



# SLOVENSKI STANDARD

## SIST EN 13595-3:2002

01-november-2002

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### Varovalna obleka za poklicne voznike motornih koles - Jopiči, hlače in enodelne ali večdelne obleke - 3. del: Preskusna metoda za ugotavljanje razpočne trdnosti

Protective clothing for professional motorcycle riders - Jackets, trousers and one-piece or divided suits - Part 3: Test method for determination of burst strength

Schutzkleidung für professionelle Motorradfahrer - Jacken, Hosen und ein- oder mehrteilige Anzüge - Teil 3: Prüfverfahren zur Bestimmung der Berstfestigkeit

Vêtements de protection pour les motocyclistes professionnels - Vestes, pantalons et combinaisons une ou deux pièces - Partie 3: Méthode d'essai pour déterminer la résistance à l'éclatement

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**Ta slovenski standard je istoveten z: EN 13595-3:2002**

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13.340.10	Varovalna obleka	Protective clothing
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 13595-3**

July 2002

ICS 13.340.10

English version

**Protective clothing for professional motorcycle riders - Jackets,  
trousers and one-piece or divided suits - Part 3: Test method for  
determination of burst strength**

Vêtements de protection pour les motocyclistes  
professionnels - Vestes, pantalons et combinaisons une ou  
deux pièces - Partie 3: Méthode d'essai pour déterminer la  
résistance à l'éclatement

Schutzkleidung für professionelle Motorradfahrer - Jacken,  
Hosen und ein- oder mehrteilige Anzüge - Teil 3:  
Prüfverfahren zur Bestimmung der Berstfestigkeit

This European Standard was approved by CEN on 6 April 2002.

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 Management Centre or to any CEN member.

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.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document EN 13595-3:2002 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.

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**EN 13595-3:2002 (E)****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****iTeh STANDARD PREVIEW**

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. It also specifies appropriate test methods whereby conformity against these requirements can be assessed.

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

EN ISO 13938-1, *Textiles - Bursting properties of fabrics - Part 1: Hydraulic method for determination of bursting strength and bursting distension (ISO 13938-1:1999).*

EN ISO 13938-2, *Textiles - Bursting properties of fabrics - Part 2: Pneumatic method for determination of bursting strength and bursting distension (ISO 13938-2:1999).*

**3 Terms and definitions**

For the purpose 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 burst strength

### 4.1 Principle

A circular test specimen and an underlying elastic diaphragm are clamped around their edges over the top of a chamber. The specimen is gradually stretched into a dome shape by forcing fluid into the chamber at a constant rate. The pressure of the fluid at failure of the specimen and the distension, measured in terms of the height of the dome, are recorded.

### 4.2 Apparatus and materials

**4.2.1** A diaphragm bursting test apparatus, similar to EN ISO 13938-1 and EN ISO 13938-2 (exception clamping device); it consists of:

**4.2.1.1** A rigid chamber filled with fluid and having a circular aperture of diameter equal to, or up to 0,5 mm greater than the diameter of the circular free area (4.2.1.3).

**4.2.1.2** A circular elastic diaphragm mounted over the aperture in the chamber. The diaphragm and its seal with the chamber shall be able to withstand pressures greater than the burst strength of the material being assessed. The modulus of elasticity of the diaphragm shall be clearly smaller than that of the test specimen.

**NOTE** A value of 5 % of the modulus of the test specimen is recommended.

**4.2.1.3** A means of clamping the test specimen around its edge, above the diaphragm and over the aperture in the chamber (4.2.1.1), leaving a central circular free area of diameter  $113 \text{ mm} \pm 1 \text{ mm}$ .

The design of the clamping system shall ensure that the test specimen does not slip during the test and shall neither stretch nor compress the central area of the specimen as it is clamped.

**NOTE** The following has been found to be suitable: six concentric grooves 2,5 mm apart and 1,25 mm deep cut into the lower clamping surface so that the ridges between the grooves have 0,5 mm radius tops. The upper ring is divided into 16 identical segments each of which is clamped against the body with a 25 mm diameter screw. These are tightened with a torque wrench to press the upper ring segments against the lower ring, and to clamp the sample. The complete upper ring has an internal diameter of 113 mm. The upper segments have grooves that interlock with the lower ring ridges.

