

EN

ANNEX

EU ECOLABEL CRITERIA AND ASSESSMENT AND VERIFICATION
REQUIREMENTS

Criteria for awarding the EU Ecolabel to stationary and portable computers:

1. Energy Consumption
 - (a) Energy savings
 - (b) Power management
 - (c) Graphics capabilities
 - (d) Internal power supplies
 - (e) Enhanced performance displays
2. Restriction and substitution of hazardous substances in the product and its sub-assemblies and component parts
 - (a) Substances of Very High Concern
 - (b) Restrictions on CLP hazard classifications and Article 57 criteria
3. Lifetime extension
 - (a) Durability testing for portable computers
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 - (c) Data storage drive reliability and protection
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4. Design, material selection and end-of-life management
 - (a) Material selection and compatibility with recycling
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6. Further criteria
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7. Information
 - (a) User instructions
 - (b) Information appearing on the EU Ecolabel

Assessment and verification

(a) Requirements

The specific assessment and verification requirements are indicated within each criterion.

Where the applicant is required to provide declarations, documentation, analyses, test reports, or other evidence to show compliance with the criteria, these may originate from the applicant and/or his supplier(s) and/or their supplier(s), as appropriate.

Where appropriate, test methods other than those indicated for each criterion may be used if these are described in the user manual of the Ecolabel criteria application and the competent body assessing the application accepts their equivalence.

Competent bodies shall preferentially recognise tests which are accredited according to ISO 17025 and verifications performed by bodies which are accredited under the EN 45011 standard or an equivalent international standard.

Where appropriate, competent bodies may require supporting documentation and may carry out independent verifications.

Criterion 1. Energy consumption

1(a) Total energy consumption of the computer

The total energy consumption of computers shall meet the appropriate energy-efficiency requirements set out in the Agreement as amended by Energy Star v6.1.

Capability adjustments allowed under the Agreement ¹ as amended by Energy Star v6.1 may be applied at the same level, with the exception of:

- Discrete Graphics Processing Units (GPUs): See sub-criterion 1(c);
- Internal power suppliers: See sub-criterion 1(d)
- Enhanced-performance integrated displays: See sub-criterion 1(e);

Assessment and verification: The applicant shall submit a test report for the computer model(s) carried out according to the Energy Star v6.1 test methods for computers which are specified in the Eligibility Criteria.

Accompanying text proposed to appear in the Commission statement: 'No later than 2 years after the EU Ecolabel criteria for Computers have entered into force, the Commission shall evaluate the market penetration of Computers meeting the eligibility criteria of the Energy Star v6.1 requirements and, if justified, present to the EUEB and Regulatory Committee an amendment of this criterion.'

1(b) Power management

Whenever the user or a software attempts to deactivate the default power management settings, a warning message shall be displayed communicating to the user that an energy saving setting will be disabled and giving the option to retain the setting.

Assessment and verification: The applicant shall provide the description of the power management settings that appears in the model's user manual, accompanied by screen shots of example instances when warning messages are displayed.

1(c) Graphics capabilities

The following Functional Adder $TEC_{graphics}$ allowances for discrete graphics cards (dGfx) shall apply and supercede those of the Energy Star v6.1 Eligibility Criteria.

Table 1. Functional Adder allowances for discrete graphics cards (dGfx) in desktop, integrated desktop and notebook computers

dGfx category (Gigabytes/second) ¹	TEC Allowance (kWh/year)	
	Desktop and integrated desktops	Notebooks
G1 (≤ 16 FB_BW)	18	7
G2 ($16 < \text{FB_BW} \leq 32$)	30	11
G3 ($32 < \text{FB_BW} \leq 64$)	38	13
G4 ($64 < \text{FB_BW} \leq 96$)	54	20

¹ Regulation (EC) No 106/2008 of 15 January 2008 on a Community energy-efficiency labelling programme for office equipment

G5 (96<FB_BW≤128)	72	27
G6 (FB_BW>128 with data width <192 bit)	76	33
G7 (FB_BW>128) with data width ≥192 bit)	90	60
Notes: 1. Categories are defined according to the frame buffer bandwidth in gigabytes per second (GB/s)		

The exemption for Category D desktop and integrated desktop computers described in Annex 1, point 1.1.4 of Regulation (EU) No 617/2013 on ecodesign requirements for computers and computer servers ² shall not be permitted for ecolabelled products.

Assessment and verification: The applicant shall submit a test report for the computer model(s) carried out according to the Energy Star v6.1 test methods for computers which are specified in the Eligibility Criteria.

1(d) Internal Power Supplies

Internal power supplies in desktop and integrated desktop computers shall qualify for the TEC_{PSU} allowances of Energy Star v6.1 and shall achieve minimum efficiencies as a proportion of the rated output current of 0.87 at 20%, 0.90 at 50% and 0.87 at 100%.

