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EUROPEAN STANDARD  
 NORME EUROPÉENNE  
 EUROPÄISCHE NORM

**EN 50087**

January 1993

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Descriptors: Household electrical appliances, milk coolers, safety requirements, protection against electric shock, protection against mechanical hazard, fire protection

English version

**Safety of household and similar electrical appliances  
 Particular requirements for bulk-milk coolers**

Sécurité des appareils  
 électrodomestiques et analogues  
 Règles particulières pour les  
 refroidisseurs de lait en vrac

Sicherheit elektrischer Geräte für den  
 Hausgebrauch und ähnliche Zwecke  
 Besondere Anforderungen für Milch-  
 kühler für frischvermolkene Milch

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This European Standard was approved by CENELEC on 9 December 1992. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CENELEC**

European Committee for Electrotechnical Standardization  
 Comité Européen de Normalisation Electrotechnique  
 Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

## Foreword

A proposal for a Part 2 to EN 60335-1, dealing with particular requirements for bulk-milk coolers, document CLC/TC 61 (DE) 295, was circulated in September 1988.

This proposal was discussed during the Stockholm meeting in December 1989, when it was decided to submit a draft European Standard to the enquiry procedure. This draft, document CLC/TC 61 (SEC) 748, was circulated under the enquiry procedure in October 1990. It was discussed during the Baden meeting in May 1991 and submitted to the voting procedure in February 1992.

The text of the draft was ratified by CENELEC as EN 50087 on 9 December 1992.

This European Standard has been prepared by the secretariat of CENELEC Technical Committee TC 61.

The following dates are applicable:

- latest date of publication of an identical national standard (dop) 1993-10-01
- date of withdrawal of conflicting national standards (dow) 1995-10-01

For products which have complied with the relevant national standard before 1995-10-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2000-10-01.

This standard has to be used in conjunction with EN 60335-1:1988, Safety of household and similar appliances, Part 1: General requirements, including its amendments A2:1988, A5:1989, A6:1989, A51:1991, A52:1992, A53:1992 and A54:1992. Where reference is made to Part 1, EN 60335-1 is meant.

Where a particular subclause of Part 1 is not mentioned in this standard, that subclause applies as far as is reasonable. Where this standard states "addition", "modification" or "replacement", the relevant text of Part 1 is to be adapted accordingly.

Subclauses which are in addition to those in Part 1 are numbered starting with 101. Additional annexes are lettered AA, BB, etc.

There are no special national conditions (snc) causing a deviation from this European Standard, other than those listed in annex ZX to EN 60335-1.

There are no national deviations from this European Standard, other than those listed in annex ZY to EN 60335-1.

Other publications quoted in this standard:

- |                    |   |
|--------------------|---|
| EN 60335-2-24:1988 | Safety of household and similar electrical appliances - Part 2: Particular requirements for refrigerators and food freezers |
| EN 60529:1991      | Degrees of protection provided by enclosures (IP Code)  |
| HD 277 S1:1980     | Safety of household and similar electrical appliances - Particular requirements for motor-compressors                       |
| HD 280 S1:1986     | Safety requirements for electric fans and regulators - Part 1: Fans and regulators for household and similar purposes       |

ISO 817:1974	Organic refrigerants - Number designation
ISO 5149:19..	Mechanical refrigerating systems used for cooling and heating - Safety requirements
ISO 5708:1983	Refrigerated bulk-milk tanks

NOTE: In this document, the following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type;*
- explanatory matter: in small roman type.

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## Safety of household and similar electrical appliances Particular requirements for bulk-milk coolers

### 1 Scope

This clause of Part 1 is applicable except as follows:

#### 1.1 *Replacement:*

This standard applies to automatically-controlled refrigerated bulk-milk tanks intended for fixed or mobile installation on farms or at milk collecting points having a rated volume not exceeding 25 000 litres.

It also applies to immersion coolers and to equipment delivered as a number of units for assembly into a single appliance.

NOTE 1. Bulk-milk coolers can be combined with heat-recovery units.

NOTE 2: This standard does not apply to:

- milk coolers incorporated in heating systems;
- milk coolers having a pre-cooling system;
- instantaneous milk coolers;
- refrigerators and food freezers (EN 60335-2-44).

NOTE 3: For bulk-milk coolers intended to be used in vehicles or on board ships, additional requirements may be necessary.

NOTE 4: Attention is drawn to the fact that in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.

### 2 Definitions

This clause of Part 1 is applicable except as follows:

#### 2.2.8 *Replacement:*

**rated volume:** Volume of the maximum permissible filling of the tank stated by the manufacturer (ISO 5708).

#### 2.2.30 *Replacement:*

**normal load:** Load obtained when the bulk-milk cooler is operated under the following conditions:

For bulk-milk coolers having a direct cooling system, the tank is filled with water at  $35\text{ °C} \pm 0,5\text{ °C}$  up to:

- 50 % of its rated volume when constructed for 2 milkings,
- 25 % of its rated volume when constructed for 4 milkings.

