

## Substance listing

The TEG Banned and Declarable Substances List (BAD-SL) applies to all products, components, substances and preparations that end up in a finished product, *and, where covered by the scope description, it also applies to the packaging*. It identifies substances which are either prohibited or restricted by regulations, customers' or TDK requirements, due to health related or environmental hazards.

*The information provided herein does not relieve the reader of the responsibility to observe and comply with all applicable legal regulations. In cases where updated, local, national, or regional laws and standards are more stringent than those set forth in this list, those stricter requirements shall take precedence.*

This list is intended to be used to communicate contractual requirements regarding banned and restricted substances to suppliers. Please also pay attention to the notes at the end of this document.

## Module A

### Table A-1 Prohibited substances

The following table of Prohibited Substances refers to chemical substances, which shall not be included in our products.

Substance name	CAS No./ Source	Category	Threshold	Scope	Key Regulations and Industrial Standards (see Annex)
Cadmium / Cadmium compounds	Refer to IEC 62474 and GADSL	Prohibited	< 100 ppm	All applications except for packaging, batteries and the exemptions shown below.	1-3, 12, 13, 15, 20, 26, 44, 45
		Exemptions	-	Exempted applications of Annexes III and IV of the EU RoHS Directive (2011/65/EU) as amended by Directive (EU) 2015/863 and Annex II of the EU ELV Directive (2000/53/EC)	
Hexavalent chromium compounds	Refer to IEC 62474 and GADSL	Prohibited	< 1000 ppm	All applications except for packaging and the exemptions shown below.	1-3, 12, 13, 15, 20, 26, 44, 45
		Exemptions	-	Exempted applications of Annexes III and IV of the EU RoHS Directive (2011/65/EU) as amended by Directive (EU) 2015/863 and Annex II of the EU ELV Directive (2000/53/EC)	
Lead / Lead compounds	Refer to IEC 62474 and GADSL	Prohibited	< 1000 ppm	All applications except for packaging, batteries and the exemptions shown below.	1-3, 12, 13, 15, 20, 23, 26, 27, 44, 45
		Exemptions	-	Exempted applications of Annexes III and IV of the EU RoHS Directive (2011/65/EU) as amended by Directive (EU) 2015/863 and Annex II of the EU ELV Directive (2000/53/EC)	
Mercury / Mercury compounds	Refer to IEC 62474 and GADSL	Prohibited	< 1000 ppm	All applications except for packaging and the exemptions shown below.	1-3, 12, 13, 15, 20, 26, 31, 44, 45
		Exemptions	-	Exempted applications of Annexes III and IV of the EU RoHS Directive (2011/65/EU) as amended by Directive (EU) 2015/863 and Annex II of the EU ELV Directive (2000/53/EC)	
Polybrominated biphenyls (PBB's)	Refer to IEC 62474 and GADSL	Prohibited	< 1000 ppm	All applications	1, 12-13, 15, 20, 44, 45
Polybrominated diphenyl ethers (PBDE's)	Refer to IEC 62474 and GADSL	Prohibited	< 1000 ppm	All applications	1, 3, 12-13, 15-16, 20-21, 44, 45
Bis-(2-ethylhexyl) phthalate (DEHP)	117-81-7	Prohibited	< 1000 ppm	All applications	1, 3
Butyl benzyl phthalate (BBP)	85-68-7	Prohibited	< 1000 ppm	All applications	1, 3
Dibutyl phthalate (DBP)	84-74-2	Prohibited	< 1000 ppm	All applications	1, 3
Diisobutyl phthalate (DIBP)	84-69-5	Prohibited	< 1000 ppm	All applications	1, 3
REACH Regulation (EC) No. 1907/2006 Annex XVII (Restricted Substances)	Refer to the ECHA (European Chemicals Agency) website <a href="https://echa.europa.eu/en/substances-restricted-under-reach">https://echa.europa.eu/en/substances-restricted-under-reach</a>	Prohibited	Depending on the item <sup>*1</sup>	Depending on the item <sup>*1</sup>	3

