

## BOMcheck List of Restricted and Declarable Substances for Supplied Articles

BOMcheck is an industry collaboration sharing one cloud-based platform to manage supply chain compliance to substance regulations around the world. This list is managed by the BOMcheck Steering Group and is aligned with the IEC 62474 screening of REACH Candidate List Substances, the IPC-1752A and IPC-1752B Standards for Materials Declaration Management (<http://www.ipc.org/ContentPage.aspx?pageid=Materials-Declaration>).

### 1. Product restrictions

#### Restriction of Certain Hazardous Substances (RoHS) Directive 2011/65/EU

The RoHS substance restrictions apply to every individual homogenous material in the part. BOMcheck is aligned with the IPC 1752A substance category list EUROHS-0508. The BOMcheck Full Materials Declaration tool provides the CAS numbers, common chemical names, synonyms and trade names for the substances which are included in each RoHS substance group.

Appendix A provides the list of substance applications exempt from the RoHS substance restrictions for certain periods, as published in Annex III of the RoHS Directive 2011/65/EU and renewed by the European Commission. Appendix B provides the list of exemptions published in Annex IV of the RoHS Directive 2011/65/EU, which apply specifically to medical devices and monitoring and control instruments. Note that these substance exemptions in the EU RoHS Directive do not provide any exemption from the product labelling requirements in China RoHS – the substances must be listed in the marking table.

Substance group	Maximum concentration of the substance in any individual homogenous material in the part
Cadmium/cadmium compounds	0.01% by weight (100 ppm) of homogeneous materials
Hexavalent Chromium compounds	0.1% by weight (1 000 ppm) of homogeneous materials
Lead/lead compounds	0.1% by weight (1 000 ppm) of homogeneous materials
Mercury/mercury compounds	0.1% by weight (1 000 ppm) of homogeneous materials
PBBs	0.1% by weight (1 000 ppm) of homogeneous materials
PBDEs	0.1% by weight (1 000 ppm) of homogeneous materials

## RoHS substance restrictions amendment 1 (Directive 2011/65/EU, as amended by Directive (EU) 2015/863 of March 2015)

On 4 June 2015 the European Commission published Delegated Directive 2015/863 which officially added four new substances and maximum concentration values in homogenous materials to Annex II of the RoHS Directive. Electrical and electronic equipment must comply with these additional substance restrictions from 22 July 2019, except for Medical Devices (Category 8) and Monitoring and Control Instruments (Category 9) which must comply with these additional substance restrictions from 22 July 2021.

Substance group	Maximum concentration of the substance in any individual homogenous material in the part
Bis(2-ethylhexyl) phthalate (DEHP)	0.1% by weight (1 000 ppm) of homogeneous materials
Butyl benzyl phthalate (BBP)	0.1% by weight (1 000 ppm) of homogeneous materials
Dibutyl phthalate (DBP)	0.1% by weight (1 000 ppm) of homogeneous materials
Diisobutyl phthalate (DIBP)	0.1% by weight (1 000 ppm) of homogeneous materials

## Registration Evaluation Authorisation and Restriction of Chemicals (REACH) Regulation 1907/2006 (as amended)

### REACH Candidate List substances found in Supplied Articles

REACH Article 33 requires all suppliers to inform their customers if the product they supply includes any article which contains any of the substances in the Candidate List in concentrations > 0.1% w/w of the article. An article is any item that has a special shape, surface or design which determines its function to a greater degree than its chemical composition (e.g. a screw, resistor, wire). Please note that this definition of an article may apply to individual components in your product. For further guidance on what is considered an article under the REACH Regulation please refer to the ECHA Guidance published at [https://echa.europa.eu/documents/10162/2324906/articles\\_en.pdf](https://echa.europa.eu/documents/10162/2324906/articles_en.pdf)

There are 235 Substances of Very High Concern (SVHCs) on the current REACH Candidate List published 14 June 2023 at <https://echa.europa.eu/candidate-list-table>. BOMcheck has determined that 120 of these SVHCs are not normally found in concentrations > 0.1% w/w in Supplied Articles. If parts and materials are manufactured using conventional industry processes, then the supplier can rely on the BOMcheck guidance and screen out these 120 SVHCs (BOMcheck will set the supplier's Regulatory Compliance Declaration to 'compliant' for these SVHCs).

The CAS numbers published by ECHA for the 115 REACH Candidate List substances which can normally be found in Supplied Articles are included in the table below. Note that ECHA has not published CAS numbers for some REACH Candidate List Substances. BOMcheck is aligned with the IPC 1752A and IPC 1752B substance category list EUREACH-0623.

REACH Candidate List Substances which can normally be found in Supplied Articles	CAS number(s) published by ECHA	Threshold
<i>Included in REACH Candidate List on 28 October 2008</i>		
Benzyl butyl phthalate (BBP)	85-68-7	0.1% by weight (1 000 ppm) of any article
Dibutyl phthalate (DBP)	84-74-2	0.1% by weight (1 000 ppm) of any article
Bis (2-ethylhexyl) phthalate (DEHP)	117-81-7	0.1% by weight (1 000 ppm) of any article
Hexabromocyclododecane (HBCDD) and all major diastereoisomers	25637-99-4, 3194-55-6, 134237-50-6, 134237-51-7,	0.1% by weight (1 000 ppm) of any article

	134237-52-8	
Shortchain chlorinated paraffins (C10 – C13)	85535-84-8	0.1% by weight (1 000 ppm) of any article
Cobalt dichloride (CoCl <sub>2</sub> )	7646-79-9	0.1% by weight (1 000 ppm) of any article
Diarsenic pentoxide	1303-28-2	0.1% by weight (1 000 ppm) of any article
Diarsenic trioxide	1327-53-3	0.1% by weight (1 000 ppm) of any article
Tributyl tin oxide (TBTO)	56-35-9	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 13 January 2010</b>		
Tris (2-chloroethyl) phosphate (TCEP)	115-96-8	0.1% by weight (1 000 ppm) of any article
Lead chromate	7758-97-6	0.1% by weight (1 000 ppm) of any article
Lead chromate molybdate sulfate red (C.I. Pigment Red 104)	12656-85-8	0.1% by weight (1 000 ppm) of any article
Lead sulfochromate yellow (C.I. Pigment Yellow 34)	1344-37-2	0.1% by weight (1 000 ppm) of any article
Diisobutyl phthalate (DIBP)	84-69-5	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 18 June 2010</b>		
Disodium tetraborate, anhydrous	1303-96-4, 1330-43-4, 12179-04-3	0.1% by weight (1 000 ppm) of any article
Tetraboron disodium heptaoxide, hydrate	12267-73-1	0.1% by weight (1 000 ppm) of any article
Boric acid	10043-35-3, 11113-50-1	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 20 June 2011</b>		
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	0.1% by weight (1 000 ppm) of any article
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 19 December 2011</b>		
2,2'-dichloro-4,4'-methylenedianiline	101-14-4	0.1% by weight (1 000 ppm) of any article
N,N-dimethylacetamide	127-19-5	0.1% by weight (1 000 ppm) of any article
Bis(2-methoxyethyl) phthalate	117-82-8	0.1% by weight (1 000 ppm) of any article
Bis(2-methoxyethyl) ether	111-96-6	0.1% by weight (1 000 ppm) of any article
Aluminosilicate Refractory Ceramic Fibres	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article

