

## *Possible requirements for electronic displays*

COMMISSION REGULATION (EU) No .../2015

of **XXX**

**implementing Directive 2009/125/EC of the European Parliament and of the Council  
with regard to ecodesign requirements for electronic displays**

**and  
repealing Regulation 642/2009 with regard to ecodesign requirements for televisions**

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products<sup>1</sup>, and in particular Article 15(1) thereof,

After consulting the Ecodesign Consultation Forum referred to in Article 18 of Directive 2009/125/EC,

Whereas:

- (1) Under Directive 2009/125/EC ecodesign requirements are to be laid down by the Commission for energy-related products that represent significant volumes of sales and trade, having a significant environmental impact and presenting significant potential for improvement in terms of their environmental impact without entailing excessive costs.
- (2) Article 16(2)(a) of Directive 2009/125/EC provides that the Commission, in accordance with the procedure referred to in Article 19(3) and the criteria set out in Article 15(2), and after consulting the Consultation Forum, has to introduce, as appropriate, implementing measures for consumer electronics.
- (3) The ecodesign requirements for televisions were laid down in Regulation 642/2009/EC implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for televisions<sup>2</sup>.
- (4) Regulation 801/2013 has amended regulation 642/2009 to include additional requirements on networked standby power consumption.

---

<sup>1</sup> OJ L 285, 31.10.2009, p. 10.

<sup>2</sup> OJ L 191, 23.07.2009, p. 42

- (5) Regulation 642/2009/EC was to be reviewed no later than three years after its entry into force.
- (6) The Commission has reviewed Regulation 642/2009/EC in the light of technological progress. The review study has analysed technical, environmental and economic aspects of televisions and other electronic displays, including computer displays and digital photo frames. The results of the study have been presented to the Consultation Forum established by Article 18 of Directive 2009/125/EC.
- (7) The study has concluded that there was a need for the introduction of a new set of ecodesign energy-related requirements for televisions. The study also showed that the same set of requirements should also apply to computer displays because of the rapidly increasing functionality overlap between this product group and the television product group. Furthermore the study concluded that the Regulation should apply to the other display product groups available on the market where the primary function is to display visual information and that are neither televisions nor computer displays, e.g. digital photo frames. Consequently, the defined product scope of the Regulation in all energy and non-energy requirements comprises electronic displays that are primarily intended for use in a household and/or in an office, including televisions, computer displays and digital photo frames. Where specified, other defined display product groups will be in scope for the non-energy requirements of the regulation
- (8) An electronic display may have 2D and 3D modes and may employ, but is not restricted to, one of the following display technologies: Organic Light Emitting Diode (OLED), Liquid Crystal Display with a Light Emitting Diode back-light (LCD-LED), Liquid Crystal Display with a Cold Cathode Fluorescent Lamp back-light (LCD-CCFL), Light Emitting Diode (LED), Quantum dot LED (QLED), Plasma Display Panel (PDP), Cathode Ray Tube (CRT), Field Emission Display (FED), Vacuum Fluorescent Display (VFD), Surface-conduction Electron-emitter Display (SED), Electro-Luminescence Display (ELD) and various gas discharge displays.
- (9) Electronic displays associated with battery powered devices designed for mobility (products generically termed mobile computing and communications devices) and primarily powered by an internal battery, are normally designed to optimise energy efficiency to meet user requirements of long battery lifetime with, smaller or lighter and cheaper batteries. Furthermore the recyclability and specialist material recovery parameters of the display part of these products, in practice, need to be considered in the context of the entire device. Consequently these products shall be exempted from all requirements of this regulation, except from resource-efficiency requirements.
- (10) Displays in integrated desktop computers are not covered by Regulation (EU) 617/2013 on computers<sup>3</sup>, but because of the difficulty of isolating their energy use, and in view of a revision of the computers Regulation, shall be exempted from all requirements of this regulation, except from resource-efficiency requirements.
- (11) Digital signage displays, projectors, smart boards and displays in game consoles should be exempted from all requirements of the Regulation because they belong to product groups that are subject to other regulatory work.
- (12) Medical imaging displays, broadcast displays, enhanced performance displays, security displays and status displays have distinct characteristics and should therefore be exempted from the scope of this Regulation, except from resource-efficiency requirements.

---

<sup>3</sup> Regulation (EU) 617/2013 of 26 June 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for computers and computer servers; OJ L 175, 26.06.2013, p.13.

- (13) Displays integrated in medical equipment, displays integrated in industrial or laboratory equipment and displays integrated in all-in-one video conference systems have distinct characteristics and uses and should therefore be exempted from the scope of this Regulation.
- (14) OLED and QLED displays are a relatively new, maturing technology but with high potential for further improvement in terms of energy efficiency and should be exempted from the on-mode power demand requirements specified in Tier I of the Regulation. However, these displays should be subject to all other requirements laid down in the Regulation.
- (15) PDP displays are a mature technology with a below average energy efficiency and a manufacturing base that is diminishing rapidly. In order to facilitate a reasonable final period for the termination of their market distribution they should be exempted from the on-mode power demand requirements specified in Tier I of the Regulation. However, these displays should be subject to all other requirements laid down in the Regulation.
- (16) As the Regulation lays down specific requirements for standby and off mode electric power demand of electronic displays, the requirements of Commission Regulation (EC) No 1275/2008 of 17 December 2008 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power demand of electrical and electronic household and office equipment<sup>4</sup> should not apply to electronic displays covered by the scope of this Regulation and Regulation (EC) No 1275/2008 should be amended accordingly.
- (17) Specific requirements for televisions regarding standby, including networked standby and off mode have been set by the Commission Regulation 801/2013, amending Regulation 1275/2008 and Regulation 642/2009. These do not apply to electronic displays covered by the scope of this Regulation and Regulation (EC) No 801/2013 needs to be amended accordingly.
- (18) The provisions of Commission Regulation (EC) No 278/2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for no-load condition electric power demand and average active efficiency of external power supplies<sup>5</sup> should apply to external power supplies that are placed on the market with electronic displays. For those displays with a standard or non-standard, DC power source input interface and that are placed on the market without an external AC to DC power supply, a correction to the declared measured DC on-mode power is needed to allow for energy loss in AC to DC conversion.
- (19) Considering the European policy on raw materials<sup>6</sup>, it is recognised that the industry of electronic displays is one of the major utilizer of indium, which has been identified as critical within the European raw material initiative<sup>7</sup>. Although the recovery of indium from waste displays is not yet fully established, there is a need to avoid this

---

<sup>4</sup> OJ L 339, 18.12.2008, p. 45

<sup>5</sup> OJ L 93, 7.4.2009, p.3

<sup>6</sup> Commission Communication on "Tackling the challenges in commodity markets and on raw materials", COM(2011) 25 final, 2.2.2011, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0025:FIN:EN:PDF>

<sup>7</sup> Commission Communication "On the review of the list of critical raw materials for the EU and the implementation of the Raw Materials Initiative", COM(2014) 297 final, 26.5.2014, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0297&from=EN>

resource from being sent to landfill, in line with the objectives of waste policies<sup>8</sup>. It is recognised that the electronic displays industry has voluntarily agreed to make available information on the average material composition of the displays, to support the development of recycling technologies. This information should be submitted to a centralised database organised by Industry to consolidate the indium volumes by display technology type, and provide access or reporting to recyclers or their representative organizations.

- (20) Furthermore, given the importance of material efficiency, the Regulation lays down requirements on non-energy related aspects, including extraction of key components, marking of plastic parts, minimum recyclability index for certain plastic parts and mercury free logo. These requirements should apply in addition to the requirements of Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, and Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE).
- (21) The ecodesign requirements should not have any significant negative impact on functionality of the product on its affordability, on life cycle costs or on industry's competitiveness. Furthermore, the requirements should not impose on manufacturers' proprietary technology or excessive administrative burden, nor should they negatively affect health, safety and the environment.
- (22) Improvements in the ecodesign requirements of electronic displays should be achieved by applying existing non-proprietary, cost-effective technologies that can reduce the total combined costs of purchasing, operating and disposing them at end of life.
- (23) The ecodesign requirements should be introduced gradually in order to provide sufficient timeframe for manufacturers to redesign products that are subject to this Regulation. The timing should be such as to avoid negative impacts on the functionalities of equipment already on the market, and to take into account cost impact for end-users and manufacturers, in particular small and medium-sized enterprises, while ensuring timely achievement of the objectives of the Regulation.
- (24) A review of this Regulation is foreseen no later than four years after its entry into force.
- (25) Measurements of the relevant product parameters should be performed through reliable, accurate and reproducible measurement methods, which take into account the recognised state of the art measurement methods including, where available, harmonised standards adopted by the European standardisation organisations, as listed in Annex I to Regulation (EU) 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation<sup>9</sup>.
- (26) In conformity with Article 8 of Directive 2009/125/EC, this Regulation should specify the applicable conformity assessment procedures.
- (27) In order to facilitate compliance checks, manufacturers should provide information in the technical documentation referred to in Annexes IV and V to Directive 2009/125/EC insofar as this information relates to the requirements laid down in this Regulation.

---

<sup>8</sup> Commission Communication "Towards a circular economy: A zero waste programme for Europe", COM(2014) 398 final, 2.7.2014, [http://eur-lex.europa.eu/resource.html?uri=cellar:50edd1fd-01ec-11e4-831f-01aa75ed71a1.0001.01/DOC\\_1&format=PDF](http://eur-lex.europa.eu/resource.html?uri=cellar:50edd1fd-01ec-11e4-831f-01aa75ed71a1.0001.01/DOC_1&format=PDF)

<sup>9</sup> OJ L 316, 14.11.2012, p. 12.

