



Council of the
European Union

Brussels, 2 February 2023
(OR. en)

5942/23
ADD 1

ENER 51
ENV 86

COVER NOTE

From:	European Commission
date of receipt:	31 January 2023
To:	General Secretariat of the Council
No. Cion doc.:	D087416/01 - ANNEXES 1 to 5
Subject:	ANNEXES to the Commission Regulation laying down ecodesign requirements for smartphones, mobile phones other than smartphones, cordless phones and slate tablets pursuant to Directive 2009/125/EC of the European Parliament and of the Council and amending [add reference to the revised Ecodesign Regulation on standby, networked standby and off mode]

Delegations will find attached document D087416/01 - ANNEXES 1 to 5.

Encl.: D087416/01 - ANNEXES 1 to 5



EUROPEAN
COMMISSION

Brussels, XXX
[...] (2023) XXX draft

ANNEXES 1 to 5

ANNEXES

to the

Commission Regulation

laying down ecodesign requirements for smartphones, mobile phones other than smartphones, cordless phones and slate tablets pursuant to Directive 2009/125/EC of the European Parliament and of the Council and amending [add reference to the revised Ecodesign Regulation on standby, networked standby and off mode]

ANNEX I

Definitions applicable to the Annexes

- (1) 'networked standby' means networked standby within the meaning of Article 2(11) of Commission Regulation (EC) No 1275/2008¹;
- (2) 'P_n' is the power consumption in networked standby mode, expressed in Watt and rounded to two decimal places;
- (3) 'spare part' means a separate part that can replace a part with the same or similar function in a mobile phone, cordless phone or slate tablet. The functionality of the mobile phone, cordless phone or slate tablet is restored or upgraded when the part is replaced by a spare part. Spare parts may be used parts;
- (4) 'serialised part' means a part which has a unique code that is paired to an individual unit of a device and whose replacement by a spare part requires the pairing of that spare part to the device by means of a software code to ensure full functionality of the spare part and the device;
- (5) 'professional repairer' means an operator or undertaking which performs repair and professional maintenance of mobile phones, cordless phones or slate tablets, either as a service or with a view to the subsequent resale of the repaired device;
- (6) 'fastener' means a hardware device or substance that mechanically, magnetically or by other means connects or fixes two or more objects, parts or pieces. A hardware device which in addition serves an electrical function shall also be considered a fastener;
- (7) 'required fastener' means any fastener to be disassembled according to the repair instructions provided by manufacturers, importers or authorised representatives to get access to a part which is meant to be replaced by a spare part;
- (8) 'reusable fastener' means a fastener that can be completely reused in the reassembly for the same purpose and that does no damage either to the product or to the fastener itself during the disassembly or reassembly process in a way that makes their multiple reuse impossible;
- (9) 'resupplied fastener' means a removable fastener that is supplied at no additional cost with the spare part which it is intended to connect or fix; adhesives shall be considered resupplied fasteners if they are supplied with the spare part in a quantity that is sufficient for the reassembly, at no additional cost;
- (10) 'removable fastener' means a fastener that is not a reusable fastener, but whose removal does not damage the product, or leave residue, which precludes reassembly;
- (11) 'battery' means any part consisting of one or several battery cells, including, as relevant to the product model, an electronic circuitry with battery-related sensors for battery management, housing(s), battery tray, brackets, shieldings, thermal interface materials, and electric connections to other assemblies of the device;

¹ Commission Regulation (EC) No 1275/2008 of 17 December 2008 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment (OJ L 339, 18.12.2008, p. 45)

- (12) ‘back cover’ or ‘back cover assembly’ means the main backside housing, including one or more of the following elements, as relevant to the product model: the frame, a backside cover layer attached to the main back cover body, rear-facing camera lens covers, printed antennas, brackets, shieldings, gaskets, electric connections to other assemblies of the device and thermal interface materials;
- (13) ‘auxiliary microphone’ means a microphone that is not essential for user’s voice signals, but provides secondary functions, such as, but not limited to, ambient noise reduction;
- (14) ‘front-facing camera assembly’ means any part consisting of one or several cameras oriented towards the user of the device, including, as relevant to the product model:
- (a) camera components and related sensors;
 - (b) flashlight components;
 - (c) optical components;
 - (d) mechanical components needed for functions such as image stabilisation and focus;
 - (e) module housing(s);
 - (f) brackets;
 - (g) shieldings;
 - (h) signal lights;
 - (i) auxiliary microphones;
 - (j) electric connections to other assemblies of the device;
- (15) ‘rear-facing camera assembly’ means any part consisting of one or several cameras oriented to the rear side of the device, including, as relevant to the product model:
- (a) camera components and related sensors;
 - (b) flashlight components;
 - (c) optical components;
 - (d) mechanical components needed for functions such as image stabilisation and focus;
 - (e) module housing(s);
 - (f) brackets;
 - (g) shieldings;
 - (h) auxiliary microphones;
 - (i) electric connections to other assemblies of the device;
- (16) ‘external audio connector’ means a connector for audio signals to connect to a headset or external loudspeakers or similar audio device, including, as relevant to the product model, brackets, gaskets and electric connections to other assemblies of the device;
- (17) ‘external charging port’ means a port for wired battery charging, possibly also used for data exchange and reverse charging of another device, which is composed of a

- USB-C receptacle and a related housing and including, as relevant to the product model, brackets, gaskets and electric connections to other assemblies of the device;
- (18) ‘mechanical button’ means a mechanical switch or an assembly of mechanical switches that can be depressed or a slider button which can be mechanically moved to switch on or off functions such as volume, triggering the camera, or switching on or off the device and including, as relevant to the product model, brackets, gaskets and electric connections to other assemblies of the device;
- (19) ‘main microphone(s)’ means the microphone(s) intended for the user’s voice signals including, as relevant to the product model, gaskets and electric connections to other assemblies of the device;
- (20) ‘speaker’ means any loudspeaker and any mechanical part to generate sound, including, as relevant to the product model, module housing(s), gaskets and electric connections to other assemblies of the device;
- (21) ‘hinge assembly’ means a part that allows a device to be folded while preserving its operational integrity including, where relevant, module housings;
- (22) ‘mechanical display folding mechanism’ means a part that allows a device, including its display, to be folded while preserving its operational integrity;
- (23) ‘charger’ means an external power supply to charge the battery of and provide electrical power to a battery-powered mobile phone, cordless phone or slate tablet;
- (24) ‘SIM tray and memory card tray’ means a movable tray for a removable SIM card or memory card;
- (25) ‘display assembly’ means the assembly of display unit and where relevant front panel digitiser unit, including, as relevant to the product model:
- (a) backplate;
 - (b) shielding;
 - (c) display frame;
 - (d) backlight units;
 - (e) electronics circuitry including:
 - (i) display driver but excluding the main graphics processing unit functionality;
 - (ii) row and column controllers;
 - (iii) touch signal circuitry;
 - (iv) electric connections to other assemblies of the device;
- (26) ‘protective foil for foldable display’ means a protective film designed to be attached to the display of a foldable device to enhance the reliability and to reduce mechanical wear of the screen surface;
- (27) ‘free access website’ means a website that can be accessed without having to pay or to provide personal information, including an email address or phone number;
- (28) ‘failure analysis’ means a process of collecting and analysing data to identify the part of a mobile phone, cordless phone or slate tablet which causes a malfunction;

- (29) 'separate protective cover' means a protective cover which may be shipped with a mobile phone, cordless phone or slate tablet, but does not serve as a required part of the housing and is not considered an integral part of the product;
- (30) 'encryption' means a (reversible) transformation of data by a cryptographic algorithm to produce ciphertext, namely to hide the information content of the data;
- (31) 'key' means a sequence of symbols that controls the operation of a cryptographic transformation (e.g., encipherment, decipherment);
- (32) 'disassembly' means a process whereby a product is separated into its parts and/or components in such a way that it could subsequently be reassembled and made operational;
- (33) 'operating system' means the general type of pre-installed software that controls the execution of programs and that may provide services such as resource allocation, scheduling, input-output control and data management; it is normally subject to regular updates leading to the establishment of a range of major and minor versions; it includes any pre-installed software applications which the user cannot uninstall;
- (34) 'security update' means an operating system update, including security patches, if relevant for a given device, whose main purpose is to provide enhanced security for the device;
- (35) 'corrective update' means an operating system update, including corrective patches, whose purpose is to provide corrections to bugs, errors or malfunctions in the operating system;
- (36) 'functionality update' means an operating system update whose main purpose is to implement new functionalities;
- (37) 'rated capacity' means the amount of electricity declared by the manufacturer that a battery can deliver during a 5-hour period when measured under specified conditions, expressed in milliampere-hours (mAh);
- (38) 'battery endurance in cycles' means the number of charge/discharge cycles a battery can withstand until its usable electrical capacity has reached 80 % of its rated capacity, expressed in cycles;
- (39) 'state of charge' means the available capacity in a battery expressed as a percentage of rated capacity;
- (40) 'state of health' means a measure of the general condition of a rechargeable battery and its ability to deliver the specified performance compared with its initial condition, expressed as the remaining full charge capacity relative to the rated capacity, in %;
- (41) 'battery management system' means an electronic device that controls or manages the electric and thermal functions of the battery, that manages and stores the data on the parameters for recording the date of manufacturing of the battery, date of first use of the battery, number of charge/discharge cycles, and the state of health of the battery, and that communicates with the product in which the battery is incorporated;
- (42) 'remaining capacity' of a battery means the capacity with the battery keeping normal peak performance and measured relative to when the product was new;

- (43) 'smart charging' means an adaptive battery charging profile based on algorithms learning from user behaviour to optimise the charging profile in terms of reducing battery lifetime limiting effects;
- (44) 'R_{cyc}' means the recyclability rate, expressed in %;
- (45) 'ingress protection rating' means the extent of protection provided by an enclosure against ingress of solid foreign objects and/or against ingress of water, measured according to standardised test methods and expressed with a coding system to indicate the degree of such protection;
- (46) 'date of placement on the market' means the date of placing on the market of the first unit of a product model;
- (47) 'date of end of placement on the market' means the date of placing on the market of the last unit of a product model;
- (48) 'secure deletion of the encryption key' means the effective erasure of the encryption key used to encrypt and decrypt data, overwriting the key completely in such a way that access to the original key, or parts of it, becomes infeasible;
- (49) 'proprietary tool' means a tool that is not available for purchase by the general public or for which any applicable patents are not available to licence under fair, reasonable and non-discriminatory terms;
- (50) 'basic tools' means a screwdriver for slotted heads, a screwdriver for cross recess screws, a screwdriver for hexalobular recess heads, a hexagon socket key, a combination wrench, combination pliers, combination pliers for wire stripping and terminal crimping, half round nose pliers, diagonal cutters, multigrip pliers, locking pliers, a prying lever, tweezers, magnifying glass, a spudger and a pick;
- (51) 'commercially available tool' means a tool that is available for purchase by the general public and is neither basic tools nor a proprietary tool;
- (52) 'production-equivalent environment' means an environment that is comparable with the environment in which a product was manufactured;
- (53) 'use environment' means an environment where the product is in use;
- (54) 'workshop environment' means an environment, that is neither a use environment nor a production-equivalent environment, and where machinery and/or tools are used under controlled conditions as suitable for the repair activities;
- (55) 'generalist' means a person with general knowledge of basic repair techniques and safety precautions;
- (56) 'layman' means a person without any specific repair experience or related qualifications;
- (57) 'declared values' means the values provided by the manufacturer, importer or authorised representative for the stated, calculated or measured technical parameters in accordance with Article 4, for the verification of compliance by the Member State authorities;
- (58) 'fully extended state' means a state of the device whereby movable parts as intended for use, such as displays and keyboards, are unfolded, flipped open or similarly extended in a way that the projected area of length times width is maximised.

