

1 Executive Summary

On the basis of the Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (“RoHS Directive”) the European Commission has contracted Öko-Institut together with Fraunhofer IZM in order to evaluate and to assess both, existing exemptions listed in the Annex of the RoHS Directive based as well as five new requests. Basis for this evaluation are the criteria given in Article 5 (1) (b) of the directive. In summary the following objectives were pursued:

1. Execute a clear assessment on whether five new requests for exemptions are justified in line with the criteria given in Article 5 (1) (b);
2. Perform a detailed review of existing exemptions listed in the Annex of the RoHS Directive based on the criteria for exemptions in Article 5 (1) (b);
3. Provide the involvement and consultation of stakeholders (inter alia producers of electrical and electronic materials, components and equipment, recyclers, treatment operators, environmental organisations, employee and consumer associations), including set up and continuous maintenance of an account / a website;
4. Provide recommendations for a clear and unambiguous wording of the reviewed and new exemptions

The following table gives an overview of the 29 existing exemptions subject to the review and the recommendations given by the contractor.

Table 1 Overview RoHS exemptions

No.	Current title	New No.	Recommendation	New Wording proposal
1	Mercury in compact fluorescent lamps not exceeding 5 mg per lamp	1	Continue with amended wording (expiry date 31 July 2014 except for general lighting purposes >150W)	Mercury in single capped fluorescent lamps not exceeding (per burner):
				For general lighting purposes < 50W: 3,5 mg
				For general lighting purposes ≥ 50W and < 150: 5 mg
				For general lighting purposes > 150W: 15 mg (expiry date 31 December 2012)
				For general lighting purposes with circular or square structural shape and tube diameter ≤ 17 mm: 7 mg
				For special purposes: 5 mg
2	Mercury in straight fluorescent lamps for general purposes – halophosphate 10 mg – triphosphate with normal lifetime 5 mg – triphosphate with long lifetime	2a	Continue with amended wording, two exemptions (expiry date 31 July 2014)	Mercury in double-capped linear fluorescent lamps for general purposes not exceeding
				Tri-band phosphor with normal lifetime T2: 4 mg
				Tri-band phosphor with normal lifetime > T2 and ≤ T5: 3 mg

	8 mg	2b		Tri-band phosphor with normal life-time > T5 and ≤ T8 and < 183 cm: 3,5 mg
				Tri-band phosphor with normal life-time > T8 and ≤ T12: 3,5 mg
				Tri-band phosphor with long lifetime: 5 mg
				Mercury in other fluorescent lamps not exceeding:
				Halophosphates all shapes: 8 mg
				T5 non-linear tri-band phosphor lamps: 8 mg
				T9 non-linear tri-band phosphor lamps: 15 mg
				Induction lamps: 15 mg
3	Mercury in straight fluorescent lamps for special purposes	3	Continue with amended wording but review the applicability by 31 December 2012	Mercury in cold cathode fluorescent lamps:
				Mercury in short length (not over 500 mm) cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) not exceeding 3,5 mg per lamp until 31.12.2012
				Mercury in medium length (over 500mm and not over 1500 mm) cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) not exceeding 5 mg per lamp until 31.12.2012;
4	Mercury in other lamps not specifically mentioned in this Annex	4a-I	Continue with amended wording, two exemptions (expiry date 31 July 2014)	Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding in lamps with improved colour rendering index > 60
				P ≤ 155 W: 30 mg per burner
				155 < P ≤ 405 W: 40 mg per burner
				P > 405 W: 40 mg per burner
				Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding in other High Pressure Sodium (vapour) lamps
				P ≤ 155 W: 25 mg
				155 < P ≤ 405 W: 30 mg per burner
				P > 405 W: 40 mg per burner
				– P > 405 W: 25 mg
				Mercury in High Pressure Mercury (Vapour) lamps except for general lighting (HPMV)
				Mercury in Metal halide lamps (MH)
		4a-II		
		4a-III		

