

Appendix II – Comparison of Type I ecolabelling criteria

Certification System & Standard	Scope	CRITERIA					Other relevant criteria or views															
		Battery Content	Quality	Design	Info																	
	Substances of Very High Concern (SVHCs)	Specific (hazardous) substances	Longevity and Charge cycles	Removability, Upgradeability & Reparability, Recyclability	Information for users and/or 3 rd parties																	
EU Ecolabel EU Ecolabel Personal, Notebook and Tablet Computers Commission Decision 2016/1371/EU	The product group of 'personal, notebook and tablet computers' shall comprise desktop computers, integrated desktop computers, portable all-in-one computers, notebook computers, two-in-one notebook computers, tablet computers, thin clients, workstations, and small-scale servers. Gaming consoles and digital picture frames shall not be considered computers for the purpose of this Decision.	<p>Criterion 2(a) Rechargeable batteries packs The product shall not contain substances that have been identified according to the procedure described in Article 59(1) of the 'REACH Regulation' and are included in the Candidate List of SVHCs, at concentrations of greater than 0.10% (weight by weight).</p> <p>Table 2. Grouping of Candidate List SVHC's and CLP hazards</p> <p><i>Group 1</i> Carcinogenic, Mutagenic and/or Toxic for Reproduction (CMR) Category 1A or 1B CMR: H340, H350, H350I, H360, H360F, H360D, H360FD, H360Fd, H360Df</p> <p><i>Group 2</i></p> <ul style="list-style-type: none"> - Category 2 CMR: H341, H351, H361f, H361d, H361fd, H362 - Category 1 aquatic toxicity: H400, H410 - Category 1 and 2 acute toxicity: H300, H310, H330 - Category 1 aspiration toxicity: H304 - Category 1 Specific Target Organ Toxicity (STOT): H370, H372 <p><i>Group 3</i> Category 2, 3 and 4 aquatic toxicity: H411, H412, H413 Category 3 acute toxicity: H301, H311, H331, EUH070 Category 2 STOT: H371, H373</p> <p>Components and subassemblies that are specifically derogated regarding crit. 2(c) Lithium ion and polymer batteries</p> <p>Cathode materials Scope of the derogation - Battery cell cathode materials classified with group 2 and 3 hazards. These shall include: Lithium cobalt oxide; Lithium manganese dioxide; Lithium iron phosphate; Lithium cobalt nickel manganese oxide</p> <p>Solvents and salts Scope of the derogation - Electrolyte solvents and salts classified with group 2 and 3 hazards. These shall include: Propylene carbonate; Ethylene carbonate; Diethyl carbonate; Di-Methyl Carbonate; Ethyl methyl carbonate; Lithium Hexafluorophosphate</p>	<p>Criterion 2(c) Rechargeable battery packs</p> <ul style="list-style-type: none"> - Rechargeable battery cells <p>Flame retardants, plasticisers, steel additives and coatings, cathode materials, solvents and salts that meet the criteria for classification with the CLP hazards in Table 2 shall not be present in the sub-assemblies and component parts in Table 5 at or above a concentration limit of 0.10% (weight by weight).</p>	<p>Criterion 3(b) Rechargeable battery quality and lifetime</p> <p>(i) Minimum battery life: Notebooks, tablets and two-in-one computers shall provide the user with a minimum of 7 hours of rechargeable battery life after the first full charge. For notebooks this shall be benchmarked using either:</p> <ul style="list-style-type: none"> - For home and consumer products the Futuremark PCMark 'Home' scenario - For business or enterprise products the BAPOCO Mobilemark 'Office productivity' scenario <p>For models which qualify for Energy Star TECgraphics allowances, the 'Media creation & consumption' scenario shall be used instead.</p> <p>(ii) Charging cycle performance: Notebook, tablet and two-in-one computer rechargeable batteries shall meet the following performance requirements, dependant on whether the rechargeable battery can be changed without tools (as specified in criterion 3(d)):</p> <ul style="list-style-type: none"> - Models in which rechargeable batteries can be changed without tools shall maintain 80% of their declared minimum initial capacity after 750 charging cycles; - Models in which rechargeable batteries cannot be changed without tools shall maintain 80% of their declared minimum initial capacity after 1000 charging cycles. <p>This performance shall be verified for rechargeable 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 It A or 0.5 It A (accelerated test procedure). Partial charging may be used to comply with this requirement (as specified in sub-criterion 3(c)(ii)).</p> <p>(iii) Partial charging option for achieving cycle performance: The performance requirements described in 3(b)(ii) may be achieved using factory installed software and firmware 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 at up to 80% charging according to the requirements in 3(b)(ii). The maximum partial charge shall provide a battery life that complies with sub-criterion 3(b)(i).</p> <p>(iv) Minimum guarantee: The applicant shall provide a minimum two year commercial guarantee for defective batteries¹⁹.</p>	<p>Criterion 3(d)</p> <p>(ii) Rechargeable battery replacement: The rechargeable battery pack shall be easy to extract by one person (either a non-professional user or a professional repair service provider) according to the steps defined below 21. Rechargeable batteries shall not be glued or soldered into a product and there shall be no metal tapes, adhesive strips or cables that prevent access in order to extract the battery. In addition, the following requirements and definitions of the ease of extraction shall apply:</p> <ul style="list-style-type: none"> - For notebooks and portable all-in-one computers it shall be possible to extract the rechargeable battery manually without tools; - For sub-notebooks it shall be possible to extract the rechargeable battery in a maximum of three steps using a screwdriver; - For tablets and two-in-one notebooks it shall be possible to extract the rechargeable battery in a maximum of four steps using a screwdriver and spudger. <p>Simple instructions on how the rechargeable battery packs are to be removed shall be provided in a repair manual or via the manufacturer's website.</p> <p>(iii) Repair manual: The applicant shall provide clear disassembly and repair instructions</p> <ul style="list-style-type: none"> ... For portable 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 manufacturer's website for a period of at least five years. <p>Criterion 4(b) Design for disassembly and recycling</p> <p>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 1.</p> <ul style="list-style-type: none"> ... Portable computer products - Rechargeable battery 	<p>Criterion 6(a) User instructions</p> <p>iv. The following indications on how to prolong the lifetime of the computer:</p> <ul style="list-style-type: none"> - Information to let the user know the factors influencing the lifetime of rechargeable batteries as well as instructions for the user facilitating prolongation of their life (only applicable to mobile computers powered with rechargeable batteries). - 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. - Information to let the user know where to go to obtain professional repairs and servicing of the computer, including contact details. Servicing should not be limited exclusively to the applicant's Authorised Service Providers. <p>v. 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 ('the WEEE Directive').</p> <p>Criterion 3(b) Rechargeable battery quality and lifetime</p> <p>(v) User information: Information about known factors influencing the lifetime of rechargeable 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.</p>																
