SLOVENSKI STANDARD
SIST EN 702:1996

01-december-1996

Varovalna obleka - Zaġļ ita pred uļ inki toplote in plamena - Preskusna metoda: doloļ anje prenosa toplote ob dotiku skozi zaġļ itno obleko ali njene materiale

Protective clothing - Protection against heat and flame - Test method: Determination of the contact heat transmission through protective clothing or its materials

Schutzkleidung - Schutz gegen Hitze und Flammen - Prüfverfahren: Bestimmung des Kontaktwärmedurchgangs durch Schutzkleidungen oder deren Materialien

Vetements de protection - Protection contre la chaleur et la flamme - Méthode d'essai: Détermination de la transmission thermique par contact a travers les vetements de protection ou leurs matériaux

Ta slovenski standard je istoveten z: **EN 702:1994**

ICS:

13.340.10	Varovalna obleka	Protective clothing

SIST EN 702:1996 **en**

EUROPEAN STANDARD

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Descriptors: Personal protective equipment, accident prevention, protective clothing, heat protection, fire protection, tests, determination, heat transfer, testing conditions

English version

Protective clothing - Protection against heat and flame - Test method: Determination of the contact heat transmission through protective clothing or its materials

Vêtements de protection - Protection contre la chaleur et la flamme - Méthode d'essai: Détermination de la transmission thermique par contact à travers les vêtements de protection ou leurs matériaux

Schutzkleidung - Schutz gegen Hitze und Flammen - Prüfverfahren: Bestimmung des Kontaktwärmedurchgangs durch Schutzkleidungen oder deren Materialien

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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.

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CEN

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

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

Ref. No. EN 702:1994 E

Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 162 "Protective clothing including hand and arm protection and lifejackets" of which the secretariat is held by DIN.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

This European standard corresponds to ISO 12127.

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 May 1995, and conflicting national standards shall be withdrawn at the latest by May 1995.

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, United Kingdom.

1 Scope

This European standard specifies a test method for the determination of the contact heat transmission. It is applicable to protective clothing (including hand protectors) or its constituent materials intended to protect against high contact temperatures. The application of this Standard is restricted to contact temperatures from 100 °C to 500 °C.

2 Definitions

For the purpose of this standard, the following definitions apply:

2.1 Contact temperature T_c

The surface temperature of the contact area of the heating cylinder which is kept constant.

2.2 Start of the time measurement

The moment when the upper surface of the calorimeter and the bottom edge of the heating cylinder have approached to 10 mm.

2.3 Threshold time t_t

The time between the start of the time measurement and the moment when the temperature of the calorimeter is 10 °C above its starting value.

2.4 Contacting speed

The relative speed by which the heating cylinder and calorimeter with the sample are brought into contact with each other.

2.5 Contact force

The force acting on the specimen and the calorimeter when they have been brought into contact with the heating cylinder.

3 Principle

The heating cylinder is heated up to the contact temperature and the specimen is placed onto the calorimeter. The heating cylinder is lowered onto the specimen supported by the calorimeter, or, alternatively, the calorimeter with the specimen is lifted up to the heating cylinder, in each case the operation shall be carried out at a constant speed. By monitoring the temperature of the calorimeter, the threshold time is determined.

4 Apparatus

4.1 Heating cylinder

The heating cylinder is constructed from a suitable metal which can withstand temperatures up to over 500 °C (e.g. pure nickel). Figure 1 shows a possible version of the heating cylinder. The contact surface shall have a diameter of (25,2 ± 0,05) mm and shall be surface ground. A central boring ends 3 mm above the lower surface of the heating cylinder. This boring is intended to hold the temperature sensor, necessary for the temperature regulation of the heating cylinder, and its diameter should be chosen accordingly. A spiral slot of depth D, width B and pitch Z is machined in the upper part of the heating

cylinder. D, B and Z shall be chosen in such a way that the total heated length of a heating conductor can be placed in the slot. The heating cylinder shall be enclosed by a heat resistant insulation, leaving free the bottom contact surface.

4.2 Calorimeter

The calorimeter as shown in figure 2 consists of a cylindrical disc of black anodized pure aluminium of (25 ± 0,05) mm diameter and (5 ± 0,02) mm thickness which is fixed on a mounting made from polyamide 6.6. The upper contact surface of the calorimeter shall be surface ground before anodization and on the lower surface a temperature sensor (e.g. platinum resistor) shall be fixed.

4.3 Assembly

Figure 3 shows a possible version of the assembly. The heating cylinder and calorimeter are mounted with parallel faces and with their symmetrical axes in line in a supporting frame. Provision shall be made for a controlled speed movement of either the heating cylinder down towards the calorimeter or the calorimeter up towards the heating cylinder. The additional weight shall be dimensioned in such a way that the contact force is (49 ± 0,5) N. Between measurements, during cooling periods a suitable shielding shall be put between the heating cylinder and the calorimeter in order to prevent the calorimeter from being heated up by the thermal radiation of the heating cylinder.

4.4 Electronics

Suitable electronic devices shall be provided to:

- heat up the heating cylinder to at least 500 °C and control the temperature;
- control the contacting speed;
- measure and register the calorimeter temperature to an accuracy of ± 0,1 °C;
- measure the threshold time.

