

BANNED/RESTRICTED CHEMICAL SUBSTANCES

REVISIONS		
Revision No	Revision Date	Revision Description
9.0	17.01.2019	Table 1 has been updated in accordance with Persistent Organic Pollutants (POPs) Regulation, REACH SVHC updated list, Prop 65 and ROHS Directive Amendments.
8.0	17.08.2017	Requirements on Biocidal Products, Conflict Minerals, ADR, Swedish Tax are added. Table 1 updated in accordance with updated SVHC list, Annex XIV List, Turkish REACH (KKDIK). New conditions are added for Br, Cl, P use.
7.0	12.11.2015	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.
6.0	27.10.2014	Substances classified as K2 in Table 1 have been updated in scope of REACH Annex XIV Authorisation List. The sunset dates of K2 substances have been updated. K2 substances will be banned in Arçelik 6 months before the legal dates. DEHP, BBP, DBP, DIBP can not be used after 01.11.2014. SVHC list updated and current SVHC list contains 155 substances. BPA is banned in food contact materials. Restrictions for batteries have been revised.
5.0	08.01.2014	PFOA is classified as "K1" and <u>restricted</u> . 7 new substances are added to SVHC list and current SVHC list contains 151 substances. Table 1 has been updated regarding to these changes. References list has been updated. Document type, name and number have been changed. GCP-16329 Procedure has been repealed.
4.0	03.07.2013	Table 1 and Table 3 have been updated according to new developments (REACH, RoHS Recast etc.). Sunset dates for K2 substances have been defined. References list has been updated.

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Revision No	Revision Date	Revision Description
3.0	02.07.2012	Material risk classes have been cancelled and ANNEX-1 is updated with placing analysis report/declaration form providing conditions. Food contact and full concentration (in scope of By-Law on Inventory and Control of Chemicals) informations have been added to analysis report/declaration form providing conditions. Table 1 has been revised regarding to new PAH Standard. Outofdate EEE Regulation has been replaced by new Turkish WEEE Regulation. SVHCs published in June 2012 have been added to Table 1. Battery and accumulators requirements have been revised in the scope of related regulations.
2.0	16.03.2012	PFOA is classified as "K1" and <u>restricted</u> . 7 new Table 1 is updated regarding to current SVHC list and "hazard" for substances column is added. Cd limit in Table 1 has been changed. General declaration form has been canceled. English version of the procedure has been added.
1.1	23.08.2011	Cd restriction for batteries is revised in compliance with 2006/66/EC directive on batteries and accumulators.
1.0	26.07.2011	Procedure and its annexes has been revised completely.
0.1	13.09.2007	Minor revision has been done.
0.0	15.11.2005	Procedure published.

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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 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 semi-synthetic 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.

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

n) SVHC Declaration Form (D) : Suppliers' declaration form which includes the concentration of SVHCs (w/w) in their supplied parts, sub-products, packaging materials and materials.

o) 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).

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

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

s) Biocidal product: Substance or mixture, in the form in which it is supplied to the user, consisting of, containing or generating one or more active substances, with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling effect on any harmful organisms.

t) Active substance: a substance or a micro-organism that has an action on or against harmful organisms including viruses and fungus.

u) Treated article: any substance, mixture or article which has been treated with, or intentionally incorporates, one or more biocidal products.

v) Reactively added compound: a compound that is bound to a stable polymer through a chemical reaction and forms covalent bonds.

y) Additive compound: a compound that is added by means other than reactive.

3.3 Process 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

The legal and other requirements to be complied in scope of this procedure are as follows:

- RoHS Directive (Directive 2011/65/EU and 2015/863/EU) (Directive on the Restriction Of the Use of Certain Hazardous Substances in Electric and Electronic Equipment)
- 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)

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- Turkish Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (KKDİK) (O.J. 30105, 23.06.2017)
- Turkish Regulation on Classification, Labelling and Packaging of Substances and Mixtures (SEA) (O.J. 28848, 11.12.2013)
- Turkish Biocidal Product Regulation (O.J. 27449, 31.12.2009)
- Turkish Biocidal Treated Articles Comminique (O.J. 30420, 13.05.2018)
- Biocidal Product Regulation (BPR) ((EU) 528/2012)
- Swedish Tax On Certain Chemicals In Electronics Law (2016:1067)
- Conflict Minerals (USA Dodd Frank Act Section1502, EU 2017/821)
- ADR (The European Agreement concerning the International Carriage of Dangerous Goods by Road)
- Commision 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
- EU and Turkish POPs Regulations (O.J. 30595, 14.11.2018) (EC 850/2004)
- California Proposition 65 Law

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) Accessorries: 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.)

BANNED/RESTRICTED CHEMICAL SUBSTANCES**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.

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.

During the panel approval process, following information and declaration also will be taken in addition to others mentioned above.

Panel suppliers should give also these below information with signed declaration to Arçelik Electronic Plant.

These information will be on mercury content (as mg per lamp) and lead content (as ppm and with highlighting exemptions regarding RoHS directive) of the panel to be approved.