Blue Angel Computers RAL-UZ 78a (2014)	Applies to: <ul style="list-style-type: none"> - Desktop computers und integrated desktop computers, - Portable computers, except for tablets/slate computers and mobile thin clients - Workstations (stationary and mobile), - Small-scale servers that are not marketed for use in data centers, - Thin clients. Does not apply to: Game consoles; Tablet computers/slate computers; Mobile thin clients; Small-scale servers marketed for use in data centers; Electronic organizers (MDAs, PDAs) and similar mobile devices; Video or audio players (MP3 players); Navigation devices; Mobile Phones/Smartphones; E-Book Readers; Television Sets; Computer Monitors/Monitors.	X	X	<p>3.2.1 Rechargeability The computers must be equipped with rechargeable batteries meeting the definition in para. 1.5.3.</p> <p>3.2.3 Battery Capacity The battery capacity shall be measured in accordance with Standard EN 61960, as amended (current version: DIN EN 61960:2012-04), after a first discharge and charge cycle (discharge with 0.2 It A) in accordance with para. 7.3.1. Discharge Behaviour at a Temperature of 20 °C (rated capacity)²⁰ for three different batteries each in the following five successive cycles. During at least one measurement cycle, the output capacity of all three batteries (according to para. 7.3.1 – step 3 of the standard, in Ah) must be not less than 100 % of the rated capacity specified by the manufacturer.</p> <p>3.2.4 Life and Life Cycle Test The life of the rechargeable batteries shall be determined. For this purpose, the applicant shall specify the test method used to determine the batteries' life, give the number of charge and discharge cycles during the test as well as the remaining charge capacity at the end of life cycle test. The applicant shall give consent to RAL using this information for future revisions of these Basic Criteria.</p>	<p>3.2.2 Replaceability The computers shall be designed to allow the user to replace the rechargeable batteries (accumulators) without the need for special tools.</p> <p>3.3.1 Repairability ... Rechargeable batteries, (if any) in particular, must be available for a period of 5 years from the end of production. The product information shall include details on the above requirements.</p> <p>3.4 Recyclable Design</p> <p>3.4.1 Structure and Connection Technology ... Rechargeable batteries (accumulators), if any, must be easy to remove without the use of tools or with the use of universal tools.</p>	<p>3.7 Consumer Information / User Manual</p> <ul style="list-style-type: none"> ... Information on manufacturer-operated product take-back programs to promote reuse and recycling²¹ 10. Information that the batteries must not be disposed of with the normal household waste but instead should be taken to a waste collection facility. 	<p>4 Outlook on Possible Future Requirements</p> <p>The next revision of these Basic Criteria is expected to consider the following aspects:</p> <ul style="list-style-type: none"> - More detailed requirements for the use of recycled plastics in the manufacture of computers, monitors and keyboards; - Requirements for battery capacity and for the life of batteries for portable computers. 															
Mobile Phones RAL-UZ 106 (2013)	These Basic Criteria apply to mobile phones according to the definition in para. 1.5.1. Mobile phones include mobile phones and smart phones using the LTE (often also called 4G), HSDPA (3G+), UMTS (3G) or GSM standard (2G). The devices shall be primarily designed for making phone calls, text messaging and/or the mobile use of internet services. The size of the visible display is used to distinguish mobile phones from mobile computers (e.g. tablet PCs). Thus, devices with a maximum visible display size of 100 cm ² are considered as mobile phones, provided that they meet the above requirements.	X	X	<p>3.1 Battery State-of-Charge Indicator The mobile phone shall have an integrated state-of-charge indicator. The latter shall optically display the current state of charge during use and during charging. Also, the device shall, upon completion of the charging process, display a clearly visible note advising the user to disconnect the charger from the mains or that the computer is no longer needed for charging.</p> <p>3.3 Longevity 3.3.1 Warranty The applicant undertakes to offer a free minimum 2-year warranty on the mobile phone, except for the rechargeable battery. The product manual shall include warranty details. The rechargeable batteries shall meet the technical requirements in para. 3.8.2 Life and Life Cycle Test</p> <p>Four different batteries per size and type shall be tested. All four tested batteries shall meet the requirements of the following test method.</p> <p>Test Specifications for Rechargeable Lithium Batteries:</p> <table border="1"> <thead> <tr> <th>Cycle No.</th> <th>Charge</th> <th>Rest period after charge</th> <th>Discharge</th> <th>Rest period after discharge</th> </tr> </thead> <tbody> <tr> <td>1-149</td> <td>Manufacturer specification</td> <td>30 minutes</td> <td>1.0 C to cut-off voltage</td> <td>30 minutes</td> </tr> <tr> <td>150</td> <td>Manufacturer specification</td> <td>1 hour</td> <td>0.2 C to cut-off voltage</td> <td></td> </tr> </tbody> </table> <p>The minimum discharge time for cycle 150 shall be 3.5 hours and the capacity delivered during cycle 150 shall be equal to 90 % of the rated capacity.</p>	Cycle No.	Charge	Rest period after charge	Discharge	Rest period after discharge	1-149	Manufacturer specification	30 minutes	1.0 C to cut-off voltage	30 minutes	150	Manufacturer specification	1 hour	0.2 C to cut-off voltage		<p>3.4.2 Structure and Connection Technology The following shall apply to mobile phones: The rechargeable batteries shall be easy to remove for recycling purposes to allow their recycling by material type separate from the rest of the device.</p> <p>An efficient removal of the rechargeable batteries for recycling purposes shall be possible by using standard tools (guidance value: in no more than 5 seconds). The housing of the device may be damaged during this process but the leaking of battery chemicals must be prevented.</p> <p>3.8.1 Replaceability Blue Angel eco-labelled products shall be so designed as to allow the user to replace the rechargeable batteries without any special tool.</p>	<p>3.11 Operating Instructions The product manual as well as manufacturer's website shall allow easy access to the following basic user information:</p> <ol style="list-style-type: none"> 1. Information on the significance and correct interpretation of the battery state-of-charge indicator. ... 7. Information on the take-back scheme. 8. Instructions to avoid high ambient temperatures that might lead to a significantly reduced battery capacity. The aim is to prevent the battery from irreversible capacity loss and, hence, a reduced battery life. 9. Instructions for "proper" storing of the device (storage temperatures and charge state), as this is a decisive factor for battery life extension. 10. Instructions for replacing the rechargeable battery. ... 13. Instructions that the battery should not be disposed of as normal household waste but instead should be taken to a battery collection facility. 	<p>3.8.3 Safety The batteries shall meet the test requirements specified in EN 62133, as amended (EN 62133:2003, Parts 3 and 4, or equivalent parts, respectively).</p>
