



**SLOVENSKI STANDARD**  
**SIST EN 13594:2002**

**01-november-2002**

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**Varovalne rokavice za poklicne voznike motornih koles - Zahteve in preskusne metode**

Protective gloves for professional motorcycle riders - Requirements and test methods

Schutzhandschuhe für professionelle Motorradfahrer - Anforderungen und Prüfverfahren

Gants de protection pour motocyclistes professionnels - Exigences et méthodes d'essai

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 13594**

July 2002

ICS 13.340.40

English version

## Protective gloves for professional motorcycle riders - Requirements and test methods

Gants de protection pour motocyclistes professionnels -  
Exigences et méthodes d'essai

Schutzhandschuhe für professionelle Motorradfahrer -  
Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 25 March 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.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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## Foreword

This document EN 13594:2002 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of an identical text or by endorsement, at the latest by January 2003, and conflicting national standards shall be withdrawn at the latest by January 2003.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.

Annex A is informative.

The Annexes B and C are normative.

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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## Introduction

Motorcyclists' gloves are intended to give protection against ambient conditions without reducing the users' dexterity in operating the motorcycle's controls and switches. In addition the gloves are intended to give mechanical protection to the hands and wrists in accidents. The particular hazards in motorcycle accidents are impacts with the motorcycle, conflicting vehicles, road furniture, and the road surface. Further information is provided in informative annex A.

## 1 Scope

This European Standard applies to protective professional motorcycle riders gloves for use while riding motorcycles for on-road activities. It specifies the requirements for the sizing, ergonomic characteristics, mechanical properties, cleaning, marking and information for users. It also describes the appropriate test methods whereby conformity against these requirements can be assessed.

## 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 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 388:1994, *Protective gloves against mechanical risks*. [Standards/sist/6065de89-7e76-43f6-a098-010606525e8b/sist-en-13594-2002](#)

EN 420:1994, *General requirements for gloves*.

EN 1082-1:1996, *Protective clothing — Gloves and arm guards protecting against cuts and stabs by hand knives — Part 1: Chain mail gloves and arm guards*.

EN 1621-1, *Motorcyclists' protective clothing against mechanical impact — Part 1: Requirements and test methods for impact protectors*.

prEN 13595-2, *Protective clothing for professional motorcycle riders — Jackets, trousers, and one-piece or divided suit — Part 2: Test method for determination of impact abrasion resistance*.

EN 13595-3, *Protective clothing for professional motorcycle riders — Jackets, trousers, and one-piece or divided suits — Part 3: Test method for determination of burst strength*.

ISO 11642, *Leather — Tests for colour fastness — Colour fastness to water*.

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 388, EN 420 and EN 1082-1 together with the following apply.

### 3.1

#### **zone of specific protection (zone of protection)**

area of a glove that is intended to provide additional specific protection, and is subject to specific testing

This minimum zone shall be centred over the knuckles.

NOTE The knuckles are the projections of the metacarpophalangeal joints on the back of the hand.

### 3.2

#### **protective layer (of motorcyclists' gloves)**

leather or fabric in a single piece or multiple pieces or layers that, joined together by seams or other means, make up the continuous and mechanically strong structure of the gloves from the fingertip to the top of the cuff

NOTE The protective layer may be lined and may be fitted with additional decorative and safety features to its outer surface.

### 3.3

#### **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.

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## 4 Requirements

Motorcyclists gloves complying with this standard shall meet the requirements in 4.1 to 4.12. Additionally, gloves may meet the requirements for one or more of the properties specified in 4.13.

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### 4.1 Dye fastness

Gloves shall not be manufactured from material containing dyes which will readily migrate when the gloves become wet with water. When tested in accordance with ISO 11642, the change in colour of any component of the multi-fibre fabric shall not be worse than Grey Scale Rating 3. All colours in a series of gloves shall be tested.

### 4.2 pH of leather

The gloves shall meet the requirements of 4.4.2 of EN 420:1994. All colours in a series of gloves shall be tested.

### 4.3 Chromium (VI) content of leather

The gloves shall meet the requirements of 4.4.3 of EN 420:1994. All colours in a series of gloves shall be tested.

### 4.4 Hard inclusions

Hard materials shall only be present external to the protective layer of the glove. There shall not be hard or sharp edges, seams, buckles or other items on the inner surfaces of the glove's protective layer. Metallic, ceramic or similar hard materials shall not be present as studs, staples, rivets or similar structures penetrating the protective surfaces of gloves or their cuffs. Examinations shall be made according to 6.3.

