List of Restricted and Declarable Substances (August 2022)

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 which are exempt from the RoHS substance restrictions for certain time 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. A declaration containing the worst case concentration of these substances is required so that compliance can be calculated when the exemption expires in the future. 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 have to 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-ethythexy1) phthalate (DEHP)	0.1% by weight (1 000ppm) of homogeneous materials
Butyl benzyl phthalate (BBP)	0.1% by weight (1 000ppm) of homogeneous materials
Dibutyl phthalate (DBP)	0.1% by weight (1 000ppm) of homogeneous materials
Diisobutyl phthalate (DIBP)	0.1% by weight (1 000ppm) 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 re(1Jires all suppliers to inform their customers if the product they supply includes any artide which contains any of the substances in the candidate List inconcentrations > 0.1% w/w of the artide. An article is any item whichhas a special shape, sur1ace or designwhich determines its function to a greater degree than its chemical composition (e.g. a screw, resistor, wire). Pleasenote that this definition of an article may apply to individual components in your product. For further guidance on what isconsidered an article under the REACH Regulation please refer to the ECHA Guidance published at https1/echa.europa.eu/documents/10162/23036412/articles en.pdf

There are 211 Substances of Very High Concern (SVHCs) on the current REACH candidate List published 19 January 2021 at http1/echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp. The BOMcheck Substance List WOl1<ing Group has determined that 111 of these SVHCs are not normally found in concentrations> 0.1% w/w in SUpplied Articles. If parts and materials are manufacturedusing conventional industry processes, then the supplier can rely on the BOMcheckguidanceand screen out these 111 SVHCs (BOMcheck **wil** set the supplie s Regulatory Compliance Declaration to 'compliant' for these SVHCs). If any partsor materials are manufactured in a veryunusual way (for example, using a secret process or unique ingredients) then the supplier must address each of the 211 SVHCs individually.

The CASnumbers published by ECHA for the 100 REACH Candidate List substances which cannormally be found in Supplied Articles are included in the table below. Note that ECHA has not published CASnumbers forsome REACH candidate List Substances. The BOMcheck Full Materials Declaration tool provides the CAS numbers, common chemical names, synonyms and trade names for all of the REACH Candidate List substances. BOMcheck is aligned with the IPC 1752A substance category list EUREACH-0121 and the IPC 1752B substance categorylist EUREACH-0121.

REACH Candidate List Substances which can nonnally be found in Supplied Articles	CAS number(s) published by ECHA	Threshold
Included in REACH Candidare Lisr on 28 Ocrober 2008		
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-ethythexyl)phthalate (DEHP)	117-81-7	0.1% by weight (1 000 ppm) of any article
Hexabromocydododecane (HBCDD) and**al** major diastereoisomers	25637-99-4, 3194-	0.1% by weight (1 000 ppm) of any article

	55-6, 134237- . 134237-51-7, 134237-52-B	
Shortchain chlorinated paraffins (C10- C13)	85535-84-8	0.1% by weight (1 000 ppm) of any article
Cobalt dichloride (CoCl2)	7646-79-9	0.1% by weight (1 000 ppm) of any article
Diarsenicpentoxide	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
Tributy1tin oxide (TBTO)	56-35-9	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on 13 January 2010		
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-B5-8	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
Included in REACH Candidare Lisr on 18 June 2010		
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
Included in REACH Candidare Lisr on 20 June 2011		
1,2-Benzenedicart>oxylic 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-Benzenedicart>oxylic acid, di-C6-B-branched alkyl esters, C7-rich (DIHP)	71888-B9-6	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on 19December 2011		
2,2'-dichloro-4,4'-methylenedianiline	101-14-4	0.1% by weight (1 000 ppm) of any article
N,N-0imethylacetamide	127-19-5	0.1% by weight (1 000 ppm) of any article
Bis(2-methoxyethyl) phthalate	117-B2-8	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 GAS number(s) provided	0.1% by weight (1 000 ppm) of any article

Zirconia Aluminosilicate Refractory Ceramic Fibres	No CASnumber(s) provided	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on 18 June 2012		
Diboron trioxide	1303-S6-2	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-<limethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on 19December 2012		
Bis(pentabromophenylJether (decabromodiphenyl ether· DecaBDE)	1163-19-5	0.1% by weight (1 000 ppm) of any article
1,2-Benzenedicart>oxyfic 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-)Jdioxotrilead	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	6().-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(H2Si2O5), barium satt (1:1), lead-doped	68784-75-8	0.1% by weight (1 000 ppm) of any article
N,N-0imethylformamide; dimethyl fonnamide	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 zirconiumoxide	12626-81-2	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on 20 June 2013		
4-Nonytphenol, branched and linear, ethoxylated *[substances with a linear and/or branched alkyl chain with a carbonnumber of 9 covaJenYy bound in position 4 to phenol, ethoxylated covering UVCB- andwe/l-defined substances, polymers and homologues, which indude any of the individual isomers and/orcombinations thereof]*	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
cadmiumoxide	1306-19-0	0.1% by weight (1 000 ppm) of any article
Dipentyt phthalate (DPP)	131-18-0	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on 16 December 2013		
Disodium 4-amino-3-[14'-[(2,4-0iaminophenyt)azo][1,1'-biphenyt]-4-yt]azo] -5-hydroxy-6-{phenylazo)Oaphthalene-2,7-0isulphonate (C.I. Direct Black 38)	1937-37-7	0.1% by weight (1 000 ppm) of any article
Trixylyt phosphate	25155-23-1	0.1% by weight (1 000 ppm) of any article
Disodium 3,3'-[[1,1'-biphenyt)-4,4'-0iytbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)	573-58-0	0.1% by weight (1 000 ppm) of any article
Dihexytphthalate	84-75-3	0.1% by weight (1 000 ppm) of any article
Imidazolidine-2-thione; (2-imidazofine-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
Included in REACH Candidare Lisr on 16 June 2014		
1,2-Benzenedicart>oxylic acid, dihexyt ester, branched and linear	68515-50-4	0.1% by weight (1 000 ppm) of any article

Included in REACH Candidare Lisr on 17 December 2014		
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-drtertpentylphenol (UV-328)	25973-55-1	0.1% by weight (1 000 ppm) of any article
2-ethylhexyl 10-ethyl-4,4-0iocty1-7-oxo-8-oxa-3,5-0ithia-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-ll2-{(2-ethylhexyl)oxyJ-2-oxoethyl]thioJ-4-octyl-7-oxo-8-oxa-3,5-0tthia-4-stannatetradecanoate (reactionmass of DOTE and MOTE)	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on 15 June 2015		
1,2-benzeoedicarboxylic acid, d C6-10-alkytesters; 1.2-beozenedicarboXylic acid, mixed decyl and hexyl and octyl dieslers wtth greater than or equal to 0.3% of dillexyl Dhlhalale (EC No. 201-559-5)	68515-51-5, 68648,-93-1	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on 17 December 2015		
Pertluorononan-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
2,4-0i-tert-butyl-fH5-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
Included in REACH Candidare Lisr on 20 June 2016		
Benzo[defjchrysene	50-32-8	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on 12 January 2017		
4,4'-isopropylidenediphenol (bisphenol A)	80-05-7	0.1% by weight (1 000 ppm) of any article
Nooadecafluorodecanoic acid (PFDA) and rts sodium and ammoniumsalts	3108,-42-7, 335-76-2, 3830-45-3	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on 7 July 2017		
Pertluorohexane-1-sulphonic acid and its salts (PFHxS)	No CAS number(s) provided	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on 15 January 2018		
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-Dodecachloropentacydo(12.2.1.16,9.02,13.05,10]octadeca-7,15-diene ("Oechlorane Plus"TM) [covering any of rts individual anti- an•dn-isomers or anv combination thereon	No CASnumber(s) provided	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr 01127 June 2018		
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
Oecamethylcyclopentasiloxane (05)	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
Oisodiumoctaborate	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
Included in REACH Candidare Lisr 01115 January 2019		
Benzo[k]fluoranthene	207-08-9	0.1% by weight (1 000 ppm) of any article
Fluorantheoe	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'-hydroxyphenylJ-4-methylpentane	6807-17-6	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr 01116 July 2019		
Tlis(4-oonylphenyl, branched and linear) phospllite (TNPP) with greater than or equal to 0.1% w/Wof 4-nonylphenol, branched and linear (4-NP)	No CASnumber(s) provided	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr 01116 January 2020		
Diisohexylphthalate	71850-09-4	0.1% by weight (1 000 ppm) of any article
Pertluorobutane sulfonic acid(PFBS) and rts salts	No CASnumber(s) provided	0.1% by weight (1 000 ppm) of any article

Included in REACH Candidare Lisr on*25 June 2020*		
Dibutylbis(pentane-2,4-dionato-O,O'Jtin	22673-19-4	0.1% by weight (1 000 ppm) of any article
Included in REACH Candidare Lisr on*19January 2021*		
Bis(2-(2-methoxyethoxy)ethyl)ether	143-24-8	0.1% by weight (1 000 ppm) of any article
Dioctyltin dilaurate. stannane, dioctyl-. bis(cocoacyloxy) derivs.•and any other stannane, diocty1-, bis(fatty acyloxy) derivs. wherein C12 is the predominant carbon number of the fa""a •low moietv	No CAS number(s) provided	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 BOMched<SubstanceList Working Group has screened out 53of these substancerestrictions because theyare not relevant to parts and materials in Supplied Articles. BOMcheck enables suppliers to dedare against the following 22 restricted substances which canbepresent abovethe threshold levels inparts and materials normally found in Supplied Articles. Note that "Nocontent permitted' means "The chemical substance is not allowed to bepresent 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 CASnumber.;, common chemical names. synonyms and trade names for these restricted substances. BOMcheck is aligned with the IPC 1752A substance category ijst EUREACH-ARTICLE67-2018/2005 and the IPC 1752Bsubstance category list IPC-1752B/EUREACH-ARTICLE67-2018/2005.

REACH restricted substances which cannormally be found in Supplied Articles	Threshold
Bisphenol A in thermal paper	0.02% by weight (200 ppm) in thermal paper
Sumof Selected Phthalates Group 1 (DIBP, BBP, DBP, DEHP)	0.1% w/Wof plasticised material
Asbestos fibres	**No** intentionally added content
Dibutyltin (DBncompounds	0.1% by weight of fin in a material
Monomethyl dibrornodiphenyl 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
Restrictions which apply to parts usedin childcare products and toys	
Benzene	Concentration must be < 0.0005% w/W in toys

Dioctyltin (DOT) compounds	0.1% by weight oftin in a material
Selected Phthalates Group 2 (DIDP, DINP, DNOP)	0.1% w/Wof plasticised material when used in toys and childcare articles which can beplaced in the mouth
Any individual PAH compound -toysand childcare articles	0.00005% by weight (0.5 ppm) inplastic or rubber material in toys and childcare articles that comeinto direct, prolonged or repetitive skin ororal cavity contact
Restrictions which apply to parts containing leather or textiles	
Dioctyltin (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 withskin
Tri (2,3-<libromo-propyl)phosphate	Not permitted in textile articles which may come into contact with skin
Tris (aziridinyl) phosphinoxide	Not permitted in textile articles which may come into contact with skin
Restrictions which apply to parts which comeinto contact with skin	
Any individual PAH compound	0.0001% by weight (1 ppm) in plastic or rubber material that comeinto direct, prolonged or repetitive skin or oral cavity contact
Nickel andnickel alloys	Must not be usedin applications with direct and prolonged skin contact and where the rate of nickel release is > 0.5 micro gms per cm2per week
Restrictions which apply to parts which contain chemical products (liquids, gases, powders)	
Benzene	< 0.1% w/W in any substance or preparation
Pentachlorophenol	0.1% w/W in any substanceor preparation
Nonylphenol andnonylphenol ethoxyJates	Concentration must be < 0.1% w/W