- (28) Benchmarks for currently available products with high energy efficiency should be identified. This will help to ensure the wide availability and easy accessibility of information, in particular for small and medium-sized enterprises, which will further facilitate the integration of best design technologies and the development of more efficient products for reducing energy consumption.
- (29) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 19(1) of Directive 2009/125/EC,

HAS ADOPTED THIS REGULATION:

*Article 1*  
***Subject matter and scope***

- (1) This Regulation establishes ecodesign requirements for the placing on the market of electronic displays, including but not limited to:
- (a) televisions, including hospitality televisions
  - (b) computer displays;
  - (c) digital photo frames.
- (2) Points from 1 to 5 of Annex II shall not apply to:
- (a) status displays;
  - (b) enhanced performance displays;
  - (c) broadcast displays;
  - (d) security displays
  - (e) medical imaging displays.
- (3) This Regulation shall not apply to the following products:
- (a) digital signage displays,
  - (b) projectors,
  - (c) smart boards
  - (d) all-in-one videoconference systems
  - (e) displays integrated into medical equipment,
  - (f) any display integrated into battery-powered products designed for mobility and primarily powered by an internal battery
  - (g) any display integrated into industrial machinery measurement or laboratory equipment or specific equipment not targeted to the consumer market.

*Article 2*  
***Definitions***

The following definitions shall apply for the purpose of this Regulation:

1. ‘*Electronic display*’ means an electronic product with a display screen and associated electronics, that is primarily intended for use in a household and/or in an office, that

as its primary function displays visual information and that is, as delivered to the user to be connected to an AC mains power source, or a standardised DC power source (e.g. USB) for its intended use, either directly or via an external power supply. The term '*monitor*', used in some cases, is considered as equivalent to '*display*' in respect to the provisions part of the present Regulation;

Electronic displays are devices capable of displaying dynamic visual information from wired or wireless sources including but not limited to:

- (i) broadcast and similar services for terrestrial, cable, satellite, and/or broadband transmission of digital signals;
- (ii) display-specific connections such as, but not limited to, VGA, DVI, HDMI, DisplayPort;
- (iii) non display-specific connections such as, but not limited to, Thunderbolt, USB;
- (iv) media storage devices such as USB flash drive, memory card, or a DVD/Blu-ray Disc,
- (v) network connections, usually using Internet Protocol, typically carried over Ethernet or WiFi, including wireless digital streams such as AirPlay, DIAL, WirelessHD, WiDi.

Electronic displays include, but are not limited to, the following products:

- (a) '*Television*' means an electronic display that is manufactured with an internal television tuner and primarily conceived to display television images;
- (b) '*Computer display*' means an electronic display that is primarily conceived to display a computer's user interface and as result of running programs, allowing the user to interact with the computer, using a keyboard and mouse, via a touch-sensitive interface and/or via gesture or movement detectors;
- (c) '*Digital photo frame*' means an electronic display, that is primarily conceived to display still or dynamic visual information primarily without user interaction. It may also have features, such as, but not restricted to, a programmable timer, occupancy and/or luminance sensor, and connectivity for, audio, video and data through direct or wireless interfaces.

2. '*Battery-powered devices designed for mobility*' means any electronic display device with an integrated electronic display that can regularly function using any feature and any application it is designed for, using exclusively the power supplied by an internal battery. The battery may be easily removable or not removable without specific tools and may be rechargeable via connection to an external power source, and/or an internal energy source such as an integrated photovoltaic system. Battery powered devices include but are not limited to a device such as the following: notebook computer as defined in article 2(7) of Regulation (EC) No 617/2013, a *mobile workstation* as defined in article 2(10) of Regulation (EC) No 617/2013, a *Telephone*, a *Smartphone*, an *Electronic-book (e-book) reader*, a *Notepad*, a *Personal Digital Assistant*, and a *handheld game console*

3. '*Digital signage display*' (also known as 'public display') means an electronic display with a diagonal display screen size greater than 27 inches. It shall be marketed for digital signage in public or private areas, such as, but not restricted to,

retail or department stores, restaurants, museums, conference and meeting centres, fairs, train or metro stations, airports, school campuses or healthcare organisation for simultaneous viewing by one or more users and is not configured or supplied as a free-standing device for desktop use. Its specification shall include all of the following definitive features:

- (a) a scaling function for multiple display / split screen (e.g. 'video walls');
- (b) specific ID to address the selected display screen uniquely (even in a display group of 25 or more units);
- (c) remote control disabling function;
- (d) vertical and portrait physical orientation of the display screen;
- (e) designed for continuous use ('24x7');
- (f) designed to be installed, hanging from horizontal surfaces, attached to vertical surfaces or mounted on a floor stand.

The following characterising features can be present in addition to but not instead of the definitive features:

- i. high brightness level (e.g. 3000 cdl/m<sup>2</sup>);
  - ii. LAN connection for controlling, monitoring or to receive the information to display.
  - iii. boosted cooling;
  - iv. HD-SDI signal interface capability;
  - v. a power-on delay function to reduce power peaks in large installations;
  - vi. control button lock and
    - i. self-monitoring function (e.g. product internal temperature).
4. 'Smart board' or digital white board' means an electronic display with "touch-technology" capability allowing direct viewer interaction with the displayed image by touching the display surface. A whiteboard display includes the following features:
- a) designed to be installed hanging, on a wall, or mounted on a floor-stand with a portrait or landscape physical orientation of the display screen;
  - b) integrated computer and computer software with specific functionalities to manage, content in windows and interaction.
5. 'Hospitality Television' means a television, typically used in hotel rooms, which includes the following features:
- a) Control ports for bi-directional communication (DB-9, RJ11, RJ12, RJ45, coaxial cable, or HDMI-CEC);
  - b) Integrated or integratable software and/or hardware solutions for hospitality offering management and maintenance of guest room display content such as Slide Show, Video-On-Demand (VOD), decoded MPEG-4 from satellite signal or hospitality-specific applications
  - c) Auto Sensing inputs

- d) Gateway Network Appliance (GNA) for remote web based programmability and setup
  - e) Integrated b-LAN™ communication with PPV support
6. ‘*Medical imaging displays and displays integrated in medical devices*’ means electronic displays and other products covered by the scope of:
- (a) the Council Directive 93/42/EEC of 14 June 1993 concerning medical devices<sup>10</sup>, or
  - (b) the Council Directive of 20 June 1990 on the approximation of the laws of the Member States relating to active implantable medical devices 90/385/EEC<sup>11</sup>, or
  - (c) the Directive 98/79/EC of the European Parliament and of the Council of 27 October 1998 on in vitro diagnostic medical devices<sup>12</sup> and
  - (d) any amendment or modification of the above mentioned legislation.
7. ‘*Broadcast display*’ means an electronic display that is designed and marketed for professional use by broadcasters and video production houses for video content creation. Its specification shall include all of the following definitive features:
- (a) colour calibration (as required in TV production);
  - (b) screen marker (for image focusing);
  - (c) remote control by wired connection interface (typically BNC) with analogue or digital control signal protocols.
- The following characterising features can be present in addition to but not instead of the definitive features:
- (e) a simultaneous mix of parallel input signals (e.g., different image signals);
  - (f) a wave-form monitor function;
  - (g) an RGB cut-off mode;
  - (h) HD-SDI signal interfaces;
  - (i) a tally lamp (indication of system selection and operation); and
  - (j) a horizontal image shift;
8. ‘*Enhanced performance display*’ means a professional computer display whose specifications shall include all of the following functions and features:
- (a) A contrast ratio of 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  $\pm 85^\circ$  relative to that perpendicular.
  - (b) a native resolution greater than or equal to 2.3 megapixels (MP);
  - (c) a colour gamut area of at least sRGB as defined by IEC 61966 2-1. Shifts in colour space are allowable as long as 99% or more of defined sRGB colours are supported;
  - (d) a brightness and colour uniformity of >90% across the image;

<sup>10</sup> OJ L 169, 12.7.1993, p. 1.

<sup>11</sup> OJ L 189, 20.7.1990, p. 17.

<sup>12</sup> OJ L 331, 7.12.1998, p.1.

- (e) colour and brightness stability at the delivered specified performance across the specific working temperature range and nominal working life.
9. ‘*Security display*’ means a professional electronic display which shall include all of the following specifications:
- (a) reinforced design for heavy continuous usage (‘24/7’)
  - (b) self-monitoring function capable of communicating the following information to a remote server:
    - power status;
    - internal temperature from anti-overload thermal sensing;
    - video source;
    - audio source and audio status (volume/mute);
    - model and firmware version;
  - (c) end-user specified specialist form factor facilitating the installation of the display into professional housings or consoles;
10. ‘*Status display*’ means an electronic display capable of displaying alphanumeric characters or simple images. Its principal function is to display the status of the product(s) and/or the result of the activity, performed by the product(s). Status displays include also displays incorporating an end-user interface to allow the control of the associated product(s);
11. ‘*Game console*’ means a device as defined in article 2(1) of Regulation (EC) No 617/2013.
12. ‘*All-in-one video conference systems*’ means a videoconference codec (encoder/decoder) with integrated display and loudspeakers, to be used in interactive telecommunications using specific protocols such as ITU-T H.320 or H.323, whose specification shall include all of the following functions and features:
- (a) an encryption function;
  - (d) intelligent QoSTM function (quality of service function to achieve and maintain a stable transmission); and
  - (e) KIOSK mode (remote consulting, customized distance learning).
13. ‘*Projector*’ is an optical device for processing analogue or digital video image information, in any, broadcasting, storage or networking format to modulate a light source and project the resulting image onto an external screen;
14. ‘*High-Definition display*’ (HD display) means an electronic display that has at least one digital input with a native (design) resolution of 1920 by 1080 pixels Or in other formats with a minimum horizontal resolution of 1920 pixels;
15. ‘*Computer*’ means a device as defined in article 2(1) of Regulation (EC) No. 617/2013;
16. ‘*Integrated desktop computer*’ means a computer as defined in article 2(6) of Regulation (EC) No 617/2013 ;
17. ‘*End-user*’ means a consumer using the product.;

18. ‘2D mode’ means an electronic display mode where images are constructed on the display screen in two planes (height and width) and presented to the viewer with no additional optical processing;
19. ‘3D mode’ means a mode where separate sequential images are presented on the display screen and optically processed to present to the viewer, apparently simultaneous offset images creating a perception of physical depth (third dimension).

