

TDK-Lambda Group
Green Procurement
Standard

28th edition

*it is merged into TDK Green Procurement Standard.

Document name was changed to TDK-Lambda group Green Procurement Standard.

Apr 16, 2020

TDK-Lambda Corporation

ENVIRONMNT QUARITY DIV

Product Environment G

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TDK-Lambda changed the word “Green Procurement Guideline” to “Green Procurement Standard” to facilitate activity of environment protection more as one of TDK group. TDK-Lambda requirement became same as TDK Green Procurement Standard.

<<TDK-Lambda Environmental Philosophy>>

We protect the earth by taking care of nature and limited natural resources. This is the responsibility of all the people of the world.

TDK-Lambda declares that preserving the earth's environment is a top priority. We not only deal with issues of company-wide, but each of us also participates actively in the activity as a member of the community.

Introduction

TDK group promotes activity for protection of the global environment.

We have entered an age in which protection of the global environment is one of the most important issues for corporate activities in terms of achieving the sustainable development of humankind. Related efforts enhance corporate value, and their steady accumulation contributes to the international community. In order to fulfill our responsibility to the environment, at TDK we have stipulated an Environmental Policy and Environmental Vision. The goal of Environmental Vision 2035 is “to halve the CO2 emission basic-unit in a life-cycle perspective by 2035”. In our relations with suppliers in particular, with the aim of giving priority to the procurement of production parts and materials that contribute to reducing the environmental load, we established the TDK Green Procurement Standard (First Edition) in April 1999 and request the cooperation of our suppliers in the creation of environment-conscious products.

In order to take account of changes in Japanese and international environment-related laws and regulations, as well as changes in social requirements and technological progress, we have conducted a revision of this document. We request our suppliers to appreciate TDK’s environmental efforts and the contents of this document, and we look forward to their continued cooperation by supply chain unity.

For more information on TDK’s environmental responsibility, please visit the TDK website →
Sustainability → Environment → Environmental Policy and Environmental Vision.

English: https://www.tdk.com/corp/en/sustainability/environmental_responsibility/sus03100.htm

Japanese: https://www.jp.tdk.com/corp/ja/sustainability/environmental_responsibility/sus03100.htm

Chinese: https://www.jp.tdk.com/corp/zh/sustainability/environmental_responsibility/sus03100.htm

April 1, 2020
Procurement & Logistics Group
SCM & Management System HQ
TDK Corporation

1. About the TDK Green Procurement Standard

1-1 Purpose

The purpose of this document is to give priority to the procurement of purchased items from suppliers that contribute to reducing the environmental load and fulfill social responsibility by clarifying chemical substances that are prohibited (“prohibited substances”) and chemical substances for which controlled content is required (“controlled substances”), thereby further promoting green procurement activities by the TDK Group.

1-2 Scope of Application

This document applies to business partners from whom the TDK Group procures products or to whom it consigns manufacture, etc. (hereafter referred to collectively as “suppliers”) and purchased items sold and delivered by suppliers to the TDK Group. Please note, however, that if the TDK Group requires a specific standard relating to chemical substance content in addition to this document, the specific requirement shall take precedence.

1-3 Definition of Terms

The terms in this document shall be defined as follows:

(1) TDK Group

The “TDK Group” covers companies in Japan and overseas in which TDK Corporation, either directly or indirectly, possesses a majority of the voting rights of all shareholders.

(2) Purchased items

“Purchased items” are products sold and delivered by suppliers to the TDK Group that conform to one of the following four categories:

(a) Chemical

A “chemical” is a substance or Preparation as explained in TITLE I Chapter 2 Article 3(1) and (2), respectively, of the European Council’s No. 1907/2006 REACH regulation (Registration, Evaluation, Authorization and Restriction of Chemicals).

Ex. Metallic material, metallic oxide, resin pellet, paste, solder, binder, adhesive, paint, ink

(b) Part

A “part” is an article as explained in TITLE I Chapter 2 Article 3(3) of the European Council’s No. 1907/2006 REACH regulation. Ex. Electronic parts, machinery parts, insulation tape and film

(c) Packaging

Among (b) parts, “packaging” refers to items used for sending, protecting, and identifying TDK products.

Ex. Trays, bags, buffer materials, staplers, cardboard boxes, reels, tape, binding bonds, wraps, labels, manuals, index cards

Exceptions: Retrievable and reusable pallets, containers, and boxes that do not cause secondary contamination

(d) Other purchased items

Among items sold and delivered by suppliers to the TDK Group, “other purchased items” refer to items that do not fall into any of the above three categories and for which either the TDK Group designates applicability of this document or the supplier declares applicability of this document.

Ex. Jigs and tools, office items, metal molds, equipment, and other items designated by the TDK Group

(3) Chemical substances

“Chemical substances” refer to elements (single substances) and compounds (including alloys).

(4) Environment-related substances

“Environment-related substances” refer to the chemical substances designated by the TDK Group and listed in attached Environment-Related Substances (Appendix 1) that exert an impact, or have a possibility of exerting an impact, on the human body, environment, or socially.

(5) Prohibited substances

Among environment-related substances, “prohibited substances” refer to the chemical substances listed in the attached Environment-Related Substances (Appendix 1) “Prohibited Substances A-1,” “Prohibited Substances A-2,” “Prohibited Substances A (Supplement).”

(6) Content-controlled substances

Among environment-related substances, “content-controlled substances” refer to the chemical substances listed in the attached Environment-Related Substances (Appendix 1) “Content-Controlled Substances A.”

(7) Content

“Content” refers to the fact that chemical substances are included in purchased items as ingredients or constituents.

(8) Intentional addition

“Intentional addition” refers to the fact that a specified chemical substance is included in the purchased item for a reason.

(9) Impurities

Among substances contained in purchased items, “impurities” refer to substances that cannot be totally removed mechanically in the refining process or substances that occur in the synthetic reaction process and technically cannot be totally removed.

Note: Although dopant, which is used in the manufacture of semiconductor devices, etc., is sometimes added intentionally, the extremely small amount remaining in semiconductor devices is actually treated as an impurity.

