

## Banned and restricted substances

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The list has been prepared following the list substances relevant for electrical appliances drawn up by the ZVEI. It does not claim to be complete but rather specifies the banned and restricted substances of those materials usually used for the production of STAHL-products. Regulations stipulated in European and German legislation have to be fulfilled in any case. Substances specified on the list supplied in material have to be declared R. STAHL in any case.

Substance/group of substances	CAS-No.	Typical application	Affected application	Limit value		Legal regulation <sup>1</sup>
				Weight %		
				in		
Lead Lead compounds	7439-92-1	Solders, hybrid circuits, ceramic parts, glasses, batteries	Electric and electronic devices	0.1	hom. material	EU RoHS
			Packaging and packaging components	0.01	constituent	EU VerpackRL
Cadmium Cadmium compounds	7440-43-9	Contact coatings, hard and soft solders, glasses, batteries, corrosion protection, colouring pigments, semiconductors	Electric and electronic devices	0.01	hom. material	EU RoHS
			Plastics, dyestuffs, treatment of metallic surfaces, brazing fillers	0.01	hom. material	EU REACH
			Packaging Packaging components	0.01	constituent	EU VerpackRL
			Batteries accumulators	0.002	constituent	EU BattRL
Chromium VI (hexavalent chromium)		Anti-corrosion coatings	Electric and electronic devices	0.1	hom. material	EU RoHS
			Packaging Packaging components	0.01	constituent	EU VerpackRL
Mercury Mercury compounds	7439-97-6	Discharge lamps, relays, switches, batteries	Electric and electronic devices	0.1	hom. material	EU RoHS
			Wood preservation, Prevention of vegetation, industrial water treatment			EU REACH DE ChemVerbotsV
			Packaging Packaging components	0.01	constituent	EU VerpackRL
			Batteries accumulators	0.0005	constituent	EU BattRL
Arsenic Arsenic compounds	7440-38-2	Lead and copper alloys, metal adhesives, soft solders, glasses, semiconductor materials, biocide	Wood preservation			EU REACH DE ChemVerbotsV
Asbestos <sup>2</sup>	1332-21-4	Insulating materials	General ban	0.1	hom. material in total	EU REACH DE ChemVerbotsV
Synthetic mineral fibres, consisting of undirected, vitreous (silicate) fibres with a mass content of oxides containing sodium, potassium, calcium, magnesium and barium of more than 18%		Insulating and sound proofing material	Thermal insulation and sound insulation in building construction, including technical insulation and in ventilating systems	0.1	constituent	DE ChemVerbotsV

