DRAFT COMMUNIQUE ON ECODESIGN REQUIREMENTS FOR ELECTRONIC DISPLAYS (2019/2021/EU) (SGM:2021/5)

Objective

ARTICLE 1 – (1) The purpose of this Communique is to establish ecodesign requirements for the placing on the market and putting into service of electronic displays, including televisions, monitors and digital signage displays related to the implementation of the Regulation on the Ecodesign of Energy-Related Products (2009/125/EC) published in the Official Gazette numbered dated 07/10/2010 and No. 27722.

Scope

ARTICLE 2 – (1) This Communique shall apply to electronic displays, including televisions, monitors and digital signage displays

(2) This Communique shall not apply to the following electronic displays:

a) any electronic display with a screen area smaller than or equal to 100 square centimetres,

b) projectors,

c) all-in-one video conference systems,

ç) medical displays,

d) virtual reality headsets,

e) The products specified in the 6th paragraph of Article 2 of the Regulation on the Control of Waste Electrical and Electronic Equipment published in the Official Gazette dated 22/05/2012 and numbered 28300, large and fixed industrial tools specified in Annex-1/A of the same Regulation and the implantation products specified in Annex- 1/B and the screens that are in infectious contact and the products listed below, integrated displays or the displays attached to these products,

1) Equipment designed to be sent to space,

2) Large-scale stationary facilities, excluding any equipment not specially designed and installed as part of these facilities,

3) Person or goods transportation vehicles, except electric two-wheeled vehicles that are not type-approved,

4) Off-road moving vehicles for professional use only,

5) Specially designed device for research and development offered only on an inter-business basis.

f) displays that are components or subassemblies of products covered by implementing measures adopted under Regulation on the Ecodesign of Energy-Related Products (2009/125/EC) published in the Official Gazette numbered dated 07/10/2010 and No. 27722.

(3) The requirements in points A and B of Annex II shall not apply to the following displays:

a) broadcast displays,

b) professional displays,

c) security displays,

ç) digital interactive whiteboards,

d) digital photo frames,

e) digital signage displays.

(4) The requirements in points A, B and C of Annex II shall not apply to the following displays:

a) status displays,

b) control panels.

Legal Basis

ARTICLE 3 – (1) This Communique has been prepared on the basis of the Law No. 4703 of 29/6/2001 on the Preparation and Implementation of Technical Legislation on Products and Presidential Decree No. 1 on the Presidency Organization published in the Official Gazette No. 30474 dated 10/7/2018.

Compliance with the European Union Legislation

ARTICLE 4 – (1) This Communique has been prepared based on Commission Regulation 2019/2021/EU, laying down ecodesign requirements of electronic displays published in accordance with the Directive 2009/125/EC of the European Parliament and Council, amending Commission Regulation No 1275/2008/EC, repealing Commission Regulation No 642/2009/EC, in the framework of alignment with the legislation of European Union.

Definitions

ARTICLE 5 – (1) For the purpose of this Regulation the following definitions shall apply:

a) 'EU' means European Union,

b) 'digital interactive whiteboard' means an electronic display which allows direct user interaction with the displayed image. The digital interactive whiteboard is designed primarily to provide presentations, lessons or remote collaboration, including the transmission of audio and video signals. Its specification shall include all of the following features:,

1) primarily designed to be installed hanging, mounted on a ground stand, set on a shelf or desk or fixed to a physical structure for viewing by multiple people;,

2) to be necessarily used with computer software with specific functionalities to manage content and interaction;

3) integrated or designed to be specifically used with a computer for running the software in point (2);

4) user interaction by finger or pen touch or other means such as hand, arm gesture or voice;

c) ‘tuner/receiver’ means an electronic circuit that detects television broadcast signal, such as terrestrial digital or satellite, but not internet unicast, and facilitates the selection of a TV channel from a group of broadcast channels;

ç) ‘Ministry’ means Ministry of Industry and Technology;

d) ‘digital signage display’ means an electronic display that is designed primarily to be viewed by multiple people in non-desktop based and non domestic environments. Its specifications shall include all of the following features:

1) unique identifier to enable addressing a specific display screen;

2) a function disabling unauthorised access to the display settings and displayed image;

3) network connection (encompassing a hard-wired or wireless interface) for controlling, monitoring or receiving the information to display from remote unicast or multicast but not broadcast sources;

4) designed to be installed hanging, mounted or fixed to a physical structure for viewing by multiple people and not placed on the market with a ground stand;

5) does not integrate a tuner to display broadcast signals;

e) ‘status display’ means a display used to show simple but changing information such as selected channel, time or power consumption. A simple light indicator is not considered a status display;

f) ‘electronic display’ means a display screen and associated electronics that, as its primary function, displays visual information from wired or wireless sources;

g) ‘screen area’ means the viewable area of the electronic display calculated by multiplying the maximum viewable image width by the maximum viewable image height along the surface of the panel (both flat or curved);

ğ) ‘security display’ means an electronic display whose specification shall include all of the following features:

1) self-monitoring function capable of communicating at least one of the following information to a remote server:

(a) power status;

(b) internal temperature from anti-overload thermal sensing;

(c) video source;

(ç) audio source and audio status (volume/mute);

(d) model and firmware version;

2) user-specified specialist form factor facilitating the installation of the display into professional housings or consoles;

h) ‘all-in-one video conference system’ means a dedicated system designed for video conferencing and collaboration, integrated within a single enclosure, whose specification shall include all of the following features:

1) support for specific videoconference protocol ITU-T H.323 or IETF SIP as delivered by the manufacturer;

2) camera(s), display and processing capabilities for two-way real-time video including packet loss resilience;

3) loudspeaker and audio processing capabilities for two-way real-time hands-free audio including echo cancellation;

4) an encryption function;

5) high network availability (HiNA).