(10) Non-applicability

“Non-applicability” refers to an exception being made to the application of prohibited substance and content-controlled substance regulations if the supplier uses the substance only for a specific end use, accurately enters the contained amount, and declares non-applicability.

(11) End use

“End use” refers to purpose of use in the purchased item using the chemical substance. The existence or not of prohibition, threshold levels, non-applicability, and so on are stipulated by end use in the annex.

Note: The end use in the purchased item using the chemical substance refers not to end use by the TDK Group but, for example, the addition of formaldehyde for making a purchased textile product. If the attached table entry were as follows, content would be prohibited.

| Chemical substances | Requirement | Applications(use) of substance and scope of the Standards |
|---------------------|--------------------|---|
| Formaldehyde | Content prohibited | Textile product |

(12) Threshold level

The “threshold level” stipulated in the annex is the permissible concentration of the chemical substance contained in each subpart of a purchased item.

Note: Some laws define the threshold level as the ratio of concentration per total product weight rather than per subpart. In this document, however, the definition is concentration ratio per subpart.

(13) Subpart

A “subpart” is a homogeneous material part that cannot be separated anymore.

(14) Homogeneous material

A “homogeneous material” is a material that cannot be mechanically separated into other materials. “Homogenous” means “of uniform composition throughout,” and “cannot be mechanically separated” means that it cannot be separated by unscrewing, cutting, shredding, grinding, polishing, etc.

Ex. Plastic, ceramic, glass, metal, plating film, paper, resin, ink, coating material, paint

1-4 Guarantee

(a) The supplier is required to “guarantee” that the purchased item conforms to this document and that information in submitted documents is accurate and complete. Please note that even if the purchased item or materials in the purchased item have been manufactured by a company other than the supplier, the supplier is required to take responsibility and submit accurate and complete information on the purchased item and purchased item materials.

(b) In the case that conformity with this document applies to only part of purchased item specifications, nonconformity with this document, including a violation of the guarantee described above, will be considered to be a defect of the purchased item.

1-5 Confidentiality

In principle submitted information will only be used within the TDK Group. If a public organization or customer of the TDK Group requests disclosure, we will disclose the information after taking appropriate measures so that the supplier cannot be identified, etc. We will abide by related laws, ordinances, and other norms in the handling of suppliers’ personal information.

1-6 Revisions

This document may be revised to take account of Japanese and international laws and regulations, changes in social requirements, etc.

1-7 Inquiries

Please make inquiries and submit materials requested in this document to the requesting section of the TDK Group or the following contact:

Product Environment G

Quality Assurance Department,

Environment Quality Div.

TDK-Lambda Corporation

Tel.: +81-258-23-0260 Fax: +81-259-21-1115

2. Environment-Related Substance Standards

2-1 Prohibition of Prohibited Substances

In principle purchased items must not contain prohibited substances. However, this does not apply if a prohibited substance under the threshold level stipulated in Environment-Related Substances (Appendix 1) is contained as an impurity or if the supplier itself declares accurately in advance of delivery that the purchased item contains a prohibited substance.

2-2 Declaration of Content-Controlled Substances

If a purchased item contains a content-controlled substance, the supplier itself must declare accurately in advance of delivery that the purchased item contains a content-controlled substance. However, this does not apply if a content-controlled substance below the threshold level stipulated in the Environment-Related Substances (Appendix 1) is contained as an impurity.

2-3 Survey of Chemical Substance Content

If the TDK Group requests a supplier to conduct a survey relating to this document, if the supplier itself declares substance content in accordance with the provisions of 2-1 and 2-2, or if the supplier declares non-applicability, please accurately compile documents as shown in List of Materials to Be Submitted (Appendix 2) depending on the type of purchased item and promptly submit them.

2-4 Amendment of Information on Chemical Substance Content in Purchased Items

If information on chemical substances contained in purchased items (composition, amount contained, etc.) is amended, or if a change occurs, please update the Survey of Chemical Substance Content information immediately and notify the TDK Group of the correction in writing.

2-5 Additions and Changes to Standards of External Organizations Quoted in Appendix

The prohibited substances and content-controlled substances stipulated in the attached Appendix are quotations of the lists of prohibited substances and content-controlled substances stipulated in the legal requirements of other countries (REACH, RoHS [Restriction of Hazardous Substances directive], etc.) or independently by external organizations, such as the Global Automotive Declarable Substance List (GADSL). Since it is essential to conform to these lists in order to meet legal requirements and customer and social requirements, the TDK Group requests suppliers to regularly check these lists and deliver purchased items that meet the requirements of the latest applicable list. If, as a result of a list amendment, it is determined that a purchased item does not meet the requirements of the amended list, please update the Survey of Chemical Substance Content information within 30 days from the day of list amendment and notify the TDK Group of the correction in writing. If there is no report, it will be assumed that the requirements of the amended list are guaranteed.

Please note that lists will be amended regardless of the wishes of the TDK Group and without any specific forewarning to suppliers.

2-6 Response to Further Survey Requests

If the TDK Group considers it necessary because of legal revisions, changes in customer requirements, revisions of this document, or other reasons, the TDK Group may request a further Survey of Chemical Substance Content for all or specific purchased items. In this case, we ask suppliers to submit the further survey promptly. However, the following complementary documents may be submitted in lieu of a further survey:

- (a) Non-use guarantee, non-use certificate, etc. relating to the amended part
- (b) Non-use guarantee, non-use certificate, etc. relating to the specific requirement

2-7 Response to Revision of This Document

If the TDK Group revises this document, suppliers are requested to check the content immediately. If, as a result of the revision, a purchased item no longer satisfies this document, please update the Survey of Chemical Substance Content information within 30 days from the said revision and notify the TDK Group of the correction in writing. If there is no notification, it will be assumed that the requirements of the amended list are guaranteed.

3. Related Documents and Materials

Appendix 1 Environment-Related Substance List

See Appendix 1 for specific substance lists and supplementary lists.