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		Battery Content		Quality		Design			
		Substances of Very High Concern (SVHCs)	Specific (hazardous) substances	Longevity and Charge cycles		Removability, Upgradeability & Reparability, Recyclability			
Computers and Keyboards RAL-UZ 78 (2017)	<p>Applies to: computers as defined in paragraph 1.5.1.</p> <p>Applies to: these Basic Criteria also apply to keyboards placed on the market as a separate unit or together with a computer.</p> <p>Does not apply to: Mobile phones/smart phones; E-book readers; Television sets; Computer monitors (RAL-UZ 78c).</p>	X	X	<p>4 Special Requirements for Notebook Computers</p> <p>4.1 Rechargeability</p> <p>Notebook computers must be equipped with batteries/accumulators meeting the definition in para. 1.5.2.</p> <p>4.3 Battery/Accumulator Capacity</p> <p>The battery/accumulator capacity shall be measured in accordance with standard EN 61960, as amended (current version: DIN EN 61960:2012-04), in accordance with standard paragraph 7.3.1 „Discharge performance at 20°C (rated capacity)“^a. The rated capacity (C), thus determined, must at least be equal to the nominal capacity (N) indicated on the battery/accumulator and in the product documents.</p> <p>4.5 Battery/Accumulator Durability</p> <p>The battery/accumulator must achieve a minimum of 500 full charge cycles: full charge cycles ≥ 500</p> <p>A full charge cycle is to be understood as the drain of a quantity of electricity (in ampere hours) from the battery/accumulator in the amount of its nominal capacity (N) that has been stored in the battery/accumulator by one or more charging processes.</p> <p>The minimum number of full charge cycles achievable shall be specified in the product documents.</p> <p>After 500 full-charge cycles the battery/accumulator must, in addition, have in a fully charged state, a remaining capacity (Q_{Rem}) of at least 80% of the nominal capacity (N).</p> <p>$Q_{\text{Rem}} \geq 80\% N$</p> <p>Full charge cycles shall be calculated and remaining capacity shall be measured in accordance with the requirements set out in Appendix A: Determination of Battery/Accumulator Durability.</p>		<p>3.2 Durability</p> <p>3.2.1 Spare Parts Availability</p> <p>The applicant undertakes to make sure that the availability of spare parts for appliance repair is guaranteed for at least 5 years from the time that production ceases. Especially batteries/accumulators, (if any) must be available for at least 5 years following the end of production. The spare parts must be offered at reasonable cost by the manufacturer itself or a by third party.</p> <p>3.2.2 Capacity Expansion</p> <p>Computers to be Blue Angel eco-labelled must be so designed as to ensure easy accessibility to the replaceable components and expansion interfaces (e.g. IC sockets plug-in connectors). For this purpose, it must be possible to open housing parts, chassis and battery covers easily and without expert knowledge.</p> <p>3.3 Recyclable Design</p> <p>3.3.1 Structure and Connection Technology</p> <p>The devices to be Blue Angel eco-labelled must be so designed as to allow easy disassembly for recycling purposes...</p> <p>Batteries/accumulators (if any) must be easy to remove without the use of any tools or with the use of universal tools.</p> <p>4.2 Replaceability</p> <p>The computers shall be designed to allow the user to easily replace the batteries/accumulators without the need for expert knowledge.</p>		<p>3.6 Product Documents</p> <p>The product documents included with the computer shall include both the technical specifications and the environment and health-related user information. These documents shall either be installed on the computer, supplied as a CD-ROM or in printed form, preferably on recycled paper, together with the device or made available on the Internet from the time of delivery for a period of at least 5 years after the end of production.</p> <p>...</p> <p>7. If the computer is a notebook computer the product documents shall additionally include information according to para. 4 (Special Requirements for Notebook Computers):</p> <p>7.1 Instructions on how to remove and replace the battery/accumulator or battery/accumulator pack according to para. 4.2 (Replaceability),</p> <p>7.2 Indication of nominal capacity, nominal voltage and type designation according to para. 4.4(Battery/Accumulator Marking) as well as instructions for decoding if the battery/ accumulator displays a coded date of manufacture,</p> <p>7.3 Indication of the minimum achievable full charge cycles according to para.4.5 (Battery/Accumulator Durability),</p> <p>7.4 Information on the software tools for battery/accumulator status reading and for battery/ accumulator protection according to para. 4.6 (Battery/Accumulator Status and Battery/ Accumulator Protection Software),</p> <p>7.5 A note advising the user that batteries/accumulators must not be disposed of with the normal household waste but instead should be taken to a waste collection facility.</p> <p>4.4 Battery/Accumulator Marking</p> <p>The battery/accumulator (or battery/accumulator pack) must be marked in accordance with standard EN 61960 providing at least the following information:</p> <ul style="list-style-type: none"> - nominal capacity (N), - nominal voltage, - type designation, - date of manufacture (may be coded). <p>These specifications (except for the date of manufacture) shall also be given in the product documents. In case the date of manufacture has been given in coded form the product documents shall include instructions for decoding.</p> <p>In addition, the battery/accumulator (or battery/accumulator pack) shall provide the following information to help improve the recycling process:</p> <ul style="list-style-type: none"> - indication of the metal with the greatest mass percentage (e.g. cobalt, manganese, nickel, iron), - indication of substances contained in the battery/accumulator that hinder the recycling process (e.g. tin, phosphorous). - This information may also be provided in coded form, for example, in accordance with the marking system proposed by the Battery Association of Japan (BAJ). 	