ı) ‘control panel’ means an electronic display whose main function is to display images associated with product operational status; it may provide user interaction by touch or other means to control the product operation. It may be integrated into products or specifically designed and marketed to be used exclusively with the product;

i) ‘professional display’ means an electronic display designed and marketed for professional use for editing video and graphic images. Its specification shall include all of the following features:

1) a contrast ratio of at least 1000:1 measured at a perpendicular to the vertical plane of the screen and at least 60:1 measured at a horizontal viewing angle of at least 85° relative to that perpendicular and at least 83° from the perpendicular on a curved screen, with or without a screen cover glass;

2) a native resolution of at least 2,3 mega pixels;

2) colour Gamut support is 38,4 % of CIE LUV or greater (equivalent to greater than 99 % of Adobe RGB and over 100 % of sRGB colour space). Shifts in colour space are allowable as long as the resultant colour space is at least 38,4 % of CIE LUV. Colour and luminance uniformity shall be as required for grade 1 monitors;

j) ‘monitor’ or ‘computer monitor’ or ‘computer display’ means an electronic display intended for one person for close viewing such as in a desk-based environment;

k) ‘projector’ means an optical device for processing analogue or digital video image information, in any format, to modulate a light source and project the resulting image onto an external surface;

l) ‘Virtual reality headset’ means a head-weareable device that provides immersive virtual reality for the wearer by displaying stereoscopic images for each eye with head motion tracking functions.

m) ‘digital photo frame’ means an electronic display that displays exclusively still visual information;

n) ‘grade-1 monitor’ means a monitor for high-level technical quality evaluation of images at key points in a production or broadcast workflow, such as image capture, post-production, transmission and storage;

o) ‘television’ means an electronic display designed primarily for the display and reception of audiovisual signals and which consists of an electronic display and one or more tuners/receivers;

ö) ‘medical display’ means an electronic display covered by the scope of:

1) Medical Device Regulation published in the Official Gazette dated 07/06/2011 and numbered 27957,

2) Regulation of Active Medical Devices that can be Placed on the Body published in the Official Gazette dated 07/06/2011 and numbered 27957,

3) Regulation on Medical Diagnostic Devices Used Outside the Body (In Vitro) published in the Official Gazette dated 09/01/2007 and numbered 26398;

p) 'integrated', referring to a display which is part of another product as a functional component, means an electronic display that is not able to be operated independently from the product and that depends on it for providing its functions, including power;

r) 'broadcast display' means an electronic display designed and marketed for professional use by broadcasters and video production houses for video content creation. Its specifications shall include all of the following characteristics:

1) colour calibration function;

2) input signal analysis function for input signal monitoring and error detection, such as wave-form monitor/vector scope, RGB cut off, facility to check the video signal status at actual pixel resolution, interlace mode and screen marker;

3) Serial Digital Interface (SDI) or Video over internet Protocol (VoIP) integrated with the product;

4) not intended for use in public areas;

s) 'HiNA' means High Network Availability as defined in Article 4 paragraph (ıı) of Communique on Ecodesign Requirements for Standby and Off-Mode, and Networked Standby, Electric Power Consumption of Electrical and Electronic Household and Office Equipment (1275/2008/EC) (SGM:2021/13) dated …/…/… and numbered ….

(2) For the purposes of the Annexes, additional definitions are set out in Annex I.

Ecodesign Requirements

ARTICLE 6 – (1) The ecodesign requirements set out in Annex II shall apply from the dates indicated therein.

Conformity Assessment

ARTICLE 7 – (1) The conformity assessment procedure referred to in Article 10 of Regulation on the Ecodesign of Energy-Related Products (2009/125/EC) published in the Official Gazette dated 07/10/2010 and No. 27722 shall be the internal design control system set out in Annex IV to that Directive or the management system set out in Annex V to that Directive.

(2) For the purposes of conformity assessment pursuant to Article 10 of Regulation on the Ecodesign of Energy-Related Products (2009/125/EC) published in the Official Gazette dated 07/10/2010 and No. 27722, the technical documentation shall contain the reason why certain, if any, plastic parts are not marked as per the exemption set out in point D(2) of Annex II, and the details and results of the calculations set out in Annex III to this Communique.

(3) Where the information included in the technical documentation for a particular model has been obtained using either or both of the methods listed below, the technical documentation shall include the details of such calculation, the assessment undertaken by the manufacturer to verify the accuracy of the calculation and, where appropriate, the declaration of identity between the models of different manufacturers. The technical documentation shall include a list of all equivalent models, including the model identifiers.

a) from a model that has the same technical characteristics relevant for the technical information to be provided but is produced by a different manufacturer, or

b) by calculation on the basis of design or extrapolation from another model of the same or a different manufacturer, or both.

(4) The technical documentation shall include the information in the order and as set out in Annex VI of the Communique on the Energy Labeling of Electronic Displays (SGM:2021/6).

(5) For market surveillance purposes, for products in product database, manufacturers, importers or authorised representatives may, without prejudice to Annex IV, point 3(f) of Regulation on the Ecodesign of Energy-Related Products (2009/125/EC) published in the Official Gazette numbered dated 07/10/2010 and No. 27722, refer to the technical documentation uploaded to the product database or on their own website which contains the same information laid down in Communique on the Energy Labeling of Electronic Displays (2019/2013/EU) (SGM:2021/6).

Verification Procedure for Market Surveillance Purposes

ARTICLE 8 – (1) The Ministry shall apply the verification procedure set out in Annex IV to this Communique when performing the market surveillance checks referred to in Article 6 point 2 of Regulation on the Ecodesign of Energy-Related Products (2009/125/EC) published in the Official Gazette dated 07/10/2010 and No. 27722.

Circumvention and Software Updates

ARTICLE 9– (1) The manufacturer or importer or authorised representative shall not place on the market products designed to be able to detect they are being tested (e.g. by recognising the test conditions or test cycle) and to react specifically by automatically altering their performance during the test with the aim of reaching a more favourable level, for any of the parameters declared by the manufacturer, importer or authorised representative, in the technical documentation or included in any of the documentation provided.