Zirconia Aluminosilicate Refractory Ceramic Fibres	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 18 June 2012</b>		
Diboron trioxide	1303-86-2	0.1% by weight (1 000 ppm) of any article
1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	112-49-2	0.1% by weight (1 000 ppm) of any article
1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 19 December 2012</b>		
Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	1163-19-5	0.1% by weight (1 000 ppm) of any article
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	0.1% by weight (1 000 ppm) of any article
Diisopentylphthalate	605-50-5	0.1% by weight (1 000 ppm) of any article
N-pentyl-isopentylphthalate	776297-69-9	0.1% by weight (1 000 ppm) of any article
Dibutyltin dichloride (DBTC)	683-18-1	0.1% by weight (1 000 ppm) of any article
Lead oxide sulfate	12036-76-9	0.1% by weight (1 000 ppm) of any article
[Phthalato(2-)]dioxotrilead	69011-06-9	0.1% by weight (1 000 ppm) of any article
Dioxobis(stearato)trilead	12578-12-0	0.1% by weight (1 000 ppm) of any article
Fatty acids, C16-18, lead salts	91031-62-8	0.1% by weight (1 000 ppm) of any article
Lead dinitrate	10099-74-8	0.1% by weight (1 000 ppm) of any article
Pentalead tetraoxide sulphate	12065-90-6	0.1% by weight (1 000 ppm) of any article
Sulfurous acid, lead salt, dibasic	62229-08-7	0.1% by weight (1 000 ppm) of any article
Tetralead trioxide sulphate	12202-17-4	0.1% by weight (1 000 ppm) of any article
Trilead dioxide phosphonate	12141-20-7	0.1% by weight (1 000 ppm) of any article
Orange lead (lead tetroxide)	1314-41-6	0.1% by weight (1 000 ppm) of any article
Lead cyanamidate	20837-86-9	0.1% by weight (1 000 ppm) of any article
Pyrochlore, antimony lead yellow	8012-00-8	0.1% by weight (1 000 ppm) of any article

4-Aminoazobenzene	60-09-3	0.1% by weight (1 000 ppm) of any article
1,2-Diethoxyethane	629-14-1	0.1% by weight (1 000 ppm) of any article
Silicic acid (H <sub>2</sub> SiO <sub>5</sub> ), barium salt (1:1), lead-doped	68784-75-8	0.1% by weight (1 000 ppm) of any article
N,N-dimethylformamide; dimethyl formamide	68-12-2	0.1% by weight (1 000 ppm) of any article
Lead titanium trioxide	12060-00-3	0.1% by weight (1 000 ppm) of any article
Lead titanium zirconium oxide	12626-81-2	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 20 June 2013</b>		
4-Nonylphenol, branched and linear, ethoxylated <i>[substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]</i>	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
Ammonium pentadecafluorooctanoate (APFO)	3825-26-1	0.1% by weight (1 000 ppm) of any article
Pentadecafluorooctanoic acid (PFOA)	335-67-1	0.1% by weight (1 000 ppm) of any article
Cadmium	7440-43-9	0.1% by weight (1 000 ppm) of any article
Cadmium oxide	1306-19-0	0.1% by weight (1 000 ppm) of any article
Dipentyl phthalate (DPP)	131-18-0	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 16 December 2013</b>		
Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)	1937-37-7	0.1% by weight (1 000 ppm) of any article
Trixylyl phosphate	25155-23-1	0.1% by weight (1 000 ppm) of any article
Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)	573-58-0	0.1% by weight (1 000 ppm) of any article
Dihexyl phthalate	84-75-3	0.1% by weight (1 000 ppm) of any article
Imidazolidine-2-thione; (2-imidazoline-2-thiol)	96-45-7	0.1% by weight (1 000 ppm) of any article
Cadmium sulphide	1306-23-6	0.1% by weight (1 000 ppm) of any article

<b>Included in REACH Candidate List on 16 June 2014</b>		
1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 17 December 2014</b>		
2-Benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	3846-71-7	0.1% by weight (1 000 ppm) of any article
2-(2H-Benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	25973-55-1	0.1% by weight (1 000 ppm) of any article
2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	15571-58-1	0.1% by weight (1 000 ppm) of any article
Reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 15 June 2015</b>		
1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with greater than or equal to 0.3% of dihexyl phthalate (EC No. 201-559-5)	68515-51-5, 68648-93-1	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 17 December 2015</b>		
Perfluorononan-1-oic-acid and its sodium and ammonium salts	375-95-1, 21049-39-8, 4149-60-4	0.1% by weight (1 000 ppm) of any article
1,3-propanesultone	1120-71-4	0.1% by weight (1 000 ppm) of any article
2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	3864-99-1	0.1% by weight (1 000 ppm) of any article
2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350)	36437-37-3	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 20 June 2016</b>		
Benzo[def]chrysene	50-32-8	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 12 January 2017</b>		
4,4'-isopropylidenediphenol (bisphenol A)	80-05-7	0.1% by weight (1 000 ppm) of any article
Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	3108-42-7, 335-76-2, 3830-45-3	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 7 July 2017</b>		