For the purposes of the Annexes, additional definitions are laid down in Annex I.

#### *Article 3*

##### ***Ecodesign requirements***

The ecodesign requirements for electronic displays are set out in Annex II.

Compliance of electronic displays with the applicable ecodesign requirements shall be measured in accordance with the methods set out in Annex III.

#### *Article 4*

##### ***Amendment to Regulation (EC) No 1275/2008***

Point 3 of Annex I to Regulation (EC) No 1275/2008 is replaced by the following:

‘3. Consumer equipment, radio sets, videocameras, video recorders, hi-fi recorders, audio amplifiers, home theatre systems, musical instruments and other equipment for the purpose of recording or reproducing images and/or sound, including signals or other technologies for the distribution of sound and image other than by telecommunications, but excluding electronic displays subject to the requirements laid down by points from 1 to 10 of Annex II to Commission Regulation (EC) [...] ***[Numbering of the Regulation to be added before publication in the OJ].***’

#### *Article 5*

##### ***Amendment to Regulation (EC) No 617/2013***

Point 7.1(y). of Annex II to Regulation (EU) No 617/2013 is repealed.

#### *Article 6*

##### ***Amendment to regulation (EC) No 801/2013***

Article 2 of Regulation (EC) No 801/2013, amending regulation (EC) No 642/2009, is repealed.

#### *Article 7*

##### ***Application of Regulation (EC) No 278/2009***

Article 2(1) (g) of Regulation (EC) No 278/2009 is replaced by the following:

‘(g) it is intended for use with electrical and electronic household and office equipment as referred to in Article 2(1) of Regulation (EC) No 1275/2008 or with computers covered by the scope of Commission Regulation (EU) [...] ***[Numbering of the Regulation to be added before publication in the OJ]*** or with electronic displays subject to the requirements laid down by points from 1 to 10 of Annex II to Commission Regulation (EU) [...] ***[Numbering of the Regulation to be added before publication in the OJ].***’

*Article 8*  
**Conformity assessment**

The conformity assessment procedure referred to in Article 8 of Directive 2009/125/EC<sup>13</sup> shall be the internal design control system set out in Annex IV to that Directive or the management system for assessing conformity set out in Annex V to that Directive.

*Article 9*  
**Market surveillance and verification procedure**

Market surveillance shall be carried out in accordance with the rules specified in Directive 2009/125/EC.

Checking of electronic displays for compliance with the applicable ecodesign requirements shall be carried out in accordance with the verification procedure set out in Annex III to this Regulation.

Kommentiert [PT1]: WHY ONLY POINT 2?

*Article 10*  
**Indicative benchmarks**

The indicative benchmarks for best-performing products and technology available on the market at the time of entry into force of this Regulation are identified in Annex IV.

*Article 11*  
**Revision**

The Commission shall review this Regulation and present the results of this review to the Ecodesign Consultation Forum no later than four years after its entry into force in the light of technological progress.

In the light of rapid technological development, this review shall consider opportunities to tighten ecodesign requirements, to lay down requirements for new display technologies, particularly OLED and QLED display technologies, 3D mode and resolution levels above UHD, to update definitions/scope.

Furthermore, the review shall specifically consider different life-cycle phases and the feasibility of establishing and applying ecodesign requirements on other significant environmental aspects.

*Article 12*  
**Repeal**

Regulation 642/2009 is repealed as of the day of entry into force of this Regulation, except for Articles 3 and 5 thereof and Annexes I to III thereto that shall apply until this Regulation starts to apply.

References to the repealed Regulation shall be constructed as references to this Regulation and shall be read in accordance with the correlation table in Annex VI.

---

<sup>13</sup> OJ L 285, 31.10.2009, p. 10.

*Article 13*  
***Entry into force and application***

This Regulation shall enter into force on the twentieth day following that of its publication in the Official Journal of the European Union.

It shall start applying as indicated for each specific point in Annex II. as specifically indicated in each point.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

*For the Commission*  
*The President*  
Jean-Claude JUNCKER

## ANNEX I

### **Achronyms and abbreviations and applicable for the purposes of the Annexes**

- (1) 'ABC' means Automatic Brightness Control
- (2) 'APD' means Automatic Power Down;
- (3) 'CRT' means a Cathode Ray Tube;
- (4) 'DVD' means a Digital Versatile Disc;
- (5) 'DVI' means a digital visual interface;
- (6) 'FED' means a Field Emission Display;
- (7) 'HD' means High-Definition;
- (8) 'HDMI' means a High-Definition Multimedia Interface;
- (9) 'HD-SDI' means High Definition Serial Digital Interface;
- (10) 'LCD' means a Liquid Crystal Display;
- (11) 'LCD-CCFL' means a Liquid Crystal Display technology with a Cold Cathode Fluorescent Lamp back-light;
- (12) 'LCD-LED' means a Liquid Crystal Display technology with a Light Emitting Diode back-light;
- (13) 'LED' means Light Emitting Diode;
- (14) 'OLED' means an Organic Light Emitting Diode;
- (15) 'PDP' means a Plasma Display Panel;
- (16) 'QLED' means Quantum dot Light Emitting Diode; 'SED' means a Surface-conduction Electron-emitter Display;
- (17) 'UHD' means Ultra High Definition, known also as 'Ultra-HD' and '4k' definition;
- (18) 'USB' means a Universal Serial Bus;
- (19) 'VFD' means a Vacuum Fluorescent Display;
- (20) 'VGA' means a Video Graphics Array;
- (21) 'Automatic Brightness Control (ABC)' means the self-acting mechanism that controls the brightness of a display as a function of the ambient light level illuminating the display product. Measurement of the ambient light level is performed via a sensor, sometimes indicated in documentation as "light sensor" or "economy sensor";
- (22) 'Brightest on-mode condition' means the mode, pre-set by the manufacturer, which provides an acceptable picture with the highest measured luminance. This includes a pre-set mode incorporated for use specifically in the context of demonstrating the display, for example in high illumination (retail) conditions (often termed 'shop mode');
- (23) 'Blu-ray Disc' means a high capacity optical disc for data storage which supersedes the Digital Versatile Disc (DVD);
- (24) 'Enhanced reactivation or mode control functions' means reactivation functions other than those traditionally supported by electronic displays (such as infrared remote

control unit and internal timer) and using sensor systems for voice recognition, room presence and/or gesture detection ;

- (25) '*Equivalent electronic display model*' means a variant of a specific model of electronic display placed on the market by the same manufacturer but under a different commercial code number. Such a variant may be defined as an equivalent electronic display only if it has essentially identical, electrical, physical and functional characteristics that affect energy consumption energy efficiency and recycling ecodesign criteria (e.g. the same on-mode, off-mode, standby mode, networked standby condition power demand, automatic power down and/or power management functions, peak luminance ratio, time of the extraction of key components, marking of plastic parts, minimum recyclability rate index for certain plastic parts and mercury free logo)
- (26) '*Extraction*' means the separation of the entire component unbroken from the original product and/or its other components, performed manually or mechanically, preliminarily to shredding treatments;
- (27) '*HiNA*' means High Network Availability
- (28) '*HiNA functionality*' means a device with the function of a router, network switch, or wireless network access point (not being a terminal or node) or a combination of those functions;
- (29) '*Home mode/standard mode*' means a display screen setting which is recommended to the end-user by the manufacturer from the initial set up menu or the mode that the display product comes shipped in if no setting is recommended;
- (30) '*Filler*' means a relatively inert solid material added to a plastic to modify its strength, permanence, working properties or other qualities;
- (31) '*Fire retardant (FR)*' means a substance added or treatment applied, in order to delay ignition or to reduce the rate of combustion; 'Brominated fire retardant - BFR' means bromine containing fire retardant;
- (32) '*Forced menu*' means a set of display settings pre-defined by the manufacturer, of which the end-user of the display must select a particular setting upon initial start-up of the display;
- (33) '*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 ( $\text{cd}/\text{m}^2$ ). The Luminance of a display is understood to refer to the brightness of a display;
- (34) '*Mercury Free*' means a product in which concentration values of mercury (Hg) by weight in homogeneous materials do not exceed 0,1% as defined in Directive 2011/65/EU of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- (35) '*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);
- (36) '*Networked Electronic Display*' means a display product that can connect to a network using one or more network ports;
- (37) '*Network availability*' means the capability of a display product to resume functions after a remotely initiated trigger has been detected by a network port;