How to Read Appendix 1

| Requirement | Threshold level | Meaning |
|--------------------|-----------------|---|
| Content prohibited | — | Prohibited to be intentionally added or to be contained as impurity |
| Content prohibited | < 1,000 ppm | Intentional addition prohibited; content as impurity must be less than 1,000 ppm. |
| Content controlled | — | If content is identified, the amount must be clarified and declared, regardless of whether it is intentional addition or impurity. |
| Content controlled | < 1,000 ppm | If content exceeds 1,000 ppm, the amount must be clarified and declared, regardless of whether it is intentional addition or impurity. |
| Non-applicability | — | In certain specific cases, if no special provisions are provided separately, the supplier may be exempted from application of the prohibited substance or content-controlled substance standards if the supplier accurately enters the contained amount and declares non-applicability. |

Note: Even if specific legal requirements (RoHS directive, ELV director, etc.) stipulate “no more than” (\leq), in consideration of customer requirements, etc., this document stipulates “less than” ($<$).

Appendix 2 List of Documents to Be Submitted

Appendix 3 Analysis Methods

4. Record of Establishment and Revisions

| | |
|---------------|--------------|
| April 1, 2004 | 1st edition |
| Dec 21, 2004 | 2nd edition |
| Jan 21, 2005 | 3rd edition |
| Apr 26, 2006 | 4th edition |
| Nov 29, 2006 | 5th edition |
| Feb 27, 2008 | 6th edition |
| Oct 8, 2008 | 7th edition |
| Nov 5, 2008 | 8th edition |
| Nov 27, 2009 | 9th edition |
| Mar 8, 2011 | 10th edition |
| Jan 17, 2012 | 11th edition |
| Jul 13, 2012 | 12th edition |
| Jan 31, 2013 | 13th edition |
| Aug 20, 2013 | 14th edition |
| Dec 27, 2013 | 15th edition |
| Sep 1, 2014 | 16th edition |
| Jan 7, 2015 | 17th edition |
| Sep 9, 2015 | 18th edition |
| Dec 28, 2015 | 19th edition |
| July 21, 2016 | 20th edition |
| Nov 15, 2016 | 21st edition |
| Feb 10, 2017 | 22nd edition |
| Sep 22, 2017 | 23rd edition |
| May 7, 2018 | 24th edition |
| Aug 7, 2018 | 25th edition |
| Jan 31, 2019 | 26th edition |
| Sep 2, 2019 | 27th edition |
| Apr 10, 2020 | 28th edition |

5. Main Revisions

- TDK-Lambda Green Procurement Guideline was merged into TDK Green Procurement Standard.

- Revision of Appendix 1 Environment-Related Substance List
 - Addition of PFOA (Prohibited Substances A-1)

PFOA has been added as prohibited substance because it will transition from Annex XVII of the REACH regulation to the EU POPs regulation.
 - Addition of red phosphorus (Prohibited Substances A-2)

JEITA (Japan Electronics and Information Technology Industries Association) issued a call for caution concerning "the occurrence of troubles in case red phosphorus that proper moisture-proofing treatment is not implemented is used as flame retardant in resins". Considering the risk of serious accidents involving production of fumes or fires due to the deterioration of the insulation of the resin and corrosion of terminals, it was decided to restrict the use of red phosphorus limited to high risk applications.
 - Revision of the provisions concerning phthalates

The provisions concerning "Selected Phthalates Group 1 and Group 2" in Content-Controlled Substances A are included in "REACH (EC) No. 1907/2006 Annex XVII (Restricted substances)" of Prohibited Substances A-1, so they were deleted from Content-Controlled Substances A in order to avoid duplication and inconsistency.

Prohibited Substances A-1

| Chemical substances | CAS No. | Requirement | Threshold level | Scope | Reference List |
|--|--|--------------------|-------------------------------------|--|------------------|
| Cadmium/Cadmium compounds | See the latest versions of IEC 62474 or GADSL accordingly | Content prohibited | <100ppm | All applications except for packaging and batteries (See Prohibited Substances A (Supplement) for packaging and batteries) | 1 to 8, 18 |
| | | Non-applicability | - | Exempted applications of the latest version of EU RoHS 2011/65/EU Annex III, IV, and ELV 2000/53/EC Annex II | |
| Hexavalent chromium compounds; Chromium VI compounds | See the latest versions of IEC 62474 or GADSL accordingly | Content prohibited | <1,000ppm | All applications except for packaging (See Prohibited Substances A (Supplement) for packaging) | 1 to 8, 18 |
| | | Non-applicability | - | Exempted applications of the latest version of EU RoHS 2011/65/EU Annex III, IV, and ELV 2000/53/EC Annex II | |
| Lead/Lead compounds | See the latest versions of IEC 62474 or GADSL accordingly | Content prohibited | <1,000ppm | All applications except for packaging and batteries (See Prohibited Substances A (Supplement) for packaging and batteries) | 1 to 8, 18 |
| | | Non-applicability | - | Exempted applications of the latest version of EU RoHS 2011/65/EU Annex III, IV, and ELV 2000/53/EC Annex II | |
| Mercury/Mercury compounds | See the latest versions of IEC 62474 or GADSL accordingly | Content prohibited | <1,000ppm | All applications except for packaging and batteries (See Prohibited Substances A (Supplement) for packaging and batteries) | 1 to 11, 18 |
| | | Non-applicability | - | Exempted applications of the latest version of EU RoHS 2011/65/EU Annex III, IV, and ELV 2000/53/EC Annex II | |
| Specific bromine flame retardant polybrominated biphenyls (PBB's) | See the latest versions of IEC 62474 or GADSL accordingly | Content prohibited | <1,000ppm | Plastic preproducts (Resin) | 1, 3 to 6, 8, 19 |
| Specific bromine flame retardant polybrominated diphenyl ethers (PBDE's) | See the latest versions of IEC 62474 or GADSL accordingly | Content prohibited | <1,000ppm | Plastic preproducts (Resin) | 1, 3 to 6, 8, 19 |
| Bis (2-ethylhexyl) Phthalate (DEHP) | 117-81-7 | Content prohibited | <1,000ppm | All applications | 39 |
| Butyl Benzyl Phthalate (BBP) | 85-68-7 | Content prohibited | <1,000ppm | All applications | 39 |
| Dibutyl Phthalate (DBP) | 84-74-2 | Content prohibited | <1,000ppm | All applications | 39 |
| Diisobutyl Phthalate (DIBP) | 84-69-5 | Content prohibited | <1,000ppm | All applications | 39 |
| Hexabromocyclododecane (HBCD) and all major diastereoisomers | See the latest versions of IEC 62474 | Content prohibited | - | All applications | 3, 30, 38 |
| Perfluorooctanoic acid (PFOA), its salts and PFOA related compounds | See the latest versions of IEC 62474 or GADSL accordingly | Content prohibited | <25ppb | PFOA or its salts in substances, mixtures or articles. | 28,38 |
| | | | <1,000ppb (1ppm) | Total amount of PFOA related compounds in substances, mixtures or articles. | |
| REACH (EC) No. 1907/2006 Annex XVII (Restricted substances) | See the latest information from the Homepage of ECHA (European Chemicals Agency) https://echa.europa.eu/substances-restricted-under-reach | Content prohibited | Depending on legal requirements | Depending on the limitation of each substances | 3 |
| Substances classified as "P (Prohibited)" or "D / P (Declarable / Prohibited)" in "GADSL Reference List" | See the latest information of "GADSL Reference List" http://www.gadsl.org | Content prohibited | <1,000ppm (If not stated otherwise) | Depending on the limitation of each substances | 1 to 8, etc |

