



Brussels, XXX  
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ANNEXES 1 to 9

## ANNEXES

to the

**Commission Delegated Regulation (EU) .../...**

**supplementing Regulation (EU) 2017/1369 of the European Parliament and of the Council with regard to energy labelling of smartphones and slate tablets.**

**ANNEX I**  
**Definitions applicable to the Annexes**

- (1) ‘declared values’ means the values provided by the supplier for the stated, calculated or measured technical parameters in the technical documentation pursuant to Article 3(3) of Regulation (EU) 2017/1369 and in accordance with Article 3(1), point (d), and Annex VI of this Regulation;
- (2) ‘battery endurance per cycle’ means the time a smartphone or slate tablet can operate with an initially fully charged battery, running a defined test scenario, before the device shuts off automatically due to a drained battery, expressed in hours (h);
- (3) ‘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;
- (4) ‘END<sub>device,standby</sub> (h)’ means the measured battery endurance per cycle for the function “standby”, expressed in hours;
- (5) ‘END<sub>device,active</sub> (h)’ means the battery endurance calculated as a weighted value based on the measured endurance for defined functions, excluding standby, expressed in hours;
- (6) ‘END<sub>device</sub> [h]’ means the battery endurance calculated as a weighted value based on the measured endurance for defined functions, including standby, expressed in hours;
- (7) ‘nominal voltage’ means the voltage of a battery measured at the mid point between fully charged and fully discharged based on a 0.2 C discharge rate;
- (8) ‘C’ means a measure of the rate at which a battery is charged relative to its capacity, defined as the charge current divided by the capacity, expressed in 1/h;
- (9) ‘IP’ means ingress protection and refers to the ingress protection of a device;
- (10) ‘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 area of length times width is maximised;
- (11) ‘guarantee’ means any undertaking by the retailer or supplier to the consumer to do any of the following:
  - (a) reimburse the price paid;
  - (b) replace, repair or handle the smartphone or slate tablet in any way if it does not meet the specifications set out in the guarantee statement or in the relevant advertising;
- (12) ‘spare part’ means a separate part that can replace a part with the same or similar function in a smartphone or slate tablet. A part shall be considered necessary for use if the smartphone or slate tablet cannot function as intended without that part. The functionality of the smartphone or slate tablet is restored or is upgraded when the part is replaced by a spare part;
- (13) ‘disassembly’ means a process whereby a product is taken apart in such a way that it could subsequently be reassembled and made operational;
- (14) ‘fastener’ means a hardware device that mechanically or magnetically connects or fixes two or more objects, parts or pieces. Connectors with both mechanical and electrical function shall be considered as fasteners;

- (15) ‘reusable fastener’ means a fastener that can be completely reused in the reassembly for the same purpose, or, in case the fastener cannot be reused, a fastener that is supplied at no additional cost with the spare part which it is intended to connect or fix. Adhesives shall be considered reusable fasteners if they are supplied with the spare part in a quantity that is sufficient for the reassembly, at no additional cost; screws and other connectors such as, but not limited to, snap-fits and clips shall be classified as reusable fasteners, unless they cause damage either to the product or to the fastener itself during the disassembly or reassembly process in a way that makes their reuse impossible;
- (16) ‘removable fastener’ means a fastener that is not reusable, but whose removal does not entail a high risk of damaging the product or of leaving residue which precludes reassembly. Adhesives that are not reusable fasteners shall be considered removable fasteners unless their removal process, using commercially available tools with a reasonable level of effort, does not allow the full removal of the residues and entails a high risk of permanently precluding the reassembly of the product;
- (17) ‘step’ means an operation that finishes with the removal of a part (or bundle) or with a change of tool;
- (18) ‘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;
- (19) ‘functionality update’ means an operating system update whose main purpose is to implement new functionalities;
- (20) ‘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;
- (21) ‘back cover’ or ‘back cover assembly’ means the main backside housing, including, 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 or plated antennas, brackets, shieldings and thermal interface materials;
- (22) ‘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;
- (23) ‘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;
- (24) ‘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;
- (25) ‘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;
- (26) ‘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;
- (27) ‘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;
- (28) ‘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;
- (29) ‘speaker’ means all loudspeakers and mechanical parts to generate sound, including, as relevant to the product model, module housing(s), gaskets and electric connections to other assemblies of the device;
- (30) ‘hinge assembly’ means a mechanism by means of a part or an assembly that allows a device to be folded while preserving its operational integrity including, where relevant, module housings;
- (31) ‘mechanical display folding mechanism’ means a mechanism by means of a part or an assembly that allows a device, including its display, to be folded while preserving its operational integrity;
- (32) ‘charger’ means a compatible external power supply unit and a charging cable to connect to the charging port and to charge the battery of the mobile phone, cordless phone or slate tablet;

- (33) 'display assembly' means the assembly of display unit and where relevant front panel digitiser unit, including, as relevant to the product module:
- (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;
- (34) 'professional repairer' means a professional repairer as defined in Annex I, point (6) to Commission Regulation (EU) .../... [OP: please introduce number of accompanying ecodesign regulation];
- (35) 'repair and maintenance information' means the repair and maintenance information that Regulation (EU) .../... [OP: please introduce number of accompanying ecodesign regulation] requires manufacturers, importers or authorised representatives to provide access to in relation to the relevant product;
- (36) 'date of placement on the market' means the date of placement on the market of the first unit of a product model;
- (37) 'date of end of placement on the market' means the date of placement on the market of the last unit of a product model;
- (38) '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;
- (39) 'basic tools' means a screwdriver with slotted heads, a cross recess screwdriver, a hexalobular recess screwdriver, 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, and a magnifying glass;
- (40) 'commercially available tool' means a tool that is available for purchase by the general public and is neither a basic tool nor a proprietary tool;
- (41) 'separate protective cover' means a protective cover which might 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.

**ANNEX II**  
**Energy efficiency classes**

A. The energy efficiency class of a smartphone or a slate tablet shall be determined on the basis of its Energy Efficiency Index (EEI) as set out in Table 1. The EEI of a smartphone or a slate tablet shall be determined in accordance with Annex IV, point 1.

*Table 1: Energy efficiency classes of smartphones and slate tablets*

<b>Energy Efficiency Class</b>	<b>Energy Efficiency Index (EEI)</b>
A (most efficient)	$EEI > 0,00142$
B	$0,00128 < EEI \leq 0,00142$
C	$0,00114 < EEI \leq 0,00128$
D	$0,00100 < EEI \leq 0,00114$
E	$0,00086 < EEI \leq 0,00100$
F	$0,00072 < EEI \leq 0,00086$
G (least efficient)	$EEI \leq 0,00072$

B. The repeated free fall reliability class of a smartphone or a slate tablet shall be determined on the basis of the number of falls without defect as set out in Table 2. The number of falls without defect shall be determined in accordance with Annex IV, point 4.

*Table 2: Repeated free fall reliability classes of smartphones and slate tablets*

<b>Repeated Free Fall Reliability Class</b>	<b>Falls without defect</b>
A (most robust)	$n > 300$
B	$200 < n \leq 300$
C	$100 < n \leq 200$
D	$50 < n \leq 100$
E (least robust)	$n \leq 50$

C. The reparability class of a smartphone or a slate tablet shall be determined on the basis of the reparability index as set out in Table 2a. The reparability index shall be determined in accordance with Annex IV, point 5.