Polybrominated byphenyls (PBB)		Flame-protected plastics, in components and printed board assemblies	General ban	0.1	hom. material	EU Regulation EC 850/2004 EU RoHS
Polybrominated diphenyl ether (PBDE) <sup>3</sup>		Flame-protected plastics, foams, in components and printed board assemblies	General ban	0,1	hom.material	EU REACH EU RoHS DE ChemVerbotsV
Hexabromocyclododecane (HBCDD)	25637-99-4	Flame-protected plastics and foams	General ban	0.0		EU REACH
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	Softener in plastics, additive for colours, cosmetic products and pesticides	General ban	0.0		EU REACH
Butyl Benzyl Phthalate (BBP)	85-68-7	Softener in plastics	General ban	0.0		EU REACH
Dibutyl phthalate (DBP)	84-74-2	Softener in plastics, in adhesives and ink for printers, pesticides	General ban	0.0		EU REACH
Polychlorinated biphenyls (PCB)	1336-36-3	Insulating material in transformers, hydraulic fluid, fluid for heat transfer	General ban	0.005	hom. material	EU REACH
Polychlorinated terphenyls (PCT)	61788-33-8					DE ChemVerbotsV
Nonylphenol Nonylphenoethoxylate (NPFO)	104-40-5	In washing solutions, cleaing agents, in fungicides, pharmaceuticals and softeners for cellulose ester	Cleaning agents, textile and leather processing, metal processing, production of pulp and paper	0.1	hom. material	EU REACH
Perfluorooctane sulfonate (PFOS)	45298-90-6 1763-23-1	Fire foams, textiles, paper, chromium plating, photography, hydraulic fluid	General ban Limit value 0.005 % in preparations	0.1	hom. material	DE ChemVerbotsV
Monomethyl-dichlorodiphenylmethane			General ban	0.0005	hom. material	EU REACH DE ChemVerbotsV
Monomethyltetrachloro-diphenylmethane	76253-60-6		General ban	0.0005	hom. material	EU REACH DE ChemVerbotsV
Monomethyl-dibromodiphenylmethane (DBBT)	99688-47-8		General ban	0.0005	hom.material	EU REACH DE ChemVerbotsV
Carbon tetrachloride	56-23-5	Fire extinguishing substances, degreasing agents, cleaning agents, solvents and diluting agents	General ban	0.1	hom. Werkstoff	EU REACH DE ChemOzonSchi chtV
Hexachloroethane	67-72-1	Melting and casting of aluminium and its alloys	Must not be used for production or processing of nonferrous metals			EU REACH
Aromatic Amines <sup>4</sup>		Rubber-antioxidant, antiageing agents for oils and lubricants, for production of azo dyes	General ban	0.1	hom. material in total	EU REACH DE ChemVerbotsV
(DBB) Di- $\mu$ -xodinbutyl-stanniohydroxyboran, Dibutyltin hydrogenborate	75113-37-0		General ban	0.1	constituent	EU REACH DE ChemVerbotsV
Dioxins and furans <sup>5</sup>			General ban	0.0001	constituent	DE ChemVerbotsV

Pentachlorophenol (Penta) Pentachlorophenol-sodium salt and other pentachlorophenol salts and compounds	87-86-5 133-49-3	Wood, textiles or leather that has been treated with fungicides	General ban	0.0005 constituent	EU REACH DE ChemVerbotsV
Organotin compounds			Biocidal substances in dyes		DE ChemVerbotsV
Creosote <sup>6</sup>		Wood preservation, soot	Wood preservatives and wood that has been treated with creosote		EU REACH DE ChemVerbotsV
Benzene	71-43-2	Solvents, heat transfer media, biocides	Must not be put on the market as a substance or as part of preparations	0.1 constituent	EU REACH DE ChemVerbotsV
Trichlorobenzene (TCB)	120-82-1				
Substances of very high concern (substances stated on the „candidate list“) pursuant to Article 59 para. 1 in the current version			Obligation to provide information	0.1	EU REACH
Substances stated in Annex XIV of regulation 1907/2006			Must not be put on the market	0.0	EU REACH
Formaldehyde	50-00-0	Biocide	Washing agents, cleaning agents and maintenance agents	0.2 constituent	DE ChemVerbotsV
			Wood (evaporations of wood materials must not exceed the equalization concentration of 0.1 ml/m <sup>3</sup> (ppm) in the air of the test chamber)		DE ChemVerbotsV
Pesticides <sup>7</sup>		Biocide			EU Regulation EC 850/2004 DE ChemVerbotsV
(Short chain) chlorinated paraffins		Softeners, flame protection, binders in lacquers, metal working, joint sealants, greasing agents	Metal working and metal finishing, greasing agents for leather	1 constituent	EU REACH
Aliphatic CHCs <sup>8</sup>		Solvents, cleaning agents	General ban	0.1 constituent in total	EU REACH DE ChemVerbotsV
Ozone-depleting substances <sup>9</sup>		Refrigerants, propellant gas, foams, extinguishing agents, solvents, cleaning agents	General ban	1 constituent in total	EU Regulation EC 2037/2000 DE ChemOzonSchi chtV
Fluorinated greenhouse gases <sup>10</sup>		Refrigerants, expanding agents, foams	Containers that are not refillable , direct evaporation systems, fire protection, fire extinguishers, windows, footwear, tyres, foams, applications in magnesium die casting		EU Regulation EC 842/2006