GADSL

Substances listed in the "Global Automotive Declarable Substance List (GADSL)" published by the Global Automotive Stakeholder Group (GASG)

(Always the latest version is applied.)

<http://www.gadsl.org>

IEC62474

Substances listed in the International IEC62474 Standard for electrical and electronic products published by the International Electrotechnical Commission(IEC).

(Always the latest version is applied.)

<http://std.iec.ch/iec62474>

Prohibited Substances A-1 Non-applicability List(EU RoHS 2011/65/EU)

EU RoHS 2011/65/EU Annex III / EU RoHS 2011/65/EU Annex IV

http://ec.europa.eu/environment/waste/rohs_eee/legis_en.htm

Prohibited Substances A-1 Non-applicability List(ELV 2000/53/EC)

ELV 2000/53/EC AnnexII

http://ec.europa.eu/environment/waste/elv_index.htm

Prohibited Substances A-2

| Chemical substances | CAS No. | Requirement | Threshold level | Scope | Reference List |
|---|--------------|--------------------|-----------------------------|---|----------------|
| Asbestos | See IEC62474 | Content prohibited | - | All applications | 3, 21 |
| Certain azo compounds | See IEC62474 | Content prohibited | <30ppm | Parts from products coming into direct contact with the human body and which were manufactured to function in continual contact with it. (Leather and textile products) | 3 |
| Arsenic/Arsenic compounds | See IEC62474 | Content prohibited | <1,000ppm | All applications except for the following exempted applications. | 3 |
| | | Non-applicability | - | Compound semiconductors containing an arsenic component; copper foil bonding on printed circuit boards | - |
| Fluorinated greenhouse gases (HFC, PFC, SF6) | See IEC62474 | Content prohibited | - | All applications (Examples: Refrigerants, blowing agents, extinguishing agents, cleaning agents, insulating media, caustic gas) | 22 |
| Formaldehyde | 50-00-0 | Content prohibited | - | Composite wood products (plywood, particle board, MDF) or Components | 23 |
| | | Content prohibited | <75ppm | Textiles | 24 |
| | | Non-applicability | - | All applications other the above | - |
| Nickel | 7440-02-0 | Content prohibited | 0.5µg/cm ² /week | Applications with possibility of direct and prolonged contact with the skin (Examples: Exterior of portable electronic equipment) | 3 |
| Ozone Depleting Substances | See IEC62474 | Content prohibited | - | All applications | 25 to 27 |
| Perfluorooctane sulfonate (PFOS) C8F17SO2X (X=OH, metal salt, halide, amide and other derivatives including polymers) | See IEC62474 | Content prohibited | - | All applications | 28 to 30 |
| Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl) ; 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)-Phenol | 3846-71-7 | Content prohibited | - | All applications | 30 |
| Polychlorinated biphenyls (PCB's) | See IEC62474 | Content prohibited | - | All applications | 3, 21, 30 |
| Polychlorinated Terphenyls (PCTs) | 61788-33-8 | Content prohibited | - | All applications | 3, 21, 30 |
| Polychlorinated naphthalenes (PCNs) (Cl ≥ 2) | See IEC62474 | Content prohibited | - | All applications | 30 |
| Radioactive substances | See IEC62474 | Content prohibited | - | All applications | 31 to 33 |
| Tri-substituted organostannic compounds Tributyl Tin (TBT) and Triphenyl Tin (TPT) compounds | See IEC62474 | Content prohibited | <1,000ppm by weight of tin | All applications | 3 |
| Tributyl Tin Oxide (TBTO) | 56-35-9 | Content prohibited | <1,000ppm | All applications | 3 |
| Dimethylfumarate (DMF) | 624-49-7 | Content prohibited | <1,000ppm | All applications | 3 |
| Dibutyltin (DBT) compounds | See IEC62474 | Content prohibited | <1,000ppm by weight of tin | All applications | 3 |
| Diocetyl tin (DOT) compounds | See IEC62474 | Content prohibited | <1,000ppm by weight of tin | Textile articles intended to come into contact with the skin Two-component room temperature vulcanisation moulding kits (RTV-2 moulding kits). | 3 |
| Red Phosphorus * | 7723-14-0 | Content prohibited | - | Flame retardant in resin parts used between electrodes in electrical insulation sections. (Representative examples of components that may use the above application are as follows. It must be noticed that the examples are non-exhaustive. Connectors, AC power cords, AC adaptors, AC power inlets, AC power outlets, DC plugs, DC power jacks, power switches, terminal blocks, fan motors, bobbins for transformers, bobbins for inductors, bases (stands), core cases.) | - |
| | | Non-applicability | - | 1. Applications other than flame retardant in resin parts used between electrodes in electrical insulation sections. 2. Flame retardant in the prohibition scope, in resin parts (resin material) adopted prior to April 1, 2020, which the following requirements : - Items for which moisture-proof coating or an equivalent measure (stabilization treatment) has been applied to the red phosphorus particles. | - |

* There is no registration of red phosphorus in the chemSHERPA substance list, so please enter it as a voluntary declaring substances.