		4b		Mercury in other discharge lamps for special purpose not specifically mentioned in this Annex
5	Lead in glass of cathode ray tubes, electronic components and fluorescent tubes		Continue with amended wording (3 parts)	<p>► Lead in glass of cathode ray tubes. Assuming that each exemption is required to have an expiry date, the consultants propose 31 July 2014 to give the stakeholders opportunities to submit evidence in the next review of the Annex for the further need of this exemption beyond 2014, if appropriate.</p> <p>► Lead in the glass of fluorescent tubes not exceeding 0,2% by weight. Expiry date: 31 July 2014.</p> <p>► Electrical and electronic components which contain lead in a glass or ceramic other than a dielectric ceramic, or in a glass or ceramic matrix compound (e.g. piezoelectronic devices) until 31 July 2014, and for the repair, and to the reuse, of equipment put on the market before 1 January 2015</p>
6	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		Continue with amended wording (expiry date 31 December 2013)	<p>(6a). Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0,35% lead by weight</p> <p>(6b). Lead as an alloying element in aluminium containing up to 0,4% lead by weight</p> <p>(6c). Copper alloy containing up to 4% lead by weight</p>
7a	Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead)		Continue with amended wording (expiry date 30 June 2013)	Lead in high melting temperature type solders (i.e. lead-based alloys containing 85% by weight or more lead) until 30 June 2013, and lead in such solders for the repair and reuse of equipment put on the market before 1 July 2013.
7b	Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunications.		Continue with amended wording (expiry date 31 July 2014)	Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunications, until 31 July 2014, and for the repair or the reuse of such equipment put on the market before 1 August 2014.
7c	Lead in electronic ceramic parts (e.g. piezoelectronic devices)		Continue with amended wording (3 parts)	Electrical and electronic components which contain lead in a glass or ceramic other than a dielectric ceramic or in a glass or ceramic matrix compound, (e.g. piezoelectronic devices) until 31 July 2014, and for the repair, and to the reuse, of equipment put on the market before 1 August 2014.

				Electrical and electronic components for a voltage of 125 V AC or 250 V DC or higher which contain lead in a dielectric ceramic until 31 July 2014, and for the repair, and to the reuse, of equipment put on the market before 1 August 2014.
				Electrical and electronic components for a voltage of less than 125 V AC or 250 V DC which contain lead in a dielectric ceramic until 31 December 2012, and for the repair, and to the reuse, of equipment put on the market before 1 January 2013.
8	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.		Continue with amended wording (expiry date 31 December 2011 and 31 July 2014)	8a) Cadmium and its compounds in one shot pellet type thermal cut-offs until 31 December 2011 and in one shot pellet type thermal cut-offs used as spare parts for the reuse and repair of equipment put on the market before 1 January 2012. 8b) Cadmium and its compounds in electrical contacts until 31 July 2014, and in electrical contacts in spare parts used for the repair and reuse of equipment put on the market before 1 August 2014.
9	Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators		Continue with amended wording (expiry date 31 December 2013)	Hexavalent chromium as an anti-corrosion agent of the carbon steel cooling system in absorption refrigerators up to 0,75 weight-% in the cooling solution except for applications where the use of other cooling technologies is practicable (i.e. available on the market for the specific area of application) and does not lead to negative environmental, health and/or consumer safety impacts.
9a	DecaBDE in polymeric applications		Recommendation obsolete	
9b	Lead in lead-bronze bearing shells and bushes		Continued with amended wording (expiry date 31 July 2014)	Lead in bearing shells and bushes for refrigerant-containing compressors for HVACR applications, with expiry date of 31 July 2014.
11	Lead used in compliant pin connector systems.		Continue with amended wording (expiry date 30 June 2010)	(11a) Lead used in C-press compliant pin connector systems until 30 June 2010, and for the repair, or to the reuse, of electrical and electronic equipment put on the market before 1 July 2010 (11b) Lead used in other than C-press compliant pin connector systems until 31 December 2012, and for the repair, or to the reuse, of electrical and electronic equipment put on the market before 1 January 2013