Perfluorohexane-1-sulphonic acid and its salts (PFHxS)	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 15 January 2018</b>		
Benz[a]anthracene	56-55-3, 1718-53-2	0.1% by weight (1 000 ppm) of any article
Cadmium hydroxide	21041-95-2	0.1% by weight (1 000 ppm) of any article
Chrysene	218-01-9, 1719-03-5	0.1% by weight (1 000 ppm) of any article
1,6,7,8,9,14,15,16,17,17,18,18-Dodecachloropentacyclo[12.2.1.16,9.02,13.05,10]octadeca-7,15-diene ("Dechlorane Plus"™) [covering any of its individual anti- and syn-isomers or any combination thereof]	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 27 June 2018</b>		
Benzo[ghi]perylene	191-24-2	0.1% by weight (1 000 ppm) of any article
Octamethylcyclotetrasiloxane (D4)	556-67-2	0.1% by weight (1 000 ppm) of any article
Decamethylcyclopentasiloxane (D5)	541-02-6	0.1% by weight (1 000 ppm) of any article
Dodecamethylcyclohexasiloxane (D6)	540-97-6	0.1% by weight (1 000 ppm) of any article
Terphenyl, hydrogenated	61788-32-7	0.1% by weight (1 000 ppm) of any article
Disodium octaborate	12008-41-2	0.1% by weight (1 000 ppm) of any article
Lead	7439-92-1	0.1% by weight (1 000 ppm) of any article
Dicyclohexyl phthalate (DCHP)	84-61-7	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 15 January 2019</b>		
Benzo[k]fluoranthene	207-08-9	0.1% by weight (1 000 ppm) of any article
Fluoranthene	206-44-0, 93951-69-0	0.1% by weight (1 000 ppm) of any article
Phenanthrene	85-01-8	0.1% by weight (1 000 ppm) of any article
Pyrene	129-00-0, 1718-52-1	0.1% by weight (1 000 ppm) of any article
2,2-bis(4'-hydroxyphenyl)-4-methylpentane	6807-17-6	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 16 July 2019</b>		

Tris(4-nonylphenyl, branched and linear) phosphite (TNPP) with greater than or equal to 0.1% w/w of 4-nonylphenol, branched and linear (4-NP)	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 16 January 2020</b>		
Diisohexyl phthalate	71850-09-4	0.1% by weight (1 000 ppm) of any article
Perfluorobutane sulfonic acid (PFBS) and its salts	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 25 June 2020</b>		
Dibutylbis(pentane-2,4-dionato-O,O')tin	22673-19-4	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 19 January 2021</b>		
Bis(2-(2-methoxyethoxy)ethyl)ether	143-24-8	0.1% by weight (1 000 ppm) of any article
Dioctyltin dilaurate, stannane, dioctyl-, bis(coco acyloxy) derivs., and any other stannane, dioctyl-, bis(fatty acyloxy) derivs. wherein C12 is the predominant carbon number of the fatty acyloxy moiety	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 8 July 2021</b>		
Medium-chain chlorinated paraffins (MCCP) [UVCB substances consisting of more than or equal to 80% linear chloroalkanes with carbon chain lengths within the range from C14 to C17]	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
4,4'-(1-methylpropylidene)bisphenol	77-40-7	0.1% by weight (1 000 ppm) of any article
Orthoboric acid, sodium salt	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 17 January 2022</b>		
6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol	119-47-1	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 17 January 2023</b>		
1,1'-[ethane-1,2-diylbis(oxy)]bis[2,4,6-tribromobenzene]	37853-59-1	0.1% by weight (1 000 ppm) of any article
2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol	79-94-7	0.1% by weight (1 000 ppm) of any article
4,4'-sulphonyldiphenol	80-09-1	0.1% by weight (1 000 ppm) of any article
Barium diboron tetraoxide	13701-59-2	0.1% by weight (1 000 ppm) of any article
Bis(2-ethylhexyl) tetrabromophthalate covering any of the individual isomers and/or combinations thereof	26040-51-7	0.1% by weight (1 000 ppm) of any article
Isobutyl 4-hydroxybenzoate	4247-02-3	0.1% by weight (1 000 ppm) of any article



Melamine	108-78-1	0.1% by weight (1 000 ppm) of any article
Perfluoroheptanoic acid and its salts	375-85-9 6130-43-4 21049-36-5 20109-59-5	0.1% by weight (1 000 ppm) of any article
reaction mass of 2,2,3,3,5,5,6,6-octafluoro-4-(1,1,1,2,3,3,3-heptafluoropropan-2-yl)morpholine and 2,2,3,3,5,5,6,6-octafluoro-4-(heptafluoropropyl)morpholine	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 14 June 2023</b>		
bis(4-chlorophenyl) sulphone	80-07-9	0.1% by weight (1 000 ppm) of any article
diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8	0.1% by weight (1 000 ppm) of any article

#### REACH substance restrictions applicable to Supplied Articles

REACH Article 67 contains over 75 different substance restrictions. However, the BOMcheck Substance List Working Group has screened out 53 of these substance restrictions because they are not relevant to parts and materials in Supplied Articles. BOMcheck enables suppliers to declare against the following 22 restricted substances which can be present above the threshold levels in parts and materials normally found in Supplied Articles. Note that "No content permitted" means "The chemical substance is not allowed to be present in the material at any concentration level."

The BOMcheck Regulatory Compliance Declaration tool provides information sheets for each individual substance restriction. The BOMcheck Full Materials Declaration tool provides the CAS numbers, common chemical names, synonyms and trade names for these restricted substances. BOMcheck is aligned with the IPC 1752A and IPC 1752B substance category list EUREACH-ARTICLE67-2018/2005.

REACH restricted substances which can normally be found in Supplied Articles	Threshold
Sum of perfluorocarboxylic acids containing 9 to 14 carbon atoms	0.0000025% by weight (25ppb) of any article
Bisphenol A in thermal paper	0.02% by weight (200 ppm) in thermal paper
Sum of Selected Phthalates Group 1 (DIBP, BBP, DBP, DEHP)	0.1% w/w of plasticised material
Asbestos fibres	No intentionally added content
Dibutyltin (DBT) compounds	0.1% by weight of tin in a material
Monomethyl dibromodiphenyl methane	No intentionally added content
Monomethyl dichlorodiphenyl methane	No intentionally added content
Monomethyl tetrachlorodiphenyl methane	No intentionally added content
Polychlorinated terphenyls (PCTs)	No intentionally added content
1,2,4 Trichlorobenzene	Concentration must be < 0.1% w/w
Dimethyl Fumarate	0.00001% (0.1 ppm) w/w

