SLOVENSKI STANDARD
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SIST EN 13595-1:2002
SIST EN 13595-2:2003
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SIST EN 13595-4:2002

Varovalna obleka za voznike motornih koles - 1. del: Preskusne metode

Protective garments for motorcycle riders - Part 1: Test methods

Motorradfahrerschutzkleidung - Teil 1: Prüfmethoden

Vêtements de protection pour les motocyclistes - Partie 1 : Méthodes d'essai

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ICS:

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EUROPEAN STANDARD

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EN 17092-1

March 2020

ICS 13.340.10

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English Version

Protective garments for motorcycle riders - Part 1: Test methods

Vêtements de protection pour les motocyclistes - Partie 1 : Méthodes d'essai

Motorradfahrerschutzkleidung - Teil 1: Prüfmethoden

This European Standard was approved by CEN on 25 November 2019.

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European foreword

This document (EN 17092-1:2020) 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of an identical text or by endorsement, at the latest by September 2020, and conflicting national standards shall be withdrawn at the latest by March 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document, together with EN 17092-2:2020, EN 17092-3:2020, EN 17092-4:2020, 17092-5:2020 and EN 17092-6:2020, supersedes EN 13595-4:2002, EN 13595-3:2002, EN 13595-2:2002 and EN 13595-1:2002.

This standard is part of a series of standards specifying test methods and requirements for motorcyclists’ protective garments. EN 17092 comprises multiple parts:

— *Part 1: Test methods*

— *Part 2: Class AAA garments — Requirements*

— *Part 3: Class AA garments — Requirements*

— *Part 4: Class A garments — Requirements*

— *Part 5: Class B garments — Requirements*

— *Part 6: Class C garments — Requirements*

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Introduction

This document is a part of a series of standards including EN 17092-2, EN 17092-3, EN 17092-4, EN 17092-5 and EN 17092-6, which describe the requirements for motorcyclists' protective garments according to the various classes of protection offered. EN 17092-1 specifies test methods to be used to test motorcyclists' protective garments to confirm that they meet the requirements of the EN 17092-2 and following parts.

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1 Scope

This document describes some of the test methods for use with EN 17092 protective garments for motorcycle riders (Part 2 and following parts). It describes the appropriate test methods for zoning, ergonomics, mechanical properties and impact abrasion resistance.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 388:2016+A1:2018, *Protective gloves against mechanical risks*

EN 1621-1:2012, *Motorcyclists' protective clothing against mechanical impact — Part 1: Motorcyclists' limb joint impact protectors — Requirements and test methods*

EN 1621-2:2014, *Motorcyclists' protective clothing against mechanical impact — Part 2: Motorcyclists' back protectors — Requirements and test methods*

EN 1621-3:2018, *Motorcyclists' protective clothing against mechanical impact — Part 3: Motorcyclists' chest protectors — Requirements and test methods*

EN 1621-4:2013, *Motorcyclists' protective clothing against mechanical impact — Part 4: Motorcyclists' inflatable protectors — Requirements and test methods*

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EN 13594:2015, *Protective gloves for motorcycle riders — Requirements and test methods*

EN ISO 3377-1:2011, *Leather — Physical and mechanical tests - Determination of tear load — Part 1: Single edge tear (ISO 3377-1:2011)*

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EN ISO 4674-1:2016, *Rubber- or plastics-coated fabrics — Determination of tear resistance — Part 1: Constant rate of tear methods (ISO 4674-1:2016)*

EN ISO 5077:2008, *Textiles — Determination of dimensional change in washing and drying (ISO 5077:2007)*

EN ISO 13688:2013, *Protective clothing — General requirements (ISO 13688:2013)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

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3.1
garment
jacket or trouser separate, one-piece or two-piece suit, impact protector ensemble clothing, and other protective motorcycle rider clothing types excluding protective motorcycle rider clothing for the head, neck, hands, or feet

3.2
waistline
line in the horizontal plane of the waist, at the level of the highest points of the iliac crests on a subject standing upright

3.3
beltline
line in a horizontal plane, at the level of the bottom seam, or 4 cm down from the top of the waistband, at the centre front of the trousers on a subject standing upright

3.4
loop restraint
mechanism whereby a loop of material attached to or a part of a garment limb passes around a digit of the hand

3.5
rotor
complete assembly, which spins in a clockwise rotation, comprised of the 3 arms of the sample carrier and the 3 arms of the mass carrier, also including the axle and optionally the electric motor

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3.6
sample carrier
three arms of the rotor, on which the sample holders are mounted

