

## **Criterion 2. Substitution of hazardous substances used in the main computer components**

The final product shall not contain hazardous substances in accordance with the rules set out in the following sub-criteria which apply to:

- Substances of Very High Concern (SVHC's)
- Restrictions based on hazard classifications
- Restrictions on substances in specified component parts

Applicants are required to verify that the final product and specified component parts complies with these sub-criteria.

### **2(a) Substances of Very High Concern (SVHC's)**

The product shall not, unless specifically derogated, contain substances that:

- (i) Meet the criteria in Article 57 of Regulation (EC) No 1907/2006,
- (ii) Have been identified according to the procedure described in Article 59(1) of Regulation (EC) No 1907/2006 which establishes the candidate list for substances of very high concern.

No derogation shall be given to substances that meet either of these two conditions, and which are present in an article or in any homogeneous part of a complex article in concentrations greater than 0,10 % (weight by weight). For the purpose of this criterion verification shall be provided, as a minimum, for the component parts identified in 2(b).

**Assessment and verification:** Substances that are present in the final product shall be screened against the version of the candidate list published by ECHA at the time of the application for a license. The applicant shall compile declarations of compliance from, as a minimum, suppliers of the component parts specified in 2(b). Where a derogation has been granted then the applicant shall show that use of the substance is in compliance with the stated derogation conditions and verification requirements.

### **2(b) Restrictions based on hazard classifications**

#### ***2(b)(i) Overall rules applying to specified components and substance groups***

Substances that, in accordance with Regulation (EC) No 1272/2008 of the European Parliament ('the CLP Regulation') and of the Council or Council Directive 67/548/EC, meet the criteria for classification with the hazard classes or risk phrases listed in table 2.1 shall not be present in the specified component parts of a computer at or above a concentration limit of 0.10% unless stipulated otherwise or if substances or substance groups have been specifically derogated. Specific concentration limits identified in

the CLP Regulation, and any subsequent Adaptations to Technical Progress (ATP's), shall take precedence over this generic concentration limit.

For the purpose of this criterion the main component parts of a computer are defined as comprising:

#### Circuitry

- Printed Circuit Boards >10 cm<sup>2</sup>
- Central Processing Units and Graphics Processing Units (including cooling units)
- Electrical solder and metal contacts

#### Internal devices

- Data storage and optical drives
- Electrical and data connections (internal and external)

#### External elements

- External cables and power packs
- External housing and enclosure materials
- External casing and surfaces of peripheral devices

#### Displays

- Display screen glass
- Liquid Crystal Display unit
- Screen LED backlight units

#### Batteries

- Notebook or tablet batteries

Homogeneous parts with a weight of below 25 g and the metal chassis of the product are excluded from the scope of this criterion.

The hazard classifications in Table 2.1 generally refer to substances. However, if information on substances cannot be obtained, the classification rules for mixtures apply. The most recent classification rules adopted by the European Union shall take precedence over the listed hazard classifications or risk phrases.

The use of substances or mixtures which change their properties upon processing (e.g., become no longer bioavailable, undergo chemical modification) so that the identified hazard no longer applies are exempted from the above requirements. This shall include polymers that have been modified to incorporate a function and additives which become covalently bonded with polymers.

Table 2.1: Restricted hazard classifications and risk phrases and their CLP categorisation

<b>Acute toxicity</b>	
<b>Category 1 and 2</b>	<b>Category 3</b>
H300 Fatal if swallowed (R28)	H301 Toxic if swallowed (R25)
H310 Fatal in contact with skin (R27)	H311 Toxic in contact with skin (R24)
H330 Fatal if inhaled (R23/26)	H331 Toxic if inhaled (R23)
H304 May be fatal if swallowed and enters airways (R65)	EUH070 Toxic by eye contact (R39/41)

<b>Specific target organ toxicity</b>	
<b>Category 1</b>	<b>Category 2</b>
H370 Causes damage to organs (R39/23, R39/24, R39/25, R39/26, R39/27, R39/28)	H371 May cause damage to organs (R68/20, R68/21, R68/22)
H372 Causes damage to organs (R48/25, R48/24, R48/23)	H373 May cause damage to organs (R48/20, R48/21, R48/22)

<b>Carcinogenic, mutagenic or toxic for reproduction</b>	
<b>Category 1A and 1B</b>	<b>Category 2</b>
H340 May cause genetic defects (R46)	H341 Suspected of causing genetic defects (R68)
H350 May cause cancer (R45)	H351 Suspected of causing cancer (R40)
H350i May cause cancer by inhalation (R49)	
H360F May damage fertility (R60)	H361f Suspected of damaging fertility (R62)
H360D May damage the unborn child (R61)	H361d Suspected of damaging the unborn child (R63)
H360FD May damage fertility. May damage the unborn child (R60, R60/61)	H361fd Suspected of damaging fertility. Suspected of damaging the unborn child (R62/63)
H360Fd May damage fertility. Suspected of damaging the unborn child (R60/63)	H362 May cause harm to breast fed children (R64)
H360Df May damage the unborn child. Suspected of damaging fertility (R61/62)	

