are exempt. => Intentional inclusion prohibited in packaging materials, except in packaging materials for industrial products. - Based on the latest legal requirements, revised Table 2.1-1 Battery Restrictions 2.2 Substances Banned from Use in Manufacturing Processes <ul style="list-style-type: none"> - Revised names of the following substances: No.4 Amosite, Crocidolite (blue asbestos) => Asbestos - Revised regulations (thresholds) of the following substances: No. 9 Formulations and other substances containing in excess of 1% by weight of any of the substances cited in Nos. 2 through 8 => Preparations or other substances that contain > 0.1% asbestos by weight; or preparations or other substances that contain > 1% of items 2, 3, 5, 6, or 7 above by weight - Added HCFC - Deleted Appendix 3, List of Epson Group Companies

Appendix 1: Substance Handling Standards

1. Definitions

- (1) substance banned in products
A substance whose presence in an Epson product (including supplied accessories, options, packaging materials, etc.) is prohibited.
 - Level 1 banned substances are currently banned.
 - Level 2 banned substances are substances that are scheduled to be banned.
- (2) substance banned from use in manufacturing processes
Substances whose use is banned in manufacturing processes for production materials
- (3) controlled substances
IEC 62474 substance list (Declarable substance groups and declarable substances)
URL: <http://std.iec.ch/iec62474/iec62474.nsf/Index?open&q=110741>
See item 5 (2) "Reporting information about substances in products" for information about controlled substance surveys.
- (4) present
This means that a substance is present in a component or material that comprises a product, regardless of whether the substance was added intentionally.
- (5) presence banned
This means that a substance cannot be present in components or materials that comprise a product, regardless of whether the substance was added intentionally.
If laws or regulations specify a maximum allowed concentration for a substance, the substance must not exceed that limit even if it is present as an impurity.
- (6) intentional inclusion
This means that a substance is present in a component or material that comprise a product, the substance having been intentionally added to impart particular characteristics, properties, functions, qualities, or a particular appearance. This does not include cases where the substance is not present in the components or materials that comprise the end product.
- (7) intentional inclusion prohibited
This means that a substance is not intentionally used in components or materials that comprise a product and, moreover, that the prohibition on use has been communicated to suppliers through the supply chain. This does not include cases where the substance is not present in the components or materials that comprise the end product.
- (8) impurity
An impurity is a substance that is present in a naturally occurring material and that cannot be completely removed by technical means when refined as an industrial material. An impurity may also be a substance that was produced synthetically and cannot be completely removed by technical means.
- (9) homogeneous material
A homogeneous material is a single material that has a uniform composition or a single material that is comprised of multiple materials that cannot be separated or dissolved into different materials by mechanical action.
- (10) threshold
This is the maximum allowable concentration of a substance in a component or material that comprises a product.
- (11) concentration $(\text{weight of substance}) / (\text{weight of part containing the substance})$
Since the denominator of the concentration differs depending on the law or regulation, please calculate the concentration of the substance based on the denominator specified for the threshold in this standard.

(12) article

An object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition; production materials other than substances and preparations/mixtures are considered to be articles.

2. Substance group handling standards

Standards for the handling of substance groups are shown in items 2.1 and 2.2 below. Handling standards have been established pursuant to applicable laws and regulations.

Please ensure compliance with specified conditions relating to banned substances (e.g., thresholds, parts where substances are present, uses).

2.1 Substances banned in products

Table 2.1-1 Battery Restrictions

Table 2.1-2 EU RoHS Directive Exemptions

Table 2.1-3 Examples of Banned Substances & Substance Groups

Table 2.1-4 Regulations Referenced

Table 2.1-5 Analysis Standards

2.2 Substances Banned from Use in Manufacturing Processes

2.3 Substances Banned in Products

Substances banned in products are shown below.

There are currently no Level 2 banned substances (substances scheduled to be banned).

Level 1 banned substances (currently banned)

No.	Substance (Group) Name	CAS No.	Regulation (Threshold)	Referenced Regulation
1	White phosphorous	12185-10-3	Presence banned	16
2	Benzidine and its salts	92-87-5, etc.	Presence banned	16
3	4-aminodiphenyl / 4-aminodiphenyl and its salts	92-67-1, etc.	Presence banned	16
4	4-nitrodiphenyl and its salts	92-93-3, etc.	Presence banned	16
5	Bis (chloromethyl) ether	542-88-1	Presence banned	16
6	2-naphthylamine / beta-naphthylamine and its salts	91-59-8, etc.	Presence banned	16
7	Rubber cement containing benzene, where the benzene accounts for more than 5% of the rubber cement solvent (including diluting agent)	-	Presence banned	16
8	Polychlorinated biphenyls (PCBs) and specific substitutes	See Table 2.1-3	Presence banned	17, 25
9	Polychlorinated terphenyls (PCTs)*1	See Table 2.1-3	Presence banned	2
10	Hexachlorobenzene	118-74-1	Presence banned	17
11	Aldrin	309-00-2	Presence banned	17
12	Dieldrin	60-57-1	Presence banned	17
13	Endrin	72-20-8	Presence banned	17
14	DDT	50-29-3	Presence banned	17
15	Chlordanes or Heptachlor	57-74-9, etc.	Presence banned	17
16	Bis (tributyltin) oxide	56-35-9	Presence banned	17
17	N,N'-ditolyl-p-phenylenediamine, N-Tolyl-N'-xylyl-p-phenylenediamine, or N,N'-Dixylyl-p-phenylenediamine	27417-40-9, 28726-30-9, 70290-05-0	Presence banned	17
18	2,4,6-tri-tert-butylphenol	732-26-3	Presence banned	17
19	Toxaphene	8001-35-2	Presence banned	17
20	Mirex	2385-85-5	Presence banned	17

No.	Substance (Group) Name	CAS No.	Regulation (Threshold)	Referenced Regulation
21	2,2,2-trichloro-1,1-bis (4-chlorophenyl) ethanol (Kelthane or Dicofol)	115-32-2	Presence banned	17
22	Hexachlorobuta-1,3-diene	87-68-3	Presence banned	17
23	2-(2H-Benzo[d][1,2,3]triazol-2-yl)-4,6-di-tert-butylphenol (synonym: Tinuvin320)	3846-71-7	Presence banned	17
24	Perfluorooctane sulfonyl fluoride (PFOS-F)	307-35-7	Presence banned	17
25	Pentachlorobenzene	608-93-5	Presence banned	17
26	Alpha hexachlorocyclohexane	319-84-6	Presence banned	17
27	Beta hexachlorocyclohexane	319-85-7	Presence banned	17
28	Gamma hexachlorocyclohexane	58-89-9	Presence banned	17
29	Chlordecone	143-50-0	Presence banned	17
30	Endosulfan	115-29-7 959-98-8 33213-65-9	Presence banned	17
31	Hexabromocyclododecane (HBCDD) and all major diastereoisomers	See Table 2.1-3	Presence banned	6, 17
32	Pentachlorophenol or its salts and esters	87-86-5, etc.	Presence banned	17
33	DBBT (monomethyl-dibromo-diphenyl methane)	99688-47-8	Presence banned	2
34	DBB (di- μ -oxo-di-n-butyltin hydroxyborane)	75113-37-0	Presence banned	2
35	Monomethyl-tetrachloro-diphenyl methane	76253-60-6	Presence banned	2
36	Monomethyl-dichloro-diphenyl methane	81161-70-8	Presence banned	2
37	Polybrominated biphenyls (PBBs) ^{*1}	See Table 2.1-3	Presence banned	1
38	Polybrominated diphenylethers (PBDEs)	See Table 2.1-3	Presence banned	1, 17
39	Polychlorinated naphthalene (Cl: 1 or more)	See Table 2.1-3	Presence banned	7, 17
40	Asbestos	See Table 2.1-3	Presence banned	2, 11, 25
41	Ozone-depleting substances (CFC, Halon, HBFC, HCFC & others)	See Table 2.1-3	Presence banned	5, 18, 26, 38
42	Dimethyl fumarate ^{*1}	624-49-7	Presence banned	2
43	Alkanes, C10-13, chloro (Short chain chlorinated paraffins)	See Table 2.1-3	Presence banned	6, 11, 15, 17
44	Perfluorooctane sulfonates (PFOS) and its salt ^{*2}	See Table 2.1-3	Presence banned	6, 17, 33

Level 1 banned substances (currently banned)

