Molex, LLC.
Product Stewardship

Molex Chemical Substances Specification For Products and Packaging: Supplier Requirements

Contents

1.0 Purpose

2.0 Scope

3.0 Revisions

4.0 Summary of Requirements

5.0 Requirements in Detail

- 5.1 Product Contents Definition
- 5.2 Product Compliance Requirements
- 5.3 Full Material Declaration Requirements
- 5.4 Declaration of Non-Use Requirements
- 5.5 Processing Information
- 5.6 Substance Testing
- 5.7 XRF Screening
- 5.8 Molex-Specified Parts
- 5.9 Customer-Specified Parts
- 5.10 Packaging Compliance Requirements
- 5.11 Environmental Information Change Management
- 5.12 Revisions to Specification

6.0 Definitions

7.0 Molex Resources

8.0 References

1.0 Purpose

This document specifies the necessary chemical substance information to be provided to Molex by suppliers.

2.0 Scope

Products:	This specification applies to products, sub-assemblies, components, materials, and packaging supplied to Molex by suppliers that are present in Molex products at any time. a) Molex products that are designed, manufactured, sold, or distributed by Molex. b) Molex products whose design and production are outsourced to third parties. c) Third parties' products whose design and production are outsourced to Molex, except for when the third parties specify the parts and materials, and the third parties had clearly communicated to Molex that EHS data is not required. Any chemical that has the potential to remain in or on the product is in scope. Any other chemical that does not have the potential to remain in or on the product is not in scope.
Packaging:	This specification applies to packaging materials used for delivery to customers and protection of parts, e.g., trays, reels, sticks, bags, cushions, staples, sheets, wraps, tapes, labels, corrugated cardboard, wooden frames, vinyl ties, and inks or paints for printing on packaging. Packaging is subject to different legal, industry, and customer requirements than products.

3.0 Revisions

This document supersedes all previous revisions.

Revision:	F
Date of Release:	October 9th, 2023
Revision Details:	4.0 & 5.3 – Added IPC1752A Class D form as another FMD submission method
	5.6 – Updated information on substance testing standards
	7.0 – Expanded Molex chemical substances list

4.0 Summary of Requirements

Suppliers must first register with the Molex SAP Ariba solution by contacting the Molex local representative or by requesting access to the Molex Suppliers Portal.

Suppliers of materials or components shall provide the following documents to Molex. The forms or relevant Molex standards can be downloaded from Section 7.0 – Molex Resources. For detailed explanation of each requirement, review Section 5.0 – Requirements in Detail.

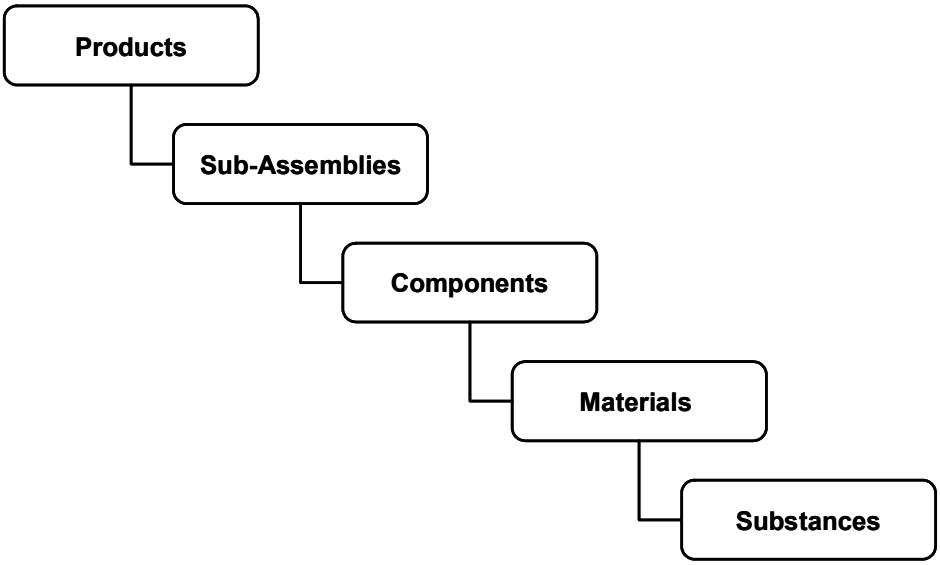
Full Material Declaration (FMD)[1] (Choose from one of three options): • IPC 1752A Class D • IMDS (Molex ID: 13255) • Molex Data Collection Tool (DCT)
Declaration of Non-Use (DoNU)[2]
Substance Test Reports[3]
Declaration of Non-Use for Packaging[4]

