

BANNED/RESTRICTED CHEMICAL SUBSTANCES**REVISIONS**

Revision No	Revision Date	Revision Description
0	01.08.2015	Procedure published.
1	14.12.2015	Substances classified as K2 and K3 in Table 1 have been updated in scope of REACH Annex XIV Authorisation List and updated REACH SVHC Candidate List. Current SVHC list contains 163 substances.
2	10.04.2017	Annex 1 have been updated. Current SVHC list contains 173 substances.

3. METHOD:**3.1 INTRODUCTION**

The aim of this procedure is, managing the use of chemical substances which are harmful to the environment and health in the parts (components), materials and substances of the electrical and electronic equipment that are produced by Arçelik, in line with the related legal requirements, this procedure and Arçelik's environmental policy.

3.2 DEFINITIONS AND ABBREVIATIONS

a) Electrotechnical Products : Products which are dependent on electric current or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields and designed for use with a voltage rating not exceeding 1000 volts for alternating current and 1500 volts for direct current.

b) Substance: means a chemical element and its compounds in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any

BANNED/RESTRICTED CHEMICAL SUBSTANCES

solvent which may be separated without affecting the stability of the substance or changing its composition

c) Polymer Materials: The products which are provided from synthetic or semisynthetic organic condensation or polymerization. Examples of polymer materials are polyethylene, polyvinyl chloride, epoxy resin, polyamide, polycarbonate, ABS resin, paint, ink, etc.

d) Metals: Metals are combinations of metallic elements. Examples of metallic materials are Fe-alloys, Ni-alloys, Sn-alloys, etc.

e) Electronics: Electronic components, electronic parts. Examples of electronics are semiconductors, active components like diodes and integrated circuits, passive components like resistors and capacitors, electrical and electronic connectors, relays, PCBs (Printed Circuit Boards), etc.

f) Preparation: a mixture or solution composed of two or more substances.

g) Banned Substances: Substances whose intentional use has been prohibited by existing regulations or industrial policies. It is forbidden to use these substances.

h) Restricted Substances: Substances whose intentional use has been restricted (substance or limit based) by existing regulations.

i) Threshold Limit: Concentrations given for chemical substances must be lower than the determined limit values. If there is not limit for these substances, then these substances must not be used intentionally.

j) Homogenous Material : one material of uniform composition throughout or a material, consisting of a combination of materials, that cannot be disjointed or separated into different materials by mechanical actions such as unscrewing, cutting, crushing, grinding and abrasive processes.

k) CAS No (Chemical Abstracts Service Number) : The unique numerical identification assigned by the "Chemical Abstracts Service" to every chemical.

l) EC No (The European Commission Number) : The number is assigned by the Commission of the European Union; the EC number is the official number of a substance in the European Union.

m) SVHC (Substances of Very High Concern) : Substances of very high concern that are published by European Chemicals Agency (ECHA).

BANNED/RESTRICTED CHEMICAL SUBSTANCES

n) Analysis Report : The report prepared by Accredited Laboratories using test results performed according to the international standards. Typical measurement methods are as follows; Inductively Coupled-Plasma-Atomic (Optical) Emission Spectroscopy (ICP-AES [ICP-OES]), Atomic Absorption Spectroscopy (AAS), Inductively Coupled-Plasma Mass Spectroscopy (ICP-MS) and Gas Chromatography/Mass Spectrometry (GC/MS).

o) G.T.I.P. : Customs tariffs statistics position, a twelve-stage code that are used in Turkish customs tariffs schedule.

p) Recyclable Materials: Substances which are used in materials such as plastics, cardboards, glasses and metals can be recycled.

3.3 PROSES OWNER AND RESPONSIBILITIES

All of Arçelik's suppliers commit to comply with the legal regulations that are stated in article 3.4 "Scope of Procedure", Arçelik's standards, criterias and thereby the restrictions and notification requirements identified in this procedure.

3.4 SCOPE OF PROCEDURE

In scope of this procedure :

- RoHS Recast (EU Directive 2011/65/Eu) (Directive on the Restriction Of the Use of Certain Hazardous Substances in Electric and Electronic Equipment)
- Commission Regulation (EC) No 642/2009 of 22 July 2009 Implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for televisions
- Turkish Regulation on Waste Electric and Electronic Equipment (Turkish WEEE Regulation) (O.J. 28300, 22/05/2012)
- REACH (EU Regulation 1907/2006) (Regulation of the Registration, Evaluation, Authorization and Restriction of Chemicals)
- Turkish Regulation on Control of Waste Batteries and Accumulators (O.J. 25569, 31.08.2004)
- Directive on Batteries and Accumulators (EU Directive 2006/66/EC)
- International Standards for Phytosanitary Measures 15 (ISPM 15)

BANNED/RESTRICTED CHEMICAL SUBSTANCES

- By-Law on Inventory and Control of Chemicals (O.J. 27092, 26.12.2008)

This procedure is applied to:

- 1) Intended for products;

Products that are produced or supplied by Arçelik A.Ş.

- 2) Intended for parts (components) and materials used in products;

Materials and parts identified above, detailed below:

- a) Parts and materials,
- b) Grouped/Mounted parts,
- c) Accessories: AC adaptor, remote control etc.,
- d) Auxiliary materials for other structural materials,
- e) Instructions for use and manuals,
- f) Packaging,
- g) Spare parts,
- h) Packaging for transportation,
- i) Other substances, materials and parts that used in these products and transmitted to the customers with these products

This procedure is not applied to:

- a. Determining gas and dust (immision) limits in working area (production facility, equipment, building lot, cooling, climate etc.)
- b. Chemicals used in research and development studies
- c. Chemicals used for quality control, error analysis, health control or environmental effect measurement,
- d. Chemicals used in production processes but not contained in finished product (volatile oil etc.)

3.5 CONDITIONS OF USE OF CHEMICAL SUBSTANCES IN PRODUCTS / COMPONENTS / MATERIALS

All parts, materials, sub-materials, products during banned/prohibited chemical management control process are classified into three groups and categories as given below, for each chemicals are identified in Table 1.

Category 1 (K1): Chemicals classified as in this category in Table 1 can not be used or only can be used below specified limits in products/components/materials supplied to Arçelik.