No.	Substance (Group) Name	CAS No.	Regulation (Threshold)	Ref. Reg.
45	Nickel and nickel compounds	See Table 2.1-3	Products that maintain direct, sustained contact with the skin, including watch cases and watch belts: <ul style="list-style-type: none"> - Use is prohibited if the rate of nickel released from these products exceeds 0.5 $\mu\text{g}/\text{cm}^2$ per week. - Use is acceptable if non-nickel coatings are provided on the products and the rate of nickel released from these products does not exceed 0.5 $\mu\text{g}/\text{cm}^2$ per week for at least two years under normal usage conditions. 	2
46	Formaldehyde	50-00-0	Presence is prohibited in products directly and indirectly related to fiber products such as clothing. ^{*1} <p>Composite wood products below that do not meet the requirements of TSCA Title VI and sections 93120-92130.12, title 17, California Code of Regulations.</p> <ol style="list-style-type: none"> (1) Hardwood plywood - veneer core (HWPW-VC) (2) Hardwood plywood - composite core (HWPW-CC) (3) Particleboard (PB) (4) Medium density fiberboard (MDF) (5) Thin medium density fiberboard (Thin MDF) (6) Finished goods that contain (1)-(5) <p>The following items are exempt.</p> <ul style="list-style-type: none"> - Packing materials - Products where the final place of consumption is outside the U.S. 	9, 10 27

No.	Substance (Group) Name	CAS No.	Regulation (Threshold)	Ref. Reg.
47	Cadmium and cadmium compounds	See Table 2.1-3	Prohibited in homogeneous materials in concentrations exceeding 100 ppm.	1
			Stabilizers, pigments, paints/inks, and plating used in products: Prohibited in concentrations exceeding 75 ppm in homogeneous materials.	14
			Batteries: See Table 2.1-1 on page 21-22.	Table 2.1-1
			Packaging materials: Heavy metals (lead, mercury, cadmium, and hexavalent chromium) shall not be present in materials in a total combined mass exceeding 100 ppm.	8
48	Hexavalent chromium compounds	See Table 2.1-3	Prohibited in homogeneous materials in concentrations exceeding 1000 ppm.	1
			Prohibited in leather articles and articles containing leather parts that come into contact with the skin in concentrations equal to or greater than 3 ppm of the total dry weight of the leather.	2
			Packaging materials: Heavy metals (lead, mercury, cadmium, and hexavalent chromium) shall not be present in materials in a total combined mass exceeding 100 ppm.	8
49	Lead and lead compounds	See Table 2.1-3	Prohibited in homogeneous materials in concentrations exceeding 1000 ppm. Exemptions: See Table 2.1-2 on page 23-24.	1, 2
			Plastics, paints, and inks used in products: Prohibited in homogeneous materials in concentrations of 100 ppm or more. (Lead carbonate and lead sulfate are prohibited in any concentration in paints and inks.)	13
			Batteries: See Table 2.1-1 on page 21-22.	Table 2.1-1
			Packaging materials: Heavy metals (lead, mercury, cadmium, and hexavalent chromium) shall not be present in materials in a total combined mass exceeding 100 ppm.	8
			Thermoset and thermoplastic-sheathed electrical wires, cables and cords: Prohibited in surface coating material in concentrations exceeding 300 ppm, unless the amount has been reported and approved by Epson.	31
			Jewelry (including watch bands): Prohibited in individual parts in amounts of 500 ppm or more. This does not apply, however, to internal watch parts that consumers do not touch, crystal glass, and natural gems that have not been treated with a lead additive.	2
50	Mercury and mercury compounds	See Table 2.1-3	Intentional inclusion prohibited.	12
			Prohibited in homogeneous materials in concentrations exceeding 1000 ppm. Exemptions: See Table 2.1-2 on page 23-24.	1
			Batteries: See Table 2.1-1 on page 21-22.	Table 2.1-1
			Packaging materials: Heavy metals (lead, mercury, cadmium, and hexavalent chromium) shall not be present in materials in a total combined mass exceeding 100 ppm.	8

No.	Substance (Group) Name	CAS No.	Regulation (Threshold)	Ref. Reg.
51	Azocolourants and azodyes which form certain aromatic amines* ³	See Table 2.1-3	Azo compounds that form designated amines are prohibited in parts that come into contact with the human body in products designed to be in continuous physical contact with the human body.	2
		See Table 2.	The use as substances of azodyes contained in the list of azodyes is prohibited. Prohibited in compounds in concentrations exceeding 1000 ppm.	2
52	Cobalt chloride* ⁴	7646-79-9	Prohibited in silica gel or other preparations in concentrations exceeding 100 ppm.	2
53	Tri-substituted organostannic compounds* ⁵	See Table 2.1-3	Prohibited in articles in concentrations exceeding 1000 ppm (calculated as a tin equivalent).	2, 15, 17
54	Diocetyl tin (DOT) compounds	See Table 2.1-3	Prohibited in articles in concentrations exceeding 1000 ppm (calculated as a tin equivalent). Adhesives are exempt.	2
55	Di (2-ethylhexyl) phthalate (DEHP)	117-81-7	Prohibited in homogeneous materials in concentrations exceeding 1000 ppm.	1
56	Dibutyl phthalate (DBP)	84-74-2	Prohibited in homogeneous materials in concentrations exceeding 1000 ppm.	1
57	Benzyl butyl phthalate (BBP)	85-68-7	Prohibited in homogeneous materials in concentrations exceeding 1000 ppm.	1
58	Diisobutyl phthalate (DIBP)	84-69-5	Prohibited in homogeneous materials in concentrations exceeding 1000 ppm.	1
59	Dibutyltin (DBT) compounds	See Table 2.1-3	Prohibited in concentrations exceeding 1000 ppm (calculated as a tin equivalent) in mixtures and articles for the general public.	2
60	5-tert-butyl-2,4,6-trinitro-m-xylene (Musk xylene)	81-15-2	Prohibited in concentrations exceeding 1000 ppm in articles as delivered.	3
61	4,4'-Diaminodiphenylmethane (MDA)	101-77-9	Prohibited in concentrations exceeding 1000 ppm in articles as delivered.	3
62	Diarsenic pentaoxide	1303-28-2	Prohibited in concentrations exceeding 1000 ppm in articles as delivered.	3
63	Diarsenic trioxide	1327-53-3	Prohibited in concentrations exceeding 1000 ppm in articles as delivered.	3
64	2,4 – Dinitrotoluene (2,4-DNT)	121-14-2	Prohibited in concentrations exceeding 1000 ppm in articles as delivered.	3
65	Tris (2-chloroethyl) phosphate (TCEP)	115-96-8	Prohibited in concentrations exceeding 1000 ppm in articles as delivered.	3
66	Trichloroethylene	79-01-6	Prohibited in concentrations exceeding 1000 ppm in articles as delivered.	3
67	Benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-Trimethylpentene (BNST)	68921-45-9	Intentional inclusion prohibited, except as an additive in rubber.	34
68	Polyvinyl chloride (PVC)	9002-86-2	Intentional inclusion prohibited in packaging materials, except in packaging materials for industrial products.	21

No.	Substance (Group) Name	CAS No.	Regulation (Threshold)	Ref. Reg.
69	Red phosphorus* ⁶	7723-14-0	Inclusion in concentrations exceeding 1000 ppm in resin materials used in electrical or electronic parts is prohibited. An exemption is granted, however, when any of the following apply: Inclusion in parts or locations that are not involved in the electrical insulation between different electrodes. Red phosphorus is coated with a water-proof substance or a corresponding action has been taken to effectively control the generation of phosphate.	Epson Policy
70	Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA	See Table 2.1-3	Intentional inclusion prohibited.	28
71	PAH Benzo[a]pyrene Benzo[e]pyrene Benzo[a]anthracene Chrysene Benzo[b]fluoranthene Benzo[j]fluoranthene Benzo[k]fluoranthene Dibenzo[a,h]anthracene	50-32-8 192-97-2 56-55-3 218-01-9 205-99-2 205-82-3 207-08-9 53-70-3	Production materials containing rubber or plastic components that come into direct as well as prolonged or short-term repetitive contact with the skin or oral cavity must not contain 1 ppm or more per piece.	2
72	Arsenic acid	7778-39-4	Prohibited in concentrations exceeding 1000 ppm in articles as delivered.	3
73	Formaldehyde, oligomeric reaction products with aniline (technical MDA)	25214-70-4	Prohibited in concentrations exceeding 1000 ppm in articles as delivered.	3
74	Bis (2-methoxyethyl) ether (Diglyme)	111-96-6	Prohibited in concentrations exceeding 1000 ppm in articles as delivered.	3
75	1,2-dichloroethane	107-06-2	Prohibited in concentrations exceeding 1000 ppm in articles as delivered.	3