Code of Panel	Lead Content (ppm) (mention whether it's exempted or not)	Backlight lamp quantity (Number)	Mercury content (mg per lamp)	Total Mercury Content (mg)

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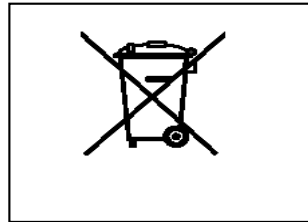
As a note; the analysis methods of RoHS and Turkish WEEE Regulations materials are shown in Table 4 and CAS numbers and compounds of restricted/banned/declarable substances are shown in ANNEX-2.

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 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 described 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. Conditions for Materials Containing Biocidal Products

The materials supplied to Arçelik A.Ş. containing biocidal products for the purpose of providing hygienic properties (antibacterial, antifungal, antimicrobial etc.) should be complied with the provisions of the EU Biocidal Products Regulation (BPR) and T.R. Biocidal Products Regulation issued by Ministry of Health.

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In this context, the biocidal product used in the material should be licenced from T.R. Ministry of Health and should be approved by ECHA under the EU Biocidal Products Regulation.

The authorization number and inventory number and licence of biocidal product, MSDSs of its active substances, accredited laboratory test report concerning biocidal activity should be provided to Arçelik A.Ş. In addition the active substance in the biocidal product should be approved in scope of EU Biocidal Product Regulation.

3.5.5. Turkish Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (KKDIK (Turkish REACH))

The purpose of the Turkish Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals is to ensure a high level of protection of human health and the environment, including the promotion of alternative methods for assessment of hazards of substances, as well as the free circulation of substances on the internal market while enhancing competitiveness and innovation.

In scope of this Regulation, besides chemical declaration and restriction requirements, there is also registration obligation for chemical substances produced or imported more than 1 ton per year on its own or in a mixture until 31.12.2023 via online Chemical Registration System in the web site of T. R. Ministry of Environment and Urbanization. Pre-registration for substances to be registered should be made via the online Chemical Registration System until 31.12.2020. This obligation applies to the chemicals placed on the Turkish market.

3.5.6. Conditions for Bromine (Br), Chlorine (Cl) and P (Phosphorus) Use in Plastics and Circuit Boards

According to Swedish Tax on Chemicals within Certain Electronics Law, electronics and white goods are subjected to taxation depending the content of Br, Cl, P in the equipment. In this scope the products/components/materials supplied to Arçelik A.Ş. should be complied with following conditions:

- The plastic parts of products/materials/components (plastic part that are above 25 g) supplied to Arçelik A.Ş. currently, do not contain additive Br and additive Cl compounds above the 0.1% concentration limit (w/w) at homogenous materials level.
- The plastic parts of products/materials/components (plastic part that are above 25 g) to be supplied to Arçelik A.Ş. first time, do not contain additive Br and Cl (additive or reactive) and additive P compounds above the 0.1% concentration limit (w/w) at homogenous materials level.

Circuit boards, with the exeption of the boards' components, should be complied with following conditions:

- The circuit board (exeption of its components) supplied to Arçelik A.Ş. currently, do not contain additive Br and additive Cl compounds above the 0.1% concentration limit (w/w) at homogenous materials level.

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- The circuit board (exception of its components) to be supplied to Arçelik A.Ş. first time, do not contain additive Br and Cl (additive or reactive) and additive P compounds above the 0.1% concentration limit (w/w) at homogenous materials level.

3.5.7. Conflict Minerals

The minerals extracted from the territories in which the conflicts are experienced in the world (the Democratic Republic of Congo and neighboring countries) finance armed conflicts in this region. These minerals are called 'conflict minerals' and in order to prevent the use of these minerals, regulations have been published first in USA (Dodd Frank Act) and then EU.

The minerals that fall within the scope of "Conflict Minerals" are tin, tungsten, tantalum, gold minerals and called as 3TG. As Arçelik A.Ş. in the context of our "responsible producer" principle, we are committed to avoiding any action that contributes to the financing of conflicts and to support our suppliers and our business partners in this regard.

In this context, the suppliers of Arçelik A.Ş. should take necessary precautions to prevent the use of conflict minerals and should respond to the surveys sent by Arçelik A.Ş. if required. Arçelik A.Ş. will be able to carry out on-site audits to its selected suppliers in this regard.

3.5.8. ADR

All substances /materials supplied to Arçelik A.Ş. and covered by ADR should be packed, filled, sent, transported and unstuffed in accordance with ADR provisions.

3.5.9. Conditions for Chemical Labelling and Safety Data Sheets

All labels and safety data sheets (SDS) of chemicals supplied to Arçelik A.Ş. should be complied with Turkish Regulation on Classification, Labelling and Packaging of Substances and Mixtures (SEA) and Turkish Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (KKDİK).

3.6 ENFORCEMENT and RECORD MANAGEMENT

This procedure enters into force on 01.07.2011.

