# KÜLMLETID. OSA 2: KLASSIFIKATSIOON, NÕUDED JA KATSETINGIMUSED

# Refrigerated display cabinets - Part 2: Classification, requirements and test conditions (ISO 23953-2:2023)

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD



| | |
|---|---|
| See Eesti standard EVS-EN ISO 23953-2:2023 sisaldab Euroopa standardi EN ISO 23953-2:2023 ingliskeelset teksti. | This Estonian standard EVS-EN ISO 23953-2:2023 consists of the English text of the European standard EN ISO 23953-2:2023. |
| Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas. | This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation. |
| Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 20.12.2023. | Date of Availability of the European standard is 20.12.2023. |
| Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest. | The standard is available from the Estonian Centre for Standardisation and Accreditation. |

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 97.130.20

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN ISO 23953-2

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Supersedes EN ISO 23953-2:2015

English Version

# Refrigerated display cabinets - Part 2: Classification, requirements and test conditions (ISO 23953-2:2023)

Meubles frigorifiques de vente - Partie 2: Classification, exigences et méthodes d'essai (ISO 23953-2:2023)

Verkaufskühlmöbel - Teil 2: Klassifizierung, Anforderungen und Prüfbedingungen (ISO 23953-2:2023)

This European Standard was approved by CEN on 25 September 2023.

This European Standard was corrected and reissued by the CEN-CENELEC Management Centre on 24 January 2024.



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

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



Ref. No. EN ISO 23953-2:2023 E

## European foreword

This document (EN ISO 23953-2:2023) 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.

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 June 2024, and conflicting national standards shall be withdrawn at the latest by June 2024.

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 ISO 23953-2:2015.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For the relationship with EU Directive(s) / Regulation(s), see informative Annex ZA and ZB, which is an integral part of this document.

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

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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.

## Endorsement notice

The text of ISO 23953-2:2023 has been approved by CEN as EN ISO 23953-2:2023 without any modification.

# 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



This European Standard has been prepared under a Commission's standardization request M/582 C(2022) 2764 final to provide one voluntary means of conforming to the ecodesign requirements of Commission Regulation (EU) No 2019/2024 of 1st October 2019 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for refrigerating appliances with a direct sales function OJEU L 315/313 5th December 2019 keeping into account the amending Commission Regulation (EU) 2021/341 of 23 February 2021 OJEU L 68/108.

Once this standard is cited in the Official Journal of the European Union under that Regulation, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding ecodesign requirements of that Regulation and associated EFTA regulations.

**Table ZA.1 — Correspondence between this European Standard and Commission Regulation (EU) No 2019/2024 of 01 October 2019 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for refrigerating appliances with a direct sales function OJEU L 315/313 5th December 2019 and Commission's standardisation request M/582 C(2022) 2764 final**

| Ecodesign Requirements of Regulation (EU) No 2019/2024 OJEU L 315/313 5th December 2019 | Clause(s)/sub-clause(s) of this EN | Remarks/Notes |
|---|---|---|
| Article 4.3. (b) | Annex D.3, D.4, D.5, D.6, D.7, D.8 | Calculation methods |
| Annex III 1 | Annex D.2 | General condition for the test. See below for loading height references |
| | 5.3.3.3.2 a); b); c) | |
| | 5.3.3.3.2 (d) i. | Loading of vertical closed freezer shall be half loading |
| | 5.3.3.3.2 (d) ii. | Loading of vertical closed chilled cabinet shall be full loading |
| Annex III 2 | 5.1, 5.2.1, 5.2.3, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.6, 5.3.7, Annex A and Annex D | Energy consumption and Annex A for $S_{TDA}$ calculation. $E_{daily}$ is equivalent to $E_{TEC}$; TDA is equivalent to $S_{TDA}$. |
| Annex III Table 4 | Table E.1 | M and N coefficients |

**WARNING 1 —** Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

**WARNING 2 —** Other Union legislation may be applicable to the products falling within the scope of this standard.

# 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



This European Standard has been prepared under a Commission's standardization request M/582 C(2022) 2764 final to provide one voluntary means of conforming to the energy labelling requirements of Commission Delegated Regulation (EU) No 2019/2018 of 11th March 2019 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of refrigerating appliances with a direct sales function OJEU L 315/155 5th December 2019 keeping into account the amending Commission Regulation (EU) 2021/340 of 17 December 2020 OJEU L 68/108.

