



# SLOVENSKI STANDARD

## SIST EN 16838:2025

01-januar-2025

Nadomešča:  
SIST EN 16838:2019

---

### Hladilne vitrine in skrinje za sladoled - Razvrščanje, zahteve, zmogljivost in preskus porabe energije

Refrigerated display scooping cabinets and pozzetto for gelato - Classification, requirements, performance and energy consumption testing

Verkaufskühlmöbel und Pozzetti für Speiseeis - Klassifizierung, Anforderungen, Leistung und Energieaufnahmeprüfung

Vitrines réfrigérées de vente de glace et pozzetto - Classification, exigences, performance et essai de consommation énergétique

Ta slovenski standard je istoveten z: **EN 16838:2024**

<https://standards.iteh.ai/catalog/standards/sist/312712a0-8485-4ce4-bebf-f274d6268a02/sist-en-16838-2025>

---

#### **ICS:**

97.130.20      Hladilne naprave za trgovine      Commercial refrigerating appliances

**SIST EN 16838:2025**

**en,fr,de**



EUROPEAN STANDARD

EN 16838

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2024

ICS 97.130.20

Supersedes EN 16838:2019

English Version

## Refrigerated display scooping cabinets and pozzetto for gelato - Classification, requirements, performance and energy consumption testing

Vitrines réfrigérées de vente de glace et pozzetti -  
Classification, exigences, performance et essai de  
consommation énergétique

Verkaufskühlmöbel und Pozzetti für Speiseeis -  
Klassifizierung, Anforderungen, Leistung und  
Energieaufnahmeprüfung

This European Standard was approved by CEN on 30 September 2024.

CEN 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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

[SIST EN 16838:2025](https://standards.itech.ai/catalog/standards/sist/312712a0-8485-4ce4-bebf-f274d6268a02/sist-en-16838-2025)

<https://standards.itech.ai/catalog/standards/sist/312712a0-8485-4ce4-bebf-f274d6268a02/sist-en-16838-2025>



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

## Contents

	Page
European foreword .....	4
<b>1 Scope</b> .....	<b>5</b>
<b>2 Normative references</b> .....	<b>5</b>
<b>3 Terms and definitions</b> .....	<b>5</b>
<b>4 Symbols and abbreviations</b> .....	<b>8</b>
<b>5 Requirements</b> .....	<b>9</b>
<b>5.1 Construction</b> .....	<b>9</b>
<b>5.1.1 General</b> .....	<b>9</b>
<b>5.1.2 Materials</b> .....	<b>10</b>
<b>5.1.3 Refrigerating system</b> .....	<b>10</b>
<b>5.1.4 Electrical components</b> .....	<b>11</b>
<b>5.1.5 Temperature display</b> .....	<b>11</b>
<b>5.2 Operating characteristics</b> .....	<b>12</b>
<b>5.2.1 Classification according to temperature</b> .....	<b>12</b>
<b>5.2.2 Defrosting</b> .....	<b>14</b>
<b>5.2.3 Water vapour condensation</b> .....	<b>14</b>
<b>5.2.4 Energy consumption</b> .....	<b>14</b>
<b>5.2.5 Specific energy consumption</b> .....	<b>14</b>
<b>6 Test condition</b> .....	<b>14</b>
<b>6.1 General</b> .....	<b>14</b>
<b>6.2 Tests outside test room</b> .....	<b>15</b>
<b>6.3 Tests inside test room</b> .....	<b>19</b>
<b>6.3.1 General</b> .....	<b>19</b>
<b>6.3.2 Test room — General design, walls, floor and radiant heat</b> .....	<b>19</b>
<b>6.3.3 Preparation and general test procedures for gelato scooping cabinet and pozzetto</b> .....	<b>27</b>
<b>6.3.4 Temperature test</b> .....	<b>37</b>
<b>6.3.5 Water vapour condensation test</b> .....	<b>41</b>
<b>6.3.6 Electrical energy consumption test</b> .....	<b>43</b>
<b>6.3.7 Heat extraction rate measurement when condensing unit is remote from gelato scooping cabinet and pozzetto</b> .....	<b>43</b>
<b>7 Test report</b> .....	<b>49</b>
<b>7.1 General</b> .....	<b>49</b>
<b>7.2 Tests outside test room</b> .....	<b>49</b>
<b>7.3 Tests inside test room</b> .....	<b>50</b>
<b>7.3.1 General test conditions</b> .....	<b>50</b>
<b>7.3.2 Gelato scooping cabinet and pozzetto preparation</b> .....	<b>50</b>
<b>7.3.3 Temperature test</b> .....	<b>51</b>
<b>7.3.4 Water vapour condensation test</b> .....	<b>52</b>
<b>7.3.5 Electrical energy consumption test</b> .....	<b>52</b>
<b>7.3.6 Heat extraction rate measurement when the condensing unit is remote from the gelato scooping cabinet and pozzetto</b> .....	<b>52</b>
<b>8 Marking</b> .....	<b>54</b>
<b>8.1 Marking plate</b> .....	<b>54</b>
<b>8.2 Information to be supplied by the manufacturer</b> .....	<b>54</b>