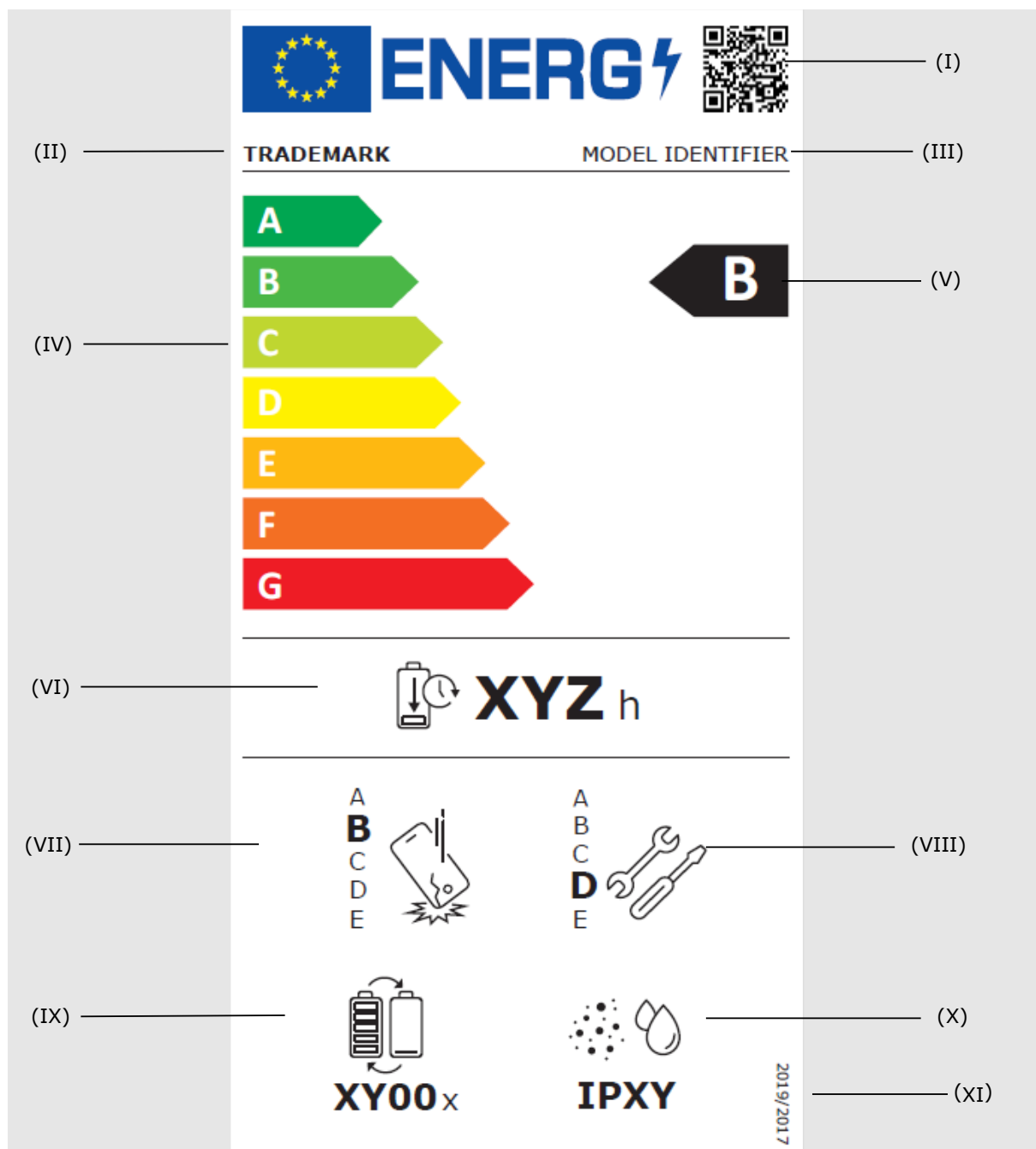
*Table 2a: Reparability classes of smartphones and slate tablets*

<b>Reparability Class</b>	<b>Reparability Index (R)</b>
A (most repairable)	$R \geq 4,00$
B	$4,00 > R \geq 3,35$
C	$3,35 > R \geq 2,55$
D	$2,55 > R \geq 1,75$
E (least repairable)	$1,75 > R \geq 1,00$

**ANNEX III**  
**Label for smartphones and slate tablets**

1. LABEL FOR SMARTPHONES AND SLATE TABLETS

Label:



The following information shall be included in the label for smartphones and slate tablets:

- (i) a QR code;
- (ii) the trade mark;
- (iii) the supplier's model identifier, meaning the code, usually alphanumeric, which distinguishes a specific smartphone or slate tablet model from other models with the same trade mark;