For bulk-milk coolers having an indirect cooling system, the ice storage container is filled with water at  $20\text{ °C} \pm 1\text{ °C}$  up to the level as indicated by the manufacturer. The milk tank is empty and the agitator and the ice-water pump are in operation.

2.2.101 **refrigerated bulk-milk tank; bulk-milk cooler:** Equipment for bulk refrigeration and bulk storage of refrigerated fresh raw milk (ISO 5708).

- 2.2.102 **tank for two milkings**: Tank intended to be emptied for milk collection each day and designed for cooling and storing its rated volume every 24 h (ISO 5708).
- 2.2.103 **tank for four milkings**: Tank intended to be emptied for milk collection every two days and designed for cooling and storing its rated volume every 48 h (ISO 5708).
- 2.2.104 **immersion cooler**: Detachable milk cooler the evaporator of which is immersed in the milk contained in the associated inner vessel.
- 2.2.105 **direct cooling system**: Cooling system in which the evaporator of the refrigerating system is in direct thermal contact with the milk or the inner vessel (ISO 5708).
- 2.2.106 **indirect cooling system**: Cooling system in which the heat is transferred from the milk to the refrigerant through a cooling medium (ISO 5708).
- 2.2.107 **agitator**: Device to mix the milk to promote heat transfer and to ensure uniform distribution of butterfat (ISO 5708).
- 2.2.108 **performance temperature (PT)**: Ambient temperature to be used when measuring the milk cooling time (ISO 5708).
- 2.2.109 **safe operating temperature (SOT)**: Higher limit of the range of ambient temperatures at which the equipment is required to function effectively (ISO 5708).
- 2.2.110 **reference position**: The position specified by the manufacturer for correct installation and operation of the tank (ISO 5708).

### 3 General requirements

This clause of Part 1 is applicable.

### 4 General notes on tests

This clause of Part 1 is applicable except as follows:

#### 4.3 Addition:

*The tests of clause 10 are carried out after that of clause 11 and are followed by the tests of clause 9.*

#### 4.4 Replacement:

*The bulk-milk cooler is installed in the reference position taking into account the manufacturer's instructions (for example as far as the condenser ventilation is concerned).*

*The tests are carried out with any movable part of the appliance placed in the most unfavourable position which may occur in normal use.*

#### 4.5 Replacement:

The tests are carried out at the following ambient temperature:

- safe operating temperature for clauses 11 and 19;
- performance temperature for clauses 10 and 13;
- $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$  for other clauses.

4.101 Bulk-milk coolers designed for more than four milkings are tested as specified for those for four milkings.

### 5 Rating

This clause of Part 1 is applicable.

### 6 Classification

This clause of Part 1 is applicable except as follows:

#### 6.1 Modification:

Instead of the degree of protection against moisture, the following applies:

2. According to the degree of protection against harmful ingress of water as specified in EN 60529.

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3. According to operating temperature

	Performance temperature (PT) °C	Safe operating temperature (SOT) °C
Class A	38	43
Class B	32	38
Class C	25	32

4. According to number of milkings

- tank for two milkings
- tank for four milkings

### 7 Marking

This clause of Part 1 is applicable except as follows:

#### 7.1 Addition:

Appliances shall be marked with:

- rated volume, in litres;
- number of milkings;
- operating temperature class;
- symbol or formula of refrigerant;
- amount of refrigerant.



If the agitator is not disconnected automatically when the cover is raised, the cover shall be marked with the substance of the following:

Switch off the agitator before opening.

NOTE: If parts of the appliance have different degrees of protection against moisture, they should be marked individually.

#### 7.6 Addition:

IPXX ..... IP number

Symbols for refrigerants are given in ISO 817.

#### 7.12 Addition:

The instruction sheet shall include:

- full information on requirements specified for the relevant electrical installation, for example protective measures (equipotential bonding);
- a statement that parts which are not marked IPX6 have to be installed where they are not likely to be cleaned with a water jet;
- details on how to operate the milk cooler;
- details on how to clean the milk cooler.

## 8 Protection against electric shock

This clause of Part 1 is applicable.

## 9 Starting of motor-operated appliances

This clause of Part 1 is applicable except as follows:

### 9.1 Replacement:

Motors shall start under all normal voltage conditions which may occur in use.

*Compliance is checked by the following test which is started between 15 min and 60 min after the test of clause 11:*

*The appliance with lids closed is started three times under normal load, supplied at 0,85 rated voltage. It is kept switched on for a sufficient time to ensure that the motors run properly and that there is adequate lubrication.*

*The interval between starts shall be sufficient to prevent overheating, to avoid an abnormal increase in the pressure of the refrigerant and to equalize the pressure between the high-pressure and the low-pressure sides. However, it shall be not longer than 30 min.*

*In all cases, the appliance shall function in such a way that safety is not affected.*

*The test is not carried out on motors which comply with the locked rotor test of subclause 19.3 of HD 277 S1 or of annex AA.*