Category 2 (K2): Chemicals classified as in this category in Table 1 can not be used above the 0.1 % (w/w) limit in products/components/materials supplied to Arçelik. Further these substances can not be used in products/components/materials supplied to Arçelik after specified sunset dates.

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Category 3 (K3): Chemicals classified as in this category should be notified to Arçelik when used in products/components/materials above 0.1 % (w/w) limit.

Analysis reports or declaration forms of the materials and sub-materials should be provided to Arçelik according to ANNEX-1 of this procedure. For the missing materials in ANNEX-1, please contact with Arçelik (reachinfo@arcelik.com).

This procedure is updated by Arçelik, annually.

As a note; the analysis methods of RoHS and Turkish WEEE Regulations materials are shown in Table 4 and CAS numbers and compounds of restricted/banned/declarable substances are shown in ANNEX-2.

Definitions of references in column "Hazard":

A: Allergen

BA: Bio Accumulating

C: Carcinogenic

DE: Dangerous to the Environment

ED: Endocrine Disrupter

GW: Global Warming

HAT: High Aquatic Toxic

M: Mutagenic

POP: Persistent Organic Pollutant

R: Toxic to Reproduction

T: Toxic

PBT: Persistent, Bio Accumulating, Toxic

vPvB: Very Persistent very Bio Accumulating

EqLC: equivalent level of concern having probable serious effects to the environment

3.5.1. Batteries and Accumulators

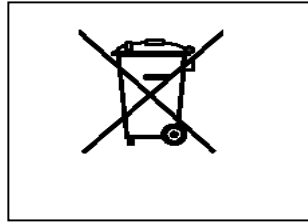
Management of the batteries and accumulators, must be complied with EU Directive (2013/56/EU) and The Turkish regulation called "Waste Batteries and Accumulators

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Management”. Batteries and accumulators should not contained the banned substances exceeding the limits defined in Table 2. NiCd (Nickelcadmium) batteries are prohibited.

The crosses-out wheeled bin symbol (Symbol 1) should be on batteries. If lead content is higher than 40 ppm (0.004 %), the chemical symbol of lead (Pb) will be placed under the crosses-out wheeled bin symbol (Please refer to EU Directive).

Batteries and Accumulators must be labeled as indicated in The Turkish regulation which title is “Waste Battery and Accumulators Management”. Battery products shall be labeled and market as described in the Turkish Standards (TS EN 61429). Batteries containing mercury (Hg) more than 0.0005% by weight and their packages shall be labeled symbol decribed in Symbol 1.



Symbol 1

3.5.2. Hazardous Substances in Packaging Materials

According to both EU Directive and Turkish Regulations, the total concentration of cadmium (Cd), lead (Pb), mercury (Hg) and hexavalent chromium (Cr +6) should not be contained more than 100 ppm.

3.5.3. Specific Conditions for Wooden Materials

Wooden palets and wooden product that supplied to Arçelik must be complied with ISPM 15 standard (International Standards for Phytosanitary Measures 15).

3.5.4 By-Law on Inventory and Control of Chemicals

The purpose of this by-law is to regulate the rules and principles related to set up an inventory and control of chemicals in order to protect the man and the environment against their negative effects.

Any manufacturer who has produced substance or any importer who has imported a substance, on its own or in a preparation above 1 tonne/year shall submit to the Ministry of Environment and Urban Planning official web portal (This requirement is only valid for Turkish manufacturers).

3.6 ENFORCEMENT and RECORD MANAGEMENT

BANNED/RESTRICTED CHEMICAL SUBSTANCES

This procedure enters into force on 01.07.2011.

The documents provided from suppliers in scope of this procedure shall be kept for 10 ye

BANNED/RESTRICTED CHEMICAL SUBSTANCES
Table 1. Banned/Restricted/Declarable substances

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
4,4'- Diaminodiphenylmethane (MDA)	CAS : 101-77-9	K1	Banned	PU curing agent Protector for resin and epoxy	C	REACH
5-tert-butyl-2,4,6-trinitro-m- xylene (musk xylene)	CAS : 81-15-2	K1	Banned	Scent formulations	VPvB	REACH
Asbestos	See ANNEX-2	K1	Banned	All applications(insulator, paint, pigment,etc.)	C	REACH
Bisphenol A	80-05-7	K1	Banned	Food contact materials (PC etc.)		French Law
Organostannic compounds (TBT, TPT, DBT, DOT compounds)	See ANNEX-2	K1	Banned	All applications especially parts where prolonged skin contact is expected (stabizer, paint, pigment,etc.)	DE, ED, HAT, T	REACH
Formaldehyde	CAS: 50-00-0	K1	Banned	Composite wood products or components, stereo cabinets (ex.phenol resin, etc.)	C, T, A	US/CA CARB Rule
IPPD (N-isopropyl-N- phenyl-p- phenylenediamine)	CAS : 101 -72 -4	K1	Banned	Especially rubber parts		

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Nickel	CAS : 7440-02-0	K1	Banned	Stainless steel and plating where prolonged skin contact is expected (ex.headphone)	A, C, T	76/769/EEC 94/27/EC
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Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
PCB (Polychlorinated Biphenyls) PCT (Polychlorinated Terphenyls) PCN (Polychlorinated Naphthalenes) and specific substitutes	See ANNEX-2	K1	Banned	Insulation oil, solvent, lubricant oil, electrical insulation, electrolytic solution, plasticizers, coatings for electrical wire and cables, dielectric sealants, flame retardant, stabilizer, paint	BA, DE, ED, POP, T	EU Directive 76/779/EEC Turkish Legislation on PCB, PCT Control, REACH
Perfluorooctane sulfonate (PFOs)	CAS : 2795-39-3	K1	Banned	Antistatic agent for films and plastics	BA, POP	76/769/EEC and 2006/122/EC
PFC, SF6	See ANNEX-2	K1	Banned	Refrigerant, extinguishing agents, insulating media, etc.	GW	Kyoto Protocol
Phenol, 2-(2H-benzotriazol-2-yl)- 4,6-bis(1,1-dimethylethyl)	CAS : 3846-71-7	K1	Banned	Adhesive, paint, ink, plastic, ribbon, etc..	BA, T	Japan Law
Radioactive Substances	See ANNEX-2		Banned	Measuring devices, detector etc.	C, M, R, T	EU-D 96/29/Euratom;