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

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Table 1. Banned/Restricted/Declarable substances

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
4,4'- Diaminodiphenylmethane (MDA)	CAS : 101-77-9	K1	Banned	PU curing agent Protector for resin and epoxy	REACH
5-tert-butyl-2,4,6-trinitro-m- xylene (musk xylene)	CAS : 81-15-2	K1	Banned	Scent formulations	REACH
Arsenic compounds	-	K1	Banned	Wood protection	REACH, KKDIK
Asbestos	See ANNEX-2	K1	Banned	All applications(insulator, paint, pigment,etc.)	REACH, KKDIK
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.)	REACH, KKDIK
Formaldehyde	CAS: 50-00-0	K1	Banned	Composite wood products or components, stereo cabinets (ex.phenol resin, etc.)	US/CA CARB Rule
Nickel	CAS : 7440-02-0	K1	Banned	Stainless steel and plating where prolonged skin contact is expected (ex.headphone)	REACH, KKDIK

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	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	REACH, KKDIK
Perfluorooctane sulfonate (PFOs)	CAS : 2795-39-3	K1	Banned	Antistatic agent for films and plastics	REACH
PFC, SF6	See ANNEX-2	K1	Banned	Refrigerant, extinguishing agents, insulating media, etc.	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..	Japan Law
Radioactive Substances	See ANNEX-2	K1	Banned	Measuring devices, detector etc.	EU-D 96/29/Euratom; 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	Legislation
Dimethyl fumarate	CAS: 624-49-7	K1	0.00001% (0.1 ppm)	Biocides	REACH, KKDIK
Cadmium/cadmium compounds ³	See ANNEX-2	K1	%0.007 ¹ (70 ppm) (Table 3 for exemptions)	Plastic (Polymeric Material) ²	RoHS (EU Directive and its amendments), Turkish WEEE Regulation
			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	
			0.02% ⁵ (200 ppm)	Applications where prolonged skin contacts is less than 30 sn	
PAH	See ANNEX-2	K1	%0.0001 (1 ppm)	Plastic, resin (materials contact with skin short and long term)	GS Standard, REACH, KKDIK

¹ Limit is valid as homogenous material level.
² Resin, paint, ink, rubber, plastic are included.
³ Cadmium plating is prohibited on the product.

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Lead and its compounds	See ANNEX-2	K1	0.01 ¹ % (100 ppm) (See Table 3 for exemptions)	Plastics (Polymeric Material) ²	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.)	REACH, KKDIK
Mercury and its compounds	See ANNEX-2	K1	0.071 ¹ % (700 ppm) (See Table 3 for exemptions)	All applications other than batteries (polymer, metal, elektronik material, electromechanic material)	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.

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Dibutyltin hydrogen borate (DBB)	CAS: 75113-37-0	K1	%0.1		REACH, KKDİK
Pentachlorophenol	CAS: 87-86-5	K1	Banned	Pesticides	REACH, KKDİK
Monomethyl-tetrachloro-diphenyl methane	CAS: 76253-60-6	K1	Banned	capacitors and transformers	REACH, KKDİK
Monomethyl-dichloro-diphenyl methane	-	K1	Banned	capacitors and transformers	REACH, KKDİK
DBBT	CAS: 99688-47-8	K1	Banned		REACH, KKDİK
Hexachloroethane	CAS: 67-72-1	K1	Banned	pyrotechnics and explosives	REACH, KKDİK
Dichloromethane	CAS: 75-09-2	K1	%0.1	solvent	REACH, KKDİK

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	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)	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)	RoHS (EU Directive and its amendments), Turkish WEEE Regulation
2-(2-methoxyethoxy) ethanole	CAS: 111-77-3	K1	0.1%	Paint, paint remover	REACH
Pentadecafluorooctanoic acid (PFOA)	CAS: 335-67-1	K1	0.1%	Electrical wire insulation, Specialist circuit boards, Non-stick coatings	REACH
Toluene	CAS: 108-88-3	K1	0.1%	Paints and adhesives	REACH, KKDIK
1,2-Dichloroethane	CAS: 107-06-2	K1	Banned	Vinyl chloride monomer production	REACH
2,4- Dinitrotoluene (2,4-DNT)	CAS: 121-14-2	K1	Banned	Production of flexible PU foams	REACH
2,2'-Dichloro-4,4'-methylenedianiline	CAS: 101-14-4	K1	Banned	PU	REACH

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.

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Ammonium dichromate	CAS: 7789-09-5	K1	Banned	Oxidizing agent, mordant for textiles, production of photosensitive screens	REACH
Arsenic acid	CAS: 7778-39-4	K1	Banned	Special glass, laminated printed circuit boards	REACH
Benzyl butyl phthalate (BBP)**	CAS : 85-68-7	K1	Banned	PVC plasticizer	REACH, ROHS
Bis (2-ethylhexyl)phthalate (DEHP)**	CAS: 117-81-7	K1	Banned	PVC plasticizer	REACH, ROHS
Bis(2-methoxyethyl) ether	CAS: 111-96-6	K1	Banned	Solvent	REACH
Chromium trioxide	CAS: 1333-82-0	K1	Banned	Electronic components, HDPE,LLDPE,PP	REACH
Chromic acid, Oligomers of chromic acid and dichromic acid, Dichromic acid	CAS: 7738-94-5, 13530-68-2	K1	Banned	Chrome coating derivatives	REACH

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.