[1]For automotive components, IMDS is the only acceptable method.
[2]For medical products, DoNU is not required but supplier must submit RoHS, REACH, and EU MDR declaration.
[3]By ISO 17025 accredited laboratories that strictly followed IEC 62321.
[4]Not mandatory, required only if requested.

⚠ Alternative documents are unacceptable as they may not sufficiently meet Molex requirements.

5.0 Requirements in Detail

5.1 Product Contents Definition



Products – Assembly level parts that are sold to external or internal customers. Sub-Assemblies and components may be products themselves, or they may be used in higher-level assemblies that are products.

Sub-Assemblies – Sub-Assemblies are assembled units that are combined with other components or sub-assemblies to create finished products. Sub-Assemblies are combinations of components. This level does not exist for all products.

Components – A component is a part of a sub-assembly or product that is fabricated from Material(s) or purchased from suppliers that fabricate them from materials. Components may also result from the combination of other components, materials, substances and/or compounds. (Ex: Plated, lubricated terminals).

Materials (Raw Materials) – Materials are the items of which something is composed or can be made (see also homogeneous materials below). Components may consist of several materials. A material may also be a coating that is applied during the construction of the product. For example, in terminals plated with both a nickel and a Tin layer, the base metal (copper alloy) and each plating layer is considered a homogeneous material and therefore shall be considered separately. As another example, a cable is constructed of wire, insulation, jacketing and may be marked with ink. Each of these materials is considered a homogeneous material.

Substances / Substance Groups – Substances are physical materials made up of one or more chemical compounds or elements. Substances have a discrete physical existence with uniform properties. A collection of substances that are chemically similar is a substance group, for example lead compounds.

5.2 Product Compliance Requirements

No prohibited substance listed in the Molex Chemical Substances List shall be contained (intentionally added or as an impurity) in any homogeneous material at a concentration level that exceeds the MCV. No detectable level of banned substances is permitted. If specified by the Molex requestor, additional substance restrictions may apply.

Exemptions utilized, whether legislative or as indicated, shall be declared to Molex in the FMD and/or Declaration of Non-Use.

5.3 Full Material Declaration Requirements

Suppliers of materials shall provide a full declaration of the intentionally added substances, except up to 5% of the intentionally added substances may be classified as proprietary substances. Proprietary substances shall not contain prohibited or declarable substances above the thresholds/MCVs in Molex Chemical Substances List.

For the substances that are reported in the FMD, the following information shall be provided:

- Substance names and CAS numbers
- Average PPM and/or Percent levels in each homogeneous material

Supplier should provide the FMD utilizing IPC 1752A Class D XML form, IMDS (Molex Company ID 13255), or the Molex Data Collection Tool (DCT). Acceptable alternatives shall be agreed between the supplier and the Molex requestor. Molex may request alternative formats of data submission as they become available, e.g., a supplier website. IMDS is the only acceptable method for transportation related products.

Any exemptions utilized shall be clearly indicated for the material.