BANNED/RESTRICTED CHEMICAL SUBSTANCES

		K1				Japan Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors, 1986; US NRC
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Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Dimethyl fumarate	CAS: 624-49-7	K1	0.00001% (0.1 ppm)	Biocides	A	REACH
Cadmium/cadmium compounds ³	See ANNEX-2	K1	%0.007 ¹ (70 ppm) (Table 3 for exemptions)	Plastic (Polymeric Material) ²	BA, C, DE, HAT, T	RoHS (EU Directive and its amendments), Turkish WEEE Regulation

BANNED/RESTRICTED CHEMICAL SUBSTANCES

			0.007 ¹ % (70 ppm) (Table 3 for exemptions)	Applications other than plastic (metal, electronic material. Ex.resistor material, thick glass film material, brass plating)		
			See Table 2	Batteries		
Benzo[a]pyrene	See ANNEX-2	K1	0.0001% ⁵ 1 ppm	Applications where prolonged skin contact is much more than 30 sn	BA, C, DE, ED, HAT, POP, T	GS Standard
			0.002% ⁵ 20 ppm	Applications where prolonged skin contacts is less than 30 sn		
PAH (sum of 18 PAH)	See ANNEX-2	K1	0.001% ⁵ (10 ppm)	Applications where prolonged skin contact is much more than 30 sn	BA, C, DE, ED, HAT, POP, T	GS Standard
			0.02% ⁵ (200 ppm)	Applications where prolonged skin contacts is less than 30 sn		

¹ Limit is valid as homogenius material level.

² Resin, paint, ink, rubber, plastic are included.

³ Cadmium plating is prohibited on the product.

⁵ Limit for all PAHs will be 1 ppm after 27th December 2015.

BANNED/RESTRICTED CHEMICAL SUBSTANCES
Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Lead and its compounds	See ANNEX-2	K1	0.01 ¹ % (100 ppm) (See Table 3 for exemptions)	Plastics (Polymeric Material) ²	BA, DE, HAT, R, T	RoHS (EU Directive and its amendments), Turkish WEEE Regulation
			0.07 ¹ % (700 ppm) (See Table 3 for exemptions)	Applications other than plastics, nickel plating (metal material, electronic material)		
Azocolourants and azodyes which form certain aromatic amines	See ANNEX-2	K1	0.03%	All applications where prolonged skin contact is expected (headphone, rubber products, ink, paint, etc.)	C, M, R	EU Directive 76/779/EEC
Mercury and its compounds	See ANNEX-2	K1	0.071 ¹ % (700 ppm)	All applications other than batteries (polymer, metal, electronic material, electromechanic material)	BA, DE, T	

BANNED/RESTRICTED CHEMICAL SUBSTANCES

			(See Table 3 for exemptions)			RoHS (EU Directive and its amendments), Turkish WEEE Regulation
			See Table 2	Batteries		

¹ Limit is valid as homogenius material level.

² Resin, paint, ink, rubber, plastic included.

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Hexavalent chromium and its compounds	See ANNEX-2	K1	0.07 ⁴ % (700 ppm) (Table 3 for exemptions)	All applications (spot test result should be negative)	C, DE, T	RoHS (EU Directive and its amendments), Turkish WEEE Regulation
PBBs and PBDEs (decaBDE included)	See ANNEX-1 CAS:1163-19-5 (for decaBDE)	K1	0.07 ¹ % (700 ppm)	All application (e.g. flame retardant)	BA, DE, ED, POP	RoHS (EU Directive and its amendments), Turkish WEEE Regulation
2-(2-methoxyethoxy) ethanole	CAS: 111-77-3	K1	0.1%	Paint, paint remover	PBT, vPvB	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Pentadecafluorooctanoic acid (PFOA)	CAS: 335-67-1	K1	0.1%	Electrical wire insulation, Specialist circuit boards, Non-stick coatings	R, PBT	REACH, Norwegian Environmental Agency Restriction
Toluene	CAS: 108-88-3	K1	0.1%	Paints and adhesives	C, M, R	REACH
1,2-Dichloroethane	CAS: 107-06-2	K2	0.1%	Vinyl chloride monomer production	C	REACH
			SD: 22.05.2017			
2,4- Dinitrotoluene (2,4-DNT)	CAS: 121-14-2	K1	Banned	Production of flexible PU foams	C	REACH
2,2'-Dichloro-4,4'-methylenedianiline	CAS: 101-14-4	K2	0.1%	PU	C	REACH
			SD: 22.05.2017			

¹Limit is valid as homogenous material level.

⁴Limit is valid as homogenous material level. Spot test result should be negative (The material should pass the spot test).

SD: Sunset date. Substance is banned after this date.

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Ammonium dichromate	CAS: 7789-09-5	K2	0.1%	Oxidizing agent, mordant for textiles, production of photosensitive screens	C, M, R	REACH
			SD: 21.03.2017			
			0.1%		C	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Arsenic acid	CAS: 7778-39-4	K2	22.02.2017	Special glass, laminated printed circuit boards		
Benzyl butyl phthalate (BBP)**	CAS : 85-68-7	K1	Banned	PVC plasticizer	R	REACH
Bis (2-ethylhexyl)phthalate (DEHP)**	CAS: 117-81-7	K1	Banned	PVC plasticizer	R	REACH
Bis(2-methoxyethyl) ether	CAS: 111-96-6	K2	0.1%	Solvent	R	REACH
			SD: 22.02.2017			
Chromium trioxide	CAS: 1333-82-0	K2	0.1%	Electronic components, HDPE,LLDPE,PP	C, M	REACH
			SD: 21.03.2017			
Chromic acid, Oligomers of chromic acid and dichromic acid, Dichromic acid	CAS: 7738-94-5, 13530-68-2	K2	0.1%	Chrome coating derivatives	C	REACH
			SD: 21.03.2017			

SD: Sunset date. Substance is banned after this date.

**DEHP, BBP, DBP, DIBP do not used in materials/components. "phthalate free" material supply will be increased and use of all phthalates will be restricted step by step.

