



LexmarkTM

**Product Environmental Specification
Revision: 9**

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Owner: Brian David Cook

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Lexmark Product Environmental Specification

Revision Level: 9

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Revision History

Revision	Revision Description	Approved	Date
0.6	Initial Release	Tonya Jackson	June 21, 2004
1.0	Changed owner; updated definitions, added plastics content	Matthew Russell	August 14, 2005
1.1	Updated with new regulations	Craig Bertelsen	October 23, 2006
1.2	Renumbered sections; consolidated and renumbered tables; added Appendix B to indicate permitted exemptions; added statement regarding use of Brominated Flame Retardants; overhauled battery section; updated mercury reporting section and packaging sections.	Johnny Sears	October 24, 2007
1.3	<p>Changed section 1.2 for clarification and added requirement to confirm conformity to this specification by submitting a declaration of conformity</p> <p>Added several new terms/definitions to section 1.4</p> <p>Minor revisions to wording of section 2.4; also removed special statement on use of BFRs as this is now covered in Table 3</p> <p>Updates to batteries section (section 2.7.2 and 2.7.3 specifically); renamed 2.7.3</p> <p>Updated section 2.9 on packaging to include references to REACH substances; moved specific requirements into Table 6; added statement on the use of desiccants in customer shippable packaging</p> <p>Completely revised section 3.1 on material composition reporting requirements; added specific requirements for how information should be reported; removed previous section 3.1.1 on mercury reporting requirements as this information was redundant; created new section 3.1.1 regarding post consumer recycled content</p> <p>Minor revisions to section 3.3 on packaging material documentation; points to specific form for certifying compliance to packaging material content requirements</p> <p>Updated Table 3 – Restricted Substances to include numerous new substances to align with latest regulatory and customer requirements</p> <p>Previous Table 6 – JIG substances has been removed and replaced with a new Table 4 – Reportable Substances</p> <p>Previous Table 4 on Batteries has been renumbered to Table 5 and updated to list only material content restrictions for batteries</p> <p>Previous Table 5 on packaging material restrictions has been renumbered to Table 6 and with new restricted and reportable substances to align with latest regulatory and customer requirements.</p> <p>Appendix A has been updated with several new</p>	Johnny Sears	October 7, 2009

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	tables of expanded substance listings for certain substance families Appendix B on RoHS restrictions has been revised for clarification.		
1.4	Appendix B removed exemption 14 which has expired as of 1 January 2011	Brian David Cook	27 April 2011
1.5	Updated to restrict Phthalates DINP, DIDP and DNOP that were previously reportable as a plastic additive in Plastic components above 25g, except wires and cables. Removed references to potential restrictions due to the RoHS recast that did not come about.	Brian David Cook	7 May 2012
1.6	Corrected Table 5 - Batteries threshold limits for Cadmium and Mercury. Added reference to PCR content code required per the Manufacturing Execution System Tracking Bar Code Labels spec no. 3078962 Updated references to RoHS to state 2011/65/EU	Brian David Cook	24 July 2013
8	Revised file name to reflect EC level instead of version level from pre-Enovia control Added reference to Commission Delegated Directive (EU) 2015/863 of March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances. - DEHP - BBP - DBP - DIBP Added Taiwan and Turkey to list of countries with chemical inventories Added exemption expiration date for Mercury in Button Cell Batteries (1 September 2015) Miscellaneous corrections as needed	Brian David Cook	10 September 2015
9	Made Commission Delegated Directive (EU) 2015/863 of March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances mandatory as of 22 July 2018 to insure compliance for 22 July 2019 enforcement date - DEHP - BBP - DBP - DIBP (this phthalate was moved from the reported table 4 to restricted table 3) Updated allowed exemptions to remove 5a Removed mercury exemption for button cell batteries that expired 1 October 2015	Brian David Cook	13 Dec 2016

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1. Introduction

1.1 Purpose

This specification defines and communicates the minimum environmental requirements for the design, manufacture and marketing of Lexmark parts and products. These requirements are based on global regulatory obligations, international treaties and conventions, and certain market demands, all of which are subject to change. Be sure to use the most current version of this document as a guide and refer to the actual regulations for the details of compliance.

Since this specification is included in the contract package with our suppliers, it should be noted that it is intended to be an inclusive document that covers a range of applications. If a regulation cited within this document does not apply to the particular part or product being supplied to Lexmark, Lexmark will not unnecessarily require its suppliers to adhere to such regulations. For instance, if the part or product being supplied does not include a battery, the supplier does not need to meet the requirements described in section 2.7 - **Batteries**.

1.2 Scope

All materials, components, parts, assemblies and packaging supplied to Lexmark and/or designed by Lexmark must meet this specification, including all the tables and links referenced herein. This includes materials that are used on a product, such as coatings, grease, paints, pastes, and adhesives and materials that are shipped with products, such as toner, ink, lubricants, cleaners, wet wipes, and desiccants.

This specification also applies to materials or chemicals used to manufacture components, parts and assemblies supplied for use in Lexmark products or packaging. See section 2.5 for restrictions on the use of certain chemicals in the manufacturing process.

Compliance with this specification is subject to verification. This includes, but is not limited to the requirement that suppliers sign and submit a declaration of conformity statement. In most cases, this will be accomplished when submitting the Lexmark Materials Content Declaration Form (Lexmark DOC-0009361) as described in section 3.1. In cases where said form is not provided, suppliers shall sign and submit the Lexmark Declaration of Conformity (Lexmark DOC-0009363) as required by Lexmark (form is available at <http://www.lexmark.com/SDoC>). This may also include on-site inspection and examination on supplier's premises, upon reasonable advance notice to supplier. Failure to comply with this specification may necessitate implementation of corrective actions at the supplier's cost. Without limiting any other rights and remedies available to it under applicable law, Lexmark reserves the right to cancel any outstanding order, refuse any shipments and otherwise terminate existing agreements if the supplier fails to comply with any requirement of the specification or if Lexmark reasonably believes the supplier has failed to do so.

1.3 Document Maintenance and Control

This specification was originated by Lexmark Product Environmental Programs, Department H0D9237/001-2, 740 New Circle Road, Lexington, Kentucky 40550. The specification will be updated as new requirements or corrections are identified; however, the supplier is required to be familiar with and comply with all applicable laws, rules and regulations as these are updated. Questions and comments should be directed to the document owner listed on the title page.

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In the event of a conflict between this specification and any Lexmark part specification or material/chemical specification, the supplier must immediately notify its Lexmark purchasing representative.

1.4 Definitions

Assembly is an integrated set of components. A populated printed circuit board, fuser, or power supply are all examples of an assembly because individually functioning components can be removed.

CAS # is the Chemical Abstract System number assigned to a chemical for unique identification. The CAS numbering system is an international convention. For example, the CAS# for lead is 7439-92-1.

Component is a combination of homogenous materials that have been formed into a single manufactured mechanical or electrical part. Examples of components may include microprocessors, plastic enclosures, coin cell batteries, capacitors, etc. Assemblies and semi-finished goods are not themselves considered components but are made up of components.

Customer Shippable Packaging Materials are packaging materials (see separate definition below) that are intended to arrive at the end user customer. This does not include packaging that is used to transport parts from manufacturing location to manufacturing location.

External Cables are cables and cords that are likely to be accessible to the consumer during ordinary use.