12	Lead as a coating material for the thermal conduction module c-ring.		Continue with amended wording (expiry date 30. June 2010)	Lead as a coating material for the thermal conduction module C-ring until 30 June 2010, and for the repair, or to the reuse, of electrical and electronic equipment put on the market before 1 July 2010.
13	Lead and cadmium in optical and filter glass		Continue with amended wording (expiry date 31 July 2014)	(13a) Lead in white glasses used for optical applications. (13b) Cadmium and lead in filter glasses.
14	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight.		Continue with amended wording (expiry date 31 December 2010)	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight until 31 December 2010, and for the repair and reuse of products that were put on the market before 1 January 2011.
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages.		Continue with amended wording (expiry date 31 July 2014)	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages until 31 July 2014, and for the repair, or to the reuse, of electrical and electronic equipment put on the market before 1 August 2014.
16	Lead in linear incandescent lamps with silicate coated tubes.		Not to be continued (transition period until mid 2011)	
17	Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications.		Continue exemption (expiry date 31 July 2014)	Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications.
18	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (Ba-Si2O5:Pb) as well as when used as speciality lamps for diazo-printing reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba)2MgSi2O7:Pb).		Not to be continued (transition period until mid 2011) except for sun tanning lamps (expiry date 31 July 2014)	Lead as activator in the fluorescent powder (1% lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi2O5:Pb) - expiry date 31 July 2014.
19	Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact Energy Saving Lamps (ESL).		Not to be continued (transition period until mid 2011)	Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact Energy Saving Lamps (ESL).
20	Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCD)		Not to be continued (transition period until mid 2011)	

21	Lead and cadmium in printing inks for the application of enamels on borosilicate glass.		Continue (expiry date 31 July 2014)	Lead and cadmium in printing inks for the application of enamels on borosilicate glass (expiry date 31 July 2014).
22	Lead as impurity in RIG (rare earth iron garnet) Faraday rotators used for fibre optic communications systems.		Continue (expiry date 31 December 2009)	Lead as impurity in RIG (rare earth iron garnet) Faraday rotators used for fibre optic communication systems until 31 December 2009.
23	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.		Continue with amended wording (expiry date 30 June 2010)	Lead in finishes of fine pitch components others than connectors with a pitch of 0.65 mm and less until 30 June 2010, and lead in the finishes of such fine pitch components used as spare parts for the repair and reuse of equipment put on the market before 1 July 2010.
24	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors.		Continue (expiry date 31 July 2014)	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors until 31 July 2014, and for repair and reuse of equipment put on the market before 1 August 2014.
25	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.		Continue with amended wording (expiry date 31 July 2014)	Lead oxide in surface conduction electron emitter displays (SED) used in structural elements; notably in the seal frit and frit ring.
26	Lead oxide in the glass envelope of Black Light Blue (BLB) lamps.		Not to be continued (transition period until mid 2011)	
27	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.		Not to be continued (no transition period)	
28	Hexavalent chromium in corrosion preventive coatings of unpainted metal sheetings and fasteners used for corrosion protection and Electromagnetic Interference Shielding in equipment falling under category three of Directive 2002/96/EC (IT and telecommunications equipment). Exemption granted until 1 July 2007		Not to be continued (already expired)	
29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC (*). (* OJ L 326, 29.12.1969, p. 36		Continue (expiry date 31 July 2014)	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC.

Table 2 Overview RoHS exemption requests

No.	Topic	Recommendation	Wording
1	Lead in Solders for the connection of very thin enamelled wires with a terminal	No clear recommendation possible	
2	Lead and Cadmium as components of the glazes and colour used to glaze or decorate lamp bases, lamp carriers or clocks	No clear recommendation possible	Lead and cadmium in glazes and colors used on ceramic lamp bases, lamp carriers and clocks until 31 July 2014.
3	Pb in solder of Cortex component	Refuse	
4	Cadmium within a color converting single crystal semiconductor film for use in solid state illumination or display systems	Grant (expiry date 31 July 2014)	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
5	Lead in solders for the connection of very thin (<100 µm) enamelled copper wires and for the connection of enamelled clad aluminium wires (CCAWs) with a copper layer smaller than 20 µm.	No clear recommendation possible	

Beyond these specific recommendations some general considerations are given in Chapter 5 relating to transition periods, expiry dates and “Grandfathering” and whole product units as spare parts.