Matters Related to Prohibited Substances Used in Packaging Materials

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| Chemical substances | Requirement | Threshold level | Scope | Reference List |
|---|--------------------|---------------------|--|----------------|
| Mercury, cadmium, Hexavalent chromium, and lead | Content prohibited | Total (*1) <100 ppm | Applications as packaging except for the following exempted applications. (for distributing and protecting TDK products) | 12 |
| | Non-applicability | - | Reusable packaging material (for repeated use). | - |

*1) Cadmium, lead, mercury and Hexavalent chromium must individually be less than their respective threshold levels; and concurrently, the total of the 4 heavy metals must be less than 100 ppm, for each of the individual components, paints, and inks that constitute the packaging. Hexavalent chromium must be analyzed as part of total chromium, and the total of the 4 elements must be less than 100 ppm. If it is 100 ppm or greater, analyze the Hexavalent chromium independently within the total chromium to verify whether the total is less than 100 ppm.

Matters Related to Prohibited Substances in Batteries and Storage Batteries

| Chemical substances | Requirement | Threshold level | Scope | Reference List |
|-----------------------------------|--------------------|-----------------|---|----------------|
| Mercury/ Mercury compounds *1) | Content prohibited | <5ppm | Batteries and accumulators (except for button cells). *2) *4) | 13 |
| | | <20,000ppm | Batteries and accumulators (button cells). *2) *4) | 13 |
| Cadmium/ Cadmium compounds *1) | Content prohibited | <20ppm | Portable batteries and accumulators except for the following exempted applications. *3) | 13 |
| | Non-applicability | - | Portable batteries or accumulators for emergency and alarm systems, including emergency lighting; medical equipment; or cordless power tools. *3) | 13 |
| Lead/ Lead compounds *1) | Content prohibited | <40ppm | Alkaline Zinc manganese dioxide batteries | 14 |
| | Content prohibited | <2,000ppm | Non-alkaline Zinc manganese dioxide batteries | 14 |
| | Non-applicability | - | Except for the batteries and accumulators above. | - |
| Perchlorates | Content prohibited | <0.006ppm | Coin cell batteries | 17 |

*1) Even if content is less than threshold level, labelling (marked with the symbol) is required in the EU Directive on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC (2006/66/EC).

*2) ‘battery’ or ‘accumulator’ means any source of electrical energy generated by direct conversion of chemical energy and consisting of one or more primary battery cells (nonrechargeable) or consisting of one or more secondary battery cells (rechargeable).

*3) ‘portable battery or accumulator’ means any battery, button cell, battery pack or accumulator that:
 (a) is sealed; and
 (b) can be hand-carried; and
 (c) is neither an industrial battery or accumulator nor an automotive battery or accumulator.

*4) ‘button cell’ means any small round portable battery or accumulator whose diameter is greater than its height and which is used for special purposes such as hearing aids, watches, small portable equipment and back-up power.

*5) ‘battery pack’ means any set of batteries or accumulators that are connected together and/or encapsulated within an outer casing so as to form a complete unit that the enduser is not intended to split up or open.

*6) ‘industrial battery or accumulator’ means any battery or accumulator designed for exclusively industrial or professional uses or used in any type of electric vehicle.

*7) ‘automotive battery or accumulator’ means any battery or accumulator used for automotive starter, lighting or ignition power.

*8) In addition to the "EU Directive (2006/66/EC) on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC", other requirements may be established in some of the EU member states.

Content-Controlled Substances A

| Chemical substances | CAS No. | Requirement | Threshold level | Scope | Reference List |
|---|---|--------------------|---|--|----------------|
| Halogen and Halogen compounds (Only Bromine from organic brominated compounds and Chlorine from organic chlorinated compounds) | - | Content controlled | Bromine and chlorine (individually) <900ppm and total combined halogens <1,500ppm | All substances and their applications except PBBs*, PBDEs*, and HBCDD*. * See respective requirements. (Examples: Organic brominated compounds, (including brominated flame retardants, TBBPA), and organic chlorinated compounds (including chlorinated flame retardants and PVC)." | 19, 20 |
| REACH (EC) No. 1907/2006 SVHC (Candidate List of Substances of Very High Concern for Authorisation) | See the latest version of the Candidate list on the HP of ECHA (European Chemicals Agency) http://echa.europa.eu/web/guest/candidate-list-table | Content controlled | <1,000ppm | All applications | 3 |
| Beryllium/Beryllium compounds | See the latest information of GADSL Reference List | Content controlled | <1,000ppm | All applications except for the following exempted applications. | 35 |
| | | Non-applicability | - | Beryllium copper alloy, beryllium nickel alloy, beryllium gold alloy | - |
| Selenium/Selenium compounds | See the latest information of GADSL Reference List | Content controlled | <1,000ppm | All applications except for the following exempted applications. | 36 |
| | | Non-applicability | - | Optical components containing zinc selenide (Examples: Reflecting mirrors, lenses); JIS compliant stainless steel containing selenium | - |
| Antimony/Antimony compounds | See the latest information of GADSL Reference List | Content controlled | <1,000ppm | All applications | |
| Perchlorates | See IEC62474 (latest version) | Content controlled | <0.006ppm | All applications | 16 |
| Substances classified as "D (Declarable)" in "GADSL Reference List" | See the latest information of GADSL Reference List http://www.gadsl.org | Content controlled | <1,000ppm (If not stated otherwise) | Depending on the limitation of each substances | 1 to 8,etc |

GADSL

Substances listed in the "Global Automotive Declarable Substance List (GADSL)" published by the Global Automotive Stakeholder Group (GASG)

(Always the latest version is applied.)

<http://www.gadsl.org>

IEC62474

Substances listed in the International IEC62474 Standard for electrical and electronic products published by the International Electrotechnical Commission(IEC).

(Always the latest version is applied.)