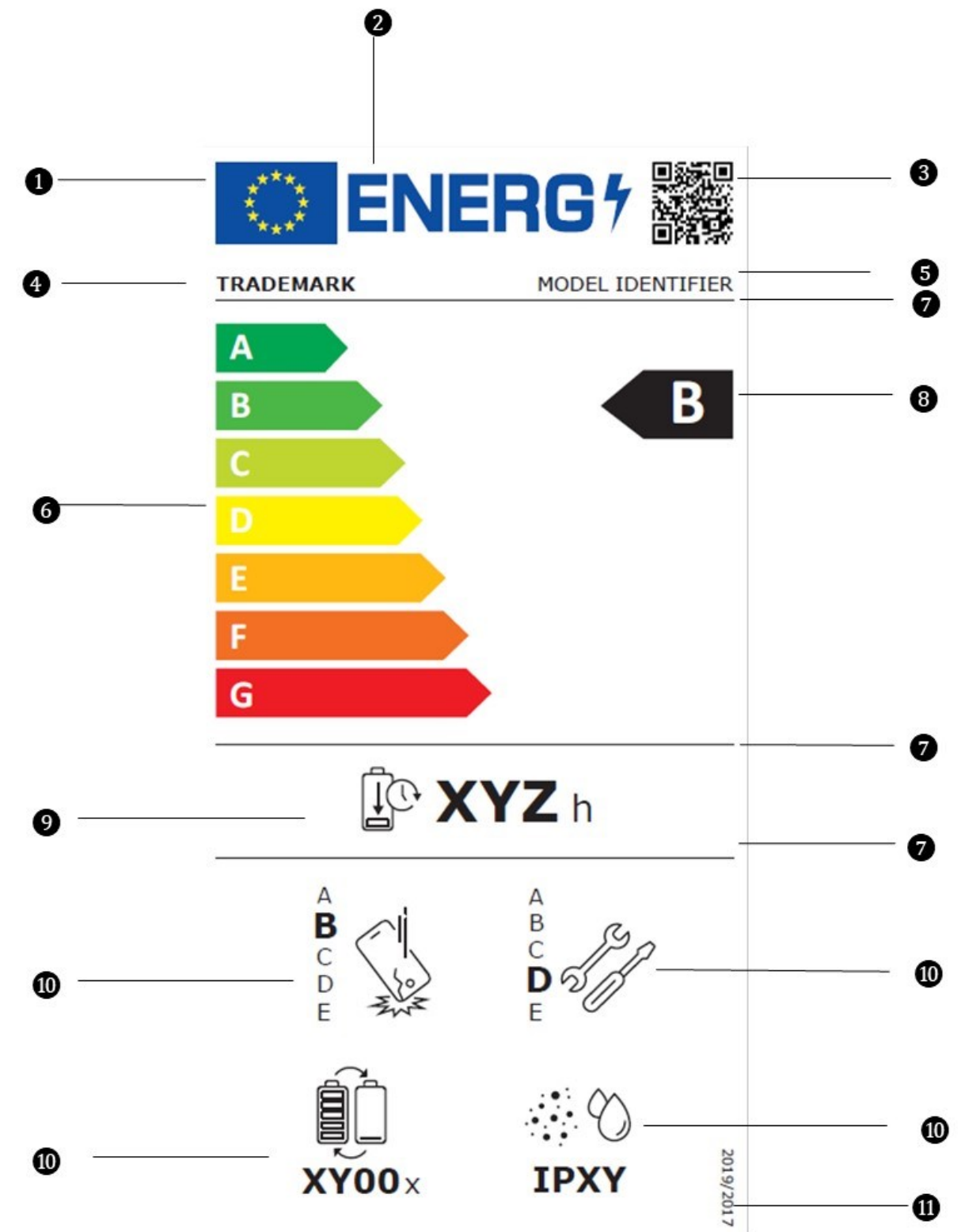
- (iv) the scale of energy efficiency classes from A to G;
- (v) the energy efficiency class determined in accordance with Annex II;
- (vi) the battery endurance per cycle, active use only (END<sub>device,active</sub>) in h per full battery charge, rounded to full hours in accordance with Annex III, point 1;
- (vii) repeated free fall reliability class determined in accordance with Annex II;
- (viii) reparability class determined in accordance with Annex II;
- (ix) battery endurance in cycles, in cycles, in ranges  $\geq 500$ ,  $\geq 600$ ,  $\geq 700$ ,  $\geq 800$ ,  $\geq 900$ ,  $\geq 1000$ ,  $\geq 1100$ ,  $\geq 1200$ ,  $\geq 1300$ ,  $\geq 1400$  in accordance with Annex IV, point 2;
- (x) ingress protection rating in accordance with Annex IV, point 3;
- (xi) the number of this Regulation, that is '2022/XXXX' [OP please insert the number of this Regulation].

## 2. LABEL DESIGN FOR SMARTPHONES AND SLATE TABLETS

- 2.1. The design of the label for smartphones and slate tablets shall be as in the figure below.

*[image with exact dimensions to be inserted]*





- 2.2. The label for smartphones and slate tablets shall fulfil the following specifications:
- (a) The label shall be at least 68 mm wide and 136 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to those specifications above;
  - (a) The background of the label shall be 100 % white;
  - (b) The typefaces shall be Verdana and Calibri;

- (c) The dimensions and specifications of the elements constituting the label shall be as indicated in the label design;
- (d) Colours shall be CMYK – cyan, magenta, yellow and black, following this example: 070,100,0: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black;
- (e) The label shall fulfil all of the following requirements (numbers refer to the figures above):
- ① the colours of the EU logo shall be as follows:
    - the background: 100,80,0,0;
    - the stars: 0,0,100,0;
  - ② the colour of the energy logo shall be: 100,80,0,0;
  - ③ the QR code shall be 100 % black;
  - ④ the trade mark shall be 100 % black and in Verdana Bold, 7 pt;
  - ⑤ the model identifier shall be 100 % black and in Verdana Regular 7 pt;
  - ⑥ the A to G scale shall be as follows:
    - the letters of the energy efficiency scale shall be 100 % white and in Calibri Bold 19 pt; the letters shall be centred on an axis at 4mm from the left side of the arrows;
    - the colours of the A to G scale arrows shall be as follows:
      - A-class: 100,0,100,0;
      - B-class: 70,0,100,0;
      - C-class: 30,0,100,0;
      - D-class: 0,0,100,0;
      - E-class: 0,30,100,0;
      - F-class: 0,70,100,0;
      - G-class: 0,100,100,0 ;
  - ⑦ the internal dividers shall have a weight of 0,5 pt and the colour shall be 100 % black;
  - ⑧ the letter of the energy efficiency class shall be 100 % white and in Calibri Bold 23 pt. The energy efficiency class arrow and the corresponding arrow in the A to G scale shall be positioned in such a way that their tips are aligned. The letter in the energy efficiency class arrow shall be positioned in the centre of the rectangular part of the arrow which shall be 100 % black;
  - ⑨ the value of the battery endurance per cycle shall be in Verdana Bold 20 pt; 'h' shall be in Verdana Regular 13 pt; the text shall be centred and 100 % black;
  - ⑩ the pictograms shall be as shown as in the label design and as follows:
    - the pictograms' lines shall have a weight of 1 pt and they and the texts (numbers and units) shall be 100 % black;

- repeated free fall reliability class pictogram: the range of repeated free fall reliability classes (A to D) shall be centred under the pictogram, with the letter of the applicable repeated free fall reliability class in Verdana Bold 12 pt and the other letters of the repeated free fall reliability classes in Verdana Regular 8 pt; the text shall be centred under the pictogram;
- reparability class pictogram: the range of reparability classes (A to E) shall be centred under the pictogram, with the letter of the applicable reparability class in Verdana Bold 12 pt and the other letters of the reparability classes in Verdana Regular 8 pt; the text shall be centred under the pictogram;
- battery endurance in cycles pictogram: the value of the battery endurance in cycles shall be in Verdana Bold 12 pt; ‘x’ shall be in Verdana Regular 10 pt; the text shall be centred under the pictogram;
- ingress protection rating pictogram: the text under the pictogram(s) shall be in Verdana Bold 12 pt, and it shall be centred under the pictogram;

**11** the number of the regulation shall be 100 % black and in Verdana Regular 5 pt.

**ANNEX IV**  
**Measurement and calculation methods**

For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards, the reference numbers of which have been published in the *Official Journal of the European Union* or using 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.

In the absence of relevant standards and until the publication of the references of the relevant harmonised standards in the *Official Journal of the European Union*, the transitional testing methods set out in Annex IVa, or other reliable, accurate and reproducible methods, which take into account the generally recognised state-of-the-art methods, shall be used.

Where a parameter is declared pursuant to Article 3(3) of Regulation (EU) 2017/1369 and in accordance with Table 7 of Annex VI to this Regulation, its declared value shall be used by the supplier for the calculations in this Annex.