Substances which are restricted or declarable by other legislation

BOMcheckincludes substances which are restricted or declarable in legislation in all parts of the wol1c:J, including North America, Asia Pacific and Europe. The BOMcheck Substance List WOl1<ing Group has screened-Out substance restrictions or declaration requirements which are not relevant to parts and materials normally round in Supplied Articles. BOMcheck enables suppliers to declare against the following substances which can bepresent aboVe the threshold levels in parts and materials normally found in SUpplied Articles. Note that "Ilk>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 substancerestriction or declaration requirement, including the applicable legislation and information on alternative substances. The BOMcheck Full Materials Declaration tool provides the CASnumbers, common chemical names, synonyms and trade names for these regulated substances.

Substances which cannormally be found in Supplied Articles	Threshold
Phenol, Isopropylated Phosphate (3:1) (PIP 3:1)	No intentionally added content
Bisphenol Sin thermal paper	0.02% by weight (200 ppm) in thermal paper

Perfluorooctanoic acid and its salts	0.0000025% by weight (25ppb) of any article
Formaldehyde	No intentionally added content incomposite wood productsor 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% (500ppm) by weight in a material
HBCDD(Hexabromocyclododecane)	0.01% (100ppm) by weight in a material
Shortchain chlorinated paraffins (C10-C13)	0.15% (1 500ppm) by weight in a material
Polychlorinated biphenyls (PCBs)	No intentionally added content
Polychloronaphthaleoes	No intentionally added content
Restrictions which apply to parts usedin childcare products and toys	
Flame retardant chemicals	0.1% by weight **(1** 000ppm) in a material in toys and childcareproducts
Di-n-pentyl phthalate (DPENP)	0.1% by weight **(1** 000ppm) in a material in toys and childcareproducts
Di-n-hexyl phthalate (DHEXP)	0.1% by weight **(1** 000ppm) in a material in toys and childcareproducts
Oicyclohexyl phthalate (DCHP)	0.1% by weight **(1** 000ppm) in a material in toys and childcareproducts
Diisooonyl phthalate (OINP)	0.1% by weight **(1** 000ppm) in a material in toys and childcareproducts
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-!)ropyl)phosphate (TDCPP)	**No** content permitted in toys and childcare products
Lead/lead compounds in consumer products designed or intended primarily for children 12 years of age or younger	0.01% w/W in accessible parts in toys and childcare articles
Lead/lead compounds in paint and similar surface coatings of toys and other articles intended tobe used by children	0.009% w/W in paint in toys and childcare articles
Restrictions which apply to parts which comeinto contact with food	
Bisphenol A	No content permitted inproducts which contact with **food**

Restrictions which apply to parts which contain chemical products (liquids, gases, powders)	
Ozone depleting substances	No intentionally added content
Fluorinated Greenhouse Gases (PFC, SF6, HFC)	No content permitted
Restrictions which apply to parts which contain textiles	
Flame retardant chemicals	0.1% by weight (1 000ppm) in a material in textiles

Batteries substance restrictions

The following restrictions apply to all batteries. The BOMcheck Full Materials Declaration tool provides the CASnumbers, 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

Dr Paul Goodman at RINA Consulting carried out a screening of the 900plus substances on the Proposition 65 list and identified 105 that may berelevant tocomponent parts of Supplied Artides On other words, any component of a manufactured product which is not defined as a substance or preparation (mixture) under the REACH regulation). Dr Goodman's screening showsthat 39of these substances donot require "safe harbour" warnings. This leaves 66 substances which may be found incomponent parts of Supplied Artides and may require "safe harbour" warnings.

BOMcheck's assessment of OrGoodman's screening has identified that 28 of these 66 substances are already regulated under RoHS, REACH substance restrictions. POPs regulation or REACH Candidate List in BOMcheck. In other words, if supplier parts are already compliant to the RoHS. REACH substance restrictions. POPs regulation and REACH candidate List in BOMcheck then there are only 38new substances that suppliers need to assess for Proposition 65. The detailed screening assessment ispublished inside BOMcheck and reduces the time and cost for Proposition 65 compliance by 97%.

If the finished product indudes a supplier part which contains Proposition 65 substance(s) then youneed to assess whether theuser could beexposed to the part during normal useof theproduct. If yes, then you should provide an appropriate "safe harbour" warning and communicate the name of one Proposition 65 substance for each endpoint (forexample, one carcinogen of the Proposition 65 substance(s) are listed for cancer).

Proposition 65 substances which can normally be found in Supplied Articles	Threshold
Leadand Lead Compounds	0.009% (90 ppm) of any material
Bisphenol A(BPA)	0.0003% (3ppm) of any material
Phthalate plasticisers	
Diisononylphthalate (DiNP)	No intentionally added content

