

STN	Skúšobné metódy chladiacich zariadení izolovaných prepravných prostriedkov Časť 2: Eutektické chladiace zariadenia	STN EN 16440-2 14 0681
------------	---	--

Testing methodologies for refrigerating devices for insulated means of transport - Part 2: Eutectic cooling devices

Táto norma obsahuje anglickú verziu európskej normy.

This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 08/23

Obsahuje: EN 16440-2:2023

137356

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2023

Slovenská technická norma a technická normalizačná informácia je chránená zákonom č. 60/2018 Z. z. o technickej normalizácii v znení neskorších predpisov.

EUROPEAN STANDARD

EN 16440-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2023

ICS 27.200

English Version

Testing methodologies for refrigerating devices for insulated means of transport - Part 2: Eutectic cooling devices

Méthodes d'essai des dispositifs de réfrigération des moyens de transport isothermes - Partie 2 : Dispositifs de réfrigération eutectiques

Prüfung von Kühleinrichtungen für wärmegeämmte Transportmittel - Teil 2: Eutektische Kühleinrichtungen

This European Standard was approved by CEN on 10 April 2023.

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.



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

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

EN 16440-2:2023 (E)

Contents	Page
European foreword	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
3.1 General terms and definitions	5
3.2 Terms and definitions for eutectic units with fans only	9
3.3 Typical setups for direct and indirect eutectic cooling devices	9
3.4 Symbols and uncertainties	11
4 Requirements	12
4.1 General	12
4.2 Description of the eutectic cooling devices and eutectic units	12
4.3 Test equipment	12
4.3.1 General requirements	12
4.3.2 Requirements for the calorimeter box	13
4.3.3 Requirements for the conditioned test room	16
4.4 Installation and connection of the eutectic cooling device	17
4.4.1 General	17
4.4.2 Installation of eutectic cooling device with locally separated components (split system)	17
5 Test conditions and methodology	17
5.1 General	17
5.2 Test conditions	17
5.2.1 Generality and rated conditions	17
5.2.2 Temperature measurements	18
5.3 Testing of dependent eutectic cooling device	19
5.3.1 General	19
5.3.2 Mandatory test 1: Testing of the charging time and the total energy consumption of the eutectic cooling device	21
5.3.3 Mandatory test 2: Testing of the maximum cooling time and the useful cooling energy	21
5.3.4 Optional test 3: Testing of the recharging time	22
5.3.5 Optional test 4: Testing of cooling time and energy after recharging	22
5.3.6 Measurements for performance testing	22
5.4 Time measurement	23
5.5 Functional tests - Defrosting device test	23
5.6 Air flow measurement	23
6 Test results	23
6.1 General	23
6.2 Useful cooling capacity	24
6.3 Total power	25
6.4 Determination of the cooling energy efficiency ratio EER_C	25
7 Test report	26
8 Marking	27

8.1	Marking, type plate	27
8.2	Information on total energy consumption	27
	Bibliography	28

EN 16440-2:2023 (E)**European foreword**

This document (EN 16440-2:2023) has been prepared by Technical Committee CEN/TC 413 “Insulated means of transport for temperature sensitive goods with or without cooling and/or heating device”, the secretariat of which is held by DIN.

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 December 2023, and conflicting national standards shall be withdrawn at the latest by December 2023.

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.

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.

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 is applicable to eutectic cooling devices which are intended to be used with insulated transport equipment.

The following applications are covered:

- eutectic cooling devices with or without compressor/condenser unit intended to be installed into insulated means of transport (e.g. lorries, trailers, swap bodies, other transport equipment and wagons). Charging of the eutectic elements from the liquid to the solid phase can be performed either by a compressor/condenser unit mounted onto the vehicle or by a stationary direct or indirect system. The eutectic cooling devices are equipped, if relevant, with necessary components for the charging, transmission, cooling and/or with temperature control devices. The eutectic elements can be fitted with or without fans;
- eutectic cooling devices with independent eutectic elements are not covered by this document.

This document specifies the testing methodologies.

This document is only applicable for mono-temperature eutectic cooling devices. This document does not provide any safety requirements.

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.

EN ISO 5801, *Fans — Performance testing using standardized airways (ISO 5801)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025)*

ISO/IEC Guide 99, *International vocabulary of metrology — Basic and general concepts and associated terms (VIM)*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN