

# OSRAM Index List Environment

Version 24 – February 2017

OSRAM Index List Environment is to be applied in the design and production of environmentally compatible products of all business units of OSRAM and affiliated companies (OSRAM) as well as for procurement of equipment, parts and materials used in products distributed by OSRAM. It is a high ambition of OSRAM to avoid and reduce certain hazardous substances in products above and beyond statutory regulations.

Placing certain hazardous substances in electrical and electronic equipment on the market of is subject to specific regional (EU) or national restrictions and bans. Within the European Union (EU) these restrictions and bans are defined in EU Directives and subsequent member states' national regulations, and in direct legally enforceable regulations. In addition OSRAM has to fulfil specific customer requirements regarding substance content and documentation.

Compliance with such restrictions is a legal obligation of the party putting said equipment or products on the market. Therefore either OSRAM or customers of OSRAM bear responsibility.

Equipment, parts and materials supplied to OSRAM are mounted in equipment and/ or products which can be subject to

- the restrictions of substances defined in Directive 2011/65/EU ("RoHS-Directive", see [http://ec.europa.eu/environment/waste/rohs\\_eee/legis\\_en.htm](http://ec.europa.eu/environment/waste/rohs_eee/legis_en.htm))
- the restrictions of substances defined in Directive 2000/53/EC ("End-of-life vehicles – ELV")
- the restrictions of substances defined in Directive 2006/66/EC ("Directive on batteries"),
- the restrictions of substances defined in EU Directive 1907/2006/EC ("REACH"),
- the restrictions of substances defined in Directive 94/62/EC ("Packaging Directive").

The purpose of the **OSRAM Index List Environment** is to inform suppliers and partners about legal and internal requirements regarding substances in products and consists of the following documents:

- **Supplier's Verification** regarding restrictions, avoidance and declaration of materials in products
- Informative **list of exemptions** as listed in Annex III of Directive 2011/65/EU ("RoHS exemptions") including amendments (Status **January 2017**)
- **OSRAM Index List Environment:**
  - *List of prohibited hazardous substances* (sorted by possible applications) (Status **January 2017**)
  - *OSRAM List of Declarable Substances* (Status **January 2017**)

The Suppliers Verification has to be signed by suppliers of equipment, parts and materials, which are delivered to OSRAM and affiliated companies.

The OSRAM Index List Environment: List of prohibited hazardous substances (see appendix) provides an informative overview of substance regulations within the EU and other countries. The list is not exhaustive, but focuses on applications. For some substances the legislator has permitted definite applications or specific exemptions. If deliveries to OSRAM contain hazardous substances in applications exempted by such regulations (e.g. RoHS exemptions) then these substances have to be declared by suppliers in advance according to type and amount in the web based data base BOMcheck® unless otherwise stipulated.

The OSRAM Index List Environment: List of declarable substances (see appendix) contains hazardous substances whose distribution in products is not or only partially (e.g. for defined applications or defined areal) prohibited. The use of these substances should be avoided where possible (e.g. DEHP in PVC cables), or at least minimized, since they are a potential hazard to human or the environment during the products manufacture, use or disposal. However, in many cases these substances cannot be avoided for technical or economic reasons. OSRAM clearly encourages its suppliers to focus towards reduction and avoidance of these substances during design and development of new products. This is particularly recommended for substances on the REACH Candidate List, so called Substance of Very High Concern (SVHC).

If articles containing these substances exceeding 0.1% (wt) are delivered to OSRAM a corresponding declaration must be available in BOMcheck® unless otherwise stipulated. This is also required from contract manufacturers and distributors supplying such articles. They all have to provide their commercial customers with: “sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance”.

Comprehensive and precise contractually binding substance declarations are often requested by OSRAM customers, e.g. use of SVHC, halogenated flame retardants, arsenic compounds in lamp glass, antimony trioxide in plastic materials. Most of these substances are not added in OSRAM production processes, but are ingredients of delivered direct materials (equipment, parts and materials used in products distributed by OSRAM). Therefore also OSRAM needs sufficient information about all relevant substances in supplied materials, parts and products from SUPPLIER.

Due to the dynamic changes of above mentioned regulations or customer expectations, regular updates of these declarations will be essential in the future. In order to be able to manage all information requirements OSRAM decided to join the substance declaration web-hosted database BOMcheck® (www.BOMcheck.net). BOMcheck® is an industry-wide initiative offering a regulatory compliance tool designed specifically to enable suppliers to provide declarations for REACH, RoHS and other restricted substances legislation.

The BOMcheck® system offers the following benefits:

- Efficient and low cost method to demonstrate chemical compliance to all customers
- Expert guidance to create substances declarations for manufacturer part lists
- Keep up-to-date as new substances are added to REACH and RoHS
- Matching table for customer part number vs. manufacturer part number
- Attach manufacturer’s electronic signature to the substance declarations
- Inform all manufacturing customers
- Reducing the risk of regulatory non-compliance

OSRAM expects its suppliers to provide all necessary substance declarations for direct materials fast, efficient and reliable preferred directly in BOMcheck® or alternatively in IMDS® for materials, part and products used in automotive products in order to be able to make compliance assessments of our products and declarations towards our customers.

**Contact:**

OSRAM GmbH  
Environmental Protection, Health and Safety  
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[www.osram.com/ile](http://www.osram.com/ile)

# Suppliers Verification

## Restrictions, avoidance and declaration of materials in products (ILE Version 24)

Supplier:	
Address:	
Responsible person / function:	
Phone & Fax:	
Email:	

### The supplier verifies that

- products, parts and materials supplied to OSRAM today and in the future satisfy the restrictions and bans defined in regulations listed in OSRAMs Index List Environment in a way, so that the use of these deliveries in products manufactured and distributed by OSRAM or customers of OSRAM does not cause violations of the listed legal requirements;
- a system is installed in suppliers company which ensures compliance with legal requirements regarding use of substances in products as far as applicable. The system includes products, parts and materials procured from sub suppliers. Supplier is able to provide relevant documentation regarding installed processes and product compliance immediately on request;
- according to Directive 2011/65/EU (RoHS) delivered products, parts and materials do not contain the following substances and their respective compounds exceeding defined maximum concentration values, unless in an application exempted by Annex of RoHS Directive (incl. amendments).

Substances / application	Maximum concentration values in homogeneous materials (2011/65/EU - RoHS)
Lead (Pb), Mercury (Hg), hexavalent Chromium (Cr <sup>6+</sup> ) Polybrominated biphenyls (PBB) and Polybrominated diphenyl ethers (PBDE)	0.1 % (weight)
Cadmium (Cd)	0.01 % (weight)
Bis(2-ethylhexyl) phthalate (DEHP) Benzyl butyl phthalate (BBP) Dibutyl phthalate (DBP) Diisobutyl phthalate (DIBP)	0.1 % (weight) banned as of July 22, 2019 <input type="checkbox"/> Substances are not contained (please check, if substances are now and in the future NOT contained in any delivered material)

- In case deliveries to OSRAM contain per article any Substance of Very High Concern (SVHC) as listed in the so-called Candidate List (see <http://echa.europa.eu/web/guest/candidate-list-table>) according Regulation (EC)1907/2006/EC (REACH), amount and applications will be declared to OSRAM proactively without further request per product/material preferably in BOMcheck<sup>®</sup>, IMDS<sup>®</sup> or alternatively in a OSRAM defined format to [reach@osram.com](mailto:reach@osram.com);
- Further justified information needs regarding regulated substances in deliveries to OSRAM such as the use of RoHS substances in applications exempted by Directive 2011/65/EU will be answered to OSRAM fast, efficient and reliable on request.

OSRAM reserves the right to verify suppliers' compliance with the OSRAM Index List Environment at any time or to have such verifications carried out by a third party. In case a violation of applicable laws or duties laid down in this document is established after signature of the enclosed verification, OSRAM must be notified immediately. In case suppliers fail to comply with the OSRAM Index List requirements, OSRAM reserves the right to take appropriate actions, including termination of business relationships.

\_\_\_\_\_  
Place, Date, Stamp

\_\_\_\_\_  
Name, Signature

**Annex (informative)**

**List of applications of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) which are exempted from the requirements of Article 4(1) of EU Directive 2011/65/EU (RoHS), Annex III (Status: January 2017)**

1	Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):	Renewal is pending for 1(a)-1(f)
1(a)	For general lighting purposes < 30 W:	2,5 mg shall be used per burner after 31 December 2012
1(b)	For general lighting purposes ≥ 30 W and < 50 W:	3,5 mg may be used per burner after 31 December 2011
1(c)	For general lighting purposes ≥ 50 W and < 150 W: 5 mg	
1(d)	For general lighting purposes ≥ 150 W: 15 mg	
1(e)	For general lighting purposes with circular or square structural shape and tube diameter ≤ 17 mm	7 mg may be used per burner after 31 December 2011
1(f)	For special purposes 5 mg	
1(g)	For general lighting purposes < 30 W with a lifetime equal or above 20 000 h: 3,5 mg	Expires on 31 December 2017 (Renewal is pending)
2(a)	Mercury in double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp):	Renewal is pending for 2(a)1 – 2(a)5
2(a)(1)	Tri-band phosphor with normal lifetime and a tube diameter < 9 mm (e.g. T2):	4 mg may be used per lamp after 31 December 2011
2(a)(2)	Tri-band phosphor with normal lifetime and a tube diameter ≥ 9 mm and ≤ 17 mm (e.g. T5):	3 mg may be used per lamp after 31 December 2011
2(a)(3)	Tri-band phosphor with normal lifetime and a tube diameter > 17 mm and ≤ 28 mm (e.g. T8):	3,5 mg may be used per lamp after 31 December 2011
2(a)(4)	Tri-band phosphor with normal lifetime and a tube diameter > 28 mm (e.g. T12):	3,5 mg may be used per lamp after 31 December 2012
2(a)(5)	Tri-band phosphor with long lifetime (≥ 25 000 h): 8 mg	5 mg may be used per lamp after 31 December 2011
2(b)	Mercury in other fluorescent lamps not exceeding (per lamp):	Renewal is pending for 2(b)(3) and 2(b)(4)
2(b)(1)	<del>Linear halophosphate lamps with tube &gt; 28 mm (e.g. T10 and T12): 10 mg</del>	Expired
2(b)(2)	<del>Non-linear halophosphate lamps (all diameters): 15 mg</del>	Expired
2(b)(3)	Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9)	15 mg may be used per lamp after 31 December 2011
2(b)(4)	Lamps for other general lighting and special purposes (e.g. induction lamps)	15 mg may be used per lamp after 31 December 2011
3	Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp):	Renewal is pending for 3(a) – 3(c)
3(a)	Short length (≤ 500 mm)	3,5 mg may be used per lamp after 31 December 2011
3(b)	Medium length (> 500 mm and ≤ 1 500 mm)	5 mg may be used per lamp after 31 December 2011
3(c)	Long length (> 1 500 mm)	13 mg may be used per lamp after 31 December 2011
4(a)	Mercury in other low pressure discharge lamps (per lamp)	15 mg may be used per lamp after 31 December 2011 Renewal is pending

4(b)	Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 60:	Renewal is pending for 4(b)-I – 4(b)-III
4(b)-I	P ≤ 155 W	30 mg may be used per burner after 31 December 2011
4(b)-II	155 W < P ≤ 405 W	40 mg may be used per burner after 31 December 2011
4(b)-III	P > 405 W	40 mg may be used per burner after 31 December 2011
4(c)	Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):	Renewal is pending for 4(c)-I – 4(c)-III
4(c)-I	P ≤ 155 W	25 mg may be used per burner after 31 December 2011
4(c)-II	155 W < P ≤ 405 W	30 mg may be used per burner after 31 December 2011
4(c)-III	P > 405 W	40 mg may be used per burner after 31 December 2011
<del>4(d)</del>	<del>Mercury in High Pressure Mercury (vapour) lamps (HPMV)</del>	<del>Expired</del>
4(e)	Mercury in metal halide lamps (MH)	Renewal is pending
4(f)	Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex	Renewal is pending
4(g)	Mercury in hand crafted luminous discharge tubes used for signs, decorative or architectural and specialist lighting and light-artwork, where the mercury content shall be limited as follows: (a) 20 mg per electrode pair + 0,3 mg per tube length in cm, but not more than 80 mg, for outdoor applications and indoor applications exposed to temperatures below 20 °C; (b) 15 mg per electrode pair + 0,24 mg per tube length in cm, but not more than 80 mg, for all other indoor applications.	Expires on 31 December 2018
<del>5(a)</del>	<del>Lead in glass of cathode ray tubes</del>	<del>Expired</del>
5(b)	Lead in glass of fluorescent tubes not exceeding 0,2 % by weight	Renewal is pending
6(a)	Lead as an alloying element in steel for machining purposes and in galvanised steel containing up to 0,35 % lead by weight	Renewal is pending
6(b)	Lead as an alloying element in aluminium containing up to 0,4 % lead by weight	Renewal is pending
6(c)	Copper alloy containing up to 4 % lead by weight	Renewal is pending
7(a)	Lead in high melting temperature type solders (i.e. lead- based alloys containing 85 % by weight or more lead)	Renewal is pending
<del>7(b)</del>	<del>Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications</del>	<del>Expired</del>
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 a glass or ceramic matrix compound	Renewal is pending
7(c)-II	Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher	Renewal is pending
7(c)-III	Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC	Expires on 1 January 2013 and after that date may be used in

		spare parts for EEE placed on the market before 1 January 2013
7(c)-IV	Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors	Renewal is pending
8(a)	Cadmium and its compounds in one shot pellet type thermal cut-offs	<del>Expires on 1 January 2012 and after that date may be used in spare parts for EEE placed on the market before 1 January 2012</del>
8(b)	Cadmium and its compounds in electrical contacts	Renewal is pending
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	Renewal is pending
9(b)	Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications	Renewal is pending
11(a)	Lead used in C-press compliant pin connector systems	May be used in spare parts for EEE placed on the market before 24 September 2010
11(b)	Lead used in other than C-press compliant pin connector systems	<del>Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013</del>
12	Lead as a coating material for the thermal conduction module C-ring	May be used in spare parts for EEE placed on the market before 24 September 2010
13(a)	Lead in white glasses used for optical applications	Renewal is pending
13(b)	Cadmium and lead in filter glasses and glasses used for reflectance standards	Renewal is pending
14	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight	<del>Expired on 1 January 2011 and after that date may be used in spare parts for EEE placed on the market before 1 January 2011</del>
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages	Renewal is pending
16	<del>Lead in linear incandescent lamps with silicate coated tubes</del>	<del>Expired</del>
17	<del>Lead halide as radiant agent in high intensity discharge (HID) lamps used for professional reprography applications</del>	<del>Expired</del>
18(a)	<del>Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as speciality lamps for diazoprinting reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba)<sub>2</sub>MgSi<sub>2</sub>O<sub>7</sub>:Pb)</del>	<del>Expired</del>
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)	Renewal is pending
19	<del>Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact energy saving lamps (ESL)</del>	<del>Expired</del>
20	<del>Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCDs)</del>	<del>Expired</del>