Oi-isodecylphthalate (DIOP)	No intentionally added content
Oi-n-hexytphthalate (OnHP)	No intentionally added content
Flame retardants and plasticisers	
Tris(1,3-<lichloro-2-propyl) Phosphate (TOCPP)	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-<libromopropyJ)phosphate	0.0025% by weight (25 ppm) of any material
Flame retardants	
Antimony Oxide (Antimony trioxide)	0.1% by weight (1 000ppm) of any material
Tetrabrornobisphenol A	0.1% by weight (1 000ppm) of any material
2,2-Bis(bromomethyl)-1,3-propanediol	0.1% by weight (1 000ppm) of any material
Mirex	0.1% by weight (1 000ppm) of any material
UV protection agents	
Benzophenone	0.1% by weight (1 000ppm) of any material
Colourants	
Benzidine-0ased Dyes	0.1% by weight (1 000ppm) of any material
3,3'-0imethoxybenzidine-based dyes metabolized to 3,3'-<limethoxyt>enzidine	0.1% by weight (1 000ppm) of any material
3,3'-0imethylbenzidine-based dyesmetabolized to 3,3'-<limethylbenzidine	0.1% by weight (1 000ppm) of any material
O&C Orange No. 17	0.1% by weight (1 000ppm) of any material
1-Amino-2,4-<libromoanthraquinone	0.1% by weight (1 000ppm) of any material
1-Amino-2-methylanthraquinone	0.1% by weight (1 000ppm) of any material
Direct Blue 6 (Technical Grade)	0.1% by weight (1 000ppm) of any material
Direct Brov.n 95 (Technical Grade)	0.1% by weight (1 000ppm) of any material
Disperse Blue 1	0.1% by weight (1 000ppm) of any material
Impurities in extender oils and black colourants	
Naphthalene	0.0001% by weight (1 ppm) of any material
REACH Article 67substance restrictions which may be found in hardware and electrical and electronic equipment (Regulation 1907/2006)	
Any individual PAH COlll)()Und	0.0001% by weight (1 ppm) in plastic or rubber material that come into direct, prolongedor repetitive skin or oral cavity contact
Asbestos	Nointentionally added content

Azocolourants and azodyes which form certain aromatic amines	Not permitted in textile and leather articles Which may comeinto direct andprolonged contact withskin
Nickel andnickel 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 cmA'per week
Tar oils and creosotes	No content permitted in wood and wooden materials
RoHSsubstancerestrictions [Directive 2011/65/EU)	
cadmium/cadmium corrc,ounds	0.01% by weight (100ppm) of homogeneous materials
Mercury/Mercury corrc,ounds	0.1% by weight (1 000ppm) of homogenous materials
PBBs	0.1% by weight [1 000ppm) of homogenous materials
PBOEs	0.1% by weight [1 000ppm) of homogenous materials
REACH candidate list substances (Regulation 1907/2006)	
OEHP(Di(2-ethylhexyl) phthalate)	0.1% by weight (1 000ppm) of any article
DBP (Dibutyl phthalate)	0.1% by weight (1 000ppm) of any article
BBP(Benzylbutylphthalate)	0.1% by weight (1 000ppm) of any article
SCCP (Short-chained chlorinated paraffins)	0.1% by weight (1 000ppm) of any article
Direct Black 38(Technical Grade)	0.1% by weight (1 000ppm) of any article
4-Aminoazobenzene	0.1% by weight (1 000ppm) of any article
Persistent Organic Pollutants Regulation 850/2004	
Perfluorooctanoic acid and its salts	0.0000025% by weight (25ppb) of any article
PFOS (Perfluorooctane Sulfonates)	0.1% by weight [1 000ppm) of any material
Polychlorinated biphenyls (PCBs)	Nointentionally added content

Industry restricted and declarable substances

The following substances are restricted by leading OEMs to comply withproduct safety standards in Germany and to reduce severe environmental or health and safety irrc,acts. Suppliers can check the information pages in the BOMcheck tool tofind out Which OEMs reQUire their suppliers tocomply with particular industry substance restrictions.

Substances which cannormally be found in Supplied Articles	Threshold
Beryllium and Beryllium compounds	0.1% by weight (1 000ppm) of any material
Brominated flame retardants (other thanPBBs. PBOEs or HBCDD)	Declare if> 0.1% w/wtotal bromine content from BFRs
Brominated flame retardants (other thanPBBs. 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/wtotal chlorine content from CFRs

Chlorinated flame retardants	Declare if> 0.09%total chlorine content fromCFRs in printed wiling board laminate
PVC and PVC copolymers	Declare if> 0.1% w/wtotal 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
Restrictions which apply to parts containing leather or textiles	
Alkylphenol and alkylphenol ethoxylates	0.01% by weight (100 ppm) in textile and leather articles
Restrictions which apply to parts usedin lamps and lamp ballasts	
Antimony compounds inglass	0.1% *wtw* in glass in lamps
Alsenic compounds in glass	0.1% *wtw* in glass in lamps
Polycyclic Aromatic Hydrocarbons(PAH)	0.005% in potting material inelectronic or magnetic ballast for lamps
Restrictions which apply to parts which comeinto contact with skin	
AzD Colourants	30 ppm if part comesinto contact with skin
Benzoapyrene incontact with skin	The limits for different applications areprovided in the information sheet
Sumof all PAHs	The limits **for**different applications areprovided in the information sheet

2. Packaging restrictions

Packaging Directive 94/62/EC

Substances	Maximum concentration in the supplied packaging
Sumof all heavy metals (Cd, Hg, Cr(VII) 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 re(1Jires all suppliers to inform their customers if the product they supply includes any artide which contains any of the substances in the candidate List inconcentrations > 0.1% w/w of the artide. An article is a product which has a special shape, surface or design which determines its function to a greater degree than tts 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 http://echa.europa.eu/documents/10162/13632/articles_en.pdf(. The REACH regulation also applies to packaging.

There are 209 Substances of Very High Concern (SVHCs) **on** the current REACH candidate List published 25 June 2020. The BOMcheck SUbstance List Working Group has determined that 169 of these SVHCs are not normally found in concentrations> 0.1% w/w in packaging. BOMcheck enables suppliers to screen-out these

169 substances and instead requires suppliers to declare against thefollowing 40 substances which can be present ,n concentrations> 0.1% w/W in packaging articles.