Nordic Swan	<p>The standard applies to:</p> <ul style="list-style-type: none"> - Desktop Computer (display or keyboard can also be licensed individually) - Integrated Desktop Computer - Notebook computer (including slate) - Workstation - Thin Client - Small-scale Server 	X	X	X	<p>4.6 Battery/Accumulator Status and Protection Software</p> <p>The applicant shall make the following software tools available for the computer:</p> <ul style="list-style-type: none"> - Software for Determining the Battery/Accumulator Status: The software must allow the reading of the battery's/accumulator's "state of health" (defined as the ratio of „full charge capacity“ to „design capacity“ according to Smart Battery System Specifications), „state of charge“ (according to Smart Battery System Specifications) as well as the number of full charge cycles already performed from the battery/accumulator and to display these data for the user. Provided that the battery/accumulator (or battery/accumulator pack) does not have integrated electronics to record these data the computer itself must be equipped with corresponding electronics. The software must access the corresponding electronics and be capable of reading the battery/accumulator status data. The electronics must, if applicable, detect a battery/accumulator replacement and take it into account when giving the number of full charge cycles. - Battery/Accumulator Protection Software: The software shall be able to limit the battery's/accumulator's charge to a value smaller than the maximum amount of usable electricity (e.g. 80% of the full charge capacity). Doing so will extend the battery's/accumulator's life. <p>The applicant shall - from the date of placing the computer on the market or, at least, from the date of filing the application until, at least, 6 years after production ceases - make these software tools available for free-of-charge download on its website as well as inform about these tools in the computer product documents. Provided that the computer is placed on the market with a pre-installed operating system the software tools described above-described must also be pre-installed on the computer.</p>		<p>1 Environmental requirements</p> <p>1.2 Power consumption</p> <p>O3 Energy / power consumption of computer</p> <p>Following requirements apply for Slate computers:</p> <p>...</p> <p>It must be possible to swap the battery. A replacement battery must be available as an option or spare part. The battery replacement can be done at a repair shop.</p>		<p>In the next revision Nordic Ecolabelling will focus on:</p> <ul style="list-style-type: none"> - Energy consumption and other environmental impacts in the production phase (carbon footprints shall be evaluated) - Additives in plastic (phthalates) - Possibilities to exclude substances on the Candidate List of Substances of Very High Concern, Article 59(10) of the REACH Regulation from the licensed product. <p>The next coming revision will focus on:</p> <p>Requirements on the battery</p>
Nordic Ecolabelling of Rechargeable Batteries Version 4.5, 07 December 2010 - 30 June 2018	<p>The standards applies to: portable batteries that are rechargeable in accordance with the definition provided in the European Union's Batteries Directive 2006/66/EC.</p> <p>The criteria do not encompass batteries that are built into or form a permanent part of electronic products and where replacement is not possible.</p>	<p>O1 Content</p> <p>Applicants must submit a specification detailing all constituent substances present in the battery (metals, other solid substances and liquid chemical substances). The specification must state the chemical name, concentration (as ppm or weight %) and a description of the purpose of the constituent substance.</p> <p>O2 Metal content of batteries</p> <p>The metal content of the battery must not exceed the following limits: < 0.1 ppm Hg; < 5.0 ppm Cd; < 5.0 ppm Pb; < 10.0 ppm As.</p>	<p>O12 The quality of rechargeable batteries</p> <p>Quality testing must be performed by an impartial test laboratory which fulfils the general requirements applicable to test institutions provided for in the chapter headed "Analysis laboratory/test institution".</p> <p>... All batteries that undergo testing must meet the following requirements: At least one of the 5 cycles performed in the test must involve a discharge period of a minimum of 5 hours.</p>		<p>O6 Charger, battery sizes</p> <p>This requirement applies only to chargers for rechargeable batteries of the following sizes: AAA: HR03, AA: HR6, C:HR14, D: HR20, 9V:HR 22.</p> <p>If the rechargeable batteries are sold together with a charger, the charger must be suitable for use with a minimum of two battery sizes.</p>	<p>O4 Information on batteries containing nanoparticles</p> <p>If nanoparticles are used in the batteries, the producer must publish information on how batteries containing nanoparticles are to be handled by battery recycling firms.</p> <p>This information must focus particular attention on measures aimed at shielding employees from exposure to nanoparticles. "Publish" means making the information available on a website or the equivalent.</p>	<p>O9 Collection system for batteries and packaging</p> <p>The relevant national rules, laws and/or industry-wide agreements concerning collection systems for packaging and batteries must be fulfilled in the</p>		

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	<p>Nordic Ecolabel licences are not available for chargers for rechargeable batteries alone. Batteries sold in combination packs with a charger are eligible for a Nordic Ecolabel (including where batteries are sold together with, for example, power tools where the charger is purchased together with the tool and battery or Nordic ecolabelled batteries designed for particular applications where the battery is sold together with a charger as part of the electrical appliance).</p>	<p>O3 Nanotechnology Nanoparticles may be present only in electrode material in the battery for the purpose of increasing the energy efficiency of the batteries. If nanoparticles are present in electrode material, the applicant must specify the extent to which the energy efficiency of the battery is improved.</p> <p>O5 Requirements applicable to plastic in battery chargers If the rechargeable batteries are sold together with a charger, the charger must fulfil the following requirements:</p> <ul style="list-style-type: none"> - The plastic in the casing must be labelled in accordance with ISO 11469. - The plastic in the casing must not be chlorinated plastic. - Cadmium and lead must not be actively added to the plastic in the casing and cables. - Chloro-paraffins must not be actively added to the plastic in the casing and cables. - Halogenated organic flame-retardants or flame retardants with risk classifications within the following areas must not be present in the plastic in the casing or cables: Carcinogenic, mutagenic or toxic for reproduction in accordance with European Union chemicals legislation. 	<p><i>Li-ion/LiP batteries and cells:</i> The conditions during capacity testing must be in accordance with the, at the time of application applicable, IEC 61960 standard for Li-ion/LiP cells and batteries applicable at the time of application.</p> <p><i>Cycle life testing:</i> All tested batteries must meet the following requirements:</p> <ul style="list-style-type: none"> - The discharge time for cycle 799 must be at least 30 minutes (correspond to 50% of remaining capacity) - The discharge time for cycle 800 must be at least 3.5 timer hours (correspond to 70% of remaining capacity) <p><i>Initial capacity testing:</i> All batteries that undergo testing must meet the following requirements:</p> <ul style="list-style-type: none"> - At least one of the 5 cycles performed in the test must involve a discharge period of a minimum of 5 hours. - All (4) tested cells/batteries must comply with the requirement. <p><i>Endurance testing:</i> Endurance testing must comply with the conditions described in table 4 and the tested cells/batteries must meet the requirements stated in table 5. Cycles 1-50 are repeated until the required number of cycles has been reached for the tested battery type. The required number of cycles for the different battery types are listed in.