(2) The energy consumption of the product and any of the other declared parameters shall not deteriorate after a software or firmware update when measured with the same test standard originally used for the declaration of conformity except with explicit consent of the end-user prior to the update. No performance change shall occur as result of rejecting the update..

(3) A software update shall never have the effect of changing the product's performance in a way that makes it non-compliant with the ecodesign requirements applicable for the declaration of conformity.

Indicative Benchmarks

ARTICLE 10 – (1) The indicative benchmarks for the best-performing products and technologies available on the market at the time of adopting this Communique are set out in Annex V.

Consultation Forum Transactions

ARTICLE 11 – (1) The Ministry shall participate in the meetings with respect to this Communique of the advisory board established by the European Commission in order to carry out studies on updating the scope of legislation, the appropriateness of the balance of stringency between larger and smaller products; the need to adapt regulatory requirements as result of new

technologies available, such as HDR, 3D mode, high frame rate, resolution levels above UHD-8K; the appropriateness of the allowances; the appropriateness of setting on-mode energy efficiency requirements for digital signage displays or other displays not covered in this respect; the appropriateness of setting different or additional requirements to enhance durability, to facilitate repair and reuse, including the time frame for making available spare parts, and for including a standardised external power supply; the appropriateness of setting different or additional requirements to improve dismantling at end of life and recyclability, including in relation to critical raw materials and in relation to the conveying of information to recyclers; and resource efficiency requirements for displays integrated into products covered by Regulation on the Ecodesign of Energy-Related Products (2009/125/EC) and into any other product belonging to Regulation on Control of Waste Electrical and Electronic Equipment,

Repeal

ARTICLE 12 – (1) The Communique on Energy Labeling of Televisions (SGM-2012/7) published in the Official Gazette dated 22/06/2012 and numbered 28331 has been repealed.

Entry into Force

ARTICLE 13– (1) This Communique shall enter into force on 01/03/2021.

Enforcement

ARTICLE 14 – (1) The provisions of this Communique shall be enforced by the Minister of Industry and Technology.

ANNEX - I

DEFINITIONS APPLICABLE FOR THE ANNEXES

1. For the purposes of the annexes, the following definitions shall apply:

a) ‘step’ referring to dismantling or disassembling, means an operation that finishes with a change of tool or with the removal of a component or part;

b) ‘network’ means a communication infrastructure with a topology of links and an architecture that includes the physical components, organisational principles and communication procedures and formats (protocols);

c) ‘network interface’ or ‘network port’ means a wired or wireless physical interface, providing network connection, through which functions of the electronic display can be remotely activated and data received or sent. Interfaces to input data such as video and audio signals, but not originated from a network source and not using a network address, are not considered to be a network interface;

ç) ‘networked display’ means an electronic display that can connect to a network using one of its network interfaces, if enabled;

d) ‘networked standby mode’ means a condition in which the electronic display is able to resume a function by way of a remotely initiated trigger from a network interface;

e) ‘network availability’ means the capability of an electronic display to activate functions after a remotely initiated trigger has been detected by a network interface;

f) ‘flame retardant’ or ‘fire retardant’ means a substance that markedly retards the propagation of a flame;

g) ‘Printed Circuit Board’ (PCB) means an assembly that mechanically supports and electrically connects electronic or electrical components using conductive tracks, pads and other features etched from one or more sheet layers of conductive metal laminated onto or between sheet layers of a non-conductive substrate;

ğ) ‘on mode’ or ‘active mode’ means a condition in which the electronic display is connected to a power source, has been activated and is providing one or more of its display functions;

h) ‘touch functionality’ means the possibility of inputting commands using, as input device, a touch-sensitive device, that generally is in the form of a transparent film layered on top of an electronic display panel;

ı) ‘brightest on mode configuration’ means the configuration of the electronic display, set by the manufacturer, which provides an acceptable picture with the highest measured peak white luminance;

i) ‘equivalent model’ means a model which has the same technical characteristics relevant for the technical information to be provided, but which is placed on the market or put into service by the same manufacturer, importer or authorised representative as another model with a different model identifier;

j) ‘halogenated flame retardant’ means a flame retardant that contains any halogen;

k) ‘room presence sensor’ or ‘gesture detection sensor’ or ‘occupancy sensor’ means a sensor monitoring and reacting to the movements in the space around the product whose signal can trigger the switching to on mode. Lack of movement detection for a predetermined time can be used to switch into standby mode or networked standby mode;

l) ‘External Power Supply (EPS)’ means a device as defined in the Communique on Ecodesign Requirements of External Power Supplies published in the Official Gazette dated 01/09/2020 and numbered 31231 (2019/1782/EU) (SGM: 2020 /5)

m) ‘standby mode’ means a condition where the electronic display is connected to a power source, depends on energy input from that source to work as intended and provides only the following functions, which may persist for an indefinite time:

1) reactivation function, or reactivation function and only an indication of enabled reactivation function; and/or

2) information or status display;

n) ‘homogeneous material’ means one material of uniform composition throughout or a material consisting of a combination of materials, that cannot be disjointed or separated into different materials by mechanical actions such as unscrewing, cutting, crushing, grinding and abrasive processes;

o) ‘off mode’ means a condition in which the electronic display is connected to the mains power source and is not providing any function; and conditions providing only an indication of off mode condition; and conditions providing only functionalities intended to ensure electromagnetic compatibility pursuant to Electromagnetic Compatibility Regulation (2014/30/EU);

ö) ‘luminance’ means the photometric measure of the luminous intensity per unit area of light traveling in a given direction, expressed in units of candelas per square meter (cd/m2). The term brightness is often used to ‘subjectively’ qualify the luminance of a display;

p) ‘shop configuration’ means the configuration for use specifically in the context of demonstrating the electronic display, for example in high illumination (retail) conditions and not involving an auto power-off if no user action or presence is detected. This configuration may be not accessible through a displayed menu;

r) ‘microLED display’ means an electronic display where individual pixels are lit using microscopic GaN LED technology;

s) ‘model identifier’ means the code, usually alphanumeric, which distinguishes a specific product model from other models with the same trade mark of the same manufacturer’s, importer’s or authorised representative’s name;