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3.7
mass carrier
three additional arms, containing the masses needed to adjust the required total rotational mass inertia of the rotor

3.8
time to stop
time between the release of the rotor and the end of the sliding of the samples on the concrete tile

3.9
distance to stop
calculated rotational distance travelled by the sample carriers, between the release of the rotor and the end of the sliding of the samples on the concrete tile

3.10
structural strong layer(s)
SSL
layer of material or combination of layers of materials that confer the mechanical properties on a garment that allows it to resist damage and mechanical stress and thereby provide protection in an accident. The layer or layers may be of leather, fabric, or other materials individually or in combination and may or may not include the outermost layer

3.11
hole
break in a test sample, in any dimension, caused by abrasion

Note 1 to entry: see 5.4.5.3.

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3.12
test run
single test at a predetermined revolutions per minute, executed on three test samples

3.13
test cycle
three successive test runs (see 3.12 and 5.4.5.1) to test a material or a combination of materials

3.14
overgarment
clothing designed to be worn over a suit, jacket or trousers

3.15
undergarment
clothing designed to be worn under a suit, jacket or trousers

4 Test samples

Samples shall be provided for examination and testing according to Table 1.

Tests shall be performed on complete garments and specimens obtained from them. If it is not possible to perform any required test using an actual test sample garment, the test may be performed using a representative sample of same materials and construction as found in the complete garment.

In the case of garments with pockets or other provisions for removable impact protectors, the manufacturer shall submit for testing, samples of all impact protectors appropriate for the garment as listed in the information notice for users.

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Before testing, garments and samples shall be cleaned according to the manufacturer instructions. It is not necessary to clean garments before testing where only trivial surface cleaning treatments are recommended, for example wiping with a damp sponge (see EN ISO 13688:2013, 5.2). Test samples shall be conditioned in an atmosphere of (23 ± 2) °C and (50 ± 5) % relative humidity for a minimum period of 24 h before testing.

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Testing shall either be carried out in the conditioning environment or shall be started within 30 min of the removal of the test samples from that environment.

It is recommended to perform the tests in the above conditioning atmosphere; if not possible, the test atmosphere shall not exceed the temperature of (23 ± 5) °C and a relative humidity of 15 % to 75 %.

The dimensions given in the following Table 1 are intended with a tolerance of ± 5 % unless specified by the cited method.

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Table 1 — Minimum testing samples quantities

EN 17092-2:2020 and following parts clause	Test	Test method	Test piece	Samples quantity necessary for classes AAA, AA, A	Samples quantity necessary for class B	Samples quantity necessary for class C
4.1.1	Innocuousness	EN ISO 13688:2013, 4.2		one garment or one sample of each material equivalent to an area of two A4 sheets and one sample of each metallic material which could come into prolonged contact with the skin		
4.1.2	Dimensional stability of garments	EN ISO 5077:2008; EN ISO 13688:2013, 5.2 (for garment preparation)	one garment	one garment	one garment	one garment
4.2.1 (not relevant for part 5)	Impact energy absorption (general)	EN 1621-1:2012, EN 1621-2:2014, EN 1621-3:2018, EN 1621-4:2013 according to the type and location of the protector	One garment and, if applicable, all mandatory and optional impact protectors specified by the manufacturer in the garment's information notice	See the relevant part of EN 1621 series	Not applicable	See the relevant part of EN 1621 series
4.2.2 (not relevant for part 5)	Impact protector location and fixation	**5.5.2**	One garment with all mandatory and optional impact protectors specified by the manufacturer in the garment's information notice		Not applicable	one garment with all mandatory and optional impact protectors specified by the manufacturer in the garment's information notice

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EN 17092-2:2020 and following parts clause	Test	Test method	Test piece	Samples quantity necessary for classes AAA, AA, A	Samples quantity necessary for class B	Samples quantity necessary for class C
4.3 (4.2 in part 5)	Impact abrasion resistance	5.4	9 test pieces with diameter ≥ 125 mm of each material layer or combination of layers with all materials oriented in the same direction (machine / warp / weft / cross) and also with an indication of the direction and outside face. If the manufacturer has declared the specific orientation of the layers is essential, then the sample layers shall be oriented as in the garment.	**one garment,** alternatively an assembly at least (600 × 600) mm having the same combination of materials as found in the garment with all materials oriented in the same warp or machine direction (alternatively weft or cross direction) and also with an indication of the direction and outside face. If the manufacturer has declared the specific orientation of the layers is essential, then the sample layers shall be oriented as in the garment **Not applicable for Class C under garments.**		
4.4.2 (4.3.2 in part 5)	Seam strength	EN 13594:2015, 6.7 and Annex B	3 test pieces of each seam type or joint between materials forming the SSL Regular test pieces: (50 × 80) mm minimum dimensions: (30 × 60) mm	**one garment** alternatively one sample of each SSL construction made with same materials, and with the same type of seam as it is in the garment and with the dimension of at least 40 cm length and 20 cm width and with the seam placed lengthwise in the sample.		