### 4.5 Ergonomic requirements

When tested in accordance with the method described in annex B, the assessor shall be able to carry out all the defined movements without any significant problem or hazard being encountered.

**EN 13594:2002 (E)****4.6 Sizing**

Motorcyclists gloves shall be marked with their numerical sizes conforming to hand circumference measurements in EN 420, and hand length measurements conforming to EN 1082-1:1996, annex B. Sizing shall be verified according to annex B. The range of sizes supplied shall be included in the information presented to the user.

NOTE The length and circumference ratios of hands are not constant between populations, or sexes, or with age. To maintain dexterity and to ensure a continuity of blood flow, the digit lengths of gloves need to be correct for the particular rider. Hand length designation is provided for in EN 420, but not defined.

**4.7 Coverage**

Motorcyclists gloves shall provide protective coverage to the whole hand, from the fingertips to a position not less than 50 mm beyond the wrist joint. The construction of gloves throughout this area of coverage shall meet the requirements of 4.9, 4.10, 4.11 and 4.12.

Gloves providing optional impact protection shall also meet the requirements of 4.13

**4.8 Restraint**

When tested in accordance with 6.5 the restraint system shall resist a force of 35 N to minimize the danger of being pulled off in an accident. The adjustment range of the restraint system shall be not less than 30 mm.

At least one size of glove between 8 and 9<sup>1/2</sup> shall be tested.

**4.9 Tear strength**

When tested according to 6.3 of EN 388:1994 the tear strength of the strongest layer of material within the protective layer of gloves shall be at least 40 N.

This requirement applies to the whole of the required coverage of the glove.

**4.10 Strength of seams**

All seams or joints between pieces of material forming the protective layer of motorcyclists' gloves shall have at least the minimum strengths specified when tested with the appropriate methods. Woven textiles and leather seams shall have a tensile strength of more than 15 N/mm when tested according to 6.6.1 and annex C. Knitted fabric seams and complex seams which cannot easily be tested in accordance with annex C shall have a bursting pressure of more than 600 kPa when tested according to 6.6.2. Seams attaching overlays to the protective layer are not subject to this requirement.

**4.11 Cut resistance**

Cut resistance shall be provided over the whole of the required coverage of the glove excluding the area between the fingers. The minimum cut resistance (index) determined according to 6.2 of EN 388:1994 shall be at least 2,2.

**4.12 Abrasion resistance**

When tested in accordance with 6.7, the abrasion time shall be at least 2,5 s.

Abrasion resistance shall be provided over the whole of the required coverage of the glove.

**4.13 Optional additional protection, Impact energy attenuation**

Motorcycle riders' gloves may be designed and constructed to attenuate impact energy, providing specific impact protection. The following requirements shall be met by such gloves.



When tested according to 6.8.2, with an impact energy of 5 J, the mean peak transmitted force shall not exceed 4 kN. In addition, no part of the glove shall crack or shatter producing sharp edges, and the chamois leather between the specimen and anvil shall not be torn or holed.

## 5 Test apparatus

Measuring instruments, unless otherwise specified, shall be accurate to  $\pm 2\%$  of the pass/fail level of the characteristic being measured. Unless otherwise specified below, apparatus shall be as specified in the Normative references cited in the Requirements or Procedures subclauses.

### 5.1 Glove restraint testing cones

The test cones shall be made of rigid materials with hard polished surfaces. Each test cone shall consist of a cylindrical body  $100 \text{ mm} \pm 5 \text{ mm}$  long with a hook or other means of attachment at one end. The other end shall have a straight-sided conical expansion  $50 \text{ mm} \pm 1 \text{ mm}$  long (see figure 1). The diameters of the cones used for testing difference sizes of gloves shall be as follows:

Table 1

Glove size	Cylindrical body diameter $d_1$ (mm)	Widest part of cone $d_2$ (mm)
$8 + 8^{1/2}$	$45 \pm 1$	$65 \pm 1$
$9 + 9^{1/2}$	$50 \pm 1$	$70 \pm 1$