</p> <table border="1"> <thead> <tr> <th>Cell type</th> <th>Rated capacity</th> <th>No. cycles</th> <th>Requirement (1C, second last cycle)</th> <th>Requirement (0.2C, last cycle)</th> </tr> </thead> <tbody> <tr> <td>LR03 (AAA)</td> <td>< 850 mAh</td> <td>500</td> <td>30 minutes</td> <td>4 hours</td> </tr> <tr> <td>LR03 (AAA)</td> <td>≥ 850 mAh</td> <td>400</td> <td>30 minutes</td> <td>4 hours</td> </tr> <tr> <td>LR06 (AA)</td> <td>< 2000 mAh</td> <td>500</td> <td>30 minutes</td> <td>4 hours</td> </tr> <tr> <td>LR06 (AA)</td> <td>≥ 2000 mAh ≤ 2500 mAh</td> <td>400</td> <td>30 minutes</td> <td>4 hours</td> </tr> <tr> <td>LR06 (AA)</td> <td>> 2500 mAh</td> <td>300</td> <td>30 minutes</td> <td>4 hours</td> </tr> <tr> <td>LR14 (C)</td> <td>-</td> <td>500</td> <td>30 minutes</td> <td>4 hours</td> </tr> <tr> <td>LR20 (D)</td> <td>-</td> <td>500</td> <td>30 minutes</td> <td>4 hours</td> </tr> <tr> <td>Other</td> <td>-</td> <td>400</td> <td>30 minutes</td> <td>4 hours</td> </tr> </tbody> </table> <p>O13 Charger quality If the rechargeable batteries are sold together with a charger, the charger must fulfil the following requirements:</p> <p><i>Testing of the charger:</i> The quality of the charger must be tested by a test laboratory that is impartial and fulfils the general requirements applicable to the test institutions provided for in the chapter "Analysis laboratory/test institution".</p> <p><i>The measurement must produce the following results:</i></p> <ul style="list-style-type: none"> - The charger must automatically stop charging when the battery is fully charged. Fully charged is defined as a reference charge with a cut-off of - $\Delta V = 5 \text{ mV} + 10\%$. - The maximum trickle charge current must on average be $< C/20$, based on the lowest battery capacity that the charger is recommended to charge by the dealer. - The maximum no-load current must on average be $< C/50$, based on the lowest battery capacity that the dealer recommends the charger is recommended to charge. 	Cell type	Rated capacity	No. cycles	Requirement (1C, second last cycle)	Requirement (0.2C, last cycle)	LR03 (AAA)	< 850 mAh	500	30 minutes	4 hours	LR03 (AAA)	≥ 850 mAh	400	30 minutes	4 hours	LR06 (AA)	< 2000 mAh	500	30 minutes	4 hours	LR06 (AA)	≥ 2000 mAh ≤ 2500 mAh	400	30 minutes	4 hours	LR06 (AA)	> 2500 mAh	300	30 minutes	4 hours	LR14 (C)	-	500	30 minutes	4 hours	LR20 (D)	-	500	30 minutes	4 hours	Other	-	400	30 minutes	4 hours	<p>O10 Consumer information on the battery The batteries must carry a clear indication of their capacity in accordance with the requirements applicable to capacity labelling provided for in the EU's Batteries Directive 2006/66/EC. "Clear indication" means that the capacity labelling shall be expressed in terms of a unit (mAh) and that other numerical markings on the battery must not be such that the customer is likely to be misled into thinking that they represent the capacity labelling.</p> <p>O21 Marketing The general part of the requirement is removed as decided by the Board of Directors 17 November 2014. If the Nordic Ecolabelled rechargeable batteries are sold together with a charger, it must be made clear to the consumer, for example by means of the positioning of the Nordic Ecolabel logo and the text on the packaging, that the Nordic Ecolabel applies to the batteries only and not to the charger.</p>	<p>Nordic countries in which the ecolabelled products are on sale. <i>The following systems have been established:</i> Norway: packaging and batteries. Sweden: packaging and batteries (statutory participation in collection scheme by manufacturers). Finland: packaging and batteries (statutory participation...). Denmark: batteries (statutory participation...). Iceland: None.</p> <p>O11 Working conditions The licence holder must have a code of conduct in place in accordance with the ten principles provided for in the United Nations Global Compact.</p> <p>New criteria</p> <ul style="list-style-type: none"> - The possibility should be considered of imposing further requirements on constituent substances, particularly heavy metals and the use of solvents in the production of the batteries. - The possibility of imposing requirements on energy consumption during the production of the batteries should be considered. - The possibility of imposing transport requirements on certain types of rechargeable batteries should be considered. - Collection figures in the Nordic countries should be monitored with a view to determining whether further requirements as to consumer information should be imposed. - The possibility of imposing the requirement that further consumer information on optimum use/charging of rechargeable batteries should be considered.
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TCO Certified TCO Certified Notebooks 5.0 (2015) 	<p>This document contains requirements, test methods and references for Notebook computers with a display size > 6".</p> <p>A.6.4 Hazardous substances (in relation with A.6.4 Hazardous substances) The limit value for batteries is 0.0005 % for mercury, 0.002 % for cadmium and 0.004 % lead per listed part, according to EU Directive 2006/66/EC.</p>	<p>A.6 Environment Mandate A.6.4.2: 2. The Notebook computer shall not contain PBB, PBDE and HBCDD.</p> <p>Note: This applies to components, parts and raw materials in all assemblies and sub- assemblies of the product e.g. batteries, paint, surface treatment, plastics and electronic components.</p>	X	<p>Mandate A.6.5.1: ... 2. The brand owner shall guarantee the availability of spare parts for at least three years from the time that production ceases. Instructions on how to replace these parts shall be available to professionals upon request.</p>		X	X																																											

Certification System & Standard	Scope	CRITERIA							
		Battery Content		Quality		Design		Info	
		Substances of Very High Concern (SVHCs)	Specific (hazardous) substances		Longevity and Charge cycles		Removability, Upgradeability & Reparability, Recyclability	Information for users and/or 3 rd parties	Other relevant criteria or views
TCO Certified Smartphones 2.0 (2015)	This document contains requirements, test methods and references for Smartphones for display sizes $\geq 3''$ to $\leq 6''$. The intended use of a Smartphone is portable computing and mobile communication.	A.6.4.1 Hazardous substances (in relation with A.6.4 Hazardous substances) The limit value for batteries is 0.0005 % for mercury, 0.002 % for cadmium and 0.004 % lead per listed part, according to EU Directive 2006/66/EC.	A.6 Environment Mandate A.6.4.2: 2. The Notebook computer shall not contain PBB, PBDE and HBCDD. Note: This applies to components, parts and raw materials in all assemblies and sub- assemblies of the product e.g. batteries, paint, surface treatment, plastics and electronic components.		X		Mandate A.6.4.7: Batteries shall be rechargeable and when necessary, replaceable by the end user or a qualified professional.	X	X
TCO Certified Tablets 3.0 (2015)	This document contains requirements, test methods and references for Tablet computers with a display size $> 4''$. The intended use of a tablet computer certified according to this criteria document shall not be mobile communication with the product held to the head.	A.6.4.1 Hazardous substances (in relation with A.6.4 Hazardous substances) The limit value for batteries is 0.0005 % for mercury, 0.002 % for cadmium and 0.004 % lead per listed part, according to EU Directive 2006/66/EC.	A.6 Environment Mandate A.6.4.2: 2. The Notebook computer shall not contain PBB, PBDE and HBCDD. Note: This applies to components, parts and raw materials in all assemblies and sub- assemblies of the product e.g. batteries, paint, surface treatment, plastics and electronic components.		X		Mandate A.6.5.1: ... 2. The brand owner shall guarantee the availability of spare parts for at least three years from the time that production ceases. Instructions on how to replace these parts shall be available to professionals upon request.	X	X