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Diarsenic pentaoxide	CAS : 1303-28-2	K1	Banned	Glass, cable coating	REACH
Diarsenic trioxide	CAS : 1327-53-3	K1	Banned	Glass, cable coating	REACH
Dibutyl phthalate (DBP)**	CAS : 84-74-2	K1	Banned	PVC plasticizer	REACH, ROHS
Dichromium tris(chromate)	CAS: 24613-89-6	K1	Banned	Metal processing	REACH
Diisobutyl phthalate (DIBP)**	CAS : 84-69-5	K1	Banned	PVC plasticizer	REACH, ROHS
Formaldehyde, oligomeric reaction products with aniline (technical MDA)	CAS: 25214-70-4	K1	Banned	MDI production	REACH
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	REACH

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

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Lead chromate	CAS: 7758-97-6	K1	Banned	Production of paints and pigments	REACH
Lead chromate molibdate sulphate red (C.I. Pigment Red 104)	-	K1	Banned	Paints	REACH
Lead sulfochromate yellow (C.I. Pigment Yellow 34)	CAS : 1344-37-2	K1	Banned	Paints	REACH
Pentazinc chromate octahydroxide	CAS: 49663-84-5	K1	Banned	Thinner, paint primer	REACH
Potassium chromate	CAS : 7789-00-6	K1	Banned	Anticorrosive, metal coating	REACH
Potassium dichromate	CAS : 7778-50-9	K1	Banned	Anticorrosive, metal coating	REACH
Potassium hydroxyoctaoxidizinc atedichromate	CAS: 11103-86-9	K1	Banned	Paint primer	REACH

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

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Sodium chromate	CAS: 7775-11-3	K1	Banned	Anticorrosive, metal coating	REACH
Sodium dichromate	CAS: 7789-12-0/ 10588-01-9	K1	Banned	Anticorrosive, metal coating	REACH
Strontium chromate	CAS: 7789-06-2	K1	Banned	Paints, varnishes, adhesives	REACH
Trichloroethylene	CAS: 79-01-6	K1	Banned	Production of chlorinated and fluorinated product derivatives	REACH
Tris(2-chloroethyl) phosphate, TCP	CAS : 115-96-8	K1	Banned	Flame retardant for PU, PVC etc.	REACH
POPs (POPs List)	See Annex-2	K1	Banned	-	POPs
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)**	CAS: 71888-89-6	K2	0.1% SD: 04.01.2020	PVC plasticizer	REACH
1,2,3-Trichloropropane (1,2,3-TCP)	CAS: 96-18-4	K3	0.1%	Biocides, chlorinated solvents	REACH

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BANNED/RESTRICTED CHEMICAL SUBSTANCES

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
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**	CAS: 68515-51-5, 68648-93-1	K3	0.1%	Plasticizers, lubricants, adhesives, coatings, construction materials, cable components, polymer foils	REACH
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters**	CAS:68515-42-4	K2	0.1%	PVC	REACH
			SD: 04.01.2020		
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	CAS: 84777-06-0	K2	0.1%	-	REACH
			SD: 04.01.2020		
1,2-Diethoxyethane	CAS: 629-14-1	K3	0.1%	Solvent, fabric clening compounds	REACH
1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	CAS: 110-71-4	K3	0.1%	Battery, microelectronic components	REACH
1-bromopropane (n-propyl bromide)	CAS: 106-94-5	K2	0.1%	Solvent	REACH
			SD: 04.01.2020		
1-Methyl-2-pyrrolidone (NMP)	CAS: 872-50-4	K3	0.1%	Solvents	REACH
1,2-bis(2-methoxyethoxy) ethane (TEGDME; triglyme)	CAS: 112-49-2	K3	0.1%	Battery	REACH

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BANNED/RESTRICTED CHEMICAL SUBSTANCES

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	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	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	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)	REACH
2-Ethoxyethanol	CAS: 109-86-4	K3	0.1%	Solvents	REACH
2-Ethoxyethyl acetate (2-EEA)	CAS: 111-15-9	K3	0.1%	Solvents	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)	REACH
2-Methoxyaniline; o-Anisidine	CAS: 90-04-0	K3	0.1%	Packaging inks	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
2-Methoxyethanol	CAS: 110-80-5	K3	0.1%	Solvents	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)	REACH
3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	CAS: 143860-04-2	K3	0.1%	Laboratory chemicals	REACH
4-(1,1,3,3-Tetramethylbutyl)phenol; 4-tert-octyl phenol	CAS: 140-66-9	K3	0.1%	Phenolic resins	REACH
4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues]	-	K2	%0.1	Paints	REACH
			SD: 04.07.2020		
4,4'-bis(dimethylamino)benzophenone (Michler's ketone)	CAS: 90-94-8	K3	0.1%	Printed circuit board, paint	REACH
4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol	CAS: 561-41-1	K3	0.1%	Paint	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	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	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	REACH
4,4'-methylenedi- <i>o</i> -toluidine	CAS: 838-88-0	K3	0.1%	Textile chemical	REACH
4,4'-oxydianiline and its salts	CAS: 101-80-4	K3	0.1%	Plastic materials	REACH
4-Aminoazobenzene	CAS: 60-09-3	K3	0.1%	Pigments	REACH
4-methyl- <i>m</i> -phenylenediamine (toluene-2,4-diamine)	CAS: 95-80-7	K3	0.1%	Paint	REACH
4-Nonylphenol, branched and linear, ethoxylated	-	K2	0.1%	Epoxy resin	REACH
			SD: 04.01.2020		

