
Hladilne omare za živila - Toplotna in energijska učinkovitost, ocene, okoljski preskusni pogoji in povezane preskusne metode (ISO 19424:2026)

Refrigerated food lockers - Thermal and energy performance, ratings, environmental test conditions and associated testing methods (ISO 19424:2026)

Schließfächer mit Kühlfunktion für Lebensmittel - Thermische und energetische Leistung, Bewertungen, Umgebungsprüfbedingungen und zugehörige Prüfverfahren (ISO 19424:2026)

Casiers réfrigérés pour aliments - Performance thermique et énergétique, évaluation, conditions d'essai environnementales et méthodes d'essai associées (ISO 19424:2026)

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ICS:

97.040.30

Hladilni aparati za dom

Domestic refrigerating
appliances**SIST EN ISO 19424:2026****en,fr,de**

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EN ISO 19424

September 2026

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English Version

Refrigerated food lockers - Thermal and energy
performance, ratings, environmental test conditions and
associated testing methods (ISO 19424:2026)

Casiers réfrigérés pour aliments - Performance
thermique et énergétique, évaluation, conditions
d'essai environnementales et méthodes d'essai
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Thermische und energetische Leistung, Bewertungen,
Umgebungsprüfbedingungen und zugehörige
Prüfverfahren (ISO 19424:2026)

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European foreword

This document (EN ISO 19424:2026) has been prepared by Technical Committee ISO/TC 86 "Refrigeration and air-conditioning" in collaboration with Technical Committee CEN/TC 44 "Commercial and Professional Refrigerating Appliances and Systems, Performance and Energy Consumption" the secretariat of which is held by UNI.

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**International
Standard**

ISO 19424

**Refrigerated food lockers —
Thermal and energy performance,
ratings, environmental test
conditions and associated testing
methods**

*Casiers réfrigérés pour aliments — Performance thermique et
énergétique, évaluation, conditions d'essai environnementales et
méthodes d'essai associées*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 86 *Refrigeration and air-conditioning*, Subcommittee SC 7, *Testing and rating of commercial refrigerated display cabinets*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 44, *Commercial and professional refrigerating appliances and systems, performance and energy consumption*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Refrigerated food lockers — Thermal and energy performance, ratings, environmental test conditions and associated testing methods

1 Scope

This document specifies requirements for the thermal and energy performance of refrigerated food lockers in given environmental conditions and intended for the temporary cold storage of chilled or frozen pre-ordered or pre-selected foodstuff until the final collection by the consumer.

This document also covers construction characteristics relevant for thermal and energy performance.

This document specifies tests conditions and methods for checking the requirements to be satisfied as well as the classification of refrigerated lockers, their marking and the list of characteristics to be declared by the manufacturer.

This document is not applicable to refrigerated vending machines.

It is also not applicable to:

- commercial beverage coolers covered by ISO 22044;
- ice cream freezers covered by ISO 22043;
- refrigerated display cabinets covered by ISO 23953-1 and ISO 23953-2;
- cabinets intended for storage or cabinets intended for use, e.g. in catering or non-retail refrigerated applications.

This document does not cover health and safety aspects and ergonomic principles.

The document does not cover safe storage temperatures for any specific perishable foodstuff.

The refrigeration system, providing the cooling function, is either fully or partially integrated or completely remote from the refrigerated food locker and connected by interconnecting pipe-work.

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.

ISO 23953-1, *Refrigerated display cabinets — Part 1: Vocabulary*

ISO 23953-2:2023, *Refrigerated display cabinets — Part 2: Classification, requirements and test conditions*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 23953-1 and the following apply.

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

3.1.1

refrigerated food locker locker

commercial appliance with frozen, chilled or high temperature storage temperature zones, intended for the temporary cold storage of pre-ordered or pre-selected foodstuff until the final collection by the consumer

Note 1 to entry: Refrigerated food lockers are foreseen for constant operation and are located inside or outside a building or under a specific weather protection which is not part of the refrigerated food locker.