ş) ‘normal configuration’ means a display setting which is recommended to the end-user by the manufacturer from the initial set up menu or the factory setting that the electronic display has for the intended product use. It must deliver the optimal quality for the end user in the intended environment and for the intended use. The normal configuration is the condition in which the values for off, standby, networked standby and on mode are measured;

t) ‘organic light emitting diode (OLED)’ means a technology in which light is produced from a solid state device embodying a pn junction of organic material. A junction emits optical radiation when excited by electric current;

u) ‘Automatic Brightness Control (ABC)’ means the automatic mechanism that, when enabled, controls the brightness of an electronic display as a function of the ambient light level illuminating the front of the display;

ü) ‘disassembling’ means reversible taking apart of an assembled product into its constituent materials and/or components without functional damage that would preclude reassembling, reuse or refurbishment of the product;,

v) ‘pixel (picture element)’ means the area of the smallest element of a picture that can be distinguished from its neighbouring elements;

y) ‘dismantling’ means possibly irreversible taking apart of an assembled product into its constituent materials and/or components;

z) ‘PMMA’ means PolyMethylMethAcrylate;

aa) ‘USB’ means Universal Serial Bus;

bb) ‘product database’ means a collection of data concerning products created by European Union Commission which is arranged in a systematic manner and consists of a consumer-oriented public part, where information concerning individual product parameters is accessible by electronic means, of an online portal for accessibility and of a compliance part, with clearly specified accessibility and security requirements, as laid down in Energy Labeling Framework Regulation (2017/1369/EU) dated …. and No. …. ;

cc) ‘default’, referring to a specific feature or setting, means the value of a specific feature as set at the factory and available when the customer uses the product for the first time and after performing a ‘reset to factory settings’ action, if allowed by the product;

çç) ‘close viewing’ means a viewing distance comparable to that obtained when viewing an electronic display held in the hand or when sitting at the desk;

dd) ‘spare part’ means a separate part that can replace a part with the same function in a product;

ee) ‘reactivation function’ means a function that via a remote switch, a remote control unit, an internal sensor, a timer or, for networked displays in networked standby mode, the network, provides a switch from standby mode or networked standby mode to a mode, other than off-mode, providing additional functions;

ff) ‘professional repairer’ means an operator or undertaking which provides services of repair and professional maintenance of electronic displays;

gg) ‘forced menu’ means a specific menu, appearing upon initial start-up of the display or upon a reset to factory settings, offering a set of alternative display settings, pre-defined by the manufacturer.

ANNEX – II

ECODESIGN REQUIREMENTS

A. ENERGY EFFICIENCY REQUIREMENTS

1. ENERGY EFFICIENCY INDEX LIMITS FOR ON-MODE

a) The energy efficiency index (EEI) of an electronic display shall be calculated using the following equation:

$$EEI = \frac{(P_{measured} + 1)}{(3 \times [90 \times \tanh(0{,}02 + 0{,}004 \times (A - 11)) + 4] + 3) + corr}$$

Where:

- *A* represents the screen area in dm^2.
- $P_{measured}$, is the measured power in Watts in on mode in the normal configuration, in standard dynamic range (SDR);
- *corr* is a correction factor of 10 for OLED electronic displays that do not apply the ABC allowance in point B (1). This shall apply until 28 February 2023. corr shall be zero in all other cases.

b) The EEI of an electronic display shall not exceed the maximum EEI (EEI_{max}) according to the limits in Table 1 from the dates indicated.

Table 1
EEI limits for on-mode

	EEI_{max} for electronic displays with resolution up to 2 138 400 pixels (HD)	EEI_{max} for electronic displays with resolution above 2 138 400 pixels (HD) and up to 8 294 400 pixels (UHD-4k)	EEI_{max} for electronic displays with resolution above 8 294 400 pixels (UHD-4k) and for MicroLED displays
01/03/2021	0,90	1,10	n.a.
01/03/2023	0,75	0,90	0,90

B. ALLOWANCES AND ADJUSTMENTS FOR THE PURPOSE OF THE EEI CALCULATION AND FUNCTIONAL REQUIREMENTS

From 1 March 2021, electronic displays shall meet the requirements listed below.

1. Electronic displays with automatic brightness control (ABC)

Electronic displays qualify for a 10 % reduction in $P_{measured}$, if they meet all of the following requirements:

a) ABC is enabled in the normal configuration of the electronic display and persists in any other standard dynamic range configuration available to the end-user;

b) the value of $P_{measured}$, in the normal configuration, is measured with ABC disabled or, if ABC cannot be disabled, in an ambient light condition of 100 lux measured at the ABC sensor;

c) the value of $P_{measured}$ with ABC disabled, if applicable, shall be equal to or greater than the on mode power measured with ABC enabled in an ambient light condition of 100 lux measured at the ABC sensor;

ç) with ABC enabled, the measured value of the on mode power must decrease by 20 % or more when the ambient light condition, measured at the ABC sensor, is reduced from 100 lux to 12 lux; and

d) the ABC control of the display screen luminance meets all of the following characteristics when the ambient light condition measured at the ABC sensor changes:

- the measured screen luminance at 60 lux is between 65 % and 95 % of the screen luminance measured at 100 lux;
- the measured screen luminance at 35 lux is between 50 % and 80 % of the screen luminance measured at 100 lux; and
- the measured screen luminance at 12 lux is between 35 % and 70 % of the screen luminance measured at 100 lux.

