



SLOVENSKI STANDARD
SIST EN 62115:2005/oprAD:2014
01-september-2014

Električne igrače - Varnost - Dopolnilo AD

Electric toys - Safety

Elektrische Spielzeuge - Sicherheit

Jouets électriques - Sécurité

Ta slovenski standard je istoveten z: EN 62115:2005/prAD:2014

ICS:

| | | |
|-----------|-----------------|-----------------|
| 13.120 | Varnost na domu | Domestic safety |
| 97.200.50 | Igrače | Toys |

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EUROPEAN STANDARD
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ICS 13.120; 97.200.50

English Version

Electric toys - Safety

Jouets électriques - Sécurité

Elektrische Spielzeuge - Sicherheit

This draft amendment prAD, if approved, will modify the European Standard EN 62115:2005; it is submitted to CENELEC members for enquiry.

Deadline for CENELEC: 2014-10-31.

It has been drawn up by CLC/TC 61.

If this draft becomes an amendment, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

This draft amendment was established by CENELEC in three official versions (English, French, German).

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European Committee for Electrotechnical Standardization
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14 Foreword

15 This document (EN 62115:2005/prAD:2014) has been prepared by CLC/TC 61 "Safety of household and
16 similar electrical appliances".

17 This document is currently submitted to the Enquiry.

18 This document has been prepared under a mandate given to CENELEC by the European Commission
19 and the European Free Trade Association, and supports essential requirements of EU Directive(s).

20 For the relationship with EU Directive 2009/48/EC, see informative Annexes ZZA and ZZB, which are an
21 integral part of this document.

22 Clauses, subclauses, notes, tables and figures which are additional to those in IEC 62115:2003 +
23 A1:2004+ A2:2010 are prefixed "Z".

24 NOTE The following print types are used:

- 25 – requirements: in roman type;
- 26 – *test specifications: in italic type;*
- 27 – notes: in small roman type.

28 Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the
29 associated noun are also in bold.

30 **CLC/TC 61 note:**

31 This prAD (future A13) is submitted to the CENELEC Enquiry as agreed during the CLC/TC 61 meetings
32 in Brussels in 2013.

33 This document was updated following the discussions of CLC/TC 61/WG 7 "Toys" at its last joint meeting
34 the MT 26 in Guangzhou China.

35 During the preparation of this draft by CLC/TC 61/WG 7 "Toys", a coordination with IEC has been
36 performed. Therefore, the technical content of this CENELEC draft is identical to the technical content of
37 a Draft for Comments (DC) of IEC on the same standard (61/4716/DC).

38 For achieving this, the following changes have been introduced, with respect to a previous version of this
39 prAD (future A13) inside CLC/TC 61/WG 7:

- 40 – Although it is specified in 5.5, 5.6 and Clause 9 of the main part of the toy standard that all the tests
41 are carried out in the worst mode, position etc., it is in addition specified in 5.6 that this is also
42 applicable to the radiation.
- 43 – Emission measurement accuracy and distance is added in 20.X2.1 as it was explained in the first
44 version of prAD (future A13) in 20.1.1.1 and the editor's note in 20.1.5.
- 45 – Measurement details in the subclauses of 20.Z2 is referred to the general 20.Z2.1.
- 46 – The classification of lasers in 20.Z3 are now referred to the latest IEC 60825-13 instead the older
47 IEC 60825-1"

48 16 Components

49 16.1 *Renumber the existing note as Note 1*

50 *Add the following new note:*

51 Note Z1: The compliance of **light-emitting diode (LED)** and **laser** components is assessed using Clause 20 of Annex E.

52 Annex E

53 *Replace the text of the existing Annex E by the following.*

54

55

Annex E (normative)

56

57

58

Safety of Toys incorporating Optical Radiation Sources

59 The following modifications to this standard are applicable for **toys** incorporating **optical**
60 **radiation sources**, emitting in the wavelength range 200 nm to 3 000 nm.

61 Note 1: Based on various ICNIRP Guidelines and Statements, this standard specifically addresses the hazards
62 associated with **LED** and **laser** light sources in **toys**.

63 Note 2: A flow chart showing the assessment methodology for optical radiation safety in **toys** is given in Annex ZD.

64 Note 3 Example calculations for assessing the optical radiation safety of **LEDs** in **toys** from information given the
65 **LED** datasheets are given in Annex ZE.