<b>Annex A (normative) Data requirements for performance and energy rating of gelato scooping cabinets and pozzetto.....</b>	<b>56</b>
<b>A.1 General .....</b>	<b>56</b>
<b>A.2 Designation of gelato scooping cabinets families .....</b>	<b>56</b>
<b>A.3 Data requirements for rating of gelato scooping cabinets and pozzetto with incorporated condensing unit .....</b>	<b>56</b>
<b>A.4 Data requirements for rating of gelato scooping cabinets and pozzetto with remote condensing unit.....</b>	<b>59</b>
<b>Annex ZA (informative) Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EU) No 2019/2024 OJEU L 315/313 aimed to be covered.....</b>	<b>60</b>
<b>Annex ZB (informative) Relationship between this European Standard and the energy labelling requirements of Commission Delegated Regulation (EU) No 2019/2018 OJEU L 315/155 aimed to be covered.....</b>	<b>61</b>

iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

[SIST EN 16838:2025](https://standards.iteh.ai/catalog/standards/sist/312712a0-8485-4ce4-bebf-f274d6268a02/sist-en-16838-2025)

<https://standards.iteh.ai/catalog/standards/sist/312712a0-8485-4ce4-bebf-f274d6268a02/sist-en-16838-2025>

## EN 16838:2024 (E)

### European foreword

This document (EN 16838:2024) has been prepared by Technical Committee CEN/TC 44 “Commercial and Professional Refrigerating Appliances and Systems, Performance and Energy Consumption”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2025, and conflicting national standards shall be withdrawn at the latest by April 2025.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 16838:2019.

EN 16838:2024 includes the following significant technical changes with respect to EN 16838:2019:

- addition of Annexes ZA and ZB;
- definition of the split system and relevant method for the measurement of energy consumption.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annexes ZA and ZB, which are integral parts of this document.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

<https://standards.iteh.ai/catalog/standards/sist/312712a0-8485-4ce4-bebf-f274d6268a02/sist-en-16838-2025>

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

## 1 Scope

This document specifies classification, requirements for the construction, performance and energy consumption testing of:

- gelato scooping cabinets used for sale and display of artisan and self-made gelato;
- pozzetto used for sale of artisan and self-made gelato, without any display function.

It specifies test conditions and methods for checking that the requirements have been satisfied, their marking and the list of their characteristics to be declared by the manufacturer.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60335-1:2020, *Household and similar electrical appliances — Safety — Part 1: General requirements*

IEC 60335-2-89:2019, *Household and similar electrical appliances — Safety — Part 2-89: Particular requirements for commercial refrigerating appliances and ice-makers with an incorporated or remote refrigerant unit or motor-compressor*

ISO 5149-2:2014, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 2: Design, construction, testing, marking and documentation*

## 3 Terms and definitions

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

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

— ISO Online browsing platform: available at <https://www.iso.org/obp/ui/#iso:code:3d:67:268a02/sist-en-16838-2025>

— IEC Electropedia: available at <https://www.electropedia.org/>

### 3.1

#### **gelato scooping cabinets**

refrigerating appliance with a direct sales function which enables artisan and self-made gelato contained in tubs to be stored, displayed and scooped within prescribed temperature limits

Note 1 to entry: Artisan and self-made gelato are hereafter called “gelato”.

