SLOVENSKI STANDARD
SIST EN 12546-2:2001

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Materiali in predmeti v stiku z ģivili - Izolirane posode za domaļ o uporabo - 2. del: Podrobni opis za izolirane vreļ e in ģkatle

Materials and articles in contact with foodstuffs - Insulated containers for domestic use - Part 2: Specification for insulated bags and boxes

Materialien und Gegenstände in Kontakt mit Lebensmitteln - Isolierbehälter zum Gebrauch im Haushalt - Teil 2: Beschreibung für Isoliertaschen und Isolierbehälter

Matériaux et objets en contact avec les denrées alimentaires - Récipients isolants a usage domestique - Partie 2: Spécification pour les sacs et boîtes isolants

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67.250	Materiali in predmeti v stiku z živili	Materials and articles in contact with foodstuffs

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English version

Materials and articles in contact with foodstuffs - Insulated containers for domestic use - Part 2: Specification for insulated bags and boxes

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This European Standard was approved by CEN on 4 March 2000.

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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.

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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 Technical Committee CEN/TC 194 "Utensils in contact with food", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by October 2000, and conflicting national standards shall be withdrawn at the latest by October 2000.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 standard has been prepared as a series of 3 Parts which have the following titles:

Part 1: Specification for vacuum ware, insulated flasks and jugs
Part 2: Specification for bags and boxes
Part 3: Specification for thermal packs.

1 Scope

This part of EN 12546 specifies requirements for portable domestic food and/or drink insulated containers such as boxes, chests and bags, intended to contain generally wrapped or packaged foods and/or drinks in their own containers.

It does not apply to insulated bags designed specifically for short term storage and transportation of frozen foods, containers fitted with a device for production or removal of heat, containers for industrial or catering uses, or insulated flasks and jugs.

It does not deal with the requirements for materials in contact with food which are defined by legislation already in existence.

2 Definitions

For the purposes of this standard the following definitions apply

2.1 Insulated container

container, consisting of an inner container and an outer protective case with an insulant between them in order to reduce to a minimum the transfer of heat to or from the contents of the inner container.

NOTE: Insulated bags and boxes intended primarily for use with cold food and/or drinks are often referred to as cool bags or cool boxes and those intended primarily for hot food and/or drinks as hot bags or hot boxes.

2.2 Nominal capacity.
declared inner usable volume in litres.

3 Requirements

3.1 Capacity
The capacity measured according to 4.1 shall not differ from the nominal capacity by more than ± 5 % for rigid containers and ± 10 % for flexible containers.

3.2 Insulation performance
The insulation performance measured according to 4.2 shall be declared to the user by means of the pictogram shown in figure 1 where the declared time in hours is stated according to the following rules:

[X hours + Y minutes] is the time measured in 4.2

for (0 < Y ≤ 30) min declared time (hours): X
for (30 < Y < 60) min declared time (hours): X + 1

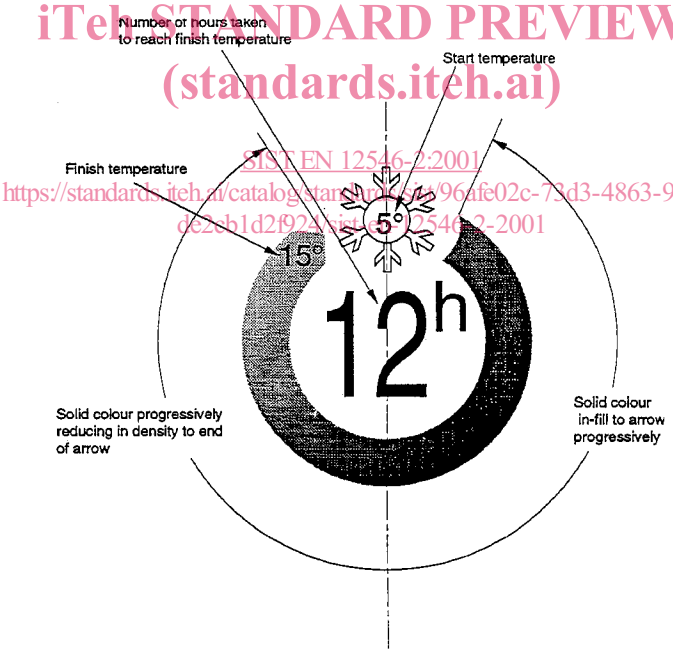

Figure 1 — Pictogram for insulation performance

3.3 Impact resistance
The impact resistance shall be such that when tested in accordance with 4.3 the insulated container shall suffer not more than superficial damage which does not impair its function.

3.4 Handle strength
The handle and its attachment when tested in accordance with 4.4 shall remain effective.

3.5 Cleaning
The inner container of the insulated container shall be designed in such a way that it shall be possible to clean it easily and completely.

Insulated containers in which the inner lining is not continuous or may allow seepage between the inner container, the insulant and the outer protective case (for example through stitched seams) shall be tested in accordance with 4.5 and shall show no traces of the coloured water used.

4 Test methods

4.1 Capacity

4.1.1 Rigid containers

4.1.1.1 Principle

The empty container is weighed, filled with water, and weighed again. The mass of water is calculated and used to estimate the actual volume.

4.1.1.2 Apparatus and test materials

4.1.1.2.1 **Domestic tap water**

4.1.1.2.2 **Weighing machine** capable of weighing the filled insulated container to an accuracy of ± 0,1g.

4.1.1.2.3 **Level surface**

4.1.1.3 Procedure

4.1.1.3.1 Ensure the container is completely empty. Remove the lid and all removable accessories and weigh the container.