Homogenous Material is a unit that cannot be mechanically disjointed into different materials. The term "Homogenous" means having uniform composition throughout. Examples of homogenous materials are individual types of plastics, ceramics, glass, metals, alloys, resins, and coatings. Mechanically disjointed means that the materials can, in principle, be separated by mechanical actions such as unscrewing, cutting, crushing, grinding, and abrasive processes.

Intentionally Added or Intentionally Introduced shall mean that a substance is deliberately utilized in the production of a material or part.

Materials are made up of one or more substances (e.g., an alloy is a material, which in turn is made up of a number of substances).

Mechanical plastic parts are plastic parts that do not internally carry an electrical signal such as housings, brackets, bezels, latches, etc that form the basic structure of the product and/or have mechanical functions. Plastic parts such as fans, motors, connectors, printer fuser assemblies, etc are not considered "mechanical plastic parts" in the context of this specification.

Not detectable means that a substance in a part or homogenous material is not detected at the lowest detectable limit using standard analytical methods.

Packaging is material used to protect products from damage due to storage or transportation (e.g., boxes, shipping supplies, cushioning & foam, bags, shrink wrap, tapes, adhesives). This includes any inks and dyes used to label packages.

Parts include fabricated materials, components, devices and assemblies.

Post-consumer recycled content means that at least a portion of the material content comes from post consumer materials where post consumer materials are materials generated by consumer, business, or institutional sources that have served their intended use or completed their lifecycle and

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would be destined for disposal had they not been diverted from the waste stream for reuse or recycling.

Products are stand-alone, final assemblies that Lexmark markets under its own brand including complete machines supplied by an original equipment manufacturer (OEM) to Lexmark for sale under the Lexmark brand.

REACH SVHC candidate list substances are substances identified as Substances of Very High Concern according to the process defined in Article 59 of EU REACH Regulation (EC) No. 1907/2006. The most recent list of REACH SVHCs can be found at: <https://echa.europa.eu/candidate-list-table>.

Please note that the SVHC candidate list is expected to be updated every 6 months (most likely in December and June of each year) so suppliers are advised to monitor this list accordingly.

RoHS substances are those substances regulated by European Union Directive 2011/65/EU, “on the Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment.” These substances include mercury, lead, cadmium, hexavalent chromium, polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs).

RoHS amended substances are those substance added by Commission Delegated Directive (EU) 2015/863 of March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances.

- DEHP
- BBP
- DBP
- DIBP

Substances are chemical elements and their compounds (e.g. lead is a chemical element and lead oxide is a compound). Registry numbers of the Chemical Abstracts System of the American Chemical Society (CAS #) and/or European Chemical (“EC” numbers) are attributed to all chemical elements and most of their compounds and should be used for identification purposes.

Threshold limit is the concentration level which defines the limit (equal to or) above which the presence of a substance or material in a product or part is prohibited and/or must be declared.

2. Requirements

2.1 Product Chemical Content Labeling & Hazard Communication

Lexmark products are distributed internationally and must meet the health, safety, and environmental regulations of all countries to which they are supplied. In order to comply with these regulations, a safety data sheet (SDS) must be provided or created for all products in accordance with the regulations that exist in the countries where the product will be imported, processed, used, or distributed.

Products must be also labeled according to the regulations that exist in the countries where the product will be imported, processed, used, or distributed.

Table 1 lists some of the regulations that may apply to the chemical labeling and SDS creation for products. Note that some of the regulations may apply to chemicals as raw materials or replenished supplies, but the same chemicals may be covered differently if contained in articles, the definition of which is specific to each regulation.

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2.2 Chemical Registration Requirements

The following requirements apply to the chemical components of all materials, parts, supplies and products containing chemical substances. These include, but are not limited to, bulk chemicals, inks, toners, inks and toners contained in computer printer cartridges, and other supply chemicals. Excluded are those products that can be described as articles, the definition of which is specific to each country.

All chemical substances, materials or mixtures must either comply with all applicable rules, regulations or orders under the US Toxic Substances Control Act (TSCA), 15 U.S.C.A. Section 2601*et seq.*, or must not be subject to TSCA.

Table 2 describes all countries that have chemical registration requirements and the inventory listing that is required for each. All chemicals **must be listed** on the chemical inventory for each country. Any deviations from this must be identified along with alternative compliance documentation.

2.3 Biocide Registration

Any chemicals used as biocides in Lexmark materials, parts, and products must be registered in compliance with any applicable worldwide biocide registration regulations. This includes US Federal Insecticide, Fungicide and Rodenticide Act (FIFRA 40CFR 158), EU Biocidal Products Directive 98/8/EC, and the Canadian Pest Control Products Act R.C.S. 1985, c.P-9.

2.4 Product Content Restrictions

The use of certain substances in materials, parts, or products may limit the ability to market products entirely or in certain countries or jurisdictions. In order to comply with global regulations such as the EU Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances (RoHS II) in Electrical and Electronic Equipment, Lexmark prohibits the use of some substances in its products.

Table 3 lists those chemicals and substances that **must not be present in Lexmark materials, parts, or products above the provided threshold limits**. Note that some substances are restricted only for specific applications, which are indicated in the table along with the applicable threshold limit.

2.5 Manufacturing Chemical Restrictions

The use of certain substances in the manufacture of Lexmark materials, parts, or products may restrict the ability to market products in certain countries or jurisdictions. **Ozone depleting chemicals must not be used by suppliers or any subcontracted suppliers in the manufacture of Lexmark materials, parts, and products**¹. Table A3 and Table A4 of Appendix A, attached hereto and incorporated herein by reference, provide an expanded list of these chemicals for reference.

2.6 Product Chemical Emissions

Parts and products covered by this specification shall comply with the requirements of and shall not emit toxic or environmentally detrimental chemicals during normal use conditions which exceed the threshold values or requirements listed in U.S. Code of Federal Regulation 29 CFR 1910 (tables Z 1-3) (see <https://www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR>) or the California

¹ Manufacturing processes do not include facilities equipment or systems such as chillers and fire suppression systems.

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State Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) lifetime exposure limits (see <http://www.calepa.ca.gov/>).

2.7 Batteries

2.7.1 Battery Content Restrictions

All batteries contained in parts or products covered by this specification shall meet the material content restrictions listed in **Table 5**.

2.7.2 Product Design and Labeling Requirements for Batteries

All batteries contained in parts or products covered by this specification shall be designed for easy identification and removal. Battery type, weight and location must be disclosed to Lexmark. Batteries shall be labeled with appropriate labels including but not limited to hazard warnings, battery type/chemistry, and the manufacturer/brand name. The battery marking shall be located on or adjacent to each battery. Documentation that demonstrates compliance to regulations, such as a Material Safety Data Sheet [MSDS] or Product Data Sheet [PDS], must be supplied upon request.

2.7.3 Battery Type Requirements

Battery type is limited to lithium metal or lithium ion button/coin cell battery type with the following lithium content:

- Each lithium metal cell must contain no more than 1.0 gram of lithium.
- Each lithium ion cell must have an equivalent lithium content of no more than 1.5 grams.

Batteries must be of a type that meet all applicable design, manufacture, marking, testing, and other battery specific requirements necessary to avoid classification as a dangerous good for purposes of transport for all modes of transportation, as defined in the following standards when shipped installed in, or with equipment:

- United States, "Hazardous Materials Regulations," Title 49, Code of Federal Regulations, US Department of Transportation (DOT) (Including Special Provision 188)
- International Civil Aviation Organization (ICAO), "Technical Instructions for the Safe Transport of Dangerous Goods by Air"
- International Air Transport Association (IATA), "Dangerous Goods Regulations"
- International Carriage of Dangerous Goods by Road (ADR)
- International Maritime Dangerous Goods Code (IMDG)

Each lithium battery must also be of a type that has been demonstrated to meet the lithium metal or lithium ion battery testing requirements in the most recent version of the UN Manual of Tests and Criteria, Part III, Subsection 38.3 (including any revisions, amendments, addenda, or other changes to those testing requirements that are effective as of the date on which the lithium battery is supplied to Lexmark).