BANNED/RESTRICTED CHEMICAL SUBSTANCES

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
4-Nonylphenol, branched and linear covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	-	K3	0.1%	Plastic and epoxy materials; printed circuit boards, paint	REACH
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%	-	REACH
6-methoxy-m-toluidine (p-cresidine)	CAS: 120-71-8	K3	0.1%	Chemical production	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	REACH
Acetic acid, lead salt, basic	CAS: 51404-69-4	K3	0.1%	Electronics, paint	REACH
Acrylamide	CAS :79-06-1	K3	0.1%	Polyacrylamide production	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Alkanes, C10-13, chloro (Short Chained Chlorinated Paraffines)	CAS : 85535-84-8	K3	0.1%	Flame retardant for rubber	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	REACH
Ammonium pentadecafluorooctanoate (APFO)	CAS: 3825-26-1	K3	0.1%	Electrical wire insulation, Specialist circuit boards, Non-stick coatings	REACH
Anthracene	CAS: 120-12-7	K3	0.1%	Black rubber and plastics, liquid crystal, pigments	REACH
Anthracene oil	CAS: 90640-80-5	K2	0.1% SD: 04.04.2020	Production of anthracene and carbon black	REACH
Anthracene oil, anthracene paste	CAS : 90640-81-6	K3	0.1%	Same with anthracene oil	REACH
Anthracene oil, anthracene paste, anthracene fraction	CAS : 91995-15-2	K3	0.1%	Same with anthracene oil	REACH
Anthracene oil, anthracene paste, distn. oils	CAS : 91995-17-4	K3	0.1%	Same with anthracene oil	REACH
Anthracene oil, anthracene-low	CAS : 90640-82-7	K3	0.1%	Same with anthracene oil	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Biphenyl-4-ylamine	CAS: 92-67-1	K3	0.1%	Resin	REACH
Bis(2-methoxyethyl) phthalate**	CAS: 117-82-8	K2	0.1%	PVA, PVC etc. plasticizer	REACH
			SD: 04.01.2020		
Bis(tributyltin)oxide (TBTO)	CAS: 56-35-9	K3	0.1%	Wood protector, biocides	REACH
Boric Acid	CAS: 10043-35-3 / 11113-50-1	K3	0.1%	Glass fiber, LCD display	REACH
Cadmium chloride	CAS: 10108-64-2	K3	0.1%	Semiconductor, solar panel etc. production	REACH
Cadmium fluoride	CAS: 7790-79-6	K3	0.1%	Solar cells, glass production, optical applications, laboratory applications	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.)	REACH
Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	CAS: 123-77-3	K3	0.1%	Plastic and resin	REACH
Diboron trioxide	CAS: 1303-86-2	K3	0.1%	Glass, fiberglass, paint, adhesive, enamel	REACH

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Diethyl sulphate	CAS: 64-67-5	K3	0.1%	Chemical production	REACH
Dihexyl phthalate**	CAS: 84-75-3	K3	0.1%	PVC	REACH
Diisopentylphthalate**	CAS: 605-50-5	K2	0.1% SD: 04.01.2020	PVC	REACH
Dimethyl sulphate	CAS: 77-78-1	K3	0.1%	Chemical production	REACH
Dinoseb (6-sec-butyl-2,4-dinitrophenol)	CAS: 88-85-7	K3	0.1%	Plastics	REACH
Dioxobis(stearato)trilead	CAS: 12578-12-0	K3	0.1%	Plastics	REACH
Dipentyl phthalate (DPP)**	CAS: 131-18-0	K2	0.1% SD: 04.01.2020	PVC	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	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	REACH

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Disodium tetraborate, anhydrous	CAS : 1303-96-4/ 1330-43-4/ 12179-04-3	K3	0.1%	Glass and glass fibers	REACH
Phenolphthalein	CAS: 77-09-8	K3	0.1%	pH-indicator paper, disappearing inks	REACH
[Phthalato(2-)]dioxotrilead	CAS: 69011-06-9	K3	0.1%	Plastics	REACH
Furan	CAS: 110-00-9	K3	0.1%	Detergents, solvents	REACH
Hydrazine	CAS: 302-01-2 / 7803-57-8	K3	0.1%	Paint, ink, foaming agent	REACH
Cadmium oxide	CAS: 1306-19-0	K3	0.1%	Nickel cadmium (Ni-Cd) batteries	REACH
Cadmium sulphide	CAS: 1306-23-6	K3	0.1%	Semiconductors, paints, coloured plastics	REACH
Calcium arsenate	CAS: 7778-44-1	K3	0.1%	copper and lead refining	REACH
Cobalt(II) diacetate	CAS: 71-48-7	K3	0.1%	Catalyst production	REACH
Cobalt(II) dinitrate	CAS: 10141-05-6	K3	0.1%	Catalyst production, rechargeable batteries	REACH
Cobalt(II) carbonate	CAS: 513-79-1	K3	0.1%	Catalyst production, ground coat frit	REACH
Cobalt(II) sulphate	CAS: 10124-43-3	K3	0.1%	Anticorrosive agent	REACH
Cobalt dichloride	CAS: 7646-79-9	K3	0.1%	Paint	REACH