**1. CALCULATION OF THE ENERGY EFFICIENCY INDEX**

Smartphones and slate tablets shall be tested for battery endurance per cycle with the following test settings, starting the test with a fully charged battery:

**1.1. General device settings and configuration**

- an application shall be installed on the device to embed the test scenario and the needed contents used during the testing;
- all applications shall be closed (except required system applications);
- no specific user account (e.g. Google or Apple ID) shall be needed to perform the test;
- the web browser used during the testing shall be the native OS browser of the device;
- power saving features shall be disabled before starting the testing;
- no accessory shall be connected to the device;
- any system OS and Software update shall be deferred until after testing is completed;
- all radio frequency related features shall be managed by the application (meaning for instance switching ON/OFF Wifi according to the test scenario);
- for Dual-SIM devices, only one SIM card shall be inserted; for Dual-SIM devices with eSIM, eSIM shall be switched off; for devices with eSIM only, eSIM shall be used;
- brightness shall be set at 200cd/m<sup>2</sup> using an external equipment to ensure this setting;
- auto brightness shall be switched off and the refresh rate shall be set at the default value;
- darkmode shall be disabled;

- all audio volumes (call and media) shall be set at 75 dBA at a defined distance using an external equipment to ensure this setting. The audio volume shall be set using a sound level meter at 20 cm from the front (screen) of the device;
- speaker to be used during video shall be the one set in the default setting of the device;
- Tx power shall be set at 10dB;
- during the call, the application shall ensure that the screen is off, no specific simulation of the proximity sensor shall be required;
- any network simulator may be used, if capable of supporting the required settings; the specific contents (video, web pages, files) shall be uploaded on the simulator.

## **1.2. Test sequence**

Measured times shall be Time of Active Usage ( $T_A$ ), being the sum of all times in active use according to the test sequences below, and Time of Idle ( $T_I$ ), being the sum of all times in idle according to the test sequences below.

### **1.2.1. Test sequence for smartphones:**

From 100 % to 98 % battery charge level: Idle.

From 98 % to 75 % battery charge level: Repeat a cycle of:

- Phone call (4 min);
- Web browsing (9 min);
- Video streaming (4 min);
- Data transfer: FTP upload and download (8 min);
- Video playback (4 min);
- Gaming (1 min).

From 75 % to 73 % battery charge level: Idle.

From 73 % to 50 % battery charge level: Repeat a cycle of:

- Phone call (4 min);
- Web browsing (9 min);
- Video streaming (4 min);
- Data transfer: FTP upload and download (8 min);
- Video playback (4 min);
- Gaming (1 min).

From 50 % to 48 % battery charge level: Idle.

From 48% to 25% battery charge level: Repeat a cycle of:

- Phone call (4 min);
- Web browsing (9 min);
- Video streaming (4 min);

- Data transfer: FTP upload and download (8 min);
- Video playback (4 min);
- Gaming (1 min).

From 25% to 23% battery charge level: Idle.

From 23% to PowerOff: Repeat a cycle of:

- Phone call (4 min);
- Web browsing (9 min);
- Video streaming (4 min);
- Data transfer: FTP upload and download (8 min);
- Video playback (4 min);
- Gaming (1 min).

When device powers off: Terminate test.

### **1.2.2. Test sequence for slate tablets:**

From 100% to 98% battery charge level: Idle.

From 98% to 75% battery charge level: Repeat a cycle of:

- Web browsing (11 min);
- Video streaming (6 min);
- Data transfer: FTP upload and download (2 min);
- Video playback (6 min);
- Gaming (5 min).

From 75% to 73% battery charge level: Idle.

From 73% to 50% battery charge level: Repeat a cycle of:

- Web browsing (11 min);
- Video streaming (6 min);
- Data transfer: FTP upload and download (2 min);
- Video playback (6 min);
- Gaming (5 min).

From 50% to 48% battery charge level: Idle.

From 48% to 25% battery charge level: Repeat a cycle of:

- Web browsing (11 min);
- Video streaming (6 min);
- Data transfer: FTP upload and download (2 min);
- Video playback (6 min);
- Gaming (5 min).

From 25% to 23% battery charge level: Idle.

From 23% to PowerOff: Repeat a cycle of:

- Web browsing (11 min);
- Video streaming (6 min);
- Data transfer: FTP upload and download (2 min);
- Video playback (6 min);
- Gaming (5 min).

When device powers off: Terminate test.

### 1.3. Calculation

The endurance of the device in active mode and in idle shall be calculated as follows:

Endurance device active (h):

$$END_{device,active} = \frac{T_A}{(80)} \times 100$$

Endurance device standby (h):

$$END_{device,standby} = \frac{T_I}{(9)} \times 100$$

The endurance score shall be the aggregated and normalised value in hours, as a calculated value derived from the four types of battery endurance per cycle tests.

Overall battery endurance ( $END_{device}$ ) in hours shall be calculated as follows:

(a) smartphones:

$$END_{device} = \frac{24}{\left(\frac{4}{END_{device,active}} + \frac{20}{END_{device,standby}}\right)}$$

(b) slate tablets:

$$END_{device} = \frac{24}{\left(\frac{2}{END_{device,active}} + \frac{22}{END_{device,standby}}\right)}$$

The energy efficiency index (EEI) of a smartphone or slate tablet shall be calculated using the following equation:

$$EEI = \frac{END_{Device}}{U_{nom} \times C_{rated}}$$

Where:

- EEI is the Energy Efficiency Index in 1/mW;
- $U_{nom}$  is the nominal voltage in V;
- $C_{rated}$  is the rated battery capacity in mAh.

The EEI shall be calculated with the operating system installed on the product model at the date of placement on the market. Until the date of end of placement on the market, if an updated version of the operating system is installed on the same product model, the EEI shall be recalculated; if the change in the EEI or in any other parameter value part of the label and of the product information sheet is not detrimental for the end users, then the change is not to be considered relevant in respect to Article 4(4) of Regulation (EU) 2017/1369.

## 2. MEASUREMENT OF THE BATTERY ENDURANCE IN CYCLES

Batteries of smartphones and slate tablets shall be tested for battery endurance in cycles until the battery's usable electrical capacity has reached 80 % of its rated capacity; the battery 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 “≥ x00”.

### 3. MEASUREMENT OF THE INGRESS PROTECTION

Ingress protection against particle and moisture ingress shall be stated as an IP code, corresponding to the levels listed in Table 3. Tests shall be performed without protective cover.

**Table 3: Allowable ingress protection classes**

Level	Ingress of solid foreign objects	Ingress of water with harmful effects
	Object size	Protection against
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

### 4. MEASUREMENT OF THE NUMBER OF FALLS WITHOUT DEFECT

The number of falls without defect per unit shall be determined with the following test conditions, without protective foils and separate protective cover, if any, and in the fully extended state, if applicable:

- (a) fall height 1m;
- (b) after a defined number of falls corresponding to the intervals specified in Table 4 and Table 5, 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 without 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;



- (c) 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;
- (d) 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;
- (e) 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;
- (f) in case of a determined defect and in any case after the maximum number of falls specified in table 4 and 5, the test of the unit shall be terminated.

**Table 4: Test intervals for determining if the unit is defective (smartphones)**

Falls per unit	Unit tested without any protective foil or separate protective cover	Unit tested in fully extended state, if applicable
100	1 <sup>st</sup> check for defects	1 <sup>st</sup> check for defects
200	2 <sup>nd</sup> check for defects	2 <sup>nd</sup> check for defects
300	3 <sup>rd</sup> check for defects	3 <sup>rd</sup> check for defects

**Table 5: Test intervals for determining if the unit is defect (slate tablets)**

Falls per unit	Unit tested without any protective foil or separate protective cover	Unit tested in fully extended state, if applicable
52	1 <sup>st</sup> check for defects	1 <sup>st</sup> check for defects
104	2 <sup>nd</sup> check for defects	2 <sup>nd</sup> check for defects
208	3 <sup>rd</sup> check for defects	3 <sup>rd</sup> check for defects
312	4 <sup>th</sup> check for defects	4 <sup>th</sup> check for defects

Repeated free fall tests shall be performed with five units of each model for each of the applicable test cases.