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2.8 Plastic Selection, Content and Parts Coding

This section deals with the regulatory and recycling labeling requirements for plastics used in Lexmark products. This section does not apply to plastics used in packaging. Lexmark follows the ISO 11469:2000 coding scheme in which ">" and "<" (greater than and less than) symbols are used to indicate recyclability. An acronym is used between these symbols to identify the plastic. The proper acronyms are listed in ISO Standards 1043-1, 1043-2, 1043-3 and 1043-4. Here are some examples of the proper recycling code for several resins:

ABS	>ABS<
ABS/polycarbonate alloy, organic phosphorus flame retardant	>(ABS+PC)FR40<
Nylon 6/6 w/ 30% glass fiber	>PA66-GF30<
polycarbonate/PBT blend with 10% glass fiber	>(PC+PBT)-GF10<
PPE/PS, 25% glass fiber, 15% mica, organic phosphorus flame ret.	>(PPE+PS)-(GF25+P15)FR40<

Lexmark requires all plastic parts made from thermoplastic resins, including thermoplastic elastomers to be labeled irrelevant of mass (greater or less than 25 g) unless the parts:

- Only have functional surface area, such as: rollers, cams, bearings, compound gears, sliders, detack fingers, etc.
- Are made from co-injection molded parts or two-shot molded parts of incompatible resins that can not be separated
- Have Insert and outsert molded parts where the dissimilar materials can not be separated
- Have non-functional area insufficient to hold label of legible size

Parts manufactured from thermoset resin or vulcanized rubber should not be coded.

Recycling codes should be permanent, in a visible area, but should not interfere with the function or the aesthetics of the part. These marks may be made by injection molding or stamping. Lexmark prohibits the use of labels or printing inks for the purpose of these markings.

In addition to marking the parts, part drawings and/or CAD drawing files of plastic parts must include a note or statement that the part is recyclable and the resin code of the material specified for that part. Here is an example:

"This part is considered recyclable and must be coded with the following information:"
> (put ISO recycling code here) <

2.9 Packaging Materials Content

Table 6 lists all substances that are banned or restricted for use in Lexmark customer shippable packaging materials. Due to regulatory requirements such as the EU REACH Regulation, the table also lists categories of substances that must be reported to Lexmark when used. These substances are indicated as reportable in the table and while not strictly banned, suppliers are encouraged to avoid their use in Lexmark packaging materials. All other listed substances that do not have the reportable designation are prohibited.

In addition to the restrictions listed in **Table 6**, the use of desiccants in Lexmark customer shippable packaging must be approved in advance by Lexmark packaging engineering.

The full set of packaging requirements (in addition to material content requirements) can be found in the latest revision of the Lexmark packaging specification entitled, *Lexmark Supplier and Interplant*

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Packaging and Handling Specification, which is available from your Lexmark purchasing representative or at <http://www.lexmark.com/pkg-spec>.

3. Documentation Requirements

3.1 Material Composition Reporting Requirements

Lexmark requires suppliers to furnish material composition data for each component supplied to Lexmark. This information is necessary for Lexmark to meet its obligations relative to compliance certifications, customer inquiries, and product end-of-life handling programs. For each component in a product, part, or assembly, Lexmark requires that suppliers disclose every material and substance the component contains. This full material content declaration will minimize the need for Lexmark to ask suppliers for additional material declarations on said components if the list of substances of concern is expanded. In cases where full disclosure is not possible, suppliers must, at a minimum, declare the presence or absence of each substance listed in both **Table 3** and **Table 4**. For each substance in the tables that is present in a component at concentrations above the given thresholds, the weight of that substance in grams must also be reported.

It is important to note that substances listed in **Table 4** are not currently banned for use in products but regulations (such as the EU REACH Regulation), industry standards and customer requirements drive the need to report on the presence of these substances when used. Suppliers must report this information to Lexmark using the Lexmark Materials Content Declaration Form (Lexmark DOC-0009361) or an IPC 1752 class 6 material declaration². These forms are available at <http://www.lexmark.com/mat-dec> or from your Lexmark purchasing representative or engineering contact. Alternative material declaration formats must receive prior approval from Lexmark before being accepted.

At Lexmark's request, suppliers must be able to provide technical documentation to support claims made in material content reports. This documentation may include internal design controls, sub-supplier declarations, or analytical test data.

3.1.1 Post Consumer Recycled Content

Suppliers are encouraged to look for opportunities to incorporate post consumer recycled content (PCR) into products, parts, or assemblies supplied to Lexmark. All opportunities should be conveyed to your Lexmark purchasing representative or engineering contact in order to request review and approval by the Lexmark Materials Engineering Department.

Plastic parts containing PCR content must be tracked via the guidelines established in the Lexmark Manufacturing Execution System (MES) Tracking Bar Code Labels Specification no. 3078962. Any deviation in post consumer content supply must be reported to Lexmark in order to maintain status on the EPEAT registry.

² The IPC 1752 form is also available for free download at <http://www.ipc.org>

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3.2 Status Change Notification

If the material, part, or product being manufactured for or marketed by Lexmark does not meet one or more of the requirements in this specification, the supplier must immediately notify its Lexmark purchasing representative in writing. This also applies if the supplier, subcontractor or manufacturing partner makes changes in its operations that will cause a material, part or product to no longer comply with this specification.

Suppliers shall implement all Engineering Changes in conformance with this specification. Any engineering changes that include the addition of a new component or a change in material will obligate the supplier to provide the appropriate material composition documentation as described in section 3.1 above for the new component or material. In addition, Lexmark may require samples of the new component or material for testing.

Any deviation from the requirements of this specification must be approved in writing through an alternative compliance plan. A working group to include Lexmark Purchasing, Engineering, Product Environmental Programs, and the supplier (if applicable) must approve all alternative compliance plans.

3.3 Packaging Material Documentation

Certification by the supplier is required for all packaging materials purchased by Lexmark for resale of products, parts, and supplies to Lexmark customers. Each supplier of such customer shippable packaging materials must complete and sign all sections of the Lexmark Packaging Certification Form (Lexmark DOC-0009349) to declare conformity to the requirements of section 2.9 above. This form is available from your Lexmark purchasing representative or at <http://www.lexmark.com/pkg-cert>.