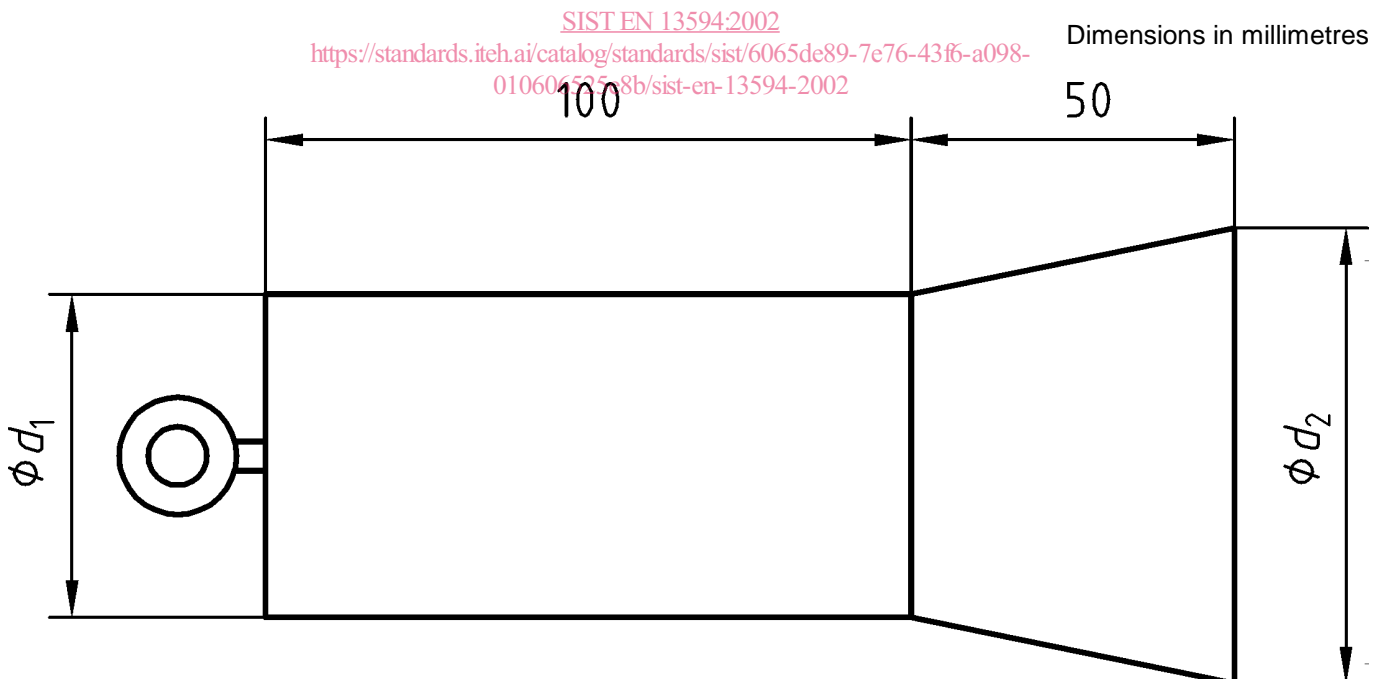


Figure 1 — Glove restraint testing cone

### 5.2 Impact test apparatus

The apparatus and instrumentation shall be as specified in EN 1621-1 for impact testing except that the mass of the striker shall be  $2,5 \text{ kg} \pm 0,1 \text{ kg}$ , the striker face shall be flat and  $80 \text{ mm} \pm 2 \text{ mm}$  in diameter, and the top surface of the anvil shall have a radius of curvature of  $100 \text{ mm} \pm 1 \text{ mm}$ .

**EN 13594:2002 (E)****6 Procedures****6.1 Test specimens**

Test gloves shall be supplied by manufacturers or their agents complete with labels and the Information for Users that will be supplied with the products. Whenever possible, test specimens should be taken from whole gloves, but when this is not possible, samples from stock materials representative of the glove to be tested may be used. Alternatively, independent test reports supplied by the raw material distributor/manufacturer can be used in support of the application.

**6.2 Conditioning gloves and test specimens**

Gloves and stock material shall be cleaned five times by the method(s) specified in the manufacturer's Information for users, except that this shall not be required where only trivial surface cleaning treatments which are considered not to affect the performance of the gloves are recommended, for example wiping with a damp sponge.