Table 2: List of Azodyes

Substance name	CAS No.
A mixture of disodium(6-(4-anisidino)-3-sulfonato-2-(3,5-dinitro-2-oxidophenylazo)-1-naohtolato)(1-(5-chloro-2-oxidophenylazo)-2-naphtholato)chromate(1-); trisodium bis(6-(4-anisidino)-3-sulfonato-2-(3,5-dinitro-2-oxidophenylazo)-1-naphtholato)chromate(1-)	Not allocated Component 1: CAS-No.:118685-33-9 C ₃₉ H ₂₃ ClCrN ₇ O ₁₂ S ₂ Na Component 2: C ₄₆ H ₃₀ CrN ₁₀ O ₂₀ S ₂ .3Na

Treatment of Substances Regulated by REACH Regulation No. 1907/2006

Substances subject to restrictions under Annex X-VIII shall be handled as required by law.

Reference: European Chemical Agency website <https://echa.europa.eu/web/guest/home>

IEC 62474 and other sources were used for the CAS Nos. Not all substances banned from inclusion in products are covered. See Table 2.1-3 “Examples of Banned Substances & Substance Groups” on page 25-33.

For referenced regulations, see Table 2.1-4 “List of Referenced Regulations” on page 34.

Notes/Comments on substances

Notes regarding substances

- *1 Threshold per Epson policy
- *2 C8F17SO2X [X=OH, Metal salts (O-M+), halide, amide, and other derivatives including polymers]
- *3 A list of azodyes is shown in Table 2.
- *4 Indicator cards are exempt because there are no risk of aspirating cobalt chloride under ordinary conditions (ordinary use).
- *5 Tributyltin (TBT) compounds / Triphenyltin (TPT) compounds / Other tri-substituted organostannic compounds
Inclusion of Bis (tributyltin) oxide is prohibited, as it belongs to a group of substances that is unconditionally banned under Japan's Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances. (See No. 16.)
- *6 See Ban on red phosphorus https://www.epson.jp/SR/supply_chain_csr/pdf/seg_k_0100_rp_e.pdf for details.

Table 2.1-1 Battery Restrictions

Primary battery						
Battery type			Restricted substances and thresholds (as a % of battery weight)			Referenced regulation
			Cadmium and cadmium compounds	Lead and lead compounds	Mercury and mercury compounds	
1	Alkaline battery	Button cell	< 20 ppm	< 1000 ppm	Intentional inclusion prohibited. If present as an impurity, < 5 ppm in homogeneous material and < 25 mg per cell.	4, 19, 22, 30, 32, 36, 37
		Non-button cell	< 10 ppm	< 40 ppm	Intentional inclusion prohibited. If present as an impurity, < 1 ppm by weight of the battery and < 5 ppm in homogeneous material.	19, 20, 22, 23, 30, 32
2	Manganese battery	All	< 10 ppm	< 1000 ppm	Intentional inclusion prohibited. If present as an impurity, < 1 ppm by weight of the battery and < 5 ppm in homogeneous material.	19, 20, 22, 23, 30, 32
3	Lithium battery	Button cell	< 20 ppm Not applicable to industrial/commercial batteries*	< 2000 ppm Not applicable to industrial/commercial batteries*	Intentional inclusion prohibited. If present as an impurity, < 5 ppm in homogeneous material and < 25 mg per cell.	4, 30, 32, 36
		Non-button cell	< 20 ppm < 150 ppm for industrial/commercial batteries	< 2000 ppm	Intentional inclusion prohibited. If present as an impurity, < 5 ppm in homogeneous material.	4, 30, 32, 35, 36
4	Mercury-oxide battery	All	Use prohibited			19, 24, 29
5	Other primary battery	All	< 20 ppm < 150 ppm for industrial/commercial batteries	< 2000 ppm	Intentional inclusion prohibited. If present as an impurity, < 5 ppm in homogeneous material, and < 25 mg per cell in case of button cells.	4, 30, 32, 35, 36

* Industrial/commercial battery: A battery designed exclusively for industrial or commercial use.

Table 2.1-1 Battery Restrictions

Secondary battery						
Battery type			Restricted substances and thresholds (as a % of battery weight)			
			Cadmium and cadmium compounds	Lead and lead compounds	Mercury and mercury compounds	Referenced regulation
6	Ni-MH battery Alkaline secondary battery	Button cell	< 20 ppm Not applicable to industrial/commercial batteries*	< 2000 ppm Not applicable to industrial/commercial batteries*	Intentional inclusion prohibited. If present as an impurity, < 5 ppm in homogeneous material and < 25 mg per cell.	4, 19, 32, 36
		Non-button cell	< 10 ppm	< 2000 ppm < 4000 ppm for industrial/commercial batteries*	Intentional inclusion prohibited. If present as an impurity, < 1 ppm by weight of the battery and < 5 ppm in homogeneous material.	19, 20, 32, 36
7	Lead-acid battery	Use prohibited except for industrial/commercial batteries*				36
		Industrial/commercial batteries	< 100 ppm	-	Intentional inclusion prohibited. If present as an impurity, < 5 ppm in homogeneous material.	4, 19, 32, 36, 37
8	Ni-Cd battery	Use prohibited except for industrial/commercial batteries*				36
		Industrial/commercial button cell	-	-	Intentional inclusion prohibited. If present as an impurity, < 5 ppm in homogeneous material.	4, 19, 32, 36
		Industrial/commercial non-button cell	-	< 4000 ppm	Intentional inclusion prohibited. If present as an impurity, < 1 ppm by weight of the battery and < 5 ppm in homogeneous material.	4, 19, 20, 32, 36
9	Other secondary battery	All	< 20 ppm Not applicable to industrial/commercial batteries*	< 2000 ppm Not applicable to industrial/commercial batteries*	Intentional inclusion prohibited. If present as an impurity, < 5 ppm in homogeneous material and < 25 mg per cell.	4, 19, 32, 36

*Commercial/industrial battery: A battery designed exclusively for industrial or commercial use.

Table 2.1-2 EU RoHS Directive Exemptions

Table 2.1-2 lists exemptions that apply to Epson and exemption expiration dates. If the item is not listed, please check the legal exemption and its expiration date. Please contact Epson if you have any questions.

Reference: EU Commission website http://ec.europa.eu/environment/waste/rohs_eee/legis_en.htm

RoHS Directive exemptions are currently under review. Exemptions and their expiration dates may change depending on review outcomes.

Substance Group	No.	Exemption	Expiration
Mercury and mercury compounds	1 (a)	Mercury in single-capped (compact) fluorescent lamps of < 30 W for general lighting purposes: ≤ 5 mg per burner	Expired
	1 (a)	Mercury in single-capped (compact) fluorescent lamps of < 30 W for general lighting purposes: ≤ 3.5 mg per burner	Expired
	1 (a)	Mercury in single-capped (compact) fluorescent lamps of < 30 W for general lighting purposes: ≤ 2.5 mg per burner	Expired
	1 (b)	Mercury in single-capped (compact) fluorescent lamps of ≥ 30 W and < 50W for general lighting purposes: ≤ 5 mg per burner	Expired
	1 (b)	Mercury in single-capped (compact) fluorescent lamps of ≥ 30 W and < 50 W for general lighting purposes: ≤ 3.5 mg per burner	Expired
	1 (c)	Mercury in single-capped (compact) fluorescent lamps of ≥ 50 W and < 150 W for general lighting purposes: ≤ 5 mg per burner	Expired
	1 (d)	Mercury in single-capped (compact) fluorescent lamps of ≥ 150 W for general lighting purposes: ≤ 15 mg per burner	Expired
	1 (e)	Mercury in single capped (compact) fluorescent lamps for general lighting purposes with a circular or square structural shape and tube diameter ≤ 17 mm	Expired
	1 (f)	Mercury in single capped (compact) fluorescent lamps for special purposes: ≤ 5 mg per burner	Expired
	3 (a)	Mercury in short (≤ 500 mm) cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes	Expired
	3 (b)	Mercury in medium (> 500 mm ≤ 1500 mm) cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes	Expired
	3 (c)	Mercury in long (> 1500 mm) cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes	Expired
	4 (f)	Mercury in other discharge lamps not specifically addressed in RoHS Directive annexes	Undecided