ANNEX II

Ecodesign requirements

A. Mobile phones other than smartphones

1. RESOURCE EFFICIENCY REQUIREMENTS

1.1. Design for repair and reuse

(1) Availability of spare parts:

- (a) From [*21 months after the entry into force of this Regulation*] or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall make available to professional repairers at least the following spare parts, including required fasteners, if not reusable, until at least 7 years after the date of end of placement on the market, when present:
 - (i) battery or batteries;
 - (ii) front-facing camera assembly;
 - (iii) rear-facing camera assembly;
 - (iv) external audio connector(s);
 - (v) external charging port(s);
 - (vi) mechanical button(s);
 - (vii) main microphone(s);
 - (viii) speaker(s);
 - (ix) hinge assembly;
 - (x) mechanical display folding mechanism.
- (b) Spare parts concerned by points (a) and (c) shall not be assemblies comprising more than one of the listed spare part types, with the following exceptions:
 - (i) microphones may be part of a loudspeaker or external charging port assembly;
 - (ii) external audio connector(s) may be combined with the external charging port(s) as the same port(s);
 - (iii) external charging port(s) may be combined with the external audio connector(s) as the same port(s);
 - (iv) hinge assembly may be part of a mechanical display folding mechanism;
 - (v) microphone, speaker(s), buttons and external connectors may be combined with a higher level assembly if the following reliability requirements are met:
 - the power button has a contact closure cycle resistance ≥ 225.000 cycles;
 - the volume button has a contact closure cycle resistance ≥ 100.000 cycles;

- the charging connector has a insertion/extraction cycle resistance ≥ 12.000 cycles.
- (c) From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later:
 - (i) manufacturers, importers or authorised representatives shall make available to professional repairers and end-users at least the following spare parts, including required fasteners, if not reusable, until at least 7 years after the date of end of placement on the market:
 - (a) battery or batteries;
 - (b) back cover or back cover assembly, if to be fully removed for replacement of the battery;
 - (c) protective foil for foldable displays;
 - (d) display assembly;
 - (e) charger, unless the device complies with [OP please add reference to the common charger provision, Article 3(4) in the proposal for a Directive amending Directive 2014/53/EU of the European Parliament and of the Council²];
 - (f) SIM tray and memory card tray, if there is an external slot for a SIM tray or memory card tray.
 - (ii) manufacturers, importers or authorised representatives may provide the battery or batteries referred to in point (i)(a) only to professional repairers if manufacturers, importers or authorised representatives ensure that the following requirements are met:
 - (a) after 500 full charge cycles the battery has, in a fully charged state, a remaining capacity of at least 83 % of the rated capacity;
 - (b) the battery endurance in cycles achieves a minimum of 1000 full charge cycles and after 1000 full charge cycles the battery has, in a fully charged state, a remaining capacity of at least 80 % of the rated capacity;
 - (c) the device meets IP67 rating.
- (d) From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, the list of spare parts concerned by point (a) and (c) and the procedure for ordering them shall be publicly available on the free access website of the manufacturer, importer or authorised representative, until the end of the period of availability of these spare parts;
- (2) Access to repair and maintenance information
 - (a) From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall, at least until 7 years after the date of end of placement on the market, provide access to repair

² OP please add the references to the proposal above

and maintenance information to professional repairers for parts covered by points 1(a) and (c) in the following conditions, unless that information is made publicly available at the free access website of the manufacturer, importer or authorised representative:

- (a) The manufacturer's, importer's or authorised representative's website shall indicate the process for professional repairers to register for access to information; to accept such a request, the manufacturers, importers or authorised representatives may only require the professional repairer to demonstrate that:
 - (i) the professional repairer has the technical competence to repair mobile phones other than smartphones and complies with the applicable regulations for repairers of electrical equipment in the Member States where it operates. Reference to an official registration system as professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point;
 - (ii) the professional repairer is covered by insurance covering liabilities resulting from its activity regardless of whether this is required by the Member State;
- (b) Manufacturers, importers or authorised representatives shall accept or refuse the registration within 5 working days from the date of request. In the case of refusal, a clear justification will be provided to the requestee outlining the reasons behind such decision, which shall be revoked, if the same professional repairer requests to be registered with updated information, which complies with the conditions for being granted access;
- (c) Manufacturers, importers or authorised representatives may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates of such information. The registration as such shall be provided for free. A fee shall be considered reasonable in particular if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information;
- (d) Once registered, a professional repairer shall have access, within 1 working day after requesting it, to the requested repair and maintenance information. The information may be provided for an equivalent model or model of the same family, if relevant;
- (e) The repair and maintenance information referred to in point (a) shall contain the level of detail needed to be able to replace parts covered by point 1(a) and (c) and shall at least include:
 - (i) the unequivocal product identification;
 - (ii) a disassembly map or exploded view;
 - (iii) wiring and connection diagrams, as required for failure analysis;
 - (iv) electronic board diagrams;
 - (v) a list of necessary repair and test equipment;

- (vi) technical manual of instructions for repair, including marking of the individual steps;
 - (vii) diagnostic fault and error information (including manufacturer-specific codes, where applicable);
 - (viii) component and diagnosis information (such as minimum and maximum theoretical values for measurements);
 - (ix) instructions for software and firmware (including reset software);
 - (x) information on how to access data records of reported failure incidents stored on the device, where applicable, with the exception of personal identifiable information such as related to user behavior and location information;
 - (xi) information on how to access professional repair, including the internet webpages, addresses and contact details of professional repairers registered in accordance with points 2 (a) and (b);
- (f) Without prejudice to intellectual property rights, third parties shall be allowed to use and publish unaltered repair and maintenance information initially published by the manufacturer, importer or authorised representative and covered by point (e) once the manufacturer, importer or authorised representative terminates access to that information after the end of the period of access to repair and maintenance information.
- (b) From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, repair instructions and maintenance information for parts concerned by point 1(c) shall be publicly available at the free access website of the manufacturer, importer or authorised representative, until at least 7 years after the date of end of placement on the market. This information shall contain the level of detail needed to be able to replace parts covered by point 1(c).
- (3) Maximum delivery time of spare parts
- (a) manufacturers, importers or authorised representatives shall ensure that:
 - (i) during the first 5 years of the period referred to in points 1(a) and (c), spare parts are delivered within 5 working days after having received the order;
 - (ii) during the remaining 2 years of the period referred to in points 1(a) and (c), spare parts are delivered within 10 working days after having received the order.
 - (b) In the case of spare parts concerned by point 1(a), the availability of spare parts may be limited to professional repairers registered in accordance with point 2 (a) and (b).
- (4) Information on the price of spare parts
- During the period referred to in points 1(a) and (c), manufacturers, importers or authorised representatives shall provide indicative pre-tax prices at least in euro for spare parts listed in points 1(a) and (c), including the pre-tax price of fasteners and tools, if supplied with the spare part, on the free access website of the manufacturer, importer or authorised representative.

(5) Disassembly requirements

Manufacturers, importers or authorised representatives shall meet the following disassembly requirements:

- (a) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for replacement of the display assembly and of parts referred to in point 1(a), with the exception of the battery or batteries, meets the following criteria:
 - (i) fasteners shall be removable, resupplied or reusable;
 - (ii) the process for replacement shall be feasible in at least one of the following ways:
 - with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - with commercially available tools.
 - (iii) the process for replacement shall, as a minimum, be able to be carried out in a workshop environment;
 - (iv) the process for replacement shall, as a minimum, be able to be carried out by a generalist.
- (b) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for replacement of parts referred to in point 1(c), with the exception of the battery or batteries, meets the following criteria:
 - (i) fasteners shall be removable, resupplied or reusable;
 - (ii) the process for replacement shall be feasible with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - (iii) the process for replacement shall be able to be carried out in a use environment;
 - (iv) the process for replacement shall be able to be carried out by a layman.
- (c) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for battery replacement:
 - (i) meets the following criteria:
 - fasteners shall be resupplied or reusable;
 - the process for replacement shall be feasible with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - the process for replacement shall be able to be carried out in a use environment;
 - the process for replacement shall be able to be carried out by a layman.
 - (ii) or, as an alternative to point (i), ensure that:
 - the process for battery replacement meets the criteria set out in (a);

- after 500 full charge cycles the battery must, in addition, have in a fully charged state, a remaining capacity of at least 83 % of the rated capacity;
- the battery endurance in cycles achieves a minimum of 1000 full charge cycles, and after 1000 full charge cycles the battery must, in addition, have in a fully charged state, a remaining capacity of at least 80 % of the rated capacity;
- the device is at least dust tight and protected against immersion in water up to one meter depth for a minimum of 30 minutes.

(6) Requirements for preparation for reuse

From [21 months after the entry into force of this Regulation], manufacturers, importers or authorised representatives shall ensure that devices include a software function, that resets the device to its factory settings and erases securely by default all personal information including but not limited to address book, text messages, pictures, videos, settings and call history.

1.2. Design for reliability

From [21 months after the entry into force of this Regulation]:

- (1) Resistance to accidental drops: Manufacturers, importers or authorised representatives shall ensure that the devices pass 45 falls without any protective foil or separate protective cover, except for foldable mobile phones other than smartphones designed to be used with a protective foil on the foldable display, without loss of functionality, following the test procedure set out in Annex III; foldable mobile phones other than smartphones designed to be used with a protective foil on the foldable display shall pass 35 falls in the un-extended state and 15 falls in the extended state, without loss of functionality, following the test procedure set out in Annex III and tested with the protective foil.
- (2) Scratch resistance: Manufacturers, importers or authorised representatives shall ensure that the screen of the device passes the hardness level 4 on the Mohs hardness scale, except for foldable mobile phones other than smartphones designed to be used with a protective foil on the foldable display.
- (3) Protection from dust and water: Manufacturers, importers or authorised representatives shall ensure that the devices are protected against the ingress of solid foreign objects of size bigger than 1 millimeter and splashing of water.
- (4) Battery endurance in cycles: Manufacturers, importers or authorised representatives shall ensure that the devices achieve at least 500 cycles at 80 % remaining capacity, to be tested under charging conditions where the charging rate is limited by the battery management system and not by the power delivery capabilities of the power supply.
- (5) Battery management:
 - (i) manufacturers, importers or authorised representatives shall include an optional charging feature selectable by the user which terminates the charging process automatically, when the battery is charged to 80 % of its full capacity. When this feature is enabled, manufacturers, importers, or authorised representatives may enable the device to periodically fully charge the battery for the purposes of maintaining accurate battery state

of charge estimates. The user shall be informed automatically when charging the device for the first time or during the installation process, that the life span of the battery can be extended if the feature is selected and the battery is regularly charged only to 80 % of its full capacity;

- (ii) manufacturers, importers or authorised representatives shall provide a power management feature which by default ensures that once the battery is fully charged there is no further charging power supplied to the battery unless the charge level drops below 95 % of its maximum charge capacity.

