SLOVENSKI STANDARD
SIST EN 13595-4:2002

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Varovalna obleka za poklicne voznike motornih koles - Jopiči, hlače in enodelne ali večdelne obleke - 4. del: Preskusna metoda za ugotavljanje odpornosti proti urezu

Protective clothing for professional motorcycle riders - Jackets, trousers and one-piece or divided suits - Part 4: Test method for determination of impact cut resistance

Schutzkleidung für professionelle Motorradfahrer - Jacken, Hosen und ein- oder mehrteilige Anzüge - Teil 4: Prüfverfahren zur Bestimmung der Fallschnittfestigkeit

Vetements de protection pour les motocyclistes professionnels - Vestes, pantalons et combinaisons une ou deux pieces - Partie 4: Méthodes d'essai pour déterminer la résistance a la coupure par impact

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13.340.10	Varovalna obleka	Protective clothing
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EUROPEAN STANDARD

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English version

Protective clothing for professional motorcycle riders - Jackets, trousers and one-piece or divided suits - Part 4: Test method for determination of impact cut resistance

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Schutzkleidung für professionelle Motorradfahrer - Jacken, Hosen und ein- oder mehrteilige Anzüge - Teil 4: Prüfverfahren zur Bestimmung der Fallschnittfestigkeit

This European Standard was approved by CEN on 5 April 2002.

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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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Foreword

This document EN 13595-4:2002 has been prepared by 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 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2003, and conflicting national standards shall be withdrawn at the latest by January 2003.

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

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

This standard is part of a series of standards specifying requirements for particular items of clothing or particular performance levels and hazards. EN 13595 comprises four parts:

Part 1: General requirements;

Part 2: Test method for determination of impact abrasion resistance;

Part 3: Test method for determination of burst strength;

Part 4: Test method for determination of impact cut resistance.

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, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

The only protection a motorcyclist involved in a road traffic accident has against injury is the clothing he or she is wearing at the time. Motorcyclists' clothing is generally worn as an extension of normal clothing, providing protection against ambient conditions of wind, water and cold, but it should also provide some protection from injury in the event of an accident. It is intended not to hinder a rider from controlling his machine. It should be of an acceptable appearance to the wearer.

This European Standard is primarily concerned with the protection provided by clothing against injury in accidents. The hazards to which motorcyclists are exposed vary widely depending on the physical environment such as the nature of the road track or mountainside, the climatic environment, the traffic environment, the speed at which the motorcycle is being ridden and the skill of the rider. The number of combinations of possible hazards is very large. Total clothing performance against every identified hazard could be required for each combination. This would be impracticably complicated. Therefore this standard contains the requirements for single characteristics of single items of clothing or simple combinations of garments.

This standard is part of a series of standards specifying requirements for particular items of clothing or particular hazards. Further Parts will be issued in due course.

1 Scope

This European Standard specifies performance requirements for clothing materials and assembly methodology utilised in the manufacture of professional motorcycle riders jackets, trousers and one-piece and divided suits which are intended to protect the wearer against mechanical injury on metalled road surfaces.

This European Standard specifies appropriate test method for the determination of impact cut resistance.

2 Normative references

This European Standard incorporates by dated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For a dated reference, 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 (including amendments).

EN 412:1993, *Protective aprons for use with hand knives.*

EN 13595-1:2002, *Protective clothing for professional motorcycle riders — Jackets, trousers and one-piece or divided suits — Part 1: General requirements.*

3 Terms and definitions

For the purposes of this European Standard, the following term and definition apply.

3.1
professional rider
person who is employed to provide or contracts to perform for reward, the services requiring the riding of a motorcycle

Examples are:

a) the delivery of letters, packets or other small freight;

b) the transport of passengers by motorcycle;

c) emergency medical treatment;

d) vehicle breakdown support.

4 Determination of impact cut resistance

4.1 Principle

A test specimen is mounted over a rectangular hole so that it is under a predefined tension. An impact striker of fixed mass, with a sharp blade fitted to its lower surface, is dropped vertically from a predetermined height onto the specimen over the centre of the hole. The maximum penetration of the blade through the material is measured.

4.2 Apparatus

4.2.1 A test apparatus as described in 4.1 of EN 412:1993 with the following modifications:

4.2.1.1 A blade holding block with a mass of 110 g ± 2 g including the blade.

4.2.1.2 A circular wood or plastic specimen support block of diameter 125 mm ± 5 mm and thickness 80 mm ± 20 mm with a rectangular hole of width 5 mm ± 0,5 mm, length 30 mm ± 1 mm through its full thickness and at its centre. The block shall be positioned so that the vertical back of the test blade enters the rectangular hole 7,5 mm ± 0,5 mm from one of its shorter ends with the blade equidistant from the sides of the hole.

NOTE The flesh simulating plastic mass referred to in EN 412 is not required.

4.2.1.3 A quick release mechanism for supporting the blade holding block (4.2.1.1) at a position above the top surface of the test specimen so that the speed of the block at impact of the blade with the specimen is:

Method	Impact speed (m/s)	free fall drop height (mm)
1st	2,0 ± 0,2	200
2nd	2,8 ± 0,2	400

4.2.2 A piece of reference fabric at least 0,4 m x 0,2 m with the following characteristics:

— fabric warp and weft: cotton spun from open end fibres;

— linear mass warp and weft: 161 tex;

— twist warp; double twist S 280 t/m; single yarn Z 500 t/m;

— twist weft; same as warp;

— warp: 18 threads per 10 mm;

— weft: 11 threads per 10 mm;

— crimp warp: 29 %;

— crimp weft: 4 %;

— tensile strength in warp: 1 400 N;

— tensile strength in weft: 1 000 N;

— mass per unit area: 540 g/m^2;

— thickness: 1,2 mm.

NOTE This fabric is the same as that used in the blade cut resistance test of EN 388:1994. It is made by Collamtis, P. O. Box , 59930 La Chapelle d'Armentieres, France, and is available after verification under reference LEM 6 from l'Institut Textile de France, Avenue Guy de Collogue, P. O. Box 60, 69132 Ecully, CEDEX, France. This information is given for the convenience of the user of this European Standard and does not constitute an endorsement by CEN or CENELEC. Equivalent products may be used if they can be shown to lead to the same result.

4.2.3 A device for measuring distances of up to 50 mm to the nearest 0,1 mm, for example a vernier calliper.

4.3 Preparation of test specimens

Take a specimen (220 ± 20) mm × (220 ± 20) mm from each different construction of the clothing assembly. For particular constructions only available in smaller dimensions, use the largest specimen available and adjust the position of the tensioning weights as appropriate. For sheet materials, a specimen (220 ± 20) mm × (220 ± 20) mm shall be taken and the test procedure shall accurately replicate the use of the material(s) in finished garments.

Mark on the test specimen the six required impact points, including any points in the test area likely to provide the lowest level of protection.

Store the test specimen and reference fabric (4.2.2) in an environment of 23 °C ± 2 °C and 50 % ± 5 % relative humidity for at least 24 h before testing and either carry out the test in this atmosphere or immediately after it has been removed.

4.4 Procedure

4.4.1 The reference fabric (4.2.2) is folded in half to produce a double thickness comprising two layers of canvas with the warps running in the same direction, with the test specimens (4.3) not folded, but tested as submitted, to produce an assembly approximately 200 mm × 200 mm, and follow the procedure described in 4.4.2 to make six cuts into this assembly at 45° to the warp.

4.4.2 Use the device (4.2.3) to measure the thickness of the assembly to be tested and record this value as [L_0] to the nearest 0,1 mm.

Place the test assembly over the mounting block (4.2.1.2) and clamp it as described in EN 412 so that the longer edges of the rectangular hole in the block are aligned with the required test direction.

Gently lower the block until the tip of the blade is almost in contact with the upper surface of the test specimen and check that the blade is aligned with the required impact point.

From this position, raise the blade holding block (4.2.1.1) by the drop height required to ensure an impact speed of:

— Method 1: 2,0 m/s ± 0,2 m/s (zone 3 and zone 4 test specimens, see EN 13595-1:2002, annex C)

— Method 2: 2,8 m/s ± 0,2 m/s (Reference fabric 4.4.2, zone 1 and zone 2 specimens, see EN 13595-1:2002, annex C)

Adjust the quick release mechanism (4.2.1.3) to clamp the blade holding block in this position.

Activate the quick release mechanism to drop the blade holding block onto the test specimen.

Mark the blade at a point level with the upper surface of the specimen and remove the blade from the specimen.

Use the device (4.2.3) to measure to the nearest 0,1 mm the distance between the marked point and the tip of the blade and record this value as L_t. Calculate the blade penetration through the specimen L_p using the formula: $L_p = L_t - L_0$

Repeat this procedure a further five times for the remaining test sites identified in 4.3. In the case of woven materials, such as the reference fabric (4.2.2), two cuts shall be made parallel to the warp direction of the material, two parallel to the weft direction of the material and two parallel to the bias direction. In the case of other materials the cuts shall be at 60 degrees to each other.

Calculate the mean of the six L_p blade penetration values.

4.4.3 If the test assembly is two thickness of reference fabric (4.2.2) and the mean blade penetration is not in the range 14 mm ± 1,5 mm, repeat the procedure in 4.4.2 using either a freshly sharpened blade or blunted blade as appropriate.

4.5 Test report

The test report shall include the following information:

a) reference to this European Standard; EN 13595-4;

b) a description of the test specimens or the garment from which they were taken;

c) for each impact:

   1) a description of the impact position on the test specimen;

   2) the impact velocity of the blade;

   3) the blade penetration recorded.

d) the mean blade penetration;

e) any deviations from the specified procedure, such as alternative test sites or orientations.