<b>Hazardous to the aquatic environment</b>	
<b>Category 1 and 2</b>	<b>Category 3 and 4</b>
H400 Very toxic to aquatic life (R50)	H412 Harmful to aquatic life with long-lasting effects (R52/53)
H410 Very toxic to aquatic life with long-lasting effects (R50/53)	H413 May cause long-lasting effects to aquatic life (R53)
H411 Toxic to aquatic life with long-lasting effects (R51/53)	

<b>Hazardous to the ozone layer</b>	
EUH059 Hazardous to the ozone layer (R59)	

**2(b)(ii) Derogations applying to substances with a favourable hazard profile and those required for the function of the product**

In accordance with Article 6(7) of Regulation (EC) No 66/2010 the substance groups in table 2.2 are specifically derogated from the requirements set out in Article 2(b)(i) and in accordance with the derogation conditions stipulated.

*Table 2.2. Derogation of substance groups by hazard classification*

<b>Substance group</b>	<b>Sub-components</b>	<b>Hazard derogations</b>	<b>Derogation conditions</b>
<i>1. Reflecting substitutes with an improved hazard profile</i>			
1.1 Flame retardants	Printed Circuit Boards	<i>H412, H413</i>	<i>- Control of hazardous reaction products.</i>
	Internal connectors and switches	<i>H413</i>	<i>-</i>
	Plastic enclosures and casings	<i>H412, H413</i>	<i>- Control of PFOA emissions from PTFE production</i>
	Recycled plastic in enclosures and casings	<i>FR's (H412, H413) and their synergists (H351) that are not REACH restricted or identified as SVHC's</i>	<i>- Declaration of FR and synergist by the component supplier.</i>

1.2 Plasticisers	External cables	<i>H413</i>	-
	Recycled content (all components)	<i>Substances present in recycle that are not REACH restricted or identified as SVHC's</i>	<i>- Declaration of the plasticiser by the component supplier.</i>
<b>2. Substances required for the function of the product</b>			
2.1 LED doping	Chip and diode	<i>H301, H331, H400, H410</i>	<ul style="list-style-type: none"> <li>- <i>Control of workforce exposure during manufacturing</i></li> <li>- <i>LED specification to minimise chip thickness</i></li> </ul>

**Assessment and verification:** The applicant shall obtain declarations of compliance from, as a minimum suppliers of the specified component parts. This shall declare that, where present in the specified component parts, the following substances do not meet the criteria for classification with one or more of the hazard classifications or risk phrases listed in table 2.1:

- Flame retardants in PCB's, CPU's, electrical/data connectors, disc/optical drives and computer casings;
- Plasticisers in cables, power packs and wiring
- Plastic stabilisers in external cables
- Plastic colorants in external casings
- Biocides in plastic and rubber parts of peripheral devices and external cables
- Solders and metal contacts on PWB and connecting internal devices
- Thermal conducting elements of CPU's and GPU's
- Coolants used within CPU/GPU cooling systems
- Battery electrolytes in portable devices
- External metals and associated coatings
- Screen glass fining agents
- Liquid crystals in TFT display units
- LED doping and luminescent materials

Where substances are derogated in 2(b)(ii) then the declaration shall specifically identify those derogated substances and provide supporting evidence showing how the derogation conditions are to be met.

The following technical information shall be provided to support the declaration of classification or non-classification for each substance identified as being used:

- (i) *For substances that have not been registered under Regulation (EC) No 1907/2006 or which do not yet have a harmonised CLP classification:* Information meeting the requirements listed in Annex VII to that Regulation.
- (ii) *For substances that have been registered under Regulation (EC) No 1907/2006 and which do not meet the requirements for CLP classification:* Information based on the REACH registration dossier confirming the non-classified status of the substance.;
- (iii) *For substances that have a harmonised classification or are self-classified:* SDS shall be provided where available. If these are not available or the substance is self-classified then information shall be provided relevant to the substances hazard classification according to Annex II to Regulation (EC) No 1907/2006;

Where self-classifications are made the robustness of the evidence on which they are based shall be independently verified by a third party toxicologist or by reference to Governmental or third party verified evidence studies. Evidence from the use of third party verified screening tools which are equivalent, or can be read across, to the hazard list in table 2.1 shall be accepted.

