Nederlandse

Ontwerp

norm

NEN-EN-ISO 6942

Beschermende kleding - Bescherming tegen hitte en vuur - Beproevingsmethode: Beoordeling van materialen en samenstellingen van materialen bij blootstelling aan warmtestraling (ISO/DIS 6942:1997)

Publicatie uitsluitend voor commentaar

Protective clothing - Protection against heat and fire - Method of test: Evaluation of materials and material assemblies when exposed to a source of radiant heat (ISO/DIS 6942:1997)

juni 1998
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Commentaar voor 1998-09-15

Zal vervangen NEN-EN 366:1993

Als Europees normontwerp is gepubliceerd: prEN ISO 6942:1998

Definitief vastgestelde normen zullen als Nederlandse norm gelden. Daarom wordt dit normontwerp in Nederland voor commentaar gepubliceerd. Op het ontwerp ingebracht commentaar zal aan de bevoegde normcommissie worden voorgelegd die hiermee rekening zal houden bij de bepaling van de Nederlandse stem. Indien er geen bezwaar bij het NNI wordt ingebracht, kan dat leiden tot ongewijzigd definitieve vaststelling van het ontwerp als norm.

Van Europese normen bestaan drie officiële versies: Engels, Frans en Duits. Voor Nederland zal de Engelse versie gelden, tenzij voor een geautoriseerde versie in het Nederlands wordt gekozen.

Normcommissie 302 094 "Persoonlijke beschermingsmiddelen"

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN ISO 6942

May 1998

ICS

Will supersede EN 366:1993

Descriptors:

English version

Protective clothing - Protection against heat and fire - Method of test: Evaluation of materials and material assemblies when exposed to a source of radiant heat (ISO/DIS 6942:1997)

Vêtements de protection - Protection contre la chaleur et le feu - Méthode d'essai - Evaluation des matériaux et assemblages de matériaux exposés à une source de chaleur radiante (ISO/DIS 6942:1997)

Schutzkleidung - Schutz gegen Hitze und Feuer - Prüfverfahren: Beurteilung von Materialien und Materialkombinationen, die einer Hitze-Strahlungsquelle ausgesetzt sind (ISO/DIS 6942:1997)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 162.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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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Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. prEN ISO 6942:1998 E

Content

Foreword

This draft revision of the European Standard was prepared by CEN/TC 162 'Protective clothing including hand and arm protection and life jackets', the Secretariat of which is held by DIN.

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

If accepted, this draft revision of the European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards shall be withdrawn.

This draft revision of the European Standard is essentially identical with the proposed draft revision of ISO 6942:1993 and it is currently submitted to the parallel enquiry.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

0 Introduction

The following changes have been made in this revision of the previous EN 366: 1993.

A small, curved copper plate calorimeter has been substituted for the previous large aluminium block calorimeter. This gives better reproducibility than the previous calorimeter but with shorter response times and lower transmission factors.

Revised specimen holders are used. The specimen holder for test B also holds the calorimeter in position in the existing apparatus. The method of mounting the specimens has also been simplified.

A simplified measurement system has been introduced. The three previous heat transfer levels based on intersections with two theoretical threshold curves are replaced by measurements of the time to temperature rises of 12 °C and 24 °C. The percentage transmission factor is derived directly from these two figures.

The definitions have been revised in accordance with these changes.

The remaining features of the apparatus, the radiation source, test frame and temperature measuring device, remain the same. Method A assesses the effect of radiation on the test material or material combination. It remains virtually unchanged, apart from the method of mounting multilayer specimens. Method B measures the heat transmission through the test material or material combination. As a result of the changes to method B, it now gives different, but more reproducible results than the previous method B. This will necessitate the changing of performance levels based on EN 366: 1993.

Clothing for protection against radiant heat is worn under widely varying conditions, ranging from long term use at a low heat flux density to very short periods of use at high radiation intensities. The test method and performance levels specified should be related to the type of use envisaged. The heat flux density should also be selected so that it is representative of the levels experienced in the intended use.