Table 2.1-2 EU RoHS Directive Exemptions

Substance Group	No.	Exemption	Expiration
Lead and lead compounds	5 (b)	Lead in glass of fluorescent tubes not exceeding 0.2% by weight	Expired
	6 (a)	Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0.35% lead by weight	One year prior to the legally mandated exemption expiration date
	6 (b)	Lead as an alloying element in aluminum containing up to 0.4% lead by weight	
	6 (c)	Copper alloy containing up to 4% lead by weight	
	7 (a)	Lead in high melting temperature type solders (i.e., lead-based alloys containing 85% by weight or more lead)	Undecided
	7 (b)	Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signaling, transmission, and network management for telecommunications	Expired
	7 (c)-I	Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g., piezoelectronic devices, or in a glass or ceramic matrix compound	Undecided
	7 (c)-II	Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher	Undecided
	7 (c)-III	Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC	Expired
	7 (c)-IV	Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors	Undecided
	13 (a)	Lead in white glass used for optical applications	Undecided
	15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages	Expired
	29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC (1)	Expired
	34	Lead in cermet-based trimmer potentiometer elements	Undecided

Table 2.1-3 Examples of Banned Substances & Substance Groups

No.	Substance Group	Substance Name	CAS No.
8	Polychlorinated biphenyls (PCBs) and specific substitutes	Polychlorinated biphenyls (all isomers and congeners)	1336-36-3
8	Polychlorinated biphenyls (PCBs) and specific substitutes	Monomethyl-tetrachloro-diphenyl methane	76253-60-6
8	Polychlorinated biphenyls (PCBs) and specific substitutes	Monomethyl-dichloro-diphenyl methane	81161-70-8
8	Polychlorinated biphenyls (PCBs) and specific substitutes	Monomethyl-dibromo-diphenyl methane (DBBT)	99688-47-8
9	Polychlorinated terphenyls (PCTs)	Polychlorinated terphenyls (PCT) (all isomers and congeners)	61788-33-8
31	Hexabromocyclododecane (HBCDD) and all major diastereoisomers	Hexabromocyclododecane (HBCDD)	25637-99-4, 3194-55-6
31	Hexabromocyclododecane (HBCDD) and all major diastereoisomers	alpha-hexabromocyclododecane	134237-50-6
31	Hexabromocyclododecane (HBCDD) and all major diastereoisomers	beta-hexabromocyclododecane	134237-51-7
31	Hexabromocyclododecane (HBCDD) and all major diastereoisomers	gamma-hexabromocyclododecane	134237-52-8
31	Hexabromocyclododecane (HBCDD) and all major diastereoisomers	1,2,5,6,9,10-hexabromocyclodecane	3194-55-6
37	Polybrominated biphenyls (PBBs)	Polybrominated biphenyls	59536-65-1
37	Polybrominated biphenyls (PBBs)	Dibromobiphenyl	92-86-4
37	Polybrominated biphenyls (PBBs)	2-Bromobiphenyl	2052-07-5
37	Polybrominated biphenyls (PBBs)	3-Bromobiphenyl	2113-57-7
37	Polybrominated biphenyls (PBBs)	4-Bromobiphenyl	92-66-0
37	Polybrominated biphenyls (PBBs)	Tribromobiphenyl	59080-34-1
37	Polybrominated biphenyls (PBBs)	Tetrabromobiphenyl	40088-45-7
37	Polybrominated biphenyls (PBBs)	Pentabrphenyl	56307-79-0
37	Polybrominated biphenyls (PBBs)	Hexabromobiphenyl	59080-40-9
37	Polybrominated biphenyls (PBBs)	hexabromo-1,1-biphenyl	36355-01-8
37	Polybrominated biphenyls (PBBs)	Firemaster FF-1	67774-32-7
37	Polybrominated biphenyls (PBBs)	Heptabromobiphenyl	35194-78-6
37	Polybrominated biphenyls (PBBs)	Octabromobiphenyl	61288-13-9
37	Polybrominated biphenyls (PBBs)	Nonabiphenyl	27753-52-2
37	Polybrominated biphenyls (PBBs)	Decabromobiphenyl	13654-09-6
38	Polybrominated diphenylethers (PBDEs)	Bromodiphenyl ether	101-55-3
38	Polybrominated diphenylethers (PBDEs)	Dibromodiphenyl ethers	2050-47-7
38	Polybrominated diphenylethers (PBDEs)	Tribromodiphenyl ether	49690-94-0
38	Polybrominated diphenylethers (PBDEs)	Tetrabromodiphenyl ethers	40088-47-9
38	Polybrominated diphenylethers (PBDEs)	Hexabromodiphenyl ether	36483-60-0
38	Polybrominated diphenylethers (PBDEs)	Heptabromodiphenylether	68928-80-3
38	Polybrominated diphenylethers (PBDEs)	Nonabromodiphenylether	63936-56-1
38	Polybrominated diphenylethers (PBDEs)	Decabromodiphenyl ether	1163-19-5
38	Polybrominated diphenylethers (PBDEs)	Pentabromodiphenyl ether	32534-81-9
38	Polybrominated diphenylethers (PBDEs)	Octabromodiphenyl ether	32536-52-0
39	Polychlorinated naphthalene (Cl: 1 or more)	Naphthalene, chloro derivatives	70776-03-3
39	Polychlorinated naphthalene (Cl: 1 or more)	1-Chloronaphthalene	90-13-1
39	Polychlorinated naphthalene (Cl: 1 or more)	2-Chloronaphthalene	91-58-7
39	Polychlorinated naphthalene (Cl: 1 or more)	1,5-Dichloronaphthalene	1825-30-5
39	Polychlorinated naphthalene (Cl: 1 or more)	1,4-Dichloronaphthalene	1825-31-6
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2-Dichloronaphthalene	2050-69-3
39	Polychlorinated naphthalene (Cl: 1 or more)	1,6-Dichloronaphthalene	2050-72-8
39	Polychlorinated naphthalene (Cl: 1 or more)	1,7-Dichloronaphthalene	2050-73-9
39	Polychlorinated naphthalene (Cl: 1 or more)	1,8-Dichloronaphthalene	2050-74-0