Assessment and verification: The applicant shall declare compliance of the models internal power supply according to requirements of the test report for Energy Star v6.1.

1(e) Enhanced-performance displays

Integrated desktop and notebook computers that incorporate Enhanced Performance Displays shall automatically adjust the picture brightness to the ambient light conditions. This Automatic Brightness Control (ABC) function shall be installed as the default setting. The ABC shall be validated according to the following test procedure:

$$\text{Test (i)} \quad \left(\frac{P_{50} - P_{10}}{P_{10}} \right) \geq 5 \quad \text{Test (ii)} \quad \left(\frac{P_{100} - P_{50}}{P_{50}} \right) \geq 5 \quad \text{Test (iii)} \quad P_{300} \geq P_{100}$$

Where P_n is the Power consumed for On Mode with ABC enabled at n lux with a direct light source.

Assessment and verification: The applicant shall submit a test report for the computer model showing compliance with the specified validation procedure.

² Commission Regulation (EU) No 617/2013 of 26 June 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for computers and computer servers

Criterion 2. Restriction and substitution of hazardous substances in the product and its sub-assemblies and component parts

2(a) Restriction on Substances of Very High Concern (SVHC's)

The product and its associated sub-assemblies and components as defined below shall not contain substances that have been identified according to the procedure described in Article 59(1) of Regulation (EC) No 1907/2006 (the 'REACH Regulation') which establishes the candidate list for substances of very high concern in concentrations of greater than 0.10% (weight by weight).

The absence of the above referred to substances shall be declared for the product and, as a minimum, the following sub-assemblies:

All products

- Populated motherboard (including CPU, RAM and graphics units)
- Internal or external Power Supply Units
- External power cable
- Internal cables, cords and connectors
- Data storage devices (HDD or SSD)
- Optical Drive (if installed)
- Chassis, casing and bezel

Integrated desktops, portable all-in-one computers and notebooks

- Display unit (including backlighting)

Desktops and integrated desktops

- Wired or wireless keyboard
- Wired or wireless mouse

Notebooks and portable all-in-one computers

- Battery

In communicating this requirement to suppliers of the listed sub-assemblies applicants may pre-screen the candidate list based on the relevance of substances to the product using the IEC 62474 declarable substance list.

No derogation shall be given to the above referred to substances if they are present in an article ('the product') or in any homogeneous part of a complex article ('associated sub-assemblies') in concentrations greater than 0,10 % (weight by weight).

Assessment and verification: The applicant shall compile declarations of the non-presence of candidate list substances for the product and, as a minimum, the listed sub-assemblies. Where declarations are made based on a pre-screening of the candidate list using IEC 62474 the screened list given to sub-assembly suppliers shall also be provided by the applicant. 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) Restriction of CLP hazard classifications and Article 57 criteria

Hazard classifications and criteria that shall apply

The product and its associated sub-assemblies and components shall not contain substances that meet the criteria for classification as toxic, hazardous to the environment, carcinogenic, mutagenic or toxic for reproduction (CMR), in accordance with Regulation (EC) No 1272/2008 ('the CLP Regulation') and Council Directive 67/548/EC ('the DSD Directive').

Substances that meet the aforementioned criteria shall not be present in the product and its associated sub-assemblies and components at concentrations greater than 0.10%. Specific concentration limits identified in Annex VI of the CLP Regulation or in sub-criterion 2(b)(ii) shall take precedence over this generic concentration limit.

The CLP hazard classifications and REACH Article 57 criteria that shall apply are listed in Table 2. For the purpose of this product group the hazard classifications and Article 57 criteria are grouped based on their hazardous properties. Derogations shall be granted for individual hazard classifications or groups of hazards according to the requirements in Appendix 1.

Table 2. CLP hazard classifications and REACH Article 57 criteria that apply to the product

Group 1 hazards	
<i>The following hazards, or combinations of hazards, identify a substance as being within group 1:</i>	
<ul style="list-style-type: none"> ○ CMR Category 1A or 1B ○ PBT and vPvB substances ○ Endocrine disruptors, neurotoxins or sensitisers of equivalent concern. ○ vP or vB (REACH definitions) <i>in combination with</i> Category 1 hazards to the aquatic environment, Category 1 and 2 acute toxins or Category 1 STOT 	
Carcinogenic, mutagenic or toxic for reproduction (CMR)	
<i>CLP Category 1A and 1B</i>	
H340 May cause genetic defects (R46)	
H350 May cause cancer (R45)	
H350i May cause cancer by inhalation (R49)	
H360F May damage fertility (R60)	
H360D May damage the unborn child (R61)	
H360FD May damage fertility. May damage the unborn child (R60, R60/61)	
H360Fd May damage fertility. Suspected of damaging the unborn child (R60/63)	
H360Df May damage the unborn child. Suspected of damaging fertility (R61/62)	
Hazardous to the aquatic environment	
<i>CLP Category 1</i>	
H400 Very toxic to aquatic life (R50)	
H410 Very toxic to aquatic life with long-lasting effects (R50/53)	
Acute toxicity	

