SLOVENSKI STANDARD
SIST EN 12830:2001

01-julij-2001

Registratorji temperature za transport, skladiščenje in prodajo hladne, zamrznjene, globoko zamrznjene/hitro zamrznjene hrane in sladoleda - Preskusi, značilnosti, ustreznost

Temperature recorders for the transport, storage and distribution of chilled, frozen, deep-frozen/quick-frozen food and ice cream - Tests, performance, suitability

Temperaturregistriergeräte für den Transport, die Lagerung und die Verteilung von gekühlten, gefrorenen, tiefgefrorenen Lebensmitteln und Eiskrem - Prüfungen, Leistung, Gebrauchstauglichkeit

Enregistreurs de température pour le transport, l'entreposage et la distribution de denrées alimentaires réfrigérées, congelées, surgelées et des cremes glacées - Essais, performance, aptitude a l'emploi

Ta slovenski standard je istoveten z: EN 12830:1999

ICS:

17.200.20	Instrumenti za merjenje temperature	Temperature-measuring instruments
67.260	Tovarne in oprema za živilsko industrijo	Plants and equipment for the food industry

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EUROPEAN STANDARD

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English version

Temperature recorders for the transport, storage and distribution of chilled, frozen, deep-frozen/quick-frozen food and ice cream - Tests, performance, suitability

Enregistreurs de température pour le transport, l'entreposage et la distribution de denrées alimentaires réfrigérées, congelées, surgelées et des crèmes glacées - Essais, performance, aptitude à l'emploi

Temperaturregistriergeräte für den Transport, die Lagerung und die Verteilung von gekühlten, gefrorenen, tiefgefrorenen Lebensmitteln und Eiskrem - Prüfungen, Leistung, Gebrauchstauglichkeit

This European Standard was approved by CEN on 4 June 1999.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 141 "Pressure gauges - Thermometers - Means of measuring and/or recording temperature in the cold chain", the secretariat of which is held by AFNOR.

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 January 2000, and conflicting national standards shall be withdrawn at the latest by January 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Standard is a document meeting the objectives of directives :

- 92/1/EEC of January 13, 1992 of the Commission on the monitoring of temperatures in the means of transport, warehousing and storage of quick-frozen foodstuffs intended for human consumption ;

- 93/43/EEC of June 14, 1993 of the Council of the hygiene of foodstuffs and in particular on "temperature control criteria".

1 Scope

This European Standard specifies the technical and functional characteristics of air temperature recorders for equipping the means used for the transport, storage and distribution of chilled, frozen and deep-frozen/quick-frozen food and ice cream.

It specifies the test methods which allow the determination of the equipment's conformity to suitability and performance requirements.

It applies to the whole recorder-temperature sensor(s). The temperature sensor(s) may be integrated into the recorder or remote from it [external sensor(s)].

It does not define the location of the recorder and its sensors with respect to types of usage such as transport, storage and distribution.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

prEN 13486, *Temperature recorders and thermometers for the transport, storage and distribution of chilled, frozen, deep-frozen/quick-frozen food and ice-cream – Periodic verification*

EN 50081-1, *Electromagnetic compatibility - Generic emission standard - Part 1 : Residential, commercial and light industry.*

EN 50082-1, *Electromagnetic compatibility - Generic immunity standard - Part 1 : Residential, commercial and light industry.*

EN 60068-2-27, *Basic environmental testing procedures - Part 2 : Tests - Test Ea and guidance : Shock. (IEC 60068-2-27:1987)*

EN 60529, *Degrees of protection provided by enclosures (IP Code). (IEC 60529:1989)*

EN 61010-1, *Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1 : General requirements. (IEC 61010-1:1990+A1:1992, modified)*

3 Definitions

For the purposes of this European Standard, the following definitions apply :

3.1
(measurable) quantity
attribute of a phenomenon, body or substance that may be distinguished qualitatively and determined quantitatively[1)]

EXAMPLE : Temperature.

3.2
unit (of measurement)
particular quantity, defined and adopted by convention, with which other quantities of the same kind are compared in order to express their magnitudes relative to that quantity[1)]

EXAMPLE : The unit of temperature used in this standard is "degree Celsius".

[1)] Definition taken from VIM2 (see ANNEX B).

3.3
symbol of a unit
conventional sign designating a unit of measurement[1)]

EXAMPLE : °C is the symbol of "degree Celsius".

3.4
value (of a quantity)
magnitude of a particular quantity generally expressed as a unit of measurement multiplied by a number[1)]

EXAMPLE : 15 °C.

3.5
true value (of a quantity)
value consistent with the definition of a given particular quantity[1)]

NOTE This is a value that would be obtained by a perfect measurement.

3.6
measurement
set of operations having the object of determining a value of a quantity[1)]

3.7
measurand
particular quantity subject to a measurement[1)]

EXAMPLE : Temperature.

3.8
influence quantity
quantity that is not the measurand but that affects the result of the measurement[1)]

3.9
indication (of a measuring instrument)
value of a quantity provided by a measuring instrument[1)]

3.10
accuracy of measurement
closeness of the agreement between the result of a measurement and a true value of the measurand[1)]

3.11
maximum permissible errors (of a measuring instrument) **; limits of permissible error** (of a measuring instrument)
extreme values of an error permitted by specifications, regulations, etc. for a given measuring instrument[1)]

3.12
uncertainty of measurement
parameter, associated with the result of a measurement, that characterizes the dispersion of the values that could reasonably be attributed to the measurand[1)]

3.13
error (of measurement)
result of a measurement minus a true value of the measurand[1)]

3.14
relative error
error of a measurement divided by a true value of the measurand[1)]

[1)] Definition taken from VIM2 (see ANNEX B).