Method A assesses the degradation of the test material or material combination when exposed for three minutes to a given heat flux density. It is appropriate for use at low and medium heat flux levels. It is less appropriate for use at high heat flux levels, where high levels of transmission through the material occur before degradation.

Method B measures the transmission of heat through the material or material assembly. It is appropriate for use at medium and high heat flux levels, but not at low heat flux levels.

Results are expressed as a Radiant Heat Transfer Index (RHTI) and a % heat transmission factor (%TF).

The RHTI results are not related to the heat transfer levels (t_1, t_2 and t_3) measured on the previous EN 366:1993 method. They should not be taken as indicative of the period of time for which the tested material or material assembly will provide protection against the heat flux density level employed. The RHTI can be used to compare the performance of different materials and material assemblies at a given heat flux density level. The figures obtained can also be compared with results obtained by the EN 367 method, which uses a calorimeter with a similar response.

The value of the %TF is determined as the mean % heat transmission over the range between 12 °C and 24 °C temperature rise. The temperature rise is not always linear over this range. The %TF is not comparable with results for TF obtained with the EN 366:1993 method, which uses a much heavier calorimeter and measures the TF when a steady state has been reached, and which gives higher results.

1 Scope

This draft revision of the European Standard specifies two complementary methods (A and B) for determining the behaviour of materials used for protective clothing subjected to radiant heat.

These tests are performed on representative single or multi-layer textiles or other materials intended for the manufacture of clothing for protection against heat. They may also be used for material assemblies, which correspond to the overall composition of a protective garment assembly, with or without undergarments.

Method A serves to visually assess any changes in the material after exposure to radiant heat. Method B serves to determine the protective effect of the materials. Either one or both methods may be used.

The tests specified here serve to classify materials. However, to be able to make a statement or prediction as to the suitability of a material for protective clothing, additional criteria must be considered.

Since the tests are carried out at ambient temperature, the results do not necessarily reflect the behaviour of the materials at higher temperatures and therefore are only to a limited extent suitable for predicting the performance of the protective clothing made from the materials under test.

2 Normative reference

This draft revision of the 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 draft revision of the European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 20 139 Textiles; standard atmospheres for conditioning and testing (ISO 139:1973)

3 Definitions

3.1 test specimen: All the layers of fabric or other material arranged in the order and orientation as used in practice and including undergarments.

3.2 incident heat flux density: The amount of energy incident per unit time on the exposed face of the calorimeter, expressed in kW/m².

3.3 percentage heat transmission factor (%TF): A measure of the percentage of heat received by the calorimeter when a test specimen is placed in front of it. It is numerically equal to the percentage ratio of the transmitted to the incident heat flux density.

3.4 radiant heat transfer index (RHTI): A whole number calculated from the mean time in seconds to achieve a temperature rise of (24 ± 0,2) °C in the calorimeter when testing by this method with a specified incident heat flux density.

3.5 change in appearance of the specimen: All changes in appearance of the material (shrinkage, formation of char, discoloration, scorching, glowing, melting, etc.)

4 Principle

4.1 Method A

A specimen is fixed to a free-standing frame (specimen holder) and exposed to a specific level of radiant heat. There is only a very low conduction of heat away at the back of the specimen; this represents a severe condition for the material. Any changes in the appearance of the specimen are recorded.

4.2 Method B

A specimen is fixed to the front of a calorimeter and exposed to a specific level of radiant heat. The times for temperature rises of 12 °C and 24 °C in the calorimeter are recorded and results are expressed as a radiant heat transfer index and the percentage heat transmission factor.

5 Apparatus

5.1 General

The test apparatus consists of the following items, which are used for both test methods:

- source of radiation (5.2);
- test frame (5.3);
- specimen holder (5.4).

For method B, the following are also required:

- calorimeter (5.5);
- temperature measuring and recording device (5.6).

5.2 Source of radiation

The radiation source consists of six silicon carbide (SiC) heating rods, with the following characteristics:

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