21	Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses	Renewal is pending
23	Lead in finishes of fine pitch components other than connectors with a pitch of 0,65 mm and less	May be used in spare parts for EEE placed on the market before 24 September 2010
24	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors	Renewal is pending
25	<del>Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring</del>	Expired
26	<del>Lead oxide in the glass envelope of black light blue lamps</del>	Expired
27	<del>Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers</del>	Expired
29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC ( 1)	Renewal is pending
30	<del>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</del>	Expired
31	<del>Lead in soldering materials in mercury free flat fluorescent lamps (which, e.g. are used for liquid crystal displays, design or industrial lighting)</del>	Expired
32	Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes	Renewal is pending
33	<del>Lead in solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers</del>	Expired
34	Lead in cermet-based trimmer potentiometer elements	Renewal is pending
36	<del>Mercury used as a cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display</del>	Expired
37	Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body	Renewal is pending
38	<del>Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide</del>	Expired
39	Cadmium in colour converting II-VI LEDs (< 10 µg Cd per mm <sup>2</sup> of light-emitting area) for use in solid state illumination or display systems	Expires on 1 July 2014 Renewal is pending
40	<del>Cadmium in photoresistors for analogue optocouplers applied in professional audio equipment</del>	Expired
41	Lead in solders and termination finishes of electrical and electronic components and finishes of printed circuit boards used in ignition modules and other electrical and electronic engine control systems, which for technical reasons must be mounted directly on or in the crankcase or cylinder of hand-held combustion engines (classes SH:1, SH:2, SH:3 of Directive 97/68/EC of the European Parliament and of the Council <sup>(1)</sup> )  <sup>1)</sup> Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery (OJ L 59, 27.2.1998, p. 1).	Expires on 31 December 2018

**OSRAM Index List Environment: List of prohibited hazardous substances**  
**Products and product parts which can be affected by legal bans of hazardous substances**  
 Summary of bans or restrictions on the distribution of hazardous substances, valid in the EU and other countries.  
 1.1.1.1.1.1.1.1.1 **Status: November 2016**

Substance/ substance group	CAS No.	Affected application	Limit value (wt. %) <sup>1)</sup>	Exce m.	Legal regulations	
<b>Electrical and electronic equipment (EEE) and components;</b>						
Lead and compounds	7439-92-1	Electrical and electronic equipment (EEE)	0.1	yes	EU	RoHS
Cadmium and compounds	7440-43-9	EEE	0.01	yes	EU	RoHS
		Metal surface coating	n.g.	yes	EU	REACH Annex XVII
Mercury and compounds	7439-97-6	EEE	0.1	yes	EU	RoHS
Hexavalent chromium (Cr <sup>VI</sup> )		EEE	0.1	yes	EU	RoHS
Polybrominated biphenyls (PBBs) Polybrominated diphenyl ethers (PBDEs)		EEE	0.1	no	EU	RoHS
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	EEE	0.1	no	EU	RoHS (banned as of 22 July 2019)
Benzyl butyl phthalate (BBP)	85-68-7					
Dibutyl phthalate (DBP)	84-74-2					
Diisobutyl phthalate (DIBP)	84-69-5					
<b>Batteries and accumulators</b>						
Lead	7439-92-1	Fixed batteries	0.004	yes	EU	2006/66/EC
Cadmium	7440-43-9	Portable batteries and accumulators	0.002	yes	EU	2006/66/EC
Mercury	7439-97-6	Batteries and accumulators	0.0005	yes	EU	2006/66/EC
<b>Insulating materials</b>						
Asbestos <sup>2)</sup>	1332-21-4	All applications	0.1 (total)	yes	EU	REACH Annex XVII
Perfluorooctane sulfonic acid and its metal salts, halides, amides, and other derivatives including polymers (PFOS)		All applications	0.1	yes	EU	REACH Annex XVII
<b>Packaging</b>						
Heavy metals (lead, cadmium, hexavalent chromium, mercury)		Packaging and packaging components	0.01 (total)		EU	94/62/EC
<b>Plastic and rubber materials</b>						
Benzo[a]pyrene, Benzo[e]pyrene, Benzo[a]anthracene, Chrysen, Benzo[b]fluoranthene, Benzo[j]fluoranthene, Benzo[k]fluoranthene and Dibenzo[a,h]anthracene,	50-32-8 192-97-2 56-55-3 218-01-9 205-99-2 205-82-3 207-08-9 53-70-3	rubber or plastic components that come into direct as well as prolonged or short-term repetitive contact with the human skin or the oral cavity	0.0001  0.00005 (child articles)	no	EU	REACH Annex XVII

**Notes**

1) "n.g." means that no limit value is given in the legislation. In these cases the legally given concentration limits for taking substances into account are to be observed.