The repeated free fall reliability classes correspond to the number of falls, which have been passed by at least three out of the five units under test.

## 5. METHOD FOR THE CALCULATION OF THE REPARABILITY INDEX OF SMARTPHONES AND SLATE TABLETS

The **Reparability Index** shall be an aggregated and normalised score, as a calculated value derived from six scoring parameters where:

- $S_{DD}$  is the “Disassembly Depth” score.
- $S_F$  is the “Fasteners (type)” score.
- $S_T$  is the “Tools (type)” score.
- $S_{SP}$  is the “Spare Parts” score.
- $S_{SU}$  is the “Software Updates (duration)” score.
- $S_{RI}$  is the “Repair Information” score.

The same scoring methodology shall apply to both smartphones and slate tablets. The **Reparability Index (R)** shall be calculated as follows:

$$R = (S_{DD} * 0,25) + (S_F * 0,15) + (S_T * 0,15) + (S_{SP} * 0,15) + (S_{SU} * 0,15) + (S_{RI} * 0,15)$$

The “Disassembly Depth” ( $S_{DD}$ ), “Fasteners (type)” ( $S_F$ ) and “Tools (type)” ( $S_T$ ) scores are parameters scores based on the aggregation of part level scores where:

- BAT is the battery.
- DA is the display assembly.
- BC is the back cover or its assembly.
- FFC is the front facing camera(s) assembly.
- RFC is the rear facing camera(s) assembly.
- EC is the external charging port(s).
- BUT is the mechanical button(s).
- MIC is the main microphone(s).
- SPK is the speaker(s).
- FM is the hinge assembly or the mechanical display folding mechanism.

The “Disassembly Depth” ( $S_{DD}$ ) score shall be calculated as follows:

- (a) if the hinge assembly or the mechanical display folding mechanism are not present in the product, the following formula shall be used:

$$S_{DD} = (DD_{BAT} * 0,30) + (DD_{DA} * 0,30) + (DD_{BC} * 0,10) + (DD_{FFC} * 0,05) + (DD_{RFC} * 0,05) + (DD_{EC} * 0,05) + (DD_{BUT} * 0,05) + (DD_{MIC} * 0,05) + (DD_{SPK} * 0,05)$$

- (b) if the hinge assembly or the mechanical display folding mechanism are present, the following formula shall be used:

$$S_{DD} = (DD_{BAT} * 0,25) + (DD_{DA} * 0,25) + (DD_{BC} * 0,09) + (DD_{FFC} * 0,04) + (DD_{RFC} * 0,04) + (DD_{EC} * 0,04) + (DD_{BUT} * 0,04) + (DD_{MIC} * 0,04) + (DD_{SPK} * 0,04) + (DD_{FM} * 0,17)$$

#### Disassembly Depth (DD) assessment at part level

The Disassembly Depth score ( $DD_i$ ) for each priority part  $i$  ( $DD_{BAT}$ ;  $DD_{DA}$ ,  $DD_{BC}$ ,  $DD_{FFC}$ ,  $DD_{RFC}$ ,  $DD_{EC}$ ,  $DD_{BUT}$ ,  $DD_{MIC}$ ,  $DD_{SPK}$ ,  $DD_{FM}$ ) shall be calculated based on the number of steps required to remove a part from a product, without damaging the product. The counting of the steps for each part starts from the product fully assembled. Points ranging from 1 to 5 are assigned as follows:

- $DD_i \leq 2$  steps = 5 pt.
- 5 steps  $\geq DD_i > 2$  steps = 4 pt.
- 10 steps  $\geq DD_i > 5$  steps = 3 pt.
- 15 steps  $\geq DD_i > 10$  steps = 2 pt.
- $DD_i > 15$  steps = 1 pt.

For the calculation of disassembly steps, the following rules shall apply:

- the disassembly depth count is completed when the target part is separated and individually accessible.
- where multiple tools need to be used simultaneously, the use of each tool counts as a separate step.

- operations related to cleaning, removing traces or heating are counted as steps.
- where remote notification or authorisation of serial numbers is necessary for the full functionality of the spare part and the device, these actions are counted as additional disassembly steps.

The “**Fasteners (type)**” ( $S_F$ ) score is calculated as follow:

- (a) for smartphones or slate tablets, except foldable ones, the following formula shall be used:

$$S_F = (F_{BAT} * 0,30) + (F_{DA} * 0,30) + (F_{BC} * 0,10) + (F_{FFC} * 0,05) + (F_{RFC} * 0,05) + (F_{EC} * 0,05) + (F_{BUT} * 0,05) + (F_{MIC} * 0,05) + (F_{SPK} * 0,05)$$

- (b) for foldable smartphones or foldable slate tablets, the following formula shall be used:

$$S_F = (F_{BAT} * 0,25) + (F_{DA} * 0,25) + (F_{BC} * 0,09) + (F_{FFC} * 0,04) + (F_{RFC} * 0,04) + (F_{EC} * 0,04) + (F_{BUT} * 0,04) + (F_{MIC} * 0,04) + (F_{SPK} * 0,04) + (F_{FM} * 0,17)$$

Fasteners (type) (F) assessment at part level:

The “Fasteners (type)” scores ( $F_i$ ) for each priority part  $i$  ( $F_{BAT}$ ,  $F_{DA}$ ,  $F_{BC}$ ,  $F_{FFC}$ ,  $F_{RFC}$ ,  $F_{EC}$ ,  $F_{BUT}$ ,  $F_{MIC}$ ,  $F_{SPK}$ ,  $F_{FM}$ ) are assigned according to the level of removability and reusability of the fasteners used in the device assembly. Points ranging from 1 to 5 are assigned as follows:

- Reusable Fasteners = 5 pt.
- Removable Fasteners = 1 pt.

The assessment of the type of fasteners is based on the disassembly process to remove the specific priority part, starting from the previous priority part in disassembly sequence already removed.

In case different types of fasteners are encountered in the disassembly of a priority part, the worst score shall be considered.

The “**Tools (type)**” ( $S_T$ ) score shall be calculated as follows:

- (a) for smartphones or slate tablets, except foldable ones, the following formula shall be used:

$$S_T = (T_{BAT} * 0,30) + (T_{SCR} * 0,30) + (T_{BC} * 0,10) + (T_{FFC} * 0,05) + (T_{RFC} * 0,05) + (T_{EC} * 0,05) + (T_{BUT} * 0,05) + (T_{MIC} * 0,05) + (T_{SPK} * 0,05)$$

- (b) for foldable smartphones or foldable slate tablets, the following formula shall be used:

$$S_T = (T_{BAT} * 0,25) + (T_{SCR} * 0,25) + (T_{BC} * 0,09) + (T_{FFC} * 0,04) + (T_{RFC} * 0,04) + (T_{EC} * 0,04) + (T_{BUT} * 0,04) + (T_{MIC} * 0,04) + (T_{SPK} * 0,04) + (T_{FM} * 0,17)$$

Tools (type) (T) assessment at part level

The “Tools (type)” scores ( $T_i$ ) for each priority part  $i$  ( $T_{BAT}$ ,  $T_{DA}$ ,  $T_{BC}$ ,  $T_{FFC}$ ,  $T_{RFC}$ ,  $T_{EC}$ ,  $T_{BUT}$ ,  $T_{MIC}$ ,  $T_{SPK}$  and  $T_{FM}$ ) are assigned according to the complexity and availability of the tools needed for its replacement. Points ranging from 1 to 5 are assigned as follows:

- No tools = 5 pt;
- Basic tools = 4pt.