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4. Tables

Table 1 Chemical Hazard Communication Requirements

Country / Regulation	Requirement
Australia / NOHSC:1008(2004) Approved Criteria for Classifying Hazardous Substances; NOHSC:2011(2003) National Code of Practice for Preparation of MSDS	SDS and Appropriate Label
Canada / Hazardous Products Act, Workplace Hazardous Materials Information System (WHMIS)	SDS and Appropriate Label
European Union / Dangerous Substances Directives 67/548/EEC as amended, Dangerous Preparations Directive 1999/45/EC, Safety Data Sheets 91/155/EEC as amended and as applicable under REACH	Safety Data Sheet and Appropriate Label
Japan / Poisonous and Deleterious Substance Control Law, Industrial Safety & Health Law, Dangerous Goods Fire Service Law	SDS and Appropriate Label, possible registration of importer and volumes
Korea / Toxic Chemicals Control Act, Industrial Safety & Health Act	MSDS and Appropriate Label, registration with Ministry of Environment
Taiwan/Toxic Substances Control Act(Article 15), Labor Safety & Health Act (Article 7)	SDS and Appropriate Label
Switzerland / AS 1972 441/442 Swiss Declaration for Commercial Products	Declaration filed
U.S. / OSHA Hazard Communication 29CFR1910.1200	SDS and Appropriate Label

Table 2 Chemical Registration Requirements

Country / Registration Inventory	Requirement
Australia / Australian Inventory of Chemical Substances (AICS)	Listing on the AICS
Canada / Canadian Domestic Substances List (DSL)	Listing on the DSL
China / Inventory of Existing Chemical Substances in China (IECSC)	Listing on the IECSC
European Union / REACH	Listing or Expected Registration Date under REACH
Japan / Existing and New Chemical Substances (ENCS) List	Listing on the ENCS List
Korea / Existing Chemicals List (ECL)	Listing on the ECL
Philippines / Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Listing on the PICCS
Switzerland / Chemical Inventory	Listing on the EINECS or Swiss inventory
U.S. / Toxic Substances Control Act (TSCA) Inventory	Listing on the TSCA Inventory
Turkey / Inventory and Control of Chemicals (CICR)	Listing on the CICR
Taiwan / Taiwan Chemical Substance Inventory (TCSI)	Listing on the TCSI

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Table 3 Restricted Substances

Substances listed in this table are prohibited from use in parts or products supplied to Lexmark unless otherwise noted within the table. Any use of these substances (including unrestricted or exempted applications) must be declared to Lexmark according to section 3.1. Threshold limits are in parts per million (ppm) calculated as the mg of substance/kg of homogenous material. Note that regulatory references and examples of use are not intended to be exhaustive lists and may not cover all regulations and uses that pertain to the substance.

Chemical/Substance	Threshold Limit (ppm) w/ relevant application	Key Regulatory/other References	Examples of Use
Asbestos and its compounds	Not Detectable	ANNEX XVII of REACH Regulation (EC) No 1907/2006	Insulator, pigment, paint, fillers
Azo dyes/colorants (see Table A1)	30 (restriction applies only to textiles and leather articles)	ANNEX XVII of REACH Regulation (EC) No 1907/2006	Pigments, dyes, colorants
Bis (2-ethylhexyl) phthalate (DEHP)	Not Detectable (restriction applies to plastic components above 25g, except wires and cables) 1000 (restriction applies to plastic components less than 25g, wires and cables) 1000 (restriction applies to all Homogeneous materials starting 22 July 2018)	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006 (recommended for ANNEX XIV), China Ten Rings Appendix B Commission Delegated Directive (EU) 2015/863 of March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances. - DEHP - BBP - DBP - DIBP RoHS amended substances come into force as of 22 July 2019 Lexmark restricted as of 22 July 2018	Plasticizer (often used in flexible PVC), dye, pigment, paint, ink, adhesive, lubricant
Brominated/Chlorinated flame retardants (other than PBBs, PBDEs, HBCDD) in mechanical plastic parts	1000 (restriction does not apply to fuser assemblies, electromechanical assemblies such as fans and motors, wires & cables, circuit board laminates and circuit board components)	Market requirement: Blue Angel and other eco-labels, customer requirements	Flame rated plastics, possibly foams & adhesives

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Chemical/Substance	Threshold Limit (ppm) w/ relevant application	Key Regulatory/other References	Examples of Use
Butyl benzyl phthalate (BBP)	<p>Not Detectable (restriction applies to plastic components above 25g, except wires and cables)</p> <p>1000 (restriction applies to plastic components less than 25g, wires and cables)</p> <p>1000 (restriction applies to all Homogeneous materials starting 22 July 2018)</p>	<p>Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006 (recommended for ANNEX XIV),</p> <p>China Ten Rings Appendix B</p> <p>Commission Delegated Directive (EU) 2015/863 of March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances.</p> <ul style="list-style-type: none"> - DEHP - BBP - DBP - DIBP <p>RoHS amended substances come into force as of 22 July 2019</p> <p>Lexmark restricted as of 22 July 2018</p>	Plasticizer (often used in flexible PVC), dye, pigment, paint, ink, adhesive, lubricant
Cadmium/Cadmium compounds	100	EU Directive 2011/65/EU (RoHS2), ANNEX XVII of REACH Regulation (EC) No 1907/2006	Colorants, dyes, pigments, paints, plastic stabilizers, coatings/plating, batteries
Chromium VI/Chromium VI compounds	1000	EU Directive 2011/65/EU (RoHS2)	Colorants, dyes, pigments, anti-corrosion surface treatment, coatings/plating, stabilizers

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Chemical/Substance	Threshold Limit (ppm) w/ relevant application	Key Regulatory/other References	Examples of Use
Dibutylphthalate (DBP)	<p>Not Detectable (restriction applies to plastic components above 25g, except wires and cables)</p> <p>1000 (restriction applies to plastic components less than 25g, wires and cables)</p> <p>1000 (restriction applies to all Homogeneous materials starting 22 July 2018)</p>	<p>Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006 (recommended for ANNEX XIV), China Ten Rings Appendix B Commission Delegated Directive (EU) 2015/863 of March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances.</p> <ul style="list-style-type: none"> - DEHP - BBP - DBP - DIBP <p>RoHS amended substances come into force as of 22 July 2019 Lexmark restricted as of 22 July 2018</p>	Plasticizer (often used in flexible PVC), dye, pigment, paint, ink, adhesive, lubricant
Dibutyltin (DBT) compounds	1000	ANNEX XVII of REACH Regulation (EC) No 1907/2006, European Commission Decision 2009/425/EC	Stabilizer for PVC, curing catalyst for silicone resin and urethane resin
Diisobutyl phthalate (DIBP)	1000 (restriction applies to all Homogeneous materials starting 22 July 2018)	<p>Commission Delegated Directive (EU) 2015/863 of March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances.</p> <ul style="list-style-type: none"> - DEHP - BBP - DBP - DIBP <p>RoHS amended substances come into force as of 22 July 2019 Lexmark restricted as of 22 July 2018</p>	Plasticizer (often used in flexible PVC), dye, pigment, paint, ink, adhesive, lubricant (frequent replacement for DBP)