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Substance name	CAS No./ Source	Category	Threshold	Scope	Key Regulations and Industrial Standards (see Annex)
EU POPs Regulation (EU) 2019/1021 Annexes I and II	Refer to the ECHA (European Chemicals Agency) website <a href="https://echa.europa.eu/en/list-of-substances-subject-to-pops-regulation">https://echa.europa.eu/en/list-of-substances-subject-to-pops-regulation</a>	Prohibited	Depending on the item*1	Depending on the item*1	4
Red Phosphorus	7723-14-0	Prohibited	-	Flame retardant in resin parts used between electrodes in electrical insulation sections adopted after April 1, 2020. (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.)	46
		Exemptions	-	1. Applications other than flame retardant in resin parts used between electrodes in electrical insulation sections. 2. Flame retardant in resin parts (resin material) in the prohibition scope, adopted prior to April 1, 2020, for which a stabilization treatment (e.g. moisture-proof coating) or an equivalent measure has been applied to the red phosphorus particles.	
Arsenic/ Arsenic compounds	See IEC62474	Prohibited	< 1000 ppm	All applications except for the exemptions shown below.	3, 44, 46
		Exemptions	-	Compound semiconductors containing an arsenic component; copper foil bonding on printed circuit boards	
Fluorinated greenhouse gases (HFC, PFC, SF <sub>6</sub> , HFO, HCFO etc.)	See IEC62474	Prohibited	-	All applications (examples: refrigerants, blowing agents, extinguishing agents, cleaning agents, insulating media, caustic gas)	9, 44
Halogenated flame retardants	See IEC62474	Prohibited	Intentional Inclusion	Flame retardants in electronic displays (Enclosures and stands of electronic displays, including televisions, monitors and digital signage displays with a screens area greater than 100 cm <sup>2</sup> )	10, 44
Pentachlorothiophenol (PCTP)	133-49-3	Prohibited	<1000ppm	All applications	22
Phenol, isopropylated phosphate (3:1) (PIP (3:1))	68937-41-7	Prohibited	Intentional Inclusion	All applications	22
Undecafluorohexanoic acid (PFHxA), its salts and related substances	Refer to IEC 62474 and GADSL	Prohibited	Total of PFHxA and its salts: <25ppb; PFHxA-related substances: <1000ppb	Textiles, leather, furs and hides in clothing and related accessories for the general public; footwear for the general public; paper and cardboard used as food contact materials within the scope of Regulation (EC) No 1935/2004 (food contact materials); mixtures for the general public, cosmetic products as defined in Article 2(1), point (a), of Regulation (EC) No 1223/2009; fire-fighting foams and foam concentrates for training and testing purposes (except for functional tests of fire extinguishing systems), fire-fighting foams and foam concentrates for public fire departments (except when these fire departments intervene in industrial fires in premises covered by Directive 2012/18/EU of the European Parliament and of the Council (Seveso III Directive) and use foams and firefighting foam concentrates exclusively for that purpose), firefighting foams and foam concentrates for civil aviation (including in civilian airports).	3, 44, 45

\*1 In accordance with the legal requirements

**Table A-2 Declarable substances**

The following table of Declarable Substances refers to chemical substances, for which information on product inclusion (e.g. substance name, CAS RN, inclusion subpart, concentration, etc.) is deemed as necessary by TDK.