Table 1. Banned/Restricted/ Declarable substances (cont'd)

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Diarsenic pentaoxide	CAS : 1303-28-2	K1	Banned	Glass, cable coating	C	REACH
Diarsenic trioxide	CAS : 1327-53-3	K1	Banned	Glass, cable coating	C	REACH
Dibutyl phthalate (DBP)**	CAS : 84-74-2	K1	Banned	PVC plasticizer	R	REACH
Dichromium tris(chromate)	CAS: 24613-89-6	K2	0.1%	Metal processing	C	REACH
			SD: 22.07.2018			
Diisobutyl phthalate (DIBP)**	CAS : 84-69-5	K1	Banned	PVC plasticizer	R	REACH
Formaldehyde, oligomeric reaction products with aniline (technical MDA)	CAS: 25214-70-4	K2	0.1%	MDI production	C	REACH
			SD: 22.02.2017			
Hexabromocyclododecane (HBCDD) and all identified diastereoisomers	CAS: 25637-99-4 3194-55-6 (134237-50-6) (134237-51-7) (134237-52-8)	K1	Banned	Flame retardant for PS, EPS,XPS	PBT	REACH

SD: Sunset date. Substance is banned after this date.

BANNED/RESTRICTED CHEMICAL SUBSTANCES

**DEHP, BBP, DBP, DIBP do not used in materials/components. "phthalate free" material supply will be increased and use of all phthalates will be restricted step by step

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Lead chromate	CAS: 7758-97-6	K1	Banned	Production of paints and pigments	C, R	REACH
Lead chromate molibdate sulphate red (C.I. Pigment Red 104)		K1	Banned	Paints	C, R	REACH
Lead sulfochromate yellow (C.I. Pigment Yellow 34)	CAS : 1344-37-2	K1	Banned	Paints	C, R	REACH
Pentazinc chromate octahydroxide	CAS: 49663-84-5	K2	0.1%	Thinner, paint primer	C	REACH
			SD: 22.07.2018			
Potassium chromate	CAS : 7789-00-6	K2	0.1%	Anticorrosive, metal coating	C, M	REACH
			SD: 21.03.2017			
Potassium dichromate	CAS : 7778-50-9	K2	0.1%	Anticorrosive, metal coating	C, M, R	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

			SD: 21.03.2017			
Potassium hydroxyoctaoxodizinc atedichromate	CAS: 11103-86-9	K2	0.1% SD: 22.07.2018	Paint primer	C	REACH

SD: Sunset date. Substance is banned after this date.

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Sodium chromate	CAS: 7775-11-3	K2	0.1%	Anticorrosive, metal coating	C, M, R	REACH
			SD: 21.03.2017			
Sodium dichromate	CAS: 7789-12-0/ 10588-01-9	K2	0.1%	Anticorrosive, metal coating	C, M, R	REACH
			SD: 21.03.2017			
Strontium chromate	CAS: 7789-06-2	K2	0.1%	Paints, varnishes, adhesives	C	REACH
			SD: 22.07.2018			
			0.1%		C	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Trichloroethylene	CAS: 79-01-6	K2	SD: 21.10.2015	Production of chlorinated and fluorinated product derivatives		
Tris(2-chloroethyl) phosphate, TCP	CAS : 115-96-8	K1	Banned	Flame retardant for PU, PVC etc.	R	REACH
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)**	CAS: 71888-89-6	K3	0.1%	PVC plasticizer	R	REACH
1,2,3-Trichloropropane (1,2,3-TCP)	CAS: 96-18-4	K3	0.1%	Biocides, chlorinated solvents	C, R	REACH

SD: Sunset date. Substance is banned after this date.

**"phthalate free" material supply will be increased and use of phthalates will be restricted step by step.

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl	CAS: 68515-51-5, 68648-93-1	K3	0.1%	Plasticizers, lubricants, adhesives, coatings, construction materials, cable components, polymer foils	R	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

diesters with $\geq 0.3\%$ of dihexyl phthalate						
1,2Benzenedicarboxylic acid, dihexyl ester, branched and linear (diisohexyl phthalate (DIHP))**	CAS:68515-50-4	K3	0.1%	PVC	R	REACH
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	CAS: 84777-06-0	K3	0.1%	-	R	REACH
1,2-Diethoxyethane	CAS: 629-14-1	K3	0.1%	Solvent, fabric clening compounds	R	REACH
1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	CAS: 110-71-4	K3	0.1%	Battery, microelectronic components	R	REACH
1-bromopropane (n-propyl bromide)	CAS: 106-94-5	K3	0.1%	Solvent	R	REACH
1-Methyl-2-pyrrolidone (NMP)	CAS: 872-50-4	K3	0.1%	Solvents	R	REACH
1,2-bis(2-methoxyethoxy) ethane (TEGDME; triglyme)	CAS: 112-49-2	K3	0.1%	Battery	R	REACH

***"phthalate free" material supply will be increased and use of phthalates will be restricted step by step.

Table 1. Banned/Restricted/ Declarable substances (cont'd)

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
1,3,5-Tris(oxiran-2-ylmethyl)-1,3,5-triazinane-2,4,6-trione (TGIC)	CAS: 2451-62-9	K3	0.1%	Metal coating, printed circuit boards	M	REACH
1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (β -TGIC)	CAS: 59653-74-6	K3	0.1%	Metal coating, printed circuit boards	M	REACH
2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	CAS: 3846-71-7	K3	0.1%	UV protection in coatings (cars, wood, plastic, rubber, PU)	PBT, vPvB	REACH
2-Ethoxyethanol	CAS: 109-86-4	K3	0.1%	Solvents	R	REACH
2-Ethoxyethyl acetate (2-EEA)	CAS: 111-15-9	K3	0.1%	Solvents	R	REACH
2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	CAS: 15571-58-1	K3	0.1%	PVC production (heat stabilizer)	R	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

2-Methoxyaniline; o-Anisidine	CAS: 90-04-0	K3	0.1%	Packaging inks	C	REACH
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Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
2-Methoxyethanol	CAS: 110-80-5	K3	0.1%	Solvents	R	REACH
2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	CAS: 25973-55-1	K3	0.1%	UV protection and light stabilizing agents in coatings (ABS, epoxy, PVC, PU, PC, unsaturated polyesters, polyacrylates)	PBT, vPvB	REACH
3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	CAS: 143860-04-2	K3	0.1%	Laboratory chemicals	R	REACH
4-(1,1,3,3-Tetramethylbutyl)phenol ; 4-tert-octyl phenol	CAS: 140-66-9	K3	0.1%	Phenolic resins	DE	REACH
4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues]	-	K3	0.1%	Paints	EqLC	REACH
4,4'-bis(dimethylamino)benzophenone (Michler's ketone)	CAS: 90-94-8	K3	0.1%	Printed circuit board, paint	C	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol	CAS: 561-41-1	K3	0.1%	Paint	C	REACH
[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Blue 26)	CAS: 2580-56-5	K3	0.1%	Paint	C	REACH