5.4 Declaration of Non-Use Requirements

Suppliers shall provide a Declaration of Non-Use:

- Confirmation that none of the prohibited substances in the Molex Chemical Substances List are contained in any homogeneous material at a concentration level that exceeds the MCVs shown (no detectable level of banned substances is permitted). If any prohibited substance exists above the MCV, it shall be indicated by CAS number with proportion in unit of PPM contained in the homogeneous material.
- Declaration of the amount of each declarable substance that exceeds the threshold listed by CAS number with proportion in unit of PPM contained in the homogeneous material.
- All substances, proprietary and non-proprietary, that contain prohibited or declarable substances above the specified thresholds/MCVs shall be declared in the Declaration of Non-Use by CAS number and maximum proportion contained in the homogeneous material.
- Declaration of any exemption utilized.
- Substance testing is not required when creating this declaration. The declaration may be made based on technical knowledge of the supply chain and substances contained.

*For medical products, DoNU is not required but supplier must submit RoHS, REACH, and EU MDR declaration.

5.5 Processing Information

Where applicable, suppliers shall supply processing information for products, sub-assemblies, components, or materials to facilitate processing by Molex or Molex's customers. Processing information shall include:

- Solder heat resistance time and temperature
- Plating material used on solderable portions of the part.
- Other product-specific processing information, as requested.

5.6 Substance Testing

To validate conformance to the MCSS substance restrictions, Molex may require suppliers to submit substance test reports for selected substances. Substance testing shall be performed for each of the substances of interest (as indicated by the Molex requestor) for each homogeneous material. Substance testing shall be conducted through ISO 17025 accredited laboratories that strictly follows the procedures specified in IEC 62321. Test reports shall contain the information listed in Substance Testing Requirements for Trace Analysis of Prohibited Substances Analysis Report Requirements.

Material Suppliers – shall submit initial substance test reports for lead (Pb), cadmium (Cd), mercury (Hg), hexavalent chromium (Cr(VI)), polybrominated biphenyls and polybrominated diphenyl ethers (PBB and PBDE), and EU RoHS phthalates: DEHP, BBP, DBP, DIBP. In addition, raw materials suppliers may also be required to submit test reports for halogens: bromine (Br) and chlorine (Cl), antimony (Sb), beryllium (Be), and other phthalates. After the initial substance test report, material suppliers shall submit re-certification at least annually to ascertain that the material composition is unchanged, the manufacturing process is unchanged, and the test results are still expected to be valid. Re-certification shall be submitted using the Test Report Certification form. Molex may require annual substance testing of materials.

Component Suppliers - upon request, component suppliers shall submit initial substance test reports for lead (Pb), cadmium (Cd), mercury (Hg), hexavalent chromium (Cr(VI)), polybrominated biphenyls and polybrominated diphenyl ethers (PBB and PBDE), and EU RoHS phthalates: DEHP, BBP, DBP, DIBP. After the initial substance test report, component suppliers shall submit re-certification at least annually to ascertain that the composition is unchanged, the manufacturing process is unchanged, and the test results are still expected to be valid. Re-certification shall be submitted using the Test Report Certification form. Molex may require annual substance testing of components.

Note: In some cases, Molex customers may not accept re-certification. Thus, ongoing annual substance testing may be required upon request by Molex.

All substance testing shall be performed using the approved methods specified in the Substance Testing Requirements for Trace Analysis of Prohibited Substances.

5.7 XRF Screening

Material and component suppliers may be required to provide XRF screening results with each lot shipped to Molex. This requirement is based on commodity type and perceived compliance risk to Molex. Suppliers required to provide XRF screening on a lot-by-lot basis will be notified by Molex of this requirement and the substances requiring screening.

5.8 Molex-Specified Parts

Component suppliers are not required to supply FMD for certain parts (products, sub-assemblies, components, or materials) which Molex specifies the materials and design, e.g., a molded part for which Molex specified the resin to be used. In this case, Molex may obtain environmental information directly from the material supplier(s), and the component supplier may be required to provide documentation as well (for example, declaration of non-use). Molex may require component suppliers to confirm that the parts, as supplied, are manufactured using the Molex-specified material(s).