(6) Operating system updates:

- (a) from the date of end of placement on the market to at least 5 years after that date, manufacturers, importers or authorised representatives shall, if they provide security updates, corrective updates or functionality updates to an operating system, make such updates available at no cost for all units of a product model with the same operating system;
- (b) the requirement referred to in point (a) shall apply both to operating system updates offered voluntarily by manufacturers, importers or authorised representatives and to operating system updates provided to comply with Union law;
- (c) security updates or corrective updates mentioned under point (a) need to be available to the user at the latest 4 months after the public release of the source code of an update of the underlying operating system or, if the source code is not publicly released, after an update of the same operating system is released by the operating system provider or on any other product of the same brand;
- (d) functionality updates mentioned under point (a) need to be available to the user at the latest 6 months after the public release of the source code of an update of the underlying operating system or, if the source code is not publicly released, after an update of the same operating system is released by the operating system provider or on any other product of the same brand;
- (e) an operating system update may combine security, corrective and functionality updates.

1.3. Marking of plastic components

From *[21 months after the entry into force of this Regulation]*, plastic components heavier than 50 g shall be marked by specifying the type of polymer with the appropriate standard symbols or abbreviated terms set between the punctuation marks ‘>’ and ‘<’ as specified in available standards. The marking shall be legible.

Plastic components shall be exempt from marking requirements provided the following conditions are fulfilled:

- (i) the marking is not possible because of the shape or size;
- (ii) the marking would impact on the performance or functionality of the plastic component;

- (iii) marking is technically not possible because of the molding method.

For the following plastic components no marking shall be required:

- (i) packaging, tape, labels and stretch wraps;
- (ii) wiring, cables and connectors, rubber parts and any other component where not enough appropriate surface area is available for the marking to be of a legible size;
- (iii) PCB assemblies, PMMA boards, optical components, electrostatic discharge components, electromagnetic interference components, speakers;
- (iv) transparent parts where the marking would obstruct the function of the part in question.

1.4. Recyclability requirements

From *[21 months after the entry into force of this Regulation]*:

- (1) Manufacturers, importers or their authorised representatives shall, without prejudice to Article 15(1) of Directive 2012/19/EU of the European Parliament and of the Council³, make available, on a free access website, the dismantling information needed to access any of the products components referred to in Annex VII, point 1, of Directive 2012/19/EU.
- (2) The information referred to in point (1) shall include the sequence of dismantling steps, tools or technologies needed to access the targeted components.
- (3) The information referred to in point (1) shall be available until at least 15 years after the placing on the market of the last unit of a product model.

2. INFORMATION REQUIREMENTS

From *[21 months after the entry into force of this Regulation]*:

- (1) Manufacturers, importers or authorised representatives shall provide in the technical documentation and make publicly available on free access websites of the manufacturer, importer or authorised representative the following information:
 - (a) compatibility with removable memory cards, if any;
 - (b) indicative weight range of the following critical raw materials and environmentally relevant materials:
 - (i) cobalt in the battery (weight range: less than 2 g, between 2 g and 5 g, above 5 g);
 - (ii) tantalum in capacitors (weight range: less than 0,05 g, between 0,05 g and 0,2 g, above 0,2 g);

³ Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) (OJ L 197, 24.7.2012, p. 38).‘

- (iii) neodymium in loud speakers, vibration motors, and other magnets (weight range: less than 0,05 g, between 0,05 g and 0,2 g, above 0,2 g);
 - (iv) gold in all components (weight range: less than 0,02 g, between 0,02 g and 0,1 g, above 0,1 g).
 - (c) the indicative value of the recyclability rate R_{cyc} ;
 - (d) the indicative percentage of recycled content for the product or a part thereof, where available; if not available, the recycled content should be indicated as “not known” or “not available”;
 - (e) ingress protection rating;
 - (f) minimum battery endurance in cycles in number of cycles;
 - (g) in case of foldable devices, it shall be indicated that ‘This device did not undergo a scratch resistance test’.
- (2) Manufacturers, importers or authorised representatives shall provide user instructions in the form of a user manual on a free access website of the manufacturer, importer or authorised representative. Those instruction shall include instructions for battery maintenance, including the following:
- (i) impacts on battery lifetime related to exposure of the device to elevated temperatures, suboptimal charging patterns, fast charging and other known adverse factors;
 - (ii) effects of switching off radio connections, such as WiFi, Bluetooth, on power consumption;
 - (iii) information about whether the device supports other features, which extend battery lifetime, such as smart charging and about how these features are activated or under which conditions they work best.
- (3) Where the package does not include a charger, the user instructions referred to in point 2 shall include the following information: “For environmental reasons this package does not include a charger. This device can be powered with most USB power adapters and a cable with USB Type-C plug.”.

B. Smartphones

1. RESOURCE EFFICIENCY REQUIREMENTS

1.1. Design for repair and reuse

(1) Availability of spare parts

- (a) From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall make available to professional repairers at least the following spare parts, including required fasteners, if not reusable, until at least 7 years after the date of end of placement on the market, when present:
 - (i) battery or batteries;
 - (ii) front-facing camera assembly;

- (iii) rear-facing camera assembly;
 - (iv) external audio connector(s);
 - (v) external charging port(s);
 - (vi) mechanical button(s);
 - (vii) main microphone(s);
 - (viii) speaker(s);
 - (ix) hinge assembly;
 - (x) mechanical display folding mechanism.
- (b) Spare parts concerned by points (a) and (c) shall not be assemblies comprising more than one of the listed spare part types, with the following exceptions:
- (i) microphones may be part of a loudspeaker or external charging port assembly;
 - (ii) external audio connector(s) may be combined with the external charging port(s) as the same port(s);
 - (iii) external charging port(s) may be combined with the external audio connector(s) as the same port(s);
 - (iv) hinge assembly may be part of a mechanical display folding mechanism;
 - (v) microphone, speaker(s), buttons and external connectors may be combined with a higher level assembly if the following reliability requirements are met:
 - the device meets IP67 rating;
 - the power button has a contact closure cycle resistance ≥ 225.000 cycles;
 - the volume button has a contact closure cycle resistance ≥ 100.000 cycles;
 - the charging connector has a insertion/extraction cycle resistance ≥ 12.000 cycles.
- (c) From *[OP: please insert the date = 21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later:
- (i) manufacturers, importers or authorised representatives shall make available to professional repairers and end-users at least the following spare parts, including required fasteners, if not reusable, until at least 7 years after the date of end of placement on the market:
 - (a) battery or batteries;
 - (b) back cover or back cover assembly, if to be fully removed for replacement of the battery;
 - (c) protective foil for foldable displays;
 - (d) display assembly;

- (e) charger, unless the device complies with [OP please add reference to common charger provision, Article 3(4) in the proposal] of Directive 2014/53/EU;
 - (f) SIM tray and memory card tray, if there is an external slot for a SIM tray or memory card tray.
- (ii) manufacturers, importers or authorised representatives may provide the battery or batteries referred to in point (i)(a) only to professional repairers if manufacturers, importers or authorised representatives ensure that the following requirements are met:
- (a) after 500 full charge cycles the battery has, in a fully charged state, a remaining capacity of at least 83 % of the rated capacity;
 - (b) the battery endurance in cycles achieves a minimum of 1000 full charge cycles and after 1000 full charge cycles the battery has, in a fully charged state, a remaining capacity of at least 80 % of the rated capacity;
 - (c) the device meets IP67 rating.
- (d) From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, the list of spare parts concerned by points (a) and (c) and the procedure for ordering them shall be publicly available on the free access website of the manufacturer, importer or authorised representative, until the end of the period of availability of these spare parts.

(2) Access to repair and maintenance information

From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall, at least until 7 years after the date of end of placement on the market, provide access to repair and maintenance information to professional repairers for parts covered by points 1(a) and (c) in the following conditions, unless that information is made publicly available at the free access website of the manufacturer, importer or authorised representative:

- (a) The manufacturer's, importer's or authorised representative's website shall indicate the process for professional repairers to register for access to information; to accept such a request, the manufacturers, importers or authorised representatives may only require the professional repairer to demonstrate that:
 - (i) the professional repairer has the technical competence to repair smartphones and complies with the applicable regulations for repairers of electrical equipment in the Member States where it operates. Reference to an official registration system as professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point;
 - (ii) the professional repairer is covered by insurance covering liabilities resulting from its activity regardless of whether this is required by the Member State;

- (b) Manufacturers, importers or authorised representatives shall accept or refuse the registration within 5 working days from the date of request. In the case of refusal, a clear justification will be provided to the requestee outlining the reasons behind such decision, which shall be revoked, if the same professional repairer requests to be registered with updated information, which complies with the conditions for being granted access;
- (c) Manufacturers, importers or authorised representatives may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates of such information. The registration as such shall be provided for free. A fee shall be considered reasonable in particular if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information;
- (d) Once registered, a professional repairer shall have access, within 1 working day after requesting it, to the requested repair and maintenance information. The information may be provided for an equivalent model or model of the same family, if relevant;
- (e) The repair and maintenance information referred to in point (a) shall contain the level of detail needed to be able to replace parts covered by point 1(a) and (c) and shall at least include:
 - (i) the unequivocal product identification;
 - (ii) a disassembly map or exploded view;
 - (iii) wiring and connection diagrams, as required for failure analysis;
 - (iv) electronic board diagrams;
 - (v) a list of necessary repair and test equipment;
 - (vi) technical manual of instructions for repair, including marking of the individual steps;
 - (vii) diagnostic fault and error information (including manufacturer-specific codes, where applicable);
 - (viii) component and diagnosis information (such as minimum and maximum theoretical values for measurements);
 - (ix) instructions for software and firmware (including reset software);
 - (x) information on how to access data records of reported failure incidents stored on the device, where applicable, with the exception of personal identifiable information such as related to user behavior and location information;
 - (xi) information on how to access professional repair, including the internet webpages, addresses and contact details of professional repairers registered in accordance with points 2 (a) and (b);
- (f) Without prejudice to intellectual property rights, third parties shall be allowed to use and publish unaltered repair and maintenance information initially published by the manufacturer, importer or authorised representative and covered by point (e) once the manufacturer, importer or authorised representative terminates access to that information after the end of the period of access to repair and maintenance information.

