



SLOVENSKI STANDARD
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Trajnost - Merilna metoda za ocenjevanje zanesljivosti pralnih strojev za uporabo v gospodinjstvu

Durability - Measurement method for the assessment of the reliability of washing machines for household use

Funktionsbeständigkeit - Messverfahren zur Bewertung der Zuverlässigkeit von Waschmaschinen für den Hausgebrauch

Durabilité - Méthode de mesure pour l'évaluation de la fiabilité des machines à laver pour usage domestique

Ta slovenski standard je istoveten z: prEN 50731:2024

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97.060 Aparati za nego perila Laundry appliances

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This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2024-07-26.

It has been drawn up by CLC/TC 59X.

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

This draft European Standard was established by CENELEC in three official versions (English, French, German).
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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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42 **European foreword**

43 This document (prEN 50731:2024) has been prepared by CLC/TC 59X "Performance of household and similar
44 electrical appliances".

45 This document is currently submitted to the Enquiry.

46 The following dates are proposed:

- latest date by which the existence of this document has to be announced at national level (doa) dor + 6 months
- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) dor + 12 months
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) dor + 36 months (to be confirmed or modified when voting)

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47 Introduction

48 As energy-related products (ErP) can often not be completely recycled, and the benefits associated with material
49 recovery cannot fully compensate the energy and material demand of the whole production chain, each
50 disposed ErP also means losses in energy and materials. Therefore, increasing the durability of ErPs can
51 contribute to a reduction in the quantity of raw materials used and energy required for the production and end-
52 of-life treatment of ErPs and consequently reduces adverse environmental impacts.

53 Due to the general longevity of washing machines and their long running hours per annum the assessment of
54 the durability, or reliability, of these products can be very time-consuming and costly. Methods and approaches
55 that may be used to quantify these aspects are included in this document. The transportation and storage of
56 washing machines is usually considered as a separate aspect from the durability and reliability of the product.
57 It is generally expected that the product will arrive at the end consumer in a state where it can fulfil its intended
58 function.

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59 1 Scope

60 This document provides a measurement method to assess the reliability of washing machines for household
61 use. This document defines the functional analysis, limiting events/states, environmental conditions and test
62 conditions of washing machines. It also elaborates on the level of confidence on the measurement results.

63 NOTE 1 The method is based on EN 45552 (General method for the assessment of the durability of energy-related
64 products) and takes into account EN 45554 (General methods for the assessment of the ability to repair, reuse and upgrade
65 energy-related products).

66 This document provides information about the interrelations of reliability, reparability and upgradeability with
67 consideration towards a durability assessment for washing machines for household use.

68 This document provides input/results about the investigation on the assessment of reparability and
69 upgradeability for washing machines for household use.

Secretary NOTE: Investigations are planned to consider the most important issues identified in CLC/TR 50727.

70 This document is not intended to be used to assess the reliability of:

- 71 — washing machines, intended for commercial or industrial use;
- 72 — washer-dryers.

73 This document does not address the ability of washing machines to be reused.

74 Product functions related to the safety of washing machines are out of the scope of this document.

75 NOTE 2 EN 60335-2-7 addresses safety requirements for household appliances. It includes aging tests that are relevant
76 to safety.

77 This document is intended to be used for the verification of a reliability declaration.

78 2 Normative references

79 The following documents are referred to in the text in such a way that some or all of their content constitutes
80 requirements of this document. For dated references, only the edition cited applies. For undated references, the
81 latest edition of the referenced document (including any amendments) applies. 7130e1a/osist-pren-50731-2024

82 EN 60456:2016¹, *Clothes washing machines for household use - Methods for measuring the performance*

83 3 Terms and definitions

84 For the purposes of this document, the following terms and definitions apply.

85 ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- 86 — ISO Online browsing platform: available at <https://www.iso.org/obp/>
- 87 — IEC Electropedia: available at <https://www.electropedia.org/>

88 3.1

89 durability

90 <of a part or a product> ability to function as required, under defined conditions of use, maintenance and repair,
91 until a limiting state is reached

92 Note 1 to entry: The degree to which maintenance and repair are within the scope of durability will vary by product or
93 product-group.

¹ As impacted by EN 60456:2016/A11:2020 and EN 60456:2016/A12:2023.

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94 Note 2 to entry: Durability can be expressed in units appropriate to the part or product concerned, e.g. calendar time,
95 operating cycles, distance run, etc. The units should always be clearly stated.

96 [SOURCE: EN 45552:2020, 3.1.1.1, Note 2 to entry deleted]

97 **3.2**
98 **reliability**

99 probability that a product functions as required under given conditions, including maintenance, for a given
100 duration without a limiting event

101 Note 1 to entry: The intended function(s) and given conditions are described in the information for use provided with the
102 product.

103 Note 2 to entry: Duration can be expressed in units appropriate to the part or product concerned, e.g. calendar time,
104 operating cycles, distance run, etc. The units should always be clearly stated.

105 [SOURCE: EN 45552:2020, 3.1.1.2]

106 **3.3**
107 **limiting event**

108 occurrence which results in a primary or secondary function no longer being delivered

109 Note 1 to entry: Examples of limiting events are failure, wear-out failure or deviation of any analogue signal.

110 [SOURCE: EN 45552:2020, 3.1.1.3]

111 **3.4**
112 **limiting state**

113 condition after one or more limiting event(s)

114 Note 1 to entry: A limiting state can be changed to a functional state by maintenance or repair of the appliance.

115 Note 2 to entry: A limiting state can change to EoL-status, if maintenance or repair is no longer viable due to socio-
116 economic or technical reasons.