Table 2.1-3 Examples of Banned Substances & Substance Groups

No.	Substance Group	Substance Name	CAS No.
39	Polychlorinated naphthalene (Cl: 1 or more)	2,3-Dichloronaphthalene	2050-75-1
39	Polychlorinated naphthalene (Cl: 1 or more)	2,6-Dichloronaphthalene	2065-70-5
39	Polychlorinated naphthalene (Cl: 1 or more)	1,3-Dichloronaphthalene	2198-75-6
39	Polychlorinated naphthalene (Cl: 1 or more)	2,7-Dichloronaphthalene	2198-77-8
39	Polychlorinated naphthalene (Cl: 1 or more)	Chloronaphthalene	25586-43-0
39	Polychlorinated naphthalene (Cl: 1 or more)	Dichloronaphthalene	28699-88-9
39	Polychlorinated naphthalene (Cl: 1 or more)	Pentachloronaphthalene	1321-64-8
39	Polychlorinated naphthalene (Cl: 1 or more)	Trichloronaphthalene	1321-65-9
39	Polychlorinated naphthalene (Cl: 1 or more)	Hexachloronaphthalene	1335-87-1
39	Polychlorinated naphthalene (Cl: 1 or more)	Tetrachloronaphthalene	1335-88-2
39	Polychlorinated naphthalene (Cl: 1 or more)	Perchloronaphthalene	2234-13-1
39	Polychlorinated naphthalene (Cl: 1 or more)	1,4,6-Trichloronaphthalene	2437-54-9
39	Polychlorinated naphthalene (Cl: 1 or more)	1,4,5-Trichloronaphthalene	2437-55-0
39	Polychlorinated naphthalene (Cl: 1 or more)	1,4,5,8-Tetrachloronaphthalene	3432-57-3
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,8-Tetrachloronaphthalene	6529-87-9
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,5-Tetrachloronaphthalene	6733-54-6
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,6,7,8-Hexachloronaphthalene	17062-87-2
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,4-Tetrachloronaphthalene	20020-02-4
39	Polychlorinated naphthalene (Cl: 1 or more)	1,3,5,8-Tetrachloronaphthalene	31604-28-1
39	Polychlorinated naphthalene (Cl: 1 or more)	Heptachloronaphthalene	32241-08-0
39	Polychlorinated naphthalene (Cl: 1 or more)	2,3,6,7-Tetrachloronaphthalene	34588-40-4
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4-Trichloronaphthalene	50402-51-2
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3-Trichloronaphthalene	50402-52-3
39	Polychlorinated naphthalene (Cl: 1 or more)	1,3,5-Trichloronaphthalene	51570-43-5
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,6-Trichloronaphthalene	51570-44-6
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,6-Tetrachloronaphthalene	51570-45-7
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,5-Tetrachloronaphthalene	53555-63-8
39	Polychlorinated naphthalene (Cl: 1 or more)	1,3,5,7-Tetrachloronaphthalene	53555-64-9
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,5,7-Pentachloronaphthalene	53555-65-0
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,5-Trichloronaphthalene	55720-33-7
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,7-Trichloronaphthalene	55720-34-8
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,8-Trichloronaphthalene	55720-35-9
39	Polychlorinated naphthalene (Cl: 1 or more)	1,3,6-Trichloronaphthalene	55720-36-0
39	Polychlorinated naphthalene (Cl: 1 or more)	1,3,7-Trichloronaphthalene	55720-37-1
39	Polychlorinated naphthalene (Cl: 1 or more)	1,3,8-Trichloronaphthalene	55720-38-2
39	Polychlorinated naphthalene (Cl: 1 or more)	1,6,7-Trichloronaphthalene	55720-39-3
39	Polychlorinated naphthalene (Cl: 1 or more)	2,3,6-Trichloronaphthalene	55720-40-6
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,7-Tetrachloronaphthalene	55720-41-7
39	Polychlorinated naphthalene (Cl: 1 or more)	1,3,6,7-Tetrachloronaphthalene	55720-42-8
39	Polychlorinated naphthalene (Cl: 1 or more)	1,4,6,7-Tetrachloronaphthalene	55720-43-9
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,4,5,6,7-Heptachloronaphthalene	58863-14-2
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,4,5,6,8-Heptachloronaphthalene	58863-15-3
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,4,5,6-Hexachloronaphthalene	58877-88-6
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,7-Tetrachloronaphthalene	67922-21-8
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,5,6-Tetrachloronaphthalene	67922-22-9
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,5,7-Tetrachloronaphthalene	67922-23-0
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,6,8-Tetrachloronaphthalene	67922-24-1
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,4,5-Pentachloronaphthalene	67922-25-2
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,4,6-Pentachloronaphthalene	67922-26-3
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,4,5,7-Hexachloronaphthalene	67922-27-4
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,5,6,8-Hexachloronaphthalene	90948-28-0
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,5,7,8-Hexachloronaphthalene	103426-92-2

Table 2.1-3 Examples of Banned Substances & Substance Groups

No.	Substance Group	Substance Name	CAS No.
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,4,5,8-Hexachloronaphthalene	103426-93-3
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,5,7,8-Hexachloronaphthalene	103426-94-4
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,5,6,8-Hexachloronaphthalene	103426-95-5
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,4,6,7-Hexachloronaphthalene	103426-96-6
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,5,6,7-Hexachloronaphthalene	103426-97-7
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,6-Tetrachloronaphthalene	149864-78-8
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,6,7-Tetrachloronaphthalene	149864-79-9
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,5,8-Tetrachloronaphthalene	149864-80-2
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,8-Tetrachloronaphthalene	149864-81-3
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,7,8-Tetrachloronaphthalene	149864-82-4
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,7,8-Pentachloronaphthalene	150205-21-3
39	Polychlorinated naphthalene (Cl: 1 or more)	1,3,6,8-Tetrachloronaphthalene	150224-15-0
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,6,7-Pentachloronaphthalene	150224-16-1
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,6,7-Pentachloronaphthalene	150224-17-2
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,5,6-Pentachloronaphthalene	150224-18-3
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,5,7-Pentachloronaphthalene	150224-19-4
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,5,6-Pentachloronaphthalene	150224-20-7
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,7,8-Pentachloronaphthalene	150224-21-8
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,6,8-Pentachloronaphthalene	150224-22-9
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,6,8-Pentachloronaphthalene	150224-23-0
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,3,5,8-Pentachloronaphthalene	150224-24-1
39	Polychlorinated naphthalene (Cl: 1 or more)	1,2,4,5,8-Pentachloronaphthalene	150224-25-2
40	Asbestos	Asbestos	1332-21-4
40	Asbestos	Actinolite	77536-66-4
40	Asbestos	Amosite (Grunerite)	12172-73-5
40	Asbestos	Anthophyllite	77536-67-5
40	Asbestos	Chrysotile	12001-29-5
40	Asbestos	Crocidolite	12001-28-4
40	Asbestos	Tremolite	77536-68-6
41	Ozone-depleting substances	CFC-11	75-69-4
41	Ozone-depleting substances	CFC-12	75-71-8
41	Ozone-depleting substances	CFC-13	75-72-9
41	Ozone-depleting substances	CFC-111	354-56-3
41	Ozone-depleting substances	CFC-112	76-12-0
		CFC-112	76-12-0
		CFC-112a	76-11-9
41	Ozone-depleting substances	CFC-113	76-13-1
		CFC-113	76-13-1
		CFC-113a	354-58-5
41	Ozone-depleting substances	CFC-114	76-14-2
41	Ozone-depleting substances	CFC-115	76-15-3
41	Ozone-depleting substances	CFC-211	422-78-6
		CFC-211aa	135401-87-5
		CFC-211ba	422-78-6
			422-81-1
41	Ozone-depleting substances	CFC-212	3182-26-1
41	Ozone-depleting substances	CFC-213	2354-06-5
			134237-31-3
41	Ozone-depleting substances	CFC-214	29255-31-0
		CFC-214aa	2268-46-4
		CFC-214cb	-

Table 2.1-3 Examples of Banned Substances & Substance Groups

No.	Substance Group	Substance Name	CAS No.
41	Ozone-depleting substances	CFC-215	1599-41-3
		CFC-215aa	1599-41-3
		CFC-215ba	76-17-5
		CFC-215bb	-
		CFC-215cb	-
		CFC-215ca	4259-43-2
41	Ozone-depleting substances	CFC-216	661-97-2
41	Ozone-depleting substances	CFC-217	422-86-6
41	Ozone-depleting substances	Halon-1011	74-97-5
41	Ozone-depleting substances	Halon-1202	75-61-6
41	Ozone-depleting substances	Halon-1211	353-59-3
41	Ozone-depleting substances	Halon-1301	75-63-8
41	Ozone-depleting substances	Halon-2402	124-73-2
41	Ozone-depleting substances	Carbon tetrachloride	56-23-5
41	Ozone-depleting substances	Methylchloroform	71-55-6
41	Ozone-depleting substances	Methyl bromide	74-83-9
41	Ozone-depleting substances	Ethyl bromide	74-96-4
41	Ozone-depleting substances	N-propyl bromide	106-94-5
41	Ozone-depleting substances	Trifluoromethyl iodide	2314-97-8
41	Ozone-depleting substances	Methyl chloride	74-87-3
41	Ozone-depleting substances	HBFC-21 B2	1868-53-7
41	Ozone-depleting substances	HBFC-22 B1	1511-62-2
41	Ozone-depleting substances	HBFC-31 B1	373-52-4
41	Ozone-depleting substances	HBFC-121 B4	306-80-9
41	Ozone-depleting substances	HBFC-122 B3	-
41	Ozone-depleting substances	HBFC-123 B2	354-04-1
41	Ozone-depleting substances	HBFC-124 B1	124-72-1
41	Ozone-depleting substances	HBFC-131 B3	-
41	Ozone-depleting substances	HBFC-132 B2	75-82-1
41	Ozone-depleting substances	HBFC-133 B1	421-06-7
41	Ozone-depleting substances	HBFC-141 B2	358-97-4
41	Ozone-depleting substances	HBFC-142 B1	420-47-3
41	Ozone-depleting substances	HBFC-151 B1	762-49-2
41	Ozone-depleting substances	HBFC-221 B6	-
41	Ozone-depleting substances	HBFC-222 B5	-
41	Ozone-depleting substances	HBFC-223 B4	-
41	Ozone-depleting substances	HBFC-224 B3	-
41	Ozone-depleting substances	HBFC-225 B2	431-78-7
41	Ozone-depleting substances	HBFC-226 B1	2252-78-0
41	Ozone-depleting substances	HBFC-231 B5	-
41	Ozone-depleting substances	HBFC-232 B4	-
41	Ozone-depleting substances	HBFC-233 B3	-
41	Ozone-depleting substances	HBFC-234 B2	-
41	Ozone-depleting substances	HBFC-235 B1	460-88-8
41	Ozone-depleting substances	HBFC-241 B4	-
41	Ozone-depleting substances	HBFC-242 B3	70192-80-2
41	Ozone-depleting substances	HBFC-243 B2	431-21-0
41	Ozone-depleting substances	HBFC-244 B1	679-84-5
41	Ozone-depleting substances	HBFC-251 B3	75372-14-4
41	Ozone-depleting substances	HBFC-252 B2	460-25-3
41	Ozone-depleting substances	HBFC-253 B1	421-46-5
41	Ozone-depleting substances	HBFC-261 B2	51584-26-0
41	Ozone-depleting substances	HBFC-262 B1	-