### 3.2

#### **pozzetto**

refrigerating appliance with a direct sales function which enables artisan and self-made gelato contained in tubs to be stored and scooped within prescribed temperature limits

Note 1 to entry: Pozzetto is not provided of a display function.

### 3.3

#### **storage section**

non-visible part of the gelato scooping cabinet used only to store the product, separated from the display volume and with a different access

**EN 16838:2024 (E)****3.4****display section**

visible part of the gelato scooping cabinet used to display and to scoop the product

**3.5****pozzetto section**

part of the pozzetto used to scoop the product

**3.6****cover**

sliding door or night curtain or swivel panes

**3.7****lid**

removable cover for pozzetto section

**3.8****gelato tub**

container intended to store gelato

**3.9****net volume**

volume containing gelato within the top edge of the tub

**3.10****top display area of gelato tub**

area delimited by the external perimeter of a visible gelato tub top side

**3.11****front display area of gelato tub**

area delimited by the external perimeter of a visible gelato tub front side

<https://standards.iteh.ai/catalog/standards/sist/312712a0-8485-4ce4-bebf-f274d6268a02/sist-en-16838-2025>

**3.12****lateral display area of gelato tub**

area delimited by the external perimeter of a visible gelato tub lateral side

**3.13****total net storage volume**

$V_s$

sum of net volume of each tub contained in the storage section

**3.14****total net volume of pozzetto section**

$V_p$

sum of net volume of each tub contained in pozzetto section

**3.15****total display area**

**TDA**

sum of the top, front and lateral display areas of each visible gelato tub



**3.16****product family**

group of gelato scooping cabinets and pozzetto in accordance with Table A.1

**3.17****anti-condensate energy consumption****AEC**

energy consumed to remove condensate on the external surface of the gelato scooping cabinet and pozzetto, which includes fan and condensate heater energy expressed in kW·h per day

**3.18****defrost energy consumption****DFEC**

energy consumed by defrost heaters during defrost period expressed in kW·h per day

**3.19****fan energy consumption****FEC**

energy consumed by fan motors expressed in kW·h per day

**3.20****lighting energy consumption****LEC**

energy consumed by lights fitted in the gelato scooping cabinet and pozzetto, expressed in kW·h per day

**3.21****condensate evaporator pan energy consumption****PEC**

energy consumed to evaporate water collected from defrost expressed in kW·h per day

**3.22****total revised refrigeration energy consumption****TECR**

total revised energy consumption obtained from DEC and additional or alternative component energy consumption

**3.23****direct electrical energy consumption****DEC**

daily electrical energy consumption of electrical components of the cabinet

**3.24****refrigeration electrical energy consumption****REC**

daily refrigeration electrical energy consumption for remote gelato scooping cabinet and remote pozzetto for compression-type refrigerating system

**3.25****total energy consumption****TEC**

sum of direct electrical energy consumption and refrigeration electrical energy consumption

**EN 16838:2024 (E)****3.26****condensing unit**

combination of one or more compressors, condensers, and liquid receivers (when required) and the regularly furnished accessories

**3.27****remote condensing unit**

condensing unit that is located remotely from the gelato scooping cabinet and pozzetto, which is not an integral part of the cabinet

**3.28****split condensing unit**

condensing unit that is located remotely from the gelato scooping cabinet and pozzetto, which is supplied with the cabinet

**4 Symbols and abbreviations**

$t_{\text{run}}$	running time — time during which compressor is running (or solenoid valve is open), within 24 h, expressed in hours
$t_{\text{stop}}$	stopping time — time during which compressor is not running (or solenoid valve is closed) within 24 h and excluding defrost time, expressed in hours
$t_{\text{def}}$	defrost time — time during which compressor is running and hot gas solenoid valve is open (or reverse cycle valve is open)
$q_m$	mass flow rate of liquid refrigerant in kilograms per second
$\Delta t$	time between two consecutive measuring samples, in hours
$N_{\text{max}}$	number of measuring samples in 24 h
$n_{\text{def}}$	number of defrosts during 24 h
TDA	total display area, in square meters
$V_p$	total net volume of pozzetto section, in litres
$V_s$	total net volume of storage section, in litres
TEC/TDA	specific energy consumption (SEC-D) for gelato scooping cabinet expressed in kilowatt hours per 24 h per square meters
TEC/ $V_p$	specific energy consumption (SEC- $V_p$ ) for pozzetto expressed in kilowatt hours per 24 h per litres