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Chemical/Substance	Threshold Limit (ppm) w/ relevant application	Key Regulatory/other References	Examples of Use
Dioctyltin (DOT) compounds	1000 (restriction applies only to textiles and leather articles and two-component room temperature vulcanisation, or RTV-2, moulding kits)	ANNEX XVII of REACH Regulation (EC) No 1907/2006, European Commission Decision 2009/425/EC	Stabilizer for PVC, curing catalyst for silicone resin and urethane resin
Fluorinated greenhouse gases (HFC, PFC, SF6) (see Table A2)	Not Detectable Also not permitted for use in the manufacturing process	EU Regulation (EC) No. 842/2006,	Refrigerants, blowing agents, extinguishing agents, cleaning agents, insulating media, caustic gas
Formaldehyde	Not Detectable (restriction applies only to wood products and wood containing products)	California SB 509, CARB restriction on Formaldehyde	Disinfectant and preservative for engineered wood products such as cabinets, kiosk enclosures, etc.
Hexabromocyclododecane (HBCDD) and All major diastereoisomers	1000	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006 and listed in ANNEX XIV	Flame retardant; mainly used for expanded polystyrene and some types of fiber
Lead/Lead compounds in cable jacketing of external cables	300 (limit applies only to use in cable jacketing of external cables)	California Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986	Plastic stabilizer in cables and cords
Lead/Lead compounds	1000 (see Appendix B for allowable RoHS exemptions for Lead)	EU Directive 2011/65/EU (RoHS2), California Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986	Colorants, dyes, pigments, paints or surface coatings, free-machining steel, metal alloys, plastic stabilizers, plastic resins, ceramics, solders, electronic components, glass
Mercury/Mercury compounds	1000 (see Appendix B for allowable RoHS exemptions for Mercury)	EU Directive 2011/65/EU (RoHS2), ANNEX XVII of REACH Regulation (EC) No 1907/2006	relays, switches, electrical contacts, lamps and bulbs, resin stabilizer
Nickel/Nickel compounds (external parts and chassis only)	1000 (restriction applies only to external chassis or case parts likely to result in prolonged skin exposure)	ANNEX XVII of REACH Regulation (EC) No 1907/2006, EU Directive 94/27/EEC	surface treatment, decorative plating

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Chemical/Substance	Threshold Limit (ppm) w/ relevant application	Key Regulatory/other References	Examples of Use
Ozone Depleting Substances (Class I & Class II CFCs and HCFCs) (see Table A3 & Table A4)	Not Detectable Also not permitted for use in the manufacturing process	Int'l Treaty: Montreal Protocol, US: 1990 Clean Air Act, ANNEX XVII of REACH Regulation (EC) No 1907/2006	Cleaning agents, foam plastics, solvents
Perfluorooctane sulfonates (PFOS) and salts, C8F17SO2X (X=OH, metal salt, halide, amide, and other derivatives including polymers)	Not Detectable (restriction does not apply to photoresists or anti-reflective coatings for photolithography processes, photographic coatings applied to films, papers or printing plates)	ANNEX XVII of REACH Regulation (EC) No 1907/2006	Antistatic agent for films and plastics, antireflective coatings
Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)	Not Detectable	Japan Law concerning the evaluation of chemical substances	Adhesives, paints, printing inks, plastics, inked ribbons, putty, caulking or sealing fillers
Phthalates (DINP, DIDP and DNOP)	Not Detectable (restriction applies to plastic components above 25g, except wires and cables)	JIG 101, customer requirement, China Ten Rings Appendix B	Plasticizer (often used in flexible PVC), dye, pigment, paint, ink, adhesive, lubricant
Polybrominated biphenyls (PBBs) (see Table A5)	1000	EU Directive 2011/65/EU (RoHS2), ANNEX XVII of REACH Regulation (EC) No 1907/2006	Flame rated plastics
Polybrominated diphenyl ethers/ oxides (PBDEs), including deca-BDE (see Table A6)	1000	EU Directive 2011/65/EU (RoHS2), ANNEX XVII of REACH Regulation (EC) No 1907/2006	Flame rated plastics
Polychlorinated Biphenyls (PCBs) and Terphenyls (PCTs)	Not Detectable	ANNEX XVII of REACH Regulation (EC) No 1907/2006, Germany ChemVerbots V, US TSCA, Japan Law concerning the evaluation of chemical substances	Transformers, circuit board components, lubricant oil, solvents, electrolytic solution in capacitors
Polychlorinated Napthalenes (more than 3 chlorine atoms)	Not Detectable	Japan Law concerning the evaluation of chemical substances (class 1)	Additive to rubber, lubricants and paints

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Chemical/Substance	Threshold Limit (ppm) w/ relevant application	Key Regulatory/other References	Examples of Use
Polycyclic Aromatic Hydrocarbons (PAHs) (see Table A7)	10 (total sum of PAHs) (restriction applies only to external plastics and soft surfaces likely to experience frequent skin contact)	Market Requirement: German GS Mark according to ZEK 01-08	Soft and hard plastic surfaces, especially dark plastics
Polyvinyl chloride (PVC) in mechanical plastic parts	1000 (restriction does not apply to electromechanical assemblies such as fans and motors, magnetic tapes, wires & cables and circuit board components)	Market requirement: Blue Angel and other eco-labels, customer requirements	Structural plastics, dampeners, surface protectors or thin protective films
Radioactive Substances (see Table A8)	Not Detectable	EU-D 96/29/Euratom; Japan Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors, 1986; US NRC	Optical properties (thorium), measuring devices, gauges, detector
Short chain chlorinated paraffins (C10-C13)	1000	Article 33 & 7.2 and ANNEX XVII of REACH Regulation (EC) No 1907/2006	Cutting fluids, plasticizer (PVC), paints, coatings, flame retardant in plastics, rubbers
Tri-substituted organostannic compounds (see Table A9)	Not Detected	ANNEX XVII of REACH Regulation (EC) No 1907/2006, European Commission Decision 2009/425/EC, Japan Law concerning the evaluation of chemical substances (class 1, class 2)	Stabilizer, preservatives and fungicides, inks, paints, pigments, antistaining
Tributyltin oxide (TBTO)	Not Detected	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006, Japan Law concerning the evaluation of chemical substances	Stabilizer, preservatives and fungicides, inks, paints, pigments, antistaining

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Table 4 Reportable Substances

Any use of the substances listed below must be declared to Lexmark according to section 3.1. Threshold limits are in parts per million (ppm) calculated as the mg of substance/kg of homogenous material. Note that regulatory references and examples of use are not intended to be exhaustive lists and may not cover all regulations and uses that pertain to the substance.

Note on REACH SVHC candidate list substances: According to Articles 33 and 7.2 of EU REACH Regulation (EC) No. 1907/2006, suppliers must disclose the use of substances on the SVHC candidate list to downstream users if any of those substances are present in the supplied article at concentrations greater than 0.1% weight by weight. The table below seeks to identify the REACH SVHCs and other substances of concern that are applicable to electronics products; however, suppliers are expected to be familiar with the full list of REACH SVHCs and shall report on their presence even if not included in the list below or in **Table 3**. A link to the most current list of REACH SVHCs is provided within the definition for REACH SVHCs in section 1.4.

Chemical/Substance	Threshold Limit (ppm) w/ relevant application	Key Regulatory/other References	Examples of Use
5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	1000	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006	Use not expected in electronic products
Anthracene	1000	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006	Use not expected in electronic products
Antimony/Antimony compounds	1000	Customer requirement	Flame rated plastics, glass, pigment, paint, catalyst, stabilizer, elastomer rolls
Arsenic/Arsenic compounds	1000	Customer requirement, REACH registry of intentions	Pigment, paint, dye, antifoamer for glass, III-V group semiconductor substrate (GaAs), flame retardant
Beryllium/Beryllium compounds	1000	JIG 101	Ceramics, metal alloys, catalyst, solder
Bismuth/Bismuth compounds	1000	Customer requirement	Lead free solder, solder
Brominated flame retardants (other than PBBs, PBDEs, HBCDD, and TBBPA)	1000 (reportable for all applications)	JIG 101, customer requirement	Flame rated plastics, electromechanical devices, connectors, shrink tubing, circuit board component package molding and substrates,
Chlorinated flame retardants	1000	Customer requirement	Flame rated plastics, electromechanical devices, connectors, shrink tubing, circuit board component package molding and substrates,

