

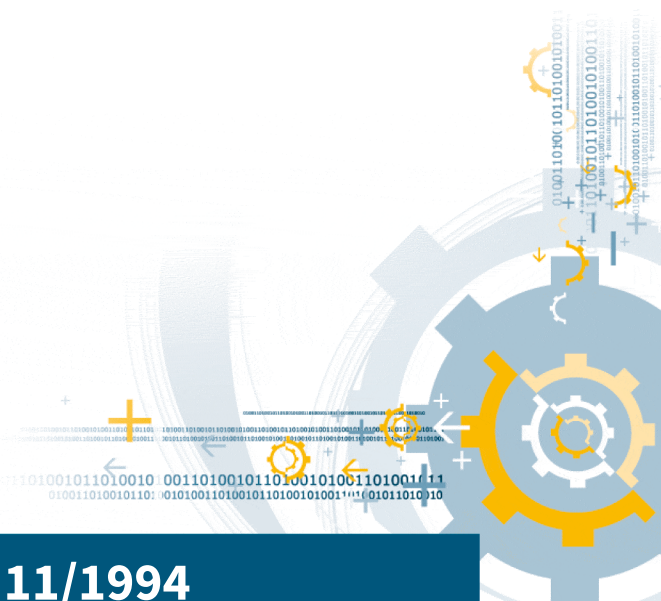


Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 530:1994

Abrasion resistance of protective clothing material - Test methods

11/1994



National Foreword

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English version

Abrasion resistance of protective clothing material - Test methods

Résistance à l'abrasion du matériau constitutif
d'un vêtement de protection - Méthode d'essaiAbriebfestigkeit von Schutzkleidungsmaterial -
Prüfverfahren

This European Standard was approved by CEN on 1994-11-08. 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.

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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

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Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 162 "Protective clothing including hand and arm protection and lifejackets" the secretariat of which 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 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of an identical text or by endorsement, at the latest by May 1995, and conflicting national standards shall be withdrawn at the latest by May 1995.

The annex A is informative and contains recommendations of assembly, maintenance and calibration of the Martindale Abrasion Machine. The annex B is informative and contains a bibliography recommendation.

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 describes two methods on abrasion resistance of materials using the same apparatus. This standard is applicable as reference standard on abrasion for standards and specifications on protective clothing.

The first method describes the determination of the abrasion resistance of protective clothing materials and the second method describes abrasion pretreatment of these materials where the test samples afterwards are used in evaluation of the remaining protective properties.

2 Normative references

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

ISO 2231:1989 Rubber- or plastics- coated fabric.
Standard atmospheres for conditioning and testing .

3 Methods of test

3.1 Principles

The abrasion test using the Martindale abrasion machine is presented in two methods of operation.

Method 1: Determination of abrasion resistance

Determination of abrasion resistance employs the instrument in the conventional manner and produces an abraded disc of material 38 mm in diameter. This is convenient where only the loss of finish or appearance, or the mass or volume of abrasion loss, is to be determined and requires only small amounts of material to be tested.

Method 2: Pretreatment procedure

Pretreatment procedure employs the instrument in inverted mode, i.e. the test piece is placed on the abradant table instead of in the test piece holder and the abradant is mounted in the test piece holder. This provides an abraded area which enables post-abrasion testing to be carried out.

3.2 Apparatus

3.2.1 Abrasion machine

Abrasion machine, of the type described by Martindale, (see annex B), and fulfilling the following requirements :

Rotational speed of each of the outer pegs:	$(47,5 \pm 2,5) \text{ min}^{-1}$
Drive ratio outer pegs : inner pegs:	32 / 30
Dimensions of the Lissajous figure:	$(60 \pm 1) \text{ mm}$
Face diameter of specimen holder insert:	$(28,65 \pm 0,25) \text{ mm}$
Combined total mass of specimen holder, spindle and weight:	$(595 \pm 7) \text{ g}$ or $(795 \pm 7) \text{ g}$

The specimen holders and abrading tables shall be plane and parallel over their entire surfaces. The drive from the motor to the machine shall be connected to a counter and switch so that the revolutions of the outer pegs are indicated and that the machine may be stopped after a predetermined number of cycles has been measured by the counter .

NOTE: Information concerning the assembly, maintenance and calibration of the abrasion machine is given in annex A. It is considered advisable that these recommendations are followed, if excessive variability of the test result is to be avoided.

3.2.2 Abradant

The abradant to be used will be specified in the specific product standard . It can be a crossbred worsted abradant, or a silicon carbide cloth, or an emery cloth . The use of silicon carbide paper or emery paper is not recommended, they usually cause problems when mounting the abradant in the Martindale apparatus .

3.2.3 Foam

Polyurethane foam backing, $(3 \pm 1) \text{ mm}$ thick, having a density of $(30 \pm 1) \text{ kg/m}^3$.

3.2.4 Felt

Felt backing, either a non-woven of $(625 \pm 50) \text{ g/m}^2$ and approximately 2,5 mm thick, or a woven felt of $(750 \pm 50) \text{ g/m}^2$ and approximately 2,5 mm thick .

3.2.5 Cutter

Punch or press cutter, to cut a circle of at least 38 mm in diameter.

3.3 Conditioning and testing atmosphere

Condition test pieces and the abradant in atmosphere A in according with ISO 2231, unless otherwise specified. Conduct the test in a room with a temperature not exceeding the range of 15°C to 30°C. Specimens are to be tested in their natural state.