From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, repair instructions and maintenance information for parts concerned by point 1(c) shall be publicly available at the free access website of the manufacturer, importer or authorised representative, until at least 7 years after the date of end of placement on the market. This information shall contain the level of detail needed to be able to replace parts covered by point 1(c).

(3) Maximum delivery time of spare parts

- (a) manufacturers, importers or authorised representatives shall ensure that:
 - (i) during the first 5 years of the period referred to in points 1(a) and (c), spare parts are delivered within 5 working days after having received the order;
 - (ii) during the remaining 2 years of the period referred to in points 1(a) and (c), spare parts are delivered within 10 working days after having received the order;
- (b) In the case of spare parts concerned by point 1(a), the availability of spare parts may be limited to professional repairers registered in accordance with points 2 (a) and (b).

(4) Information on the price of spare parts

During the period referred to in points 1(a) and (c), manufacturers, importers or authorised representatives shall provide indicative pre-tax prices at least in euro for spare parts listed in points 1(a) and (c), including the pre-tax price of fasteners and tools, if supplied with the spare part, on the free access website of the manufacturer, importer or authorised representative.

(5) Disassembly requirements

Manufacturers, importers or authorised representatives shall meet the following disassembly requirements:

- (a) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for replacement of the display assembly and of parts referred to in point 1(a), with the exception of the battery or batteries, meets the following criteria:
 - (i) fasteners shall be removable, resupplied or reusable;
 - (ii) the process for replacement shall be feasible in at least one of the following ways:
 - with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - with commercially available tools.
 - (iii) the process for replacement shall, as a minimum, be able to be carried out in a workshop environment;
 - (iv) the process for replacement shall, as a minimum, be able to be carried out by a generalist.
- (b) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for

replacement of parts referred to in point 1(c), with the exception of the battery or batteries, meets the following criteria:

- (i) fasteners shall be removable, resupplied or reusable;
 - (ii) the process for replacement shall be feasible with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - (iii) the process for replacement shall be able to be carried out in a use environment;
 - (iv) the process for replacement shall be able to be carried out by a layman.
- (c) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for battery replacement:
- (i) meets the following criteria:
 - fasteners shall be resupplied or reusable;
 - the process for replacement shall be feasible with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - the process for replacement shall be able to be carried out in a use environment;
 - the process for replacement shall be able to be carried out by a layman.
 - (ii) or, as an alternative to point (i), ensure that
 - the process for battery replacement meets the criteria set out in (a);
 - after 500 full charge cycles the battery must have in a fully charged state, a remaining capacity of at least 83 % of the rated capacity;
 - the battery endurance in cycles achieves a minimum of 1000 full charge cycles, and after 1000 full charge cycles the battery must, in addition, have in a fully charged state, a remaining capacity of at least 80 % of the rated capacity;
 - the device is at least dust tight and protected against immersion in water up to one meter depth for a minimum of 30 minutes.

(6) Requirements for preparation for reuse

From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that devices:

- (a) encrypt by default, using a random encryption key, the user data stored in the internal storage of the device;
- (b) include a software function, that resets the device to its factory settings and erases securely by default the encryption key and generates a new one;
- (c) record the following data from the battery management system in the system settings or another location accessible for end-users:
 - (i) date of manufacturing of the battery;

- (ii) date of first use of the battery after the set-up of the device by the first user;
- (iii) number of full charge/discharge cycles (reference: rated capacity);
- (iv) measured state of health (remaining full charge capacity relative to the rated capacity in %).

(7) Replacement of serialised parts

From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall, at least until 7 years after the date of end of placement on the market:

- (a) In case the parts to be replaced by spare parts referred to in point 1(a) are serialised parts, provide non-discriminatory access for professional repairers to any software tools, firmware or similar auxiliary means needed to ensure the full functionality of those spare parts and of the device in which such spare parts are installed during and after the replacement;
- (b) In case the parts to be replaced by spare parts referred to in point 1(c) are serialised parts, provide non-discriminatory access for professional repairers and end-users to any software tools, firmware or similar auxiliary means needed to ensure the full functionality of those spare parts and of the device in which such spare parts are installed during and after the replacement;
- (c) Provide, on a free access website of the manufacturer, importer or authorised representative, a description of the procedure for the notification and authorisation of the intended replacement of serialised parts by the owner of the device referred to in point (d); the procedure shall allow for remotely providing the notification and authorisation;
- (d) Before providing access to the software tools, firmware or similar auxiliary means referred to in points (a) and (b), the manufacturer, importer or authorised representative may only require to have received a notification and authorisation of the intended part replacement by the owner of the device. Such notification and authorisation may also be provided by a professional repairer with the explicit written consent of the owner;
- (e) Manufacturers, importers or authorised representatives shall provide access to the software tools, firmware or similar auxiliary means referred to in points (a) and (b) within 3 working days after having received the request and, where applicable, the notification and authorisation referred to in point (d);
- (f) The access to the software tools, firmware or similar auxiliary means referred to in point (a) may, as regards professional repairers, be limited to professional repairers registered in accordance with points 2(a) and (b).

1.2. Design for reliability

From *[21 months after the entry into force of this Regulation]*:

- (1) Resistance to accidental drops: Manufacturers, importers or authorised representatives shall ensure that the devices pass 45 falls without any protective foil or separate protective cover, except for foldable smartphones designed to be used with a protective foil on the foldable display, without loss of functionality, following the test procedure set out in Annex III; foldable smartphones designed to be used with a protective foil on the foldable display

shall pass 35 falls in the un-extended state and 15 falls in the extended state, without loss of functionality, following the test procedure set out in Annex III and tested with the protective foil.

- (2) Scratch resistance: Manufacturers, importers or authorised representatives shall ensure that the screen of the device passes the hardness level 4 on the Mohs hardness scale, except for foldable smartphones designed to be used with a protective foil on the foldable display.
- (3) Protection from dust and water: Manufacturers, importers or authorised representatives shall ensure that the devices are protected against the ingress of solid foreign objects of size bigger than 1 millimeter and splashing of water.
- (4) Battery endurance in cycles: Manufacturers, importers or authorised representatives shall ensure that the devices achieve at least 800 cycles at 80 % remaining capacity, to be tested under charging conditions where the charging rate is limited by the battery management system and not by the power delivery capabilities of the power supply.
- (5) Battery management:
 - (i) manufacturers, importers or authorised representatives shall include an optional charging feature selectable by the user which terminates the charging process automatically, when the battery is charged to 80 % of its full capacity. When this feature is enabled, manufacturers, importers, or authorised representatives may enable the device to periodically fully charge the battery for the purposes of maintaining accurate battery state of charge estimates. The user shall be informed automatically when charging the device for the first time or during the installation process, that the life span of the battery can be extended if the feature is selected and the battery is regularly charged only to 80 % of its full capacity;
 - (ii) manufacturers, importers or authorised representatives shall provide a power management feature which by default ensures that once the battery is fully charged there is no further charging power supplied to the battery unless the charge level drops below 95 % of its maximum charge capacity.
- (6) Operating system updates:
 - (a) from the date of end of placement on the market to at least 5 years after that date, manufacturers, importers or authorised representatives shall, if they provide security updates, corrective updates or functionality updates to an operating system, make such updates available at no cost for all units of a product model with the same operating system;
 - (b) the requirement referred to in point (a) shall apply both to operating system updates offered voluntarily by manufacturers, importers or authorised representatives and to operating system updates provided to comply with Union law;
 - (c) security updates or corrective updates mentioned under point (a) need to be available to the user at the latest 4 months after the public release of the source code of an update of the underlying operating system or, if the source code is not publicly released,

after an update of the same operating system is released by the operating system provider or on any other product of the same brand;

- (d) functionality updates mentioned under point (a) need to be available to the user at the latest 6 months after the public release of the source code of an update of the underlying operating system or, if the source code is not publicly released, after an update of the same operating system is released by the operating system provider or on any other product of the same brand;
- (e) an operating system update may combine security, corrective and functionality updates;
- (f) when a functionality update provided by a manufacturer, importer or authorised representative shows a negative impact on device performance, manufacturers, importers or authorised representatives shall modify the released operating system to ensure at least the same performance as before the update within a reasonable period of time, free of charge and without causing significant inconvenience to the end-user, except if the end-user has given explicit consent for the negative impact prior to the update.

1.3. Marking of plastic components

From *[21 months after the entry into force of this Regulation]*, plastic components heavier than 50 g shall be marked by specifying the type of polymer with the appropriate standard symbols or abbreviated terms set between the punctuation marks ‘>’ and ‘<’ as specified in available standards. The marking shall be legible.

Plastic components shall be exempt from marking requirements provided the following conditions are fulfilled:

- (i) the marking is not possible because of the shape or size;
- (ii) the marking would impact on the performance or functionality of the plastic component;
- (iii) marking is technically not possible because of the molding method.

For the following plastic components no marking shall be required:

- (i) packaging, tape, labels and stretch wraps;
- (ii) wiring, cables and connectors, rubber parts and any other component where not enough appropriate surface area is available for the marking to be of a legible size;
- (iii) PCB assemblies, PMMA boards, optical components, electrostatic discharge components, electromagnetic interference components, speakers;
- (iv) transparent parts where the marking would obstruct the function of the part in question.

1.4. Recyclability requirements

From *[21 months after the entry into force of this Regulation]*:

- (1) Manufacturers, importers or their authorised representatives shall, without prejudice to Article 15(1) of Directive 2012/19/EU, make available, on a free access website, the dismantling information needed to access any of the products components referred to in Annex VII, point 1, of Directive 2012/19/EU.
- (2) The information referred to in point (1) shall include the sequence of dismantling steps, tools or technologies needed to access the targeted components.
- (3) The information referred to in point (1) shall be available until at least 15 years after the placing on the market of the last unit of a product model.