CLP Category 1 and 2	
H300 Fatal if swallowed (R28)	
H310 Fatal in contact with skin (R27)	
H330 Fatal if inhaled (R23/26)	
H304 May be fatal if swallowed and enters airways (R65)	
Specific target organ toxicity (STOT)	
CLP Category 1	
H370 Causes damage to organs (R39/23, R39/24, R39/25, R39/26, R39/27, R39/28)	
H372 Causes damage to organs (R48/25, R48/24, R48/23)	

Group 2 hazards	
<i>The following hazards or combinations of hazards identify a substance as being within group 2:</i>	
<ul style="list-style-type: none"> ○ Category 1 aquatic toxins ○ Category 2 CMR, Category 1 and 2 acute toxins or Category 1 STOT ○ P and B (REACH definitions) ○ P or B (REACH definitions) <i>in combination with</i> Category 2 CMR, Category 2 and 3 hazards to the aquatic environment, Category 3 acute toxins or Category 2 STOT ○ B and non-rapidly degradable (CLP definitions) <i>in combination with</i> Category 2 CMR, Category 3 acute toxins or Category 2 STOT 	
Carcinogenic, mutagenic or toxic for reproduction	
	CLP Category 2
	H341 Suspected of causing genetic defects (R68)
	H351 Suspected of causing cancer (R49)
	H361f Suspected of damaging fertility (R62)
	H361d Suspected of damaging the unborn child (R63)
	H361fd Suspected of damaging fertility. Suspected of damaging the unborn child (R62/63)
	H362 May cause harm to breast fed children (R64)
Hazardous to the aquatic environment	
CLP Category 1 and 2	CLP Category 2 and 3
H400 Very toxic to aquatic life (R50)	H411 Toxic to aquatic life with long-lasting effects (R51/53)
H410 Very toxic to aquatic life with long-lasting effects (R50/53)	H412 Harmful to aquatic life with long-lasting effects (R52/53)
Acute toxicity	
	CLP Category 3
	H301 Toxic if swallowed (R25)
	H311 Toxic in contact with skin (R24)
	H331 Toxic if inhaled (R23)
	EUH070 Toxic by eye contact (R39/41)

Specific target organ toxicity (STOT)	
	CLP Category 2
	H371 May cause damage to organs (R68/20, R68/21, R68/22)
	H373 May cause damage to organs (R48/20, R48/21, R48/22)

Group 3 hazards	
Hazardous to the aquatic environment	
CLP Category 2	CLP Category 3 and 4
H411 Toxic to aquatic life with long-lasting effects (R51/53)	H412 Harmful to aquatic life with long-lasting effects (R52/53)
	H413 May cause long-lasting effects to aquatic life (R53)
Acute toxicity	
	CLP Category 3
	H301 Toxic if swallowed (R25)
	H311 Toxic in contact with skin (R24)
	H331 Toxic if inhaled (R23)
	EUH070 Toxic by eye contact (R39/41)
Specific target organ toxicity (STOT)	
	CLP Category 2
	H371 May cause damage to organs (R68/20, R68/21, R68/22)
	H373 May cause damage to organs (R48/20, R48/21, R48/22)

The hazard classifications in Table 2 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 as Adaptations to Technical Progress (ATPs) shall take precedence when determining hazard classifications.

2(b)(i) The scope of restrictions that shall apply to the product

In accordance with the provision within Article 6(7) of Regulation (EC) No 66/2010 application of 2(b) to the product as a whole shall be derogated and instead the scope of substance groups to which the criterion shall apply, and the associated sub-assemblies and components for which verification shall be provided, shall be defined as those in Table 3.

The restrictions and derogations applying to the sub-assemblies and components identified in Table 3 are listed in Appendix 1. The sub-assemblies and components of product shall not contain the hazardous substances listed in Appendix 1 at or above the specified concentration limits or according to the restrictions stipulated.

The restrictions contained in Appendix 1 shall be communicated to suppliers and agents responsible for the manufacturing of the specified sub-assemblies and components.

Verification and testing requirements are specified for sub-assemblies, components and production stages.