66 2 Normative references

67 IEC/TR 60825-13, *Safety of laser products – Part 13: Measurements for classification of laser*
68 *products*

69 EN 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

70 3 Terms and definitions

71 *Add the following definitions:*

72 3.E.101

73 Accessible emission

74 level of optical radiation from the toy determined at a position where human access is considered

75 3.E.102

76 Accessible Emission Limit (AEL)

77 the maximum permitted **accessible emission**

78 3.E.103

79 array of LEDs

80 two or more **LEDs** capable of providing exposure to the eye at the same time, positioned within
81 280 mm when measured from centre to centre from each other for UV **LEDs**, or 40 mm when
82 measured from centre to centre from each other for other **LEDs**

83 Note 1 to entry: Some LEDs may be physically close together but are incapable of providing exposure to the eye at the
84 same time, for example a user could not observe an LED on the front of television and the rear of a television at the
85 same time.

86 3.E.104

87 Half Width Half Maximum (HWHM)

88 the half-angle divergence of the optical radiation from an **LED**, assessed at 50% of the peak
89 value

90 **3.E.105**

91 **modulated output**

92 accessible emission where the emitter is either:

- 93 – switched on and off or switched between high power and low power state and where the peak
- 94 emission is no greater than if the emission was continuous, or
- 95 – where the **accessible emission** is effectively modulated by other-means, such as moving
- 96 reflectors, shutters, etc, or
- 97 – a combination of these two effects

98 where the duration of each cycle is less than 0.25 s

99 **3.E.106**

100 **spectral emission bandwidth**

101 full width, half maximum, of the emission spectrum

102 **3.E.107**

103 **laser**

104 device that can be made to produce or amplify electromagnetic radiation in the wavelength range

105 from 180 nm to 1 mm, primarily by the process of controlled stimulated emission

106 Note 1 to entry: The scope of the standard covers only radiation in the wavelength range 200 nm to 3.000 nm.

107 **3.E.108**

108 **light-emitting diode (LED)**

109 semiconductor PN junction device that can be made to produce electromagnetic radiation by

110 radiative recombination in the semiconductor in the wavelength range from 180 nm to 1 mm

111 Note 1 to entry: The optical radiation is produced primarily by the process of spontaneous emission, but some

112 stimulated emission may be present

113 Note 2 to entry: The scope of the standard covers only radiation in the wavelength range 200 nm to 3.000 nm

114 **5 General conditions for the tests**

115 **5.2 Addition:**

116 *The tests of clauses 20.E.2, 20.E.3 and 20.E.4 may be carried out on separate toys.*

117 **5.3 Addition:**

118 *The tests of clauses 20.E.2, 20.E.3 and 20.E.4 are carried out before or after the preconditioning*

119 *tests specified in clause 5.15, whichever is more unfavourable.*

120 **5.6 Addition:**

121 *The tests of clauses 20.E.2, 20.E.3 and 20.E.4 are carried out using the worst case emission*

122 *taking the toy's function into account.*

123 **7 Marking and instructions**

124 **7.1 Addition:**

125 For **toys** containing Optical radiation sources emitted ultraviolet (UV) or infrared (IR) radiation

126 shall display a message on the items packaging informing consumers of such radiation.

127 Note: an example of such information could be "Information: toy has UV emissions"

128 **7.4 Addition:**

129 For **toys** with **laser devices**, the instructions shall carry information indicating that the device is

130 Class 1.

131 Note: An example of such a marking could be: "Class 1 **Laser device**"

132 **20 Radiation, toxicity and similar hazards**

133 *Replacement*

134 **20.1 Addition**

135 **Toys** shall not present a radiation hazard.

136 *Toys incorporating LEDs shall comply with clause 20.E.2.*

137 *Toys incorporating lasers shall comply with clause 20.E.3.*

138 *All toys incorporating optical radiation sources shall comply with clause 20.E.4.*

139 **20.E.2 Light-emitting diodes (LEDs)**

140 The maximum emission from **toys** and **LEDs** shall comply with the following limit values.

141 **20.E.2.1 Emission from toys**

142 The total emission from toys incorporating **LEDs** or an **array of LEDs** shall not exceed the **AEL**
143 specified in Clauses 20.E.2.2, 20.E.2.3 and 20.E.2.4.

144 Note 1: The total emission only incorporates the emissions that the eye is exposed to from one viewing position. Any
145 emissions that cannot be viewed simultaneously shall be assessed separately and independently.