REACH Candidate List Substances which can normally be found in packaging	CASnumber{s) published byECHA	Threshold
Included in REACH Candidare Lisr on 28 Ocrober 2008		
Benzyl butyl phthalate (BBP)	85-68-7	0.1% by weight (1 000ppm) of any article
Dibutyl phthalate (DBPJ	84-74-2	0.1% by weight (1 000ppm) of any article
Bis (2-ethythexyl)phthalate (DEHPJ	117-B1-7	0.1% by weight (1 000ppm) of any article
Hexabromocydododecane (HBCDDJ and all major diastereoisomers	25637-994, 3194-55-6, 134237-50-6, 134237-51-7, 134237-52-8	0.1% by weight (1 000ppm) of any article
Cobalt dichloride (CoCl2)	7646-79-9	0.1% by weight (1 000ppm) of any article
Tributy1tin oxide (TBTOJ	56-35-9	0.1% by weight (1 000ppm) of any article
Included in REACH Candidare Lisr on 13 January 2010		
Tris (2-chloroethyt) phosphate (TCEPJ	115-96-B	0.1% by weight (1 000ppm) of any article
Diisobutyl phthalate (DIBPJ	84-69-5	0.1% by weight (1 000ppm) of any article
Included in REACH Candidare Lisr on 18 June 2010		
Disodiumtetraborate, anhydrous	1303-96-4, 1330-43-4, 12179-04-3	0.1% by weight (1 000ppm) of any article
Tetraboron cfisodium heptaoxide, hydrate	12267-73-1	0.1% by weight (1 000ppm) of any article
Boric acid	10043-35-3, 11113-50-1	0.1% by weight (1 000ppm) of any article
Included in REACH Candidare Lisr on 20 June 2011		
1,2-Benzenedicart>oxylic aad, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	0.1% by weight (1 000ppm) of any article
1,2-Benzenedicart>oxyfic acid, di-C6-B-branched alkyl esters. C7-lich {DIHP)	71888-B9-6	0.1% by weight (1 000ppm) of any article
Included in REACH Candidare Lisr on 19December 2011		
2,2'-cfichloro-4,4'-methylenedianiline	101-14-4	0.1% by weight (1 000ppm) of any article
Bis(2-methoxyethY1) phthalate	117-B2-B	0.1% by weight (1 000ppm) of any article
Included in REACH Candidare Lisr on 18 June 2012		
Diboron trioxide	1303-B6-2	0.1% by weight (1 000ppm) of any article

Included in REACH Candidare Lisr on 19December 2012		
Bis(pentabrorrophenylJether (decabromodiphenyl ether; DecaBDE)	1163-19-5	0.1% by weight (1 000ppm) of any article
1,2-Benzenedicart>oxylic acid, dipenty1ester, branched and linear	84777--06-0	0.1% by weight (1 000ppm) of any article
Diisopentylphthalate	605-50-5	0.1% by weight (1 000ppm) of any article
N-pentyl-isopentylphthalate	776297-69-9	0.1% by weight (1 000ppm) of any article
Dibutyltin dichloride (DBTC)	683-18-1	0.1% by weight (1 000ppm) of any article
Lead oxide sulfate	12036-76-9	0.1% by weight (1 000ppm) of any article
[Phthalato(2-)Jdioxotrilead	69011--06-9	0.1% by weight (1 000ppm) of any article
Dioxobis(stearato)trilead	12578-12--0	0.1% by weight (1 000ppm) of any article
Fatty acids, C16-18, lead salts	91031-62-8	0.1% by weight (1 000ppm) of any article
Lead dinitrate	10099-74-8	0.1% by weight (1 000ppm) of any article
Pentalead tetraoxide sulphate	12065-90-6	0.1% by weight (1 000ppm) of any article
Sulfurous acid, lead salt, dibasic	62229-08-7	0.1% by weight (1 000ppm) of any article
Tetralead trioxide sulphate	12202-17-4	0.1% by weight (1 000ppm) of any article
Trilead dioxide phosphonate	12141-20-7	0.1% by weight (1 000ppm) of any article
Included in REACH Candidare Lisr on 20 June 2013		
Dipentyt phthalate (DPP)	131-18-0	0.1% by weight (1 000ppm) of any article
Included in REACH Candidare Lisr on 16 December 2013		
Dihexytphthalate	84-75-3	0.1% by weight (1 000ppm) of any article
Imidazolidine-2-thione; (2-imidazofine-2-thiol)	96-45-7	0.1% by weight (1 000ppm) of any article
Included in REACH Candidare Lisr on 16 June 2014		
1,2-Benzenedicart>oxylic acid, dihexyt ester, branched and linear	68515-50-4	0.1% by weight (1 000ppm) of any article
Included in REACH Candidare Lisr on 17 December 2014		
2-Benzotriazol-2-yl-4,6-cfi-tert-butylphenol (UV-320)	3846-71-7	0.1% by weight (1 000ppm) of any article

2-(2H-Benzotriazol-2-yl}-4,6-ditertpenty1phenol (UV-328)	25973-55-1	0.1% by weight (1000 ppm) of any article
2-ethylhexy110-ethyl-4,4-0iocty1-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	15571-58-1	0.1% by weight (1000 ppm) of any article
Reaction mass of 2-ethylhexyl 10-ethyl-4,4-0iocty17--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 massof DOTE and MOTE)	No CAS number(s) provided	0.1% by weight (1000 ppm) of any article
Included in REACH Candidare Lisr on 15 June 2015		
1,2-benzenedicarboxylic acid, d C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octy1 diesters with greater than or equal to 0.3% of dihexyl phthalate (EC No. 201-559-51	68515-51-5, 68648-93-1	0.1% by weight (1000 ppm) of any article
Included in REACH Candidare Lisr on 17 December 2015		
2,4-0i-tert-0uty1-6-{5-chlorobenzotriazol-2-yl)phenol (UV-327)	3864-99-1	0.1% by weight (1000 ppm) of any article
2-(2H-benzotriazol-2-yl)-4-(tert-buty1)-6-(sec-butyl)phenol (UV-350)	36437-37-3	0.1% by weight (1000 ppm) of any article

REACH substance restrictions applicable to packaging articles

REACH Article 67 contains over 65 different substance restrictions. However. the BOMcheck SUbstance List Working Group has screened-out 62of these substance restrictions because they are not relevant toparts and materials nonnally found in packaging articles. BOMcheck enables suppliers to declare against the following 3 restricted substanceswhich can bepresent above the threshold levels in packaging articles.