Once this standard is cited in the Official Journal of the European Union under that Regulation, compliance with the normative clauses of this standard given in Table ZB.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding energy labelling requirements of that Regulation and associated EFTA regulations.

**Table ZB.1 — Correspondence between this European Standard and Commission Delegated Regulation (EU) No 2019/2018 of 11th March 2019 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of refrigerating appliances with a direct sales function OJEU L 315/155 5th December 2019 and Commission's standardisation request M/582 C(2022) 2764 final**

| Energy labelling requirements of Regulation (EU) No 2019/2018 OJEU L 315/155<br>5th December 2019 | Clause(s)/sub-clause(s) of this EN | Remarks/Notes |
|---|---|---|
| Annex III 1.2 item ,vi | 5.1, 5.2.1, 5.2.3, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.6, 5.3.7 and Annex D | Testing methods , efficiency calculation<br>$E_{daily}$ is equivalent to $E_{TEC}$, see line below for Annex IV 2 b. |
| Annex III 1.2 items vii and ix | Annex A | $S_{TDA}$ calculation<br>TDA is equivalent to $S_{TDA}$. See line below for Annex IV 2.c).4.d) (TDA) |
| Annex III 1.2 items viii and x | 5.3.4 | Classification according to temperature |
| Annex IV 1 | Annex D.2 | General condition for the test |
| Annex IV 2 | 5.1, 5.2.1, 5.2.3, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.6, 5.3.7, Annex A and Annex D | Energy consumption and Annex A for $S_{TDA}$ calculation |
| | 5.3.3.3.2 a); b); c) | |

| | | |
|---|---|---|
| | 5.3.3.3.2 (d) i. | Loading of vertical closed freezer shall be half loading |
| | 5.3.3.3.2 (d) ii. | Loading of vertical closed chilled cabinet shall be full loading |
| Annex IV 2 b | 5.1, 5.2.1, 5.2.3, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.6, 5.3.7 and Annex D | $E_{daily}$ is equivalent to $E_{TEC}$. |
| Annex IV 2.c).4.d) (TDA) | Annex A | $S_{TDA}$ calculation<br>TDA is equivalent to $S_{TDA}$. |
| Annex IV Table 3 | Table E.1 | M and N coefficients |

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**WARNING 2 —** Other Union legislation may be applicable to the products falling within the scope of this standard.

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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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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).

This third edition cancels and replaces the second edition (ISO 23953-2:2015), which has been technically revised.

The main changes are as follows:

— revision of:

  — the scope has been revised as this document not applicable to commercial beverage coolers covered by ISO 22044 and ice cream freezers covered by ISO 22043;

  — mass flow with EEV only, to adapt standard to technological improvement;

  — $E_{\mathrm{CPEC,24h}}$ also for brine / indirect cooling;

  — testing repeatability;

  — requirements for refrigerant with glide;

— addition of:

  — extrapolation methods for liquid cooled condensing units, depth, height, length and plug-in alternative components;

  — liquid cooled condensing unit (semi plug-in) type;

— $S_{TDA}$ for new types of cabinets;

— standard rating conditions and configurations;

— marking, load limits, multiple loading line for different M-package temperature.

A list of all parts in the ISO 23953 series can be found on the ISO website.

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 display cabinets —

# Part 2:
# Classification, requirements and test conditions



## 1 Scope

This document specifies requirements for the performance of refrigerated display cabinets used in the sale and display of foodstuffs and construction characteristics impacting performance. It specifies test conditions and methods for checking that the requirements have been satisfied, as well as classification of the cabinets, their marking and the list of their characteristics to be declared by the manufacturer.

This document is not applicable to refrigerated vending machines, commercial beverage coolers covered by ISO 22044, ice cream freezers covered by ISO 22043. It is also not applicable to cabinets intended for storage or cabinets intended for use, for instance, in catering or non-retail refrigerated applications.

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

This document is not intended to specify storage temperature for foodstuff.

## 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 817:2014, *Refrigerants — Designation and safety classification*

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

ISO 23953-1:2023, *Refrigerated display cabinets — Part 1: Vocabulary*

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*

## 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 23953-1:2023 and the following 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

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