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
[4-[4,4'-bis(dimethylamino)benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Violet 3)	CAS: 548-62-9	K3	0.1%	Paint	C	REACH
4,4'-methylenedi-otoluidine	CAS: 838-88-0	K3	0.1%	Textile chemical	C	REACH
4,4'-oxydianiline and its salts	CAS: 101-80-4	K3	0.1%	Plastic materials	C	REACH
4-Aminoazobenzene	CAS: 60-09-3	K3	0.1%	Pigments	C	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

4-methyl-m-phenylenediamine (toluene-2,4-diamine)	CAS: 95-80-7	K3	0.1%	Paint	C	REACH
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]	-	K3	0.1%	Epoxy resin	EqLC	REACH

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
4-Nonylphenol, branched and linear covering also UVCB- and well-defined substances which include any of the	-	K3	0.1%	Plastic and epoxy materials; printed circuit boards, paint	EqLC	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

individual isomers or a combination thereof]						
5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual stereoisomers of [1] and [2] or any combination thereof]	-	K3	0.1%	-	vPvB	REACH
6-methoxy-m-toluidine (p-cresidine)	CAS: 120-71-8	K3	0.1%	Chemical production	C	REACH
α,α -Bis[4-(dimethylamino)phenyl]-4 (phenylamino) naphthalene-1-methanol (C.I. Solvent Blue 4)	CAS: 6786-83-0	K3	0.1%	Paint	C	REACH
Acetic acid, lead salt, basic	CAS: 51404-69-4	K3	0.1%	Electronics, paint	R	REACH
Acrylamide	CAS : 79-06-1	K3	0.1%	Polyacrylamide production	C, M	REACH

Table 1. Banned/Restricted/ Declarable substances (cont'd)

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Alkanes, C10-13, chloro (Short Chained Chlorinated Paraffines)	CAS : 85535-84-8	K3	0.1%	Flame retardant for rubber	PBT, vPvB	REACH
Aluminosilicate Refractory Ceramic Fibres (fibres covered by index number 650-017- 00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008	See ANNEX-2	K3	0.1%	Ceramic Fibres for high temperature izolation	C	REACH
Ammonium pentadecafluorooctanoat e (APFO)	CAS: 3825-26-1	K3	0.1%	Electrical wire insulation, Specialist circuit boards, Non-stick coatings	R, PBT	REACH
Anthracene	CAS: 120-12-7	K3	0.1%	Black rubber and plastics, liquid crystal, pigments	PBT	REACH
Anthracene oil	CAS: 90640-80-5	K3	0.1%	Production of anthracene and carbon black	C, PBT, vPvB	REACH
Anthracene oil, anthracene paste	CAS : 90640-81-6	K3	0.1%	Same with anthracene oil	C, M, PBT, vPvB	REACH
Anthracene oil, anthracene paste, anthracene fraction	CAS : 91995-15-2	K3	0.1%	Same with anthracene oil	C, M, PBT, vPvB	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Anthracene oil, anthracene paste, distn. oils	CAS : 91995-17-4	K3	0.1%	Same with anthracene oil	C, M, PBT, vPvB	REACH
Anthracene oil, anthracene-low	CAS : 90640-82-7	K3	0.1%	Same with anthracene oil	C, M, PBT, vPvB	REACH
Biphenyl-4-ylamine	CAS: 92-67-1	K3	0.1%	Resin	C	REACH

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Bis(2-methoxyethyl) phthalate**	CAS: 117-82-8	K3	0.1%	PVA, PVC etc. plasticizer	R	REACH
Bis(tributyltin)oxide (TBTO)	CAS: 56-35-9	K3	0.1%	Wood protector, biocides	PBT	REACH
Boric Acid	CAS: 10043-35-3 / 11113-50-1	K3	0.1%	Glass fiber, LCD display	R	REACH
Brominated flame retardants (other than PBB, PBDE, HBCDD)	See ANNEX-2	K3	0.1%	Plastics	BA, HAT, PBT	DIGITALEUROPE /CECED/ AeA / EERA

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Cadmium chloride	CAS: 10108-64-2	K3	0.1%	Semiconductor, solar panel etc. production	CMR	REACH
Cadmium fluoride	CAS: 7790-79-6	K3	0.1%	Solar cells, glass production, optical applications, laboratory applications	CR	REACH
Cadmium sulphate	CAS: 10124-36-4 31119-53-6	K3	0.1%	Laboratory applications, lead acide batteries, strached and damaged surface coatings (aerospace etc.)	CMR	REACH
Diazene-1,2- dicarboxamide (C,C'- azodi(formamide))	CAS: 123-77-3	K3	0.1%	Plastic and resin	EqLC	REACH
Diboron trioxide	CAS: 1303-86-2	K3	0.1%	Glass, fiberglass, paint, adhesive, enamel	R	REACH

***"phthalate free" material supply will be increased and use of phthalates will be restricted step by step.

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Diethyl sulphate	CAS: 64-67-5	K3	0.1%	Chemical production	C	REACH
Dihexyl phthalate**	CAS: 84-75-3	K3	0.1%	PVC	R	REACH
Diisopentylphthalate**	CAS: 605-50-5	K3	0.1%	PVC	R	REACH
Dimethyl sulphate	CAS: 77-78-1	K3	0.1%	Chemical production	C	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Dinoseb (6-sec-butyl-2,4-dinitrophenol)	CAS: 88-85-7	K3	0.1%	Plastics	R	REACH
Dioxobis(stearato)trilead	CAS: 12578-12-0	K3	0.1%	Plastics	R	REACH
Dipentyl phthalate (DPP)**	CAS: 131-18-0	K3	0.1%	PVC	R	REACH
Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate	CAS: 573-58-0	K3	0.1%	Paper and textile dyes	C	REACH
Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate	CAS: 1937-37-7	K3	0.1%	Wool, silk dyes, prints; hair dyes	C	REACH