2. Forced menu and set up menus

a) Electronic displays may be placed on the market with a forced menu on initial activation proposing alternative settings. Where a forced menu is provided, the normal configuration shall be set as default choice, otherwise the normal configuration shall be the out-of-the-box setting.

b) If the user selects a configuration other than the normal configuration and this configuration results in a higher power demand than the normal configuration, a warning message about the likely increase in energy use shall appear and confirmation of the action shall be explicitly requested.

c) If the user selects a setting other than those that are part of the normal configuration and this setting results in a higher energy consumption than the normal configuration, a warning message about the likely increase in energy consumption shall appear and confirmation of the action explicitly requested.

ç) A change by the user in a single parameter in any setting shall not trigger any change in any other energy-relevant parameter, unless unavoidable. In such a case a warning message shall appear about the change of other parameters and the confirmation of the change shall be explicitly requested.

3. Peak white luminance ratio

a) In the normal configuration, the peak white luminance of the electronic display in a 100 lux ambient light viewing environment shall not be less than 220 cd/m^2 or, if the electronic display is primarily intended for close viewing by a single user, not less than 150 cd/m^2.

b) If the electronic display's peak white luminance in the normal configuration is set to lower values, it shall not be less than 65 % of the peak white luminance of the display, in a 100 lux ambient light viewing environment in the brightest on mode configuration.

C. OFF MODE, STANDBY AND NETWORKED STANDBY MODE REQUIREMENTS

From 1 March 2021, electronic displays shall meet the requirements listed below.

1. Power demand limits other than on-mode

Electronic displays shall not exceed power demand limits in the different modes and conditions listed in Table 2:

Table 2

power demand limits other than on-mode (W)

	Off mode	Standby mode	Networked standby mode
Maximum limits	0,30	0,50	2,00
Allowances for additional functions when present and enabled			
Status display	0,0	0,20	0,20
Deactivation using room presence detection	0,0	0,50	0,50
Touch functionality, if usable for activation	0,0	1,0	1,0
HiNA function	0,0	0,0	4,00
Total maximum power demand with all additional functions when present and enabled	0,30	2,20	7,70

2. Availability of off, standby and networked standby modes

a) Electronic displays shall provide off mode or standby mode or a networked standby mode or other modes which do not exceed the applicable power demand requirements for standby mode.

b) The configuration menu, instruction manuals and other documentation, if any, shall refer to off mode, standby mode or networked standby mode using those terms.

c) Automatic switch to off mode and/or standby mode and/or another mode which does not exceed the applicable power demand requirements for standby mode shall be set as default, including for networked displays where the network interface is enabled when in on mode.

ç) Networked standby mode shall be disabled in 'normal configuration' of a networked television. The end user shall be prompted to confirm the activation of networked standby, if it is needed for a chosen remotely activated function, and must be able to disable it.

d) Networked electronic displays shall comply with the requirements for standby mode when networked standby mode is disabled.

3. Automatic standby in televisions

a) Televisions shall provide a power management function, enabled as delivered by the manufacturer that, within 4 hours following the last user interaction, shall switch the television from on mode into standby mode or networked standby mode or another mode which does not exceed the applicable power demand requirements respectively for standby or networked standby mode. Before such automatic switch, televisions shall show, for at least 20 seconds, an alert message warning the user of the impending switch, with possibility of delaying or temporarily cancelling it.

b) If the television provides a function allowing the user to shorten, extend or disable the 4-hour period for automatic mode transitions detailed in (a), a warning message shall appear about a potential increase in energy use and a confirmation of the new setting must be requested when an extension beyond the 4-hour period or disabling is selected.

c) If the television is equipped with a room presence sensor, the automatic transition from on mode into any mode as detailed in (a) applies if no presence is detected for no more than 1 hour.

ç) Televisions with various selectable input sources shall prioritise the power management protocols of the signal source selected and displayed over those default power management mechanisms described in the paragraphs (a) to (c) above.

4. Automatic standby in displays other than televisions

a) Electronic displays other than televisions, with various selectable input sources shall switch, as configured in the normal configuration, into standby mode, networked standby mode or another mode which does not exceed the applicable power demand requirements respectively for standby or networked standby mode when no input is detected by any input source for over 10 seconds and, for digital interactive whiteboards and for broadcast displays, for over 60 minutes.

b) Before triggering such a switch, a warning message shall be displayed and the switch completed within 10 minutes.

D. MATERIAL EFFICIENCY REQUIREMENTS

From 1 March 2021, electronic displays shall meet the requirements indicated below.

1. Design for dismantling, recycling and recovery

a) Manufacturers, importers or their authorised representatives shall ensure that joining, fastening or sealing techniques do not prevent the removal, using commonly available tools, of the components indicated in the Regulation on Control of Waste Batteries and Accumulators published in the Official Gazette dated 03/03/2005 and numbered 25744 or in Regulation on Control of Waste Electric Electronic Goods published in the Official Gazette dated 22/05/2012 and numbered 28300 on batteries and accumulators and waste batteries and accumulators, when present.

b) Manufacturers, importers or their authorised representatives shall, without prejudice to Regulation on Control of Waste Electric Electronic Goods published in the Official Gazette dated 22/05/2012 and numbered 28300, make available, on a free-access website, the dismantling information needed to access any of the products components referred to in that Regulation.

c) This dismantling information shall include the sequence of dismantling steps, tools or technologies needed to access the targeted components.

ç) The end of life information shall be available until at least 15 years after the placing on the market of the last unit of a product model.

2. Marking of plastic components

a) Plastic components heavier than 50 g:

(1) 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.