- A set of tools that is supplied (or offered to be supplied at no additional cost) with the spare part = 3 pt.
- A set of tools that is supplied (or offered to be supplied at no additional cost) with the product = 2 pt.
- Commercially available tools =1pt.

The assessment of the type of tools is based on the disassembly process to remove the specific priority part, starting from the previous priority part in disassembly sequence already removed.

Where different types of tools are needed for the disassembly of a priority part, the lowest score should be considered.

### **Spare parts**

The “**Spare Parts**” (Ssp) score shall be calculated at product level as follows:

- Spare parts for all priority parts are available to end users and professional repairers = 5 pt;
- Spare parts for display assembly, battery, back cover (or back cover assembly) and cameras are available to end users and professional repairers; spare parts for all other parts are available to professional repairers = 4 pt;
- Spare parts for display assembly, battery and back cover (or back cover assembly) are available to end users and professional repairers; spare parts for all other parts are available to professional repairers = 3 pt;
- Spare parts for display assembly and battery are available to end users and professional repairers; spare parts for all other parts are available to professional repairers = 2 pt;
- Spare parts for display assembly are available to end users and professional repairers; spare parts for all other parts are available to professional repairers = 1 pt;
- Spare parts for the hinge assembly, mechanical display folding mechanism are to be available only in case of foldable smartphones.

### **Software Updates (duration)**

The “**Software Updates (duration)**” (Ssu) score shall be calculated at product level as follows:

- Minimum guaranteed availability of security updates for at least 7 years, and of operating system functionality updates for at least 6 years = 5 pt.
- Minimum guaranteed availability of security updates for 6 years, and of operating system functionality updates for 5 years = 4 pt.
- Minimum guaranteed availability of security updates for 5 years, and of operating system functionality updates for 5 years = 3 pt.
- Minimum guaranteed availability of security updates for 5 years, and of operating system functionality updates for 4 years = 2 pt.
- Minimum guaranteed availability of security updates for 5 years, and of operating system functionality updates for 3 years =1 pt.

- The above durations refer to years after the date of end of placement on the market of the product model.

### **Repair Information**

The **Repair Information (S<sub>RI</sub>)** score shall be calculated at product level as follows:

- Public availability of repair and maintenance information, except electronic board diagrams, at no cost for end users and availability of repair and maintenance information, including electronic board diagrams, at no cost for professional repairers = 5 pt.
- Availability of repair and maintenance information at no cost for professional repairers = 3 pt.
- Availability of repair and maintenance information with a reasonable and proportionate fee for professional repairers = 1 pt.
- A fee shall be considered reasonable if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information.

**ANNEX IVa**  
**Transitional Methods**

**References and qualifying notes for smartphones and slate tablets**

Parameter	Source	Reference Test Method / Title	Notes
Fasteners (type) score (S <sub>F</sub> ) and Tools (type) score (S <sub>T</sub> )	CEN	EN 45554:2020	Fasteners and connectors: please refer to Table A.1 of the standard, unless differently specified in this Regulation.  Tools: please refer to Table A.2 of the standard, unless differently specified in this Regulation.
EEI	European Commission	EEI test specifications	<a href="https://ec.europa.eu/docsroom/documents/50214">https://ec.europa.eu/docsroom/documents/50214</a>
Reparability index	European Commission	Reparability Index Calculator	Available at: <a href="https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2022-05/Reparability_Index_Calculator_Final_v5.xls">https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2022-05/Reparability_Index_Calculator_Final_v5.xls</a>
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 1millimeter and splashing of water: IP44 .
Rated capacity and battery endurance in cycles	CENELEC	IEC EN 61960-3:2017	Battery endurance in cycles shall be measured with the following test sequence:  1) one cycle at 0.2C discharge rate and measure capacity; 2) cycles 2-499 at 0.5C discharge rate; 3) repeat step 1.  To determine the number of cycles beyond 500 cycles, one should then continue with step 4 4) 99 cycles at 0.5 C discharge rate 5) repeat step 1 6) repeat steps 4 and 5 until measured capacity is below 80 %.  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.
Scratch hardness	CEN	EN 15771:2010	Scratch hardness shall be tested on the visible display area, without protective cover on the display
Battery endurance test ambient conditions	ECMA	ECMA 383	Ambient temperature (23±5) °C, relative humidity 10 % to 80 %, ambient light (250±50) Lux
Repeated free fall reliability	IEC	IEC 60068-2-31, Free fall repeated – Procedure 2	Smartphones 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 3 units pass the test.  The free fall test shall be interrupted as set out in Table 4 to verify, if full functionality of the device is still given. The number of falls passed by at least 3 out of 5 units is the value to be stated in the product information sheet as set out in Annex V.

	IEC 60068-2-31, Free fall – Procedure 1	<p>Slate tablets shall be tested for resistance to accidental drops, fall height 1 meter on 3 mm steel plate backed by 10-19 mm thick hardwood (deviation from procedure 1); 26 controlled orientations with drop on each face, edge and corner; the test has to be performed with 5 units consecutively and is passed, if at least 3 units pass the test.</p> <p>After a number of falls as set out in Table 5 full functionality of the device shall be verified. The number of falls passed by at least 3 out of 5 units is the value to be stated in the product information sheet as set out in Annex V.</p>
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**ANNEX V**  
**Product information sheet**

Pursuant to Article 3(1), point (b), the supplier shall enter into the product database the information as set out in Table 6.

The user manual or other literature provided with the product shall clearly indicate the link to the model in the product database as a human-readable Uniform Resource Locator (URL) or as QR code or by providing the product registration number.