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	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	REACH
Fatty acids, C16-18, lead salts	CAS: 91031-62-8	K3	0.1%	Plastics (especially PVC)	REACH
Formamide	CAS: 75-12-7	K3	0.1%	Solvent	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	REACH
Henicosaflluoroundecanoic acid	CAS: 2058-94-8	K3	0.1%	Non-stick coatings, cable-wire isolation	REACH
Heptacosaflluorotetradecanoic acid	CAS: 376-06-7	K3	0.1%	Non-stick coatings, cable-wire isolation	REACH
Imidazolidine-2-thione (2-imidazoline-2-thiol)	CAS: 96-45-7	K3	0.1%	o-ring, gasket, polyacrylate resin	REACH
Lead (II) bis(methanesulfonate)	CAS: 17570-76-2	K3	0.1%	Electronic components	REACH
Lead bis(tetrafluoroborate)	CAS: 13814-96-5	K3	0.1%	Metal processing	REACH
Lead di(acetate)	CAS: 301-04-2	K3	0.1%	Production of computer, electronic and optical devices	REACH
Lead diazide	CAS :13424-46-9	K3	0.1%	Pyrotechnics	REACH

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Lead dinitrate	CAS: 10099-74-8	K3	0.1%	Paint	REACH
Lead dipicrate	CAS : 6477-64-1	K3	0.1%	Pyrotechnics	REACH
Lead hydrogen arsenate	CAS : 7784-40-9	K3	0.1%	Biocides	REACH
Lead monoxide (lead oxide)	CAS: 1317-36-8	K3	0.1%	Resin and ceramic materials, paint, battery	REACH
Lead oxide sulfate	CAS: 12036-76-9	K3	0.1%	Plastics (especially PVC)	REACH
Lead styphnate	CAS : 15245-44-0	K3	0.1%	Pyrotechnics	REACH
Lead cyanamidate	CAS: 20837-86-9	K3	0.1%	Electrocoatings	REACH
Lead titanium trioxide	CAS: 12060-00-3	K3	0.1%	Semi conductive applications	REACH
Lead titanium zirconium oxide	CAS: 12626-81-2	K3	0.1%	Electro-ceramic and piezo-ceramic applications	REACH
Methoxyacetic acid	CAS: 625-45-6	K3	0.1%	Sanitizers and anticorrosive materials for food contact surfaces	REACH
Methyloxirane (Propylene oxide)	CAS: 75-56-9	K3	0.1%	Paints, varnishes, paint removers, adhesives	REACH
N-methylacetamide	CAS: 79-16-3	K3	0.1%	Laboratory chemicals	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
N,N-dimethylacetamide (DMAC)	CAS: 127-19-5	K3	0.1%	Solvent	REACH
N,N-dimethylformamide	CAS: 68-12-2	K3	0.1%	Printed circuit boards	REACH
N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	CAS: 101-61-1	K3	0.1%	Paint	REACH
N-pentyl-isopentylphthalate**	CAS: 776297-69-9	K2	0.1%	PVC	REACH
			SD: 04.01.2020		
o-aminoazotoluene	CAS: 97-56-3	K3	0.1%	Laboratory chemicals	REACH
o-Toluidine	CAS: 95-53-4	K3	0.1%	Laboratory chemicals	REACH
Orange lead (lead tetroxide)	CAS: 1314-41-6	K3	0.1%	Resin and ceramic materials, paints, batteries	REACH
Pentacosaflluorotridecanoic acid	CAS: 72629-94-8	K3	0.1%	Non-stick coatings, wire-cable isolations	REACH
Pentalead tetraoxide sulphate	CAS: 12065-90-6	K3	0.1%	Plastics (especially PVC), batteries	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

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BANNED/RESTRICTED CHEMICAL SUBSTANCES