5.9 Customer-Specified Parts

When customers require the use of components or materials from specific suppliers, and that the customer has requested Molex to manage EHS data, Molex shall request environmental information from those suppliers as necessary to satisfy the legal, industry, and customer requirements for environmental information for the products involved.

When customers require the use of components from specific suppliers, and that the customer has clearly communicated to Molex that EHS data for the customer-specified part is NOT required, then EHS data is not required. Since such components are out of scope of MCSS requirements, it cannot be allowed to be applied to general market products (custom product only, sold to a single customer). On that note, if the customer does not clearly waive the requirement with written communications, Molex must continue to manage EHS data, meaning collecting it from its supplier(s).

In the event a customer-specified supplier refuses to provide EHS information, Molex shall notify the customer and reserve the right to change to another supplier.

5.10 Packaging Compliance Requirements

Corrugated Packaging
All Molex corrugated packaging that is used to ship products that are sold directly into the European Union shall meet the requirements of the EU Directive 94/62/EC (Packaging and Packaging Waste Reduction), and REACH Regulation 1907/2006, including their subsequent revisions.

Wood Packaging
Pallets and other wood packaging used to transport parts from suppliers to Molex shall meet the requirements of The General Standard for Pallets (Molex Standard 2156860009).

Recycling Marking
All packaging suppliers shall meet the recycling marking requirements as defined on the applicable Molex drawings or specifications for each packaging item. If the Molex drawings or specifications for individual packaging components do not contain recycling marking requirements, the recycling marking requirements of The General Standard for Packaging Design to Minimize Environmental Impact shall apply.

Substance Requirements
No packaging may contain prohibited substances above the MCVs listed in the Molex Chemical Substances List – packaging of this specification.

5.11 Environmental Information Change Management

Suppliers shall maintain a reliable, systematic process for notifying customers of changes to environmental information (including any changes to the composition of materials). Suppliers shall provide advanced notice of changes (material composition changes, changes of materials in parts, different manufacturing process, etc.) that affect any environmental information previously supplied per this specification in accordance with the Molex purchasing terms and conditions. Suppliers shall submit revised environmental information (FMD, DoNU, and/or substance test report) along with the change notice.

Suppliers of raw materials shall provide annual RoHS Test Report Certification confirming there has been no changes to their materials that would affect the most recently submitted information. Only the Molex Test Report Certification shall be used for this confirmation unless otherwise approved by Molex.

5.12 Revisions to Specification

Molex shall review this document at least annually and shall make whatever changes are necessary to continue to control substances that are regulated, projected to be regulated, or have the potential to be regulated for the protection of human health and the environment. This includes all legal, industry, and customer requirements that are relevant to Molex products. Upon release of a newer revision, Molex will communicate it to its suppliers and ample time will be given to conform with the newest revision.

6.0 Definitions

Banned Substances

Banned substances are prohibited substances where the maximum concentration value is 0 parts per million. No detectable level of a banned substance is permitted in a homogeneous material.

Chemical Abstract Service (CAS) Number

A number assigned by the American Chemical Society to identify a specific substance or compound.

Contained In

'Contained in' refers to a situation in which a substance is added to, blended with, fills up, or adheres to products, sub-assemblies, components, or materials. This definition applies to substances that remain in or on the final product, regardless of if the substance is intentionally added or an impurity.

Data Collection Tool (DCT)

The Data Collection Tool (DCT) is an Excel-based tool used to transmit FMD and other necessary information. Various checks are incorporated to guide the supplier to input the data correctly.

Declarable Substances

For substances that are not currently prohibited substances, there may still be a legal, industry, or customer requirement to report the proportion parts per million level when it is above a threshold. These substances are classified as declarable substances and are either included in legal requirements (for example, the REACH legislation), or may be included in future restrictions as prohibited substances. Declarable substances shall be reported to Molex when present above thresholds found in this specification.