**Table 6: Product information sheet**

Trade mark:		
Model identifier:		
General product parameters:		
Parameter	Value	
Device type	[smartphone/tablet]	
Operating system	[Android/iOS/other]	
Energy efficiency class	[A/B/C/D/E/F/G] <sup>b</sup>	
Battery endurance per cycle (END <sub>device</sub> [h])	x	
Battery endurance per cycle, standby (END <sub>device,standby</sub> [h])	x	
Battery endurance per cycle, active use only (END <sub>device,active</sub> [h])	x	
Shipped with protective cover	[yes/no]	
Repeated free fall reliability test – falls without defect [n]	[≥ xxx]	
Repeated free fall reliability test – falls without defect, tested in fully extended state [n]	[≥ xxx/n.a.]	
Repeated free fall reliability class	[A/B/C/D/E] <sup>b</sup>	
Battery endurance in cycles – default settings [cycles]	≥x00	
Ingress protection rating	IPxx	
Specified immersion depth in water, in case of IPx8 [m]	[x.x/n.a.]	
Screen scratch resistance on Mohs hardness scale	x	
Rated battery capacity (C <sub>rated</sub> [mAh])	x.xxx	
External standardised suitable power supply	Required output power [W]	xx
	Receptacle type (at device end)	[USB-A/USB-Micro B/USB-C/other]
Reparability information:		
Repair instructions for end-users: Weblink to the manufacturer's	https://xxx	



website, where the information in Annex II, point 2, to Commission Regulation (EU) XXXX/XXX <sup>1</sup> [OP – please insert the number of accompanying Ecodesign Regulation] <sup>a</sup> is found:		
Battery user-replaceable		[yes/no]
Minimum guaranteed availability of operating system security updates <sup>c</sup> (years)		x
Minimum guaranteed availability of operating system functionality updates <sup>c</sup> (years)		x
Reparability Class (based on the scores below)		[A/B/C/D/E] <sup>b</sup>
Disassembly Depth (S <sub>DD</sub> )		x,x
Fasteners (type) score (S <sub>F</sub> )		x,x
Tools (type) score (S <sub>T</sub> )		x,x
Spare Part score (S <sub>SP</sub> )		x,x
Software Updates (duration) score (S <sub>SU</sub> )		x,x
Repair Information score (S <sub>RI</sub> )		x,x
Spare Parts available to end users		[list of components]
Spare Parts available to professional repairers		[list of components]
Weblink to repair instructions for end-users		https://xxx
Maximum pre-tax price for spare parts	battery [EUR]	xx,xx
	back cover or back cover assembly [EUR]	xx,xx
	display assembly [EUR]	xx,xx
	front-facing camera assembly [EUR]	xx,xx
	rear-facing camera assembly [EUR]	xx,xx
	external audio connector(s) [EUR]	xx,xx
	external charging port(s) [EUR]	xx,xx
	mechanical button(s) [EUR]	xx,xx
	main microphone(s) [EUR]	xx,xx
	speaker(s) [EUR]	xx,xx
	hinge assembly [EUR]	xx,xx

<sup>1</sup> Commission Regulation (EU) XXX/XXX [OP – please insert the OJ-L reference of Regulation C(XXXX)XXXX].

mechanical display folding mechanism [EUR]	xx,xx
protective foil for foldable display [EUR]	xx,xx
charger [EUR]	xx,xx
SIM tray [EUR]	xx,xx
memory card tray [EUR]	xx,xx

**Additional information:**

Date of placement on the market of the product model	dd/mm/yyyy
Date of end of placement on the market of the product model	dd/mm/yyyy
Minimum duration of the guarantee offered by the supplier <sup>a</sup> [months]	xx
<b>Supplier's address<sup>a</sup>:</b>	

<sup>a</sup> changes to these items shall not be considered relevant for the purposes of Article 4(4) of Regulation (EU) 2017/1369.

<sup>b</sup> if the product database automatically generates the definitive content of this cell the supplier shall not enter these data.

<sup>c</sup> As from Annex II, point 1.2.6, of Regulation (EU) xx/yy [Ecodesign smartphones].

<sup>d</sup> As from Annex II, point 1.1.2, of Regulation (EU) xx/yy [Ecodesign smartphones].

**ANNEX VI**  
**Technical documentation**

1. The technical documentation referred to in Article 3(1), point (d), shall include:
  - (a) a general description of the model allowing it to be unequivocally and easily identified;
  - (b) references to the harmonised standards applied or other measurement standards used;
  - (c) specific precautions to be taken when the model is assembled, installed, maintained or tested;
  - (d) the values for the technical parameters set out in Table 7; those values are considered as the declared values for the purpose of the verification procedure set out in Annex IX;
  - (e) the details and the results of calculations performed in accordance with Annex IV;
  - (f) measurement or testing conditions if not described sufficiently in point (b), including battery charging algorithms for the default charging procedure, if applicable;
  - (g) parameters of the initial test procedure for the energy efficiency index, if not described sufficiently under the settings of Annex IV, point 1, and of Annex IVa.
  
2. These elements shall also constitute the mandatory specific parts of the technical documentation that the supplier shall enter into the database, pursuant to Article 12(5) of Regulation (EU) 2017/1369.

**Table 7: Technical parameters of the model and their declared values**

PARAMETER	UNIT	VALUE
battery endurance per cycle ( $END_{device}$ )	[h]	x
battery endurance per cycle, talk time ( $END_{talk}$ )	[h]	x
battery endurance per cycle, web browsing ( $END_{web}$ )	[h]	x
battery endurance per cycle, video watching ( $END_{video}$ )	[h]	x
battery endurance per cycle, standby ( $END_{device,standby}$ )	[h]	x
battery endurance per cycle, active use only ( $END_{device,active}$ )	[h]	x
shipped with protective cover	[yes/no]	-
repeated free fall reliability test – falls without defect, tested with protective cover	[n]	[≥ xxx/n.a.]
repeated free fall reliability test – falls without defect, tested without protective cover	[n]	[≥ xxx/n.a.]

repeated free fall reliability test – falls without defect, tested in fully extended state	[n]	[≥ xxx/n.a.]
battery endurance in cycles – default settings	[cycles]	≥x00
ingress protection rating		IPxx
specified immersion depth in water, in case of IPx8		[x.x/n.a.]
screen scratch resistance	Mohs hardness scale	x
rated battery capacity (C <sub>rated</sub> )	[mAh]	x.xxx
specified final voltage for battery endurance in cycles test [V]	[V]	x.xx

3. Where the information included in the technical documentation for a smartphone or slate tablet model has been obtained by any of the following methods, or both:
- (a) from a model that has the same technical characteristics relevant for the technical information to be provided but is produced by a different supplier,
  - (b) by calculation on the basis of design or extrapolation from another model of the same or a different supplier,

the technical documentation shall include the details of such calculation, the assessment undertaken by suppliers to verify the accuracy of the calculation and, where appropriate, the declaration of identity between the models of different suppliers.

## **ANNEX VII**

### **Information to be provided in visual advertisements, in technical promotional material and in distance selling, except distance selling on the internet**

1. In visual advertisements, for the purposes of ensuring conformity with the requirements laid down in Article 3(1), point (e), and in Article 4(1), point (c), the energy efficiency class and the range of energy efficiency classes available on the label shall be shown as set out in point 4 of this Annex.
2. In technical promotional material, for the purposes of ensuring conformity with the requirements laid down in Article 3(1), point (f), and in Article 4(1), point (d), the energy efficiency class and the range of energy efficiency classes available on the label shall be shown as set out in point 4 of this Annex.
3. In the case of paper-based distance selling, the energy efficiency class and the range of energy efficiency classes available on the label shall be shown as set out in point 4 of this Annex.
4. In the cases referred to in points 1, 2 and 3, the energy efficiency class and the range of energy efficiency classes shall be shown, as indicated in Figure 1, in accordance with the following specifications:
  - (a) an arrow shall be used, containing the letter of the energy efficiency class in 100 % white, Calibri Bold and in a font size at least equivalent to that of the price, when the price is shown;
  - (b) the colour of the arrow shall match the colour of the energy efficiency class;
  - (c) the range of available energy efficiency classes shall be in 100 % black;;
  - (d) the size shall be such that the arrow is clearly visible and legible. The letter in the energy efficiency class arrow shall be positioned in the centre of the rectangular part of the arrow, with a border of 0,5 pt in 100 % black placed around the arrow and the letter of the energy efficiency class.

By way of derogation, if the visual advertisement, technical promotional material or paper-based distance selling is printed in monochrome, the arrow may be in monochrome in that visual advertisement, technical promotional material or paper-based distance selling.



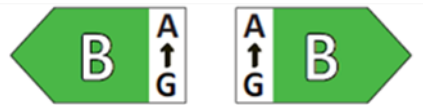
**Figure 1: Coloured/monochrome left/right arrow, with range of energy efficiency classes indicated**

1. Telemarketing-based distance selling shall specifically inform the customer of the energy efficiency class of the product and of the range of energy efficiency classes available on the label, and the customer shall be given the possibility to access the full label and the product information sheet through a free access website, or by requesting a printed copy.
2. For all the situations mentioned in points 1, 2, 3 and 5, it shall be possible for the customer to obtain, on request, a printed copy of the label and the product information sheet.

## **ANNEX VIII**

### **Information to be provided in the case of distance selling through the Internet**

1. The appropriate label made available by suppliers in accordance with Article 3(1), point (g), shall be shown on the display mechanism in proximity to the price of the product. The size shall be such that the label is clearly visible and legible and shall be proportionate to the size specified in Annex III. The label may be displayed using a nested display, in which case the image used for accessing the label shall comply with the specifications laid down in point 2 of this Annex. If nested display is applied, the label shall appear on the first mouse click, mouse roll-over or tactile screen expansion on the image.
2. The image used for accessing the label in the case of nested display, as indicated in Figure 2, shall:
  - (a) be an arrow in the colour corresponding to the energy efficiency class of the product on the label;
  - (b) indicate the energy efficiency class of the product on the arrow in 100 % white, Calibri Bold and in a font size equivalent to that of the price;
  - (c) have the range of available energy efficiency classes in 100 % black;
  - (d) have one of the following two formats, and its size shall be such that the arrow is clearly visible and legible. The letter in the energy efficiency class arrow shall be positioned in the centre of the rectangular part of the arrow, with a visible border in 100 % black placed around the arrow and the letter of the energy efficiency class:



**Figure 2: Coloured left/right arrow, with range of energy efficiency classes indicated**

1. In the case of a nested display, the sequence of display of the label shall be as follows:
  - (a) the image referred to in point 2 of this Annex shall be shown on the display mechanism in proximity to the price of the product;
  - (b) the image shall link to the label set out in Annex III;
  - (c) the label shall be displayed after a mouse click, mouse roll-over or tactile screen expansion on the image;
  - (d) the label shall be displayed by pop up, new tab, new page or inset screen display;
  - (e) for magnification of the label on tactile screens, the device conventions for tactile magnification shall apply;
  - (f) the label shall cease to be displayed by means of a close option or other standard closing mechanism;
  - (g) the alternative text for the graphic, to be displayed on failure to display the label, shall be the energy efficiency class of the product in a font size equivalent to that of the price.

2. The electronic product information sheet made available by the supplier in accordance with Article 3(1), point (h) shall be shown on the display mechanism in proximity to the price of the product. The size shall be such that the product information sheet is clearly visible and legible. The product information sheet may be displayed using a nested display or by referring to the product database, in which case the link used for accessing the product information sheet shall clearly and legibly indicate 'Product information sheet'. If a nested display is used, the product information sheet shall appear on the first mouse click, mouse roll-over or tactile screen expansion on the link.

## **ANNEX IX**

### **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 supplier 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. The values and classes published on the label or in the product information sheet shall not be more favourable for the supplier than the values declared in the technical documentation.

Where a model has been designed to be able to detect it is being tested (e.g. by recognizing the test conditions or test cycle), and to react specifically by automatically altering its performance during the test with the objective of reaching a more favourable level for any of the parameters specified in this Regulation or included in the technical documentation or included in any of the documentation provided, 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, the authorities of the Member States shall apply the following procedure:

- (1) The Member State authorities shall verify one single unit of the model pursuant to points 2(a),(b) and (c), except for repeated free fall tests, where five units of a model shall be verified pursuant to points 2(a),(b) and (d), and except for battery endurance in cycles, where five units of a model shall be verified pursuant to points 2(a),(b) and (e).
- (2) The model shall be considered to comply with the applicable requirements if:
  - (a) the values given in the technical documentation pursuant to Article 3(3) of Regulation (EU) 2017/1369 (declared values), and, where applicable, the values used to calculate those values, are not more favourable for the supplier than the corresponding values given in the test reports;
  - (b) the values published on the label and in the product information sheet are not more favourable for the supplier than the declared values, and the indicated energy efficiency class, the repeated free fall reliability class and the reparability class are not more favourable for the supplier than the class determined by the declared values;
  - (c) when the Member State authorities test the unit 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 verification tolerances as given in Table 8;
  - (d) 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 9;
  - (e) when the Member State authorities test 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 those measurements) comply with the respective verification tolerances as given in Table 8.
- (3) If the results referred to in points 2(a), (b) and (e) 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(c) is not achieved, the Member State authorities shall select three additional units of the same model for testing. As an alternative, the three additional units selected may be of one or more equivalent models.
- (5) If the result referred to in point 2(d) is not achieved, the Member State authorities shall select ten additional units of the same model for testing. As an alternative, the ten 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 three units tested pursuant to point 4, where applicable, the arithmetic mean of the determined values complies with the respective tolerances given in Table 8.
- (7) The model shall be considered to comply with the applicable requirements if for these ten units tested pursuant to point 5, where applicable, the pass rate complies with the respective values given in Table 9.
- (8) If the results referred to in points 5 or 6 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 points 3 or 8 or the second paragraph of this Annex.

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

The Member State authorities shall only apply the verification tolerances set out in Table 8 and the pass rate set out in Table 9 and shall only use the procedure set out in points 1 to 9 for the requirements referred to in this Annex. For the parameters in Table 8, no other tolerances, such as those set out in harmonised standards or in any other measurement method, shall be applied.

**Table 8**  
**Verification tolerances for measured parameters**

Parameters	Verification
battery endurance per cycle ( $END_{\text{device}}$ [h])	The determined value <sup>a</sup> shall not be more than 0,5 hours lower than the declared value.
battery endurance per cycle, active use only ( $END_{\text{device,active}}$ [h])	The determined value <sup>a</sup> shall not be more than 0,5 hours lower than the declared value.
battery endurance in cycles – default settings [cycles]	The determined value <sup>a</sup> shall not be more than 20 cycles lower than the declared value.
rated battery capacity ( $C_{\text{rated}}$ [mAh])	The determined value <sup>a</sup> shall not be more than 10 % higher than the declared value.

<sup>a</sup> in the case of three additional units tested as prescribed in the third paragraph, point 4, the determined value means the arithmetic mean of the values determined for these three additional units.

**Table 9**  
**Pass rates for measured parameters**

Parameters	Pass rate
repeated free fall reliability	The determined value <sup>a</sup> corresponding to the declared value shall be met by at least 60 % of the tested devices.