Table 2.1-3 Examples of Banned Substances & Substance Groups

No.	Substance Group	Substance Name	CAS No.
41	Ozone-depleting substances	HBFC-271 B1	1871-72-3
41	Ozone-depleting substances	HCFC-21	75-43-4
41	Ozone-depleting substances	HCFC-22	75-45-6
41	Ozone-depleting substances	HCFC-31	593-70-4
41	Ozone-depleting substances	HCFC-121 HCFC-121 HCFC-121a	134237-32-4 354-14-3 354-11-0
41	Ozone-depleting substances	HCFC-122 HCFC-122 HCFC-122a HCFC-122b	41834-16-6 354-21-2 354-15-4 354-12-1
41	Ozone-depleting substances	HCFC-123 HCFC-123 HCFC-123a HCFC-123b	34077-87-7 306-83-2 354-23-4 90454-18-5 812-04-4
41	Ozone-depleting substances	HCFC-124 HCFC-124 HCFC-124a	63938-10-3 2837-89-0 354-25-6
41	Ozone-depleting substances	HCFC-131 HCFC-131 HCFC-131a HCFC-131b	27154-33-2; (134237-34-6) 359-28-4 811-95-0 2366-36-1
41	Ozone-depleting substances	HCFC-132 HCFC-132 HCFC-132a HCFC-132b HCFC-132c	25915-78-0 431-06-1 471-43-2 1649-08-7 1842-05-3
41	Ozone-depleting substances	HCFC-133 HCFC-133 HCFC-133a HCFC-133b	1330-45-6 431-07-2 1330-45-6 75-88-7 421-04-5
41	Ozone-depleting substances	HCFC-141 HCFC-141 HCFC-141a HCFC-141b	1717-00-6; (25167-88-8) 430-57-9 430-53-5 1717-00-6
41	Ozone-depleting substances	HCFC-142 HCFC-142 HCFC-142b HCFC-142a	25497-29-4 338-65-8 75-68-3 338-64-7
41	Ozone-depleting substances	HCFC-151 HCFC-151 HCFC-151a	110587-14-9 762-50-5 1615-75-4
41	Ozone-depleting substances	HCFC-221 HCFC-221ab	134237-35-7 29470-94-8 422-26-4
41	Ozone-depleting substances	HCFC-222 HCFC-222ca HCFC-222aa	134237-36-8 422-49-1 422-30-0
41	Ozone-depleting substances	HCFC-223 HCFC-223ca HCFC-223cb	134237-37-9 422-52-6 422-50-4

Table 2.1-3 Examples of Banned Substances & Substance Groups

No.	Substance Group	Substance Name	CAS No.
41	Ozone-depleting substances	HCFC-224 HCFC-224ca HCFC-224cb HCFC-224cc	134237-38-0 422-54-8 422-53-7 422-51-5
41	Ozone-depleting substances	HCFC-225 HCFC-225aa HCFC-225ba HCFC-225bb HCFC-225ca HCFC-225cb HCFC-225cc HCFC-225da HCFC-225ea HCFC-225eb	127564-92-5 128903-21-9 422-48-0 422-44-6 422-56-0 507-55-1 13474-88-9 431-86-7 136013-79-1 111512-56-2
41	Ozone-depleting substances	HCFC-226 HCFC-226da	134308-72-8 431-87-8
41	Ozone-depleting substances	HCFC-231 HCFC-231bb	134190-48-0 421-94-3
41	Ozone-depleting substances	HCFC-232 HCFC-232fc	134237-39-1 460-89-9
41	Ozone-depleting substances	HCFC-233 HCFC-233fb	134237-40-4 7125-83-9
41	Ozone-depleting substances	HCFC-234 HCFC-234db	127564-83-4 425-94-5
41	Ozone-depleting substances	HCFC-235 HCFC-235fa	134237-41-5 460-92-4
41	Ozone-depleting substances	HCFC-241 HCFC-241db	134190-49-1 666-27-3
41	Ozone-depleting substances	HCFC-242 HCFC-242fa	134237-42-6 460-63-9
41	Ozone-depleting substances	HCFC-243 HCFC-243cc HCFC-243db HCFC-243fa	134237-43-7 7125-99-7 338-75-0 460-69-5
41	Ozone-depleting substances	HCFC-244 HCFC-244ca HCFC-244cc	134190-50-4 679-85-6 421-75-0
41	Ozone-depleting substances	HCFC-251 HCFC-251fb HCFC-251dc	134190-51-5 818-99-5 421-41-0
41	Ozone-depleting substances	HCFC-252 HCFC-252fb	134190-52-6 819-00-1
41	Ozone-depleting substances	HCFC-253 HCFC-253fb	134237-44-8 460-35-5
41	Ozone-depleting substances	HCFC-261 HCFC-261fc HCFC-261ba	134237-45-9 7799-56-6 420-97-3
41	Ozone-depleting substances	HCFC-262 HCFC-262ca HCFC-262da HCFC-262fc	134190-53-7 420-99-5 102738-79-4 421-02-3
41	Ozone-depleting substances	HCFC-271 HCFC-271ba HCFC-271fb	134190-54-8 420-44-0 430-55-7
43	Alkanes, C10-13, chloro (Short chain chlorinated paraffins)	Alkanes, C10-13, chloro	85535-84-8