2. INFORMATION REQUIREMENTS

From *[21 months after the entry into force of this Regulation]*:

- (1) Manufacturers, importers or authorised representatives shall provide in the technical documentation and make publicly available on free access websites of the manufacturer, importer or authorised representative the following information:
 - (a) compatibility with removable memory cards, if any;
 - (b) indicative weight range of the following critical raw materials and environmentally relevant materials:
 - (i) cobalt in the battery (weight range: less than 2 g, between 2 g and 10 g, above 10 g);
 - (ii) tantalum in capacitors (weight range: less than 0,01 g, between 0,01 g and 0,1 g, above 0,1 g);
 - (iii) neodymium in loud speakers, vibration motors, and other magnets (weight range: less than 0,05 g, between 0,05 g and 0,2 g, above 0,2 g);
 - (iv) gold in all components (weight range: less than 0,02 g, between 0,02 g and 0,05 g, above 0,05 g).
 - (c) the indicative value of the recyclability rate R_{cyc} ;
 - (d) the indicative percentage of recycled content for the product or a part thereof, where available; if not available, the recycled content should be indicated as “not known” or “not available”;
 - (e) ingress protection rating;
 - (f) minimum battery endurance in cycles in number of cycles;
 - (g) in case of foldable devices, it shall be indicated that ‘This device did not undergo a scratch resistance test’.
- (2) Manufacturers, importers or authorised representatives shall provide user instructions in the form of a user manual on a free access website of the manufacturer, importer or authorised representative, and shall include:
 - (a) how to access on the device information from the battery management system on:
 - (i) date of manufacturing of the battery;

- (ii) date of first use of the battery after the set-up of the device by the first user;
 - (iii) number of full charge/discharge cycles (reference: rated capacity);
 - (iv) measured state of health (remaining full charge capacity relative to the rated capacity in %).
- (b) instructions for battery maintenance, including the following:
 - (i) impacts on battery lifetime related to exposure of the device to elevated temperatures, suboptimal charging patterns, fast charging and other known adverse factors;
 - (ii) effects of switching off radio connections, such as WiFi, Bluetooth, on power consumption;
 - (iii) information about whether the device supports other features, which extend battery lifetime, such as smart charging and about how these features are activated or under which conditions they work best.
- (3) Manufacturers, importers or authorised representatives shall ensure that:
 - (a) Information that data encryption is enabled by default is displayed to the user in the course of configuring a new device, including an explanation that this eases data erasure through factory reset.
 - (b) If wireless charging is selected, a message notifying the user that wireless charging will likely increase the energy use in the charging of the battery.
- (4) Where the package does not include a charger, the user instructions referred to in point 2 shall include the following information: “For environmental reasons this package does not include a charger. This device can be powered with most USB power adapters and a cable with USB Type-C plug.”.

C. Cordless phones

1. LOW POWER MODES

From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that cordless phones meet the following requirements:

- (1) the networked standby power consumption P_n of a base station shipped with a cordless phone shall not exceed 1 W, regardless of whether a handset is on the base station;
- (2) the standby power consumption P_n of a charging cradle without base station functionality shipped with a cordless phone shall not exceed 0,6 W with the charged handset on the charging cradle and 0,3 W without the handset on the charging cradle.

2. RESOURCE EFFICIENCY REQUIREMENTS

2.1. Design for repair and reuse

- (1) Availability of spare parts

- (a) From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall make available to professional repairers at least the following spare parts, including required fasteners, if not reusable, until at least 7 years after the date of end of placement on the market, when present:
 - (i) display assembly;
 - (ii) external audio connector(s);
 - (iii) external charging port(s);
 - (iv) mechanical button(s);
 - (v) main microphone(s);
 - (vi) speaker(s);
- (b) From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall make available to professional repairers and end-users at least the following spare parts, until at least 7 years after the date of end of placement on the market:
 - (i) battery or batteries;
 - (ii) battery compartment cover;
 - (iii) charger unless the basestation is equipped with the USB Type-C receptacle, which should remain accessible and operational at all times;
 - (iv) charging cradle;
- (c) Spare parts concerned by points (a) and (b) shall not be assemblies comprising more than one of the listed spare part types;

From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, the list of spare parts concerned by points (a) and (b) and the procedure for ordering them shall be publicly available on the free access website of the manufacturer, importer or authorised representative, until the end of the period of availability of these spare parts.

Cordless phones shall be designed for the use of rechargeable batteries with standardised physical dimensions.

(2) Access to repair and maintenance information

From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall, at least until 7 years after the date of end of placement on the market, provide access to repair and maintenance information to professional repairers for parts covered by points 1(a) and (b) in the following conditions, unless that information is made publicly available at the free access website of the manufacturer, importer or authorised representative:

- (a) The manufacturer's, importer's or authorised representative's website shall indicate the process for professional repairers to register for access to information; to accept such a request, the manufacturers, importers or

authorised representatives may only require the professional repairer to demonstrate that:

- (i) the professional repairer has the technical competence to repair cordless phones and complies with the applicable regulations for repairers of electrical equipment in the Member States where it operates. Reference to an official registration system as professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point;
 - (ii) the professional repairer is covered by insurance covering liabilities resulting from its activity regardless of whether this is required by the Member State.
- (b) Manufacturers, importers or authorised representatives shall accept or refuse the registration within 5 working days from the date of request. In the case of refusal, a clear justification will be provided to the requestee outlining the reasons behind such decision, which shall be revoked, if the same professional repairer requests to be registered with updated information, which complies with the conditions for being granted access;
- (c) Manufacturers, importers or authorised representatives may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates of such information. The registration as such shall be provided for free. A fee shall be considered reasonable in particular if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information;
- (d) Once registered, a professional repairer shall have access, within 1 working day after requesting it, to the requested repair and maintenance information. The information may be provided for an equivalent model or model of the same family, if relevant;
- (e) The repair and maintenance information referred to in point (a) shall contain the level of detail needed to be able to replace parts covered by points 1(a) and (b) and shall at least include:
 - (i) the unequivocal product identification;
 - (ii) a disassembly map or exploded view;
 - (iii) wiring and connection diagrams, as required for failure analysis;
 - (iv) electronic board diagrams;
 - (v) a list of necessary repair and test equipment;
 - (vi) technical manual of instructions for repair, including marking of the individual steps;
 - (vii) diagnostic fault and error information (including manufacturer-specific codes, where applicable);
 - (viii) component and diagnosis information (such as minimum and maximum theoretical values for measurements);
 - (ix) instructions for software and firmware (including reset software);

- (x) information on how to access data records of reported failure incidents stored on the device, where applicable, with the exception of personal identifiable information such as related to user behavior and location information;
- (xi) information on how to access professional repair, including the internet webpages, addresses and contact details of professional repairers registered in accordance with points 2 (a) and (b).
- (f) Without prejudice to intellectual property rights, third parties shall be allowed to use and publish unaltered repair and maintenance information initially published by the manufacturer, importer or authorised representative and covered by point (e) once the manufacturer, importer or authorised representative terminates access to that information after the end of the period of access to repair and maintenance information.

From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, repair instructions and maintenance information for parts concerned by point 1(b) shall be publicly available at the free access website of the manufacturer, importer or authorised representative, until at least 7 years after the date of end of placement on the market. This information shall contain the level of detail needed to be able to replace parts covered by point 1(b).

(3) Maximum delivery time of spare parts

- (a) manufacturers, importers or authorised representatives shall ensure that:
 - (i) during the first 5 years of the period referred to in points 1(a) and (b), spare parts are delivered within 5 working days after having received the order;
 - (ii) during the remaining 2 years of the period referred to in points 1(a) and (b), spare parts are delivered within 10 working days after having received the order.
- (b) In the case of spare parts concerned by point 1(a), the availability of spare parts may be limited to professional repairers registered in accordance with points 2 (a) and (b).

(4) Information on the price of spare parts

During the period referred to in points 1(a) and (b), manufacturers, importers or authorised representatives shall provide indicative pre-tax prices at least in euro for spare parts listed in points 1(a) and (b), including the pre-tax price of fasteners and tools, if supplied with the spare part, on the free access website of the manufacturer, importer or authorised representative.

(5) Disassembly requirements

Manufacturers, importers or authorised representatives shall meet the following disassembly requirements:

- (a) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for replacement of parts referred to in point 1(a) meets the following criteria:
 - (i) fasteners shall be removable, resupplied or reusable or resupplied;

- (ii) the process for replacement shall be feasible in at least one of the following ways:
 - with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - with commercially available tools;
 - (iii) the process for replacement shall, as a minimum, be able to be carried out in a workshop environment;
 - (iv) the process for replacement shall, as a minimum, be able to be carried out by a generalist.
- (b) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for battery replacement meets the following criteria:
- (i) fasteners shall be reusable or resupplied;
 - (ii) the process for replacement shall be feasible with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - (iii) the process for replacement shall be able to be carried out in a use environment;
 - (iv) the process for replacement shall be able to be carried out by a layman.
- (c) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for display assembly replacement meets the following criteria:
- (i) fasteners shall be removable, resupplied or reusable;
 - (ii) the process for replacement shall be feasible in at least one of the following ways:
 - with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - with commercially available tools;
 - (iii) the process for replacement shall be able to be carried out in a workshop environment;
 - (iv) the process for replacement shall be able to be carried out by a generalist.
- (6) Requirements for preparation for reuse

From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that devices include a software function, that resets the device to its factory settings and erases securely by default all personal information including but not limited to address book, text messages, pictures, videos, settings and call history.

2.2. Marking of plastic components

From *[21 months after the entry into force of this Regulation]*, plastic components heavier than 50 g shall be marked by specifying the type of polymer with the appropriate standard symbols or abbreviated terms set between the punctuation marks ‘>’ and ‘<’ as specified in available standards. The marking shall be legible.

Plastic components shall be exempt from marking requirements provided the following conditions are fulfilled:

- (i) the marking is not possible because of the shape or size;
- (ii) the marking would impact on the performance or functionality of the plastic component;
- (iii) marking is technically not possible because of the molding method.

For the following plastic components no marking shall be required:

- (i) packaging, tape, labels and stretch wraps;
- (ii) wiring, cables and connectors, rubber parts and any other component where not enough appropriate surface area is available for the marking to be of a legible size;
- (iii) PCB assemblies, PMMA boards, optical components, electrostatic discharge components, electromagnetic interference components, speakers;
- (iv) transparent parts where the marking would obstruct the function of the part in question.

2.3. Recyclability requirements

From *[21 months after the entry into force of this Regulation]*:

- (1) Manufacturers, importers or their authorised representatives shall, without prejudice to Article 15(1) of Directive 2012/19/EU, make available, on a free access website, the dismantling information needed to access any of the products components referred to in Annex VII, point 1, of Directive 2012/19/EU.
- (2) The information referred to in point (1) shall include the sequence of dismantling steps, tools or technologies needed to access the targeted components.
- (3) The information referred to in point (1) shall be available until at least 15 years after the placing on the market of the last unit of a product model.

3. INFORMATION REQUIREMENTS

From *[21 months after the entry into force of this Regulation]*:

- (1) Manufacturers, importers or authorised representatives shall provide in the technical documentation and make publicly available on free access websites of the manufacturer, importer or authorised representative the following information:
 - (a) compatibility with removable memory cards, if any;
 - (b) indicative weight range of the following critical raw materials and environmentally relevant materials:
 - (i) cobalt in the battery (weight range: less than 0,5 g, between 0,5 g and 3 g, above 3 g);
 - (ii) tantalum in capacitors (weight range: less than 0,01 g, between 0,01 g and 0,2 g, above 0,2 g);

- (iii) neodymium in loud speakers, vibration motors, and other magnets (weight range: less than 0,1 g, between 0,1 g and 0,5 g, above 0,5 g);
 - (iv) gold in all components (weight range: less than 0,02 g, between 0,02 g and 0,1 g, above 0,1 g);
 - (c) the indicative value of the recyclability rate R_{cyc} ;
 - (d) the indicative percentage of recycled content for the product or a part thereof, where available; if not available, the recycled content should be indicated as “not known” or “not available”;
- (2) Manufacturers, importers or authorised representatives shall provide user instructions in the form of a user manual on a free access website of the manufacturer, importer or authorised representative. Where the package does not include a charger, the user instructions shall include the following information: “For environmental reasons this package does not include a charger. This device can be powered with most USB power adapters and a cable with USB Type-C plug.”.