(2) Plastic components are exempt from marking requirements in the following circumstances:

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; and

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

(3) For the following plastic components no marking is required:

i) packaging, tape, labels and stretch wraps;

ii) wiring, cables and connectors, rubber parts and anywhere 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;

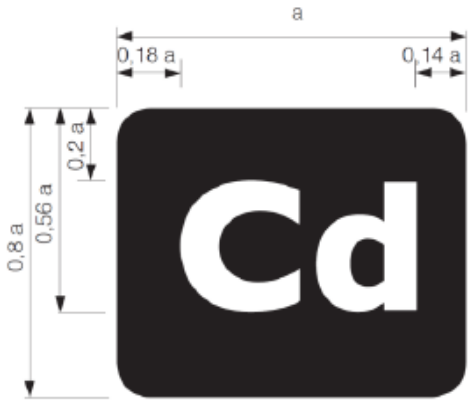
iv) transparent parts where the marking would obstruct the function of the part in question.

b) Components containing flame retardants shall additionally be marked with the abbreviated term of the polymer followed by hyphen, then the symbol 'FR' followed by the code number of the flame retardant in parentheses. The marking on the enclosure and stand components shall be clearly visible and readable.

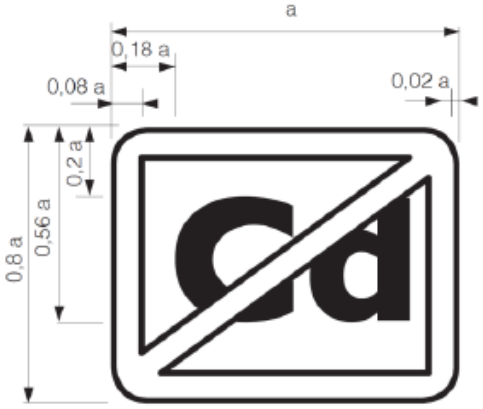
3. Cadmium logo

a) Electronic displays with a screen panel in which concentration values of Cadmium (Cd) by weight in homogeneous materials exceed 0,01 % as defined in the Regulation on Control of Waste Electrical and Electronic Equipment published in the Official Gazette dated 22/05/2012 and numbered 28300 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, shall be labelled with the 'Cadmium inside' logo. The logo shall be clearly visible durable, legible and indelible. The logo shall be in the form of the following graphic:

Cadmium inside



Cadmium free



b) The dimension of 'a' shall be greater than 9 mm and the typeface to be used is 'Gill Sans'.

c) An additional 'Cadmium inside' logo shall be firmly attached internally on the display panel or molded in a position clearly visible to workers once the external back cover bearing the external logo is removed.

ç) A 'Cadmium free' logo shall be used if concentration values of Cadmium (Cd) by weight in any homogeneous material part of the display do not exceed 0,01 % as defined within RoHS in the Regulation on Control of Waste Electrical and Electronic Equipment published in the Official Gazette dated 22/05/2012 and numbered 28300.

4. Halogenated flame retardants

a) The use of halogenated flame retardants is not allowed in the enclosure and stand of electronic displays.

5. Design for repair and reuse

a) Availability of spare parts:

(1) manufacturers, importers or authorised representatives of electronic displays shall make available to professional repairers at least the following spare parts: internal power supply, connectors to connect external equipment (cable, antenna, USB, DVD and Blue-Ray), capacitors, batteries and accumulators, DVD/Blue-Ray module if applicable and HD/SSD

module if applicable for a minimum period of seven years after placing the last unit of the model on the market;

(2) manufacturers, importers or authorised representatives of electronic displays shall make available to professional repairers and end-users at least the following spare parts: external power supply and remote control for a minimum period of seven years after placing the last unit of the model on the market;

(3) manufacturers shall ensure that these spare parts can be replaced with the use of commonly available tools and without permanent damage to the appliance;

(4) the list of spare parts concerned by point 1 and the procedure for ordering them shall be publicly available on the free access website of the manufacturer, importer or authorised representative, at the latest two years after the placing on the market of the first unit of a model and until the end of the period of availability of these spare parts; and

(5) the list of spare parts concerned by point 2 and the procedure for ordering them and the repair instructions shall be publicly available on the manufacturer's, the importer's or authorised representative's free access website, at the moment of the placing on the market of the first unit of a model and until the end of the period of availability of these spare parts.

b) Access to repair and maintenance information

(1) After a period of two years after the placing on the market of the first unit of a model or of an equivalent model, and until the end of the period mentioned under (a), the manufacturer, importer or authorised representative shall provide access to the appliance repair and maintenance information to professional repairers in the following conditions:

(2) 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, manufacturers, importers or authorised representative may require the professional repairer to demonstrate that:

i) the professional repairer has the technical competence to repair electronic displays and complies with the applicable regulations for repairers of electrical equipment. Reference to an official registration system as professional repairer, 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;

(3) the manufacturers, importers or authorised representatives shall accept or refuse the registration within 5 working days from the date of request by the professional repairer;

(4) manufacturers, importers or authorised representatives may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates. A fee is reasonable if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information.

(5) Once registered, a professional repairer shall have access to the requested repair and maintenance information within one working day after requesting it. The available repair and maintenance information shall include:

- the unequivocal appliance identification;
- a disassembly map or exploded view;
- list of necessary repair and test equipment;
- component and diagnosis information (such as minimum and maximum theoretical values for measurements);
- wiring and connection diagrams;
- diagnostic fault and error codes (including manufacturer-specific codes, where applicable); and
- data records of reported failure incidents stored on the electronic display (where applicable).

c) Maximum delivery time of spare parts

(1) during the period mentioned under point 5(a)(1) and point 5(a)(2), the manufacturer, importer or authorised representatives shall ensure the delivery of the spare parts for electronic displays within 15 working days after having received the order;

(2) in the case of spare parts available only to professional repairers, this availability may be limited to professional repairers registered in accordance with point (b).

E. INFORMATION AVAILABILITY REQUIREMENTS

From 1 March 2021, the product manufacturer, importer or authorised representative shall make available the information set out below when placing on the market the first unit of a model or of an equivalent model. The information shall be provided free of charge to third parties dealing with professional repair and reuse of electronic displays (including third party maintenance, actors, brokers and spare parts providers).

1) Availability of software and firmware updates

(a) The latest available version of the firmware shall be made available for a minimum period of eight years after the placing on the market of the last unit of a certain product model, free of charge or at a fair, transparent and non-discriminatory cost. The latest available security update to the firmware shall be made available until at least eight years after the placing on the market of the last product of a certain product model, free of charge.