***"phthalate free" material supply will be increased and use of phthalates will be restricted step by step.

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
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BANNED/RESTRICTED CHEMICAL SUBSTANCES

Disodium tetraborate, anhydrous	CAS : 1303-96-4/ 1330-43-4/ 12179-04-3	K3	0.1%	Glass and glass fibers	R	REACH
Phenolphthalein	CAS: 77-09-8	K3	0.1%	pH-indicator paper, disappearing inks	C	REACH
[Phthalato(2-)]dioxotrilead	CAS: 69011-06-9	K3	0.1%	Plastics	R	REACH
Furan	CAS: 110-00-9	K3	0.1%	Detergents, solvents	C	REACH
Hydrazine	CAS: 302-01-2 / 7803-57-8	K3	0.1%	Paint, ink, foaming agent	C	REACH
Cadmium oxide	CAS: 1306-19-0	K3	0.1%	Nickel cadmium (Ni-Cd) batteries	C	REACH
Cadmium sulphide	CAS: 1306-23-6	K3	0.1%	Semiconductors, paints, coloured plastics	C	REACH
Calcium arsenate	CAS: 7778-44-1	K3	0.1%	copper and lead refining	C	REACH
Cobalt(II) diacetate	CAS: 71-48-7	K3	0.1%	Catalyst production	C, R	REACH
Cobalt(II) dinitrate	CAS: 10141-05-6	K3	0.1%	Catalyst production, rechargeable batteries	C, R	REACH
Cobalt(II) carbonate	CAS: 513-79-1	K3	0.1%	Catalyst production, ground coat frit	C, R	REACH
Cobalt(II) sulphate	CAS: 10124-43-3	K3	0.1%	Anticorrosive agent	C, R	REACH
Cobalt dichloride	CAS: 7646-79-9	K3	0.1%	Paint	C, R	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES
Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Cyclohexane-1,2-dicarboxylic anhydride [all possible combinations of the cis- and trans-isomers [1] are covered by this entry]	CAS: 85-42-7, 13149-00-3, 14166-21-3	K3	0.1%	Plastic and epoxy materials	EqLC	REACH
Fatty acids, C16-18, lead salts	CAS: 91031-62-8	K3	0.1%	Plastics (especially PVC)	R	REACH
Formamide	CAS: 75-12-7	K3	0.1%	Solvent	R	REACH
Hexahydromethylphthalic anhydride and all possible combinations of the isomers	CAS: 25550-51-0, 19438-60-9, 48122-14-1, 57110-29-9	K3	0.1%	Plastic and epoxy materials	EqLC	REACH
Henicosaflluoroundecanoic acid	CAS: 2058-94-8	K3	0.1%	Non-stick coatings, cable-wire isolation	vPvB	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Heptacosafuorotetradecanoic acid	CAS: 376-06-7	K3	0.1%	Non-stick coatings, cable-wire isolation	vPvB	REACH
Imidazolidine-2-thione (2-imidazoline-2-thiol)	CAS: 96-45-7	K3	0.1%	o-ring, gasket, polyacrylate resin	R	REACH
Lead (II) bis(methanesulfonate)	CAS: 17570-76-2	K3	0.1%	Electronic components	R	REACH
Lead bis(tetrafluoroborate)	CAS: 13814-96-5	K3	0.1%	Metal processing	R	REACH
Lead di(acetate)	CAS: 301-04-2	K3	0.1%	Production of computer, electronic and optical devices	R	REACH
Lead diazide	CAS :13424-46-9	K3	0.1%	Pyrotechnics	R	REACH
Lead dinitrate	CAS: 10099-74-8	K3	0.1%	Paint	R	REACH

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Lead dipicrate	CAS : 6477-64-1	K3	0.1%	Pyrotechnics	R	REACH
Lead hydrogen arsenate	CAS : 7784-40-9	K3	0.1%	Biocides	C, R	REACH
Lead monoxide (lead oxide)	CAS: 1317-36-8	K3	0.1%	Resin and ceramic materials, paint, battery	R	REACH
Lead oxide sulfate	CAS: 12036-76-9	K3	0.1%	Plastics (especially PVC)	R	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Lead styphnate	CAS : 15245-44-0	K3	0.1%	Pyrotechnics	R	REACH
Lead cyanamidate	CAS: 20837-86-9	K3	0.1%	Electrocoatings	R	REACH
Lead titanium trioxide	CAS: 12060-00-3	K3	0.1%	Semi conductive applications	R	REACH
Lead titanium zirconium oxide	CAS: 12626-81-2	K3	0.1%	Electro-ceramic and piezo-ceramic applications	R	REACH
Methoxyacetic acid	CAS: 625-45-6	K3	0.1%	Sanitizers and anticorrosive materials for food contact surfaces	R	REACH
Methyloxirane (Propylene oxide)	CAS: 75-56-9	K3	0.1%	Paints, varnishes, paint removers, adhesives	C	REACH
N-methylacetamide	CAS: 79-16-3	K3	0.1%	Laboratory chemicals	R	REACH

Table 1. Banned/Restricted/ Declarable substances (cont'd)

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
N,N-dimethylacetamide (DMAC)	CAS: 127-19-5	K3	0.1%	Solvent	R	REACH
N,N-dimethylformamide	CAS: 68-12-2	K3	0.1%	Printed circuit boards	R	REACH
N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	CAS: 101-61-1	K3	0.1%	Paint	C	REACH
N-pentyl-isopentylphthalate**	CAS: 776297-69-9	K3	0.1%	PVC	R	REACH
o-aminoazotoluene	CAS: 97-56-3	K3	0.1%	Laboratory chemicals	C	REACH
o-Toluidine	CAS: 95-53-4	K3	0.1%	Laboratory chemicals	C	REACH
Orange lead (lead tetroxide)	CAS: 1314-41-6	K3	0.1%	Resin and ceramic materials, paints, batteries	R	REACH
Pentacosafuorotridecanoic acid	CAS: 72629-94-8	K3	0.1%	Non-stick coatings, wire-cable isolations	vPvB	REACH
Pentalead tetraoxide sulphate	CAS: 12065-90-6	K3	0.1%	Plastics (especially PVC), batteries	R	REACH
Perchlorates	CAS: 10034-81-8, 7778-74-7, 7790-98-9, 7601-89-0	K3	0.006 ppm	Rocket fuels		Law of the State of California