Substance name	CAS No. / Source	Category	Threshold level	Scope	Key legislation and industry standards (see Annex)
Halogens and Halogen compounds (only bromine from organic brominated compounds and chlorine from organic chlorinated compounds)	-	Declarable	Bromine and chlorine (individually) < 900 ppm and total combined halogens < 1500 ppm	All applications	41, 42
Substances on the Candidate List of SVHC (Substances of Very High Concern) for Authorisation by ECHA (European Chemicals Agency)	Refer to the ECHA (European Chemicals Agency) website <a href="https://echa.europa.eu/en/candidate-list-table">https://echa.europa.eu/en/candidate-list-table</a>	Declarable	< 1000 ppm	All applications	3
Substance on Proposition 65 List	Refer to Proposition 65 List from OEHHA (California Environmental Protection Agency, Office of Toxic Substances Control) website <a href="https://oehha.ca.gov/proposition-65/proposition-65-list">https://oehha.ca.gov/proposition-65/proposition-65-list</a>	Declarable	Any known inclusion, whether intentionally added or present as an impurity, etc.	All applications	27
Beryllium/ Beryllium compounds	Refer to GADSL	Declarable	< 1000 ppm	All applications	45
Selenium/ Selenium compounds	Refer to GADSL	Declarable	< 1000 ppm	All applications	45
Antimony/ Antimony compounds	Refer to GADSL	Declarable	< 1000 ppm	All applications	44, 45, 46

**Table A-3 Significant Substances Prior to Legal Enactment/Enforcement**

Substances planned to be added to or before enforcement of key regulations, for which inclusion information (e.g. substance name, CAS RN, inclusion subpart, concentration, etc.) is deemed as necessary by TDK.

Substances in this table automatically become "prohibited" or "prohibition after" according to the concerned law or regulation once they're enacted.

Substance name	CAS No. / Source	Category	Threshold level	Scope	Key legislation and industry standards (see Annex)
Tetrabromobisphenol A (TBBPA) [Although TBBPA is a Substance on the Candidate List of SVHC (Substances of Very High Concern) for Authorisation by ECHA (European Chemicals Agency), please report any <i>known</i> inclusion.]	79-94-7	Declarable	Any known inclusion, whether intentionally added or present as an impurity, etc.	All applications	1
Medium-chain chlorinated paraffins (MCCP) with carbon chain lengths within the range from C14 to C17 [Although MCCP is a Substance on the Candidate List of SVHC (Substances of Very High Concern) for Authorisation by ECHA (European Chemicals Agency), please report any <i>known</i> inclusion.]	Refer to IEC 62474 and GADSL	Declarable	Any known inclusion, whether intentionally added or present as an impurity, etc.	All applications	3, 38, 44, 45
Perfluorocarboxylic acids (PFCA), their salts and related substances with carbon chain lengths within the range from C15 to C21 [The range from C9 to C14 is already restricted under REACH Regulation (EC) No 1907/2006 Annex XVII (EU) (Restricted Substances).]	e.g.: 141074-63-7; 67905-19-5; 57475-95-3; 16517-11-6; 133921-38-7; 68310-12-3	Declarable	Any known inclusion, whether intentionally added or present as an impurity, etc.	All applications	38
Per- and poly-fluoroalkyl substances (PFAS) [substances that include any member of the class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom.*1]	Refer to IEC 62474 and GADSL*1	Declarable	Any known inclusion, whether intentionally added or present as an impurity, etc.	All applications	3, 30, 44, 45
Decabromodiphenyl ethane (DBDPE)	84852-53-9	Declarable	Any known inclusion, whether intentionally added or present as an impurity, etc.	All applications	3, 31

\*1 Alternatively refer to **OECD** (The Organization for Economic Co-operation and Development) Comprehensive Global Database of PFAS:  
<https://www.oecd.org/chemicalsafety/risk-management/global-database-of-per-and-polyfluoroalkyl-substances.xlsx>  
or **US EPA** (Environmental Protection Agency) PFAS Master List of PFAS Substances:  
<https://comptox.epa.gov/dashboard/chemical-lists/pfasmaster>