Note 2 to entry: The refrigeration system, providing the cooling function, is either fully or partially integrated or completely remote from the refrigerated food locker and connected by interconnecting pipe-work.

Note 3 to entry: A refrigerated food locker consists of a single or multiple separated cold storage compartments with frozen, chilled, high temperature or switchable storage temperature zones, see [Table 1](#).

Note 4 to entry: Compartments are thermally insulated and access to the foodstuff is via a locked door or locked opening(s).

Note 5 to entry: The loading of the refrigerated food locker with the foodstuff is executed by professional personnel from the operator either from the front or back and self-served by the consumer from the front.

3.1.2

installation

assembly of compartments, lockers, refrigerating system and all the apparatus necessary for their operation, which can be connected on-site to make a complete system

3.1.3

protected installation

installation specifically designed for outdoor locations and capable of operating under specific range of outdoor conditions, in accordance with the information provided in the manufacturer's instructions

Note 1 to entry: Typically, a protected installation is sheltered by an incomplete enclosure which includes one or more walls and a roof. The roof typically projects on the front side of the installation for a length which guarantees protection from dripping water with a maximum tilt angle of 15 °, see [Figure 1](#).

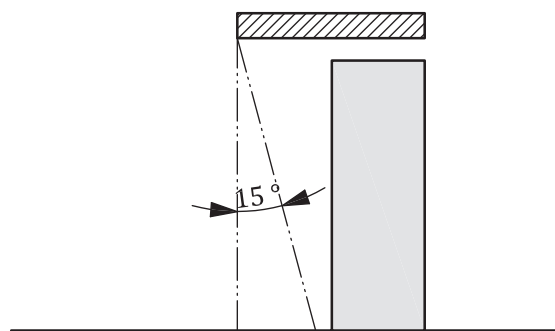


Figure 1 — Protected installation

3.1.4

indoor location

enclosed room or space inside a building, with controlled or uncontrolled environmental conditions

3.1.5

outdoor location

location outside of any building or structure, exposed to the external ambient, with no protection

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3.1.6

net volume

storage volume inside the appliance which can be used for storage of products

Note 1 to entry: Net volume shall be calculated in accordance with [Annex A](#).

3.2 Symbols

3.2.1 General

t_{run}	running time, expressed in h
t_{stop}	stopping time, expressed in h
t_{deft}	defrost time, expressed in h
q_m	mass flow rate of liquid refrigerant or secondary refrigerant, expressed in kg/s
Δt	time between two consecutive measuring samples, expressed in h
N_{max}	number of measuring samples, expressed in 24 h
Φ_{24}	heat extraction rate during a whole day, expressed in kW
$\Phi_{24\text{-deft}}$	heat extraction rate during a whole day excepting defrost time, expressed in kW
$E_{\text{CPEC},24\text{ h}}$	pumping electrical energy consumption, expressed in kWh
$E_{\text{DEC},24\text{ h}}$	direct daily electrical energy consumption, expressed in kWh
E_{HREC}	heat removal energy consumption, expressed in kWh
E_{LEC}	lighting energy consumption, expressed in kWh
$E_{\text{REC},24\text{ h}}$	refrigeration electrical energy consumption, expressed in kWh
$E_{\text{REC-RC},24\text{ h}}$	refrigeration electrical energy consumption compression-type, expressed in kWh
$E_{\text{REC-RI},24\text{ h}}$	refrigeration electrical energy consumption indirect, expressed in kWh
E_{SEC}	specific daily electrical energy consumption, expressed in kWh/m ²
E_{TEC}	total energy consumption, expressed in kWh
t_{rr}	relative or percentage running time:

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

where

$$t_{\text{run}} + t_{\text{stop}} + t_{\text{deft}} = 24$$

Φ_n instant heat extraction rate, expressed in kW

V_N net volume

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3.2.2 Compression-type refrigeration systems

h_8, h_4	specific enthalpy, expressed in kJ/kg, where state at point 8 corresponds to refrigerant outlet, and state at point 4 to refrigerant inlet, of locker
θ_{mrun}	evaporating temperature, calculated as the average of θ_{dew} and θ_{bub} obtained from pressure p_8 and averaged over the t_{run} period, expressed in °C
T_{mrun}	$= \theta_{\text{mrun}} + 273,15$, expressed in K

3.2.3 Indirect refrigeration-type systems

θ_i	secondary fluid temperature at locker inlet, expressed in °C
θ_o	secondary fluid temperature at locker outlet, expressed in °C
θ	secondary fluid median temperature, expressed in °C $(\theta_i + \theta_o)/2$
θ_{mrun}	arithmetic average of the secondary fluid median temperature (θ) during t_{run} , expressed in °C
q_L	instant value of the secondary fluid mass flow during t_{run} , expressed in kg/s
c_i	specific heat of secondary fluid, expressed in kJ/(kg · K), at locker inlet
c_o	specific heat of the secondary fluid, expressed in kJ/(kg · K), at locker outlet
$p_{\text{irun}} - p_{\text{orun}}$	pressure drop between inlet and outlet of locker during t_{run} , expressed in kPa
v	specific volume of secondary fluid, expressed in m ³ /kg (simplification: $v = \text{constant} = 0,001 \text{ m}^3/\text{kg}$)

4 Requirements

4.1 General

The installation can be indoor or outdoor. In case of outdoor installation, a protected installation shall have the following characteristics:

- avoid direct sun radiation 1 m of shadow;
- protect from rain;
- protect from dust;
- protect from wind;
- protect from snow loading (for the food locker itself) shall be taken into account 20 kg/m² for outdoor installation.

4.2 Construction

The locker and its parts shall be constructed for normal conditions of handling, transport and use. The following requirements apply:

- a) Interior fittings, including shelves, baskets, rails, etc. and their supports, shall withstand the loads for the intended use.
- b) Where sliding shelves, baskets, trays or drawers are fitted they shall retain their shape and ease of movement when fully loaded.

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- 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.

4.3 Operating characteristics

4.3.1 Classification according to temperature storage

The performance of lockers shall be in conformity with one of the classifications defined in [Table 1](#). The performance shall be verified in accordance with the conditions and test methods specified in [Clause 5](#).

Table 1 — M-package temperature classes

Class	Highest temperature, θ_{ah} , of warmest M-package less than or equal to (see Figure 9)	Lowest temperature, θ_b , of coldest M-package greater than or equal to (see Figure 9)	Lowest temperature, θ_{al} , of warmest M-package less than or equal to (see Figure 9)
	°C		
L1	-15	—	-18
M1	+5	-1	—
HT	+20	+10	—
AF	—	+ 5	—
Key L1 Frozen temperature class M1 Chilled temperature class HT High temperature class AF antifreeze class			

4.3.2 Classification according to environmental condition

Outdoor installation requires that the manufacturer state the maximum as well as the minimum environmental classes that the appliance is capable of sustaining with no changes.

Test for a winter condition shall be verified in a cold room, in one of the conditions listed in [Table 3](#) according to the relevant test of [Clause 5](#).

Classes intended to simulate outdoor winter conditions are specified in [Table 3](#) with a negative value for test room climate class.

5 Tests

5.1 General

When the characteristics of a locker are to be verified, all the tests shall be applied to the same refrigerated food locker.

All compartments within the locker shall be tested according to the declared temperature classification.

If the locker is capable of operating at different temperature classification., tests shall be carried out at each classification. Tests shall be carried out for each declared performance within the classes defined in [Table 1](#).

If a locker compartment is specified for multiple product temperature classification, the lowest temperature is used for testing of temperature performances ([5.3.4](#)) and energy consumption ([5.3.6](#)).

Lockers shall comply with the requirements specified in [Clause 4](#) using the appropriate test method as described in [Table 2](#).