Tri-substituted organostannic compounds	0.1 % by weight of tin in a material
Tar oils and creosotes	No content permitted in wood
<b>Restrictions which apply to parts used in childcare products and toys</b>	
Benzene	Concentration must be < 0.0005% w/w in toys
Diocyltin (DOT) compounds	0.1% by weight of tin in a material
Selected Phthalates Group 2 (DIDP, DINP, DNOP)	0.1% w/w of plasticised material when used in toys and childcare articles which can be placed in the mouth
Any individual PAH compound – toys and childcare articles	0.00005% by weight (0.5 ppm) in plastic or rubber material in toys and childcare articles that come into direct, prolonged or repetitive skin or oral cavity contact
<b>Restrictions which apply to parts containing leather or textiles</b>	
Diocyltin (DOT) compounds	0.1% by weight of tin in a material
Azo colourants containing certain amines	Not permitted in textile and leather articles which may come into direct and prolonged contact with skin
Tri (2,3-dibromo-propyl) phosphate	Not permitted in textile articles which may come into contact with skin
Tris (aziridiny) phosphin oxide	Not permitted in textile articles which may come into contact with skin
<b>Restrictions which apply to parts which come into contact with skin</b>	
Any individual PAH compound	0.0001% by weight (1 ppm) in plastic or rubber material that come into direct, prolonged or repetitive skin or oral cavity contact
Nickel and nickel alloys	Must not be used in applications with direct and prolonged skin contact and where the rate of nickel release is > 0.5 micro gms per cm <sup>2</sup> per week
<b>Restrictions which apply to parts which contain chemical products (liquids, gases, powders)</b>	
Benzene	< 0.1% w/w in any substance or preparation
Pentachlorophenol	0.1% w/w in any substance or preparation
Nonylphenol and nonylphenol ethoxylates	Concentration must be < 0.1% w/w

### Substances which are restricted or declarable by other legislation

BOMcheck includes substances which are restricted or declarable in legislation in all parts of the world, including North America, Asia Pacific and Europe. The BOMcheck Steering Group has screened-out substance restrictions or declaration requirements which are not relevant to parts and materials normally found in Supplied Articles. BOMcheck enables suppliers to declare against the following substances which can be present above the threshold levels in parts and materials normally found in Supplied Articles. Note that “No content permitted” means “The chemical substance is not allowed to be present in the material at any concentration level”.

The BOMcheck Regulatory Compliance Declaration tool provides information sheets for each individual substance restriction or declaration requirement, including the applicable legislation and information on alternative substances. The BOMcheck Full Materials Declaration tool provides the CAS numbers, common chemical names, synonyms and trade names for these regulated substances.

<b>Substances which can normally be found in Supplied Articles</b>	<b>Threshold</b>
Hexachlorobenzene	0.001% (10 ppm) by weight in a material
Perfluorohexane-1-sulphonic acid, its salts and related substances	0.0000025% by weight (25 ppb) of any article
Sum of perfluorocarboxylic acids containing 9 to 14 carbon atoms	0.0000025% by weight (25 ppb) of any article
Phenol, Isopropylated Phosphate (3:1) (PIP 3:1)	No intentionally added content
Bisphenol S in thermal paper	0.02% by weight (200 ppm) in thermal paper
Perfluorooctanoic acid and its salts	0.0000025% by weight (25 ppb) of any article
Formaldehyde	No intentionally added content in composite wood products or components (plywood, particle board and MDF) and textiles
Pentachlorophenol (PCP)	No intentionally added content
Polychlorinated and polybrominated dioxins and furans	No intentionally added content
Radioactive substances	No intentionally added content
Biocides	No intentionally added biocides
PFOS	0.1% w/w
Polybrominated diphenyl ethers (PBDEs)	0.05% (500 ppm) by weight in a material
HBCDD (Hexabromocyclododecane)	0.01% (100 ppm) by weight in a material
Shortchain chlorinated paraffins (C10 – C13)	0.15% (1 500 ppm) by weight in a material
Polychlorinated biphenyls (PCBs)	No intentionally added content
Polychlorinated naphthalenes (PCNs)	No intentionally added content
<b>Restrictions which apply to parts used in childcare products and toys</b>	
Flame retardant chemicals	0.1% by weight (1 000 ppm) in a material in toys and childcare products
Di-n-pentyl phthalate (DPENP)	0.1% by weight (1 000 ppm) in a material in toys and childcare products
Di-n-hexyl phthalate (DHEXP)	0.1% by weight (1 000 ppm) in a material in toys and

	childcare products
Dicyclohexyl phthalate (DCHP)	0.1% by weight (1 000 ppm) in a material in toys and childcare products
Diisononyl phthalate (DINP)	0.1% by weight (1 000 ppm) in a material in toys and childcare products
Tris (2-chloroethyl) phosphate (TCEP)	No content permitted in toys and childcare products
Tris(2-chloro-1-methylethyl) phosphate (TCPP)	No content permitted in toys and childcare products
Tris (1,3-dichloro-2-propyl) phosphate (TDCPP)	No content permitted in toys and childcare products
Lead/lead compounds	0.01% w/w in consumer products designed or intended primarily for children 12 years of age or younger
Lead/lead compounds	0.009% w/w in paint and similar surface coatings of toys and other articles intended to be used by children
Mercury	0.001% w/w in paint and similar surface coatings of toys and other articles intended for use by children
<b>Restrictions which apply to parts which come into contact with food</b>	
Bisphenol A	No content permitted in products which contact with food
<b>Restrictions which apply to parts which contain chemical products (liquids, gases, powders)</b>	
Ozone depleting substances	No intentionally added content
Fluorinated Greenhouse Gases (PFC, SF6, HFC)	No content permitted
<b>Restrictions which apply to parts which contain textiles</b>	
Flame retardant chemicals	0.1% by weight (1 000 ppm) in a material in textiles
<b>Restrictions which apply to parts which contain printing ink</b>	
Mineral oil aromatic hydrocarbons (MOAH) consisting of 1-7 aromatic cycles	0.1% by weight (1 000 ppm) in the ink
Mineral oil saturated hydrocarbons (MOSH) consisting of 16-35 carbon atoms	0.1% by weight (1 000 ppm) in the ink

#### Batteries substance restrictions

The following restrictions apply to all batteries. The BOMcheck Full Materials Declaration tool provides the CAS numbers, common chemical names, synonyms and trade names for these restricted substances.