Table 2.1-3 Examples of Banned Substances & Substance Groups

No.	Substance Group	Substance Name	CAS No.
43	Alkanes, C10-13, chloro (Short chain chlorinated paraffins)	Alkanes, C10-12, chloro	108171-26-2
43	Alkanes, C10-13, chloro (Short chain chlorinated paraffins)	Alkanes, C12-13, chloro	71011-12-6
43	Alkanes, C10-13, chloro (Short chain chlorinated paraffins)	Alkanes, chloro	61788-76-9
43	Alkanes, C10-13, chloro (Short chain chlorinated paraffins)	Other short chain chlorinated paraffins	-
44	Perfluorooctane sulfonates (PFOS) and its salt	2-Propenoic acid, 2-methyl-, dodecyl ester, polymers with 2-[methyl[(perfluoro-C4-8-alkyl)- sulfonyl]amino]ethyl acrylate and vinylidene chloride	306975-62-2
44	Perfluorooctane sulfonates (PFOS) and its salt	Glycine, N-ethyl-N-[(heptadecafluorooctyl)sulfonyl]-, potassium salt	2991-51-7
45	Nickel and nickel compounds	Nickel	7440-02-0
45	Nickel and nickel compounds	Nickel (II) oxide	1313-99-1
45	Nickel and nickel compounds	Nickel (II) chloride	7718-54-9
45	Nickel and nickel compounds	Nickel (II) chloride, hexahydrate	7791-20-0
45	Nickel and nickel compounds	Nickel (II) sulfate	7786-81-4
45	Nickel and nickel compounds	Nickel (II) sulfate, hexahydrate	10101-97-0
45	Nickel and nickel compounds	Nickel (II) sulfate, heptahydrate	10101-98-1
45	Nickel and nickel compounds	Antimony nickel titanium oxide yellow	8007-18-9
45	Nickel and nickel compounds	Nickel niobium titanium yellow rutile	68611-43-8
45	Nickel and nickel compounds	Cobalt titanate green spinel	68186-85-6
47	Cadmium and cadmium compounds	Cadmium	7440-43-9
47	Cadmium and cadmium compounds	Cadmium oxide	1306-19-0
47	Cadmium and cadmium compounds	Cadmium sulfide	1306-23-6
47	Cadmium and cadmium compounds	Cadmium chloride	10108-64-2
47	Cadmium and cadmium compounds	Cadmium sulfate	10124-36-4, 31119-53-6
48	Hexavalent chromium compounds	Barium chromate	10294-40-3
48	Hexavalent chromium compounds	Calcium chromate	13765-19-0
48	Hexavalent chromium compounds	Chromium trioxide	1333-82-0
48	Hexavalent chromium compounds	Sodium chromate	7775-11-3
48	Hexavalent chromium compounds	Sodium dichromate	10588-01-9 7789-12-0
48	Hexavalent chromium compounds	Strontium chromate	7789-06-2
48	Hexavalent chromium compounds	Potassium dichromate	7778-50-9
48	Hexavalent chromium compounds	Potassium chromate	7789-00-6
48	Hexavalent chromium compounds	Zinc chromate	13530-65-9
49	Lead and lead compounds	Lead	7439-92-1
49	Lead and lead compounds	Lead (II) sulfate	7446-14-2
49	Lead and lead compounds	Lead (II) carbonate	598-63-0
49	Lead and lead compounds	Trilead bis (carbonate) dihydroxide	1319-46-6
49	Lead and lead compounds	Lead (II) acetate, trihydrate	6080-56-4
49	Lead and lead compounds	Lead phosphate	7446-27-7
49	Lead and lead compounds	Lead selenide	12069-00-0
49	Lead and lead compounds	Lead (IV) oxide	1309-60-0
49	Lead and lead compounds	Lead (II,IV) oxide	1314-41-6
49	Lead and lead compounds	Lead (II) sulfide	1314-87-0
49	Lead and lead compounds	Lead (II) oxide	1317-36-8
49	Lead and lead compounds	Lead (II) phosphate	7446-27-7
49	Lead and lead compounds	Lead (II) titanate	12060-00-3

Table 2.1-3 Examples of Banned Substances & Substance Groups

No.	Substance Group	Substance Name	CAS No.
49	Lead and lead compounds///	Lead sulfate, sulphuric acid, lead salt	15739-80-7
49	Lead and lead compounds	Lead sulphate, tribasic	12202-17-4
49	Lead and lead compounds	Lead stearate	1072-35-1
49	Lead and lead compounds	Lead (II) chromate	7758-97-6
49	Lead and lead compounds	Lead chromate molybdate sulphate red	12656-85-8
49	Lead and lead compounds	Lead sulfochromate yellow	1344-37-2
50	Mercury and mercury compounds	Mercury	7439-97-6
50	Mercury and mercury compounds	Mercuric chloride	33631-63-9
50	Mercury and mercury compounds	Mercury (II) chloride	7487-94-7
50	Mercury and mercury compounds	Mercuric sulfate	7783-35-9
50	Mercury and mercury compounds	Mercuric nitrate	10045-94-0
50	Mercury and mercury compounds	Mercuric (II) oxide	21908-53-2
50	Mercury and mercury compounds	Mercuric sulfide	1344-48-5
51	Azocolourants and azodyes which form certain aromatic amines	Biphenyl-4-ylamine	92-67-1
51	Azocolourants and azodyes which form certain aromatic amines	Benzidine	92-87-5
51	Azocolourants and azodyes which form certain aromatic amines	4-chloro-o-toluidine	95-69-2
51	Azocolourants and azodyes which form certain aromatic amines	2-naphthylamine	91-59-8
51	Azocolourants and azodyes which form certain aromatic amines	o-aminoazotoluene	97-56-3
51	Azocolourants and azodyes which form certain aromatic amines	5-nitro-o-toluidine	99-55-8
51	Azocolourants and azodyes which form certain aromatic amines	4-chloroaniline	106-47-8
51	Azocolourants and azodyes which form certain aromatic amines	4-methoxy-m-phenylenediamine	615-05-4
51	Azocolourants and azodyes which form certain aromatic amines	4,4'-methylenedianiline	101-77-9
51	Azocolourants and azodyes which form certain aromatic amines	3,3'-dichlorobenzidine	91-94-1
51	Azocolourants and azodyes which form certain aromatic amines	3,3'-dimethoxybenzidine	119-90-4
51	Azocolourants and azodyes which form certain aromatic amines	3,3'-dimethylbenzidine	119-93-7
51	Azocolourants and azodyes which form certain aromatic amines	4,4'-methylenedi-o-toluidine	838-88-0
51	Azocolourants and azodyes which form certain aromatic amines	6-methoxy-m-toluidine	120-71-8
51	Azocolourants and azodyes which form certain aromatic amines	4,4'-methylene-bis(2-chloroaniline)	101-14-4
51	Azocolourants and azodyes which form certain aromatic amines	4,4'-oxydianiline	101-80-4
51	Azocolourants and azodyes which form certain aromatic amines	4,4'-thiodianiline	139-65-1
51	Azocolourants and azodyes which form certain aromatic amines	o-toluidine	95-53-4
51	Azocolourants and azodyes which form certain aromatic amines	4-methyl-m-phenylenediamine	95-80-7
51	Azocolourants and azodyes which form certain aromatic amines	2,4,5-trimethylaniline	137-17-7
51	Azocolourants and azodyes which form certain aromatic amines	o-anisidine	90-04-0

Table 2.1-3 Examples of Banned Substances & Substance Groups

No.	Substance Group	Substance Name	CAS No.
51	Azocolourants and azodyes which form certain aromatic amines	4-amino azobenzene	60-09-3
53	Tri-substituted organostannic compounds	Triphenyltin-N, N-dimethyldithiocarbamate	1803-12-9
53	Tri-substituted organostannic compounds	Triphenyltinfluoride	379-52-2
53	Tri-substituted organostannic compounds	Triphenyltinacetate	900-95-8
53	Tri-substituted organostannic compounds	Triphenyltinchloride	639-58-7
53	Tri-substituted organostannic compounds	Triphenyltinhydroxide	76-87-9
53	Tri-substituted organostannic compounds	Triphenyltin fattyacid [(9-11)salt]	18380-71-7 18380-72-8 47672-31-1 94850-90-5
53	Tri-substituted organostannic compounds	Triphenyltinchloroacetate	7094-94-2
53	Tri-substituted organostannic compounds	Tributyltinmethacrylate	2155-70-6
53	Tri-substituted organostannic compounds	Bis (tributyltin) fumalate	6454-35-9
53	Tri-substituted organostannic compounds	Tributyltinfluoride	1983-10-4
53	Tri-substituted organostannic compounds	Bis (tributyltin) 2,3-dibromosuccinate	31732-71-5
53	Tri-substituted organostannic compounds	Tributyltinacetate	56-36-0
53	Tri-substituted organostannic compounds	Tributyltinlaurate	3090-36-6
53	Tri-substituted organostannic compounds	Bis (tributyltin) phthalate	4782-29-0
53	Tri-substituted organostannic compounds	Copolymer of alkyl (c=8) acrylate,methyl methacrylate and tributyltin methacrylate	67772-01-4
53	Tri-substituted organostannic compounds	Tributyltinsulfamate	6517-25-5
53	Tri-substituted organostannic compounds	Bis (tributyltin) maleate	14275-57-1
53	Tri-substituted organostannic compounds	Tributyltinchloride	1461-22-9 7342-38-3
53	Tri-substituted organostannic compounds	Tributyltin cyclopentane carbonate mixture	85409-17-2
53	Tri-substituted organostannic compounds	Tributyltin-1, 2,3,4,4a, 4b, 5,6,10,10a-decahydro-7-isopropyl-1, 4a-dimethyl-1-phenanthrenecarboxylatemix	26239-64-5
53	Tri-substituted organostannic compounds	Other tri-substituted organostannic compounds	-
54	Diocetyl tin (DOT) compounds	Diocetyl tin oxide	870-08-6
54	Diocetyl tin (DOT) compounds	Diocetyl tin dilaurate	3648-18-8
54	Diocetyl tin (DOT) compounds	Other Diocetyl tin compounds	-
59	Dibutyltin (DBT) compounds	Dibutyltin oxide	818-08-6
59	Dibutyltin (DBT) compounds	Dibutyltin diacetate	1067-33-0
59	Dibutyltin (DBT) compounds	Dibutyltin dilaurate	77-58-7
59	Dibutyltin (DBT) compounds	Dibutyltin maleate	78-04-6
59	Dibutyltin (DBT) compounds	Other dibutyltin compounds	-
70	Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA	Pentadecafluorooctanoic acid	335-67-1
70	Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA	Ammonium pentadecafluorooctanoate	3825-26-1
70	Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA	Sodium pentadecafluorooctanoate	335-95-5
70	Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA	Potassium pentadecafluorooctanoate	2395-00-8
70	Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA	Silver pentadecafluorooctanoate	335-93-3
70	Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA	Pentadecafluorooctanoyl fluoride	335-66-0
70	Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA	Methyl pentadecafluorooctanoate	376-27-2
70	Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA	Ethyl pentadecafluorooctanoate	3108-24-5