Table 3. Substance groups to which hazard restrictions shall apply

Substance group	Sub-assemblies or components for which verification shall be provided
Flame retardants	<ul style="list-style-type: none"> - Printed Wiring Boards >10 cm² including the populated motherboard, - Central Processing Units (CPU's) - Data storage drives, - Internal and external power supplies - Internal connectors and sockets - Plastic casings and bezels
Plasticisers	<ul style="list-style-type: none"> - External power cables - Internal wiring - Plastic casings
Coolants	<ul style="list-style-type: none"> - CPU and GPU heat transfer systems
Polymer stabilisers	<ul style="list-style-type: none"> - External power cables
Polymer colourants	<ul style="list-style-type: none"> - Plastic casings and bezels
Polymer contaminants	<ul style="list-style-type: none"> - External plastic and man-made rubber
Biocides	<ul style="list-style-type: none"> - Plastic and rubber parts of peripheral devices and external cables
Metal solder and contacts	<ul style="list-style-type: none"> - Printed Wiring Boards - Contacts between internal components
Metallic coatings	<ul style="list-style-type: none"> - Metal casings and bezels
Vapour discharge	<ul style="list-style-type: none"> - LCD screen backlight units
Fining agents	<ul style="list-style-type: none"> - Screen glass
Cleaning agents and degreasers	<ul style="list-style-type: none"> - All internal components subject to treatment in the final assembly plant
Electrolytes	<ul style="list-style-type: none"> - Batteries in portable devices
Doping and luminescence	<ul style="list-style-type: none"> - LED backlighting

Assessment and verification: The applicant shall provide declarations of compliance with the requirements in Appendix 1. These shall be supported, where stipulated, by valid test reports and toxicological data confirming the hazard classification or the concentration of substances that are present in the specified sub-assemblies or component parts of the product.

Test reports, where required, shall be valid at the time of application for a production model. Applicants shall additionally identify where derogated substances are present in the product and provide supporting evidence showing how the derogation conditions have been met.

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

- (i) The substance's CAS, EC or list number;
- (ii) Harmonised CLP hazard classifications;
- (iii) Self-classification entries in ECHA's REACH register.

Where a classification is recorded as 'data lacking' or 'inconclusive' according to ECHA's REACH register database, or where the substance has not yet been registered under the

REACH system, toxicological data shall be provided that is sufficient to support conclusive self-classifications in accordance with Annex II of the CLP Regulation and ECHA's supporting guidance. In the above mentioned cases self-classifications shall be verified, with the following information sources being accepted:

- (i) A Safety Data Sheet fully completed in accordance with Section 2,3,9,10, 11 and 12 of Annex II of the CLP Regulation;
- (ii) Toxicological studies by ECHA Peer Agencies, Governmental regulatory bodies or Intergovernmental bodies;
- (iii) An expert review of scientific literature and existing testing data, where necessary supported by results from new testing carried out by independent laboratories using methods approved by ECHA;
- (iv) A report prepared by a toxicologist accredited to an independent hazard assessment scheme in accordance with the guidelines in Annexes I and II of ISO 17065. Schemes shall be based on the GHS or CLP hazard classification system.

Information on the hazardous properties of substances may be generated by means other than tests, for instance through the use of alternative methods such as in vitro methods, by quantitative structure activity models or by the use of grouping or read-across in accordance with Annex XI to Regulation (EC) No 1907/2006.

2(b)(ii) Substance declarations for sub-assemblies and components

Applicants shall request substance declarations for the associated sub-assemblies and components identified in Table 4. For each identified substance group the supplier, or suppliers, shall declare the CAS numbers for the substances used to fulfil the function.

Table 4. Substance groups for which CAS number declarations are required

Substance group	Sub-assemblies or components requiring declarations
Colourants	Plastic casing and bezel, keyboard, mouse
Stabilisers	External cables Internal electrical wiring

Assessment and verification: The applicant shall compile supplier declarations listing the CAS numbers of the substances used in the specified sub-assemblies and components.

Criterion 3. Product lifetime extension

3(a) Durability testing of portable computers

3(a)(i) Tests that shall apply to notebook computers

The notebook computer model shall pass durability tests. Each model shall be verified to function as specified and meet the stipulated performance benchmarks after performing the mandatory tests in Table 5 and a minimum of one additional test selected from Appendix 2..

Table 5. Mandatory durability test specification for notebook computers

Test	Test conditions and performance benchmark	Test method
Resistance to shock	<p><i>Specification:</i></p> <p>A40g half-sine pulse shall be applied for duration of 6 ms three times each to the bottom, left, right and back side.</p> <p><i>Functional requirement:</i></p> <p>The notebook shall be switched on and running a software application during the test. It shall continue to function following the test.</p>	IEC 60068 Part 2: Ea
Resistance to vibration	<p><i>Specification:</i></p> <p>A randomised vibrations in the frequency 20-2000 Hz, 1.04 Grms, shall be applied for 1 hour each to the bottom, left, right and back side.</p> <p><i>Functional requirement:</i></p> <p>The notebook shall be switched on and running a software application during the test. It shall continue to function following the test.</p>	IEC 60068 Part 2: Fh (Random test)
Accidental drop	<p><i>Specification:</i></p> <p>The notebook shall be dropped from 76 cm of height onto a surface consisting of 5.0 cm of plywood upon concrete. 4 drops shall be made per face, edge and corner.</p> <p><i>Functional requirement:</i></p> <p>The notebook shall be switched off during the test but shall successfully boot up following each test. The casing shall remain integral and the screen undamaged following the test.</p>	IEC 60068 Part 2: Ec (Freefall, procedure 1)

3(a)(ii) Tests that shall apply to tablet and two-in-one computers

The tablet computer model or the tablet component of a two-in-one computer model shall pass durability tests. Each model shall be verified to function as specified and meet the stipulated performance benchmarks for each test as specified in Table 6.