(b) Information on the minimum guaranteed availability of software and firmware updates, availability of spare parts and product support shall be indicated in the product information sheet as from Annex V of Communique on Energy Labeling of Electronic Displays (2019/2013/EU) (SGM: 2021 /6).

ANNEX-III

MEASUREMENT METHODS AND CALCULATIONS

1. For the purposes of compliance and verification of compliance with the requirements of this Communique, measurements and calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the Official Journal of the European Union or other reliable, accurate and reproducible methods, which take into account the generally recognised state-of-the-art, and in line with the following provisions.

2. Measurements and calculations shall meet the technical definitions, conditions, equations and parameters set out in this Annex. Electronic displays which can operate in both 2D and 3D modes shall be tested when they operate in 2D mode.

3. An electronic display which is split into two or more physically separate units, but placed on the market in a single package, shall, for checking the conformity with the requirements of this Annex, be treated as a single electronic display. Where multiple electronic displays that can be placed on the market separately are combined in a single system, the individual electronic displays shall be treated as single displays.

4. General conditions
Measurements shall be made at an ambient temperature of 23 °C +/- 5 °C.

5. Measurements of on mode power demand:
a) Measurements of the power demand referred to in Annex II, point A (1) shall fulfil all of the following conditions:

(1) measurements of power demand ($P_{measured}$) shall be made in the normal configuration;

(2) measurements shall be made using a dynamic broadcast-content video signal representing typical broadcast content for electronic displays in standard dynamic range (SDR). The measurement shall be the average power consumed over 10 consecutive minutes;

(3) measurements shall be made after the electronic display has been in the off mode or, if an off-mode is not available, in standby mode, for a minimum of 1 hour immediately followed by a minimum of 1 hour in the on mode and shall be completed before a maximum of 3 hours in on-mode. The relevant video signal shall be displayed during the entire on mode duration. For electronic displays that are known to stabilise within 1 hour, these durations may be reduced if the resulting measurement can be shown to be within 2 % of the results that would otherwise be achieved using the durations described here;

(4) where ABC is available, measurements shall be made with it switched off. If ABC cannot be switched off, then the measurements shall be performed in an ambient light condition of 100 lux measured at the ABC sensor.

6. Measurements of peak white luminance:
a) Measurements of the peak white luminance referred to in Annex II, point B.3 shall be made:

(1) with a luminance meter, detecting that portion of the screen exhibiting a full (100 %) white image, which is part of a ‘full screen test’ pattern that does not exceed the average picture level (APL) point where any power limiting or other irregularity occurs in the electronic display luminance drive system affecting the electronic display luminance;

(2) without disturbing the luminance meter’s detection point on the electronic display whilst switching between any of the conditions referred to in Annex II, point B.3.

ANNEX – IV

VERIFICATION PROCEDURE FOR MARKET SURVEILLANCE PURPOSES

1. The verification tolerances defined in this Annex relate only to the verification of the measured parameters by the Ministry 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 these values with a view to achieving compliance or to communicate better performance by any means.

2. Where a model has been designed to be able to detect it is being tested (e.g. by recognising 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 Communique 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.

3. When verifying the compliance of a product model with the requirements laid down in this Communique pursuant to Article 5(2) of Regulation on Ecodesign of Energy Related Products (2009/125/EC) published in the Official Gazette dated 07/10/2010 and numbered 27722, for the requirements referred to in this Annex, the Ministry shall apply the procedure indicated below for the requirements referred to in Annex II.

4. General procedure

a) The Ministry shall verify one single unit of the model.

b) The model shall be considered to comply with the applicable requirements if:

(1) the values given in the technical documentation pursuant to point 2 of Annex IV to Regulation on Ecodesign of Energy Related Products (2009/125/EC) (declared values) and, where applicable, the values used to calculate these values are not more favourable for the manufacturer, importer or authorised representative than the results of the corresponding measurements carried out pursuant to paragraph (f) thereof;

(2) the declared values meet any requirements laid down in this Communique and any 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;

(3) when the Ministry tests 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 given in Table 3; and

(4) when the Ministry checks the unit of the model, it complies with the functional requirements and the requirements on repair and end-of-life aspects.

4.1. Verification procedure for requirements established in Annex II, point B.1

The model shall be considered to comply with the applicable requirements if:.

a) the ABC of the product is enabled by default and persists in all SDR modes, except in the shop configuration;

b) the measured on mode power of the product decreases by 20 % or more when the ambient light condition measured at the ABC sensor is reduced from 100 lux to 12 lux;

c) the ABC control of display luminance meets the requirements of Annex II, point B.1(d).

4.2. Verification procedure for requirements established in Annex II, point B.2

The model shall be considered to comply with the applicable requirements if:

a) the normal configuration is provided as the default choice on initial activation of the electronic display; and

b) if the user selects a mode other than normal configuration, a second selection process is prompted to confirm the choice.

4.3. Verification procedure for requirements established in Annex II, point B.3

The model shall be considered to comply with the applicable requirements if:

The determined value of the peak white luminance or, if applicable, the peak white luminance ratio, meets the value required in point B.3.

4.4. Verification procedure for requirements established in Annex II, point C.1

The model shall be considered to comply with the applicable requirements if, when connected to the power source:

(a) the off mode and/or standby mode and/or another mode which does not exceed the applicable power demand requirements for off mode and/or standby mode, is set as default;

(b) if the unit provides networked standby mode with HiNA, the unit does not exceed the applicable power demand requirements for HiNA when networked standby is enabled; and

(c) if the unit provides networked standby mode without HiNA, the unit does not exceed the applicable power demand requirements without HiNA when networked standby is enabled.

