



SLOVENSKI STANDARD
SIST EN 441-11:2000
01-december-2000

Refrigerated display cabinets - Part 11: Installation, maintenance and user's guide

Refrigerated display cabinets - Part 11: Installation, maintenance and user's guide

Verkaufskühlmöbel - Teil 11: Empfehlungen für den Betreiber

Meubles frigorifiques de vente - Partie 11: Installation, entretien et guide de l'utilisateur

Ta slovenski standard je istoveten z: EN 441-11:1994

SIST EN 441-11:2000

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ICS:

97.130.20 Hladilne naprave za trgovine Commercial refrigerating
appliance

SIST EN 441-11:2000

en

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EUROPEAN STANDARD

EN 441-11

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 1994

ICS 97.040.30

Descriptors: Refrigerators, furniture, commerce, instructions, installation, maintenance

English version

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This European Standard was approved by CEN on 1994-10-14. 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.

The European Standards exist 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 44 "Household refrigerating appliances", the secretariat of which is held by UNI.

This European Standard shall be given the status of National Standard, either by publication of an identical text or by endorsement, at the latest by april 1995, and conflicting National Standards shall be withdrawn at the latest by april 1995.

This European is part of a series:

- Part 1: Refrigerated display cabinets - Terms and definitions
- Part 2: Refrigerated display cabinets - General mechanical and physical requirements
- Part 3: Refrigerated display cabinets - Linear dimensions, areas and volumes
- Part 4: Refrigerated display cabinets - General test conditions
- Part 6: Refrigerated display cabinets - Classification according to temperature
- Part 7: Refrigerated display cabinets - Defrosting test
- Part 8: Refrigerated display cabinets - Water vapour condensation test
- Part 9: Refrigerated display cabinets - Electrical energy consumption test
- Part 10: Refrigerated display cabinets - Test for the absence of odour and taste
- Part 11: Refrigerated display cabinets - Installation, maintenance and user's guide

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

1 Scope

1.1 This standard specifies terminology, general mechanical and physical requirements, test conditions as well as installation, maintenance and user's guide for refrigerated display cabinets for the sale and/or display of food products.

This standard does not cover refrigerated vending machines or cabinets intended for use in catering or similar non retail applications.

1.2 This part of EN 441 gives information concerning the installation and maintenance of refrigerated display cabinets and a guide to users.

2 Important siting conditions

2.1 Climate

In order to keep the ambient climate at the place of installation within agreed limits it may be necessary to install air conditioning. Such an installation should include control of the relative humidity, as excessive humidity is detrimental to cabinet performance. [SIST EN 441-11:2000](https://standards.iteh.ai/catalog/standards/sist/c82d8fd5-a5b2-4aec-a0db-2017101618-en-441-11-2000)

It can be more economical to dehumidify the air by air conditioning than through cabinet evaporators operating at lower temperatures as the latter is not energy efficient.

The grouping of cabinets in a defined area will be advantageous in terms of performance and operating costs, it may also, however, cause customer discomfort.

2.2 Air draughts

The location of the cabinets should be such that air draughts are minimized or avoided. Cabinets should not be installed adjacent to doors or in areas where exposure to considerable air movement will be experienced e.g. from air conditioning, ventilation and heating outlets.

The design of ventilating equipment should consider the air speed across the cabinets. Special attention should be afforded to air heating outlets.

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2.3 Heat radiation and lighting

To reduce to a minimum the ill effects of radiant heat, care should be exercised to ensure cabinets are not exposed to the sun, air diffusers and ducts, sun heated non-insulated roofs, walls, or other heat sources. Radiated heat entering the cabinets will increase operating costs and reduce performance. Spotlight or other concentrated lighting units should not be aimed into the cabinets.

External fluorescent lighting is preferred to incandescent and it is strongly recommended that only the former type be used.

In the event of incandescent type lighting being used, the light fittings should be adequately ventilated by the use of suitably dimensioned ventilating slots. Surfaces at ambient temperature radiate an appreciable amount of heat, which can impair performance. The use of heat reflecting ceilings or arranging cabinets to face each other will minimize this effect.

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2.4 Condensation (standards.iteh.ai)

Water vapour will condense on a cool surface if the dew point of the air is higher than the surface temperature. Regardless of how well a cabinet is insulated, condensation will take place if there is no ventilation around the cabinet. Therefore, unless specified differently by the manufacturer, do not place the cabinet closer than 100 mm to walls or any other objects that will prevent sufficient airflow around the case.

2.5 Cabinet with integral condensing unit

The purchaser should locate the cabinet in accordance with the instructions of the manufacturer, ensuring that a sufficient supply of air can enter and leave the condenser. The cabinet should be located so as to be free of excessive vibration.