Substances	Maximum concentration in the battery
Cadmium/cadmium compounds	0.001 % by weight (10 ppm) of battery
Mercury/mercury compounds	0.0001% by weight (1 ppm) of battery

Lead/lead compounds	0.004% by weight (40 ppm) of battery
Perchlorates	0.0000006% by weight (6 ppb) of battery

## Proposition 65

Screening of the 900 plus substances on the Proposition 65 list has shown that a small subset of substances may be found in components of manufactured products (not defined as a substance or preparation (mixture) under the REACH regulation). Many of these substances do not require “safe harbour” warnings and many substances are already regulated under RoHS, REACH, POPs and other regulations in BOMcheck. The remaining Proposition 65 substances which require additional compliance declarations can be found with detailed chemical guidance to help you assess if they may be found in your parts.

If the finished product includes a supplier part that contains Proposition 65 substance(s) then you need to assess whether the user could be exposed to the part during normal use of the product. If yes, then you should provide an appropriate “safe harbour” warning and communicate the name of one Proposition 65 substance for each endpoint (for example, one carcinogen of the Proposition 65 substance(s) is listed for cancer).

Proposition 65 substances which can normally be found in Supplied Articles	Threshold
Tetrahydrofuran	0.1% by weight (1 000 ppm) of any material
Methyl acrylate	0.1% by weight (1 000 ppm) of any material
Indium tin oxide	0.1% by weight (1 000 ppm) of any material
Lead and Lead Compounds	0.009% (90 ppm) of any material
Bisphenol A (BPA)	0.0003% (3 ppm) of any material
<b>Phthalate plasticisers</b>	
Diisononyl phthalate (DiNP)	No intentionally added content
Di-isodecyl phthalate (DIDP)	No intentionally added content
Di-n-hexyl phthalate (DnHP)	No intentionally added content
<b>Flame retardants and plasticisers</b>	
Tris(1,3-dichloro-2-propyl) Phosphate (TDCPP)	0.0025% by weight (25 ppm) of any material
Tris(2-chloroethyl) Phosphate	0.0025% by weight (25 ppm) of any material
Tris(2,3-dibromopropyl)phosphate	0.0025% by weight (25 ppm) of any material
<b>Flame retardants</b>	
Molybdenum Trioxide	0.1% by weight (1 000 ppm) of any material
Antimony Oxide (Antimony trioxide)	0.1% by weight (1 000 ppm) of any material
Tetrabromobisphenol A	0.1% by weight (1 000 ppm) of any material
2,2-Bis(bromomethyl)-1,3-propanediol	0.1% by weight (1 000 ppm) of any material

Mirex	0.1% by weight (1 000 ppm) of any material
<b>UV protection agents</b>	
Benzophenone	0.1% by weight (1 000 ppm) of any material
<b>Colourants</b>	
Benzidine-based Dyes	0.1% by weight (1 000 ppm) of any material
3,3'-Dimethoxybenzidine-based dyes metabolized to 3,3'-dimethoxybenzidine	0.1% by weight (1 000 ppm) of any material
3,3'-Dimethylbenzidine-based dyes metabolized to 3,3'-dimethylbenzidine	0.1% by weight (1 000 ppm) of any material
D&C Orange No. 17	0.1% by weight (1 000 ppm) of any material
1-Amino-2,4-dibromoanthraquinone	0.1% by weight (1 000 ppm) of any material
1-Amino-2-methylantraquinone	0.1% by weight (1 000 ppm) of any material
Direct Blue 6 (Technical Grade)	0.1% by weight (1 000 ppm) of any material
Direct Brown 95 (Technical Grade)	0.1% by weight (1 000 ppm) of any material
Disperse Blue 1	0.1% by weight (1 000 ppm) of any material
<b>Impurities in extender oils and black colourants</b>	
Naphthalene	0.0001% by weight (1 ppm) of any material
<b>REACH Article 67 substance restrictions which may be found in hardware and electrical and electronic equipment (Regulation 1907/2006)</b>	
Any individual PAH compound	0.0001% by weight (1 ppm) in plastic or rubber material that come into direct, prolonged or repetitive skin or oral cavity contact
Asbestos	No intentionally added content
Azocolourants and azodyes which form certain aromatic amines	Not permitted in textile and leather articles which may come into direct and prolonged contact with skin
Nickel and nickel alloys	Must not be used in applications with direct and prolonged skin contact and where the rate of nickel release is > 0.5 micro gms per cm <sup>2</sup> per week
Tar oils and creosotes	No content permitted in wood and wooden materials
<b>RoHS substance restrictions (Directive 2011/65/EU)</b>	
Cadmium/cadmium compounds	0.01% by weight (100 ppm) of homogeneous materials
Hexavalent Chromium	0.1% by weight (1 000 ppm) of homogenous materials
Mercury/Mercury compounds	0.1% by weight (1 000 ppm) of homogenous materials
PBBs	0.1% by weight (1 000 ppm) of homogenous materials

PBDEs	0.1% by weight (1 000 ppm) of homogenous materials
<b>REACH candidate list substances (Regulation 1907/2006)</b>	
Perfluorononanoic acid (PFNA) and its salts	0.1% by weight (1 000 ppm) of any article
DEHP (Di(2-ethylhexyl) phthalate)	0.1% by weight (1 000 ppm) of any article
DBP (Dibutyl phthalate)	0.1% by weight (1 000 ppm) of any article
BBP (Benzylbutyl phthalate)	0.1% by weight (1 000 ppm) of any article
SCCP (Short-chained chlorinated paraffins)	0.1% by weight (1 000 ppm) of any article
Direct Black 38 (Technical Grade)	0.1% by weight (1 000 ppm) of any article
4-Aminoazobenzene	0.1% by weight (1 000 ppm) of any article
<b>Persistent Organic Pollutants Regulation (EU) 2019/1021</b>	
Perfluorooctane sulfonic acid (PFOS) and its salts and transformation and degradation precursors	0.1% by weight (1 000 ppm) of any material
Polychlorinated biphenyls (PCBs)	No intentionally added content
Perfluorooctanoic acid and its salts	0.000025% by weight (25ppb) of any article

### Industry restricted and declarable substances

The following substances are restricted by leading OEMs to comply with product safety standards in Germany and to reduce severe environmental or health and safety impacts. Suppliers can check the information pages in the BOMcheck tool to find out which OEMs require their suppliers to comply with particular industry substance restrictions.