Declaration Of Non-Use (DONU)

A Declaration of Non-Use (DoNU) supplements the FMD to help determine compliance to legal, industry, and customer product environmental requirements. A DoNU considers substances that may be present unintentionally as contaminants or trace substances in the product or component. The DoNU evaluates each homogeneous material against a list of prohibited and declarable substances. The DoNU certifies or confirms that none of the homogeneous materials in the product or component contains any prohibited substance above its respective maximum concentration value and reports any declarable substance above its respective reporting threshold.

Exemptions

Exemptions are specific situations where a deviation is allowed from the requirements that would otherwise apply. Exemptions can apply at any level, but they are generally grouped into material exemptions, product exemptions, and application exemptions (end-use exemptions). Molex shall not generally specify exemptions for applications since Molex does not control the end-use for its products. In certain cases, Molex may identify products as exempt to specific regulations based on the application of the product, provided the end-use applications are limited and known, or if customer(s) have confirmed the end-use application in writing.

Full Material Declaration (FMD)

A Full Material Declaration (FMD) is a bill of substances that is like a bill of materials, but it contains the specific chemical substances that are intentionally used in the composition of the product or component. The FMD details the list of substances at the level of each homogeneous material. The FMD shall not include process chemicals unless the chemicals become an integral part of the final product. An example of a process chemical is a lubricant

used during the process of the material or part and the chemical does not remain on the material or part when the product is shipped. Alternatively, the FMD shall include a surface coating applied during processing that is not removed before product shipment (for example, an environmental barrier). If a solvent evaporates, then the solvent shall not be included in the FMD, but the remaining substances shall be declared (for example, hardened glue after the solvent evaporates). The FMD shall be used in conjunction with the declaration of non-use (see below) to determine if products comply with legal, industry, or customer environmental requirements.

Halogen

Halogen refers to substances such as chlorine, bromine, and each of its compounds. For example, chlorine and its compounds are considered halogens. The term "Halogen Free Low Halogen" (HFLH) is a Molex compliance requirement. Compliant with HFLH means that the product is either free of all halogen substances or is compliant with the industry standards: JS709C, JEDEC JEP 709, and IEC 61249-2. Not Compliant would mean the opposite. These substances are targeted for gradual phase out.

Homogeneous Materials

Homogeneous materials are materials that are of uniform composition throughout and that cannot be mechanically disjointed into different materials. Homogeneous materials are raw materials used to fabricate a product, or materials that are applied to a raw material or a product during fabrication. For example, in terminals plated with both a nickel and a Tin layer, the base metal (copper alloy) and each plating layer is considered a homogeneous material and therefore shall be considered separately. As another example, a cable is constructed of wire, insulation, jacketing and may be marked with ink. Each of these materials is considered a homogeneous material.

Impurities/Trace Substances

Impurities or trace substances are substances in a material that are not intentionally added. Impurities/trace substances are substances that exist in natural materials or substances generated in the process of producing a material. These substances shall not be included in the FMD but shall be addressed in the Declaration of Non-Use.

Intentionally Added Substances

Intentionally added substances are substances that are deliberately used in the formulation or fabrication of a product, sub-assembly, component, or material to provide specific characteristics, appearance, or quality. Intentionally added substances may be prohibited substances, declarable substances, or substances that are neither prohibited nor declarable. Intentionally added substances may also be referred to as the ingredients of the product. These are the substances that shall be included in the FMD.

Maximum Concentration Value (MCV)

For prohibited substances, the upper limit on the amount of the substance that can be included in the homogeneous material is called the maximum concentration value or MCV. The MCV should be expressed in terms of parts per million. Maximum concentration values for prohibited substances apply regardless of whether the prohibited substance is intentionally added or an impurity/trace substance and the MCV shall apply to the amount of the substance contained in each homogeneous material.

Prohibited Substances

Substances for which specific maximum limits (maximum concentration values) are set for their parts per million level content in materials. Prohibited substances are determined by legal, industry, or customer requirements. See definition for banned substances also.