D. Slate tablets

1. RESOURCE EFFICIENCY REQUIREMENTS

1.1. Design for repair and reuse

(1) Availability of spare parts

- (a) From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall make available to professional repairers at least the following spare parts, including required fasteners, if not reusable, until at least 7 years after the date of end of placement on the market, when present:
- (i) battery or batteries;
 - (ii) front-facing camera assembly;
 - (iii) rear-facing camera assembly;
 - (iv) external audio connector(s);
 - (v) external charging port(s);
 - (vi) mechanical button(s);
 - (vii) main microphone(s);
 - (viii) speaker(s);
 - (ix) hinge assembly;
 - (x) mechanical display folding mechanism.
- (b) Spare parts concerned by points (a) and (c) shall not be assemblies comprising more than one of the listed spare part types, with the following exceptions:
- (i) microphones may be part of a loudspeaker or external charging port assembly;

- (ii) external audio connector(s) may be combined with the external charging port(s) as the same port(s);
 - (iii) external charging port(s) may be combined with the external audio connector(s) as the same port(s);
 - (iv) hinge assembly may be part of a mechanical display folding mechanism;
 - (v) microphone, speaker(s), buttons and external connectors may be combined with a higher level assembly if the following reliability requirements are met:
 - the device meets IP42 rating;
 - the power button has a contact closure cycle resistance ≥ 20.000 cycles;
 - the volume button has a contact closure cycle resistance ≥ 10.000 cycles;
 - the charging connector has a insertion/extraction cycle resistance ≥ 3.000 cycles.
- (c) From *[OP: please insert the date = 21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later:
- (i) manufacturers, importers or authorised representatives shall make available to professional repairers and end-users at least the following spare parts, including required fasteners, if not reusable, until at least 7 years after the date of end of placement on the market:
 - (a) battery or batteries;
 - (b) back cover or back cover assembly, if to be fully removed for replacement of the battery;
 - (c) protective foil for foldable displays;
 - (d) display assembly;
 - (e) charger, unless the device complies with *[OP please add reference to common charger provision, Article 3(4) in the proposal]* of Directive 2014/53/EU;
 - (f) SIM tray and memory card tray, if there is an external slot for a SIM tray or memory card tray.
 - (ii) manufacturers, importers or authorised representatives may provide the battery or batteries referred to in point (i)(a) only to professional repairers if manufacturers, importers or authorised representatives ensure that the following requirements are met:
 - (g) the device meets IP42 rating;
 - (h) after 500 full charge cycles the battery has, in a fully charged state, a remaining capacity of at least 83 % of the rated capacity;
 - (i) the battery endurance in cycles achieves a minimum of 1000 full charge cycles and after 1000 full charge cycles the battery has, in a

fully charged state, a remaining capacity of at least 80 % of the rated capacity.

- (d) From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, the list of spare parts concerned by points (a) and (c) and the procedure for ordering them shall be publicly available on the free access website of the manufacturer, importer or authorised representative, until the end of the period of availability of these spare parts.

(2) Access to repair and maintenance information

From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall, at least until 7 years after the date of end of placement on the market, provide access to repair and maintenance information to professional repairers for parts covered by points 1(a) and (c) in the following conditions, unless that information is made publicly available at the free access website of the manufacturer, importer or authorised representative:

- (a) The manufacturer's, importer's or authorised representative's website shall indicate the process for professional repairers to register for access to information; to accept such a request, the manufacturers, importers or authorised representatives may only require the professional repairer to demonstrate that:
 - (i) the professional repairer has the technical competence to repair slate tablets and complies with the applicable regulations for repairers of electrical equipment in the Member States where it operates. Reference to an official registration system as professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point;
 - (ii) the professional repairer is covered by insurance covering liabilities resulting from its activity regardless of whether this is required by the Member State;
- (b) Manufacturers, importers or authorised representatives shall accept or refuse the registration within 5 working days from the date of request. In the case of refusal, a clear justification will be provided to the requestee outlining the reasons behind such decision, which shall be revoked, if the same professional repairer requests to be registered with updated information, which complies with the conditions for being granted access;
- (c) Manufacturers, importers or authorised representatives may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates of such information. The registration as such shall be provided for free. A fee shall be considered reasonable in particular if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information;
- (d) Once registered, a professional repairer shall have access, within 1 working day after requesting it, to the requested repair and maintenance information. The information may be provided for an equivalent model or model of the same family, if relevant;

- (e) The repair and maintenance information referred to in point (a) shall contain the level of detail needed to be able to replace parts covered by point 1(a) and (c) and shall at least include:
 - (i) the unequivocal product identification;
 - (ii) a disassembly map or exploded view;
 - (iii) wiring and connection diagrams, as required for failure analysis;
 - (iv) electronic board diagrams;
 - (v) a list of necessary repair and test equipment;
 - (vi) technical manual of instructions for repair, including marking of the individual steps;
 - (vii) diagnostic fault and error information (including manufacturer-specific codes, where applicable);
 - (viii) component and diagnosis information (such as minimum and maximum theoretical values for measurements);
 - (ix) instructions for software and firmware (including reset software);
 - (x) information on how to access data records of reported failure incidents stored on the device, where applicable, with the exception of personal identifiable information such as related to user behavior and location information;
 - (xi) information on how to access professional repair, including the internet webpages, addresses and contact details of professional repairers registered in accordance with points 2(a) and (b);
- (f) Without prejudice to intellectual property rights, third parties shall be allowed to use and publish unaltered repair and maintenance information initially published by the manufacturer, importer or authorised representative and covered by point (e) once the manufacturer, importer or authorised representative terminates access to that information after the end of the period of access to repair and maintenance information.

From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, repair instructions and maintenance information for parts concerned by point 1(c) shall be publicly available at the free access website of the manufacturer, importer or authorised representative, until at least 7 years after the date of end of placement on the market. This information shall contain the level of detail needed to be able to replace parts covered by point 1(c).

(3) Maximum delivery time of spare parts

- (a) manufacturers, importers or authorised representatives shall ensure that:
 - (i) during the first 5 years of the period referred to in points 1(a) and (c), spare parts are delivered within 5 working days after having received the order;
 - (ii) during the remaining 2 years of the period referred to in points 1(a) and (c), spare parts are delivered within 10 working days after having received the order.

- (b) In the case of spare parts concerned by point 1(a), the availability of spare parts may be limited to professional repairers registered in accordance with points 2(a) and (b).

(4) Information on the price of spare parts

During the period referred to in points 1(a) and (c), manufacturers, importers or authorised representatives shall provide indicative pre-tax prices at least in euro for spare parts listed in points 1(a) and (c), including the pre-tax price of fasteners and tools, if supplied with the spare part, on the free access website of the manufacturer, importer or authorised representative.

(5) Disassembly requirements

Manufacturers, importers or authorised representatives shall meet the following disassembly requirements:

- (a) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for replacement of the display assembly and of parts referred to in point 1(a), with the exception of the battery or batteries, meets the following criteria:
 - (i) fasteners shall be removable, resupplied or reusable;
 - (ii) the process for replacement shall be feasible in at least one of the following ways:
 - with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - with commercially available tools;
 - (iii) the process for replacement shall, as a minimum, be able to be carried out in a workshop environment;
 - (iv) the process for replacement shall, as a minimum, be able to be carried out by a generalist.
- (b) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for replacement of parts referred to in point 1(c), with the exception of the battery or batteries, meets the following criteria:
 - (i) fasteners shall be removable, resupplied or reusable;
 - (ii) the process for replacement shall be feasible with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - (iii) the process for replacement shall be able to be carried out in a use environment;
 - (iv) the process for replacement shall be able to be carried out by a layman.
- (c) From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that the process for battery replacement:
 - (i) meets the following criteria:
 - fasteners shall be resupplied or reusable;

- the process for replacement shall be feasible with no tool, a tool or set of tools that is supplied with the product or spare part, or basic tools;
 - the process for replacement shall be able to be carried out in a use environment;
 - the process for replacement shall be able to be carried out by a layman.
- (ii) or, as an alternative to point (i), ensure that
- the process for battery replacement meets the criteria set out in (a);
 - the device meets IP42 rating;
 - after 500 full charge cycles the battery must have in a fully charged state, a remaining capacity of at least 83 % of the rated capacity;
 - the battery endurance in cycles achieves a minimum of 1000 full charge cycles, and after 1000 full charge cycles the battery must, in addition, have in a fully charged state, a remaining capacity of at least 80 % of the rated capacity.

(6) Requirements for preparation for reuse

From *[21 months after the entry into force of this Regulation]*, manufacturers, importers or authorised representatives shall ensure that devices:

- (a) encrypt by default, using a random encryption key, the user data stored in the internal storage of the device;
- (b) include a software function, that resets the device to its factory settings and erases securely by default the encryption key and generates a new one;
- (c) record the following data from the battery management system in the system settings or another location accessible for end-users:
 - (i) date of manufacturing of the battery;
 - (ii) date of first use of the battery after the set-up of the device by the first user;
 - (iii) number of full charge/discharge cycles (reference: rated capacity);
 - (iv) measured state of health (remaining full charge capacity relative to the rated capacity in %).

(7) Replacement of serialised parts

From *[21 months after the entry into force of this Regulation]* or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall, at least until 7 years after the date of end of placement on the market:

- (a) In case the parts to be replaced by spare parts referred to in point 1(a) are serialised parts, provide non-discriminatory access for professional repairers to any software tools, firmware or similar auxiliary means needed to ensure the full functionality of those spare parts and of the device in which such spare parts are installed during and after the replacement;
- (b) In case the parts to be replaced by spare parts referred to in point 1(c) are serialised parts, provide non-discriminatory access for professional repairers

and end-users to any software tools, firmware or similar auxiliary means needed to ensure the full functionality of those spare parts and of the device in which such spare parts are installed during and after the replacement;

- (c) Provide, on a free access website of the manufacturer, importer or authorised representative, a description of the procedure for the notification and authorisation of the intended replacement of serialised parts by the owner of the device referred to in point (d); the procedure shall allow for remotely providing the notification and authorisation;
- (d) Before providing access to the software tools, firmware or similar auxiliary means referred to in points (a) and (b), the manufacturer, importer or authorised representative may only require to have received a notification and authorisation of the intended part replacement by the owner of the device. Such notification and authorisation may also be provided by a professional repairer with the explicit written consent of the owner;
- (e) Manufacturers, importers or authorised representatives shall provide access to the software tools, firmware or similar auxiliary means referred to in points (a) and (b) within 3 working days after having received the request and, where applicable, the notification and authorisation referred to in point (d);
- (f) The access to the software tools, firmware or similar auxiliary means referred to in point (a) may, as regards professional repairers, be limited to professional repairers registered in accordance with points 2(a) and (b).