<b>Substances which can normally be found in Supplied Articles</b>	<b>Threshold</b>
Beryllium and Beryllium compounds	0.1% by weight (1 000 ppm) of any material
Per and polyfluoroalkyl substances	No intentionally added content
Rare earth minerals	No intentionally added content
Precious metals	No intentionally added content
Brominated flame retardants (other than PBBs, PBDEs or HBCDD)	Declare if > 0.1% w/w total bromine content from BFRs
Brominated flame retardants (other than PBBs, PBDEs or HBCDD)	Declare if > 0.09% total bromine content from BFRs in printed wiring board laminate
Chlorinated flame retardants	Declare if > 0.1% w/w total chlorine content from CFRs
Chlorinated flame retardants	Declare if > 0.09% total chlorine content from CFRs in printed wiring board laminate
PVC and PVC copolymers	Declare if > 0.1% w/w total chlorine content from PVC
Antimony trioxide in plastic materials	Declare if > 0.1% w/w in plastic parts

Phthalates	Declare if > 0.1% w/w
<b>Restrictions which apply to parts containing leather or textiles</b>	
Alkylphenol and alkylphenol ethoxylates	0.01% by weight (100 ppm) in textile and leather articles
<b>Restrictions which apply to parts used in lamps and lamp ballasts</b>	
Antimony compounds in glass	0.1% w/w in glass in lamps
Arsenic compounds in glass	0.1% w/w in glass in lamps
Polycyclic Aromatic Hydrocarbons (PAH)	0.005% in potting material in electronic or magnetic ballast for lamps
<b>Restrictions which apply to parts which come into contact with skin</b>	
Azo Colourants	30 ppm if part comes into contact with skin
Benzoapyrene in contact with skin	The limits for different applications are provided in the information sheet
Sum of all PAHs	The limits for different applications are provided in the information sheet

## 2. Packaging restrictions

### Packaging Directive 94/62/EC

Substances	Maximum concentration in the supplied packaging
Sum of all heavy metals (Cd, Hg, Cr(VI) and Pb)	0.01% in the supplied packaging

### Registration Evaluation Authorisation and Restriction of Chemicals (REACH) Regulation 1907/2006 (as amended)

#### REACH Candidate List substances found in packaging

REACH Article 33 requires all suppliers to inform their customers if the product they supply includes any article which contains any of the substances in the Candidate List in concentrations > 0.1% w/w of the article. An article is a product which has a special shape, surface or design which determines its function to a greater degree than its chemical composition. Please note that this definition of an article may apply to individual components in your product. For further guidance on what is considered an article under the REACH Regulation please refer to the ECHA Guidance published at [https://echa.europa.eu/documents/10162/2324906/articles\\_en.pdf](https://echa.europa.eu/documents/10162/2324906/articles_en.pdf). The REACH regulation also applies to packaging.

There are 235 Substances of Very High Concern (SVHCs) on the current REACH Candidate List published 14 June 2023. The BOMcheck Steering Group has determined that 179 of these SVHCs are not normally found in concentrations > 0.1% w/w in packaging. BOMcheck enables suppliers to screen out these 192 substances and instead requires suppliers to declare against the following 41 substances which can be present in concentrations > 0.1% w/w in packaging articles.

REACH Candidate List Substances which can normally be found in	CAS number(s) published by ECHA	Threshold
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<b>packaging</b>		
<b><i>Included in REACH Candidate List on 28 October 2008</i></b>		
Benzyl butyl phthalate (BBP)	85-68-7	0.1% by weight (1 000 ppm) of any article
Dibutyl phthalate (DBP)	84-74-2	0.1% by weight (1 000 ppm) of any article
Bis (2-ethylhexyl) phthalate (DEHP)	117-81-7	0.1% by weight (1 000 ppm) of any article
Hexabromocyclododecane (HBCDD) and all major diastereoisomers	25637-99-4, 3194-55-6, 134237-50-6, 134237-51-7, 134237-52-8	0.1% by weight (1 000 ppm) of any article
Cobalt dichloride (CoCl <sub>2</sub> )	7646-79-9	0.1% by weight (1 000 ppm) of any article
Tributyl tin oxide (TBTO)	56-35-9	0.1% by weight (1 000 ppm) of any article
<b><i>Included in REACH Candidate List on 13 January 2010</i></b>		
Tris (2-chloroethyl) phosphate (TCEP)	115-96-8	0.1% by weight (1 000 ppm) of any article
Diisobutyl phthalate (DIBP)	84-69-5	0.1% by weight (1 000 ppm) of any article
<b><i>Included in REACH Candidate List on 18 June 2010</i></b>		
Disodium tetraborate, anhydrous	1303-96-4, 1330-43-4, 12179-04-3	0.1% by weight (1 000 ppm) of any article
Tetraboron disodium heptaoxide, hydrate	12267-73-1	0.1% by weight (1 000 ppm) of any article
Boric acid	10043-35-3, 11113-50-1	0.1% by weight (1 000 ppm) of any article
<b><i>Included in REACH Candidate List on 20 June 2011</i></b>		
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	0.1% by weight (1 000 ppm) of any article
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6	0.1% by weight (1 000 ppm) of any article
<b><i>Included in REACH Candidate List on 19 December 2011</i></b>		
2,2'-dichloro-4,4'-methylenedianiline	101-14-4	0.1% by weight (1 000 ppm) of any article
Bis(2-methoxyethyl) phthalate	117-82-8	0.1% by weight (1 000 ppm) of any article
<b><i>Included in REACH Candidate List on 18 June 2012</i></b>		
Diboron trioxide	1303-86-2	0.1% by weight (1 000 ppm) of any article
<b><i>Included in REACH Candidate List on 19 December 2012</i></b>		

Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	1163-19-5	0.1% by weight (1 000 ppm) of any article
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	0.1% by weight (1 000 ppm) of any article
Diisopentylphthalate	605-50-5	0.1% by weight (1 000 ppm) of any article
N-pentyl-isopentylphthalate	776297-69-9	0.1% by weight (1 000 ppm) of any article
Dibutyltin dichloride (DBTC)	683-18-1	0.1% by weight (1 000 ppm) of any article
Lead oxide sulfate	12036-76-9	0.1% by weight (1 000 ppm) of any article
[Phthalato(2-)]dioxotrilead	69011-06-9	0.1% by weight (1 000 ppm) of any article
Dioxobis(stearato)trilead	12578-12-0	0.1% by weight (1 000 ppm) of any article
Fatty acids, C16-18, lead salts	91031-62-8	0.1% by weight (1 000 ppm) of any article
Lead dinitrate	10099-74-8	0.1% by weight (1 000 ppm) of any article
Pentalead tetraoxide sulphate	12065-90-6	0.1% by weight (1 000 ppm) of any article
Sulfurous acid, lead salt, dibasic	62229-08-7	0.1% by weight (1 000 ppm) of any article
Tetralead trioxide sulphate	12202-17-4	0.1% by weight (1 000 ppm) of any article
Trilead dioxide phosphonate	12141-20-7	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 20 June 2013</b>		
Dipentyl phthalate (DPP)	131-18-0	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 16 December 2013</b>		
Dihexyl phthalate	84-75-3	0.1% by weight (1 000 ppm) of any article
Imidazolidine-2-thione; (2-imidazoline-2-thiol)	96-45-7	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 16 June 2014</b>		
1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 17 December 2014</b>		
2-Benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	3846-71-7	0.1% by weight (1 000 ppm) of any article