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
PVC and PVC mixtures	See ANNEX-2	K3	0.1%	Packing materials, cable ties, flexible flat cables-FFC, insulators, etc	IEEE1680
Pyrochlore, antimony lead yellow	CAS: 8012-00-8	K3	0.1%	Glass and ceramics, paints, inks	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)	REACH
Silicic acid (H ₂ Si ₂ O ₅), barium salt (1:1), lead-doped	CAS: 68784-75-8	K3	0.1%	Bulb coatings	REACH
Silicic acid, lead salt	CAS: 11120-22-2	K3	0.1%	Concrete, plaster, glass and ceramic materials	REACH
Sodium perborate; perboric acid, sodium salt	EC: 239-172-9/ 234-390-0	K3	0.1%	Temizleme, yıkama ajanları	REACH
Sodium peroxometaborate	CAS: 7632-04-4	K3	0.1%	Temizleme, yıkama ajanları	REACH
Sulfurous acid, lead salt, dibasic	CAS: 62229-08-7	K3	0.1%	Plastics (especially PVC)	REACH
Tetraboron disodium heptaoxide, hydrate	CAS: 12267-73-1	K3	0.1%	Glass and glass fibers, flame retardant	REACH

BANNED/RESTRICTED CHEMICAL SUBSTANCES

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Tetraethyllead	CAS: 78-00-2	K3	0.1%	Fuel additive	REACH
Tetralead trioxide sulphate	CAS: 12202-17-4	K3	0.1%	Plastics (especially PVC)	REACH
Tricosafuorododecanoic acid	CAS: 307-55-1	K3	0.1%	Non-stick coatings, wire-cable isolations	REACH
Triethyl arsenate	CAS: 15606-95-8	K3	0.1%	Semi conductor components	REACH
Trilead bis(carbonate)dihydroxide	CAS: 1319-46-6	K3	0.1%	Intermetiate for ceramic production	REACH
Trilead diarsenate	CAS: 3687-31-8	K3	0.1%	Manufacture of copper, lead and a range of precious metals	REACH
Trilead dioxide phosphonate	CAS: 12141-20-7	K3	0.1%	Plastics (especially PVC), batteries	REACH
Trixylyl phosphate	CAS: 25155-23-1	K3	0.1%	PVC (artificial leather, belt, flooring)	REACH
Pitch, coal tar, high temp.	EC: 266-028-2	K2	0.1%	Active carbon production	REACH
			SD: 04.04.2020		
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	REACH

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Perfluorohexane-1-sulphonic acid and its salts (PFHxS)	-	K3	0.1%	Electronic and household goods (nonstick surfaces etc.), metal processing	REACH
4,4'-isopropylidenediphenol (BPA)	CAS: 80-05-7	K3	0.1%	PC manufacture	REACH
4-Heptylphenol, branched and linear	-	K3	0.1%	Polymer production intermediate	REACH
Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	-	K3	0.1%	Lubricant, wetting agent, plasticizer and corrosion inhibitor	REACH
p-(1,1-dimethylpropyl)phenol	CAS: 80-46-6	K3	0.1%	Monomer in phenolic resin production	REACH
Benzo[def]chrysene (Benzo[a]pyrene)	CAS: 50-32-8	K3	0.1%	-	REACH
1,3-propanesultone	CAS: 1120-71-4	K3	0.1%	Lithium-ion batteries	REACH
2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	CAS: 3864-99-1	K3	0.1%	UV stabilizer for plastics	REACH

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
2-(2H-benzotriazol-2-yl)- 4-(tert-butyl)-6- (secbutyl)phenol (UV-350)	CAS: 36437-37-3	K3	0.1%	UV stabilizator for plastics	REACH
Nitrobenzene	CAS: 98-95-3	K3	0.1%	Laboratory chemical	REACH
Perfluorononan-1-oic-acid and its sodium and ammonium salts	-	K3	0.1%	Textile	REACH
Reaction products of 1,3,4-thiadiazolidine-2,5- dithione, formaldehyde and 4-heptylphenol, branched and linear (RP- HP)	-	K3	0.1%	Greases and lubricants	REACH
Chrysene	218-01-9; 1719-03-5	K3	0.1%	Coatings, adhesives, cleaning agents	REACH
Cadmium nitrate	10325-94-7; 10022- 68-1	K3	0.1%	Intermediates, laboratory chemicals	REACH
Cadmium hydroxide	21041-95-2	K3	0.1%	Intermediates, laboratory chemicals	REACH
Cadmium carbonate	513-78-0	K3	0.1%	Intermediates, laboratory chemicals	REACH
Benz[a]anthracene	56-55-3; 1718-53-2	K3	0.1%	Coatings, cleaning agents	REACH

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
1,6,7,8,9,14,15,16,17,17,18,18-Dodecachloropentacyclo[12.2.1.16,9.02,13.05,10]octadeca-7,15-diene ("Dechlorane Plus"™)	-	K3	0.1%		REACH
Terphenyl, hydrogenated	61788-32-7	K3	0.1%	Structural materials (metal, wood, plastic), paper and cardboards, electrical and electronic equipment	REACH
Octamethylcyclotetrasiloxane	556-67-2	K3	0.1%	Varnishes and waxes, paints, coatings, adhesives, perfumes, leathers, electrical and electronic equipment	REACH
Ethylenediamine	107-15-3	K3	0.1%	Water treatment products, adhesives, seals, coatings, heat transfer liquids, hydraulic liquids	REACH
Dodecamethylcyclohexasiloxane	540-97-6	K3	0.1%	Varnishes and waxes, cleaning products	REACH
Disodium octaborate	12008-41-2	K3	0.1%	Heat transfer liquids, lubricants, detergents, paint and adhesives, leathers, paper and cardboards, electrical and electronic equipment	REACH
Dicyclohexyl phthalate (DCHP)	84-61-7	K3	0.1%	Adhesives, seals, coatings, fillers, inks and toners, non-metal surface treatment materials, varnishes and waxes, polymers, textile products and dyes	REACH
Decamethylcyclopentasiloxane	541-02-6	K3	0.1%	Detergents, varnishes and waxes, textile products and dyes	REACH
Benzo[ghi]perylene	191-24-2	K3	0.1%	Paint and plastics	REACH
Benzene-1,2,4-tricarboxylic acid 1,2 anhydride	552-30-7	K3	0.1%	Intermediates	REACH