**"phthalate free" material supply will be increased and use of phthalates will be restricted step by step.

BANNED/RESTRICTED CHEMICAL SUBSTANCES
Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
PVC and PVC mixtures	See ANNEX-2	K3	0.1%	Packing materials, cable ties, flexible flat cables-FFC, insulators, etc	BA, DE, HAT, R, T	IEEE1680
Pyrochlore, antimony lead yellow	CAS: 8012-00-8	K3	0.1%	Glass and ceramics, paints, inks	R	REACH
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)	-	K3	0.1%	Unplasticized PVC (food and pharmacy packagings, credit cards, window profiles, shampoo/detergent aapackagings etc)	R	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Silicic acid (H ₂ Si ₂ O ₅), barium salt (1:1), lead-doped	CAS: 68784-75-8	K3	0.1%	Bulb coatings	R	REACH
Silicic acid, lead salt	CAS: 11120-22-2	K3	0.1%	Concrete, plaster, glass and ceramic materials	R	REACH
Sodium perborate; perboric acid, sodium salt	EC: 239-172-9/ 234-390-0	K3	%0.1	Temizleme, yıkama ajanları	R	REACH
Sodium peroxometaborate	CAS: 7632-04-4	K3	%0.1	Temizleme, yıkama ajanları	R	REACH
Sulfurous acid, lead salt, dibasic	CAS: 62229-08-7	K3	0.1%	Plastics (especially PVC)	R	REACH
Tetraboron disodium heptaoxide, hydrate	CAS: 12267-73-1	K3	0.1%	Glass and glass fibers, flame retardant	R	REACH

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
Tetraethyllead	CAS: 78-00-2	K3	0.1%	Fuel additive	R	REACH
Tetralead trioxide sulphate	CAS: 12202-17-4	K3	0.1%	Plastics (especially PVC)	R	REACH
Tricosafuorododecanoic acid	CAS: 307-55-1	K3	0.1%	Non-stick coatings, wire-cable isolations	vPvB	REACH
Triethyl arsenate	CAS: 15606-95-8	K3	0.1%	Semi conductor components	C	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Trilead bis(carbonate)dihydroxide	CAS: 1319-46-6	K3	0.1%	Intermetiate for ceramic production	R	REACH
Trilead diarsenate	CAS: 3687-31-8	K3	0.1%	Manufacture of copper, lead and a range of precious metals	C, R	REACH
Trilead dioxide phosphonate	CAS: 12141-20-7	K3	0.1%	Plastics (especially PVC), batteries	R	REACH
Trixylyl phosphate	CAS: 25155-23-1	K3	0.1%	PVC (artificial leather, belt, flooring)	R	REACH
Pitch, coal tar, high temp.	EC : 266-028-2	K3	0.1%	Active carbon production	C, PBT, vPvB	REACH
Zirconia Aluminosilicate, Refractory Ceramic Fibres (fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures)	See ANNEX-2	K3	0.1%	Refractory ceramic fibres	C	REACH

Table 1. Banned/Restricted/ Declarable substances (cont'd)

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Hazard	Legislation
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BANNED/RESTRICTED CHEMICAL SUBSTANCES

SVHCs not included in Table1 (See SVHC List)	-	K3	0.1%	-		REACH
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Table 2. Restrictions for batteries

Substance	Limit	Explanation
Mercury (Hg)	0.0005 %	Limit is not valid for button cell. Mercury in button cells should be lower than 2 % (This exemption shall apply until 1 October 2015).
Cadmium (Cd)	0.002 %	Limit is valid for batteries with three exemptions : <ul style="list-style-type: none"> • Emergency and alarm systems including emergency lighting • Medical equipment • Cordless power tools (This exemption shall apply until 31 December 2016)

BANNED/RESTRICTED CHEMICAL SUBSTANCES**Table 3.** Exemptions for restricted substances

Substance	Directive
Mercury in compact fluorescent lamps not exceeding 5 mg per lamp. a. < 30 W 2,5 mg b. ≥ 30 W and < 50 W 3,5 mg	Turkish WEEE, RoHS
Mercury in straight fluorescent lamps for general purposes not exceeding: a. triphosphor with normal lifetime 3,5 mg b. triphosphor with long lifetime 5 mg	Turkish WEEE, RoHS
Mercury in straight fluorescent lamps for special purposes a. (≤ 500 mm) 3,5 mg b. (> 500 mm and ≤ 1500 mm) 5 mg c. > 1500 mm 10 mg	Turkish WEEE, RoHS
Non-linear halophosphate lamps (all diameters) not exceeding (per lamp): 15 mg ^I	RoHS
Mercury in High Pressure Mercury (vapour) lamps (HPMV) ^{II}	RoHS
Lead in glass of fluorescent tubes not exceeding 0,2 % by weight	Turkish WEEE, RoHS

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Lead as an alloying element in steel containing up to 0,35% lead by weight, aluminium containing up to 0,4% lead by weight and as a copper alloy containing up to 4% lead by weight.	Turkish WEEE, RoHS
Lead in high melting temperature type solders (i.e. lead-based alloys containing 85% by weight or more lead), Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunications, lead in electronic ceramic parts (e.g. piezoelectronic devices)	Turkish WEEE, RoHS

ⁱ Expires on 13th April 2016 according to RoHS

ⁱⁱ Expires on 13th April 2015 according to RoHS

Table 3. Exemptions for restricted substances (cont'd)

Substance	Directive
Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC amending Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations.	Turkish WEEE, RoHS
Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators. (lower than 75 % w/w) a. Lead in lead-bronze bearing shells and bushes	Turkish WEEE, RoHS

BANNED/RESTRICTED CHEMICAL SUBSTANCES

The Commission shall evaluate the applications for deca BDE, etc.	Turkish WEEE, RoHS
Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators. (lower than 75 % w/w) a. Lead in lead-bronze bearing shells and bushes	Turkish WEEE, RoHS
Lead as a coating material for the thermal conduction module c-ring ^{III}	Turkish WEEE, RoHS
Lead and cadmium in optical and filter glass	Turkish WEEE, RoHS
Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages	Turkish WEEE, RoHS
Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications	Turkish WEEE, RoHS
Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCD) ^{III}	Turkish WEEE, RoHS
Lead and cadmium in printing inks for the application of enamels on borosilicate glass	Turkish WEEE, RoHS
Lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with NiFe lead frames and lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with copper lead frames ^{VI}	Turkish WEEE, RoHS