1.2. Design for reliability

From *[21 months after the entry into force of this Regulation]*:

- (1) Scratch resistance: Manufacturers, importers or authorised representatives shall ensure that the screen of the device passes the hardness level 4 on the Mohs hardness scale, except for foldable slate tablets designed to be used with a protective foil on the foldable display.
- (2) Protection from accidental spills: Manufacturers, importers or authorised representatives shall ensure that the devices are protected against accidental spills of water.
- (3) Battery endurance in cycles: Manufacturers, importers or authorised representatives shall ensure that the devices achieve at least 800 cycles at 80 % remaining capacity, to be tested under charging conditions where the charging rate is limited by the battery management system and not by the power delivery capabilities of the power supply.
- (4) Battery management:
 - (i) manufacturers, importers or authorised representatives shall include an optional charging feature selectable by the user which terminates the charging process automatically, when the battery is charged to 80 % of its full capacity. When this feature is enabled, manufacturers, importers, or authorised representatives may enable the device to periodically fully charge the battery for the purposes of maintaining accurate battery state of charge estimates. The user shall be informed automatically when charging the device for the first time or during the installation process, that the life span of the battery can be extended if the feature is selected and the battery is regularly charged only to 80 % of its full capacity;

- (ii) manufacturers, importers or authorised representatives shall provide a power management feature which by default ensures that once the battery is fully charged there is no further charging power supplied to the battery unless the charge level drops below 95 % of its maximum charge capacity.
- (5) Operating system updates:
- (a) from the date of end of placement on the market to at least 5 years after that date, manufacturers, importers or authorised representatives shall, if they provide security updates, corrective updates or functionality updates to an operating system, make such updates available at no cost for all units of a product model with the same operating system;
 - (b) the requirement referred to in point (a) shall apply both to operating system updates offered voluntarily by manufacturers, importers or authorised representatives and to operating system updates provided to comply with Union law;
 - (c) security updates or corrective updates mentioned under point (a) need to be available to the user at the latest 4 months after the public release of the source code of an update of the underlying operating system or, if the source code is not publicly released, after an update of the same operating system is released by the operating system provider or on any other product of the same brand;
 - (d) functionality updates mentioned under point (a) need to be available to the user at the latest 6 months after the public release of the source code of an update of the underlying operating system or, if the source code is not publicly released, after an update of the same operating system is released by the operating system provider or on any other product of the same brand;
 - (e) an operating system update may combine security, corrective and functionality updates;
 - (f) when a functionality update provided by a manufacturer, importer or authorised representative shows a negative impact on device performance, manufacturers, importers or authorised representatives shall modify the released operating system to ensure at least the same performance as before the update within a reasonable period of time, free of charge and without causing significant inconvenience to the end-user, except if the end-user has given explicit consent for the negative impact prior to the update.

1.3. Marking of plastic components

From *[21 months after the entry into force of this Regulation]*, plastic components heavier than 50 g shall be marked by specifying the type of polymer with the appropriate standard symbols or abbreviated terms set between the punctuation marks ‘>’ and ‘<’ as specified in available standards. The marking shall be legible.

Plastic components shall be exempt from marking requirements provided the following conditions are fulfilled:

- (i) the marking is not possible because of the shape or size;
- (ii) the marking would impact on the performance or functionality of the plastic component;
- (iii) marking is technically not possible because of the molding method.

For the following plastic components no marking shall be required:

- (i) packaging, tape, labels and stretch wraps;
- (ii) wiring, cables and connectors, rubber parts and any other component where not enough appropriate surface area is available for the marking to be of a legible size;
- (iii) PCB assemblies, PMMA boards, optical components, electrostatic discharge components, electromagnetic interference components, speakers;
- (iv) transparent parts where the marking would obstruct the function of the part in question.

1.4. Recyclability requirements

From *[21 months after the entry into force of this Regulation]*:

- (1) Manufacturers, importers or their authorised representatives shall, without prejudice to Article 15(1) of Directive 2012/19/EU, make available, on a free access website, the dismantling information needed to access any of the products components referred to in Annex VII, point 1, of Directive 2012/19/EU.
- (2) The information referred to in point (1) shall include the sequence of dismantling steps, tools or technologies needed to access the targeted components.
- (3) The information referred to in point (1) shall be available until at least 15 years after the placing on the market of the last unit of a product model.

2. INFORMATION REQUIREMENTS

From *[21 months after the entry into force of this Regulation]*:

- (1) Manufacturers, importers or authorised representatives shall provide in the technical documentation and make publicly available on free access websites of the manufacturer, importer or authorised representative the following information:
 - (a) compatibility with removable memory cards, if any;
 - (b) indicative weight range of the following critical raw materials and environmentally relevant materials:
 - (i) cobalt in the battery (weight range: less than 10 g, between 10 g and 20 g, above 20 g);
 - (ii) tantalum in capacitors (weight range: less than 0,01 g, between 0,01 g and 0,1 g, above 0,1 g);
 - (iii) neodymium in loud speakers, vibration motors, and other magnets (weight range: less than 0,2 g, between 0,2 g and 1 g, above 1 g);

- (iv) gold in all components (weight range: less than 0,02 g, between 0,02 g and 0,1 g, above 0,1 g);
 - (c) the indicative value of the recyclability rate R_{cyc} ;
 - (d) the indicative percentage of recycled content for the product or a part thereof, where available; if not available, the recycled content should be indicated as “not known” or “not available”;
 - (e) ingress protection rating;
 - (f) minimum battery endurance in cycles in number of cycles;
 - (g) in case of foldable devices, it shall be indicated that ‘This device did not undergo a scratch resistance test’.
- (2) Manufacturers, importers or authorised representatives shall provide user instructions in the form of a user manual on a free access website of the manufacturer, importer or authorised representative, and shall include:
- (a) how to access on the device information from the battery management system on:
 - (i) date of manufacturing of the battery;
 - (ii) date of first use of the battery after the set-up of the device by the first user;
 - (iii) number of full charge/discharge cycles (reference: rated capacity);
 - (iv) measured state of health (remaining full charge capacity relative to the rated capacity in %);
 - (b) instructions for battery maintenance, including the following:
 - (i) impacts on battery lifetime related to exposure of the device to elevated temperatures, suboptimal charging patterns, fast charging and other known adverse factors;
 - (ii) effects of switching off radio connections, such as WiFi, Bluetooth, on power consumption;
 - (iii) information about whether the device supports other features, which extend battery lifetime, such as smart charging and about how these features are activated or under which conditions they work best.
- (3) Manufacturers, importers or authorised representatives shall ensure that:
- (a) Information that data encryption is enabled by default is displayed to the user in the course of configuring a new device, including an explanation that this eases data erasure through factory reset;
 - (b) If wireless charging is selected, a message notifying the user that wireless charging will likely increase the energy use in the charging of the battery.
- (4) Where the package does not include a charger, the user instructions referred to in point 2 shall include the following information: “For environmental reasons

this package does not include a charger. This device can be powered with most USB power adapters and a cable with USB Type-C plug.”.

ANNEX III
Measurements and calculations

1. For the purposes of compliance and verification of compliance with the requirements laid down in this Regulation, measurements and calculations shall be made using harmonised standards, or other reliable, accurate and reproducible methods, which take into account the generally recognised state-of-the-art methods and are in line with the provisions set out below. The reference numbers of those harmonised standards have been published for this purpose in the Official Journal of the European Union (OJ).
2. In the absence of relevant standards and until the publication of the references of the relevant harmonised standards in the OJ, the transitional testing methods set out in Annex IIIa or other reliable, accurate and reproducible methods, which take into account the generally recognised state-of-the-art, shall be used.
3. Cordless phones placed on the market with a base station shall be tested for networked standby power consumption, with the following test settings:
 - (a) Tests shall be performed on the base station both without the handset on the base station as well as with the charged handset on the base station.
 - (b) The devices shall be measured in the condition as delivered to the end-user(factory setting).
 - (c) The power consumptions shall be measured as average power consumptions over a time period of 10 minutes.
 - (d) The measurements shall be carried out with a mains supply voltage of $230V \pm 1 \%$.
4. Cordless phones placed on the market with a charging cradle shall be tested for standby power consumption, with the following test settings:
 - (a) Tests shall be performed with the charged handset placed on the charging cradle.
 - (b) The devices shall be measured in the condition as delivered to the end-user (factory setting).
 - (c) The power consumptions shall be measured as average power consumptions over a time period of 10 minutes.
 - (d) The measurements shall to be carried out with a mains supply voltage of $230V \pm 1 \%$.
5. Batteries of mobile phones and slate tablets shall be tested according to the default charging algorithms implemented by the manufacturer. The resulting number of cycles shall be rounded down to full hundreds and stated as “ $\geq x00$ ”.
6. Ingress protection against particle and moisture ingress shall be expressed as an IP code, corresponding with the levels listed in Table 1. Tests shall be performed without protective cover.

Table 1
Ingress protection rating levels

Rating level	Ingress of solid foreign objects	Ingress of water with harmful effects
	Object size	Protection against
2	Protected from touch by fingers and ≥ 12 mm	water spray less than 15 degrees from vertical
3	$\geq 2,5$ mm	water spray less than 60 degrees from vertical
4	≥ 1 mm	splashing of water
5	dust-protected	jetting of water
6	dust-tight	powerful jetting of water
7	n.a.	temporary immersion, 1 m depth
8	n.a.	continuous immersion, 1 m or more depth

7. Resistance to accidental drops or repeated free fall reliability is measured through the number of falls without defect in the repeated free fall test. The repeated free fall tests shall be performed with five units of each model for each of the applicable test cases. The resistance to accidental drops is the number of falls which have been passed by at least four out of the five units under test. The number of falls per unit shall be determined with the following test conditions:
- (a) without protective foils and separate protective cover, if any, for non-foldable devices;
 - (b) with a protective foil on the display for foldable devices, first in the un-extended state and then in the fully extended state on the same unit under test in line with Table 2;
 - (c) fall height 1 m;
 - (d) after a defined number of falls corresponding to the intervals specified in Table 2, the unit under test has to be functional without defect, with particular reference to the following functionalities, where applicable:
 - (i) integrity of screen;
 - (ii) display with less than 10 pixel defects or similar malfunctions;
 - (iii) all cameras, tested for still images and videos;
 - (iv) mobile communication;
 - (v) Bluetooth connectivity;
 - (vi) WiFi connectivity;
 - (vii) battery charging: wired and wireless;
 - (viii) display touch sensitivity;
 - (ix) responsive buttons and switches;
 - (x) vibration alarm;
 - (xi) main microphone(s);
 - (xii) loudspeaker;

(xiii) headset audio.

- (e) cracks of the frame or backside shall not be considered a defect as long as full functionality and safe use of the unit under test is given;
- (f) cracks of the touchscreen and of any other cover layers of a display shall not be considered a defect as long as full functionality and safe use of the unit under test is given;
- (g) in case of no determined defect the test shall be continued, placing the unit under test in the tumble tester in the same orientation the device was found when the test was interrupted;
- (h) for non-foldable devices, in case of a determined defect and in any case after 157 falls the test of the unit is terminated;
- (i) for foldable devices, in case of a determined defect and in any case after 175 falls the test of the unit is terminated.