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#### <sup>1</sup> Legal regulations:

<u>RoHS:</u>	Directive 2002/95/EC of the European Parliament and the Council of 27 January 2003 on the <b>Restriction of the use of certain Hazardous Substances</b> in electrical and electronic equipment
<u>REACH:</u>	Regulation (EC) No. 1907/2006 of the European Parliament and the Council of 18 December 2006 for the <b>Registration, Evaluation, Authorisation and Restriction of Chemical substances (REACH)</b> , to establish a European Chemicals Agency,....
<u>ChemVerbotsV:</u>	Verordnung über Verbote und Beschränkungen des Inverkehrbringens gefährlicher Stoffe, Zubereitungen und Erzeugnisse nach dem Chemikaliengesetz (Chemikalien-Verbotsverordnung - ChemVerbotsV) Regulates prohibitions and restrictions in regard to placing hazardous substances, preparations and products on the market according to the Chemicals Act
<u>VerpackRL:</u>	Directive 94/62/EC of the European Parliament and the Council of 20 December 1994 on packaging and packaging waste,...
<u>BattRL:</u>	Directive 2006/66/EC of the European Parliament and the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC
<u>Regulation EC 850/2004:</u>	Regulation (EC) No. 850/2004 of the European Parliament and the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC
<u>ChemOzonSchichtV:</u>	Verordnung über Stoffe, die die Ozonschicht schädigen (Chemikalien-Ozonschichtverordnung - ChemOzonSchichtV) Regulation on substances that are depleting the ozone layer (German regulation: Chemikalien-Ozonschichtverordnung)
<u>Regulation EC 2037/2000:</u>	Regulation (EC) No. 2037/2000 of the European Parliament and the Council of 29 June 2000 on substances that deplete the ozone layer
<u>Regulation EC 842/2006:</u>	Regulation (EC) No. 842/2006 of the European Parliament and the Council of 17 May 2006 on certain fluorinated greenhouse gases (F-gas regulation)

#### <sup>2</sup> Asbestos

Aktinolite	77536-67-5
Amosite (brown asbestos, grunerite, mysorite)	12172,73-5
Anthophyllite	77536-67-5
Chrysotile (white asbestos)	12001-29-5
Crocidolite (blue asbestos)	12001-28-4
Tremolite	77536-68-6

#### <sup>3</sup> Polybrominated diphenyl ethers (PBDE)

Penta BDE	32534-81-9
Octa BDE	32536-52-0
Deca BDE	1163-19-5

#### <sup>4</sup> Aromatic amines:

4-aminobiphenyl and 4-aminobiphenyl salts	92-67-1
Benzidine and its salts and derivatives	92-87-5
4-nitrobiphenyl	92-93-3
2-naphthylamine, 2-Naphthylamine-salts	91-59-8

#### <sup>5</sup> Dioxins and furans:

1. a) 2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6
b) 1,2,3,7,8-Pentachlorodibenzo-p-dioxin	58802-08-7
c) 2,3,7,8-Tetrachlorodibenzofuran	51207-31-9, 89059-46-1
d) 2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4
2. a) 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6
b) 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3
c) 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7
d) 1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6
e) 1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9
f) 1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9
g) 1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9
h) 2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5
3. a) 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9
b) 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9

c) 1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4
d) 1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7
e) 1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0
4. a) 2,3,7,8-Tetrabromodibenzo-p-dioxin	50585-41-6
b) 1,2,3,7,8-Pentabromodibenzo-p-dioxin	109333-34-8
c) 2,3,7,8-Tetrabromodibenzofuran	67733-57-7
d) 2,3,4,7,8-Pentabromodibenzofuran	13116-92-2
5. a) 1,2,3,4,7,8-Hexabromodibenzo-p-dioxin	110999-44-5
b) 1,2,3,7,8,9-Hexabromodibenzo-p-dioxin	110999-46-7
c) 1,2,3,6,7,8-Hexabromodibenzo-p-dioxin	110999-45-6
d) 1,2,3,7,8-Pentabromodibenzofuran	107555-93-1