**Table A-1-1 Additional requirements for substances in packaging**

Substance name	Category	Threshold level	Scope	Key legislation and industry standards (see Annex)
Cadmium, hexavalent chromium, lead and mercury	Prohibited	Total <sup>*1</sup> < 100 ppm	Packaging materials (materials used to deliver and protect TDK products, e.g., trays, reels, sticks, bags, cushioning materials, staplers, sheets, wraps, corrugated cardboard, tape, ties, labels, printing ink, paint, etc.) except for the following exemptions.	5
	Exemptions	-	Reusable shipping boxes (containers)	
Mineral oil aromatic hydrocarbons (MOAH) consisting of 1-7 aromatic rings	Prohibited	< 0.1wt% (1,000ppm) in ink	Ink subparts in packaging and printed matter intended for the public	32
Total mineral oil aromatic hydrocarbons (MOAH) compounds consisting of 3-7 aromatic rings	Prohibited	< 0.1wt% (1,000ppm) in ink	Ink subparts in packaging and printed matter intended for the public	32
Mineral oil saturated hydrocarbons (MOSH) consisting of 16-35 carbon atoms	Prohibited	< 0.1wt% (1,000ppm) in ink	Ink subparts in packaging and printed matter intended for the public	

\*1 The concentration of cadmium, hexavalent chromium, lead and mercury contained in packaging or packaging components (including paints and inks) shall not exceed 100 ppm, both individually or as the total of the 4 heavy metals.

**Table A-1-2 Additional requirements for substances in batteries and accumulators**

Substance name	Category	Threshold level	Scope	Key legislation and industry standards (see Annex)
Mercury/ Mercury compounds <sup>*1</sup>	Prohibited	< 5ppm*	Batteries and accumulators <sup>*2</sup>	6
Cadmium/ Cadmium compounds <sup>*1</sup>	Prohibited	< 20 ppm*	Portable batteries and accumulators except for the exempted applications shown below. <sup>*3</sup>	6
	Exemptions	-	Portable batteries or accumulators for emergency and alarm systems, including emergency lighting; medical equipment <sup>*3</sup>	
Lead/ Lead compounds <sup>*1</sup>	Prohibited	< 40 ppm*	Alkaline zinc manganese dioxide batteries	44
	Prohibited	< 2000 ppm*	Non-alkaline zinc manganese dioxide batteries	
	Exemptions	-	Except for the batteries and accumulators above.	
Perchlorates	Prohibited	< 0.006 ppm*	Coin cell batteries <sup>*8</sup>	28

\* refers to the weight of the product.

\*1 Please note that the "EU Directive on Batteries and Accumulators and Waste Batteries and Accumulators and Repealing Directive 91/157/EEC" (2006/66/EC) imposes labeling obligations even if the inclusion concentration is below the set threshold level

\*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 (non-rechargeable) 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 nor accumulator nor an automotive battery or accumulator.

\*4-7 (intentionally left blank)

\*8 'Coin cell battery' means a small button battery which is the size and shape of a coin. The battery number will start with "CR" and it may be found in watches, appliances, keyless entry systems, and any device that is able to retain memory after the power supply is cut off.

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### Table A-1-3 Substance requirements regarding EU POPs Regulation (EU) 2019/1021

Some substances may be regulated by other laws and regulations as well. The stricter one needs to be complied with.

Substance name	Category	Threshold	Scope	Key Regulations and Industrial Standards (see Annex)
Perfluoro(octane-1-sulfonic acid) (PFOS)	Prohibited	Total of PFOS or any of its salts: <25ppb; sum of all PFOS-related compounds: <1ppm	All applications	4, 38
Perfluorooctanoic acid (PFOA), its salts and PFOA-related substances <sup>3</sup>	Prohibited	Total of PFOA or any of its salts: <25ppb; sum of all PFOA-related compounds: <1ppm	All applications	4, 38
Perfluorohexane-1-sulphonic acid (PFHxS), its salts and related substances <sup>3</sup>	Prohibited	Total of PFHxS and its salts: <25ppb; PFHxS related compounds or their related compounds or their combination: <1ppm	All applications	4, 38
1,6,7,8,9,14,15,16,17,17,18,18-dodecachloropentacyclo[12.2.1.1.16,9.02,13.05,10]octadeca-7,15-diene("Dechlorane plus" <sup>TM</sup> ) individual anti- and syn-isomers or any combination thereof	Prohibited	< 1ppm	All applications	4, 16, 31, 38
2-(2-hydroxy-3;5-di-tert-amyl-phenyl) 2H-benzotriazole (UV-328)	Prohibited	< 1ppm	All applications	4,16, 38