Table 2

Test intervals for determining if the unit is defective (smartphones)

Non-foldable device	Foldable device
45	35 un-extended state + 15 additional falls in fully extended state

ANNEX IIIa
Transitional methods

Table 3

References and qualifying notes for mobile phones, cordless phones and slate tablets

Parameter	Source	Reference Test Method / Title	Notes
Disassembly requirements	CEN	EN 45554:2020	Fasteners: please refer to Table A.1 of the standard Tools: please refer to Table A.2 of the standard, unless differently specified in this Regulation Working environment: please refer to Table A.4 of the standard Skill level: please refer to Table A.5 of the standard
Protection against particles and water	IEC	IEC 60529:1989/AMD2 :2013/COR1:2019	dust tight and protected against immersion in water up to 1 meter depth: IP67 protected against the ingress of solid foreign objects of size bigger than 1 millimeter and splashing of water: IP44
Protection from accidental spills	European Commission		A spilling test shall be performed, by letting 220 mL of de-ionized water flow, without applying additional pressure, from 5 cm away from one edge of the slate tablet (distance between edge of cup in tilted state to the unit under test), followed by use of a paper towel to gently absorb excess liquid on the slate tablet. The slate tablet should dwell for 24 hours prior to functional inspection (as specified below). The procedure has to be conducted for each edge of the tablet in the display up orientation. Each time after having run the above test procedure, the unit under test has to be functional without defect, with particular reference to the following functionalities, where applicable: (i) all cameras, tested for still images and videos; (ii) mobile communication; (iii) Bluetooth connectivity; (iv) WiFi connectivity; (v) battery charging: wired and wireless; (vi) display touch sensitivity; (vii) responsive buttons and switches; (viii) vibration alarm; (ix) main microphone(s); (x) loudspeaker; (xi) headset audio.

Rated capacity and battery endurance in cycles	CENEL EC	IEC EN 61960-3:2017	<p>Battery endurance in cycles shall be measured with the following test sequence:</p> <p>1) one cycle at 0,2C discharge rate and measure capacity</p> <p>2) cycles 2-499 at 0,5C discharge rate</p> <p>3) repeat step 1</p> <p>To determine the number of cycles beyond 500 cycles, the test shall be continued</p> <p>4) 99 cycles at 0,5 C discharge rate</p> <p>5) repeat step 1</p> <p>6) repeat steps 4 and 5 until measured capacity is below 80%</p> <p>Tests shall be performed with an external power source, which does not limit the power draw of the battery and leaves it to the specified default charging algorithm to regulate the charging rate.</p>
Scratch hardness	CEN	EN 15771:2010	Scratch hardness shall be tested on the visible display area, without protective cover on the display
Recycled content of the product or of a part	CEN	EN 45557:2020	
Standardised physical dimensions of rechargeable batteries	IEC	IEC 60086-2:2015	
Base station simulator for battery endurance test	ETSI	ETSI TR 125 914 - V16.0.0, chapter 9	
Battery endurance test ambient conditions	ECMA	ECMA 383	Ambient temperature (23±5) °C, relative humidity 10 % to 80 %, ambient light (250±50) Lux
Resistance to accidental drops	IEC	IEC 60068-2-31, Free fall repeated - Procedure 2	Mobile phones shall be tested for resistance to accidental drops, fall height 1 meter; the test has to be performed with 5 units consecutively and is passed, if at least 4 units pass the test.
Contact closure cycle resistance	ASTM	ASTM-F1578-07	<p>Buttons shall be tested as integrated in the device. The device itself acts as the contact closure monitoring device by responding as intended to a button push. The test probe orientation shall be 90 degrees to sample. In case of volume buttons, the criterion applies individually to both, the volume up and the volume down segment of a combined button. Fail criterion: Device fails to respond to button push as intended. Test report according to ASTM-F1578-07 except for the electrical characteristic changes.</p> <p>The test shall be performed with one unit, which might be the same for all buttons or one unit per button.</p>
Insertion/extraction cycle resistance	IEC, EIA	EN ISO 62680-1-3 EIA-364-09D	<p>The test shall be done at a rate of 500 ± 50 cycles per hour and no physical damage to any part of the charging port shall occur; in case the device is sold with a charging cable, this cable has to be used; in case the device is sold without a charging cable the cable shall be specified by the manufacturer, importer or authorised representative.</p> <p>The test shall be performed with one unit.</p>

R _{rec}		EN 45555:2019	<p>To be calculated as mass based recyclability rate, with the following reference end-of-life scenario:</p> <ul style="list-style-type: none"> • Battery: Co, Li (R_{rec,Li} 90 %) masses count towards recyclability rate • Mono-material parts removed when extracting the battery: Steel, Al, Mg, plastics or copper masses count towards recyclability rate • All other parts: Cu, Co, Sn (R_{rec,Sn} 50 %), Ni (R_{rec,Ni} 85 %), In (R_{rec,In} 50%), Au, Ag, PGM (R_{rec,PGM} 95 %) masses count towards recyclability rate
Critical raw material (CRM) content		EN 45558:2019	To be applied to gold following the same approach as for CRMs
Secure deletion	NIST	Guidelines for Media Sanitization, NIST Special Publication 800-88 - Revision 1	

ANNEX IV**Verification procedure for market surveillance purposes**

The verification tolerances defined in this Annex relate only to the verification by Member State authorities of the declared values and shall not be used by the manufacturer, importer or authorised representative as an allowed tolerance to establish the values in the technical documentation or in interpreting those values with a view to achieving compliance or to communicate better performance by any means.

Where a model is not in conformity with the requirements laid down in Article 6 of this Regulation, the model and all equivalent models shall be considered not compliant.

As part of verifying the compliance of a product model with the requirements laid down in this Regulation pursuant to Article 3(2) of Directive 2009/125/EC, the authorities of the Member States shall apply the following procedure for the requirements referred to in Annex II:

1. The Member State authorities shall verify one single unit of the model pursuant to points 2(a), (b), (c) and (d), except for the requirement referred to in point 1.2.1 of parts A and B of Annex II (resistance to accidental drops), where the test shall be performed with five units of the model pursuant to point 2 (e), and except for the requirement referred to in point 1.2.4 of part A and B and point 1.2.3 of part D of Annex II (battery endurance in cycles), where the test shall be performed with five units of the model pursuant to point 2 (f).
2. The model shall be considered to comply with the applicable requirements where all of the following conditions are fulfilled:
 - (a) the values given in the technical documentation pursuant to Annex IV, point 2, to Directive 2009/125/EC (declared values), and, where applicable, the values used to calculate those values, are not more favourable for the manufacturer, importer or authorised representative than the results of the corresponding measurements carried out pursuant to point (g) thereof;
 - (b) the declared values meet any requirements laid down in this Regulation, and any required product information published by the manufacturer, importer or authorised representative does not contain values that are more favourable for the manufacturer, importer or authorised representative than the declared values;
 - (c) when the Member State authorities check the unit of the model, it complies with the requirements, except for the requirements for which points (d), (e) and (f) apply;
 - (d) when the Member State authorities test the unit of the model, the determined values (the values of the relevant parameters as measured in testing and the values calculated from these measurements) comply with the respective verification tolerances as set out in Table 4;
 - (e) when the Member State authorities test five units of the model, the determined values (that is the values of the relevant parameters as measured in testing and the values calculated from those measurements) comply with the respective pass rate as given in Table 5;
 - (f) when the Member State authorities test the five units of the model, the arithmetic mean of the determined values (that is the values of the relevant parameters as measured in testing and the values calculated from these

measurements) complies with the respective verification tolerances as given in Table 4.

3. If the results referred to in point 2(a), (b), (c) or (f) are not achieved, the model and all equivalent models shall be considered not to comply with this Regulation.
4. If the result referred to in point 2(d) is not achieved, the Member State authorities shall select three additional units of the same model for testing.
5. If the result referred to in point 2(e) is not achieved, the Member State authorities shall select five additional units of the same model for testing. As an alternative, the additional units selected may be of one or more equivalent models.
6. The model shall be considered to comply with the applicable requirements if, for these units tested pursuant to point 4, where applicable, the arithmetical mean of the determined values complies with the respective verification tolerances set out in Table 4.
7. The model shall be considered to comply with the applicable requirements if for these five units tested pursuant to point 5, where applicable, the pass rate complies with the respective values given in Table 5.
8. If the results referred to in point 6 or 7 are not achieved, the model and all equivalent models shall be considered not to comply with this Regulation.
9. The Member State authorities shall provide all relevant information to the authorities of the other Member States and to the Commission without delay once a decision has been taken on the non-compliance of the model according to point 3 or 8 or according to the second paragraph of this Annex.

The Member State authorities shall use the measurement and calculation methods set out in Annex III.

The Member State authorities shall only apply the verification tolerances that are set out in Table 4 and shall use only the procedure described in the third paragraph for the requirements set out in this Annex. For the parameters in Table 4, no other tolerances, such as those set out in harmonised standards or in any other measurement method, shall be applied.

Table 4
Verification tolerances

Parameters	Verification
networked standby power consumption [W] and standby power consumption [W]	The determined value ^a shall not be more than 0,10 W higher than the declared value.
battery endurance in cycles – default settings [cycles]	The determined value ^a shall not be more than 20 cycles lower than the declared value.
rated battery capacity (C_{rated} [mAh])	The determined value ^a shall not be more than 10% higher than the declared value.
remaining battery capacity (%)	The determined value ^a shall not be more than 2% points lower than the declared value.
ingress protection rating (IPxx)	To be verified according to the standard referred to under Annex IIIa for this parameter.
protection from accidental spills	To be verified according to the standard referred to under Annex IIIa for this parameter.

^a in the case of three additional units tested as prescribed in point 4, the determined value means the arithmetic mean of the values determined for these three additional units.

Table 5
Pass rates for resistance to accidental drops

Parameters	Pass rate
resistance to accidental drops	The determined value corresponding to the declared value shall be met by at least 80 % of the tested units.

ANNEX V
Benchmarks

At the time of entry into force of this Regulation, the best available technology on the market was identified as follows:

Mobile phones:

- (1) resistance to accidental drops: >100 falls; >>100 falls for ruggedized devices;
- (2) scratch resistance: 6;
- (3) ingress protection rating: IP68 (in combination with user-replaceable battery);
- (4) battery endurance in cycles: 1200 cycles.

Cordless phones:

- (5) standby power cordless phones with base station: 0,4 W;
- (6) standby power cordless phones with charging cradle only: < 0,05 W;
- (7) ingress protection rating: IP65;
- (8) compatibility with standard size batteries: yes.

Slate tablets:

- (9) scratch resistance: 6;
- (10) ingress protection rating: IP68;
- (11) battery endurance in cycles: 1000 cycles.