**4.2.1.4** A means of pumping additional fluid into the chamber (4.2.1.1) at a constant rate to produce a pressure of up to 2 000 kPa.

**4.2.1.5** A method of recording the maximum pressure of the fluid in the chamber during the test to the nearest 25 kPa.

**4.2.1.6** A method of measuring distension of the test specimen, in terms of the height of the dome, in millimetres to the nearest 1 mm.

**4.2.2** A cutting device, such as a press knife, for cutting test specimens of a suitable size for the clamping system (4.2.1.3).

**EN 13595-3:2002 (E)****4.3 Test specimens**

**4.3.1** For sheet materials, or for each type of seam and slide fastener present in a garment, at least three specimens shall be tested. All combinations of materials beamed in the garment shall be tested, and the test procedure shall accurately replicate the use of the sheet material(s) in finished garments. Where present, exposed row(s) of topstitching thread shall be cut in samples taken from zones 1 and 2, see EN 13595-1:2002, annex C.

Use the device (4.2.2) to cut:

- Option 1: Five individual test specimens of a sufficient size to be clamped firmly in the test machine (4.2.1).
- Option 2: A single test specimen which is wide and long enough for at least five areas to be clamped and tested in turn.

**4.3.2** In the case of uncut sheet material, the test positions shall be from a range of locations across the full usable width and length of the material avoiding areas that are within 50 mm of any manufactured edges.

**NOTE** For a material with a woven structure this should prevent any two specimens containing the same warp or weft threads. Store the test specimens in a standard controlled environment of  $23\text{ °C} \pm 2\text{ °C}$  and  $50\% \pm 5\%$  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** Ensure that the test machine is reset, with the diaphragm (4.2.1.2) flat and the maximum pressure indicator set to zero.

**4.4.2** Tightly clamp one of the test specimens into the machine (4.2.1); for strong materials a very high clamping force is necessary whereas with weak thin materials care is required to avoid cutting into the specimen. Delicate materials shall be tested with cotton canvas rings placed against the clamping surfaces of the steel rings. A knitted fabric shall be placed over the elastic diaphragm to support it when testing some mesh fabrics and punched leather. A diaphragm correction is made for whatever materials are used for the diaphragm, or are used to support it (see 4.4.5). Set the distension measuring device (4.2.1.6) to zero.

Observe the upper surface of the test specimen and gradually force fluid into the chamber (4.2.1.1) at a constant rate until either the test specimen fails or the specified maximum burst pressure is reached. If the specimen does not fail, the value given in this standard shall be exceeded by at least 50 %. The bursting pressure or 50 % over pressure is recorded.

If possible use a fluid flow rate which reaches the desired end point of the test in a time of  $30\text{ s} \pm 10\text{ s}$ .

Examine the test specimen and record the direction of the failure. If the failure occurred near to or at the clamped edge of the test specimen or the test specimen slipped in the clamp then discard the results and repeat the test with another test specimen or at another test position.

Record the maximum pressure of the fluid to the nearest 25 kPa and the distension of the test specimen to the nearest 1 mm and whether the specimen failed or not.

Release fluid from the chamber until the diaphragm is flat and remove the test specimen.

**4.4.3** Repeat the procedure in 4.4.1 and 4.4.2 for the other four test specimens or test positions.

**4.4.4** Calculate the arithmetic mean of the five maximum distensions, to the nearest 1 mm.

**4.4.5** Fully tighten the clamp without a test specimen but with any additional supporting material and gradually pump fluid into the chamber (4.2.1.1) at a rate similar to that used in 4.4.2 until the diaphragm (4.2.1.2) is distended by the mean bursting distension of the five test specimens calculated in 4.4.4. Record the pressure of the fluid at this distension as  $P_0$ .



Calculate the arithmetic mean of the five maximum pressures, recorded for the test specimen. Subtract the pressure  $P_0$  from this value to correct for the effect of the modulus of the diaphragm on the burst strength of the test specimens.

#### 4.5 Test report

The test report shall include the following information:

- a) reference to this European Standard, EN 13595-3;
- b) a description of the test specimen including seam type and any fasteners;
- c) the corrected arithmetic mean maximum pressure;
- d) the mean bursting distension;
- e) a description of the failure and the number of tests associated with each;
- f) any deviations from the specified procedure.

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