146 *Compliance is checked by evaluating the technical data of LEDs and applying the limits of*
147 *clauses 20.E.2.2, 20.E.2.3 and 20.E.2.4 or by measurement of the output from a toy and*
148 *application of the same limits, using the following method.*

149 ***Toys** are operated as intended until steady state conditions and normal operating temperature is*
150 *reached.*

151 *The **spectral emission bandwidth** is measured by using a spectrometer capable of measuring*
152 *to an accuracy of ± 1 nm*

153 *The **accessible emission** is measured to an accuracy of $\pm 0,001$ Wsr⁻¹ or by any device with a*
154 *photopic luminous efficiency not exceeding 3% across the measured spectrum. The*
155 *measurements are made at a distance of 10 mm.*

156 Note 2: A product meeting the exempt risk group criteria of EN 62471 shall also meet the requirements of this
157 standard.

158 **20.E.2.2 UV AEL**

159 **20.E.2.2.1**

160 Ultraviolet radiation **accessible emissions** below a wavelength of 315 nm shall not exceed
161 0.01 mW.m⁻² when assessed at 10 mm from the emitter.

162 **20.E.2.2.2**

163 The output of ultraviolet radiation with a wavelength between 315 nm and 400 nm from **LEDs**
164 shall not exceed the **AEL** as calculated using one of the following equations.

165 – Where the output of the LED is expressed in watts per steradian:

166
$$\frac{0.01 \times C}{A} \text{ [W.sr}^{-1}\text{]} \quad (\text{E.1})$$

167 where **A** is relaxation factor specified in Table E.1, and;

168 where **C** is a correction factor given as: 0.1 for *toys* intended for children under 3 years of
169 age and, 1 for **toys** intended for children of 3 years of age and above.

170 Note 1: Relaxation Factor A depends on the peak emission wavelength λ and spectral emission bandwidth $\Delta\lambda$. See
171 ZZB.42 for calculation of Relaxation Factor A.

172 Note 2: The factor C takes account of the higher UV transmission of the eye's lens for children under 3 years of age.

173 – Where the **LED** output is expressed in watts and the solid angle is given in steradians:

$$174 \quad \frac{0.01 \times \Omega}{A} \times C \text{ [W]} \quad (\text{E.2}),$$

175 where Ω is the solid angle containing the LED emission

176 – Where the output is expressed in watts and the half-power beam angle (HWHM) is given:

$$177 \quad \frac{0.01 \times \pi \times \alpha^2}{4 \times A} \times C \text{ [W]} \quad (\text{E.3}),$$

178 where α is the full angle of emission in radians

179 Note 3: The full angle is double of the **HWHM** angle.

180 Note 4: Equations E.2 and E.3 are equivalent to equation E.1.

181 *Compliance is checked by comparing values from the component data sheets with the*
 182 *appropriate **AEL** or by measurement using the methods specified in 20.E.2.1.*

183 **20.E.2.3 Visible light AEL**

184 The output of visible optical radiation with a wavelength between 400 nm and 780 nm from **LEDs**
 185 shall not exceed the **AEL** as given below.

186 For an **LED** with a peak emission wavelength below 420 nm, the lowest **AEL** of this clause or
 187 clause 20.E.2.2 shall apply.

188 Note 1: For a white **LED** (typically constructed with a blue emitter and phosphorous coating), the peak wavelength is
 189 assumed to be at 500 nm as an approximation of the more complex multiple peak spectrum.

190 Note 2: For combination colour **LED** (e.g. a rose colour **LED** consisting of a blue emitter and a deep red emitter), the
 191 peak wavelength is assumed to be for the shortest-wavelength emitted.

192 – Where output of the **LED** is expressed in candela, it shall not exceed the **AEL** values given in
 193 Table E.2.

194 – Where the output of the **LED** is expressed in watts per steradian, it shall not exceed the **AEL**
 195 values given in Table E.3.

196 The correction factor C for wavelengths from 400 to 440 nm is 0.1 for toys intended for children
 197 under 3 years of age and, 1 for **toys** intended for children of 3 years of age and above.

198 Note 3: The **AEL** depends on the peak emission wavelength λ and emission bandwidth $\Delta\lambda$. The AEL for peak emission
 199 wavelength λ and emission bandwidth $\Delta\lambda$ are given in Table E.2 and Table E.3.