Substances which cannormally 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

Industry restricted and declarable substances

These substances are restricted by leading OEMs tocomply with retailer restrictions on PVC in packaging and use of EPS in consumer products. SUppliers can check the infonnation pages in the BOMchecktool to find out which OEMs require their suppliers to COl11)ly with particular industry substancerestrictions.

Substances which canbe found in packaging articles	Maximum concentration of the substance in the supplied packaging
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 to the RoHS Directive (2011/65/EU), as published in Commission Decision 2010/571/EU of 24 September 2010, which are valid as at July 2020.

Number	Description
1(3)	Mercury in single capped(compact) fluorescent lampsnot exceeding (per bumer):For general lighting purposes < 30 W: 2.5 mg
1(b)	Mercury in single capped(compact) fluorescent lampsnot exceeding(per bumer):For general lighting purposes 30 wand < 50 W;3.5 mg
1(C)	Mercury in single capped(compact) fluorescent lampsnot exceeding(per bumer):For general lighting purposes 50 Wand < 150 W; 5 mg
1(d)	Mercury in single capped(compact) fluorescent lampsnot exceeding (per bumer):For general lighting purposes 150 W; 15 mg
1(e)	Mercury in single capped(compact) fluorescent lampsnot exceeding(per bumer):For general lighting purposes with circularor square structural shape and tube diameters 17 mm; 7 mg
1(1)	Mercury in single capped(compact) fluorescent lampsnot exceeding(per bumer):For special purposes: 5 mg
1(g)	Mercury in single capped(compact) fluorescent lampsnot exceeding(per bumer):For general lighting purposes < 30 Wwith a lifetime equal or above 20,000 h: 3.5 mg
2(3)(1)	Mercury in double-capped linear fluorescent lamps for generation lighting purposes not exceeding (per lamp):Tri-band phosphor withnormal lifetime and a tube diameter< 9 mm(e.g. T2):4mg
2(a)(2)	Mercury in double-capped linear fluorescent lamps for generation lighting purposes not exceeding (per lamp):Tri-band phosphor withnormal lifetime and a tube diameter 9 mm ands 17 mm(e.g. TS): 3 mg
2(a)(3)	Mercury in double-capped linear fluorescent lamps for generation lighting purposes not exceeding (per lamp):Tri-band phosphor withnormal lifetime and a tube diameter> 17 mmand s 28 mm(e.g. TS):3.5 mg
2(3)(4)	Mercury in double-capped linear fluorescent lamps for generation lighting purposes not exceeding (per lamp):Tri-band phosphor withnormal lifetime and a tube diameter> 28mm(e.g. T12):3.5mg
2(3)(5)	Mercury in double-capped linear fluorescent lamps for generation lighting purposes not exceeding (per lamp):Tri-band phosphor with long lifetime C 25,000 h):5 mg
2(b)(3)	Mercury in other fluorescent lampsnot exceeding (per lamp):Non-linearlii-band phosphor lamps with tube diameter> 17 mm(e.g. T9) : 15 mg
2(b)(4)	Mercury in other fluorescent lampsnot exceeding (per lamp):Lamps for other general lighting and special purposes (e.g. induction lamps) : 15 mg
3{a)	Mercury incold cathode fluorescent lamps and external electrode fluorescent lampts (CCFL and EEFL) for special purposes not exceeding (per lamp): Short length(s 500 mm) : 3.5 mg
3{b)	Mercury incold cathode fluorescent lamps and external electrode fluorescent lampts (CCFL and EEFL) for special purposes not exceeding (per lamp): Medium length (> 500 mmands 1,500 mm): 5 mg
3{c)	Mercury incold cathode fluorescent lamps and external electrode fluorescent lampts (CCFL and EEFL) for special purposes not exceeding (per lamp): Long length(> 1,500 mm): 13 mg
4{a)	Mercury in other low pressure discharge lamps(per lamp): 15 mg
4{b)-I	Mercury inHigh Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra> 60: P s 155 W: 30 mg
4{b)-II	Mercury inHigh Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra> 60: 155 W<P s 405 W: 40 mg
4{b)-III	Mercury inHigh Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra> 60: P > 405 W:40 mg

4(c)-I	Mercury inHigh Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner): P" 155 W : 25mg
4(c)-II	Mercury inHigh Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner): 155 W < P" 405 W : 30mg
4(c)-III	Mercury inHigh 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(1)	Mercury in other discharge lamps for special purposes not specially mentioned in this Annex
5(a)	Lead in glass of cathode ray tubes
5(b)	Lead in glass of fluorescent tubes not exceeding 0.2%by weight
6(a)-I	Lead as an alloying element in steelfor 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)-I	Lead as an alloying element in aluminium containingup to 0.4% lead by weight, provided rt stems from lead-bearing aluminium scrap recycling
6(b)-II	Lead as an alloying element in aluminium lor machiningpurposes 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 terrc,erature type solders 0.e. lead-based alloys containing 85%by weight or more lead)
7(b)	Lead in solders for servers, storage and storage arraysystems, network infrastructure e<iuipment for swi1ching, signalling, transmission, andnetwork management for telecommunications
7(c)-I	Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in aglassor ceramic matrix compound
7(c)-II	Lead in dielectric ceramic in capacrtors for a rated voltageof 125 V AC **or** 250 V DC or higher
7(c)-IV	Lead in PZT based dielectric ceramic materials for capacrtors being part of integrate<Icircuits or discrete serriconductors
S(b)-I	cadmiumand rts compounds in electrical contactsusedin:circurtbreakers, thermal sensing controls, thermal motor protectors (excluding hermetic thermal motor protectors). AC swi1ches rated at: 6 A and more at 250 V AC and more, or 12 A and more at 125 V AC and more, DC swrtches rated at 20 Aand more at 18 V DCand more, and swrtches for use at voltage supply frequency greater than or equal to 200 Hz
9(b)	Lead in bearing shells and bushes for refrigerant-containing corrc,ressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications
13(a)	Lead in white glasses used lor optical applications
13(b)-{I)	Lead in ion colouredoptical filter glass types
13(b)-{II)	cadmium in striking optical filter glass types; excluding applications falling under point 39of this Annex
13(b)-{III)	cadmiumand lead in glazes used for reflectance standards
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 90nm or larger; a single die of 300mm2 **or** larger in any semiconductor technology node; stacked diepackages with die of 300 mm2or larger, or siliconinterposers of 300mm2 **or** larger
17	Lead halide as radiant agent in high intensity discharge (HID) lamps used for professional reprography applications