The controls on prohibited substances apply to both intentionally added substances and impurities/trace substances. Prohibited substances shall not be contained in products or packaging supplied to Molex above MCVs found in this specification.

Proprietary Substances

Proprietary substances are substances that are considered confidential because they supply some unique, competitive performance, cost, or quality advantages. Prohibited and declarable substances shall not be proprietary substances.

Test Report Certification

Suppliers of materials and components to Molex shall submit initial substance test reports for lead (Pb), cadmium (Cd), mercury (Hg), hexavalent chromium (Cr+6), polybrominated biphenyls (PBB), polybrominated diphenyl ethers (PBDE), butyl benzyl phthalate (BBP), di(2-ethylhexyl) phthalate (DEHP), dibutyl phthalate (DBP), and diisobutyl phthalate (DIBP), and may also be required to submit test reports for halogens: bromine (Br) and chlorine (Cl), antimony (Sb), beryllium (Be), and any other phthalates besides the above. After the initial substance test report, suppliers shall submit re-certification at least annually to ascertain that the material composition is unchanged, the manufacturing process is unchanged, and the test results are still expected to be valid.

Threshold

The threshold is the level above which the presence of a substance or material shall be declared (declarable substances) based on the requirements of this specification. Thresholds apply regardless of whether the specific substance is an intentionally added substance or an impurity/trace substance.

7.0 Molex Resources

Molex Chemical Substances List

http://www.molex.com/suppliers/images/CASNumberList_Search1.xlsx

Data Collection Tool (DCT)

https://www.molex.com/suppliers/english/Molex_DCT_20191216_V%202.2.3.7.xls

Declaration of Non-Use Form

http://www.molex.com/suppliers/images/201404-0032.docx

Declaration of Non-Use Packaging Form

http://www.molex.com/suppliers/images/201404-0034.docx

Molex General Standard for Packaging Design to Minimize Environmental Impact

Molex Standard 2156860019

Molex Substance Testing Requirements for Trace Analysis of Prohibited Substances Specification

https://www.molex.com/suppliers/images/QEHS-699000-302_rev_E.pdf

Supplier Portal

www.suppliers.molex.com

Supplier Registration Form

http://www.molex.com/supplier/login.jsp

Test Report Certification Form

http://www.molex.com/suppliers/images/Test_Report_Certification.doc

8.0 References

China SJ/T 11364-2014

Marking for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Product (China RoHS Labeling)

EU Commission Delegated Directive (EU) 2015/863

Commission Delegated Directive (EU) 2015/863 of 31 March 2015 amending Annex II to Directive 2011/65/EU on adding four additional Phthalates: Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP), and Diisobutyl phthalate (DIBP) to be restricted.

EU Directive 2000/53/EC (ELV)

Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on the end-of-life vehicles, as amended by commission decisions.

EU Directive 2011/65/EU (RoHS)

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, as amended by commission decisions.

EU Directive 94/62/EC Article 11 (Packaging and Packaging Waste Reduction)

Directive 94/62/EC Article 11, of the European Parliament and of the Council of 20 December 1994 on packaging and packaging waste, as amended by commission decisions.

EU Directive 97/129/EC (Packaging Identification)

Directive 97/129/EC commission decision of 28 January 1997 establishing the identification system for packaging materials pursuant to European Parliament and Council directive 94/62/EC on packaging and packaging waste (Text with EEA relevance)

EU Regulation 1907/2006 (REACH)

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorization, and restriction of Chemicals (REACH), as amended, including Regulation (EC) 1272/2008

Global Automotive Declarable Substance List (GADSL)

www.gadsl.org

IEC 62474 – Material Declaration for Products of and for the Electrotechnical Industry

http://std.iec.ch/iec62474

International Material Data System (IMDS)

https://public.mdsystem.com/en/web/imds-public-pages

ISPM 15

International Standard for Phytosanitary Measures No. 15 With Modifications to Annex I (2006)

Medical Device Regulation (EU 2017/745)

Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices, amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC