



SLOVENSKI STANDARD
oSIST prEN 50597:2017

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Nadomešča:
SIST EN 50597:2015

Poraba energije prodajnih avtomatov

Energy consumption of vending machines

Energieverbrauch von Verkaufsautomaten

Consommation d'énergie des distributeurs automatiques

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English Version

Energy consumption of vending machines

Consommation d'énergie des distributeurs automatiques

Energieverbrauch von Verkaufsautomaten

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2017-10-13.

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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39 European foreword

40 This document (prEN 50597:2017) was prepared by CLC/TC 59X, "Performance of household and similar
41 electrical appliances", WG11, "Power consumption of vending machines".

42 This document is currently submitted to the Enquiry.

43 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- latest date by which the national standards conflicting with this document have to be withdrawn (dow) dor + 36 months (to be confirmed or modified when voting)

44 This document will supersede EN 50597:2015.

45 This document has been prepared under a mandate given to CENELEC by the European Commission and
46 the European Free Trade Association.

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47 Introduction

48 Vending machines are included in the European Commission's eco-design study on ENER Lot 12. It is
49 foreseen that an Ecodesign Regulation implementing Directive 2009/125/EC on the eco-design of energy-
50 related products will be adopted in the future, and a corresponding standardization request will be issued to
51 CEN and CENELEC accordingly. The development of the present European Standard was deemed
52 necessary in order to anticipate the above-mentioned developments.

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53 1 Scope

54 This European Standard defines methods for the measurement of energy consumption of vending machines,
55 whether or not fitted with refrigerating appliances.

56 The standard applies (but is not limited) to the categories shown in Table 1 of machine types.

57 **Table 1 — Vending machine categories**

CATEGORY	MACHINE TYPE
1	Refrigerated closed fronted can and bottle machines where the products are held in stacks
2	Refrigerated glass fronted can and bottle, confectionery & snack machines
3	Refrigerated glass fronted machines entirely for perishable foodstuffs
4	Refrigerated dual-temperature glass fronted machines
5	Confectionery and snack machines that are not refrigerated
6	Combination machines consisting of two different categories of machine in the same housing and powered by one chiller

58 For verification purposes, all of the tests specified are to be applied to a single unit. The tests may also be
59 made individually for the study of a particular characteristic.

60 This standard does not deal with any characteristics of machine design other than energy consumption.

61 2 Normative References

62 EN 50564, *Electrical and electronic household and office equipment - Measurement of low power*
63 *consumption*

64 EN 60335-1, *Household and similar electrical appliances - Safety - Part 1: General requirements*
65 *(IEC 60335-1)*

66 EN 60335-2-75, *Household and similar electrical appliances - Safety - Part 2-75: Particular requirements for*
67 *commercial dispensing appliances and vending machines (IEC 60335-2-75)*

68 ISO 5149-2, *Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2:*
69 *Design, construction, testing, marking and documentation*

70 3 Terms and definitions

71 3.1 Terms relating specifically to the vending process

72 3.1.1

73 **automatic defrosting**

74 defrosting where no action is necessary by the user to initiate the removal of frost accumulation and to
75 restore normal operation

76 Note 1 to entry: It includes the automatic removal of defrost water.

77 3.1.2

78 **cabinet**

79 enclosure within a vending machine in which product is held ready to be vended

prEN 50597:2017 (E)80 **3.1.3**81 **automatic energy saving mode**

82 mode of a vending machine in which energy reducing measures are automatically applied as a result of
83 operational controls fitted by the manufacturer

84 Note 1 to entry: These could include light or movement sensors.

85 Note 2 to entry: Timers or other controls that can be adjusted by the machine operating company do not qualify as
86 automatic unless they have a permanent minimum configuration level that cannot be overridden by the machine
87 operating company, in which case they may be operational for the automatic energy saving mode test at their minimum
88 configuration.