$t_{rr}$  relative or percentage running time:

$$t_{rr} = \frac{t_{run}}{t_{run} + t_{stop}} = \frac{t_{run}}{24 - t_{deft}}$$

where

$$t_{run} + t_{stop} + t_{deft} = 24h$$

$\Phi_n$  instant heat extraction rate in kilowatts

$h_8, h_4$  specific enthalpy in kilojoules per kilogram, where state in Figure 15 corresponds to refrigerant outlet, and state in Figure 16 to refrigerant inlet, of gelato scooping cabinet and pozzetto

$\theta_7$  refrigerant temperature at evaporator outlet, in degrees Celsius

$\theta_8$  refrigerant temperature at the gelato scooping cabinet and pozzetto outlet, in degrees Celsius

$\theta_4$  refrigerant temperature at the gelato scooping cabinet and pozzetto inlet, in degrees Celsius

$\theta_5$  refrigerant temperature at evaporator inlet, in degrees Celsius

$p_8$  refrigerant pressure at the gelato scooping cabinet and pozzetto outlet, in Pascals

$\theta_{mrun}$  arithmetic average of evaporator-saturated temperature obtained from pressure  $p_8$  by referring to table of saturation properties for refrigerant in use — during  $t_{run}$ , in degrees Celsius

$\theta_{min}$  arithmetic average of evaporator-saturated temperature obtained from pressure  $p_8$  by referring to table of saturation properties for refrigerant in use — during the last 10 % of all running periods, in degrees Celsius

$T_{mrun} = \theta_{mrun} + 273,15$  in Kelvin

## 5 Requirements

### 5.1 Construction

#### 5.1.1 General

##### 5.1.1.1 Strength and rigidity

The gelato scooping cabinet or pozzetto and its parts shall be constructed with adequate strength and rigidity for normal conditions of handling, transport and use and attention shall be given to the following:

- a) interior fittings, including shelves, baskets, rails, etc. and their supports, shall be sufficiently strong for the duty required;
- b) where sliding shelves, baskets, trays or drawers are fitted they shall retain their shape and ease of movement when fully loaded;

**EN 16838:2024 (E)**

- c) any fitments which are provided with stops to prevent accidental removal shall be self-supporting when fully loaded and withdrawn to the limit of the stops.

**5.1.1.2 Pipes and connections**

Pipes and connections to moving or resiliently mounted parts shall be arranged so as not to foul or transmit harmful vibrations to other parts. All other pipes and connections shall be securely anchored and sufficient free length and/or vibration eliminators shall be provided to prevent failure due to fatigue. Where necessary, pipes and valves shall be adequately thermally insulated.

**5.1.1.3 Condensate drainage**

Where drains, drip trays or evaporation receptacles are fitted, they shall have ample capacity and shall be easily accessible and cleanable.

Any condensate or defrost water receptacle, or group of receptacles, requiring to be emptied manually shall have a capacity equivalent to at least 48 h of normal operation in the appropriate climate class for which the gelato scooping cabinet or pozzetto is intended.

**5.1.1.4 Joints and seams**

All construction joints and seams within the net volume shall prevent the accumulation of potentially contaminating substances.

All construction joints and seams within the net volume shall permit the easy removal of any deposits of potentially contaminating substances.

**5.1.2 Materials**

The materials shall be durable and shall not favour the development of mould or emit odours.

Under normal conditions of use, materials in contact with foodstuffs shall be resistant to moisture and shall neither be toxic nor contaminate them.

**5.1.3 Refrigerating system****5.1.3.1 Design and construction**

The design and construction of all parts of the refrigerating system subject to internal pressure shall take into account the maximum working pressure to which they are subjected when the gelato scooping cabinet and pozzetto are in operation or at rest.

For gelato scooping cabinets and pozzetto with integral condensing unit or components thereof which are charged with refrigerant prior to transportation, the maximum ambient temperature during transit shall be taken into account. All refrigerant containing components shall be in accordance with ISO 5149-2:2014.

**5.1.3.2 Condensation**

There shall be suitable means to prevent water condensed on cold surfaces of the gelato scooping cabinet and pozzetto and their parts from harmfully affecting the operation of the refrigerating system or its controls.