<http://std.iec.ch/iec62474>

Reference List of Standards

| | |
|----|---|
| 1 | 2011/65/EU (EU, "RoHS Directive" and its amendments); |
| 2 | 2000/53/EC (EU, "ELV Directive" and its amendments); |
| 3 | (EC) No. 1907/2006 (EU, "REACH Regulation"); |
| 4 | "The Restriction of the Use of Hazardous Substances in Electrical and Electronic Products" of the People's Republic of China (China, "Revised China RoHS"); |
| 5 | "Act for Resource Recycling of Electrical and Electronic Equipment and Vehicles" (Korea, Korea RoHS); |
| 6 | "The Law for Promotion of Effective Utilization of Resources" (Japan, "J-MoSS": Abbreviation combining "Japan" and an acronym of the JIS C 0950 standard title "The marking for presence of the specific chemical substances for electrical and electronic equipment"); |
| 7 | "California Electronic Waste Recycling Act" (US, State of California, SB 20, amended by SB 50 and AB 575); |
| 8 | "Swiss Ordinance on Risk Reduction related to the Use of Certain Particularly Dangerous Substances, Preparations and Articles" ("Ordinance on Chemical Risk Reduction") (Swiss "ORRChem"); |
| 9 | "Louisiana Mercury Risk Reduction Act" (US, State of Louisiana); |
| 10 | "Rhode Island General Laws, Title 23, Chapter 23-24.9" (US, State of Rhode Island, "Mercury Reduction and Education Act"); |
| 11 | "Act Relating to Comprehensive Management of Exposure to Mercury" (US, State of Vermont); |
| 12 | "Directive 94/62/EC on Packaging and Packaging Waste" (EU, "EU Packaging Directive"); |
| 13 | "Directive 2006/66/EC on Batteries and Accumulators and Waste Batteries and Accumulators" (EU, "EU Battery Directive"); |
| 14 | Chinese National Standards (GB 24427-2009) "Limitation of Mercury, Cadmium and Lead Contents for Alkaline and Non-Alkaline Zinc Manganese Dioxide Batteries" (China); |
| 15 | "Restrictions on the Manufacture, Import and Sale of Dry Cell Batteries" (Taiwan); |
| 16 | "Perchlorate Contamination Prevention Act" (US, State of California, enforced on January 1, 2007); |
| 17 | "Environmental Conservation Law - Title 7 -27-0719 Battery Management and Disposal" (US, State of New York); |
| 18 | "IEC 62474" (International Electrotechnical Commission standard); |
| 19 | "IPC-4101: Specification for Base Materials for Rigid and Multilayer Printed Boards" (Association Connecting Electronics Industries' standard); |
| 20 | "IEC 61249-2-21: Materials for Printed Boards and Other Interconnecting Structures" (International Electrotechnical Commission's standard); |
| 21 | "The Toxic Substances Control Act" (US, The United States Environmental Protection Agency, "TSCA"); |
| 22 | (EC) No. 842/2006 (EU, "Regulation on Certain Fluorinated Greenhouse Gases"); |
| 23 | "Rules by California Air Resources Board" (CARB) (US, State of California) |
| 24 | "Formaldehydverordnung" (Austria, BGB I 1990/194 §2, 12/2/1990); |
| 25 | "Montreal Protocol on Substances that Deplete the Ozone Layer" (protocol to the Vienna Convention for the Protection of the Ozone Layer) |
| 26 | (EC) No. 2037/2000 (EU, "Regulation on Substances that Deplete the Ozone Layer"); |
| 27 | "Clean Air Act" (US, EPA); |
| 28 | (EC) No 850/2004 (EU, "Regulation on Persistent Organic Pollutants"); |
| 29 | "Canadian Environmental Protection Act SOR/SOR/2008-178" (Canada, "Perfluorooctane Sulfonate and its Salts and Certain Other Compounds Regulations"); |
| 30 | "Chemical Substances Control Law" (Japan); |
| 31 | EU Directive 2013/59/Euratom (EU, "Council Directive 2013/59/Euratom laying down basic safety standards for protection against the dangers arising from exposure to ionizing radiation"); |
| 32 | "The Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors, 1986" (Japan); |
| 33 | "Acts of Nuclear Regulatory Commission" (NRC) (US) |
| 34 | "Regulations on the Restriction of Use of Hazardous Chemicals and Other Products" ("Product Regulations") FOR-2004-06-01-922" (Norway); |
| 35 | "DIGITALEUROPE/CECED*/EERA** Joint Position Guidance on implementing article 11 of Directive 2002/96 (EC) concerning information for treatment facilities" (*CECED(European Committee of Domestic Equipment Manufacturers); **EERA (European Electronics Recyclers Association)); |
| 36 | "Water Pollution Prevention Act" (Japan); |
| 37 | "US Dodd-Frank Wall Street Reform and Consumer Protection Act", Section 1502 (US) |
| 38 | "Stockholm Convention on Persistent Organic Pollutants" ("POPs") (United Nations); |
| 39 | 2015/863/EU (EU, "Commission Delegated Directive amending Annex II to Directive 2011/65/EU") |
| 40 | Blank |

Appendix 2. List of Documents to Be Submitted

1. List of Documents to Be Submitted

Appendix 2. Green Procurement Standards_28th edition

| Documents to be submitted | Type of purchased item | Remarks |
|---|---|--|
| Survey of Chemical Substance Content; "chemSHERPA" | Chemicals | chemSHERPA(CI) : Always use the latest editions |
| | Parts Packaging | chemSHERPA(AI) : Always use the latest editions |
| Precision analysis data | Chemicals Parts Packaging | Four substances: lead, cadmium, mercury, hexavalent chromium (compulsory) If there are multiple analysis data, submit a correspondence list of subpart and analysis data. |
| SDS(Safety Data Sheet) | Chemicals | Chemicals containing legally restricted substances are compulsory. |
| Responsible Minerals Initiative (RMI) check sheet | Chemicals Parts | Fill in Form-1 and submit it. |
| Supply of data on specific requirements | Purchased items designated by the TDK Group | The TDK Group will make specific requests. |
| Non-Containing Guarantee of Chemical Substances | Chemicals Parts | Fill in Form EMS-010-1A_E(Ver_8) and submit it. |
| Non-Containing Guarantee of Chemical Substances for Packaging Materials | Packaging | Fill in Form EMS-010-2 (Ver.8) and submit it. |

2. Entry Methods for Submitted Documents and Points to Note

(1) Survey of Chemical Substance Content

- Please follow the designated chemSHERPA formats.(AI or CI)
- The format of chemSHERPA is updated on a regular schedule, please submit it in the latest version of chemSHERPA website.
chemSHERPA website : <https://chemsherpa.net/chemSHERPA/english/>
- Please report composition for chemical substances contained in purchased items based on the Criteria of chemSHERPA.
The Business Departments may individually request full declaration on non declarable substances by optional reporting.
- If you respond to full declaration except for chemSHERPA formats, please contact us.
- Even in the case of non-applicability due to purpose, if an environment-related substance is added intentionally, or if such a substance is contained as an impurity in excess of the threshold level, it is necessary to enter the environment-related substance composition.