18(b)	Lead as activator in the fluorescent powder (1% lead by weight or less) of discharge lamps whenused as sun tanning lamps containing phosphors such as BSP(BaSi205: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(BaSi205:Pb) when used in medical phototherapy e(!Uipment
21(a)	cadmium when used in colour printed glass to provide filtering functions, used as a component in lighting applicationsinstalled in displays and control panels of EEE
21(b)	cadmium in printing inks for the application of enamels on glasses, such asborosilicate and soda fime glasses
21(c)	Lead in printing inks for the application of enamels on other than borosilicate glasses
24	Lead in solders for the soldering to machined through hole cfiscoidal andplanar array ceramic multilayer capacitors
25	Leadoxide in surface conduction electron emitter displays (SEO) used in structural elements, notably in the seal frit and frit ring
29	Lead bound in crystal glass as defined in Annex I (categories 1, 2, 3 and 4) of Council Directive 69/493/EEC
30	cadmiumalloys as electrical/mechanical solder joints toelectrical conductors located directly on the voicecoil in transducers used in high-powered loudspeakers with sound pressure levels 01100 dB (A) and more
31	Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. areused for liquid crystal displays, design or industrial lighting)
32	Leadoxide in seal frit used for making window assemblies for Argon and Krypton laser tubes
33	Lead in solders for the soldering of thin copper wires ol 100 µm diameter and less in power transformers
34	Lead in cermet-0ased trimmer potentiometer elements
37	Lead in theplating layer of highvoltage modes on the basis of a zinc borate glass body
38	cadmiumand cadmium oxide in thick filmpastes used on aluminiumbonded beryllium oxide
39(a)	cadmiumselenide in ctownshifting cadmium-0asedsemiconductor nanoc,ystal quantum dots for use in display lighting applications(less than 0.2microgram Cdper mm2 of display screen area)
41	Lead in solders and tennination finishes of electrical andelectronic components and finishes of printed circurtboards used inignition modules and other electrical and electronic engine control systems. which for technical reasons must be mounted directly onor in the crankcase **or** cylinderof hand-held combustion engines (classes SH:1, SH:2, SH:3 of Directive 97168/EC of the European Parliament and of the Council(')
42	Lead in bearings and bushes of diesel or gaseous fuel powered internal combustion engines applied innon-road professional use eQUipment: withengine total displacement greater than or e<1ual to 15 lrtres; or with enginetotal displacement less than 15 litres and the engine is designed to operate in applications where the time between signal to start and full load is required to be less than 10 seconds; or regular maintenance is typically performed in a harsh and dirty outdoor environment, such as mining,construction, and agriculture applications
43	Bis(2-ethylhexy1) phthalate in rubber components in engine systems, designed for use in eQUipment that is not intended solely forconsumer use andprovided that noplasticised material comesinto contact with human rrocous membranes **or** into prolonged contact with human skin and the concentration value of bis(2-ethy1hexyl)phthalate does not exceed: (a) 30% by weight of the rubber for (i) gasket coatings; (ii) solid-rubber gaskets; or (iii) rubber components included in assemblies of at least three components using electrical, mechanical or hydraulic energy to do work, and attached to the engine.(b) 1O% by weight of the rubber for rubber-containingcorrc,onents not referred to in point (a). For the purposes of this entry, "prolonged contact with human skin" means continuous contact of more than 10 minutes duration or intennittent contact over a period of 30 minutes, per day

44	Lead in solder of sensors, actuators, and engine **control** units of combustion engines within the scopeof Regulation (EU) 2016/1628 of the European Pa iament andof the Council C·J. installed in equipment used at fixed posmons while in operation which is designed for professionals, but also used by non-professional use<s