### 5.1.3.3 System protection

For gelato scooping cabinets fitted with covers, the refrigerating system shall suffer no damage if any cover in the gelato scooping cabinet is left open while the gelato scooping cabinet is operating in an ambient temperature corresponding to the climate class (see Table 4) for which the gelato scooping cabinet is intended.

When the cover is kept open under normal operating conditions (for example, during product loading) or is left open accidentally, any automatic motor overload protective device may come into operation.

For pozzetto fitted with lids, the refrigerating system shall suffer no damage if any lid in the pozzetto is left open while the pozzetto is operating in an ambient temperature corresponding to the climate class (see Table 4) for which the pozzetto is intended.

When the lid is kept open under normal operating conditions (for example, during product loading) or is left open accidentally, any automatic motor overload protective device may come into operation.

### 5.1.3.4 Refrigerant

When deciding on the refrigerant for the system, attention shall be given to the possible hazards associated with the use of certain refrigerants, due to their toxicity, flammability etc. Guidance on this point is available in ISO 5149-2:2014.

### 5.1.4 Electrical components

Electrical components shall be in accordance with IEC 60335-2-89:2019 and IEC 60335-1:2020.

### 5.1.5 Temperature display

#### 5.1.5.1 General

The gelato scooping cabinets and pozzetto shall incorporate a temperature display instrument showing the air temperature in the refrigerated equipment to provide an indication of the operation and functioning of refrigerating equipment and information on its operating state.

NOTE As a rule, measured air temperature is not identical with gelato temperature in gelato scooping cabinets and pozzetto.

#### 5.1.5.2 Temperature-measuring instrument

Suitable temperature-measuring instruments shall be used, i.e. those that fulfil the following requirements:

- the unit symbol (°C) shall be inscribed or displayed on the temperature-measuring instrument;
- the range of measurement shall be at least from -25 °C to +15 °C;
- the scale division or smallest numerical increment shall be less than or equal to 1 °C;
- the maximum errors shall be 2 K over the total measuring range;
- the time constant  $t_{90}$  of the sensor shall be equal to or less than 20 min.

NOTE The  $t_{90}$  time is the time in which 90 % of a sudden temperature change of 20 °C is indicated, the measurement medium being moderately agitated air (velocity 1 m/s).

**EN 16838:2024 (E)****5.1.5.3 Temperature sensor location**

The temperature sensor location shall be readily accessible to enable on site testing for the correct indication of temperature and replacement of the temperature measuring instrument on site in service.

NOTE 1 The temperature sensor of a thermometer is considered to be “readily accessible” if it is reachable directly for examination. It ought to be necessary to remove access panel(s) to carry out replacement.

NOTE 2 For gelato scooping cabinets and pozzetto with natural convection cooling, the positioning of the temperature sensor in a guide tube is also considered to be “readily accessible” if the sensor is introduced into and removed from the guide tube without a tool.

Wherever possible, the mounting method shall not supply heat to, or withdraw heat from the temperature sensor.

The temperature sensor shall be protected against heat radiation from the external ambient.

The temperature sensor location is defined as part of the temperature test of the gelato scooping cabinet and pozzetto. During the temperature test air temperatures at the declared sensor location shall be measured and these values noted in the test report.

NOTE 3 It is the responsibility of the supplier and end user to ensure that the temperature measurements comply with national regulation on temperature control of gelato.

**5.2 Operating characteristics****5.2.1 Classification according to temperature**

The performance of gelato scooping cabinet and pozzetto shall comply with one of the classifications defined in Table 1. The performance shall be verified in accordance with the conditions and test methods specified in 6.3.3.

**Table 1 — Temperature classes**

Class	Highest temperature, $\theta_{ah}$ , of warmest M-test gelato tubs colder than or equal to <sup>a</sup>	Lowest temperature, $\theta_b$ , of coldest M-test gelato tubs warmer than or equal to <sup>a</sup>	Highest minimum temperature, $\theta_{al}$ , of all test tubs colder than or equal to <sup>a</sup>
	°C		
G1	-10	-14	—
G2	-10	-16	—
G3	-10	-18	—
L1	-15	—	-18
L2	-12	—	-18
L3	-12	—	-15
S	Special classification		
<sup>a</sup> See Figure 1.			