#### <sup>6</sup> Creosote:

Creosote; wash oil	8001-58-9
Creosote oil; wash oil	61789-28-4
Distillates (coal tar), naphthalene oils; naphthalene oil	84650-04-4
Creosote oil, acenaphthene fraction; wash oil	90640-84-9
Distillates with a higher boiling point (coal tar); heavy anthracene oil	65996-91-0
Anthracene oil	90640-80-5
Tar acids, coal, crude oil; crude phenols	65996-85-2
Creosote, wood	8021-39-4
Low-temperature-coal tar-alkaline, extract residues (coal)	122384-78-5

#### <sup>7</sup> Pesticides

Acephate, aldicarb, aldrin, amitraz, atrazine, binapacryl, captafol, chlordane, chlordecone, chlordimeform, chlorfenapyr, chlorobenzilate, chlozolinate, DDT, 1,2-dibromoethan (EDB), dicofol, dieldrine, dinitro-o-cresole (DNOC) and its salts, dinoseb and its salts and esters, dinoterb, endosulfan, endrin, ethylene dichloride (1,2-dichloroethane), ethylene oxide, fenthion, fentin acetate, fentin hydroxide, fluoroacetamide, HCH, heptachlor, hexachlorobenzene, lindane, mercury-compounds, methamidophos, methyl parathion, mirex, mixture of benomyl, carbofuran and thiram, monocrotophos, nitrofen, parathion, pentachlorophenol and its salts and esters, phosphamidon, pyrazophos, quintozone, simazine, 2,4,5-T and its salts and esters, tecnazene, toxaphene, triorganotin compounds.

#### <sup>8</sup> Aliphatic CHCs:

Tetrachloromethane	56-23-5
1.1.2.2.-Tetrachloroethane	79-34-5
1.1.1.2-Tetrachloroethane	630-20-6
Pentachloroethane	76-01-7
Trichloromethane (chloroform)	67-66-3
1.1.1-Trichloroethane	71-55-6
1.1.2-Trichloroethane	79-00-5
1.1-Dichloroethylene	75-35-4

#### <sup>9</sup> Ozone-depleting substances pursuant to regulation EC 2037/2000

##### Chlorofluorocarbons (CFCs)

other fully halogenated chlorofluorocarbons

##### Halons

Carbon Tetrachloride (tetrachloromethane)	56-23-5
1.1.1-Trichloroethane	71-55-6

Partially halogenated hydrobromofluorocarbons

#### <sup>10</sup> Fluorinated greenhouse gases pursuant to regulation EC 842/2006

Sulphur hexafluoride	2551-62-4
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Partially fluorinated hydrocarbons (HFC):

HFC-23	75-46-7 (Trifluoromethane)
HFC-32	75-10-5 (Difluoromethane)
HFC-41	593-53-3 (Fluoromethane)
HFC-43-10mee	138495-42-8
HFC-125	354-33-6 (Pentafluoroethane)
HFC-134	359-35-3 (1,1,2,2-Tetrafluoroethane)
HFC-134a	811-97-2 (1,1,1,2-Tetrafluoroethane)
HFC-152a	75-37-6 (1,1-Difluoroethane)
HFC-143	
HFC-143a	420-46-2 (1,1,1-Trifluoroethane)

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HFC227ea	431-89-0
HFC-236cb	
HFC-236ea	
HFC236fa	431-63-0
HFC-245ca	
HFC-245fa	460-73-1 (1,1,1,3,3-Pentafluoropropane)
HFC-365mfc	
Perfluorocarbons (PFCs):	
Perfluoromethane	75-73-0
Perfluoroethane	76-16-4
Perfluoropropane	76-19-7
Perfluorobutane	355-25-9
Perfluoropentane	678-26-2
Perfluorohexane	355-42-0
Perfluorocyclobutane	115-25-3