- (38) '*Network port*' means a wired or wireless physical interface of the network connection located at the electronic display through which the electronic display can be remotely activated. For computer displays, the interfaces of the video and audio connection with the computer components are not considered to be network ports;
- (39) '*Networked standby*' means a condition where an electronic display is connected to the mains power source, depends on energy input from the mains power source to function properly, and is able to resume a function through a remotely initiated trigger via a network connection. In the networked standby condition the product produces neither sound nor picture, but can be switched into another mode with the remote control unit or an internal signal or a data instruction through a network connection. The networked standby mode provides the following functions:
- (a) networked standby reactivation function, or reactivation function and only an indication of enabled reactivation function, and/or,
  - (b) display of information or product status
- The networked standby mode may also provide the enhanced reactivation function(s);
- (40) '*Networked standby reactivation function*' means a function facilitating the activation of other modes, including on-mode, by remotely initiated trigger to a condition providing additional functions, including the main function;
- (41) '*Network switch*' means a network device that, as its primary function, filters, forwards, and distributes frames based on the destination address of each frame. All switches operate at least at the data link layer (L2);
- (42) '*Network access point*' means a device that, as its primary function, provides connectivity to a network linking multiple nodes (final devices). The networks can be either wireless (e.g. based on IEEE 802.11 more frequently called WiFi) or wired, e.g. based on IEEE 802.3 or more frequently called Ethernet;
- (43) '*On mode*' means a condition in which the product is connected to a mains power source, has been activated, and is providing one or more of its principal functions;
- (44) '*Off mode*' means a condition in which the product, even if connected to the mains power source, produces no usable function and cannot be switched into any other mode using a remote control unit, an internal or an external signal. This mode may persist for an indefinite time. The product may only exit this mode by direct end-user actuation, including of a power switch or control;
- (45) '*Printed Circuit Board assembly (PCB)/printed wiring board assembly*' means an assembly that uses a printed circuit board (or a printed wiring board) for component mounting and interconnection;
- (46) '*Plastic*' means a material which contains, as an essential ingredient, a high polymer and which, at some stage in its processing into finished products, can be shaped by flow;
- (47) '*PMMA board*' means a polymethyl methacrylate board;
- (48) '*Reactivation function*' means a function facilitating the activation, by a remote switch including a remote control unit, an internal sensor, or a timer, of other modes providing additional functions, including the main function;

- (49) *'Room presence and/or gesture detection sensor'* means a sensor monitoring and reacting to the occupancy and movements, by an end-user, in the space around the product that can allow the activation of other modes, including on-mode;
- (50) *'Remotely initiated'* means coming from outside the electronic display, e.g. via a network;
- (51) *'Recyclability'* means an ability of a product to be recycled at its end-of-life, based on cost-effective practices;
- (52) *'Recyclability rate' of a material means the ratio of that material in product parts that is recyclable.*
- (53) *'Recyclability index of plastics parts'* means the percentage by mass of plastic parts contained in a product potentially able to be recycled at the end-of-life of the product.
- (54) *'Router'* means a network device that, as its primary function, determines the optimal path along which network traffic should be forwarded. Routers forward packets from one network to another, based on network layer information (L3);
- (55) *'Screen area'* means the viewable screen area of the product calculated by multiplying the maximum viewable image width by the maximum viewable image height;
- (56) *'Standby mode'* means a condition where the product is connected to the mains power source, depends on energy input from the mains power source to function properly, produces neither sound nor picture, but can be switched into another mode with the remote control unit or an internal signal.
- (57) *'Voice recognition sensor'* means a sensor monitoring and reacting to voice commands of an end-user that can allow the activation of other modes, including on-mode ;

ANNEX II  
*Ecodesign requirements and timetable*

An electronic display product which is placed on the market split into two or more physically separate units shall, for conformance with the requirements of this Annex, be treated as a single display product regardless of the functions and powering arrangements of each unit.

**1. On-mode power demand**

The declared on-mode power demand of an electronic display shall not exceed the maximum power ( $Power_{max}$ ) calculated using the following set of equations where  $Area$  represents the viewable display screen area in decimetres squared (dm<sup>2</sup>).

**1.1.** Twelve (12) months after the publication of the Regulation in the Official Journal of the European Union (Tier 1):

$$Power_{max} = 3 \times [100 \times \tanh(0,02 + 0,006 \times (Area - 11)) + 4] + 6$$

**1.2.** Thirty-six (36) months after the publication of the Regulation in the Official Journal of the European Union (Tier 2):

$$Power_{max} = 2 \times [99 \times \tanh(0,02 + 0,0065 \times (Area - 11)) + 4] + 6$$

**1.3.** Sixty (60) months after the publication of the Regulation in the Official Journal of the European Union (Tier 3):

$$Power_{max} = 1 \times [98 \times \tanh(0,02 + 0,007 \times (Area - 11)) + 4] + 6$$

**1.4.** For products supplied with a standardised DC power connection (such as USB) and placed on the market without an external AC to DC power supply, the maximum allowable on-mode measured DC input power ( $Power_{maxDC}$ ) must be adjusted from the calculation of  $Power_{max}$  from sections 1.1, 1.2 and 1.3 to take into account the AC to DC conversion efficiency which for this Regulation is set at 86%.

$$Power_{maxDC} = Power_{max} \times 0,86$$

Where:

$Power_{maxDC}$  is the maximum on-mode power consumption of DC power connected displays

$Power_{max}$  is the maximum allowable on-mode measured input power calculated according to the appropriate section 1.1, 1.2 or 1.3 above;

**1.5.** PDP, OLED and QLED displays are exempted from the on-mode maximum power demand requirements specified in point 1.1 above, but are included and expected to comply with the on-mode maximum power demand requirements of points 1.2 and 1.3.

## **2. Standby, networked standby and off mode power demand and availability of modes**

### **2.1. Power demand in off mode**

12 months after the publication of the Regulation in the Official Journal of the European Union:

2.1.1. Power demand of an electronic display in off-mode condition shall not exceed 0,30 W, unless the condition in the next paragraph is fulfilled.

2.1.2. For electronic displays with an easily visible and accessible on/off switch, as qualified in Annex VI, which puts the electronic display in a condition with power demand not exceeding 0,01 W when operated to the Off position, the power demand of any other Off-mode condition of the electronic display shall not exceed 0,50 W.

### **2.2. Power demand in standby mode**

12 months after the publication of the Regulation in the Official Journal of the European Union:

2.2.1. The power demand of an electronic display in any condition providing only a reactivation function, or providing only a reactivation function and a mere indication of enabled reactivation function, shall not exceed 0,50 W.

2.2.2. The power demand of an electronic display in any condition providing only display of information or product status, shall not exceed 1,00 W.

2.2.3. Power demand allowances in addition to those given in 2.2.1 and 2.2.2 apply to the following enhanced reactivation functions that may be enabled by the end-user in electronic displays in standby mode;

- reactivation using only voice recognition and activation sensor: 1,0 W maximum;
- reactivation using only room presence/gesture detection and activation sensor: 0,5W maximum;
- reactivation using both voice recognition and room presence / gesture recognition sensors; 1,2 W maximum;
  
- enhanced reactivation providing a fast start function only or in addition to other enhanced reactivation functions has no additional power allowance (0,0 W)

### **2.3. Availability of off mode and/or standby mode**

12 months after the publication of the Regulation in the Official Journal of the European Union:

2.3.1. When an electronic displays is placed on the market it shall have off mode and/or standby mode, and/or another condition which does not exceed the applicable power demand requirements for off mode and/or standby-mode when the electronic display is connected to the mains power source.

2.3.2. Off mode and/or standby mode, and/or another condition which does not exceed the applicable power demand requirements for off mode and/or standby mode shall be set as

default in all electronic displays including in networked electronic displays, when placed on the market.

2.3.3. Networked electronic display with the networked connectivity activated and with at least one wired networked access port connected and/or at least one wireless networked access port activated may provide a function allowing it to enter the standby mode.

### **2.5 Activation and deactivation of network connection**

12 months after the publication of the Regulation in the Official Journal of the European Union:

2.5.1. Network connectivity of the network electronic display shall be activated by the end-user.

2.5.2. The end-user shall be able to deactivate the network connectivity of the networked electronic display.

2.5.3. If the networked standby condition is not activated, the electronic display shall comply with the requirements stated in 2.2 “power demand in standby mode”.

### **2.6. Power demand in a condition providing networked standby**

2.6.1 12 months after the publication of the Regulation in the Official Journal of the European Union:

- (a) The power demand of electronic display with HiNA functionality, in a condition providing networked standby shall not exceed 6,00 W.
- (b) The power demand of electronic displays without HiNA functionality in a condition providing networked standby shall not exceed 3,00 W.

2.6.2. 36 months after the publication of the Regulation in the Official Journal of the European Union:

(a) The power demand of electronic displays without HiNA functionality in a condition providing networked standby shall not exceed 2,00 W.

2.6.3. The power limits specified in points 2.6.1 and 2.6.2. do not include the power allowances specified in 2.2.3 for those enhanced reactivation functions that may be enabled in a networked electronic display in a networked standby condition;

### **3. Automatic power down**

12 months after the publication of the Regulation in the Official Journal of the European Union:

3.1. electronic displays, including networked electronic displays with network connectivity activated, shall provide a function with the following characteristics:

- (a) within 4 hours in on mode following the last end-user interaction and/or at the end of an ongoing function that may extend beyond the 4 hour window (e.g. recording) the electronic display shall complete an automatic switch from on mode to
  - standby mode, or,
  - off mode, or,
  - another condition which does not exceed the applicable power demand requirements for off mode and/or standby mode;

- (b) Before the automatic switch from on mode to the applicable mode/condition, electronic displays shall show an alert message warning of the impending automatic switch from on mode to the applicable mode/condition. In the case of no end-user interaction, the switch operation should be triggered.
- (c) The menu of an electronic display shall provide a function allowing the end-user to:
- shorten the time period not exceeding 4 hours set as default to any time period starting from 1 hour,
  - extend the time period not exceeding 4 hours set as default to any time period up to 12 hours, and
  - disable the auto power down function.

If the end-user chooses to extend the time period not exceeding 4 hours or to disable the auto power down function, a second selection process shall be prompted to confirm this choice accompanied by a warning message about the energy use implications.

- (d) This function shall be set as default in all electronic display products.

- 3.4. Electronic displays marketed for computer monitoring only and electronic display products with various selectable display sources, shall recognise and prioritise the power management protocols of a host computer signal source over those power management protocols and features described in point 3.1 when monitoring the host computer.
- 3.5. Networked electronic displays may provide functionalities allowing the power management function and/or the end-user to switch the electronic display from networked standby into standby mode, or off mode or another condition which does not exceed the applicable power demand requirements for off mode and/or standby mode. The standby mode may include enhanced reactivation function power allowance where applicable.