2.6 Mechanical protection

The operator should arrange adequate protection of the cabinets against damage caused by shopping trolleys, cleaning machines, fork lift vehicles etc.

2.7 Electrical installation

The electrical installation should meet existing regulations and safety codes.

The electrical supply to the cabinets should be independent of other supplies and individually isolated. Cabinet lighting and the operation of motorized night blinds should be individually protected within the electrical circuit of the cabinet. The manufacturer's recommendation on voltage, frequency and protective devices rating should be adhered to.

2.8 Drain installation

The cabinet should be correctly levelled and the drain proved. A drain pipe of adequate dimension should be installed with sufficient slope away from the cabinet to ensure drainage.

A water trap of adequate dimension should be installed in the drain pipe.

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3 Installation of refrigerating equipment

3.1 Location

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The area in which the refrigerating equipment is located should be as close as possible to the cabinets in order that connecting pipework may be kept to the minimum length.

Vibration from compressors or fan motors should be minimized when locations are being considered.

The machinery room should not be used for storage and should always be readily accessible for maintenance and service.

3.2 Ventilation

An adequately ventilated area preferably a separate room should be provided for remotely installed refrigerating equipment. Sufficient ventilation of the refrigerating equipment should be provided in order to remove the heat generated.

Basically there are three categories of installation:

- a) air cooled condensing unit;
- b) air cooled compressor with air cooled condenser installed remotely, for example upon the roof;
- c) water cooled condensing unit.

NOTE: The greatest quantity of heat is emitted from the condenser, however, compressors and their motors produce heat which should be dissipated through adequate ventilation even when the condensers are remote or water cooled.

Cabinet malfunction is often attributable to the inadequacy of ventilation of refrigerating equipment.

3.3 Temperature

The correct functioning of a refrigerating system is very dependent upon the design being suitable for the climatic variations which exist between winter and summer.

It is important that user and seller agree the operating conditions that the refrigerating system is designed to fulfil. Upper and lower limits should be agreed for the ventilation of the refrigerating equipment.

Where a water cooled condensing unit is used an adequate supply of good quality water at an acceptable temperature is essential.

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4 Cabinet operation

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4.1 Loading

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The cabinet is marked with a load limit line. Food products stored within the load limit are properly refrigerated. Food products stored outside the load limit are not properly refrigerated, and cause a disturbance of the airflow with the result that cabinet performance is jeopardized and all food products are damaged. A refrigerated display cabinet is not designed to cool down perishable food products but to maintain the temperature at which they are introduced into the cabinet. Food products warmer than the specified cabinet temperature should not be placed into a refrigerated cabinet.

DO NOT LEAVE REFRIGERATED FOOD PRODUCTS ON PALLETS OR SIMILAR IN THE SHOP LONGER THAN ABSOLUTELY NECESSARY FOR HANDLING AND LOADING.

DO NOT OVERLOAD THE CABINET : IT IS THE MOST COMMON OF ALL FAULTS AND CAN CAUSE SECONDARY FAULTS, EVENTUALLY BLOCKED EVAPORATOR AND COMPLETE BREAKDOWN.

4.2 Fittings and accessories

Use only fittings and accessories supplied with the cabinet. "Do it yourself" additions may cause condensation leading to ice build up in the cabinet or can disturb the designed airflow causing malfunction (e.g large paper signs used within the cabinet).

4.3 Stock rotation

It is important to inform the shop staff that food products should be rotated when new food products are loaded into the cabinet so that the oldest food product is the one closest to the customer and sold first.

4.4 Night-covers

Night-covers will improve food product temperature and reduce running cost if used as recommended by the manufacturer.

NOTE: The same applies to solid metal product dividers that conduct heat away from the top layer of food products.

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5 Maintenance

5.1 Cleaning

It is essential to empty and clean the cabinet regularly. The cabinet should be disconnected from the mains supply, emptied and thoroughly cleaned according to the manufacturer's instruction.

For certain cabinets hygiene requirements or other reasons may necessitate more frequent cleaning practice.

A blocked drain inside the cabinet causes a breakdown and possible damage to other parts of the cabinet. If the cabinet is supplied with a drain sump this should be emptied and cleaned regularly.

The condensers of cabinets with integral condensing units collect dust and dirt and should be cleaned regularly. Use a vacuum cleaner first to clean the front of the condenser, then to blow through its fins. Remote condensers should also be inspected and cleaned as often as required.

5.2 Manual defrosting

Cabinets without automatic defrost should be defrosted according to the manufacturer's instructions. Frost accumulation on the evaporator reduces performance and increases running costs.