## **Module B**

### **Module B-1: IEC62474 Declarable Substance List**

Substances on the IEC 62474 (International Electrotechnical Commission Standard, Material Declaration for the Electrical and Electronic Industry and its Products) list (always valid latest version).

Please refer to the URL below for the "IEC 62474 Declarable Substance List"

<http://std.iec.ch/iec62474/iec62474.nsf/Index?open&q=080632>

Suppliers shall declare inclusion of these substances in purchased products to TDK when set thresholds are exceeded.

### **Module B-2: GADSL**

Substances listed in the "Global Automotive Declarable Substance List (GADSL)" published by the Global Automotive Stakeholder Group (GASG) (always in the current valid edition).

(Threshold: 0.1% by weight (1000 ppm) if not stated otherwise)

Please refer to the URL below for the "GADSL Reference List"

<http://www.gadsl.org>

#### Note on Substance Classification

- Substances classified as "P" ("prohibited") in the "GADSL Reference List" shall not be used for TDK products. Suppliers shall check and verify that the content levels of these substances in purchased products do not exceed the permissible content thresholds.
- Substances classified as "D" ("declarable") in the "GADSL Reference List" shall be declared whenever included above the set thresholds.
- Substances classified as "D/P" in the "GADSL Reference List" are "prohibited" or "declarable" depending on the intended use. Among these substances, the requirements shown in Module A (Table A-1) shall take priority for cadmium, hexavalent chromium, lead and mercury.

## **Module C**

In case a substance regulation is stricter due to requirements of individual legislations of a country, an area or due to agreed customer's individual requirements, a substance on its own or a threshold level can be regulated stricter than mentioned above.

For such cases, these requirements are contractually agreed with suppliers, which can mean:

- (1) the threshold value of a substance can be lower than noted above,
- (2) the substance referred as declarable substance above can be rated as a prohibited substance, or
- (3) the substance is not mentioned above but can be declarable or prohibited.

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### Annex: List of reference laws & regulations and industry standards

The list below is a non-exhaustive list of key laws, regulations and industry standards that affect TDK's Environmental Product Quality activities.

The latest editions of the laws, regulations and industry standards including the amendments that followed their enactment shall be referenced.