2) <b>Asbestos</b>	<b>CAS No.</b>	<b>Asbestos</b>	<b>CAS No.</b>
Aktinolite	77536-66-4	Chrysotile	12001-29-5 and 132207-32-0
Amosite	12172-73-5	Crocidolite	12001-28-4
Anthophyllite	77536-67-5	Tremolite	77536-68-6



**OSRAM Index List Environment: List of Declarable Substances**  
**This list contains a regularly reviewed selection of relevant hazardous substances.**  
Stand: January 2017

Substance/substance group	Reason	Typical applications / reference of limit value	Limit value <sup>3)</sup> (% w/w)	Declaration via BOMcheck® / requirements
<b>Substances used in ultraviolet lamps</b>				
Silicic acid (H <sub>2</sub> SiO <sub>5</sub> ), barium salt (1:1), lead-doped [with lead (Pb) content above the applicable generic concentration limit for 'toxicity for reproduction' Repr. 1A (CLP) or category 1 (DSD); the substance is a member of the group entry of lead compounds, with index number 082-001-00-6 in Regulation (EC) No 1272/2008]	Toxic for reproduction	Luminescent material which emits ultraviolet light and is used as the phosphor coating for ultraviolet lamps	0.1	BOMcheck® (REACH Art 33)
<b>Substances used in electrolytic capacitors</b>				
N,N-dimethylacetamide	Toxic for reproduction	Solvent in the electrolyte solution for Aluminum electrolytic capacitors	0.1	BOMcheck® (REACH Art 33)
N,N-dimethylformamide	Toxic for reproduction	Solvent in the electrolyte solution for electrolytic capacitors, particularly low temperature capacitors rated to -55 °C.	0.1	BOMcheck® (REACH Art 33)
<b>Substances used in ultrasound transducers, ceramic capacitors and actuators</b>				
Lead titanium trioxide	Toxic for reproduction	Both can be used in a wide variety of piezoelectric devices including high-dielectric-constant capacitors, piezoelectric sonar and ultrasonic transducers, radio and communication filters, pyroelectric security devices, medical diagnostic transducers, stereo tweeters, gas igniters, positive temperature coefficient (PTC) sensors and switches and ultrasonic motors	0.1	BOMcheck® (REACH Art 33)
Lead titanium zirconium oxide	Toxic for reproduction		0.1	BOMcheck® (REACH Art 33)
<b>Substances used in polyurethane</b>				
2,2'-dichloro-4,4'-methylenedianiline, also known MOCA	Carcinogenic	It may be present in polyurethane up to 4% w/w	0.1	BOMcheck® (REACH Art 33)
Imidazolidine-2-thione; 2-imidazoline-2-thiol (ethylene thiourea)	Toxic for reproduction	vulcanisation agent (as such or in mixture) in the production of GRGs (General Rubber Goods) and tyres	0.1	BOMcheck® (REACH Art 33)
<b>Substances used in PVDF plastic</b>				
Perfluorononan-1-oic-acid and its sodium and ammonium salts	Toxic for reproduction PBT	PFNA may be found in PVDF plastic up to 1% w/w of the plastic	0.1	BOMcheck® (REACH Art 33)
Pentadecafluorooctanoic acid (PFOA)	Toxic for reproduction	PFOA may be found in PVDF plastic up to 1% w/w of the plastic; used as an emulsion stabilizer to manufacture polyvinylidene fluoride (PVDF) and other fluorinated polymers and elastomers	0.1	BOMcheck® (REACH Art 33)
Ammonium pentadecafluorooctanoate (APFO)	Toxic for reproduction	Emulsion stabilizer to manufacture polyvinylidene fluoride (PVDF) and other fluorinated polymers and elastomers	0.1	BOMcheck® (REACH Art 33)
Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts		PFDA may be found in PVDF plastic up to 1% by weight of the plastic.	0.1	BOMcheck® (REACH Art 33)