Table 6. Mandatory durability test specification for tablet and two-in-one notebook computers

Accidental drop	<p><i>Specification:</i></p> <p>The tablet shall be dropped from 76 cm of height onto a surface consisting of 5.0 cm of plywood upon concrete. 4 drops shall be made per back face, edge and corner.</p>	IEC 60068 Part 2: Ec (Freefall, procedure 1)
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	<p><i>Functional requirement:</i></p> <p>The tablet shall be switched off during the test but shall successfully boot up following each test. The casing shall remain integral and the screen undamaged following the test.</p>	
Screen resilience	<p><i>Specification:</i></p> <p>60kg/cm² static load to be applied to the centre of the screen lid with the notebook placed on a flat surface. The test shall be repeated x times.</p> <p>The screen shall be flexed by pushing and pulling each top corner with a force of 20 N applied 2,500 times in each direction.</p> <p><i>Functional requirement:</i></p> <p>The screen surface and pixels shall be inspected for the absence of lines, spots and cracks after each application of a loading.</p>	The test equipment and setup used shall be confirmed by the applicant.

Assessment and verification: The applicant shall provide test reports showing that the model has been tested and has met the functional performance requirements for durability. Testing and verification shall be carried out and certified by a third party.

3(b) Battery quality and lifetime

- a) Notebooks shall provide the user with a minimum of 7 hours of battery life after the first full charge. This shall be benchmarked using the BAPCo Mobilemark ‘office productivity’ scenario.
- b) Notebook and tablet batteries shall meet the following performance requirements, dependant on whether the battery can be changed without tools:
 - (i) Models in which batteries can be changed without tools shall maintain 80% of their declared initial capacity after 750 charging cycles;
 - (ii) Models in which batteries cannot be changed without tools shall maintain 80% of their declared initial capacity after 1000 charging cycles.

This performance shall be verified for battery packs or their individual cells according to the IEC EN 61960 ‘endurance in cycles’ test, to be carried out at 25°C and at a rate of either 0.2 I_t A or 0.5 I_t A (accelerated test procedure). Partial charging may be used to comply with this requirement (see sub-criterion 3(c))

- c) The performance requirements described in 3(b) may be achieved using factory installed software which partially charges the battery up to 80% of its capacity. In this case partial charging shall be set as the default charging routine and the battery performance shall then be verified according to the requirements in 3(b). The maximum partial charge shall provide a battery life that complies with sub-criterion 3(a).
- d) The longer charging cycles required by this criterion shall be reflected in a longer guarantee period for the battery provided with the product. A minimum of a one year guarantee shall be provided.
- e) Information about known factors influencing the lifetime of batteries as well as instructions on how the user can prolong battery life shall be included in factory installed energy management software, written user instructions and posted on the manufacturer’s website.

Assessment and verification: The applicant shall provide a third party test report showing that the battery packs or cell types used in the product meet the specified battery life and charging cycles. Partial charging and the accelerated test method specified by IEC EN 61960 may be used to comply. A demonstration version of the energy management software and the text content of user instructions and website postings shall additionally be provided.

3(c) Data storage drive reliability and protection

i. Stationary computers

The data storage drive or drives used in desktops, workstations and thin clients marketed for business or enterprise use shall have a projected Annual Failure Rate (AFR) of less than 0.9%. Small-scale servers shall have a projected AFR of less than 0.6% and a Bit Error Rate of >1 in 10^{16} bits. The AFR shall be determined based on Bellcore TR-NWT-000332, issue 6, 12/97 or field collected data.

ii. Portable computers

The primary data storage drive used in notebooks shall be specified to protect the drive and data from shock and vibration. The drive shall comply with one of the following:

- (i) The HDD drive shall be designed to withstand a half sine wave shock of 400 G (operating) and 900 G (non-operating) for 2 ms without damage to data or operation of the drive.
- (ii) The HDD drive head should retract from the disc surface in less than or equal to 300 milliseconds upon detection of the notebook having been dropped.
- (iii) A solid state storage drive technology such as SSD or eMMC is used.

Assessment and verification: The applicant shall provide a specification for the drive or drives integrated into the product. This shall be obtained from the drive manufacturer and shall be supported by an independently certified technical report verifying that the drive complies with the specified performance requirements.