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

Substance	CAS no / EC No	Category	Limit	Examples for Applications	Legislation
Pyrene	129-00-0; 1718-52-1	K3	0.1%	Coatings and paints, binders or release agents, lubricants, cleaning agents, binding agent for anodes, electrodes and refractory materials	REACH
Phenanthrene	85-01-8	K3	0.1%	Coatings and paints, binders or release agents, lubricants, cleaning agents, binding agent for anodes, electrodes and refractory materials	REACH
Fluoranthene	206-44-0; 93951-69-0	K3	0.1%	Coatings, adhesives, cleaning agents, binding agent for anodes, electrodes and refractory materials	REACH
Benzo[k]fluoranthene	207-08-9	K3	0.1%	Coatings, adhesives, cleaning agents, binding agent for anodes, electrodes and refractory materials	REACH
2,2-bis(4'-hydroxyphenyl)-4-methylpentane	6807-17-6	K3	0.1%	-	REACH
1,7,7-trimethyl-3-(phenylmethylene)bicyclo [2.2.1]heptan-2-one	15087-24-8	K3	0.1%	-	REACH
SVHCs not included in Table1 (See SVHC List)	-	K3	0.1%	-	REACH
Prop 65 list (updated list should be followed from the link)	-	K3	-	-	Prop 65 Law
Br, Cl	See Annex-2	K1	0.1% See Section 3.5.6	Plastics, circuit board	Swedish Tax
P	Bkz Ek-2	K1, K3	0.1% See Section 3.5.6	Plastics, circuit board	Swedish Tax

BANNED/RESTRICTED CHEMICAL SUBSTANCES**Table 2.** Restrictions for batteries

Substance	Limit	Explanation
Mercury (Hg)	0.0005 %	
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 (cont'd)

Substance	Directive
Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EE C 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
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 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 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	Turkish WEEE, RoHS
Lead as impurity in RIG (rare earth iron garnet) Faraday rotators used for fibre optic communications systems	Turkish WEEE, RoHS

BANNED/RESTRICTED CHEMICAL SUBSTANCES

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

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

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 -lon 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 acredited laboratories.

4. ANNEXES

ANNEX-1: Analysis report/declaration form providing conditions

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

ANNEX-3: SVHC Declaration Form

BANNED/RESTRICTED CHEMICAL SUBSTANCES**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. RoHS Directive (Directive 2011/65/EU and 2015/863/EU) (Directive on the Restriction Of the Use of Certain Hazardous Substances in Electric and Electronic Equipment)
3. Turkish Legislation on Waste Electrical and Electronic Equipment (Turkish WEEE).
4. Directive 2002/19/EU on Waste Electrical and Electronic Equipment (WEEE) and its amendments.
5. "Guidelines for Standardization of Material Declaration" developed by the Japan Green Procurement Survey Standardization Initiative (JGPSSI)
6. EICTA's document "EICTA position on enforcement and Measurement of Substances in the RoHS Directive" (examples for Test method given)..
7. "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.
8. Arçelik - Chemical Substances That Require Prohibition and/or Limited Use Guidelines.
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: Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products
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. Sony OEM/ODM Safety Requirements
15. Turkish AEEE Regulation (Waste Electrical and Electronic Equipment),(O.J.. 28300, 22/05/2012)
16. GS Standard – ZEK 01.4-08 Testing and Validation of Polycyclic Aromatic Hydrocarbons (PAH) in the course of GS-Mark Certification
17. International Standards for Phytosanitary Measures 15 (ISPM 15)
18. Turkish Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (KKDİK)
19. Turkish Regulation on Classification, Labelling and Packaging of Substances and Mixtures (SEA)
20. Turkish Biocidal Product Regulation (O.J. 27449, 31.12.2009)
21. Biocidal Product Regulation (BPR) ((EU) 528/2012)
22. Swedish Tax On Certain Chemicals In Electronics Law (2016:1067)
23. USA Dodd Frank Act Section 1502
24. EU 2017/821 Conflict Minerals Regulation
25. ADR (The European Agreement concerning the International Carriage of Dangerous Goods by Road)

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26. Turkish Biocidal Treated Articles Comminique (O.J. 30420, 13.05.2018)
27. EU and Turkish POPs Regulations (O.J. 30595, 14.11.2018) (EC 850/2004)
28. California Proposition 65 Law