Korea Eco-label Notebook Computer EL145:2013 	This standard specifies a method to confirm the certification criteria and conformance of Eco-label of notebook computers, including laptop computers, typically designed and manufactured for the purpose of using in multiple locations such as vehicles and airplanes.	4.3 Battery The content of lead (Pb), cadmium (Cd), mercury (Hg) and their compounds in the batteries of products shall comply with EU Directive 2006/66/EC.	X		X		4.4 Environment-friendly design The product shall be designed and manufactured by considering resource- and energy-saving, reduction of pollutant emission and hazardous substance use, recycled material use, recyclability, lifespan extension, etc. in order to reduce environmental impacts throughout the life cycle. Also, it shall comply with the followings. a) Disassembly of the product shall be done by a single technician in order to enhance the recyclability. b) For easiness of replacement and upgrade, the following criteria shall be complied with. 1) Products shall have a modular design. 2) Products shall be accessible with generally available tools and the modules shall be replaceable by the user without the use of special tools. 3) Products shall be so designed as to facilitate replacement of modules and upgrade. 4.9 Battery for power supply The service life warranty of batteries for power supply shall be at least one year.	2. With respect to marks of 'information for consumers' specified in the certification criteria by each subject, the following matters shall be complied with. A. Product-related 'information for consumers' shall be marked on the product cover. However, if the president of Technology Institute recognizes that it is not possible or undesirable to mark it on the product cover, it can be marked on an appropriate part where consumers can perceive relevant information such as product package, a product guide or a user guide. B. Service-related 'information for consumers' shall be marked inside and outside the building in the business site where service is operated. However, if the president of Technology Institute recognizes that it is not possible or undesirable to mark it inside and outside the building in the business site where service is operated, it can be marked on an appropriate part where consumers can perceive relevant information such as a contract, a delivery statement, a letter of warranty or promotion materials.	X
Mobile Phones EL433:2012	This standard describes the method of verifying the product used for verbal communication as mobile subscription wireless phone equipment (hereafter referred to as "mobile phone") is in conformity with the Eco Mark Certification Standard, including the product in which the function of information communication is added.	4.3 Battery The content of lead (Pb), cadmium (Cd), mercury (Hg) and their compounds in the batteries of products shall comply with EU Directive 2006/66/EC.	4.6 The emission of nickel Nickel release emission from product's surface of button, case, and the 2nd battery pack (exposure product only) intended to come into direct and prolonged contact with the skin shall be less than 0.5 μ g/cm ² · week.		X		4.4 Eco-friendly designed To reduce environmental impact through its life cycle, the product shall be designed and produced in consideration of resource and energy-saving, reducing pollutants and hazardous substance use, using recycled materials, improving recyclability and durability, etc. 4.7 The structure of recharging equipment The product shall have a structure in which the recharging equipment shall be used jointly with kindred model products with similar production time.	2. With respect to marks of 'information for consumers' specified in the certification criteria by each subject, the following matters shall be complied with. A. Product-related 'information for consumers' shall be marked on the product cover. However, if the president of Technology Institute recognizes that it is not possible or undesirable to mark it on the product cover, it can be marked on an appropriate part where consumers can perceive relevant information such as product package, a product guide or a user guide. B. Service-related 'information for consumers' shall be marked inside and outside the building in the business site where service is operated. However, if the president of Technology Institute recognizes that it is not possible or undesirable to mark it inside and outside the building in the business site where service is operated, it can be marked on an appropriate part where consumers can perceive relevant information such as a contract, a delivery statement, a letter of warranty or promotion materials.	X
Batteries EL764: 2012	The standard covers the cell that is able to charge and discharge used for the small sized portable power for office or house. This includes: rechargeable Alkaline-Manganese batteries, Nickel-metal hydride batteries, and Lithium secondary batteries.	The contents of lead (Pb), cadmium (Cd), mercury (Hg) in battery shall be: Pb - 40 mg/kg or less, Cd - 10 mg/kg or less, Hg - 1 mg/kg or less.	X			4.2 The capacity of battery The charging capacity by battery type should be satisfied the following criteria. - Rechargeable Alkaline-Manganese battery shall be 40% or more of rated capacity indicated in the battery in regard to the charge capacity after a 25 times charging and discharging cycle test, and during test, no leakage shall occur. - Nickel-metal hydride batteries and Lithium secondary batteries shall be 80% or more of rated capacity indicated in the battery in regard to the charge capacity after a 400 times charging and discharging cycle test, and during test, no leakage shall occur.	X	6 Consumer Information The certification reason that relevant products contribute to reduction of environmental effects should be marked.	5 Quality related criteria 5.1 The safety of battery 5.2 Quality and performance <i>[These sets of criteria heavily rely on the national and industrial standards, thereby, the author does not present them here]</i>

Certification System & Standard	Scope	CRITERIA														
		Battery Content		Quality		Design										
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Green Choice Philippines Laptop Computer NELP-GCP 20080023 	These criteria are applicable to laptop and palmtop computers.	4.2.5. Hazardous Substances The product shall not contain substances listed in the DENR AO 2005-05 and/or RoHS. Heavy metals in batteries and accumulators may not exceed the level as described in Table 5. <table border="1"><thead><tr><th></th><th>Content (%)</th></tr></thead><tbody><tr><td>Mercury</td><td>0.0005</td></tr><tr><td>Cadmium</td><td>0.002</td></tr><tr><td>Lead</td><td>0.004</td></tr></tbody></table>		Content (%)	Mercury	0.0005	Cadmium	0.002	Lead	0.004	X	4.2.3. Energy The energy consumption of portable computer power supplies shall be less than 0.75 W (watts) when plugged into a power outlet and disconnected from the computer.		4.3. OTHER CRITERIA 4.3.1 Availability of Spare Parts and Consumables The applicant shall ensure that all spare parts and consumables are available for 5 years following the termination of production. 4.2.2. 3R Design The criteria for the design of personal computers are established based on its modularity. Each part of the product or module can be separated from the whole, hence can be treated as a single entity for the purpose of recyclability, disassembly and reparability. The following requirements have to be fulfilled: <ul style="list-style-type: none">- The parts of the product shall be recyclable.- There shall be no inseparable joints between different materials such as glued or welded joints.- Modules shall be easily removed.- Connections between parts must be easily located.- Labels and/or stickers shall be made up of the same material as the part in which they are attached and/or it must not be treated in a manner that would pose difficulty in recycling.	Information for users and/or 3rd parties	Other relevant criteria or views
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EPEAT UL 110 Standard for Sustainability for Mobile Phones (2 nd Edition, 2017) 	The Standard establishes multiple attribute sustainability criteria for mobile phones, covering the mobile phone, accessories shipped in the box with the mobile phone, and packaging.	9.2.4 Required – Restriction of cadmium and mercury in the mobile phone battery cell Each battery cell contained in the product shall, at a cell level, contain not more than 20 ppm cadmium and 5 ppm mercury as per European Union Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators and its amendments, including European Union Directive 2013/56/EU of 20 November 2013.	X	10 Energy Use Requirements 10.1 Mobile phone battery charging system efficiency 10.1.1 Required – Battery Charger Systems a) Test report demonstrating that the product meets: <ul style="list-style-type: none">i. The CEC rulemaking requirements for "maximum 24-hour charge and maintenance energy (Wh)" (until June 13, 2018)ii. The requirements of the Federal Energy Conservation Standards for Battery Chargers; Final rule (after June 13, 2018) b) If the product is declared to conform in a country or region with different voltage and frequency combinations, demonstration that the test report includes 115 V/60 Hz and 230 V/50 Hz, including the least efficient set of test results 10.1.2 Optional – Reduction in energy consumption of battery charging systems a) Test report demonstrating a 10%, 20% or 30% reduction in: <ul style="list-style-type: none">i. The CEC "maximum 24-hour charge and maintenance energy (Wh)" (until June 13, 2018)ii. The Federal Energy Conservation Standards for Battery Chargers; Final rule – reduced unit energy consumption (after June 13, 2018) b) If the product is declared to conform in a country or region with different voltage and frequency combinations, demonstration that the test report includes 115 V/60 Hz and 230 V/50 Hz, including the least efficient set of test results 10.1.3 Required – External power supply energy efficiency a) Test report demonstrating that the external power supply meets the efficiency requirements of the U.S. DOE Efficiency Regulations for External Power Supplies for "Maximum Power in No- Load Mode (W)" for direct EPS b) If the product is declared to conform in a country or region with different voltage and frequency combinations, demonstration that the test report includes 115 V/60 Hz and 230 V/50 Hz, as representative voltages and with the least efficient set of test results used to meet the criterion requirements 10.1.4 Optional – Reduced maintenance mode power a) Test report demonstrating that the external power supply exceeds the efficiency requirements of the U.S. DOE Efficiency Regulations for External Power Supplies for "Maximum Power in No-Load Mode (W)" for direct EPS in accordance with Table 10.2 in the criterion b) If the product is declared to conform in countries or regions with different voltage and frequency combinations, the test report includes both 115 V/60 Hz and 230 V/50 Hz, as representative voltages and with the least efficient set of test results used to meet the criterion requirements	11.3 Rechargeable battery removability/replacement 11.3.1 Required – Battery removability/replacement by qualified repair service providers or authorized repair providers a) Instructions demonstrating how qualified repair service providers or authorized repair providers can remove and replace batteries that can provide primary power, without damage that would preclude re-use or refurbishment of the mobile phone b) List of non-proprietary tools needed c) Documentation of how the instructions are made available to qualified repair service providers or authorized repair providers (e.g. sample of relevant language from the contract, URL where information is made available) d) Documentation that information on how to recycle used batteries is provided in electronic or printed formats, or on the battery e) Instructions specifying who are the appropriate parties to remove the battery 11.3.3 Optional – Battery removability/replacement without use of tools a) Instructions demonstrating how the user can remove and replace batteries covered by this criterion without the use of tools and without causing damage to the mobile phone that would preclude re-use or refurbishment of the mobile phone b) One of the following: <ul style="list-style-type: none">i. Evidence that the instructions specified in 11.3.1 applicable for user removable batteries are provided with the product Orii. URL on the manufacturer's public website for instructions specified in 11.3.1 applicable for user removable batteries 11.4 Ease of disassembling mobile phone 11.4.1 Required – Ease of disassembling mobile phone a) Documentation that the mobile phone housing is removable or detachable to allow access to the screen, primary circuit board and battery by a qualified repair service provider or authorized repair provider without causing damage that would preclude re-use or refurbishment b) List of tools needed for removal or detachment c) Evidence that the adhesives are not used or do not prevent removal of listed components i. Documentation that any adhesive tapes claimed to be exempted are used are for EMC compliance 11.4.2 Optional – Further ease of disassembling mobile phone a) Evidence that product has same screw head design and size to remove every part required to remove the display and primary circuit board And/or b) Evidence that product has same screw head design and size to remove every part required to remove batteries	11.3.2 Optional – Battery removability instructions a) Demonstration that the removal of batteries covered by this criterion by qualified repair service providers and authorized repair providers is achievable without the use of tools for removal of the battery alone (i.e. use of tools to get to the battery is acceptable) b) URL for manufacturer's website containing information on how to obtain removal instructions in accordance with 11.3.1	13.2.1 Optional – Corporate sustainability (CS) reporting in the supply chain ...The three supplier(s) selected shall provide components or assemblies to the manufacturer from one or more of the following categories: <ul style="list-style-type: none">- Printed circuit board assemblies- Integrated circuits- Printed circuit boards- Display- Batteries <p>It is acceptable for the supplier to provide the disclosure, or for the manufacturer to include the suppliers' disclosures in the manufacturer's own reporting. If the manufacturer provides the disclosures, the data can either be separate for each supplier, or aggregated together.</p> 15.2.2 Optional – Supplier production facilities environmental management system ... The suppliers selected shall provide components or assemblies to the manufacturer from one or more of the following categories: <ul style="list-style-type: none">- Printed circuit board assemblies- Integrated circuits- Camera- Printed circuit boards- Display- Housing- Batteries									

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Japan Environment Association. Eco Mark	<p>This Eco Mark product category applies to notebook PCs, desktop PCs, all-in-one PCs (a PC with integrated monitor), CRT monitors, LCD monitors, keyboards, and mouse devices.</p> <p>This product category also includes thin clients*1 and tablet PCs*2.</p> <p>*1 Thin client: A terminal that is attached to an organization's information system network. Thin clients offer enhanced security because client PCs possess only the essential functions, while application software, files and other assets are managed by a server.</p> <p>Normally, thin clients do not have an internal magnetic disk or other means of storage.</p> <p>*2 Tablet PC: A personal computer that emphasizes features such as portability and viewing ease for business applications and that is treated as a type of notebook PC.</p> 	<p>Cadmium, lead and mercury shall not be added as prescribed constituents.</p> <p>Applies to single-cell batteries. Does not apply to solder and so forth used to interconnect single-cell batteries.</p> <p>The percentage content of lead, cadmium, hexavalent chromium, mercury, and specified brominated fire retardants (PBBS, PBDEs) shall not exceed the reference values enumerated for these specified substances in JIS C 0950, a Japanese Industrial Standard that specifies the method for indicating the content of specified substances contained in electrical and electronic equipment.</p> <p>If an applicable substance qualifies as an exception under content marking rules, the content information shall be disclosed on a website. This item applies to batteries that equipment users are not supposed to remove. This item does not apply to batteries that equipment users may remove.</p>	X	<p>The PC shall be equipped with a power switch and power consumption in the off state shall be less than 1W. If the computer is required to operate other functions (functions to supply power to a clock, monitor modem or LAN wake signals, monitor battery charge, and illuminate LEDs to notify equipment users of equipment status, etc.) when the power switch off, power consumption shall not exceed 5W.</p> <p>Standard energy consumption efficiency for battery-driven computers:</p> <table border="1"> <thead> <tr> <th>Type of power source and the number of memory channels of client/electronic computer</th> <th>Main Memory Capacity</th> <th>Independent GPU</th> <th>Monitor size</th> <th>Category</th> <th>Standard energy consumption efficiency</th> </tr> </thead> <tbody> <tr> <td>Battery-driven computer whose number of memory channels is equal to or greater than 2</td> <td>16 Gigabytes or more</td> <td></td> <td></td> <td>M</td> <td>2.25</td> </tr> <tr> <td></td> <td>From 4 gigabytes to less than 16 gigabytes</td> <td></td> <td></td> <td>N</td> <td>0.34</td> </tr> <tr> <td></td> <td>less than 4 gigabytes</td> <td>equipped</td> <td>17 or more</td> <td>P</td> <td>0.31</td> </tr> <tr> <td></td> <td></td> <td>unequipped</td> <td>less than 17 from 12 to 17</td> <td>Q R</td> <td>0.21 0.15</td> </tr> <tr> <td></td> <td></td> <td></td> <td>less than 12</td> <td>S</td> <td>0.21</td> </tr> <tr> <td>Among computers other than battery-driven computers whose number of memory channels is equal to or greater than 2, those using an AC adapter as a power unit</td> <td>16 Gigabytes or more</td> <td></td> <td></td> <td>U</td> <td>2.25</td> </tr> <tr> <td>Among computers other than battery-driven computers whose number of memory channels is equal to or greater than 2, those not using an AC adapter as a power unit</td> <td>From 4 gigabytes to less than 16 gigabytes</td> <td>equipped unequipped</td> <td></td> <td>V W</td> <td>0.51 0.64</td> </tr> <tr> <td>Computer whose number of memory channels is less than 2</td> <td>less than 4 gigabytes</td> <td></td> <td></td> <td>X</td> <td>0.53</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>Y</td> <td>0.51</td> </tr> </tbody> </table>	Type of power source and the number of memory channels of client/electronic computer	Main Memory Capacity	Independent GPU	Monitor size	Category	Standard energy consumption efficiency	Battery-driven computer whose number of memory channels is equal to or greater than 2	16 Gigabytes or more			M	2.25		From 4 gigabytes to less than 16 gigabytes			N	0.34		less than 4 gigabytes	equipped	17 or more	P	0.31			unequipped	less than 17 from 12 to 17	Q R	0.21 0.15				less than 12	S	0.21	Among computers other than battery-driven computers whose number of memory channels is equal to or greater than 2, those using an AC adapter as a power unit	16 Gigabytes or more			U	2.25	Among computers other than battery-driven computers whose number of memory channels is equal to or greater than 2, those not using an AC adapter as a power unit	From 4 gigabytes to less than 16 gigabytes	equipped unequipped		V W	0.51 0.64	Computer whose number of memory channels is less than 2	less than 4 gigabytes			X	0.53					Y	0.51	<p>Batteries shall be replaceable and removable by equipment users. This does not apply to batteries that are mounted to printed circuit boards or other components that are not supposed to be removed by equipment users.</p> <p>"Removable" means battery removal corresponding to items A, B or C in Table 2.</p> <table border="1"> <thead> <tr> <th>Designation</th> <th>Range</th> <th>Sign</th> <th>Classification</th> <th>Item</th> <th>Subclass</th> <th>Example of item evaluation</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Easy</td> <td>A</td> <td>One-touch</td> <td>One-touch</td> <td colspan="3">Power unit is off-line system, and battery (packing) can be taken out by one touch.</td> </tr> <tr> <td>B</td> <td>Removal of cover by hand</td> <td>One-touch</td> <td colspan="3">Removal of cover by hand is possible, and battery (packing) can be taken out by one touch.</td> </tr> <tr> <td>C</td> <td>Removal of cover by screw</td> <td>One-touch</td> <td colspan="3">Connector removing Removal of cover by hand is possible, and battery (packing) can be taken out by one touch.</td> </tr> <tr> <td rowspan="3">Medium</td> <td>D</td> <td>Removal of cover by screw</td> <td>Cutting</td> <td colspan="3">Removal of cover by screw is possible, and battery (packing) can be taken out by removing cover with a screwdriver etc.</td> </tr> <tr> <td>E</td> <td>Decomposition of the whole(screw removal)</td> <td>Connector removing</td> <td colspan="3">Decomposition of the whole by removing screw is possible and the battery (packing) can be taken out by removing the connector.</td> </tr> <tr> <td>F</td> <td>Decomposition of the whole (screw removal)</td> <td>Cutting</td> <td colspan="3">Decomposition of the whole by removing screw is possible, and battery (packing) can be taken out by cutting the connection with nippers etc.</td> </tr> <tr> <td rowspan="2">Difficult</td> <td>G</td> <td>Decomposition of the whole (disassembly)</td> <td>Connector removing Cutting</td> <td colspan="3">Dismantling the whole and the battery (packing) can be taken out by removing the connector. 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This does not apply in instances where, for example, batteries are mounted to a printed circuit board or other component that is not supposed to be removed by equipment users.</p> <p>For equipment that has a secondary battery, information or labels shall be provided in accordance with the Law for the Promotion of Effective Utilization of Resources so as to (1) communicate that the equipment has a secondary battery, and (2) promote the use of secondary batteries as a recyclable resource.</p>	X
Type of power source and the number of memory channels of client/electronic computer	Main Memory Capacity	Independent GPU	Monitor size	Category	Standard energy consumption efficiency																																																																																																																		
Battery-driven computer whose number of memory channels is equal to or greater than 2	16 Gigabytes or more			M	2.25																																																																																																																		
	From 4 gigabytes to less than 16 gigabytes			N	0.34																																																																																																																		
	less than 4 gigabytes	equipped	17 or more	P	0.31																																																																																																																		
		unequipped	less than 17 from 12 to 17	Q R	0.21 0.15																																																																																																																		
			less than 12	S	0.21																																																																																																																		
Among computers other than battery-driven computers whose number of memory channels is equal to or greater than 2, those using an AC adapter as a power unit	16 Gigabytes or more			U	2.25																																																																																																																		
Among computers other than battery-driven computers whose number of memory channels is equal to or greater than 2, those not using an AC adapter as a power unit	From 4 gigabytes to less than 16 gigabytes	equipped unequipped		V W	0.51 0.64																																																																																																																		
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