Substance/substance group	Reason	Typical applications / reference of the limit value	Limit value <sup>3)</sup> (% w/w)	Declaration via BOMcheck® / requirements
<b>Substances used in lithium ion batteries</b>				
1,3-Propanesultone	Carcinogenic	Solvent in battery electrolytes for sealed lithium ion batteries	0.1	BOMcheck® (REACH Art 33)
Bis(2-methoxyethyl) ether, also known as Diglyme	Toxic for reproduction	Solvent in battery electrolytes for sealed lithium ion batteries	0.1	BOMcheck® (REACH Art 33)
1,2-Bis(2-methoxyethoxy) ethane (TEGDME, triglyme)	Toxic for reproduction	Solvent in battery electrolytes for sealed lithium ion batteries	0.1	BOMcheck® (REACH Art 33)
1,2-Dimethoxyethane (ethylene glycol dimethyl ether, EGDME)	Toxic for reproduction	Solvent in battery electrolytes for sealed lithium ion batteries	0.1	BOMcheck® (REACH Art 33)
1,2-Diethoxyethane	Toxic for reproduction	May be used as a solvent in battery electrolytes for sealed lithium ion batteries	0.1	BOMcheck® (REACH Art 33)
<b>Substance used in specialist paints and coatings</b>				
4-Nonylphenol, branched and linear, ethoxylated [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]	Equivalent level of concern having probable serious effects to the environment	Found in concentrations up to 10% w/w in specialist coatings based on acrylic esters and specialist paints based on polyvinyl acetates (PVA). If the coating is applied to a very thin light structure, for example aluminium foils, then this could result in > 0.1% w/w of nonylphenol ethoxylates in the article.	0.1	BOMcheck® (REACH Art 33)
<b>Cadmium, Cadmium oxide, Cadmium sulphide</b>				
Cadmium	Carcinogenic	Pigment, heat stabiliser, in NiCd Batteries, in alloys, as a plating for plugs, contacts and switches, and in optical glass and filters	0.1	BOMcheck® (REACH Art 33) RoHS
Cadmium oxide	Carcinogenic	Heat stabiliser, in high quality power switching contacts and relays, and as photoelectric applications	0.1	BOMcheck® (REACH Art 33) RoHS
Cadmium sulphide	Carcinogenic	Yellow colorant in plastics, glass and ceramics, and is found in photoelectric devices including photoresistors, solar cells and piezoelectric transducers	0.1	BOMcheck® (REACH Art 33) RoHS
<b>Plasticizers, flame retardants, stabilizers and UV protection agent used in plastic</b>				
Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	PBT	DecaBDE is used as an additive flame retardant in plastics/polymers. DecaBDE is typically used in concentrations of 10-15% by weight of the plastic/polymer, though in some cases concentrations as high as 20% may be required.	0.1	BOMcheck® (REACH Art 33) RoHS
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	Toxic for reproduction	Plasticiser in PVC and other plastic polymers	0.1	BOMcheck® (REACH Art 33)
Diisopentylphthalate	Toxic for reproduction	Plasticiser in PVC and other plastic polymers	0.1	BOMcheck® (REACH Art 33)
Dipentyl phthalate (DPP)	Toxic for reproduction	Plasticiser in PVC and other plastic polymers.	0.1	BOMcheck® (REACH Art 33)
Dioxobis(stearato)trilead	Toxic for reproduction	Heat stabilizer in plastics, in particular for PVC products	0.1	BOMcheck® (REACH Art 33)
N-pentyl-isopentylphthalate	Toxic for reproduction	Plasticiser in PVC and other plastic polymers	0.1	BOMcheck® (REACH Art 33)

Substance/substance group	Reason	Typical applications / reference of the limit value	Limit value <sup>3)</sup> (% w/w)	Declaration via BOMcheck® / requirements
Lead oxide sulfate	Toxic for reproduction	Heat stabilizer in plastics, in particular for opaque or semi opaque PVC products	0.1	BOMcheck® (REACH Art 33)
Fatty acids, C16-18, lead salts	Toxic for reproduction	Heat stabilizer in plastics, in particular for PVC products	0.1	BOMcheck® (REACH Art 33)
Lead dinitrate	Toxic for reproduction	Heat stabilizer in nylon and polyesters	0.1	BOMcheck® (REACH Art 33)
Pentalead tetraoxide sulphate	Toxic for reproduction	Heat stabilizer in plastics, in particular for PVC products	0.1	BOMcheck® (REACH Art 33)
Sulfurous acid, lead salt, dibasic	Toxic for reproduction	Heat stabilizer in plastics, in particular for PVC products	0.1	BOMcheck® (REACH Art 33)
Tetralead trioxide sulphate	Toxic for reproduction	One of the most widely heat stabilizers for plastics, in particular for PVC products	0.1	BOMcheck® (REACH Art 33)
Trilead dioxide phosphonate	Toxic for reproduction	Heat stabilizer in plastics, in particular for PVC products	0.1	BOMcheck® (REACH Art 33)
Dibutyltin dichloride (DBTC)	Toxic for reproduction	Added to PVC plastic to make it more stable to heating and to protect against degradation from sunlight. DBTC is also used as catalyst for the production of plastics including polyurethanes and certain silicones, and for room temperature vulcanisation (RTV) silicone rubber systems.	0.1	BOMcheck® (REACH Art 33)
Bis(2-methoxyethyl) phthalate (DMEP)	Toxic for reproduction	Plasticizer in nitrocellulose, acetyl cellulose, polyvinyl acetate, polyvinyl chloride (PVC) and polyvinylidene chloride	0.1	BOMcheck® (REACH Art 33)
Benzyl butyl phthalate (BBP)	Toxic for reproduction	Plasticized plastics, particularly PVC	0.1	BOMcheck® (REACH Art 33 Upcoming RoHS)
Dibutyl phthalate (DBP)	Toxic for reproduction	Plasticized plastics, particularly PVC	0.1	BOMcheck® (REACH Art 33 Upcoming RoHS)
Bis(2-ethylhexyl)phthalate (diethylhexylphthalate, DEHP)	Toxic for reproduction	Plasticized plastics, particularly PVC	0.1	BOMcheck® (REACH Art 33 Upcoming RoHS)
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl (DHNUP)	Toxic for reproduction	Plasticiser in PVC and other plastic polymers	0.1	BOMcheck® (REACH Art 33)
Diisobutylphthalate (DIBP)	Toxic for reproduction	Plasticized plastics, particularly PVC	0.1	BOMcheck® (REACH Art 33)
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	Toxic for reproduction	Plasticiser in PVC and other plastic polymers	0.1	BOMcheck® (REACH Art 33 Upcoming RoHS)
Hexabromocyclododekane (HBCDD) 1) 2), including all major diastereoisomers: - Alpha-HBCDD - Beta-HBCDD - Gamma-HBCDD	PBT	Flame-protected plastics	0.1	BOMcheck® (REACH Art 33)
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	PBT/vPvB	Plasticized and flame retarded plastics, rubber and sealing compounds	0.1	BOMcheck® (REACH Art 33)
Tris(2-chloroethyl)phosphate (TCEP)	Toxic for reproduction	Plasticized and flame retarded plastics, painting and rubber compounds	0.1	BOMcheck® (REACH Art 33)