Table 2.1-4 Regulations Referenced

No.	Name of Regulation, Legislation, Etc.	Country or Region
1	EU RoHS Directive and its revisions 2011/65/EU	EU
2	EU REACH Regulation (EC) No 1907/2006, Annex XVII (Restrictions on substances)	EU
3	EU REACH Regulation (EC) No 1907/2006, Annex XIV (Substances subject to authorization)	EU
4	EU Battery Directive 2006/66/EU	EU
5	(EC) No. 1005/2009 on substances that deplete the ozone layer	EU
6	(EC) No. 850/2004 on persistent organic pollutants (POPS)	EU
7	(EU) No. 519/2012 amending regulation on persistent organic pollutants (POPS)	EU
8	EU Directive 94/62/EEC on packaging and packaging waste	EU
9	BGBI 1990/194: Formaldehyde Regulation §2, 12/2/1990	Austria
10	Lithuania HN 96:2000 "Hygiene Norms and Regulations"	Lithuania
11	ORRChem (Ordinance on the reduction of risks relating to substances)	Switzerland
12	Sweden SFS 1998:944	Sweden
13	Denmark Lead Regulation (Ordinance No. 1012)	Denmark
14	Denmark Cadmium Regulation	Denmark
15	Norway Product Regulations	Norway
16	Japan Industrial Safety and Health Act, Harmful Substances, etc., Prohibited for Manufacturing, etc.	Japan
17	Law Concerning the Examination and Regulation of the Manufacture etc. of Chemical Substances	Japan
18	Ozone Layer Protection Act	Japan
19	Act on Preventing Environmental Pollution of Mercury	Japan
20	Quality Control and Safety Management of Industrial Products Act	South Korea
21	Regulations concerning standards, etc., concerning packaging methods for packaging materials for Korean products	South Korea
22	Restrictions on the Manufacture, Import, and Sale of Dry Batteries	Taiwan
23	Chinese National Standards (GB 24427-2009): alkaline and non-alkaline zinc manganese dioxide batteries mercury cadmium lead restriction requirements	China
24	Limits on mercury content in battery products	China
25	Toxic Substances Control Act (TSCA)	US
26	Clean Air Act of 1990, Art. 611	US
27	Formaldehyde Standards for Composite Wood Products Act	US
28	Voluntary PFOA elimination program	US
29	Mercury-Containing and Rechargeable Battery Management Act	US
30	US state battery regulations (Maine, Connecticut, Rhode Island)	US
31	Proposition 65 Case Law	California
32	Products Containing Mercury Regulations (SOR/2014-254)	Canada
33	Canadian Environmental Protection Act SOR/2008-178	Canada
34	Prohibition of Certain Toxic Substances Regulations, 2012	Canada
35	Law No. 26.184 Portable Power and Resolution	Argentina
36	Manganese battery and alkaline-manganese battery regulations	Paraguay
37	Resolution 401/2008	Brazil
38	Montreal Protocol	Treaty

Table 2.1-5 Analysis Standards

Substance	Analysis Standard
Cadmium and cadmium compounds	<p>Analytical method in accordance with IEC 62321 <u>Polymers / Metals / Electronics</u> - ICP-OES (inductively coupled plasma-optical emission spectrometry) - ICP-MS (inductively coupled plasma mass spectrometry) - AAS (atomic absorption spectroscopy) * Analysis should be performed by one of analytical methods described above. However, alternative analytical methods recommended by analysis laboratories are also acceptable. * It is preferable to perform analysis by laboratories certified according to ISO 17025. * Use the method of analysis, testing, or measurement specified by Epson, if any.</p>
Hexavalent chromium compounds	<p>* Analytical methods recommended by analysis laboratories are acceptable. Please note that “Spot-test” is not acceptable due to large limits of quantification (LOQ) and low accuracy. * It is preferable to perform analysis by laboratories certified according to ISO 17025. * Use the method of analysis, testing, or measurement specified by Epson, if any.</p>
Lead and lead compounds	<p>Analytical method in accordance with IEC 62321 <u>Polymers / Metals / Electronics</u> - ICP-OES (inductively coupled plasma-optical emission spectrometry) - ICP-MS (inductively coupled plasma mass spectrometry) - AAS (atomic absorption spectroscopy) * Analysis should be performed by one of analytical methods described above. However, alternative analytical methods recommended by analysis laboratories are also acceptable. * It is preferable to perform analysis by laboratories certified according to ISO 17025. * Use the method of analysis, testing, or measurement specified by Epson, if any.</p>
Mercury and mercury compounds	<p>Analytical method in accordance with IEC 62321 <u>Polymers / Metals / Electronics</u> - CV-AAS (cold vapor atomic absorption spectrometry) - CV-AFS (cold vapor atomic fluorescence spectrometry) - ICP-OES (inductively coupled plasma-optical emission spectrometry) - ICP-MS (inductively coupled plasma mass spectrometry) * Analysis should be performed by one of analytical methods described above. However, alternative analytical methods recommended by analysis laboratories are also acceptable. * It is preferable to perform analysis by laboratories certified according to ISO 17025. * Use the method of analysis, testing, or measurement specified by Epson, if any.</p>
Di (2-ethylhexyl) phthalate (DEHP) Dibutyl phthalate (DBP) Benzyl butyl phthalate (BBP) Diisobutyl phthalate (DIBP)	<p>Analytical method in accordance with IEC 62321 <u>Polymers / Electronics</u> - GC-MS (gas chromatography-mass spectrometry) * Analysis should be performed by the above analytical method. However, alternative analytical methods recommended by analysis laboratories are also acceptable. * It is preferable to perform analysis by laboratories certified according to ISO 17025. * Use the method of analysis, testing, or measurement specified by Epson, if any.</p>

2.2 Substances Banned from Use in Manufacturing Processes

The following is a list of substances whose use in manufacturing is prohibited by legal or other regulations. The list is not comprehensive.

No.	Substance (Group) Name	CAS No.	Referenced Regulation
1	White phosphorous	12185-10-3	Substances prohibited by the Industrial Safety and Health Law (Japan) (Article 55 and Enforcement Order 16)
2	Benzidine and its salts	92-87-5, etc.	
3	4-aminodiphenyl / 4-aminodiphenyl and its salts	92-67-1, etc.	
4	Asbestos	See Table 2.1-3, No. 40	
5	4-nitrodiphenyl and its salts	92-93-3	
6	Bis (chloromethyl) ether	542-88-1	
7	2-Naphthylamine / beta-naphthylamine and its salts	91-59-8	
8	Rubber cement containing benzene, where the benzene accounts for more than 5% of the rubber cement solvent (including diluting agent)	-	
9	Preparations or other substances that contain > 0.1% asbestos by weight; or preparations or other substances that contain > 1% of items 2, 3, 5, 6, or 7 above by weight	-	
10	1,1,1-trichloroethane	71-55-6	Montreal Protocol Montreal Protocol Annex A, B, E and C-I, II, III
11	Carbon tetrachloride	56-23-5	
12	Methyl bromide / Bromomethane	74-83-9	
13	CFC	See Table 2.1-3, No. 41	
14	Halon		
15	HBFCs		
16	Bromochloromethane	74-97-5	
17	HCFC* ¹	See Table 2.1-3, No. 41	

The following uses are exempt from this prohibition:

- (1) Small amounts of chemical reagent occasionally used as a comparative or calibration chemical in R&D applications.
- (2) CFC and HCFC contained as a cooling agent in existing facilities or equipment.
- (3) Halons contained as an extinguishing material in existing facilities or equipment.

*1 The elimination schedule is per the Montreal Protocol and applicable national laws and regulations.

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