2-(2H-Benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	25973-55-1	0.1% by weight (1 000 ppm) of any article
2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	15571-58-1	0.1% by weight (1 000 ppm) of any article
Reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 15 June 2015</b>		
1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with greater than or equal to 0.3% of dihexyl phthalate (EC No. 201-559-5)	68515-51-5, 68648-93-1	0.1% by weight (1 000 ppm) of any article
<b>Included in REACH Candidate List on 17 December 2015</b>		
2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	3864-99-1	0.1% by weight (1 000 ppm) of any article
2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350)	36437-37-3	0.1% by weight (1 000 ppm) of any article

#### REACH Article 67 and other substance restrictions applicable to packaging articles

REACH Article 67 contains over 65 different substance restrictions. However, the BOMcheck Steering Group has screened out 62 of the REACH Article 67 substance restrictions because they are not relevant to parts and materials normally found in packaging articles. BOMcheck enables suppliers to declare against the following 6 restricted substances which can be present above the threshold levels in packaging articles.

Substances which can normally be found in packaging articles	Threshold
Arsenic compounds	No intentionally added content
Formaldehyde	0.1% in the supplied packaging
Dimethyl Fumarate	0.00001% (0.1 ppm) w/w
<b>Single-use plastics</b>	
oxo-degradable plastic	No content permitted
<b>Printing inks used in packaging</b>	
Mineral oil aromatic hydrocarbons (MOAH) consisting of 1-7 aromatic cycles	0.1% by weight (1 000 ppm) in the ink
Mineral oil saturated hydrocarbons (MOSH) consisting of 16-35 carbon atoms	0.1% by weight (1 000 ppm) in the ink

**Industry-restricted and declarable substances**

These substances are restricted by leading OEMs to comply with retailer restrictions on PVC in packaging and use of EPS in consumer products. Suppliers can check the information pages in the BOMcheck tool to find out which OEMs require their suppliers to comply with particular industry substance restrictions.

<b>Substances that can be found in packaging articles</b>	<b>Maximum concentration of the substance in the supplied packaging</b>
PVC	0.1% in supplied packaging
Expanded polystyrene (EPS) and other polymeric foam materials (e.g, EPP, EPE, EVA) as shock absorber buffers enclosing the product (excluding thin foam sheets and foam bags) inside any consumer product packaging	Not permitted

**Appendix A: Exemptions published in Annex III of the RoHS Directive (2011/65/EU), as published in Commission Decision 2010/571/EU of 24 September 2010, which are valid as at July 2023**

Number	Description
1(f)-I	Mercury in single capped (compact) fluorescent lamps not exceeding (per burner): 1(f) For special purposes: 5 mg
1(f)-II	Mercury in single capped (compact) fluorescent lamps not exceeding (per burner): For special purposes: 5 mg
2(b)(3)	Mercury in other fluorescent lamps not exceeding (per lamp): Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9) : 15 mg
2(b)(4)-I	Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index $R_a > 80$ : $P \leq 105$ W: 16 mg may be used per burner
2(b)(4)-II	Lamps emitting mainly light in the ultraviolet spectrum: 15 mg
2(b)(4)-III	Emergency lamps: 15 mg
3(a)	Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp): Short length ( $\leq 500$ mm) : 3.5 mg
3(b)	Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp): Medium length ( $> 500$ mm and $\leq 1,500$ mm) : 5 mg
3(c)	Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp): Long length ( $> 1,500$ mm) : 13 mg
4(a)-I	Mercury in low pressure non-phosphor coated discharge lamps, where the application requires the main range of the lamp-spectral output to be in the ultraviolet spectrum: up to 15 mg mercury may be used per lamp
4(b)	Lamps for other general lighting and special purposes (e.g. induction lamps): 15 mg
4(c)-I	Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner): $P \leq 155$ W : 25 mg
4(c)-II	Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner): $155$ W $< P \leq 405$ W : 30 mg
4(c)-III	Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner): $P > 405$ W : 40 mg
4(e)	Mercury in metal halide lamps (MH)
4(f)	Mercury in other discharge lamps for special purposes not specially mentioned in this Annex
4(f)-I	Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex
4(f)-II	Mercury in high pressure mercury vapour lamps used in projectors where an output $\geq 2000$ lumen ANSI is required
4(f)-III	Mercury in high pressure sodium vapour lamps used for horticulture lighting
4(f)-IV	Mercury in lamps emitting light in the ultraviolet spectrum
5(b)	Lead in glass of fluorescent tubes not exceeding 0.2% by weight