Kommentiert [PT2]: if the simplification is taken.

#### **4. Home mode/standard mode for electronic displays which are delivered with a forced menu**

12 months after the publication of the Regulation in the Official Journal of the European Union:

Electronic displays should be placed on the market with the home mode/standard mode set by default. Electronic displays may be placed on the market with a forced menu on initial activation proposing alternative modes, such as a shop mode. The home/standard mode shall be the default choice in the forced menu. If the end-user selects a mode other than home mode, a second selection process shall be prompted to confirm this choice, accompanied by a warning message about the energy use implications of a mode selection other than home mode/standard mode.

#### **5. Peak luminance ratio**

12 months after the publication of the Regulation in the Official Journal of the European Union:

**5.1.** For an electronic display without forced menu, the peak luminance of on mode condition of the display as delivered by the manufacturer (home mode/standard mode) shall not be less than 65% of the peak luminance of the brightest on mode condition provided by the electronic

display using the picture settings for the brightest on-mode condition declared by the manufacturer.

**5.2.** For an electronic display with forced menu, the peak luminance of the home mode/standard mode condition shall not be less than 65 % of the peak luminance of the brightest on-mode condition, in a manufacturer pre-set mode, provided by the electronic display.

## **6. Resource efficiency requirements**

The following information shall be provided by manufacturers

### **6.1. Technical documentation**

From 12 months after the publication of the Regulation in the Official Journal of the European Union the manufacturer shall provide in the technical documentation the following information:

(a) Identification data:

- manufacturer's name, registered trade name or registered trade mark, and the address at which it can be contacted;
- model number and other codes and marks sufficient for it to be unequivocally and easily identified;
- year of manufacture.

(b) Test parameters for measurements:

- ambient temperature;
- test voltage in V and for AC frequency in Hz
- total harmonic distortion of the electricity supply system;
- the input terminal for the audio and video test signals;
- information and documentation on the instrumentation, set-up and circuits used for electrical testing;
- where appropriate, the references of the harmonised standards applied;
- where appropriate, the other technical standards and specifications used.

(c) On mode:

- the power demand data in Watts rounded to the first decimal place for power measurements up to 100 Watts, and to the first integer for power measurements above 100 Watt ;
- the characteristics of the dynamic broadcast-content video signal representing typical broadcast TV content (in the case of UHD displays, the HD broadcast content standard video test signal shall be up converted to the native resolution of the display);
- the sequence of steps for achieving a stable condition with respect to power demand;
- for electronic displays with a forced menu, the ratio of the peak luminance of the home mode/standard mode and the peak luminance of the brightest on mode condition provided by the display and pre-set by the manufacturer expressed as a percentage rounded to the nearest integer. The picture settings of menu setting (mode) used for the brightest on mode peak luminance measurement must be declared;

- for electronic displays without forced menu: the ratio of the peak luminance of on mode condition of the display as delivered by the manufacturer and the peak luminance of the brightest on mode condition provided by the display expressed as a percentage, rounded to the nearest integer. The picture settings used for the brightest on mode peak luminance measurement must be declared.
- (d) For standby and off mode:
- the power demand data in Watts rounded to the second decimal place;
  - the measurement method used;
  - description of how the mode was selected or programmed including any enhanced reactivation functions
  - sequence of events to reach the mode where the electronic display automatically changes modes;
- (e) Automatic power down:
- the duration of on mode condition before the electronic display reaches automatically standby, or off mode, or another condition which does not exceed the applicable power demand requirements for off mode and/or standby mode.
- (f) For networked electronic displays:
- the number and type of network ports and, except for wireless network ports, where these ports are located at the electronic display; in particular it shall be noted if the same physical network port accommodates several types of network ports;
  - whether the electronic display qualifies as electronic display with HiNA functionality; if no information is provided the electronic display is considered not to be an HiNA display or a display with HiNA functionality;
  - information as to whether a networked electronic display provides functionality allowing the power management function and/or the end-user to switch the electronic display being in a condition providing networked standby into standby mode, or off mode or another condition which does not exceed the applicable power demand requirements for off mode and/or standby mode including enhanced reactivation function power allowance where applicable.
- (g) For displays monitoring computers, confirmation that the display product recognises and prioritises the computer display power management protocols set out in Point 6.2.3 of Annex II of Regulation 617/2013. Any deviation from the protocols should be reported.
- (h) For each type of network port:
- the default time after which the power management function, switches the display into a condition providing networked standby;
  - the trigger that is used to reactivate the electronic display;
  - the (maximum) performance specifications;
  - the (maximum) power demand of the electronic display in a condition providing networked standby into which the power management function will switch the electronic display, if only this port is used for remote activation.

If no information is provided, the electronic display is considered not to be networked electronic display.

(i) Hazardous substances:

- if the electronic display contains mercury or lead: the content of mercury as X,X mg, and the presence of lead.

(j) Automatic Brightness Control (ABC), if applicable:

- the manufacturer shall confirm the power reduction due to ABC by measuring and declaring the average on-mode power demand of the electronic display at an ambient light intensity, measured at the Automatic Brightness Control (ABC) sensor of the display product, of, 100lux, 35 lux, 12 lux and 3 lux,

6.2. Where the information included in the technical documentation file for a particular electronic display model has been obtained by calculation on the basis of an equivalent electronic display model, the technical documentation shall include details of such calculations and of tests undertaken by the manufacturer to verify the accuracy of the calculations undertaken. The technical information shall also include a list of all other equivalent electronic display models where the information was obtained on the same basis.

6.3. The information contained in this technical documentation may be merged with the technical documentation provided in accordance with the measure on electronic displays adopted under the Directive 2010/30/EU.

6.4. Public available information

From 12 months after the publication of the Regulation in the Official Journal of the European Union the manufacturer shall make publically available on free-access websites the following information:

- (a) manufacturer's name or trade mark;
- (b) manufacturer's model identifier which means the code, usually alphanumeric, which distinguishes a specific electronic display model from other models with the same trade mark or manufacturer's name;
- (c) the energy efficiency class as determined under Commission Regulation (EC)[...] *[Numbering of the Energy Labelling Regulation on electronic displays to be added before publication in the OJ]* ;
- (d) the visible screen diagonal in centimetres and in inches and the visible screen area in dm<sup>2</sup>;
- (e) the on-mode power demand;
- (f) the annual energy consumption (AE) in kWh per year, rounded to the first integer as determined under Commission Regulation (EC) [...] *[Numbering of the Energy Labelling Regulation on electronic displays to be added before publication in the OJ]*; it shall be described as: 'Energy consumption XYZ kWh per year, based on the power demand of the electronic display operating 4 hours per day for 365 days. The actual energy consumption will depend on how the display is used';
- (g) the standby, off-mode and networked standby power demand;
- (h) the screen resolution in physical horizontal and vertical pixel count;

- (i) whether Automatic Brightness Control is available and activated.

#### **6.5. Documentation for recycling at end of life of displays**

From 24 months after the publication of the Regulation in the Official Journal of the European Union, manufacturers, and/or importers in the European Union shall provide the following product information on every equivalent electronic display model in a freely accessible websites and kept available for 10 years from the day of the last model placed on the market:

- (a) an 'end-of-life report' containing information relevant for disassembly, recycling and/or recovery at end-of-life as specified in Annex III . The report shall include at least the following:
  - (i) the exploded diagram of the product labelling the targeted components defined in Annex III section A, when present, together with a documentation of the sequence of the dismantling operations needed to access to these components. Each of these operations shall be described in terms of type of operation (e.g. unscrewing, removing, levering, positioning), type and number of fastening techniques to be unlocked (e.g. M3 screw, snap-fit) and tool(s) required;
  - (ii) the description of the design strategies / innovations implemented to facilitate disassembly, recycling and/or recovery of the displays;
  - (iii) the rationale for each exemption, if some plastic parts are not marked as set out in Annex III section B;
  - (iv) the declared value of the recyclability index for plastic parts larger than 25 g, accompanied by a description of the calculations (including at least: the list of the plastic parts; their material composition; the considered recyclability rates for each plastic type, plus a justification in case the values differ from the ones of Table 1 presented in Annex III.C).
- (b) a video showing the dismantling operations and the indicative time needed to extract the four types of targeted components defined in Annex III section A, when present.

From 24 months after the publication of the Regulation in the Official Journal of the European Union, the value of the 'recyclability index of plastic parts' in the electronic display (as defined in Annex III section C) shall be declared in the instruction booklet for users.

ANNEX III  
END OF LIFE REQUIREMENTS

**A. Design for recovery of electronic displays**

24 months after the publication of the Regulation in the Official Journal of the European Union, manufacturers shall ensure that electronic displays are designed so that the following four types of components (when present) can be dismantled:

- printed circuit boards assembly (larger than 10 cm<sup>2</sup>);
- thin-film-transistor liquid-crystal display (larger than 100 cm<sup>2</sup>);
- PMMA board;
- mercury containing backlighting lamps;

This shall be ensured by:

- documenting the sequence of dismantling operations needed to access the targeted components, including for each of these operations: type of operation, type and number of fastening technique(s) to be unlocked, and tool(s) required;
- describing the design strategies / innovations implemented to facilitate the disassembly, recycling and/or recovery of the electronic display;
- providing a video showing the dismantling operations and the indicative time needed to extract the targeted components.

**B. Marking of plastic parts of electronic displays**

24 months after the publication of the Regulation in the Official Journal of the European Union:

**B.1.** Plastic parts larger than 25g, other than the Polymethyl Methacrylate Board (PMMA) and display optical plastics, shall be marked by specifying the type of plastic using the symbols as specified in EN 11469 and EN 1043, set between the marks “>” and “<”. The marking shall be legible and located in a visible position.