89 **3.1.4**90 **factory settings**

91 settings that are made in the factory before the machine is sent to the customer, including but not limited to
92 thermostat settings, defrost cycles and energy saving features

93 **3.1.5**94 **health control cut out function**

95 machines intended entirely for the storage and vending of perishable foodstuffs or with a compartment for
96 the storage and vending of such foodstuffs must be fitted with a function that prevents vending of foodstuff if
97 the machine or compartment experiences a time/temperature condition outside that permitted under food
98 safety regulations

99 **3.1.6**100 **loading or filling**

101 process of putting products into the vending machine

102 Note 1 to entry: This may require the door of the machine to be open.

103 **3.1.7**104 **manufacturer's instructions**

105 instructions that accompany the machine, including advice on installation of the machine at the final
106 operating location

107 **3.1.8**108 **non-refrigerated machines**

109 vending machines with no refrigeration system fitted

110 Note 1 to entry: These may dispense a variety of products including but not limited to newspapers, non-perishable
111 snacks and toys.

112 **3.1.9**113 **perishable foodstuffs**

114 foods, such as dairy products, sandwiches and plated meals that are required to be kept chilled under food
115 safety regulations

116 Note 1 to entry: Requirements vary between EU Member States.

117 **3.1.10**118 **pull down**

119 reduction of temperature inside the product storage area of a chilled vending machine to the machine's
120 nominal operating temperature as specified by the manufacturer

121 Note 1 to entry: For example, as required following the loading operation.

- 122 **3.1.11**
123 **ready mode**
124 mode of a vending machine in which the machine is available (ready) for use but no products are taken. In
125 this mode vended products are available for immediate delivery
- 126 **3.1.12**
127 **refrigerated dual temperature glass fronted machines**
128 machines which can be set up to have more than one compartment, each of which is held at a different
129 temperature, one of which is for perishable food
- 130 Note 1 to entry: The presence of a health control cut-out function in the perishable food compartment is
131 essential.
- 132 Note 2 to entry: The compartments in these machines are sized according to the needs of the final customer. In
133 practice, they are operated with no more than 50 % capacity at perishable food temperatures.
- 134 Note 3 to entry: If the machine includes a food safety thermal cut-out functionality, then for the purposes of testing, that
135 compartment with the safety cut-out is deemed for storage of perishable foodstuff.
- 136 **3.1.13**
137 **vending machine entirely for perishable foodstuffs**
138 machine designed for the safe storage of perishable foods that meet the necessary regulatory requirements
- 139 Note 1 to entry: Presence of a health control cut-out function is an essential part of that requirement.
- 140 **3.1.14**
141 **vending mode**
142 transient mode of a vending machine during which products are dispensed
- 143 **3.1.15**
144 **zone cooled vending machine**
145 vending machines for which the cabinet is not fully cooled throughout its volume and in which product is
146 cooled to the final vending temperature only as it reaches close to the dispensing mechanism (this is the
147 usual configuration for category 1 machines)
- 148 Note 1 to entry: Zone cooled machines are not appropriate for perishable foodstuffs.
- 149 **3.2 Relating to the tests**
- 150 **3.2.1**
151 **M-can**
152 test can used to simulate a product during tests, fitted with a temperature measuring device
- 153 **3.2.2**
154 **net volume**
155 net internal refrigerated volume of the cabinet within which the products directly available for vending are
156 contained, measured according to 6.4
- 157 **3.2.3**
158 **normal conditions of use**
159 operating conditions which exist when the **cabinet** is in service with all permanently located accessories, set
160 up and situated as stated in the manufacturer's instructions / technical documentation
- 161 Note 1 to entry: The effects of actions by non-technical personnel for purposes of loading, unloading, cleaning,
162 defrosting, the manipulation of accessible controls and any removable accessories, etc., according to the
163 **manufacturer's instructions** are within this definition. The effects of actions resulting from interventions by technical
164 personnel for the purposes of maintenance or repair are outside this definition.

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165 **3.2.4**
 166 **test package**
 167 food product used as load when testing chilled food compartments

168 Note 1 to entry: The test packages used in these tests shall be commercially available, unopened, 330 ml cans of
 169 drinks. The difference in heat capacity of different drinks is insignificant.

170 **4 General requirements**171 **4.1 Applicability**

172 This European Standard establishes the tests and calculations necessary to determine the energy rating of a
 173 vending machine.