3(e) Upgradeability and Repairability

For the purpose of upgrading older components or undertaking repairs and replacements of worn out components or parts, the following criteria shall be fulfilled:

- (a) **Design for upgrades and repair:** The following components of computers shall be easily accessible and exchangeable by the use of universal tools (i.e. widely used commercially available tools as screwdriver, spatula, plier, or tweezers):
 - (i) HDD/SSD,
 - (ii) Memory,
 - (iii) Screen assembly and LCD backlight (where integrated),
 - (iv) Keyboard and mouse pad (where used), and
 - (v) Cooling fan.
- (b) **Battery replacement:** The battery shall be easy to extract by one person (either the user or repair service provider). The following specific requirements apply:
 - (i) For all products batteries shall not be glued or welded into a product;
 - (ii) For notebooks and portable all-in-one computers it shall be possible for the user to extract the battery without tools;

- (iii) For sub-notebooks and ultrabooks it shall be possible to extract the battery in a maximum of three steps using a screwdriver;
 - (iv) For tablets and two-in-one notebooks it shall be possible to extract the battery in a maximum of four steps using a screwdriver and spudger;
 - (v) For sub-notebooks, ultrabooks, tablets and two-in-one computers simple instructions about how the battery packs are to be removed shall be marked on the base cover of the product.
- (c) Repair manual: The applicant shall provide clear disassembly and repair instructions (e.g. hard or electronic copy, video) and make them publicly available, to enable a non-destructive disassembly of products for the purpose of replacing key components or parts for upgrades or repairs. Additionally, a diagram shall be provided on the inside of the casing of stationary computers showing the location of the components listed in (a) can be accessed and exchanged. For mobile computers a diagram showing the location of the battery, data storage drives and memory shall be made available in pre-installed user instructions and via the manufacturers website.
- (d) Repair Service / Information: Information should be included in the user instructions or the manufacturer's website to let the user know where to go to obtain professional repairs and servicing of the computer, including contact details as appropriate. During the guarantee period referred to in (f) this may be limited to the applicant's Authorised Service Providers.
- (e) Availability of spare parts: The applicant shall ensure that original or backwardly compatible spare parts, including rechargeable batteries (if applicable), are publicly available for at least five years following the end of production for the model.
- (f) Guarantee: The applicant shall provide at no additional cost a minimum of a three year guarantee during which time they shall ensure the goods are in conformity with the contract of sale. This guarantee shall include a service agreement with pick-up and return.

Assessment and verification: The applicant shall declare the compliance of the product with these requirements to the competent body. Additionally, the applicant shall provide:

- (i) A copy of the guarantee or service agreement
- (ii) A copy of the repair manual and supporting diagrams
- (iii) A copy of the user instructions
- (iv) A description supported by photographs showing compliance for battery extraction
- (v) A picture of the battery replacement instructions on the base of the product

Criterion 4. Design, material selection and end-of-life management:

4(a) Material selection and compatibility with recycling

- a) Recyclability of plastics:
- (i) Parts with a weight greater than 25 grams shall consist of a single polymer or a polymer blend or alloy compatible with recycling;
 - (ii) Parts with a weight greater than 25 grams shall not be painted or coated in such a form that it makes them incompatible with recycling;
 - (iii) Casings, enclosures and bezels shall not contain molded-in or glued on metal unless they are easy to remove with commonly available tools;

- (iv) Casings, enclosures and bezels incorporating flame retardants shall be compatible with recycling.
- (v) Printed Wiring Boards greater than 10 cm² shall not contain aluminium based flame retardants or additives.
- b) **Material information to facilitate recycling:** Plastic parts with a mass greater than 25 grams shall be marked in accordance with ISO 11469 and ISO 1043, sections 1-4. Plastic parts incorporating flame retardants may additionally be marked with the CAS number. For plastic parts > 100 grams, the markings should be large enough and located in a visible position in order to be easily identified.

Exemptions are made in the following cases:

- (i) *Where the marking would impact on performance or functionality of the plastic part including optical plastics;*
- (ii) *Where parts cannot be marked because there is not enough available appropriate surface area for the marking to be of a legible size to be identified by a recycling operator;*
- (iii) *Where marking is technically not possible due to the moulding method; or*
- (iv) *Where the addition or location of marking causes unacceptable defect rates under quality inspection, leading to unnecessary wastage of materials.*
- c) **Recycled content:** The product shall contain on average a minimum 10% content post-consumer recycled plastic measured as a percentage of the total plastic (by weight) in the product excluding Printed Wiring Boards. Where the recycled content is greater than 25% a declaration may be made in the text box accompanying the Ecolabel (see Criterion 7(a)). *Products with a metal casing are exempt from this sub-criterion.*

Assessment and verification:

The applicant shall provide the Competent Body with an exploded diagram of the computer in written or audio-visual format. This shall identify the plastic parts greater than 25 grams by their weight, their polymer composition, and their ISO 11469 and 1043 markings. The dimensions and positions of the marking shall be illustrated and, where exemptions apply, technical justifications provided.