#	Scope (country/region/industry)	Laws, Regulations and Industry Standards
1	EU	Directive 2011/65/EU ("RoHS Directive") ("Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment" (recast))
2	EU	Directive 2000/53/EC ("ELV Directive") ("Directive on End-of-Life Vehicles")
3	EU	Regulation (EC) No. 1907/2006 ("REACH Regulation") ("Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)")
4	EU	Regulation (EU) 2019/1021 ("EU POPs Regulation") ("Regulation on Persistent Organic Pollutants (recast)", (EU POPs Regulation))
5	EU	Regulation (EU) 2025/40 ("PPWR Regulation") ("Regulation on Packaging and Packaging Waste")
6	EU	Regulation (EU) 2023/1542 ("Batteries Regulation") Regulation on batteries and waste batteries, amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC
7		(intentionally blank)
8		(intentionally blank)
9	EU	Regulation (EU) 2024/573 ("F-gas Regulation") ("Regulation on fluorinated greenhouse gases, amending Directive (EU) 2019/1937 and repealing Regulation (EU) No 517/2014")
10	EU	Regulation (EU) 2024/1781 ("Ecodesign Regulation") ("Regulation establishing a framework for the setting of ecodesign requirements for sustainable products, amending Directive (EU) 2020/1828 and Regulation (EU) 2023/1542 and repealing Directive 2009/125/EC")
11		(intentionally blank)
12	China	MIIT Order No 32 ("China RoHS 2") ("Administrative Measures for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products")
13	China	GB/T 30512 ("Requirements for prohibited substances on automobiles") ("China ELV")
14		(intentionally blank)
15	Japan	"J-MoSS": JIS C 0950 standard "The marking for presence of the specific chemical substances for electrical and electronic equipment" mentioned in the "Act on the Promotion of Effective Utilization of Resources"
16	Japan	Act on the Regulation of Manufacture and Evaluation of Chemical Substances ("Act No. 117/1973") "Chemical Substances Control Law" ("CSCL")
17		(intentionally blank)
18		(intentionally blank)
19		(intentionally blank)
20	South Korea	Act No. 11726/2012 ("Korea RoHS") ("The Act for Resource Recycling of Electrical and Electronic Equipment and Vehicles")
21	South Korea	Act No. 9805/2009 ("Korea POPs") ("Persistent Organic Pollutants Control Act")
22	United States	15 U.S.C. §2601 et seq. (1976) "The Toxic Substances Control Act" ("TSCA")
23	United States	Public Law 110-314 ("Consumer Product Safety Improvement Act of 2008") ("CPSIA")
24		(intentionally blank)
25		(intentionally blank)
26	State of California, USA	"California Electronic Waste Recycling Act of 2003" ("CA E-Waste Act") ("SB20, Chapter 526, as amended by SB 50 and AB 575")
27	State of California, USA	HSC §25249.5 et seq. ("Safe Drinking Water and Toxic Enforcement Act of 1986") ("Proposition 65")
28	State of California, USA	California Assembly Bill No. 826 (AB 826) ("The Perchlorate Contamination Prevention Act")

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#	Scope (country/region/industry)	Laws, Regulations and Industry Standards
29	State of New York, USA	<i>Battery Management and Disposal under the</i> New York Environmental Conservation Law - Title 7 § 27-0719 ("NY Battery Law")
30	State of Maine, USA	"Public Law c. 477, An Act To Stop Perfluoroalkyl and Polyfluoroalkyl Substances Pollution" (" <i>Maine</i> PFAS Regulation")
31	Canada	Prohibition of Certain Toxic Substances Regulations, 2012 (SOR/2012-285) and related regulations
32	France	Decree No. 2020-105 on the 'Fight Against Waste and the Circular Economy' Article 112 ("L'article 112 de la loi du 10 février 2020 relative à la lutte contre le gaspillage et à l'économie circulaire")
33		<i>(intentionally blank)</i>
34		<i>(intentionally blank)</i>
35		<i>(intentionally blank)</i>
36		<i>(intentionally blank)</i>
37		<i>(intentionally blank)</i>
38	United Nations	Stockholm Convention on Persistent Organic Pollutants ("POPs Convention")
39		<i>(intentionally blank)</i>
40		<i>(intentionally blank)</i>
41	Industry	IPC-4101 (Association Connecting Electronics Industries Standard, "Specification for Base Materials for Rigid and Multilayer Printed Boards")
42	Industry	IEC 61249-2-21 (International Electrochemical Commission Standard: Materials for Printed Boards and other Interconnecting Structures)
43		<i>(intentionally blank)</i>
44	<i>Industry</i>	<i>IEC 62474 (International Electrotechnical Commission Standard, Material Declaration for the Electrical and Electronic Industry and its Products) List</i>
45	<i>Industry</i>	<i>Global Automotive Declarable Substance List (GADSL)</i>
46		<i>TDK Specific Requirement</i>

### Note

The above list is a non-exhaustive list of key regulations and industry standards that affect TDK's environmental product quality activities.

### Important Note

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