(2) Precision analysis data

- The analysis target is all purchased items.
Non-applicability: The latest version of EU RoHS 2011/65/EU Annex III, IV, and ELV 2000/53/EC Annex II, and Reusable packaging material (for repeated use).
- Please submit data analyzed by the designated analytical method.
- If there are multiple analysis data, submit a correspondence list of subpart and analysis data.
- The expiration date of analysis data is not specified in particular, but if there was change that affect the quality in purchased items, please resubmit the analysis data.
- Please note, however, that if the TDK Group requires a specific standard relating to analysis data, the specific requirement shall take precedence.
Ex. Precision analysis data of halogen or phthalates. Update of analysis data, etc.

(3) SDS(Safety Data Sheet)

In order to conduct the appropriate management of chemical substances with the aim of avoiding health damage to workers, protecting the environment, protecting the ecosystem, etc., submission is compulsory if a legally designated chemical substance is contained.

(4) Responsible Minerals Initiative (RMI) check sheet

If tin, tantalum, tungsten, gold, plus cobalt are included, TDK Group may request to submit CMRT (Conflict Minerals Reporting Template) or CRT(Cobalt Minerals Reporting Template).

(5) Supply of data on specific requirements

The TDK Group may request the supply of data on specific requirements in order to respond to customer requests, etc.
Ex. Report on precision analysis test of a designated chemical substance, CMRT(Conflict Minerals Reporting Template), etc

(6) Non-Containing Guarantee of Chemical Substances

To ensure Non-containing of chemical substances and RoHS exemption, submission is compulsory.

Appendix 3. Analysis method

- (1) Analysis method conform to IEC62321.
- (2) A quantitative analysis must be conducted on each subpart of the item. The result must be within the threshold level.
- (3) If the test data are to be used as an analysis certificate, describe the test method used.
- (4) No analysis of PBB and PBDE is required by this Standards document, however, this method is recommended for analysis if it is to be conducted to meet Customer's requirements.
- (5) No analysis of DEHP, BBP, DBP and DIBP is required by this Standards document, however, this method is recommended for analysis if it is to be conducted to meet Customer's requirements.

| Substance name | Preliminary processing: | Analytical instruments: |
|---|--|--|
| Cadmium/Cadmium compounds, Lead/Lead compounds, Chromium/Chromium compounds | Prepare a solution by wet decomposition method (including pressure decomposition) in the presence of, for example, sulfuric acid, nitric acid, hydrochloric acid, hydrofluoric acid, or hydrogen peroxide; by incineration in the presence of sulfuric acid; or by pressurized acid decomposition (microwave decomposition). If precipitation occurs in the solution, dissolve it completely into a solution by, for example, hydrofluoric acid decomposition or by alkali fusion decomposition. | Examples - Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES [ICP-OES]), inductively coupled plasma mass spectrometer (ICP-MS), atomic absorption spectrometer (AAS, FLAAS). |
| Mercury/Mercury compounds | Dissolve into a solution using, for example, sulfuric acid, nitric acid, or potassium permanganate; and in a pressure decomposition flask, or a decomposing flask equipped with a reflux condenser to prevent mercury emission. A microwave decomposition method may also be used. | Examples—Reduction vaporization ICP emitted light spectrometer (ICP-AES [ICP-OES]), atomic absorption spectrometer (reduction vaporization, heated vaporization), inductively coupled plasma mass spectrometer (ICP-MS). |
| Hexavalent chromium compounds | Elute Hexavalent chromium into water solution by, for example, by hot water extraction, or decomposition in alkali solution, etc. | Example—absorptiometer and ion chromatograph, etc. |
| PBB and PBDE (for reference only) | Dissolve in an organic solvent or extract with a Soxhlet extractor. Use the silica gel column process to obtain a solution. | Gas chromatograph mass spectrometer (GC-MS) |
| DEHP, BBP, DBP and DIBP (for reference only) | Analysis method conform to IEC62321-8. Determination of certain substances in electrotechnical products - Part 8 | Gas chromatograph mass spectrometer (GC-MS) |

To: TDK-Lambda Corporation

Green Procurement Standard(28th edition) Form-1

Responsible Minerals Initiative (RMI) check sheet

Date of issue: _____

Company Name: _____

Division Name: _____

Person in charge: _____

We reply whether the following product that deliver to TDK group has contained conflict minerals or not.

| Number | Product name / Series name | Product number / Series number | Minerals | Check | |
|--------|----------------------------|--------------------------------|-----------------------------|---------|------|
| | | | | Contain | Free |
| 1 | | | Tin/Tin Compounds | | |
| | | | Tantalum/Tantalum Compounds | | |
| | | | Tungsten/Tungsten Compounds | | |
| | | | Gold/Gold Compounds | | |
| | | | Cobalt/Cobaltd Compounds | | |
| 2 | | | Tin/Tin Compounds | | |
| | | | Tantalum/Tantalum Compounds | | |
| | | | Tungsten/Tungsten Compounds | | |
| | | | Gold/Gold Compounds | | |
| | | | Cobalt/Cobaltd Compounds | | |
| 3 | | | Tin/Tin Compounds | | |
| | | | Tantalum/Tantalum Compounds | | |
| | | | Tungsten/Tungsten Compounds | | |
| | | | Gold/Gold Compounds | | |
| | | | Cobalt/Cobaltd Compounds | | |

Non-Containing Guarantee of Chemical Substances

Manufacturer:

We, manufacturer, (and our subsidiaries and affiliates) hereby guarantee that the following listed products and components/materials that we supply to TDK-LAMBDA K.K (and their subsidiaries and affiliates) do not contain the following chemical substances exceeding threshold level specified by TDK-Lambda K.K. in accordance with "TDK-LAMBDA Group Green Procurement Standard".