The applicant shall verify compatibility with recycling by providing evidence that the plastics either individually or combined do not impact the technical properties of the resulting recycled plastics in such a way that they cannot be used again in electronic products. This could include:

- A declaration from an experienced plastics recycler or permitted treatment operation in accordance with Article 23 of Directive 2008/98/EC (the Waste Framework Directive);
- Test results from an independent laboratory or an experienced plastics recycler;
- Peer and industry reviewed technical literature applicable to Europe.

The applicant shall provide third party verification and traceability for post-consumer recycled content.

4(b) Design for dismantling and recycling

For recycling purposes computers shall be designed so that target components and parts can be easily extracted from the product. A disassembly test shall be carried out according to the test procedure in Appendix 3. The test shall record the number of steps required and the associated tools and actions required to extract the target components and parts identified in (a) and (b).

- (a) The following target components and parts, selected as relevant to the product, shall be extracted during the disassembly test:

All products

- (i) Printed Wiring Boards relating to computing functions $>10 \text{ cm}^2$

Stationary computer products

- (i) Internal Power Supply Unit
(ii) HDD drives

Portable computer products

- (i) Rechargeable battery

Displays (where integrated into the product enclosure)

- (i) Printed Circuit Boards $>10 \text{ cm}^2$
(ii) Thin Film Transistor unit and film conductors in display units $>100 \text{ cm}^2$
(iii) LED backlight units

- (b) At least *two* of the following target components and parts, selected as relevant to the product, shall also be extracted during the test, following-on in the test from those in (a):

- (i) HDD drive (portable products)
(ii) Optical drives (where included)
(iii) Printed circuit boards $\leq 10 \text{ cm}^2$ and $> 5 \text{ cm}^2$
(iv) Speaker units (notebooks, integrated desktops and portable all-in-one computers)
(v) Polymethyl Methacrylate (PMMA) film light guide (where the screen size is $>100 \text{ cm}^2$)

Assessment and verification:

The applicant shall provide a 'disassembly test report' to the competent body detailing the adopted disassembly sequence, including a detailed description of the specific steps and procedures, for the target parts and components listed in (a) and (b),

The disassembly test may be carried out by:

- (i) The applicant, or a nominated supplier, in their own laboratory, or;
(ii) An independent third party testing body, or;
(iii) A specialised recycling firm that is a permitted treatment operation in accordance with Article 23 of the Waste Framework Directive.

Criterion 5. Corporate Social Responsibility

5(a) Labour conditions during manufacturing

The applicant shall obtain third party certification that the fundamental principles and rights at work as described in the International Labour Organisation's (ILO) Core Labour Standards, the UN Global Compact and the OECD Guidelines for Multi-National Enterprises are respected by final assembly plants for the product. For the purpose of verification the following ILO Core Labour Standards and supplementary provisions shall be referred to:

- a) Child Labour:
 - i. ILO Core Convention "Minimum Age" (No. 138)
 - ii. ILO Core Convention "Worst Forms of Child Labour" (No. 182)
- b) Forced and Compulsory Labour:
 - i. ILO Core Convention "Forced Labour" (No. 29)
 - ii. ILO Core Convention "Abolition of Forced Labour" (No. 105)
- c) Freedom of Association and Right to Collective Bargaining:
 - i. ILO Core Convention "Freedom of Association and Protection of the Right to Organise" (No. 87)
 - ii. ILO Core Convention "Right to Organise and Collective Bargaining" (No. 98)
- d) Discrimination:
 - i. ILO Core Convention "Discrimination (Employment and Occupation)" (No. 111)
 - ii. ILO Core Convention "Equal Remuneration" (No. 100)
- e) Working Hours:
 - i. ILO Convention "Hours of Work (Industry)" (No. 1)
- f) Remuneration:
 - i. ILO Convention "Minimum Wage Fixing" (No. 131)
 - ii. Living wage: The applicant shall ensure that wages paid for a normal work week shall always meet at least legal or industry minimum standards, are sufficient to meet the basic needs of personnel and provide some discretionary income;

The audit process shall include consultation with external stakeholders in local areas around sites, including trade unions, community organisations, NGO's and labour experts. The applicant shall publish the audit reports online to provide evidence to interested consumers.

Assessment and verification: the applicant shall certify compliance with these requirements by providing copies of certificates of compliance and supporting audit reports for each final product assembly plant for the model(s) to be ecolabelled.

Certificates shall be issued by certification bodies accredited by Social Accountability Accreditation Services (SAAS) or approved auditors for the Electronics Industry Citizenship Coalition's (EICC) Validated Audit Process. Valid certifications from schemes or processes that audit compliance with the listed Core ILO Conventions, together with the additional provisions on working hours and remuneration, shall be accepted.