117 [SOURCE: EN 45552:2020, 3.1.1.4]

118 **3.5**
119 **primary function**

120 function fulfilling the intended use

121 Note 1 to entry: There can be more than one primary function.

122 [SOURCE: EN 45552:2020, 3.1.2.1]

123 **3.6**
124 **secondary function**

125 function that enables, supplements or enhances the primary function(s)

126 [SOURCE: EN 45552:2020, 3.1.2.2]

127 **3.7**
128 **tertiary function**

129 function other than a primary or a secondary function

130 [SOURCE: EN 45552:2020, 3.1.2.3]

- 131 **3.8**
 132 **maintenance**
 133 action carried out to retain a product in a condition where it is able to function as required
- 134 Note 1 to entry: Examples of such actions include inspection, adjustments, cleaning, lubrication, testing, software update
 135 and replacement of a wear-out part. Such actions could be performed by users in accordance with instructions provided with
 136 the equipment (e.g. replacement or recharging of batteries); or the actions could be performed by service personnel in order
 137 to ensure that parts with a known time to failure are replaced in order to keep the product functioning.
- 138 [SOURCE: EN 45552:2020, 3.1.3.4]
- 139 **3.9**
 140 **repair**
 141 process of returning a faulty product to a condition where it can fulfil its intended use
- 142 [SOURCE: EN 45554:2020, 3.1.4]
- 143 **3.10**
 144 **part**
 145 hardware, firmware or software constituent of a product
- 146 [SOURCE: EN 45554:2020, 3.1.1]
- 147 **3.11**
 148 **washing cycle**
 149 complete washing process as defined by a selected programme, consisting of a series of different operations
 150 including washing, rinsing, and spinning procedure
- 151 **3.12**
 152 **reference test**
 153 initial procedure for determining the reference values of monitored parameters in the programs used for
 154 conducting the reliability test
- 155 **3.13**
 156 **parameter monitoring**
 157 procedure for monitoring defined parameters and assessing deviation from reference values
<https://standards.iteh.ai/catalog/standards/sist/9c51fb20-ccc5-40e4-b8a4-f0cc07130e1a/osist-pren-50731-2024>
- 158 **3.14**
 159 **time tracking**
 160 recording of values of defined parameters in relation to the test time
- 161 **3.15**
 162 **cotton base load**
 163 specified load
- 164 Note 1 to entry: The cotton load shall be in accordance with EN 60456:2016, C.1.
- 165 **3.16**
 166 **spin speed**
 167 rotational frequency of a drum during spin extraction
- 168 [SOURCE: EN 60456:2016, 3.1.17]
- 169 **3.17**
 170 **rinse and spin cycle**
 171 programme with the purpose of rinsing and spin drying the load

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172 **3.18**
 173 **cotton 60**
 174 colourfast washes or cotton programmes for textiles declared to be washable at 60 °C in heated washing
 175 machines (European style)

176 **3.19**
 177 **cotton 85**
 178 high temperature white washes or cotton programmes in heated washing machines with highest temperature
 179 setting (European style)

180 **3.20**
 181 **eco 40-60**
 182 name of the programme to be able to clean normally soiled cotton laundry declared to be washable at 40 °C or
 183 60 °C, together in the same washing cycle

184 [SOURCE: EN 60456:2016]

185 **3.21**
 186 **remaining moisture content**
 187 measure for the additional amount of moisture that is contained in the base load in relation to the equilibrium
 188 condition for base load items which have been conditioned in a controlled space

189 [SOURCE: EN 60456:2016, 3.1.27]

190 **3.22**
 191 **load**
 192 textile load used for the tests with defined characteristics and mass

193 **3.23**
 194 **EoL**
 195 **end-of-life**
 196 life cycle stage of a product starting when it is removed from its intended use stage

197 Note 1 to entry: Within this standard, removal from its intended use phase includes when it has been discarded as waste.

198 [SOURCE: EN 45555:2019, 3.1.1] [oSIST prEN 50731:2024](https://standards.iteh.ai/catalog/standards/sist/9c51fb20-ccc5-40e4-b8a4-f0cc07130e1a/osist-pren-50731-2024)
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4 General

200 The reliability assessment methodology for washing machines is developed using the general reliability
 201 assessment approach as described in EN 45552 and considers concepts used in EN 60456. The methodology
 202 described in this document consists of a reliability analysis and focuses on a physical testing methodology
 203 carried out on the washing machine and complemented by an additional parts tests. It contains the necessary
 204 functional analysis of a washing machine with the classification of primary, secondary and tertiary functions.
 205 During the test for reliability, the washing machine's ability to perform its function is evaluated on the basis of
 206 defined parameters. The methodology outlined in this document attempts to balance accuracy and acceleration.
 207 Acceleration significantly reduces the time required to test the washing machine, but in return the test method
 208 moves away from real life usage patterns. This is balanced by the described assessment methodology as much
 209 as possible by the specified load quantities and washing temperatures.