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Chemical/Substance	Threshold Limit (ppm) w/ relevant application	Key Regulatory/other References	Examples of Use
Chloroparaffins, medium-chained (14-17 carbon chain) (MCCPs)	1000	Customer requirement	Polyester (softener/fire retardant), insulation and sealants, glue, paint, lacquer, solvent-based surface treatments, PVC, lubricants, rubber
Cobalt dichloride	1000	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006	Use not expected in electronic products
4,4'- Diaminodiphenylmethane (4,4 – MDA)	1000	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006, JIG 101	Foams, polyurethane
Diarsenic Pentoxide	1000	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006, JIG 101	Glass, hardener for copper, lead, and gold alloys
Diarsenic Trioxide	1000	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006, JIG 101	Glass, GaAs alloys
Lead hydrogen arsenate	1000	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006	Use not expected in electronic products
Perchlorates	0.006	US/CA DTSC Rulemaking	Coin cell batteries
Phthalates (DINP, DIDP and DNOP)	1000 (reportable for wires and cables)	JIG 101, customer requirement	Plasticizer (often used in flexible PVC), dye, pigment, paint, ink, adhesive, lubricant
Polyvinyl chloride (PVC)	1000 (reportable for all applications)	JIG 101, customer requirement	Cables and wires, connectors, electronic components (such as electrolytic capacitors), battery trays, magnetic tape
Selenium/Selenium compounds	1000	Customer requirement	Anti-microbial coating in plastic products
Sodium dichromate	1000	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006	Use not expected in electronic products
TetraBromoBisphenol A (TBBPA) additive & reactive	1000	Customer requirement	Flame retardant used in FR4 and other circuit board laminates and board components

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Chemical/Substance	Threshold Limit (ppm) w/ relevant application	Key Regulatory/other References	Examples of Use
Triethyl arsenate	1000	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006	Use not expected in electronic products
Tris (2-chloroethyl) phosphate (TCEP)	1000	Proposed for Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006, JIG 101	Flame retardant

Table 5 Batteries – Material Content Restrictions

Chemical/Substance	Threshold Limit (ppm)	Key Regulatory/other References
Cadmium/Cadmium compounds	20	European Union Directive 2006/66/EC
Lead/Lead compounds	40	European Union Directive 2006/66/EC
Mercury/Mercury compounds	5	European Union Directive 2006/66/EC

Table 6 Packaging Materials - Restricted or Reportable Substances

Chemical/Substance	Threshold Limit (ppm) w/ relevant application	Key Regulatory/other References
Cadmium, Chromium VI, Lead, and Mercury and their compounds	100 (sum of concentration of all four metals and their compounds)	Article 11 of EU Directive 94/62/EC and amendments
Ozone Depleting Substances (Class I & Class II CFCs and HCFCs) (see Table A3 & Table A4)	Not Detectable Also not permitted for use in the manufacturing process	Int'l Treaty: Montreal Protocol, US: 1990 Clean Air Act, ANNEX XVII of REACH Regulation (EC) No 1907/2006
Arsenic, creosote, & compounds of chromium in wood packaging (e.g. – pallets)	ANNEX XVII of REACH Regulation (EC) No 1907/2006	ANNEX XVII of REACH Regulation (EC) No 1907/2006
Dimethylfumarate (DMF)	Not Detectable	EU Commission Decision 2009/251/EC
Brominated/Chlorinated flame retardants	1000	Market requirement
Polyvinyl chloride (PVC)	1000 (Tape used to seal certain inkjet printhead nozzles is exempt from this restriction until a suitable alternative is found)	Market requirement

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Chemical/Substance	Threshold Limit (ppm) w/ relevant application	Key Regulatory/other References
Reportable: Dangerous substances as classified in Annex I of EC Directive 67/548 and its amendments with the symbol 'N'	1000 Report concentration amount if above threshold and minimize use	EC Directive 67/548 and its amendments
Reportable: REACH SVHC candidate list substances (See section 1.4 for a link to most current list of SVHCs)	1000 Report if present above threshold and avoid use where possible	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006

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Appendix A. Detailed Substance Lists for Certain Substances

These lists are not intended to be exhaustive. They represent examples of chemicals within a substance family. Known CAS numbers are provided where possible.

Table A1 – Aromatic Amines formed from Azo colorants and Azo dyes

Chemical / Substance	CAS #
biphenyl-4-ylamine	92-67-1
Benzidine	92-87-5
4-chloro-o-toluidine	95-69-2
2-naphthylamine	91-59-8
o-aminoazotoluene	97-56-3
5-nitro-o-toluidine	99-55-8
4-chloroaniline	106-47-8
4-methoxy-m-phenylenediamine	615-05-4
4,4'-methylenedianiline	101-77-9
3,3'-dichlorobenzidine	91-94-1
3,3'-dimethoxybenzidine	119-90-4
3,3'-dimethylbenzidine	119-93-7
4,4'-methylenedi-o-toluidine	838-88-0
6-methoxy-m-toluidine	120-71-8
4,4'-methylene-bis(2-chloroaniline)	101-14-4
4,4'-oxydianiline	101-80-4
4,4'-thiodianiline	139-65-1
o-toluidine	95-53-4
4-methyl-m-phenylenediamine	95-80-7
2,4,5-trimethylaniline	137-17-7
o-anisidine	90-04-0
4-amino azobenzene	60 09 3
Notes: The European Community's aromatic amines ban applies to certain azo colorants and azo dyes that by reductive cleavage of azo groups may release one of the above 22 aromatic amines.	

Table A2 – Fluorinated Greenhouse Gas Compounds

Chemical / Substance	CAS #
Carbon tetrafluoride (Perfluoromethane)	75-73-0
Perfluoroethane (Hexafluoroethane)	76-16-4
Perfluoropropane (Octafluoropropane)	76-19-7
Perfluorobutane (Decafluorobutane)	355-25-9
Perfluoropentane (Dodecafluoropentane)	678-26-2
Perfluorohexane (Tetradecafluorohexane)	355-42-0
Perfluorocyclobutane	115-25-3
Sulfur Hexafluoride (SF6)	2551-62-4
Trifluoromethane - (HFC-23)	75-46-7
Difluoromethane - (HFC-32)	75-10-5
Methyl fluoride – (HFC-41)	593-53-3

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2H,3H-Decafluoropentane – (HFC-43-10mee)	138495-42-8
Pentafluoroethane (HFC-125)	354-33-6
1,1,2,2-Tetrafluoroethane – (HFC-134)	359-35-3
1,1,1,2-Tetrafluoroethane – (HFC-134a)	811-97-2
1,1-Difluoroethane – (HFC-152a)	75-37-6
1,1,2-Trifluoroethane–(HFC-143)	430-66-0
1,1,1-Trifluoroethane – (HFC-143a)	420-46-2
2H-Heptafluoropropane– (HFC-227ea)	431-89-0
1,1,1,2,2,3-hexafluoro-propane (HFC-236cb)	677-56-5
1,1,1,2,3,3-Hexafluoropropane – (HFC-236ea)	431-63-0
1,1,1,3,3,3-Hexafluoropropane – (HFC-236fa)	690-39-1
1,1,2,2,3-Pentafluoropropane – (HFC-245ca)	679-86-7
1,1,1,3,3-Pentafluoropropane – (HFC-245fa)	460-73-1
1,1,1,3,3-Pentafluorobutane – (HFC-365mfc)	406-58-6

Table A3 – Ozone Depleting Substances – Chlorofluorocarbons (CFCs)