200 *Compliance is checked by comparing values from the component data sheets with the*
 201 *appropriate **AEL** or by measurement using the methods specified in 20.E.2.1.*

202 **20.E.2.4 Infrared AEL**

203 The output of infrared (IR) radiation with a wavelength between 780 nm and 3000 nm from **LEDs**
 204 shall not exceed the **AEL** as calculated using the following equation.

$$205 \quad (0.32 \times S) \text{ [W.sr}^{-1}] \quad (\text{E.4})$$

206 where the infrared relaxation factor, S, is 2.0 for LEDs emitting in the spectral range 780-1000
 207 nm and, 1.0 for LEDs emitting in the spectral range 1000-3000 nm. The values are given below:

208 – For a peak emission wavelength of 780-1000 nm, an **AEL** of 0.64 W.sr⁻¹

209 – For a peak emission wavelength of 1000-3000 nm, an **AEL** of 0.32 W.sr⁻¹

210 *Compliance is checked by comparing values from the component data sheets with the*
 211 *appropriate **AEL** or by measurement.*

212 **20.E.2.5 LED arrays**

213 The total emission of an **array of LEDs** shall not exceed the **AEL** specified in Clauses 20.E.2.2,
 214 20.E.2.3 and 20.E.2.4. Where LEDs are used in combination, the most restrictive **AEL** shall be
 215 used.

216 Note 1: This is a simplification of the actual potential exposure condition.

217 **20.E.3 Lasers**

218 **Lasers** in toys shall be classified as “Class 1” in accordance with Clauses 8 and 9 of
219 EN 60825-1. Class 1 **lasers** do not include class 1M or class 1C **lasers**.

220 *Compliance is checked by testing in accordance with IEC 60825-13*

221 **20.E.4 Modulated accessible emission**

222 **Modulated output** from visible optical radiation sources shall not be modulated with the
223 frequencies between 4 and 60 Hz.

224 Note 1: Modulation of **accessible emission** may be by pulsed **LEDs** and **lasers** or by other means, such as moving
225 reflectors or shutters.

226 *Compliance is checked by measurement.*

227

Table E.1 – Relaxation Factor A for UVA AEL

| peak emission wavelength(nm) | Emission bandwidth $\Delta\lambda$, nm | | | | | | |
|-------------------------------|---|-------|-------|---------------|---------------|---------------|-----|
| | 10 nm | 20 nm | 30 nm | 40 nm | 50 nm | 60 nm | |
| 315-335 | 1.0 | | | Not permitted | | | |
| 336-340 | 1.0 | | | | Not permitted | | |
| 341-345 | 1.0 | | | | | Not permitted | |
| 346-368 | 1.0 | | | | | | |
| 369-373 | 1.0 | | | | | 0.8 | |
| 374-379 | 1.0 | | | | 0.9 | | |
| 380-383 | 1.0 | | | 0.9 | | 0.8 | |
| 384 | 1.0 | | | 0.9 | 0.8 | | |
| 385-386 | 1.0 | | 0.9 | | 0.8 | | |
| 387-389 | 1.0 | | 0.9 | 0.8 | | 0.7 | |
| 390 | 1.0 | | 0.9 | 0.8 | 0.7 | | |
| 391-393 | 1.0 | 0.9 | 0.8 | | 0.7 | | |
| 394 | 1.0 | 0.8 | | 0.7 | | | |
| 395 | 1.0 | 0.8 | 0.7 | | | 0.6 | |
| 396 | 0.9 | 0.8 | 0.7 | | 0.6 | | |
| 397 | 0.9 | 0.7 | | 0.6 | | | |
| 398 | 0.8 | 0.7 | 0.6 | | | | |
| 399 | 0.7 | 0.6 | | | | | |
| 400 | 0.6 | | | | | | |
| 401-402 | 0.5 | | | | | | |
| 403 | 0.4 | 0.5 | | | | | |
| 404 | 0.3 | 0.4 | 0.5 | | | | |
| 405 | 0.2 | 0.4 | | 0.5 | | | |
| 406 | | 0.3 | 0.4 | | 0.5 | | |
| 407 | 0.1 | | 0.4 | | | | 0.5 |
| 408 | | 0.3 | | | 0.4 | | |
| 409 | 0.05 | 0.2 | 0.3 | 0.4 | | | |
| 410 | | 0.2 | 0.3 | | | 0.4 | |
| 411 | | | 0.3 | | | | |
| 412 | | 0.1 | 0.3 | | 0.4 | | |
| 413 | | | 0.3 | | | | |
| 414 | | 0.2 | 0.3 | | | 0.4 | |
| 415 | | | 0.2 | | | | |
| 416 | | 0.05 | 0.2 | | 0.3 | | |
| 417 | | | 0.3 | | | | |
| 418 | | 0.05 | 0.2 | 0.2 | | 0.3 | |
| 419 | | | | 0.1 | | | |
| 420 | | 0.2 | | 0.3 | | | |

228