6(a)	Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0.35% lead by weight
6(a)-I	Lead as an alloying element in steel for machining purposes containing up to 0.35% lead by weight and in batch hot dip galvanised steel components containing up to 0.2% lead by weight
6(b)	Lead as an alloying element in aluminium containing up to 0.4% lead by weight
6(b)-I	Lead as an alloying element in aluminium containing up to 0.4% lead by weight, provided it stems from lead-bearing aluminium scrap recycling
6(b)-II	Lead as an alloying element in aluminium for machining purposes with a lead content of up to 0.4% lead by weight
6(c)	Copper alloy containing up to 4% lead by weight
7(a)	Lead in high melting temperature type solders (i.e. lead-based alloys containing 85% by weight or more lead)
7(c)-I	Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectric devices, or in a glass or ceramic matrix compound
7(c)-II	Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher
8(b)	Cadmium and its compounds electrical contacts
8(b)-I	Cadmium and its compounds in electrical contacts used in: circuit breakers, thermal sensing controls, thermal motor protectors (excluding hermetic thermal motor protectors), AC switches rated at: 6 A and more at 250 V AC and more, or 12 A and more at 125 V AC and more, DC switches rated at 20 A and more at 18 V DC and more, and switches for use at voltage supply frequency greater than or equal to 200 Hz
9	Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0.75% by weight in the cooling solution
13(a)	Lead in white glasses used for optical applications
13(b)	Cadmium and lead in filter glasses and glasses used for reflectance standards
13(b)-(I)	Lead in ion coloured optical filter glass types
13(b)-(II)	Cadmium in striking optical filter glass types; excluding applications falling under point 39 of this Annex
13(b)-(III)	Cadmium and lead in glazes used for reflectance standards
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages
15(a)	Lead in solders to complete a viable electrical connection between the semiconductor die and carrier within integrated circuit flip chip packages where at least one of the following criteria applies: a semiconductor technology node of 90 nm or larger; a single die of 300 mm <sup>2</sup> or larger in any semiconductor technology node; stacked die packages with die of 300 mm <sup>2</sup> or larger, or silicon interposers of 300 mm <sup>2</sup> or larger
18(b)	Lead as activator in the fluorescent powder (1% lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi <sub>2</sub> O <sub>5</sub> :Pb)
18(b)-I	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps containing phosphors such as BSP (BaSi <sub>2</sub> O <sub>5</sub> :Pb) when used in medical phototherapy equipment
21	Lead and Cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses
24	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors

29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC
30	Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more
32	Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes
34	Lead in cermet-based trimmer potentiometer elements
38	Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide
39(a)	Cadmium selenide in downshifting cadmium-based semiconductor nanocrystal quantum dots for use in display lighting applications (less than 0.2 microgram Cd per mm <sup>2</sup> of display screen area)

## Appendix B: Exemptions published in Annex IV to the RoHS Directive (2011/65/EU) which apply specifically to medical devices and monitoring and control instruments, which are valid as at July 2023

Number	Description
1	Lead, cadmium and mercury in detectors for ionising radiation
1a	Lead and cadmium in ion selective electrodes including glass of pH electrodes.
1b	Lead anodes in electrochemical oxygen sensors.
1c	Lead, cadmium and mercury in infra-red light detectors.
2	Lead bearings in X-ray tubes.
3	Lead in electromagnetic radiation amplification devices: micro-channel plate and capillary plate.
5	Lead in shielding for ionising radiation.
11	Lead in alloys as a superconductor and thermal conductor in MRI.
12	Lead and cadmium in metallic bonds creating superconducting magnetic circuits in MRI, SQUID, NMR (Nuclear Magnetic Resonance) or FTMS (Fourier Transform Mass Spectrometer) detectors.
13	Lead in counterweights.
14	Lead in single crystal piezoelectric materials for ultrasonic transducers.
15	Lead in solders for bonding to ultrasonic transducers.
17	Lead in solders in portable emergency defibrillators.
26	Lead in the following applications that are used durably at a temperature below – 20 °C under normal operating and storage conditions: (a) solders on printed circuit boards; (b) termination coatings of electrical and electronic components and coatings of printed circuit boards; (c) solders for connecting wires and cables; (d) solders connecting transducers and sensors. Lead in solders of electrical connections to temperature measurement sensors in devices which are designed to be used periodically at temperatures below – 150 °C. These exemptions expire on 30 June 2021.
27	Lead in solders, termination coatings of electrical and electronic components and printed circuit boards, connections of electrical wires, shields and enclosed connectors, which are used in (a) magnetic fields within the sphere of 1 m radius around the isocenter of the magnet in medical magnetic resonance imaging equipment, including patient monitors designed to be used within this sphere, or (b) magnetic fields within 1 m distance from the external surfaces of cyclotron magnets, magnets for beam transport and beam direction control applied for particle therapy.
31a	Lead, cadmium, hexavalent chromium, and polybrominated diphenyl ethers (PBDE) in spare parts recovered from and used for the repair or refurbishment of medical devices, including in vitro diagnostic medical devices, or electron microscopes and their accessories, provided that the reuse takes place in auditable closed-loop business-to-business return systems and that each reuse of parts is notified to the customer. Expires on: (a) 21 July 2021 for the use in medical devices other than in vitro diagnostic medical devices; (b) 21 July 2023 for the use in in vitro diagnostic medical devices; (c) 21 July 2024 for the use in electron microscopes and their accessories.
33	Lead in solders on populated printed circuit boards used in Directive 93/42/EEC class IIa and IIb mobile medical devices other than portable emergency defibrillators.
35	Mercury in cold cathode fluorescent lamps for back-lighting liquid crystal displays, not exceeding 5 mg per lamp, used in industrial monitoring and control instruments placed on the market before 22 July 2017. Expires on 21 July 2024.
37	Lead in platinized platinum electrodes used for conductivity measurements where at least one of the following conditions applies: (a) wide-range measurements with a conductivity range covering more than 1 order of magnitude (e.g. range between 0.1 mS/m and 5 mS/m) in laboratory applications for unknown concentrations; (b) measurements of solutions where an accuracy of +/- 1 % of the sample range and where high corrosion resistance of the electrode are required for any of the following: (i) solutions with an acidity < pH 1; (ii) solutions with an alkalinity > pH 13; (iii) corrosive solutions containing halogen gas; (c) measurements of conductivities above 100 mS/m that must be performed with portable instruments.



39	Lead in micro-channel plates (MCPs) used in equipment where at least one of the following properties is present: (a) a compact size of the detector for electrons or ions, where the space for the detector is limited to a maximum of 3 mm/MCP (detector thickness + space for installation of the MCP), a maximum of 6 mm in total, and an alternative design yielding more space for the detector is scientifically and technically impracticable; (b) a two-dimensional spatial resolution for detecting electrons or ions, where at least one of the following applies: (i) a response time shorter than 25 ns; (ii) a sample detection area larger than 149 mm <sup>2</sup> ; (iii) a multiplication factor larger than $1.3 \times 10^3$ . (c) a response time shorter than 5 ns for detecting electrons or ions; (d) a sample detection area larger than 314 mm <sup>2</sup> for detecting electrons or ions; (e) a multiplication factor larger than $4.0 \times 10^7$ . The exemption expires on the following dates: (a) 21 July 2021 for medical devices and monitoring and control instruments; (b) 21 July 2023 for in-vitro diagnostic medical devices; (c) 21 July 2024 for industrial monitoring and control instruments.
42	Mercury in electric rotating connectors used in intravascular ultrasound imaging systems capable of high operating frequency (greater than 50 MHz) modes of operation.