4.5. Verification procedure for requirements established in Annex II, point C.2

The model shall be considered to comply with the applicable requirements if:

a) the unit provides off mode and/or standby mode, and/or another mode which does not exceed the applicable power demand requirements for off mode and/or standby mode, when the electronic display is connected to the power source; and

b) the activation of the network availability requires the end-user’s intervention; and

c) the network availability can be disabled by the end-user; and

ç) it complies with the requirements for standby mode when networked standby mode is not enabled.

4.6. Verification procedure for requirements established in Annex II, point C.3

The model shall be considered to comply with the applicable requirements if:

a) within 4 hours in on mode following the last user interaction or within 1 hour if a room presence sensor is enabled and no movement is detected, the television automatically switches from on mode to standby mode or off mode or networked standby mode, if enabled, or another mode which does not exceed the applicable power demand requirements for standby mode. The Ministry shall use the applicable procedure to measure the power demand after the automatic power down functionality switches the television into the applicable power mode; and

b) the function is set as default; and

c) in on mode, the television shows an alert message before automatically switching from on mode to the applicable mode; and

ç) if the television provides a function allowing the user to modify the 4-hour period for automatic mode transitions detailed in (a), a warning message is prompted about a potential increase in energy use and a confirmation of the new setting is requested when an extension beyond the 4-hour period or disabling is selected; and

d) if the television is equipped with a room presence sensor, the automatic transition from on mode into any mode as detailed in (a) applies if no presence is detected for no more than 1 hour; and

e) in televisions with various selectable input sources the power management protocols of the signal source selected is prioritised over those default power management mechanisms described in (a) above.

4.7. Verification procedure for requirements established in Annex II, point C.4

The model shall be tested for each end user selectable signal input interface type which has specified that it can carry power management control signals or data. Where there are two or more identical signal interfaces not labelled for a specific host product type (e.g. HDMI-1, HDMI-2, etc.) it is sufficient to test one of these signal interfaces selected at random. Where there are labelled or menu designated signal interfaces (e.g. computer, set top box or analogous) the appropriate host signal source device should be connected to the designated signal interface for the test. The model shall be considered to comply with the applicable requirement if no signal by any input source is detected and the model switches into standby mode, off mode or networked standby mode.

4.8. Verification procedure for requirements established in Annex II, point D and E

The model shall be considered to comply with the applicable requirements if when the Ministry checks the unit of the model, it complies with the requirements on resource efficiency in Annex II, points D and E.

5. Procedure if requirements are not achieved

a) If the results referred to in points 4(b)(3) and 4(b)(4) of this Annex related to requirements not involving measured values are not achieved, the model and all equivalent models shall be considered not to comply with this Communique.

b) If the results referred to in points 4(b)(3) and 4(b)(4) of this Annex related to requirements involving measured values are not achieved, the Ministry shall select three additional units of the same model or equivalent models for testing. The model shall be considered to comply with the applicable requirements if, for these three units, the arithmetical mean of the determined values complies with the respective verification tolerances given in Table 3. Otherwise the model and all equivalent models shall be considered not to comply.

c) The Ministry shall provide all relevant information to the authorities of the Member States and to the Commission without delay after the decision is taken on the non-compliance of the model.

ç) The Ministry shall use the measurement and calculation methods set out in Annex III and only use the procedure described in points 4 and 5 for the requirements referred to in this Annex.

6. Verification tolerances

a) The Ministry shall only apply the verification tolerances that are set out in Table 3. No other tolerances, such as those set out in harmonised standards or in any other measurement method, shall be applied.

b) The verification tolerances defined in this Annex relate only to the verification of the measured parameters by the Ministry and shall not be used by the manufacturer as an allowed tolerance on the values in the technical documentation to achieve compliance with the requirements. Declared values shall not be more favourable for the manufacturer than the values reported in the technical documentation.

Table 3

Verification tolerances

Parameter	Verification tolerances
On mode power demand, ($P_{measured}$, Watts) excluding allowances and adjustments in Annex II, point B, for the purposes of EEI calculation set out in Annex II, point A.	The determined value* shall not exceed the declared value by more than 7 %
Off mode, standby mode and networked standby mode power demand (Watts), as applicable	The determined value* shall not exceed the declared value by more than 0,10 Watt if the declared value is 1,00 W or less, or by more than 10 % if the declared value is more than 1,00 W
Peak white luminance ratio	Where applicable, the determined value* shall not be lower than 60 % of the peak white luminance of the brightest on mode configuration provided by the electronic display
Peak white luminance (cd/m^2)	The determined value* shall not be lower than the declared value by more than 8 %
Visible screen diagonal in centimetres (and inches, if declared)	The determined value* shall not be lower than the declared value by more than 1 cm (or 0,4 inches).
Screen area in dm^2	The determined value* shall not be lower than the declared value by more than $0,1 dm^2$.
Timed functions as set out in Annex II, points C.3 and C.4	The switch shall be completed within 5 seconds of the set out values
Weight of plastic components as qualified in Annex II, point D	The determined value* shall not be different from the declared value by more than 5 grams

* In the case of three additional units tested as prescribed in Annex IV point 5(a), the determined value means the arithmetic mean of the values determined for these three additional units.

ANNEX – V

BENCHMARKS

1. The best available technology on the market, at the time of entry into force of this Communique, for the environmental aspects that were considered significant and are quantifiable is indicated below.

2. The following indicative benchmarks are identified for the purpose of part 3, point 2 of Annex I to Regulation on the Ecodesign of Energy Related Products published in the Official Gazette dated 07/10/2010 and numbered 27722 (2009/125/EC). They refer to the best available technology at the time of drafting this Communique for electronic displays on the market.

Diagonal of screen area		HD	UHD
(cm)	(inches)	Watt	Watt
55,9	22	15	
81,3	32	25	
108,0	43	33	47
123,2	49	43	57
152,4	60	62	67
165,1	65	56	71
Other functioning modes:			
Off mode (physical switch):		0,0 W	
Off mode (no physical switch):		0,1 W	
Standby		0,2 W	
Networked standby (non-HiNA):		0,9 W	