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

Number	Description
1	Lead, cadmium and mercury in detectors for ionising radiation
1a	Lead and cadmium in ion selective electrodes including glass of pHelectrodes.
1b	Lead anodes in electrochemical oxygen sensors.
1c	Lead, cadmium and mercury in infra-red light detectors.
1d	Mercury in reference electrodes: low chloride mercury chloride, mercury sulphate and mercury oxide.
2	Lead bearings in X-ray tubes.
3	Lead inelectromagnetic radiation amplificationdevices: micro-channel plate and capillary plate.
4	Lead in glass frit of X-ray tubes and image intensifiers and lead in glass frit binder for assembly of gas lasers and for vacuumtubes that convert electromagnetic radiation into electrons.
5	Lead in shielding for ionising radiation.
6	Lead in X-ray test objects.
7	Lead stearate X-ray diffraction crystals.
8	Radioactive cadmium isotopesource **for**portable X-ray fluorescence spectrometers.
9	cadmium in helium-cadmium lasers.
10	Lead and cadmium in atomic absorption spectroscopy lamps.
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. Expires on 30 June 2021.
13	Lead incounterweights.
14	Lead in single crystal piezoelectric materials **for**ultrasonic transducers.
15	Lead in solders for bonding to ultrasonic transducers.
16	Mercury in very high accuracy capacitance and loss measurement bridges and in high frequency RF switches and relays in monitoring and control instruments not exceeding 20mg of mercury per switch orrelav.
17	Lead in solders in por1able emergency defibrillators.
18	Lead in solders of high performance infrared imaging modules to detect in the range 8-14 µm.
19	Lead in Liquidcrystal on silicon(LCoS) displays.
20	cadmium in X-ray measurement filters.
22	Lead acetate marker for use in stereotactic head frames for use with CTand MRI and in positioning systems for gamma beam and particle therapy equipment. Expires on 30 June2021.
23	Lead as an alloying element for bearings and wear surfacesin medical equipment exposed to ionising radiation. Expires on 30 June 2021.
25	Lead in the surface coatings of pin connector systems requiring nonmagnetic connectors which are used durably at a temperature below-2o·c under normal operating and storage condttions. Expires on 30 June 2021.
26	Lead in the following applications that areused durably at a temperature below - 20·c under normal operatingand storage conditions:(a) solders onprinted circuit boards; (b) termination coatings of

	electrical and electronic components and coatings of printed circuit boards; (c) solders for connecting wires and cables; (d) solde<sconnecting transducers and senSO<S. Lead in solders of electrical connections to temperature measurement sensors in devices which are designed to be used oeriodicallv at temoeratures below 150•C. These exe=tions exoire on 30 June 2021.
27	Lead in solders, termination coatings of electrical and electronic corrc,onents 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 beused within this sphere, or (b)magnetic fields within 1 m distance from the external surfaces of cyclotron magnets, magnets for beam transport and beam directioncontrol applied for particle therapy. Expireson 30 June 2020.
29	Lead in alloys, as a superconductor or thenmal conductor, used in cryo-rooler cold heads and/or in c,yo-<:ooled cold probes and/or in c,yo-oooled equipotential bonding systems, in medical devices lcat=oiv 81and/or in industrial monttorino andcontrol instruments. Exoireson 30 June 2021.
31a	Lead, cadmium, hexavalent chromium, and polybrominated diphenyl ethers (PBDE) in spare parts recoveredfrom 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 placein auditable closed-loop business-to-business return systems and that each reuse of parts is notified to the customer. Expires on: (a) 21July 2021 for the use in medical devices other thanin vitrodiagnostic medical devices; (b) 21 July 2023 for the usein in vitromagnostic medical devices; (c) 21Julv 2024 for the use in electron microsco=s and their accessories.
33	Lead in solders on populated printed circuit boards used in Directive 93/42/EEC class Ilaand lib mobile medical devicesother than portable emergency defibriftators. Expireson 30 June 2016 for class Ila andon 31 December 2020 for class Ilb.
34	Lead as an activator in the fluorescent powder of discharge larrc,s when used for extracorporeal photopheresis lamps containing BSP(BaSi2O5:Pb) PhoSPhors. Expires on 22July 2021.
35	Mercury incold cathode fluorescent lamps for back-lighting liQuid crystal displays, not exceeding 5 mg per lamp, used in industrial monttoring and control instruments placed on the market before 22 July 2017. E•nires on 21Julv 2024.
36	Lead usedin other than C-press compliant pin connector systems for industrial monitoring and control instruments. Expires on 31 December 2020. May be used after that date in spare parts for industrial monttorina and control instruments □laced on the market before 1 Januon, 2021.
37	Lead inplatinized platinum electrodes used for conductivity measurements where at leastone of the following conditions applies: (a) wide-range measurements with a conductivity range covering more than 1 orderof magnitude (e.g. range between 0.1 mS/m and 5 mS/m) in laboratory applications for unknown concentrations; (bl 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 anacidity< 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 beperformed with =rtableinstruments. Exoires on 31December 2018.
39	Lead inmicro-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 limned to a maximum of 3 mm/MCP (detector thickness+ space for installation of the MCP), a maximum of 6 mmin total, andan alternative design yielding more spacefor the detector is scientifically and technically impracticable; (bl a two-Oimensional spatial resolution for detecting electrons or ions, where at least one of the following applies: (i) a response time shorter than 25ns; (ii) a sample detection area larger than 149 mm2; (iii) a multiplication factor larger than 1.3 • 103.(c) a response time shorter than 5 ns for detecting electrons or icns; (d) a sample detection area larger than 314 mm2 for detecting electrons or ions; (e) a multiplication factor larger than 4.0 • 107. The exemption expires on the following dates: (a) 21July 2021 for medical devices and monitoring and control instruments; (b) 21July 2023 for in-vttrodiagnostic medical devices; (c) 21July 2024 for industrial monttorina and control instruments.
40	Lead in dielectric ceramic incapacitors for a rated voltage of less than 125 V AC or 250 V DCfor industrial monttoring and control instruments. Expires on 31 December 2020. May be used after that date in spare parts for industrial monttoring and control instruments placed on the market before 1 January 2021.
41	Lead as a thermal stabiliser in polyvinyl chloride (PVC) used as base material in amperometric, potentiometric and conductometric electrochemical sensors which are used in in-vitro diagnostic medical devices for the analysis of blood andother body fluids and body gases. Expireson 31 December 2018.
42	Mercury inelectric rotating connectors used in intravascular ultrasound imaging systems capable of high operating frequency (greater than 50MHz) modes of operation. Expires on 30 June 2019.
43	cadmium anodes in Hersch cells for oxygen sensors used in industrial monttoring and control instruments, where sensitivity below 10 ppm is required. Expireson 15 July 2023.
44	cadmium in radiation tolerant video cameratubes designed for cameras with a centreresolution greater than 450 TV lines which are used in environments with ionising radiation exposure exceeding 100 Gv/hour and a total dose in excess of 1OOkl»•.