Substance/substance group	Reason	Typical applications / reference of the limit value	Limit value <sup>3)</sup> (% w/w)	Declaration via BOMcheck® / requirements
Dihexyl phthalate (DnHP)	Toxic for reproduction	Plasticizer in PVC, dye, pigment, paint, ink, adhesive, lubricant.	0.1	BOMcheck® (REACH Art 33)
Trixylyl phosphate (TXP)	Toxic for reproduction	Phosphorous-containing flame retardant which can be found in a range of plastics including PVC, polyurethane, TPE, vinylite, cellulosic resin and natural and synthetic rubber (for example, cables and foam plastics). Plastic products which use TXP as a flame retardant are used in professional and industrial applications only where high temperature performance or long term heat resistance are important. TXP is not used in plastic products intended for consumer use.	0.1	BOMcheck® (REACH Art 33)
1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	Toxic for reproduction	Chemically similar to DEHP, DBP, DIBP and BBP, may be used as a substitute for these phthalates as their use becomes phased out.	0.1	BOMcheck® (REACH Art 33)
2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	PBT; vPvB	Used as a UV protection agent for PVC and can also be used for PET, PC, PA, ABS and other polymers. Typical addition rates are 0.20-0.50% w/w of the polymer, depending on the polymer and the desired level of UV protection	0.1	BOMcheck® (REACH Art 33)
2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	PBT; vPvB	Used as a UV protection agent in plastics, rubber and polyurethane. Typical addition rates are 0.10-1.0% w/w of the polymer, depending on the polymer and the desired level of UV protection.	0.1	BOMcheck® (REACH Art 33)
2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	vPvB	UV protection agent in plastics, rubber and polyurethane. Typical addition rates are 0.2-0.5% w/w of the polymer, depending on the polymer and the desired level of UV protection	0.1	BOMcheck® (REACH Art 33)
2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350)	vPvB	UV protection agent in plastics, rubber and polyurethane. Typical addition rates are 0.2-0.5% w/w of the polymer, depending on the polymer and the desired level of UV protection	0.1	BOMcheck® (REACH Art 33)
2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	Toxic for reproduction	The reaction mass of DOTE and MOTE is added to PVC plastic to make it more stable to heating. The most commonly used reaction mass contains 70% DOTE and 30% MOTE and the addition rate in PVC is typically between 1 and 2.5%.	0,1	BOMcheck® (REACH Art 33)
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)	Toxic for reproduction		0,1	BOMcheck® (REACH Art 33)

Substance/substance group	Reason	Typical applications / reference of the limit value	Limit value <sup>3)</sup> (% w/w)	Declaration via BOMcheck® / requirements
1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate	Toxic for reproduction	may be used as plasticizers in PVC and other plastic polymers	0,1	BOMcheck® (REACH Art 33)
Benzo[def]chrysene (Benzo[a]pyrene)		Benzo[a]pyrene is a Polycyclic Aromatic Hydrocarbon (PAH) which can be found in plastic and rubber parts in a wide range of articles.	0.1	BOMcheck® (REACH Art 33)
Dicyclohexyl phthalate (DCHP)		DCHP is a phthalate which is used as a plasticizer for cellulose nitrate, ethyl cellulose, chlorinated rubber, polyvinyl acetate, polyvinyl chloride and other polymers.	0.1	BOMcheck® (REACH Art 33)
Other brominated flame retardants than PBBs, PBDEs und HBCDD		Flame-protected plastics in components and printed circuit boards	0.1 <sup>3)</sup> hm	BOMcheck® (required by customers)
4,4'-isopropylidenediphenol (bisphenol A)	Toxic for reproduction	Bisphenol A (BPA) can be found in thermal paper applications up to 3% by weight of the paper, and as an antioxidant additive in PVC where it can be present up to 1.2% by weight of the PVC.	0.1	BOMcheck® (REACH Art 33)
<b>Humidity indicators</b>				
Cobalt dichloride	Carcinogenic and Toxic for reproduction	Blue gel in dried flowers (packaging supplement)	0.1	BOMcheck® (REACH Art 33)
<b>Substances used in glass manufacture</b>				
Diarsenic pentoxide	Carcinogenic	May be found in certain types of specialist glass	0.1	BOMcheck® (REACH Art 33)
Diarsenic trioxide	Carcinogenic	May be found in certain types of specialist glass	0.1	BOMcheck® (REACH Art 33)
Antimony and Antimony compounds	Toxic	Opacifying agent for soda lime glass. Antimony trioxide is primarily used as a flame retardant in combination with halogenated flame retardants in plastics and laser-writable plastics	0.1 in glass	BOMcheck® (required by customers)
Arsenic and Arsenic compounds	Toxic, arsenic trioxide and arsenic acid and its salts are also carcinogenic	Refining and oxidizing agent for manufacturing special glass and decolourising agent for glass and enamels in particular to eliminate green colour due to iron(II) sulphate	0.1 in glass	BOMcheck® (required by customers)
<b>High temperature insulating materials</b>				
Aluminosilicate Refractory Ceramic Fibres	Carcinogenic	High temperature insulation in equipment	0.1	BOMcheck® (REACH Art 33)
Zirconia Aluminosilicate Refractory Ceramic Fibres	Carcinogenic	High temperature insulation in equipment	0.1	BOMcheck® (REACH Art 33)
<b>Biocides</b>				
Bis(tributyltin)oxide (TBTO)	PBT	Foam materials in electronics and as a biocide	0.1	BOMcheck® (REACH Art 33)
<b>Flame retardant/adhesive ingredient used for wood, paper, cotton and other plant-derived materials</b>				
Boric acid	Toxic for reproduction	Glass, glass fibres, ceramics, wood, paper, paints, coatings, paints	0.1	BOMcheck® (REACH Art 33)
Diboron trioxide	Toxic for reproduction	Glass products, fibre glass products and ceramic products	0.1	BOMcheck® (REACH Art 33)