Unless otherwise specified in the particular test procedure, gloves and test pieces shall be conditioned in an atmosphere of  $23\text{ °C} \pm 2\text{ °C}$  and  $50\% \pm 5\%$  relative humidity for a minimum period of 24 h before testing except for the procedure in annex B (Ergonomic Testing). Testing shall be carried out in the conditioning environment or within 10 min of the removal of the specimens from that environment.

**6.3 Testing for innocuousness**

The gloves shall be examined visually and by hand to locate any hard or sharp edges, seams, buckles or other items that might injure the user or other persons. The Information for Users shall be examined for a list of harmful material used in the gloves. The gloves shall be examined for hard inclusions such as studs, rivets and staples. The results of the examinations shall be recorded in the test report.

**6.4 Coverage examination**

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The gloves shall be put on by appropriate sized subjects and the closures securely fastened. The coverage of the hand and wrist and forearm above the wrist shall be examined. The wrist line of the subject shall be marked on the glove and the cuff length recorded. Areas shall be marked where the full complement of materials constituting the protective layer are absent, or where one of the materials appears to be of an inferior nature or thickness. The marked areas shall be noted for mechanical testing according to 4.9, 4.10, 4.11, 4.12 and, if relevant, 4.13. The results of the examination shall be recorded in the test report.

**6.5 Restraint testing**

The glove shall be placed on an appropriate test cone as specified in 5.1. The expanded part of the cone lies with the palm. The restraint system of the glove shall be securely fastened around the cylindrical section of the test cone. A clamp is attached to the digits 2 to 5, or wires are threaded through the digits, or another system is used to attach the digits to a single fixation point. The attachment point on the test cone and this fixation point shall be drawn apart gradually over a period of 20 s to 60 s until a separating force of  $35\text{ N} \pm 2\text{ N}$  has been reached, and maintained for 1 min.

The test shall be carried out a total of five times and the glove shall be adjusted for each test. It shall be noted whether the glove pulls off the test cone in any of the five attempts; such an occurrence constitutes a failure to meet the restraint requirements. Only one size of glove from the available size range of each glove series need be tested.

The available adjustment range of closure system shall be measured to the nearest millimetre with a rigid scale.

The results shall be recorded in the test report.

## 6.6 Seam strength testing

### 6.6.1 Tensile testing

Each seam type shall be tested.

In testing a multi-protective layer glove, each layer shall be tested separately. The result is the mean strength of the seams in the strongest layer that is continuous throughout the area of required coverage.

Test samples shall be cut from gloves or from seam samples supplied by the manufacturer which have been examined and accepted as representative of the materials and seams in the gloves. Five examples of each seam type shall be tested according to the test procedure in annex C. The seam strength shall be calculated by dividing the breaking force by the specimen width. The mean value of the five results shall be calculated. The seam type with the lowest mean value shall be compared to the performance requirement.

All results and means shall be recorded in the test report.

### 6.6.2 Burst testing

Test samples shall be selected as in 6.6.1 and tested according to the procedure in EN 13595-3.

The lowest mean value of the bursting strength of a seam design in the glove shall be compared to the performance requirement.

All results and means shall be recorded in the test report.

## 6.7 Abrasion resistance determination

Abrasion resistance shall be determined by the procedure in prEN 13595-2.

In testing a multi-layer glove, all layers including any full lining shall be tested together, except that impact attenuating padding shall be removed.

NOTE 1 The abrasion resistance of the glove is given by the abrasion resistance of the weakest area. This will generally not be through the padding. Removal of the padding makes samples easier to mount.

NOTE 2 Size 8 gloves and larger ones can usually yield one or two test specimens. the test area can be the back, ulnar surface, or palm of the glove. Samples from gloves are preferred, but manufacturers' stock materials may be used if necessary, if for example, a particular material on a digit is determined in the examination according to 6.4 to need testing as it appears inferior to the remainder of the glove.

Testing shall be carried out on at least six samples from a series of gloves. The mean abrasion resistance of the samples is calculated by reference to the canvas reference material.

The test report shall contain a description of the samples, their relative abrasion resistance and the calculated mean abrasion resistance which shall be compared with the performance requirement in 4.12.

## 6.8 Impact energy attenuation testing

Gloves provided with Specific Impact Protection shall be examined by the following procedures.

### 6.8.1 Examination of the zones of protection

A check shall be made that the glove meets the zones of protection defined by the manufacturer and these areas are marked.

The results of examination shall be recorded in the test report.