Exemptions are made in the following cases:

- (i) Where the marking would impact on performance or functionality of the plastic part
- (ii) Where marking is technically not possible due to the production methods; or
- (iii) Where the marking could cause defect rates under quality inspection, leading to unnecessary wastage of materials

Each exemption shall be justified in the ‘end-of-life report’, as set in Annex II point 6.5.

**B.2** Plastic parts larger than 25g, other than the PMMA board and display optical plastics, containing Brominated Fire Retardants (BFR) shall be marked in the following way:

- (i) >x-FR-y<

where:

x= plastic polymer

FR = Fire Retardant

y= brominated fire retardant coding, according to EN 1043.

**B.3.** Plastic parts larger than 25g, other than the Polymethyl Methacrylate board (PMMA) and display optical plastics may include information related to the presence of fillers and fire retardants other than BFR in plastic parts. When the information is added voluntarily, this shall be presented in the following way:

(i) the presence of fillers as: 'x-y'

where:

x = plastic polymer

y = abbreviated term for the fillers.

(ii) the presence of fire retardant in plastic parts as: 'x-FR-y'

where:

x= plastic polymer

FR = Fire retardant

y= type of the fire retardant coding.

### **C. Declaration of the recyclability index for plastic parts**

The recyclability index of plastic parts (heavier than 25g) in electronic displays shall be determined in accordance with the following equation:

$$R_{plastic} = \frac{\sum(m_i \times RCR_i)}{m_{tot}} \times 100 \quad [\%]$$

Where:

$R_{plastic}$  = recyclability index of plastic parts [%]

$m_i$  = mass of the  $i^{th}$  plastic part heavier than 25g

$m_{tot}$  = total mass of plastic parts heavier than 25g

$RCR_i$  = recyclability rate of the  $i^{th}$  plastic part heavier than 25g [%] as specified in the table.

Plastic parts lighter than 25g, Printed Circuit Boards (PCB), wiring and speakers are excluded from the calculation.

24 months after the publication of the Regulation in the Official Journal of the European Union, the manufacturer shall declare in the instruction booklet for users the value of the recyclability index of plastic parts (heavier than 25g) in the electronic display.

The manufacturer shall illustrate in the 'end-of-life report' (as set in Annex II point 6.5) the calculation of the recyclability index for plastic parts ( $R_{plastic}$ ) and the values used for the recyclability rate of plastics ( $RCR_i$ ).

Table 1. Recyclability rate of plastics (RCR<sub>i</sub>).

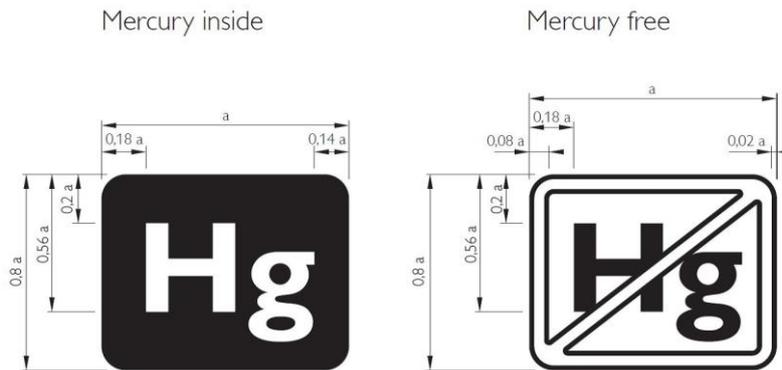
| Material  | Recyclability rate |
|---|--------------------|
| Acrylonitrile Butadiene Styrene (ABS)                                     | 94%                |
| Acrylonitrile Butadiene Styrene (ABS) with any additives                  | 94%                |
| High impact polystyrene (HIPS)  | 94%                |
| High impact polystyrene (HIPS) with any additive                          | 94%                |
| Polyamide (PA)  | 94%                |
| Polycarbonate (PC)  | 94%                |
| Polycarbonate/ Acrylonitrile Butadiene Styrene (PC-ABS)                   | 94%                |
| Polycarbonate/Acrylonitrile Butadiene Styrene (PC-ABS) with any additives | 94%                |
| Polymethyl methacrylate (PMMA)  | 94%                |
| Polypropylene (PP)  | 94%                |
| Polypropylene (PP) with natural fibres                                    | 0%                 |
| Polypropylene (PP) with other additive                                    | 94%                |
| Co-injected plastics  | 0%                 |
| Other plastics  | 0%                 |

If the manufacturer has evidence that the recyclability rate is actually higher (e.g. based on tests) then the manufacturer can use the determined recyclability rate. These evidences should be provided additionally to those foreseen in Annex II, section 6.5, point (iv)

Kommentiert [a3]: JRC: we think this is a nice proposal. However this could cause problems for verification

#### D. Mercury free logo

12 months after the publication of the Regulation in the Official Journal of the European Union electronic displays shall be labelled with the "Mercury inside" or the "Mercury free" logo. The logo shall be immediately and clearly visible on the back of the electronic display without the removal of a cover. The logo shall be in the form of the following graphic.



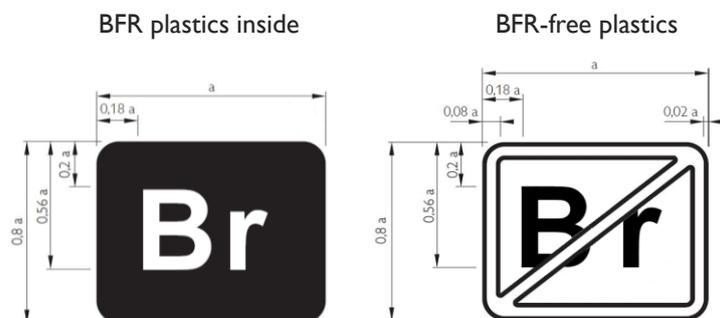
The dimension of “a” shall be greater than 9 mm and the typeface to be used is ‘Gill Sans serif’.

The logo shall be visible, durable, legible and indelible.

### E. Brominated Fire retardants logo

12 months after the publication of the Regulation in the Official Journal of the European Union electronic displays having plastic parts larger than 25g (other than PMMA board and display optical plastics) containing Brominated Fire Retardants (BFR) shall be labelled with the "BFR plastics inside" logo. Electronic displays with plastic parts larger than 25g (other than PMMA board and display optical plastics) not containing BFR shall be labelled with the “BFR-free plastics” logo.

The logo shall be immediately and clearly visible on the back of the electronic display without the removal of a cover. The logo shall be in the form of the following graphic.



The dimension of “a” shall be greater than 9 mm and the typeface to be used is ‘Gill Sans serif’.

The logo shall be visible, durable, legible and indelible.

## ANNEX IV Measurements

For the purposes of compliance and verification of compliance with the applicable 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, and produce results deemed to be of low uncertainty.

Electronic displays which can operate in both 2D and 3D modes shall be tested when they operate in 2D mode, according to the on-mode power demand test methodology established for electronic displays with 2D mode only. The on-mode power demand of the electronic display, when switched from 2D to 3D in the home mode/standard mode, shall be tested using a reliable accurate and reproducible measurement procedure for 3D electronic displays which takes into account the generally recognised state-of-the-art measurement methods, including harmonised standards, the reference numbers of which have been published in the Official Journal of the European Union.

### 1. Measurements of on-mode power demand

Measurements of the power demand referred to in Annex II, point 1 shall fulfil all of the following conditions:

(a) Conditions of electronic displays for measuring the on-mode power demand:

- Electronic displays without forced menu: the power demand referred to in points 1.1., 1.2. and 1.3. of Annex II shall be measured in the on-mode condition of the electronic display as delivered by the manufacturer, that is, the controls affecting the brightness (peak luminance) of the electronic display shall be in the position adjusted by the manufacturer for the end-user.
- Electronic displays with forced menu: the power demand referred to in points 1.1., 1.2. and 1.3. of Annex II, shall be measured in the home-mode/standard mode condition.

(b) General conditions:

- Measurements shall be made at an ambient temperature of 23 °C +/- 5 °C.
- Measurements shall be made using a dynamic broadcast-content video signal representing typical broadcast content for electronic displays. The measurement shall be the average power consumed over 10 consecutive minutes.
- Measurements shall be made after the electronic display has been in the off-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.

- Measurements shall be made with the Automatic Brightness Control function, if such a function exists, made inactive by an ambient light measured at the ABC light sensor of a level of 300 lux, or more.

## **2. Measurements of standby/off mode, enhanced reactivation functions and networked standby power demand**

- Measurements of the standby/off mode, enhanced reactivation functions and networked standby power demand shall be made using a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognised state of the art measurement methods.

## **3. Measurements of peak luminance**

Measurements of the peak luminance referred to in Annex II, point 6 shall fulfil all of the following conditions:

- Measurements of peak luminance shall be made with a luminance meter, detecting that portion of the screen exhibiting a full (100 %) white image, which is part of a ‘full screen test’ 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 electronic display luminance.
- Measurements of luminance ratio shall be made without disturbing the luminance meter’s detection point on the electronic display whilst switching between the conditions referred to in Annex II, point 5.

## **4. Extraction of key components**

Measurements of the extraction time of key components referred to in Annex II, point 7 shall be made using a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognised state of the art measurement methods, including the provision by manufacturers (through e.g. DVD, website) of the information necessary for the measurement, such as: technical documentation illustrating the dismantling sequence and a supporting video-recording that shows the compliance to the requirement.

## **5. Measurements of marking of plastic parts of electronic displays**

Measurements of marking of plastic referred to in Annex II, point XX shall be made using a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognised state of the art measurement methods.

## **6. Minimum recyclability rate index for certain plastic parts**

Measurements of minimum recyclability rate index for referred to in Annex II, point XX 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, and produce results deemed to be of low uncertainty.