Where SDS are provided they shall be completed in accordance with the guidance in Section 2,3,9,10, 11 and 12 of Annex II to Regulation (EC) 1907/2006 (requirements for the compilation of SDS).

### **2(c) Restriction of substances in specified component parts**

The final product and, where stipulated, specified component parts shall not contain the hazardous substances listed in table 2.3 at greater than the specified concentration limits and/or shall comply with the specified restrictions. The restrictions in the Table 2.3 take precedence over any derogations listed in Criterion 2(b)(ii).

Verification requirements are specified in table 2.3. Laboratory testing, where required, shall be carried out for each production model. Testing shall be carried out annually during the license period in order to demonstrate ongoing compliance.

Table 2.3. Restriction of substances in component parts

Substance group	Restriction	Concentration limit	Verification
1. Plasticisers	DEHP, BBP, DBP, DIBP, DMEP, DIPP, DPP, DnPP and DnHP shall not be used in external cables and power packs.	Sum total concentration limit of 0.1%	<i>Test method to be specified</i>
	Medium Chained Chlorinated Paraffins (MCCP's) Alkanes C14-17 shall not be used in external cables and power packs.	Sum total concentration limit of 0.1%	<i>Test method to be specified</i>
2. Plastic stabilisers	Lead shall not be present in external cables, wires and connecting cords.	Concentration limit of 0.03%.	<i>IEC 62321-3-1</i>
3. Plastic colourants	Colourants containing lead, chromium VI and cadmium, including the specific compounds included in the Candidate List, shall not be used.	<i>Not applicable</i>	<i>The potential to specify testing is to be discussed.</i>
	Pigments and dyes used to colour ABS shall be colour fast.	<i>Not applicable</i>	<i>DIN 53775-3 A migration rating of 5 is proposed.</i>
4. Biocides	Biocides intended to provide a hygiene (anti-bacterial) function shall not be added to keyboards and peripherals.		<i>Self-declaration from component suppliers.</i>
5. Plastic contaminants	The 18 listed Polycyclic Aromatic Hydrocarbons (PAHs) shall not be present at or greater than the individual and sum total concentration limits in the external surfaces of: <ul style="list-style-type: none"> <li>- Notebooks and tablets;</li> <li>- Peripheral keyboards,</li> <li>- Mice,</li> <li>- Stylus and trackpads;</li> <li>- External power cables.</li> </ul>	Individual concentrations for the eight REACH restricted PAHs shall be 1 ppm  The sum total concentration of the 18 listed PAHs shall not be greater than 10 ppm	<i>ISO 21461 for rubber parts (to be discussed)</i>  <i>ZEK 01.4-08 for plastic parts</i>
6. Mercury in backlights	Mercury shall not be present in backlights. <i>Products shall display a mercury free logo.</i>	<i>Trace limit to specified</i>	<i>Declaration that alternative mercury-free technologies are used.</i>

7. Metal solder	RoHS exemption 7b for the use of lead solder in small-scale servers shall not be accepted for Ecolabelled computers.	<i>Not applicable</i>	<i>Declaration by the manufacture specifying the alternative solder specified.</i>
8. Electrical contacts	RoHS exemption 8b for the use of cadmium shall not be accepted for Ecolabelled computers.	<i>Not applicable</i>	<i>Declaration by the manufacture detailing the alternative contact material specified.</i>
9. Thermal conductors	Beryllium and its compounds shall not be present in the specified parts unless it is in a ceramic form.	Concentration limit 0.1%	<i>Self-declaration from component suppliers.</i>
10. External steel parts	Nickel migration from in stainless steel shall be restricted where any external part will be in close contact with the skin.	Migration from metal surfaces of >0.5 ug/cm <sup>2</sup> /week	<i>EN 1811 with detection using GC-ICP-MS</i>
11. External metallic coatings	Hexavalent chromium shall not be present in metallic coatings applied to parts of a computer.	<b><i>To be specified</i></b>	<i>IEC 62321-7-1</i>
12. Screen glass	Arsenic and its compounds shall not be used in the manufacturing of screen glass.	<i>Concentration limit 0.0010%</i>	<i>Verification shall be obtained from the glass manufacturer.</i>

**Assessment and verification:** The applicant shall provide a declaration of compliance with the restriction list in table 2.3 supported by the verification evidence requested for the substances relevant to the final product. Testing, where required, shall be carried out upon application for each production model licensed and once a year thereafter, with results then to be communicated to the relevant competent body.

Failure of a test result during a license period shall result in retesting for the specific model. If the second test fails then the license shall be suspended for the specific product line. Remedial action will then be required in order to re-instate the license.