^{III} May be used in spare parts for EEE placed on the market before 24 September 2010 according to RoHS

BANNED/RESTRICTED CHEMICAL SUBSTANCES**Table 3.** Exemptions for restricted substances (cont'd)

Substance	Directive
Lead as impurity in RIG (rare earth iron garnet) Faraday rotators used for fibre optic communications systems	Turkish WEEE, RoHS
Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors	Turkish WEEE, RoHS
Lead oxide in plasma display panels (PDP) and surface conduction electron emitter displays (SED) used in structural elements; notably in the front and rear glass dielectric layer, the bus electrode, the black stripe, the address electrode, the barrier ribs, the seal frit and frit ring as well as in print pastes	Turkish WEEE, RoHS
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	Turkish WEEE
Hexavalent chromium in corrosion preventive coatings of unpainted metal sheetings and fasteners used for corrosion protection AND Electromagnetic Interference Shielding in equipment falling under WEEE Category 3 (IT and telecommunications equipment). Exemption granted until 1 July 2007. Note: Both criteria must be met.	Turkish WEEE
Lead bound in crystal glass	Turkish WEEE, RoHS

BANNED/RESTRICTED CHEMICAL SUBSTANCES

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	RoHS
Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)	RoHS
Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes	RoHS
Lead in solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers	RoHS
Lead in cermet-based trimmer potentiometer elements	RoHS
Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body	RoHS

Table 3. Exemptions for restricted substances (cont'd)

Substance	Directive
Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide	RoHS

BANNED/RESTRICTED CHEMICAL SUBSTANCES

Cadmium in colour converting II-VI LEDs (< 10 µg Cd per mm ² of light-emitting area) for use in solid state illumination or display systems ^{IV}	RoHS
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^{IV} Expires on 1st April 2014

BANNED/RESTRICTED CHEMICAL SUBSTANCES
Table 4. Examples of Test Methods for Restricted Substances

Substance Class	Matrix	Method for Inspection (Non-destructive test)	Method for Verification (Destructive Test)
Cadmium Compounds, Lead Compounds	plastic, rubber, paints, inks	XRF (handheld)	1. XRF (desktop) 2. AAS / Atomic Absorpsiyon 3. ICO-OES
Lead and Lead alloys	Metal	XRF (FP method) (fundemantal parameter, handheld)	1. XRF (desktop) 2. ICP-OES
Mercury Compounds	plastic, rubber, paints, inks	XRF (handheld)	1. XRF (desktop) 2. CV-AAS with vapor hydride generation apparatus 3. CV-AAS with thermal decomposition and/or gold amalgamation 4. ICP-OES with vapor hydride generation apparatus
Mercury	Metal		CV-AAS with thermal decomposition for analyzing mercury content in flourescent tubes
Hexavalent Chromium Compounds	Metal	1. XRF (handheld, total chromium) 2. Dip test (qualitative)	1. Alkaline digestion /colorimetric method (polymer and elektronik materials) 2. Spot-test procedure/boiling water-extraction procedure (metallic materials)
Polybrominated bphenyls (PBB) Polybrominated diphenyl ethers (PBDE)	plastics	Total bromine content / for confirmation of total bromine free: 1. XRF (handheld) 2. HPLC -Ion chromatography	For identification pf PBB and PBDE: FT-IR. Dor identification and quantification of PBB and PBDE : GC/MS (HRGC/MS)

PS: Analysis of the banned/restricted/declarable substances other than in Table 3 can be performed in accredited laboratories.

BANNED/RESTRICTED CHEMICAL SUBSTANCES

4. ANNEXES

ANNEX-1: Analysis report/declaration form providing conditions

ANNEX-2: CAS Numbers of Banned/Restricted/Declarable Substances

ANNEX-3: SVHC Declaration Form

5. REFERENCES

1. "EU Parliament and Commission Directive on Packaging and Packaging Waste" 94/62/EC and its amendments, Turkish Packaging Waste Legislation and its amendments.
2. Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 Restriction of The Use of Certain Hazardous Substances In Electrical and Electronic Equipment (RoHS) and its amendments and Turkish Legislation on Waste Electrical and Electronic Equipment (Turkish WEEE).
3. Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) and its amendments.
4. "Guidelines for Standardization of Material Declaration" developed by the Japan Green Procurement Survey Standardization Initiative (JGPSSI)
5. EICTA's document "EICTA position on enforcement and Measurement of Substances in the RoHS Directive" (examples for Test method given)..
6. "Management Regulations for the Environment-Related Substances to be Controlled which are included in parts and materials" The 13th edition of SS-00259 by Sony.
7. EACEM list of Hazardous and other Environmentally Relevant Substances
8. Arçelik - Chemical Substances That Require Prohibition and/or Limited Use Guidelines.

BANNED/RESTRICTED CHEMICAL SUBSTANCES

9. EU Waste Legislation on Batteries and Accumulators and its amendments(2013/56/EU), Turkish Waste Legislation on Batteries and Accumulators and its amendments
10. IEC 62321,Ed.2: Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products, International Electrotechnical Commission (IEC) Committee Draft, 111/95/CDV, 2007.
11. Joint Industry Guide (JIG), Material Composition Declaration for Electrotechnical Products
12. REACH Legislation and its amendments
13. Commission Regulation (EC) No 642/2009 of 22 July 2009 Implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for televisions,
14. Turkish PCB, PCT Control Legislation and its amendments.
15. Sony OEM/ODM Safety Requirements
16. By-Law on Inventory and Control of Chemicals (O.J. 27092, 26.12.2008)
17. Turkish AEEE Regulation (Waste Electrical and Electronic Equipment),(O.J.. 28300, 22/05/2012)
18. GS Standard – ZEK 01.4-08 Testing and Validation of Polycyclic Aromatic Hydrocarbons (PAH) in the course of GS-Mark Certification.

BANNED/RESTRICTED CHEMICAL SUBSTANCES