## **7. Mercury free logo**

Measurements and checks of backlighting systems of electronic displays for mercury content referred to in Annex II, point XX 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, and produce results deemed to be of low uncertainty.

#### ANNEX V **Verification procedures**

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC, the Member States' authorities shall apply the following verification procedure.

**1. Verification procedure for requirements established in points 1.1., 1.2., 1.3., 2.2.1., 2.2.2. of Annex II.**

Member States' authorities shall test one single unit.

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

- (a) the result for on-mode power demand does not exceed the applicable limit value set out in points 1.1., 1.2., and 1.3. of Annex II by more than 5%; and
- (b) the results for off-mode/standby conditions, as applicable, do not exceed the applicable limit values set out in points 2.2.1. 2.2.2. and 2.2.3 of Annex II by more than 0.10 Watt.

If the results referred to in points 1.1., 1.2., 1.3., 2.2.1. 2.2.2. and 2.2.3 of Annex II are not achieved, three additional units of the same model shall be tested.

After three additional units of the same model have been tested, the model shall be considered to comply with the requirements, if:

- (a) the average of the results for the latter three units for on-mode power demand does not exceed the applicable limit value set out in points 1.1., 1.2. and 1.3. of Annex II by more than 5%; and
- (b) the average of the results for the latter three units for off-mode/standby conditions, as applicable, do not exceed the applicable limit values set out in points 2.2.1., 2.2.2. and 2.2.3 of Annex II by more than 0.10 Watt.

If these results are not achieved, the model and all equivalent electronic displays shall be considered not to comply with the requirements.

The relevant enhanced reactivation power demand allowance (0,2 1.0W. or 1.5W) as set out in point 2.2.3. of Annex II can be added to the test results for standby mode condition if the model is tested with the enhanced reactivation function(s) enabled. The model should be tested with enhanced reactivation functions enabled and disabled.

**2. Verification procedure for requirements established in points 2.3.1. and 2.3.2. of Annex II.**

Member States authorities shall test one single unit.

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

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

- the off mode and standby mode, and/or another condition which does not exceed the applicable power demand requirements for off mode and/or standby mode, is set as default.

If any of these test results are not achieved, three additional units of the same electronic display shall be tested.

After three additional units have been tested, the model shall be considered to comply with the requirements if all three of the additional units meet all the conditions. Otherwise, the model and all equivalent electronic displays shall be considered not to comply with the requirements.

**3. Verification procedure for requirements established in point 3.1. of Annex II.**

Member States authorities shall test one single unit.

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

(i) after no more than 4 hours in on mode following the last end-user interaction and/or channel change, the electronic display automatically switches from on mode to standby mode, or off mode, or, another condition which does not exceed the applicable power demand requirements for off mode and/or standby mode. Member States authorities shall use the applicable procedure to measure the power demand after the automatic power down functionality switches the electronic display into the applicable power mode; and

(ii) the function is set as default; and

(iii) the unit displays an alert message before automatically switching from on mode to the applicable mode/condition; and

(iv) the unit provides a function allowing the end-user to shorten the time period not exceeding 4 hours set as default to any time period starting from 1 hour; and

(v) the unit provides a function allowing the end-user to extend the time period not exceeding 4 hours set as default to any time period between 5 to 24 hours; and

(vi) the unit provides a function allowing the end-user to disable the auto power down function; and

(vii) if the second selection process is prompted to confirm the end-user's choice of extending the time period not exceeding 4 hours or to disable the auto power down function.

If any of the test results under subpoints (ii) to (vii) are not achieved, the model and all equivalent electronic displays shall be considered not to comply with the applicable requirements.

If the test results under subpoint (i) is not achieved, three additional units of the same model shall be tested.

After three additional units have been tested, the model shall be considered to comply with the requirements if all three of the additional units meet the test result specified under subpoint (i). Otherwise, the model and all equivalent electronic displays shall be considered not to comply with the requirement.

**4. Verification procedure for requirements established in point 3.4. of Annex II.**

Member States authorities shall test one single unit.

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

(i) after no more than 10 minutes in on mode following the last end-user interaction the electronic display automatically switches from on mode to standby mode or, another condition which does not exceed the applicable power demand requirements for standby mode. Member States authorities shall use the applicable procedure to measure the power demand after the automatic power down functionality switches the display into the applicable power mode; and

(ii) if the function is set as default; and

(iii) if the unit provides a function allowing the end-user to shorten the time period not exceeding 10 minutes set as default to any time period starting from 1 minute; and

(iv) if the unit provides a function allowing the end-user to extend the time period not exceeding 10 minutes set as default to any time period between 11 to 60 minutes; and

(v) if the unit provides a function allowing the end-user to disable the auto power down function; and

(vi) if the second selection process is prompted to confirm the end-user's choice of extending the time period not exceeding 10 minutes or to disable the auto power down function.

If any of the test results under subpoints (ii) to (vi) are not achieved, the model and all equivalent electronic displays shall be considered not to comply with the applicable requirement.

If the test result under subpoint (i) is not achieved, three additional units of the same display shall be tested.

After three additional units have been tested, the model shall be considered to comply with the requirement if all three of the additional units meet the test result under subpoint (i). Otherwise, the model and all equivalent electronic displays shall be considered not to comply with the requirement.

#### **5. Verification procedure for requirements established in point 4. of Annex II.**

Annex II, Member States authorities shall test one single unit.

The model with forced menu on initial activation shall be considered to comply with the applicable requirement, if:

- the home mode/standard mode is provided as the default choice on initial activation of the electronic display; and
- a second selection process is prompted to confirm the choice if the end-user selects a mode other than home mode/standard mode.

If these test results are not achieved the model and all equivalent electronic displays shall be considered not to comply with the applicable requirements.

#### **6. Verification procedure for requirements established in point 5. of Annex II**

Member States' authorities shall test one single unit.

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

- (a) the result for the peak luminance of on mode condition of the electronic display without forced menu as delivered by the manufacture (home

mode/standard mode) does not fall below the applicable limit value set out in point 6.1. of Annex II by more than 5 percentage points (i.e. no less than 60%);

- (b) the result for the peak luminance of the home mode/standard mode condition of the electronic display with forced menu does not fall below the applicable limit value set out in point 6.2. of Annex II by more than 5 percentage points (i.e. no less than 60%).

If these tests results are not achieved, three additional units of the same model shall be tested.

After three additional units of the same model have been tested, the model shall be considered to comply with the requirements, if:

- (a) the average of the results for the latter three units for the peak luminance of on mode condition of the electronic display without forced menu as delivered by the manufacturer (home mode/standard mode) does not exceed the applicable limit value set out in point 6.1. by more than 5 percentage points;
- (b) the average of the results for the latter three units for the peak luminance of the home mode/standard mode condition of the electronic display with forced menu does not exceed the applicable limit value set out in point 6.2. of Annex II by more than 5 percentage points.

If these results are not achieved, the model and all equivalent electronic displays shall be considered not to comply with the requirements.

#### **7. Verification procedure for requirements established in point 2.5. of Annex II**

Member States authorities shall test one single unit.

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

- the activation of the network connectivity requires the end-user's intervention; and
- the network connectivity can be deactivated by the end-user;.
- it complies with the requirements for standby mode when networked standby condition is not offered.

If any of these test results are not achieved the model and all equivalent electronic displays shall be considered not to comply with the applicable requirements.

#### **8. Verification procedure for requirements established in points 2.6.of Annex II.**

Member States shall use the applicable procedure below, after having deactivated and/or disconnected, as applicable, all network ports of the unit.

Member States' authorities shall test one single unit as follows:

If the electronic display has, as indicated in the technical documentation, one type of network port and if two or more ports of that type are available, one of these ports is chosen randomly and that port is connected to the appropriate network complying with the maximum specification of the port. In the event of multiple wireless network ports of the same type, the other wireless ports shall be deactivated if possible. In the event of multiple wired network ports of the same, the other network ports shall be disconnected if possible. If only one network port is available, that port is connected to the appropriate network complying with the maximum specification of the port.

The unit is put in on mode. Once the unit in on mode is working properly, it is allowed to go into the condition providing networked standby and the power demand is measured. Then the appropriate trigger is provided to the electronic display through the network port and a check is made whether the electronic display is reactivated.

Where the electronic display has, as indicated in the technical documentation, more than one type of network port, for each type of network port the following procedure is repeated. If two or more network ports of a type are available, one port is chosen randomly for each type of network port and that port is connected to the appropriate network complying with the maximum specification of the port.

If for a certain type of network port only one port is available, that port is connected to the appropriate network complying with the maximum specification of the port. Wireless ports not used shall be deactivated if possible. In the event of verification of requirements, the wired network ports not used shall be deactivated if possible.

The unit is put in on mode. Once the unit in on mode is working properly, it is allowed to go into the condition providing networked standby and the power demand is measured. Then the appropriate trigger is provided to the television through the network port and a check is made whether the electronic display is reactivated.

The model shall be considered to comply with this Regulation if the results for each type of network port do not exceed the limit value by more than 5 %.

Otherwise, three more units shall be tested. The model shall be considered to comply with this Regulation if the average of the results for each type of network port of the latter three tests does not exceed the limit value by more than 5 %.

Otherwise, the model and all equivalent electronic displays shall be considered not to comply.

If the electronic display provides the enhanced reactivation function(s) it shall be tested with all the enhanced reactivation function(s) enabled.

#### **9. Verification procedure for requirements established in point 3.3. and 3.4. of Annex II.**

Member States authorities shall test one single unit.