Manufacturer: Company Name

Division Name

Name of responsible person

Signature:

TEL(Phone)

E-mail

Distributor:

We Distributor, hereby guarantee that the following listed products and components/materials that we supply to TDK-LAMBDA K.K (and their subsidiaries and affiliates) are the products and components/materials which Manufacture guaranteed as above.

Distributor: Company Name

Signature:

1. The object chemical substance and its threshold level

| NO | Substances name | Applications of substance and scope of the standards | Threshold Level (Impurities density) |
|----|--|--|--------------------------------------|
| 1 | Cadmium and Cadmium Compounds | All applications other than the Exemptions | < 100 ppm |
| | | Usage under Exemption | Based on list of exemption |
| 2 | Lead and lead compounds | All applications other than the Exemptions | < 1,000 ppm |
| | | Usage under Exemption | Based on list of exemption |
| 3 | Mercury and Mercury Compounds | All applications | < 1,000 ppm |
| | | Usage under Exemption | Based on list of exemption |
| 4 | Hexavalent Chromium and Hexavalent Chromium Compounds | All applications | < 1,000 ppm |
| 5 | PBB PBB (Polybrominated Biphenyls) | All applications | < 1,000 ppm |
| 6 | PBDE(Deca-BDE含む) PBDE (Polybrominated Biphenyl Ethers) & Deca-BDE | All applications | < 1,000 ppm |
| 7 | Bis (2-ethylhexyl) phthalate (DEHP) CAS NO. 117-81-7 | All applications | < 1,000 ppm |
| 8 | Butyl benzyl phthalate (BBP) CAS NO. 85-68-7 | All applications | < 1,000 ppm |
| 9 | Dibutyl phthalate (DBP) CAS NO. 84-74-2 | All applications | < 1,000 ppm |
| 10 | Diisobutyl phthalate (DIBP) CAS NO. 84-69-5 | All applications | < 1,000 ppm |

2. Target Product / Component / Material

| No | Item Code | Product Name | Catalog Number | Exemption code | Note (Exemption) |
|------|-----------|--------------|----------------|----------------|------------------|
| e.g. | 00011111 | FET | 2SK***** | 7(a) | |
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |

* Items, in case more than 5, can be listed and attached to this document.

3. Others

If there is any change of material/production location/production process etc. for the above items, we will confirm the content of chemical substances is less than the threshold level which described in section1. And will submit this "Non-Containing Guarantee of Chemical Substances" to TDK-LAMBDA K.K. before its delivery.

In case that the items which contain the above listed substances exceeding the threshold level is delivered to TDK-LAMBDA K.K, we will take appropriate action to recover the status, in good faith, on our own responsibility and expense.

Non-Containing Guarantee of Chemical Substances for Packaging Materials

Manufacturer:

We, manufacturer, (and our subsidiaries and affiliates) hereby guarantee that the following listed on packing materials that we supply to TDK-LAMBDA K.K (and their subsidiaries and affiliates) do not contain the following chemical substances exceeding threshold level specified by TDK-Lambda K.K. in accordance with "TDK-LAMBDA Group Green Procurement Standard".

Manufacturer:

Company Name _____

Division Name _____

Name of responsible person _____

Signature: _____

TEL(Phone) _____

E-mail _____

Distributor:

We Distributor, hereby guarantee that the following listed products and components/materials that we supply to TDK-LAMBDA K.K (and their subsidiaries and affiliates) are the products and components/materials which Manufacture guaranteed as above.

Distributor:

Company Name _____

Signature: _____

1. The object chemical substance and its threshold level

| NO | Substances name | Applications of substance and scope of the standards | Threshold Level (Impurities density) |
|----|--|---|--------------------------------------|
| 1 | PVC Polyvinyl chloride(PVC) and PVC blends | Application as packing materials (for distributing and protecting DL products) (Examples: Trays, bags, cushioning material, sheets, wraps, carton box, tapes, tie bands, labels, printing inks, paints, and the line. Reusable shuttling boxes are exempt.) | Intentional non-use |
| 2 | Cadmium, Lead, Mercury, Hexavalent chromium | | Total * <100ppm |
| 3 | PBB | All applications | <1000ppm |
| 4 | PBDE (Polybrominated Biphenyl Ethers) & Deca-BDE | All applications | <1000ppm |
| 5 | Cobalt dichloride | Prohibition of the use of Sillica-gel bag containing Cobalt dichloride. | Intentional non-use |
| 6 | Phthalates Bis (2-ethylhexyl) phthalate (DEHP) CAS NO. 117-81-7 Butyl benzyl phthalate (BBP) CAS NO. 85-68-7 Dibutyl phthalate (DBP) CAS NO. 84-74-2 Diisobutyl phthalate (DIBP) CAS NO. 84-69-5 | Application as packing materials (for distributing and protecting products) (Examples: Trays, bags, cushioning material, sheets, wraps, carton box, tapes, tie bands, labels, printing inks, paints, and the line. Reusable shuttling boxes are exempt.) | Total * <1000ppm |

* Threshold level is defined to be total containing value of 4 substances in each component.

They are defined for every component to constitute. Refer to "TDK-LAMBDA Green Procurement Standard "DL-EMS-010" for further details.

2. Target Product / Component / Material

| No | Item Code | Product Name | Catalog Number |
|------|-----------|--------------|----------------|
| e.g. | 00011111 | PC pack | PC-122 |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

* Items, in case more than 5, can be listed and attached to this document.

3. Others

If there is any change of material/production location/production process etc. for the above items, we will confirm the content of chemical substances is less than the threshold level which described in section1. And will submit this "Non-Containing Guarantee of Chemical Substances" to TDK-LAMBDA K.K. before its delivery.

In case that the items which contain the above listed substances exceeding the threshold levels delivered to TDK-LAMBDA K.K, we will take appropriate action to recover the status, in good faith, on our own responsibility and expense.