Substance/substance group	Reason	Typical applications / reference of the limit value	Limit value <sup>3)</sup> (% w/w)	Declaration via BOMcheck® / requirements
Disodium tetraborate, anhydrous	Toxic for reproduction	Glass, glass fibres, ceramics, Flame-protected wood, paper and Cotton	0.1	BOMcheck® (REACH Art 33)
Tetraboron disodium heptaoxide, hydrate	Toxic for reproduction		0.1	BOMcheck® (REACH Art 33)
<b>Yellow and red pigments for plastics and paints</b>				
Lead tetroxide (orange lead)	Toxic for reproduction	Found in anti-corrosion paints used to prevent iron and steel from rusting (content can be between 85% and 98% lead tetroxide)	0.1	BOMcheck® (REACH Art 33)
Lead cyanamidate	Toxic for reproduction	Is found in anticorrosion paints which are used to prevent steel from rusting. These red paints can typically contain around 15% lead cyanamidate.	0.1	BOMcheck® (REACH Art 33)
Pyrochlore, antimony lead yellow	Toxic for reproduction	Yellow pigment for colouring plastics and paints. When used as a colourant in plastic articles, the lead antimonate can be present in conc. > 0.1% w/w of the plastic	0.1	BOMcheck® (REACH Art 33)
4-Aminoazobenzene	Carcinogenic	(Also known as Aniline Yellow) is found in yellow inks including inks for inkjet printers.	0.1	BOMcheck® (REACH Art 33)
Lead chromate	Toxic, environment hazard	Colored paints and coatings, corrosion control coatings	0.1	BOMcheck® (REACH Art 33)
Lead chromate molybdate sulphate red (C.I. Pigment Red 104)	Carcinogenic and toxic for reproduction	Pigment for colored plastic: PVC, polyolefins and nylon	0.1	BOMcheck® (REACH Art 33)
Lead sulfochromate yellow (C.I. Pigment Yellow 34)	Carcinogenic and toxic for reproduction	Pigment for colored plastic: PVC, polyolefins and nylon	0.1	BOMcheck® (REACH Art 33)
Cadmium sulphide (Cadmium yellow and CI Pigment Yellow 37)	Carcinogenic	Yellow pigment (e.g. glass and plastic), semiconductors and photoelectronic applications (e.g. solar cells), stabilizers	0.1	BOMcheck® (REACH Art 33)
Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28; Congo Red)	Carcinogenic	dye for textiles, paper and PVA. Patent disclosures indicate that it is also found in ink used in inkjet printers. used as a pH indicator, as an addition to culture media and for biological staining, e.g. in histology gelling	0.1	BOMcheck® (REACH Art 33)
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)	Carcinogenic	Black pigment which is used as a dye for a wide range of applications including plastics, cellulose, silk, nylon, acetate, wood and leather. Patent disclosures indicate that it is also found in ink used in inkjet printers.	0.1	BOMcheck® (REACH Art 33)
<b>Substances which are restricted, if part comes into contact with skin</b>				
Azo compounds	Release of carcinogenic substances	Colored plastics	0.1 <sup>3)</sup> hm	-
Nickel, nickel compounds and nickel-based alloys in contact with skin	Different nickel compounds are carcinogenic	Metal part, Base parts, only relevant if in contact with skin during use phase, e.g. torch surface	0.1 <sup>3)</sup> hm	BOMcheck® (required by customers)
<b>Other application</b>				
Beryllium Beryllium compounds	Toxic	Contact and spring materials, copper alloys, high-temperature materials, ceramics, glasses	0.1 <sup>3)</sup> hm	BOMcheck® (required by customers)
Radioactive substances, intentionally added	Radioactive	Lamp filling gas, lamp electrodes	n.g.	BOMcheck® (required by customers)

3) Threshold concentration value for declaration: 0.1 % by weight in articles (SVHC acc. REACH Art 33), otherwise for homogeneous materials (hm)