The networked electronic display with the network connectivity activated shall be considered to comply with the applicable requirement, if:

- (i) after no more than 4 hours in on mode following the last end-user interaction and/or channel change, the electronic display automatically switches from on mode to a condition of networked standby mode or any other condition which does not exceed the applicable power demand requirements for conditions providing networked standby. Member States authorities shall use the applicable procedure to measure the power demand after the automatic power down functionality switches the electronic display into the applicable power mode; and
- (ii) the function is set as default; and
- (iii) the unit displays an alert message before automatically switching from on mode to the applicable mode/condition; and

- (iv) the unit provides a function allowing the end-user to shorten the time period not exceeding 4 hours set as default to any time period starting from 1 hour; and
- (v) the unit provides a function allowing the end-user to extend the time period no exceeding 4 hours set as default to any time period between 5 to 24 hours; and
- (vi) the unit provides a function allowing the end-user to disable the auto power down function; and
- (vii) the second selection process is prompted to confirm the end-user's choice of extending the time period not exceeding 4 hours or to disable the auto power down function; and
- (vii) as stated in the technical documentation, the power management function and/or the end-user can switch the electronic display being in a condition providing networked standby into standby mode, or off mode or another condition which does not exceed the applicable power demand requirements for off mode and/or standby mode.

If any of these test results under subpoints (ii) to (vii) are not achieved, the model and all equivalent electronic displays shall be considered not to comply with the applicable requirements.

If the test results under subpoints (i) or (viii) is not achieved, three additional units of the same model shall be tested.

After three additional units have been tested, the model shall be considered to comply with the applicable requirements if all three of the additional units meet the test results under subpoint (i) and (viii). Otherwise the model and all equivalent electronic displays shall be considered not to comply with the applicable requirements.

#### **10. Verification procedure for requirements established in point 4.2. and 4.3. of Annex II.**

Member States authorities shall test one single unit.

The model with the network connectivity activated shall be considered to comply with the applicable requirement, if:

- (i) after no more than 10 minutes hours in on mode following the last end-user interaction the electronic display automatically switches from on mode to networked standby mode or, another condition which does not exceed the applicable power demand requirements for networked standby mode. Member States authorities shall use the applicable procedure to measure the power demand after the automatic power down functionality switches the electronic display into the applicable power mode; and
- (ii) the function is set as default; and
- (iii) the unit provides a function allowing the end-user to shorten the time period not exceeding 10 minutes set as default to any time period starting from 1 minute; and
- (iv) the unit provides a function allowing the end-user to extend the time period no exceeding 10 minutes set as default to any time period between 11 to 60 minutes; and
- (v) the unit provides a function allowing the end-user to disable the auto power down function; and

- (vi) the second selection process is prompted to confirm the end-user's choice of extending the time period not exceeding 10 minutes or to disable the auto power down function; and
- (vii) as stated in the technical documentation, the power management function and/or the end-user can switch the unit being in a condition providing networked standby into standby mode, or off mode or another condition which does not exceed the applicable power demand requirements for off mode and/or standby mode.

If any of these test results under subpoints (ii) to (v) are not achieved, the model and all equivalent electronic displays shall be considered not to comply with the applicable requirements.

If the test result under subpoint (i) or (vi) are not achieved, three additional units of the same model shall be tested.

After three additional units have been tested, the model shall be considered to comply with the applicable requirements if all three of the additional units meet all the test results under subpoints (i) and (vi). Otherwise the model and all equivalent electronic displays shall be considered not to comply with the applicable requirements.

#### **11. Verification procedure for requirements established in Annex III section A.**

For the requirement set out in Annex III section A, market surveillance authority shall test one single display unit.

The model shall be considered to comply with the requirement, if, after the implementation of the documented sequence of dismantling operations set out in Annex III section A, the four types of targeted components, when present, can be extracted.

If the test results referred to above are not achieved, the model is considered not compliant.

#### **12. Verification procedure for requirements established in Annex III section B.**

For the requirement set out in Annex III section B, market surveillance authority shall test one single display unit.

The model shall be considered to comply with the requirements, if all plastic parts of the display larger than 25 g, other than those exempted as defined in Annex III section B.1, are marked with the proper symbols set out in Annex III section B.1. Models with plastic parts larger than 25 g (other than PMMA board and display optical plastics) containing brominated fire retardants shall be considered to comply with the requirements if marked with the proper symbols for fire retardant, as set out in Annex III section B.2. For exempted plastic parts, market surveillance authority shall check that a justification is provided in the 'end-of-life report', as in Annex II section 6.5.

If the test results referred to above are not achieved, the model is considered not compliant.

#### **13. Verification procedure for requirements established in Annex III section C.**

For the requirement set out in Annex III section C, market surveillance authority shall check one single display unit. The authority shall check the truthfulness of the declaration made by the manufacturer, including the type and mass of declared plastic parts larger than 25g and

the calculation of the value of recyclability index of plastic parts (as described in Annex III section C), according to Annex II section 6.5.

#### **14. Verification procedure for requirements established in Annex III section D.**

For the requirement set out in Annex III section D, market surveillance authority shall check one single display unit.

Market surveillance authority shall check if the unit has a backlighting system containing or not mercury and if it has the proper corresponding logo ('mercury free' or 'mercury inside'), as detailed in Annex III section D.

The compliance of the logo is checked by inspection and by rubbing by hand for 15 seconds with a piece of cloth soaked with water and again for 15 seconds with a piece of cloth soaked with petroleum spirit<sup>14</sup>. After this test, the marking shall be legible; it shall not be easily possible to remove the marking. If used, marking plates or labels shall show no curling.

If the test results referred to above are not achieved, the model is considered not compliant.

#### **15. Verification procedure for requirements established in Annex III section E.**

For the requirement set out in Annex III section E, market surveillance authority shall check one single display unit.

Market surveillance authority shall check if plastic parts larger than 25 g (other than PMMA board and display optical plastics) contain or not brominated fire retardants, and if the model has the proper corresponding logo ('BFR-free plastics' or 'BFR plastics inside'), as detailed in Annex III section E.

The compliance of the logo is checked by inspection and by rubbing by hand for 15 seconds with a piece of cloth soaked with water and again for 15 seconds with a piece of cloth soaked with petroleum spirit<sup>15</sup>. After this test, the marking shall be legible; it shall not be easily possible to remove the marking. If used, marking plates or labels shall show no curling.

If the test results referred to above are not achieved, the model is considered not compliant.

#### **16. The verification tolerances**

The verification tolerances defined in this Annex relate only to the verification of the measured parameters by Member State authorities 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.

#### **17. General verification requirement**

---

<sup>14</sup> The petroleum spirit to be used for the test is aliphatic solvent hexane having a maximum aromatics content of 0.1% by volume, a kauri-butane value of 29, an initial boiling point of approximately 65°C, a dry point of approximately 69°C and a specific mass of approximately 0.7 kg/l.

<sup>15</sup> The petroleum spirit to be used for the test is aliphatic solvent hexane having a maximum aromatics content of 0.1% by volume, a kauri-butanol value of 29, an initial boiling point of approximately 65°C, a dry point of approximately 69°C and a specific mass of approximately 0.7 kg/l.

A display automatically recognising a situation of on-going compliance test and reacting to it to achieve a different result, in any of the verification points from 1 to 10, has do be considered not compliant.

ANNEX VI  
**Indicative benchmarks**

The following indicative benchmarks are identified for the purpose of part 3, point 2 of Annex I to Directive 2009/125/EC.

They refer to the best available technology at the time of drafting this Regulation (July 2014) for electronic displays on the market:

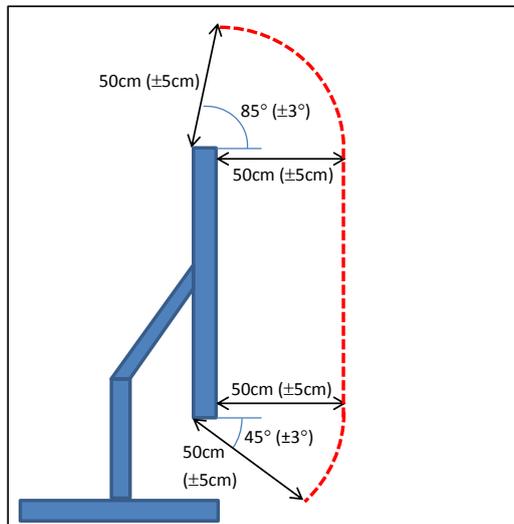
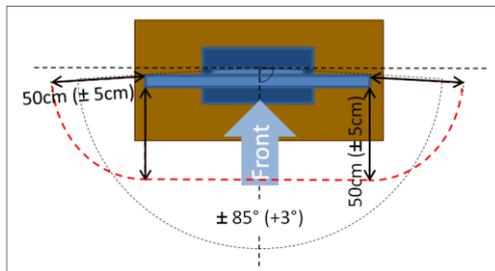
|  |            |
|--|------------|
| 55,9 cm / 22 inch diagonal of viewing area:  | 14.5 Watts |
| 81,3 cm / 32 inch diagonal of viewing area:  | 24 Watts   |
| 106,7 cm / 42 inch diagonal of viewing area: | 31 Watts   |
| 139,7 cm / 55 inch diagonal of viewing area: | 45 Watts   |

ANNEX VII  
**Parameters of easily visible and accessible on/off switch**

The two following criteria are to be met for the on/off-switch of an electronic display set to be an 'easily visible and accessible on/off switch':

1. Visibility: The off-switch, or its protective housing, shall be visible under normal room light conditions by a person positioned at a point of the red dotted line, as defined in the pictures below;
2. Accessibility: The switch shall be accessible and operable by one hand from a person positioned at a point of the red dotted line, as defined in the pictures below.

The viewing distance shall be measured from the closest edge of the display towards the observer as indicated by the black arrows.



**ANNEX VIII**  
**Correlation table**

| Regulation 642/2009 | This Regulation |
|---------------------|-----------------|
| Article 1           |                 |
| Article 2           |                 |
| Article 3           |                 |
| Article 4           |                 |
| Article 5           |                 |
| Article 6           |                 |
| Article 7           |                 |
| Article 8           |                 |
| Annexes I to III    |                 |