3.15
measuring instrument
device intended to be used to make measurements, alone or in conjunction with supplementary device(s)[1)]

3.16
recording (measuring) **instrument**
measuring instrument that provides a record of the indication[1)]

3.17
displaying device ; indicating device
part of a measuring instrument that displays an indication[1)]

3.18
recording device
part of a measuring instrument that provides a record of an indication[1)]

3.19
temperature sensor
element of a measuring instrument or measuring chain that is directly affected by the temperature

3.20
scale (of a measuring instrument)
ordered set of marks, together with any numbering, forming part of a displaying device of a measuring instrument[1)]

3.21
scale division
part of a scale between two successive scale marks[1)]

3.22
gauging (of a measuring instrument)
operation of fixing the positions of the scale marks of a measuring instrument (in some cases of certain principal marks only), in relation to the corresponding values of the measurands[1)]

3.23
adjustment (of a measuring instrument)
operation of bringing a measuring instrument into a state of performance suitable for its use[1)]

3.24
user adjustment (of a measuring instrument)
adjustment employing the means at the disposal of the user[1)]

3.25
span
modulus of the difference between the two limits of a nominal range[1)]

EXAMPLE : For a nominal range of - 35 °C to + 25 °C, the span is 60 K.

3.26
measuring range ; working range
set of values for which the error of a measuring instruments is intended to lie within specified limits[1)]

3.27
rated operating conditions
conditions of use for which specified metrological characteristics of a measuring instrument are intended to lie within given limits[1)]

[1)] Definition taken from VIM2 (see ANNEX B).

3.28
limiting conditions
extreme conditions that a measuring instrument is required to withstand without damage, and without degradation of specified metrological characteristics when it is subsequently operated under its rated operating conditions[1)]

3.29
reference conditions
conditions of use prescribed for testing the performance of a measuring instrument or for intercomparison of results of measurements[1)]

3.30
resolution (of a displaying device)
smallest difference between indications of a displaying device that can be meaningfully distinguished[1)]

3.31
response time
time interval between the instant when a stimulus is subjected to a specified abrupt change and the instant when the response reaches and remains within specified limits around its final steady value[1)]

3.32
intrinsic error (of a measuring instrument)
error of a measuring instrument, determined under reference conditions[1)]

3.33
storage and transport conditions
the extreme conditions which a non-operational measuring instrument can withstand without damage and without degradation of specified metrological characteristics when it is subsequently operated under its rated operating conditions

3.34
chilled food
food which has been subjected to cooling (without freezing) and is intended to be maintained at low temperature

3.35
frozen food
food which has been subjected to a freezing process specially designed to preserve the wholesomeness and quality of the product

3.36
deep-frozen or quick-frozen food
food which has been subjected to a quick freezing process

3.37
recording interval
time interval that has elapsed between two successively stored measurements

3.38
recording duration
time interval between the beginning and the end of the recording

3.39
chart
tape, disk, form or other structure upon which is recorded the measurand

3.40
duration of transport
time interval between loading and unloading

[1)] Definition taken from VIM2 (see ANNEX B).

4 Requirements

4.1 General

The means of temperature measurement used by the recorder shall be independent of any temperature measurement which is used to control the refrigerating system.

Manufacturers shall make recommendations on the specification of ancillary equipment in order to meet the performance requirements of this European Standard.

4.2 Measuring Range

The measuring range shall be appropriate to the use or the refrigerating system used.

In all cases, the measuring range shall conform to the following limits :

- the lower limit value shall be lower than or equal to - 25 °C ;
- the higher limit value shall be higher than or equal to + 15 °C ;
- the span shall be higher than or equal to 50 K.

4.3 Locking of settings

The date and time of the beginning of recording shall be readable from the recorded data or it shall be possible to make them readable.

The means for adjusting settings which configure the recording shall :

- either be protected against accidental or unauthorised modifications ;
- or record each adjustment of any settings that remain accessible.

4.4 Recording

4.4.1 General

At least the temperature and the time shall be recorded. The place of measurement (e.g. vehicle, cold store) and the date has to be indicated.

4.4.2 Traceability

It shall be possible to identify and consult the charts and the recorded data. It shall be possible to consult those intended for archiving for a period of at least a year.

The manufacturer shall specify storage conditions so that the data remain readable.

NOTE Depending on the foodstuffs concerned, the recording may be retained for longer.

4.4.3 Chart (disk, tape)

The scrolling speed of the chart shall be greater than or equal to :

- **for transport :**
  - 6 mm/h for a recording duration lower than or equal to 24 h ;
  - 2 mm/h for a recording duration higher than 24 h and lower than or equal to 7 d ;

- 0,5 mm/h for a recording duration higher than 7 d.

The choice of the recorder shall be made according to the use including the duration of transport.

- **for storage :**

  - 1 mm/h.

The speed shall be verified on the following graduations :

- - 20 °C for deep-frozen applications ;
- 0 °C for chilled applications.

4.5 Autonomous power supply

For devices with an autonomous power supply, this shall be indicated on the recorder or on the power supply or in the technical documentation, with the corresponding usage temperature.

NOTE The manufacturer is recommended to install an indicating device (warning light or message) warning the user that the power source needs replacing.

4.6 Degree of protection provided by the enclosure (EN 60529)

The degree of protection provided by the enclosure shall be :

- IP 20 for recorders used in heated/air conditioned closed premises or in the cabin of transport vehicles ;
- IP 55 for recorders used inside cold enclosures (storage or transport vehicles) and for external sensor ;
- IP 65 for recorders used outside buildings or transport vehicles, with sensor inside the cold enclosure.

4.7 Electrical safety (if applicable)

The recorder shall conform to the requirements of EN 61010-1.