5 Sampling and conditioning

5.1 Sampling

At least three circular specimens of 80 mm diameter shall be taken for each contact temperature from the product or from a piece of the material intended for the manufacture of the product.

5.2 Conditioning

Before the test the specimens shall be conditioned for at least 24 h in an atmosphere of (20 ± 2) °C and (65 ± 5) % relative humidity.

6 Test method

6.1 Starting conditions

The measurements shall be carried out in an atmosphere having a temperature of (20 ± 5) °C and a relative humidity between 15 % and 80 %. The heating cylinder shall be brought to the selected contact temperature ± 2 % (in °C). The temperature of the calorimeter shall be at room temperature ± 2 °C before the start of each test. The test shall be started not later than 3 min after the specimen has been taken out of the conditioning atmosphere according to 5.2.

6.2 Procedure

Place the specimen on the calorimeter so that its outer face looks upward. Remove the shielding between

the heating cylinder and the calorimeter and bring the heating cylinder into contact with the calorimeter with a contacting speed of (5,0 ± 0,2) mm/s. Measure and record the temperature of the calorimeter during the test. Carry out at least three measurements at each contact temperature.

6.3 Evaluation

Determine the threshold time t_t to the nearest 0,1 s.

7 Test report

The test report shall contain the following particulars:

a) reference to this European Standard;
b) name of supplier of product or material;
c) name, as given by the supplier, and description of the product or the material;
d) contact temperature(s) T_c;
e) threshold time t_t: individual values or, if five or more measurements per contact temperature have been made, mean value and standard deviation;
f) description of observed changes of the specimens;
g) date of testing;
h) any deviation from this standard.

Dimensions in mm

1 Slot for the heating conductor

2 Boring for the temperature sensor

3 Contact surface

* Diameter of the boring appropriate for the temperature sensor

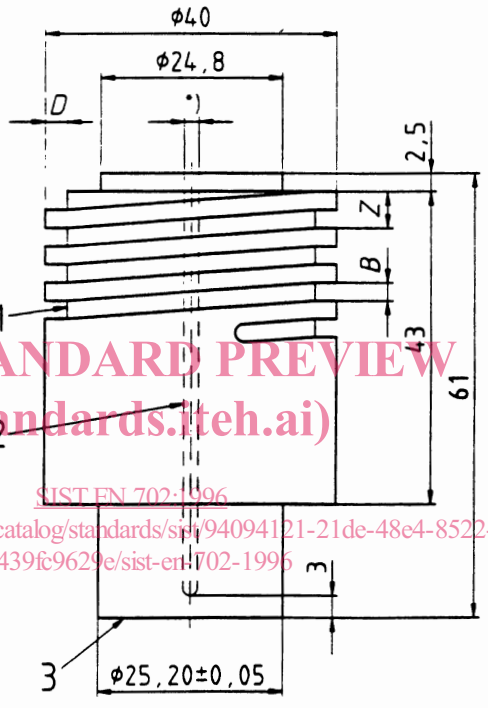

Figure 1: Heating cylinder

Dimensions in mm

1 Cylindrical disc, made from pure aluminium, black anodized

2 Temperature sensor, e.g. platinum resistor

3 Mounting, made from Polyamide 6.6

* Maximum depth of thread holes for the mounting of the calorimeter

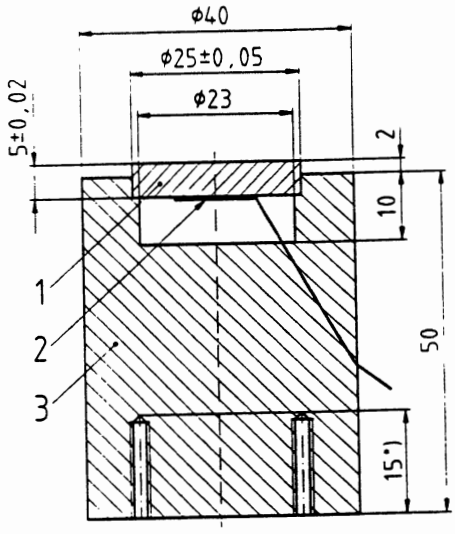

Figure 2: Calorimeter

1 Additional weight

2 Heating cylinder with insulation

3 Shielding

4 Calorimeter contact surface

5 Supporting frame

6 Motor

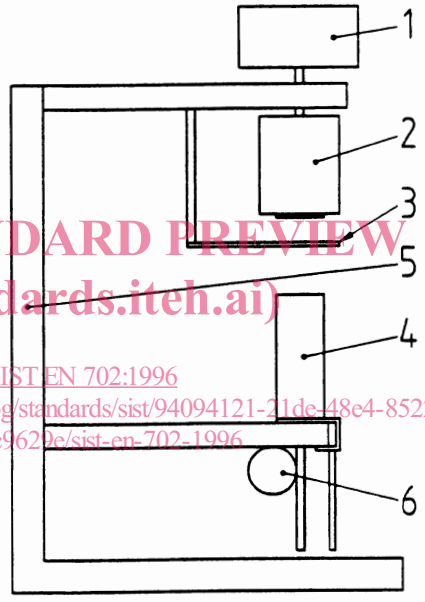

Figure 3: Assembly