4.1.1.3.2 Stand the container on the level surface, fill with water and weigh the container.

4.1.1.3.3 If the lid has a usable storage volume invert the lid and repeat the procedure for that volume.

4.1.1.4 Expression of results

Calculate the mass of water in the insulated container, M_W, in kilograms using the equation

$$M_W = (M - M_e) + (L - L_e)$$

Where

M_e is the mass of the empty container in kilograms
M is the mass of the filled container in kilograms
L_e is the mass of the empty lid in kilograms
L is the mass of the filled lid in kilograms

Express the volume of the insulated container as M_W litres.

NOTE: This assumes one litre of water has a mass of 1 kilogram.

4.1.2 Flexible containers

4.1.2.1 Principle

The empty container under test is weighed, filled with spherical balls of polystyrene or other suitable material, and weighed again. The apparent density of the balls is measured. The mass of balls is calculated and used to estimate the actual volume.

4.1.2.2 Apparatus and test materials

4.1.2.2.1 **Spherical balls** of polystyrene, or other suitable material, having a diameter of between 4 mm and 8 mm.

4.1.2.2.2 **Receptacles** with defined inner volumes of 1 l, 5 l and 20 l.

4.1.2.2.3 **Weighing machine** capable of weighing the filled insulated container to an accuracy of ± 0,1g.

4.1.2.3 Procedure

4.1.2.3.1 Fill the 1 l receptacle with the balls. Lightly compress the balls, remove the balls from the container and weigh the balls. Repeat using the 5 l receptacle, and then using the 20 l receptacle.

4.1.2.3.2 Ensure the container under test is completely empty. Remove all removable accessories and weigh the container.

4.1.2.3.3 Fill the container under test with the balls, compress the balls lightly and close the container. Weigh the filled container.

4.1.2.4 Expression of results

Calculate the average density of the balls, D_a, in grams per litre using the equation

$$D_a = \frac{(B_1/1)+(B_2/5)+(B_3/20)}{3}$$

Where

B_1 is the mass of 1 l of balls in grams
B_2 is the mass of 5 l of balls in grams
B_3 is the mass of 20 l of balls in grams

Calculate the capacity of the flexible container, F_c, in litres, using the equation

$$F_c = \frac{(F - F_e)}{D_a}$$

Where

F is the mass in grams of the filled container
F_e is the mass in grams of the empty container

4.2 Insulation performance

4.2.1 Principle

An insulated container is pre-cooled with water and then half filled with cool water and the time taken for the water to rise to a given temperature is measured.

4.2.2. Apparatus and test materials

4.2.2.1 Domestic tap water at (5 ± 1)°C

4.2.2.2 Thermocouple capable of measuring to an accuracy of ± 0,5°C

4.2.2.3 Clock accurate to 1 minute

4.2.3 Procedure

4.2.3.1 Ensure the container under test is completely empty.

4.2.3.2 Condition the container to be tested for 24 h at an ambient temperature of (32 ± 1)°C.

4.2.3.3 Fill the empty container to half its nominal capacity by pouring the water (4.2.2.1) into it. Leave for 5 min then empty. Immediately refill the container to half its nominal capacity by pouring the water (4.2.2.1) into it. Insert the thermocouple (4.2.2.2) to approximately half the depth of the water. Close the lid and start the clock (4.2.2.3).

4.2.3.4 Maintain the container in the ambient temperature of (32 ± 1)°C and measure and record the temperature of the water in the container every 15 min until it rises to 15°C.

4.2.4 Expression of results

Record the time taken for the temperature to rise to 15°C.

4.3 Impact test

4.3.1 Principle

The container under test is loaded with sand, dropped on its base and corners and assessed for damage.

4.3.2 Apparatus and test materials

4.3.2.1 Concrete floor

4.3.2.2 Sand at (-5 ± 1°C)

NOTE: The sand can be wrapped in polyethylene bags and muslin to prevent displacement of the centre of gravity.

4.3.2.3 Lifting and dropping device

4.3.3 Procedure

4.3.3.1 Fill the container with 0,25 kg of sand for every litre of nominal capacity. Close the container and leave for 1 h.

4.3.3.2 Raise the container so the point of impact is (500 ± 50) mm above the concrete floor and allow it to fall freely so that the base impacts on the concrete floor.

4.3.3.3 Repeat the test but realign the test specimen such that one corner of the base impacts the floor.

4.3.3.4 Repeat the test for the other corners of the base.

4.4 Handle strength test

4.4.1 Principle

The handle of the container is attached by means of a canvas strap to a fixed support. The container is raised and allowed to fall such that the canvas strap causes the fall to be suddenly arrested.

4.4.2 Apparatus and test materials

4.4.2.1 Sand at (-5 ± 1)°C

NOTE: The sand can be wrapped in polyethylene bags and muslin to prevent displacement of the centre of gravity.

4.4.2.2 Canvas strap of the same width as the handle of the container and of sufficient length to allow slack of 100 mm once attached at both ends.

4.4.2.3 Inelastic support fixed at a height such that container when suspended from it using the canvas strap, hangs freely.

4.4.2.4 Lifting and dropping device

4.4.3 Procedure

4.4.3.1 Fill the container with 0,5 kg of sand for every litre of capacity. Close and leave for 1 h.

4.4.3.2 Attach one end of the canvas strap to the handle of the container. Attach the other end of the canvas strap to the inelastic support. Allow the container to fall freely before being instantly arrested by means of a positive stop incorporated into the inelastic support.

4.4.3.3 Raise the container vertically through 100 mm causing the canvas strap to become slack. Release the container and allow it to fall freely such that its fall is instantly arrested by the canvas strap acting on the handles.