Chemical / Substance	CAS #
Trichlorofluoromethane	75-69-4
Dichlorodifluoromethane (CFC12)	75-71-8
Chlorotrifluoromethane (CFC 13)	75-72-9
Pentachlorofluoroethane (CFC 111)	354-56-3
Tetrachlorodifluoroethane (CFC 112)	76-12-0
Trichlorotrifluoroethane (CFC 113)	354-58-5
1,1,2 Trichloro-1,2,2 trifluoroethane	76-13-1
Dichlorotetrafluoroethane (CFC 114)	76-14-2
Monochloropentafluoroethane (CFC 115)	76-15-3
Heptachlorofluoropropane (CFC 211)	422-78-6 135401-87-5
Hexachlorodifluoropropane (CFC 212)	3182-26-1
Pentachlorotrifluoropropane (CFC 213)	6/5/2354 134237-31-3
Tetrachlorotetrafluoropropane (CFC 214)	29255-31-0
1,1,1,3-Tetrachlorotetrafluoropropane	2268-46-4
Trichloropentafluoropropane (CFC 215)	1599-41-3
1,1,1-Trichloropentafluoropropane	4259-43-2
1,2,3-Trichloropentafluoropropane	76-17-5
Dichlorohexafluoropropane (CFC 216)	661-97-2
Monochloroheptafluoropropane (CFC 217)	422-86-6
Bromochlorodifluoromethane (Halon 1211)	353-59-3
Bromotrifluoromethane (Halon 1301)	75-63-8
Dibromotetrafluoroethane (Halon 2402)	124-73-2
Carbon Tetrachloride (Tetrachloromethane)	56-23-5
1,1,1, - Trichloroethane (methyl chloroform) ¹ and its isomers except 1,1,2-trichloroethane	71-55-6
Bromomethane (Methyl Bromide)	74-83-9
Dibromofluoromethane	1868-53-7
Bromodifluoromethane	1511-62-2
Bromofluoromethane	373-52-4
Tetrabromofluoroethane	306-80-9
Tribromodifluoroethane	-

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Dibromotrifluoroethane	354-04-1
Bromotetrafluoroethane	124-72-1
Tribromofluoroethane	-
Dibromodifluoroethane	75-82-1
Bromotrifluoroethane	421-06-7
Dibromofluoroethane	358-97-4
Bromodifluoroethane	420-47-3
Bromofluoroethane	762-49-2
Hexabromofluoropropane	-
Pentabromodifluoropropane	-
Tetrabromotrifluoropropane	-
Tribromotetrafluoropropane	-
Dibromopentafluoropropane	431-78-7
Bromohexafluoropropane	2252-78-0
Pentabromofluoropropane	-
Tetrabromodifluoropropane	-
Tribromotrifluoropropane	-
Dibromotetrafluoropropane	-
Bromopentafluoropropane	460-88-8
Tetrabromofluoropropane	-
Tribromodifluoropropane	70192-80-2
Dibromotrifluoropropane	431-21-0
Bromotetrafluoropropane	679-84-5
Tribromofluoropropane	75372-14-4
Dibromodifluoropropane	460-25-3
Bromotrifluoropropane	421-46-5
Dibromofluoropropane	51584-26-0
Bromodifluoropropane	-
Bromofluoropropane	1871-72-3
Bromochloromethane	74-97-5

Notes:

¹ Exception: may be used in manufacture of material in case of transformation use where 1,1,1-trichloroethane is consumed and does not pose a threat to the stratospheric ozone layer.

Table A4 – Ozone Depleting Substances – Hydrochlorofluorocarbons (HCFCs)

Chemical / Substance	CAS #
Dichlorofluoromethane (HCFC 21)	75-43-4
Chlorodifluoromethane (HCFC 22)	75-45-6
Chlorofluoromethane (HCFC 31)	593-70-4
Tetrachlorofluoroethane (HCFC 121)	134237-32-4
1,1,1,2-tetrachloro-2-fluoroethane (HCFC 121a)	354-11-0
1,1,2,2-tetrachloro-1-fluoroethane	354-14-3
Trichlorodifluoroethane (HCFC 122)	41834-16-6
1,2,2-trichloro-1,1-difluoroethane	354-21-2
Dichlorotrifluoroethane (HCFC 123)	34077-87-7
Dichloro-1,1,2-trifluoroethane	90454-18-5
2,2-dichloro-1,1,1-trifluoroethane	306-83-2
1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a)	354-23-4
1,1-dichloro-1,2,2-trifluoroethane (HCFC-123b)	812-04-4
2,2-dichloro-1,1,2-trifluoroethane (HCFC-123b)	812-04-4

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Chlorotetrafluoroethane (HCFC 124)	63938-10-3
2-chloro-1,1,1,2-tetrafluoroethane	2837-89-0
1-chloro-1,1,2,2-tetrafluoroethane (HCFC 124a)	354-25-6
Trichlorofluoroethane (HCFC 131)	27154-33-2;(134237-34-6)
1-Fluoro-1,2,2-trichloroethane	359-28-4
1,1,1-trichloro-2-fluoroethane (HCFC131b)	811-95-0
1-Chloro-1-fluoroethane (HCFC-151)	1615-75-4
Dichlorodifluoroethane (HCFC 132)	25915-78-0
1,2-dichloro-1,1-difluoroethane (HCFC 132b)	1649-08-7
1,1-dichloro-1,2-difluoroethane (HCFC 132c)	1842-05-3
1,1-dichloro-2,2-difluoroethane	471-43-2
1,2-dichloro-1,2-difluoroethane	431-06-1
Chlorotrifluoroethane (HCFC 133)	1330-45-6
1-chloro-1,2,2-trifluoroethane	1330-45-6
2-chloro-1,1,1-trifluoroethane (HCFC-133a)	75-88-7
Dichlorofluoroethane(HCFC 141)	1717-00-6; (25167-88-8)
1,1-dichloro-1-fluoroethane (HCFC-141b)	1717-00-6
1,2-dichloro-1-fluoroethane	430-57-9
Chlorodifluoroethane (HCFC 142)	25497-29-4
1-chloro-1,1-difluoroethane (HCFC142b)	75-68-3
1-chloro-1,2-difluoroethane (HCFC142a)	25497-29-4
Hexachlorofluoropropane (HCFC 221)	134237-35-7
Pentachlorodifluoropropane (HCFC 222)	134237-36-8
Tetrachlorotrifluoropropane (HCFC 223)	134237-37-9
Trichlorotetrafluoropropane (HCFC 224)	134237-38-0
Dichloropentafluoropropane, (Ethyne, fluoro-) (HCFC 225)	127564-92-5; (2713-09-9)
2,2-Dichloro-1,1,1,3,3-pentafluoropropane(HCFC 225aa)	128903-21-9
2,3-Dichloro-1,1,1,2,3-pentafluoropropane (HCFC 225ba)	422-48-0
1,2-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC 225bb)	422-44-6
3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC 225ca)	422-56-0
1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC 225cb)	507-55-1
1,1-Dichloro-1,2,2,3,3-pentafluoropropane(HCFC 225cc)	13474-88-9
1,2-Dichloro-1,1,3,3,3-pentafluoropropane (HCFC 225da)	431-86-7
1,3-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC 225ea)	136013-79-1
1,1-Dichloro-1,2,3,3,3-pentafluoropropane(HCFC 225eb)	111512-56-2
Chlorohexafluoropropane (HCFC 226)	134308-72-8
Pentachlorofluoropropane (HCFC 231)	134190-48-0
Tetrachlorodifluoropropane (HCFC 232)	134237-39-1
Trichlorotrifluoropropane (HCFC 233)	134237-40-4
1,1,1-Trichloro-3,3,3-trifluoropropane	7125-83-9
Dichlorotetrafluoropropane (HCFC 234)	127564-83-4
Chloropentafluoropropane (HCFC 235)	134237-41-5
1-Chloro-1,1,3,3,3-pentafluoropropane	460-92-4
Tetrachlorofluoropropane (HCFC 241)	134190-49-1
Trichlorodifluoropropane (HCFC 242)	134237-42-6
Dichlorotrifluoropropane (HCFC 243)	134237-43-7
1,1-dichloro-1,2,2-trifluoropropane	7125-99-7
2,3-dichloro-1,1,1-trifluoropropane	338-75-0
3,3-Dichloro-1,1,1-trifluoropropane	460-69-5
Chlorotetrafluoropropane (HCFC 244)	134190-50-4
3-chloro-1,1,2,2-tetrafluoropropane	679-85-6

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Trichlorofluoropropane (HCFC 251) 1,1,3-trichloro-1-fluoropropane	134190-51-5 818-99-5
Dichlorodifluoropropane (HCFC 252)	134190-52-6
Chlorotrifluoropropane (HCFC 253) 3-chloro-1,1,1-trifluoropropane (HCFC 253fb)	134237-44-8 460-35-5
Dichlorofluoropropane (HCFC 261) 1,1-dichloro-1-fluoropropane	134237-45-9 7799-56-6
Chlorodifluoropropane (HCFC 262) 2-chloro-1,3-difluoropropane	134190-53-7 102738-79-4
Chlorofluoropropane (HCFC 271) 2-chloro-2-fluoropropane	134190-54-8 420-44-0

Table A5 – Polybrominated biphenyls (PBBs)

Chemical / Substance	CAS #
Polybrominated Biphenyls	59536-65-1
Dibromobiphenyl	92-86-4
2-Bromobiphenyl	715/2052
3-Bromobiphenyl	2113-57-7
4-Bromobiphenyl	92-66-0
Tribromobiphenyl	59080-34-1
Tetrabromobiphenyl	40088-45-7
Pentabromobiphenyl	56307-79-0
Hexabromobiphenyl	59080-40-9
hexabromo-1,1-biphenyl	36355-01-8
Firemaster FF-1	67774-32-7
Heptabromobiphenyl	35194-78-6
Octabromobiphenyl	61288-13-9
Nonabiphenyl	27753-52-2
Decabromobiphenyl	13654-09-6

Table A6 – Polybrominated diphenyl ethers (PBDEs)

Chemical / Substance	CAS #
Bromodiphenyl ether	101-55-3
Dibromodiphenyl ethers	2050-47-7
Tribromodiphenyl ether	49690-94-0
Tetrabromodiphenyl ethers	40088-47-9
Pentabromodiphenyl ether (note: Commercially available PeBDPO is a complex reaction mixture containing a variety of brominated diphenyloxides.	32534-81-9 (CAS number used for commercial grades of PeBDPO)
Hexabromodiphenyl ether	36483-60-0
Heptabromodiphenylether	68928-80-3
Octabromodiphenyl ether	32536-52-0
Nonabromodiphenylether	63936-56-1
Decabromodiphenyl ether	1163-19-5

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Table A7 – Polycyclic Aromatic Hydrocarbons (PAHs)

Chemical / Substance	CAS #
Acenaphthene	83-32-9
Acenaphthylene	208-96-8
Anthracene	120-12-7
Benzo(a)anthracene	56-55-3
Benzo(a)pyrene	50-32-8
Benzo(b)fluoranthene	205-99-2
Benzo(g,h,i)perylene	191-24-2
Benzo(k)fluoranthene	207-08-9
Chrysene	218-01-9
Dibenzo(a,h)anthracene	53-70-3
Fluoranthene	206-44-0
Fluorene	86-73-7
Indeno(1,2,3-c,d)pyrene	193-39-5
Naphthalene	91-20-3
Phenanthrene	81-5-8
Pyrene	129-00-0

Table A8 – Radioactive Substances

Chemical / Substance	CAS #
Uranium-238	7440-61-1
Radon	10043-92-2
Americium-241	14596-10-2
Thorium-232	7440-29-1
Cesium (Radioactive Isotopes only)	7440-46-2 (Cs-137 010045-97-3)
Strontium (Radioactive Isotopes only)	(elemental 7440-29-6) (Sr-90 10098-97-2)
Other radioactive substances	-

Table A9 – Tri-substituted Organostannic Compounds

Chemical / Substance	CAS #
Triphenyltin=N, N-dimethyldithiocarbamate	1803-12-9
Triphenyltinfluoride	379-52-2
Triphenyltinacetate	900-95-8
Triphenyltinchloride	639-58-7
Triphenyltinhydroxide	76-87-9
Triphenyltin fattyacid((9-11)salt)	18380-71-7
	18380-72-8
	47672-31-1
	94850-90-5
Triphenyltinchloroacetate	7094-94-2
Tributyltinmethacrylate	2155-70-6
Bis(tributyltin)fumalate	6454-35-9
Tributyltinfluoride	1983-10-4
Bis(tributyltin)2,3-dibromosuccinate	31732-71-5
Tributyltinacetate	56-36-0
Tributyltinlaurate	3090-36-6

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Bis(tributyltin)phthalate	4782-29-0
Copolymer of alkyl(c=8) acrylate, methyl methacrylate and tributyltin methacrylate	67772-01-4
Tributyltinsulfamate	6517-25-5
Bis(tributyltin)maleate	14275-57-1
Tributyltinchloride	1461-22-9, 7342-38-3
Tributyltin cyclopentane carbonate=mixture	5409-17-2
Tributyltin-1, 2,3,4,4a, 4b, 5,6,10,10a-decahydro-7-isopropyl-1, 4a-dimethyl-1-phenanthrenecarboxylatemix	26239-64-5

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Appendix B. Permitted RoHS Exemptions for Lead

The Annex of the EU RoHS Directive **2011/65/EU** provides a list of application specific exemptions for the continued use of prohibited RoHS substances. While this list contains numerous exemptions, only the items listed below are permitted for use in Lexmark parts and products.

The permitted exemptions have an expiration date of 21 July 2016. If a request has been made (Note: they have for the ones listed) and the exemption process has started the exemptions will not expire on July 21, 2016. The exact date of exemption expiry for any requested exemption will not be known until the request has run through the process (Note: unless the requests are withdrawn, as has been done for 7b). If the extension request is denied, the commission will set a new expiration date that is 12-18 months from the date of the decision. If the request is granted, the new expiration date will be up to 5 years from the date of the decision. If the Commission changes the scope of the exemption, the current exemption will not expire until the date to be set by the EC.

The use of exemptions and the specific exemption(s) being claimed must be declared when reporting material content data according to section 3.1. The numbering of the items below follows the numbering used in the Annex of the Directive **2011/65/EU**.

- 5(b). Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.
- 6(a). Lead as an alloying element in steel containing up to 0.35% lead by weight
- 6(b). Lead as an alloying element in aluminum containing up to 0.4% lead by weight
- 6(c). Lead as an alloying element in copper containing up to 4% lead by weight
- 7a. Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead),
- 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
- 7(c)-II Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher
- 7(c)-III Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC
- 7 (c)-IV Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors'
- 15. Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages

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