5(b) Sourcing of 'conflict-free' minerals

The applicant shall support the responsible sourcing of tin, tantalum, tungsten and their ores and gold from conflict-affected and high-risk area by:

- (i) Conducting due diligence in line with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, and
- (ii) by actively supporting at least one on-the-ground-project promoting responsible mineral production and trade in accordance with OECD and EU guidance within conflict-affected and high-risk areas.

Assessment and verification: The applicant shall declare the compliance with these requirements together with the following supporting information:

- A report describing their due diligence activities along the supply chain for the four minerals identified, and
- Descriptions of the project(s) they are engaged with, which of the four minerals are addressed and how they contribute to responsible sourcing.

Criterion 6. Further criteria

6(a) Noise

The 'Declared A weighted Sound Power Level' (re 1 pW) of the computer, in accordance with paragraph 3.2.5 of ISO 9296, shall not exceed:

- (a) For desktop computers including integrated desktop computers and workstations
 - i. Idle Mode: 3.8 bel
 - ii. Operation mode: 4.2 bel
- (b) For notebook computers including tablets, two-in-one computers and mobile workstations
 - i. Idle mode: 3.2 bel
 - ii. Operating mode: 3.6 bel

The requirements shall not apply to Idle mode if no fan is installed (e.g. CPU fans, power supply fans, computer system fans) or to Operating mode if no mechanical hard disk drive is installed.

Assessment and verification: The applicant shall provide the competent body with a test report, certifying that the levels of noise emissions have been measured in accordance with ISO 7779. The report shall state the measured sound power levels in idle and operating mode, which shall be declared in accordance with paragraph 3.2.5 of ISO 9296. In case of different configurations of identically constructed units the measurements have to be performed on the loudest individual components.

Criterion 7. Information appearing on the EU Ecolabel

7(a) User instructions

The computer shall be sold with relevant user information that provides advice on its proper environmental use. The information shall be located in a single, easy-to-find place in the user instructions as well as on the manufacturer's website. The information shall include in particular:

- (a) Energy consumption: TEC value in accordance with Energy Star v6.1, as well as the maximum power demand in each operating mode. In addition, instructions must be provided on how to use the device's energy-saving mode;
- (b) Information that energy efficiency cuts energy consumption and thus saves money by reducing electricity bills and that unplugging your computer reduces energy consumption to zero;
- (c) The following indications on how to reduce power consumption when the computer is not being used:
 - (i) Putting the computer into off mode will reduce energy consumption but will still draw some power;
 - (ii) Reducing the brightness of the screen will reduce energy use;
 - (iii) Screen savers can stop computer displays from powering down into a lower power mode when not in use. Ensuring that screen savers are not activated on computer displays can therefore reduce energy use;
 - (iv) Charging tablet computers via USB-interface by another desktop or notebook computer might increase the energy consumption in case of leaving the desktop or notebook computer in an energy-consuming idle-mode for the sole reason of charging the tablet computer.
- (d) Information that extension of the computer's lifetime reduces the overall environmental impacts.
- (e) The following indications on how to prolong the lifetime of the computer:
 - (i) Information to let the user know the factors influencing the lifetime of batteries as well as instructions for the user facilitating its prolongation (only applicable to mobile computers powered with rechargeable batteries).
 - (ii) Clear disassembly and repair instructions to enable a non-destructive disassembly of products for the purpose of replacing key components or parts for upgrades or repairs.
 - (iii) Information to let the user know where to go to obtain professional repairs and servicing of the computer, including contact details as appropriate. Service should not be limited exclusively to applicant's Authorized Service Providers.
- (f) End-of-life instructions for the proper disposal of computers, including separate instructions for the proper disposal of rechargeable batteries, at civic amenity sites or through retailer take-back schemes as applicable, which shall comply with Directive 2012/19/EU of the European Parliament and of the Council.
- (g) Information that the product has been awarded the EU Ecolabel with a brief explanation as to what this means together with an indication that more information on the Ecolabel can be found at the website address <http://www.ecolabel.eu>
- (h) Any print-versions of instruction/repair manual(s) should contain recycled content and should not contain chlorine bleached paper. To save resources, online versions should be preferred.

Assessment and verification: The applicants shall declare the compliance of the product with these requirements to the competent body and shall provide a link to the online-version or a copy of the user instructions / repair manual to the Competent Body.

7(a) Criterion 7. Information appearing on the EU Ecolabel

The optional label with text box shall contain the following texts:

- High energy efficiency
- Designed to have a longer lifetime
- Avoidance of hazardous chemicals
- Designed to be easy to recycle
- Contains xy% post-consumer recycled plastic (*only when greater than 25%*)

The guidelines for the use of the optional label with text box can be found in the "Guidelines for use of the Ecolabel logo" on the website:

http://ec.europa.eu/environment/ecolabel/documents/logo_guidelines.pdf

Assessment and verification: *the applicant shall provide a sample of the product label or an artwork of the packaging where the EU Ecolabel is placed, together with a declaration of compliance with this criterion.*