174 The standard relates to the categories of vending machines described in Table 2 and to any combination of
 175 them.

176 **Table 2 — Description of vending machine categories**

CATEGORY	MACHINE TYPE	COMMENT
1	Refrigerated closed fronted can and bottle machines where the products are held in stacks	These machines serve refrigerated beverages that are not visible before vending.
2	Refrigerated glass fronted can and bottle, confectionery & snack machines	These machines are for foodstuffs which are refrigerated for reasons not related to food safety
3	Refrigerated glass fronted machines entirely for perishable foodstuffs	These machines are refrigerated for food safety reasons and have a health control cut-out function
4	Refrigerated dual-temperature glass fronted machines	These machines have two compartments, each of which is held at a different temperature, one of which is for perishable food. The compartment containing perishable food must be controlled by a health control cut-out function.
5	Confectionery and snack machines that are not refrigerated	These machines store product at ambient temperature without cooling
6	Combination machines consisting of two different categories of machine in the same housing and powered by one chiller.	The machines usually consist of two machine modules separated by a vertical panel but could also be two units mounted one above the other. Typical combination machine would consist of a closed fronted bottle machine and a glass fronted snack machine, or two separate food and snack machines.

177 The following types of vending machine are excluded from this standard:

- 178 — drink machines dispensing hot and/or cold drinks into cups;
- 179 — machines with a food heating function;
- 180 — vending machines operating at temperatures below 0 °C; or
- 181 — any machine including one or more of these compartments.

182 The machine manufacturer shall provide adequate information to confirm that the machine is suitable for
 183 testing according to this specification and that it can perform the tests as required, if necessary with minimum
 184 intervention by manufacturers' technical staff.

185 Information shall be provided by completing the test report in Annex B.

186 4.2 Test room

187 Tests shall be carried out in a test room at climate class (3, 25 ± 1) °C and (60 ± 5) % relative humidity with
188 defined air movement. The conditions in the test room shall be measured by a probe located 500 mm
189 upstream of the vending machine (on the air supply side of the cabinet) in line with the front of the cabinet
190 and at half the height of the vending machine being tested.

191 Lighting shall be installed to maintain (600 ± 100) lx measured at a height of 1 m above the floor level.

192 Air movement shall be provided. The air movement shall be, as far as practicable, parallel to the plane of the
193 cabinet opening and to the horizontal axis. The air velocity at any point on the vertical side of the vending
194 machine shall be between 0,1m/s and 0,2 m/s.

195 The direction of air flow shall be such that the air does not enter the cabinet when the door is open.

196 4.3 Instruments, measuring equipment and measuring accuracy

197 All measurement shall be carried out with instruments that have been calibrated.

198 Temperature measurements shall be made to an accuracy of ± 1 °C. The time interval between temperature
199 measurements should be no greater than 1 min.

200 Time measurements shall be made to the nearest [0.01] hours.

201 Relative humidity shall be measured to an accuracy of ± 5 %.

202 Electrical energy consumption shall be measured to a resolution of $\pm 0,01$ kWh and with an accuracy of
203 ± 1 %.

204 NOTE See EN 50564 for guidance on power measurement.

205 4.4 Power supply

206 The tolerance on power supply shall be ± 2 % for voltage and ± 1 % for frequency in relation to the nominal
207 values given on the marking plate or otherwise stated by the manufacturer.

208 5 Conditions for the tests

209 5.1 General

210 Each machine intended to be tested shall be representative of stock or routine production and shall be
211 typical in construction and have only default settings as supplied on delivery to the customer except as
212 required to meet 5.6 and to achieve the operational modes required under 6.3.

213 Machines are to be prepared according to the **manufacturer's instructions** as if they were to be installed in
214 their intended vending location, including the fitting of parts such as leg covers and spacers.

215 Unless otherwise specified, the tests are carried out on a single machine that shall withstand all the relevant
216 tests, and are carried out in the order given in this standard.

217 Machines are to be categorised according to the information in the manufacturer's brochure.

218 A machine described as being capable of being operated as a chilled food machine and fitted with a health
219 cut out function shall be tested as a category 3 machine.

220 Where a machine which is described as providing the facility for a compartment to sell perishable food, and
221 the compartment is fitted with a health control cut out function, it must be tested as a category 4 machine.

222 Where a machine is fitted with a chiller but no reference is made to perishable food, it is to be tested as a
223 category 2 machine.

224 All carousel or drum machines (where the products on display are held on a circular disc) fitted with a chiller
225 are to be tested as category 3 machines.

226 Combination machines shall be supplied by the manufacturer with as nearly as possible half the total volume
227 set up for each category of machine, e.g. half as can/bottle and half as snack.