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EN 17092-2:2020 and following parts clause	Test	Test method	Test piece	Samples quantity necessary for classes AAA, AA, A	Samples quantity necessary for class B	Samples quantity necessary for class C
4.5 (4.4 in part 5)	Tear strength	EN ISO 3377-1:2011 EN ISO 4674-1:2016, method B	leather: 6 test pieces (40 × 70) mm textile: 6 test pieces (50 × 200) mm. Strongest layer to be tested	one garment or one sample of each material in leather or in textile equivalent with an area of (320 × 320) mm		
4.6.2 (4.5.2 in part 5)	Two-piece suit requirements for joint between the upper and the lower part	5.5.3.1	upper part and lower part of the two-piece suit	one two-piece suit garment	one two-piece suit garment	not applicable
4.6.3 (4.5.3 in part 5)	Garment sleeve restraint	5.5.3.2	2 sleeves	one garment	one garment	one garment, if it has sleeves
4.7 (4.6 in part 5)	Risk category zoning	5.2	one garment	one garment with all mandatory impact protectors	one garment	one garment with all appropriate impact protectors
4.8 (4.7 in part 5)	Fit and ergonomics	5.6	one garment	one garment with all mandatory and optional impact protectors	one garment	one garment with all mandatory and optional impact protectors
NOTE All specimens can be taken from one single garment, if technically possible. Generally it is sufficient to carry out each test on specimens taken from one single size garment.						

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5 Test methods

5.1 General

Dimensions and other data are subjected to a tolerance of ±3 % unless specified otherwise

5.2 Procedure for determination and demarcation of risk category zones

5.2.1 General

The determination and marking of risk category zones (see Figures 1 to 11) is carried out in steps:

1) Zone 1 areas are located by placing the impact protector area templates of the shoulder, elbow, knee, or hip impact protectors, as appropriate according to the mandatory protector requirements for the Class of the garment, on the corresponding locations of the garment, and then marking around the outside edges of said templates.

2) Zone 2 and zone 3 are then located as follows:

   a) primary reference points at the neck, waistline or beltline (as appropriate), crotch, shoulders, elbows, wrists, knees, and ankles are located and marked;

   b) each of the primary reference points is used to determine the location of a specific cross section of the body and to determine the starting point for measurements around the circumference that is described by that cross section;

   c) the locations of two secondary reference points along each circumference are determined using two percentages of the measure of that circumference. (These secondary reference points describe points where the boundaries of the risk category zones intersect the circumferences.);

   d) the secondary reference points of each circumference are then linked to the secondary reference points on the other circumferences with flexible tape and by marking, creating lines that describe the complete boundaries of the risk category zones across the entire garment.

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For all procedures in 5.2.2 and 5.2.3, all mandatory impact protectors to be provided with the garment (see also Clause 4) shall be in their installed or attached positions and all adjustment straps, devices or fit adjusting systems shall be adjusted to their maximum looseness so that the garment may be at its maximum expansion. All vents, pockets, and other external openings shall be closed.

5.2.2 Determination and demarcation of risk category Zone 1

Select the appropriate templates (as described in EN 1621-1:2012, 6.3.1.5.2 and 6.3.1.5.3) for the mandatory impact protectors, according to the type of protectors (Type A or B) supplied with the garment and EN 1621-1:2012, 5.3. Position the protectors and templates as described in EN 1621-1:2012, 6.3.1.5.4, with the exception that the template shall be placed directly on the exterior of the garment, over the corresponding protector locations, and then mark the boundaries of the templates on the garment. All areas inside these boundaries are considered Zone 1. See Figure 1 for an illustration of typical Zone 1 template placement.

Only for Class B or Class C garments without pockets for impact protectors (EN 17092-4:2020): using Type A impact protector templates (as described in EN 1621-1:2012, 6.3.1.5.2 and 6.3.1.5.3), position the protector templates as described in EN 1621-1:2012, 6.3.1.5.4, with the exception that the template shall be placed directly on the exterior of the garment, over the corresponding body joint, and then mark the boundaries of the templates on the garment. This step is not required for the hip protectors of

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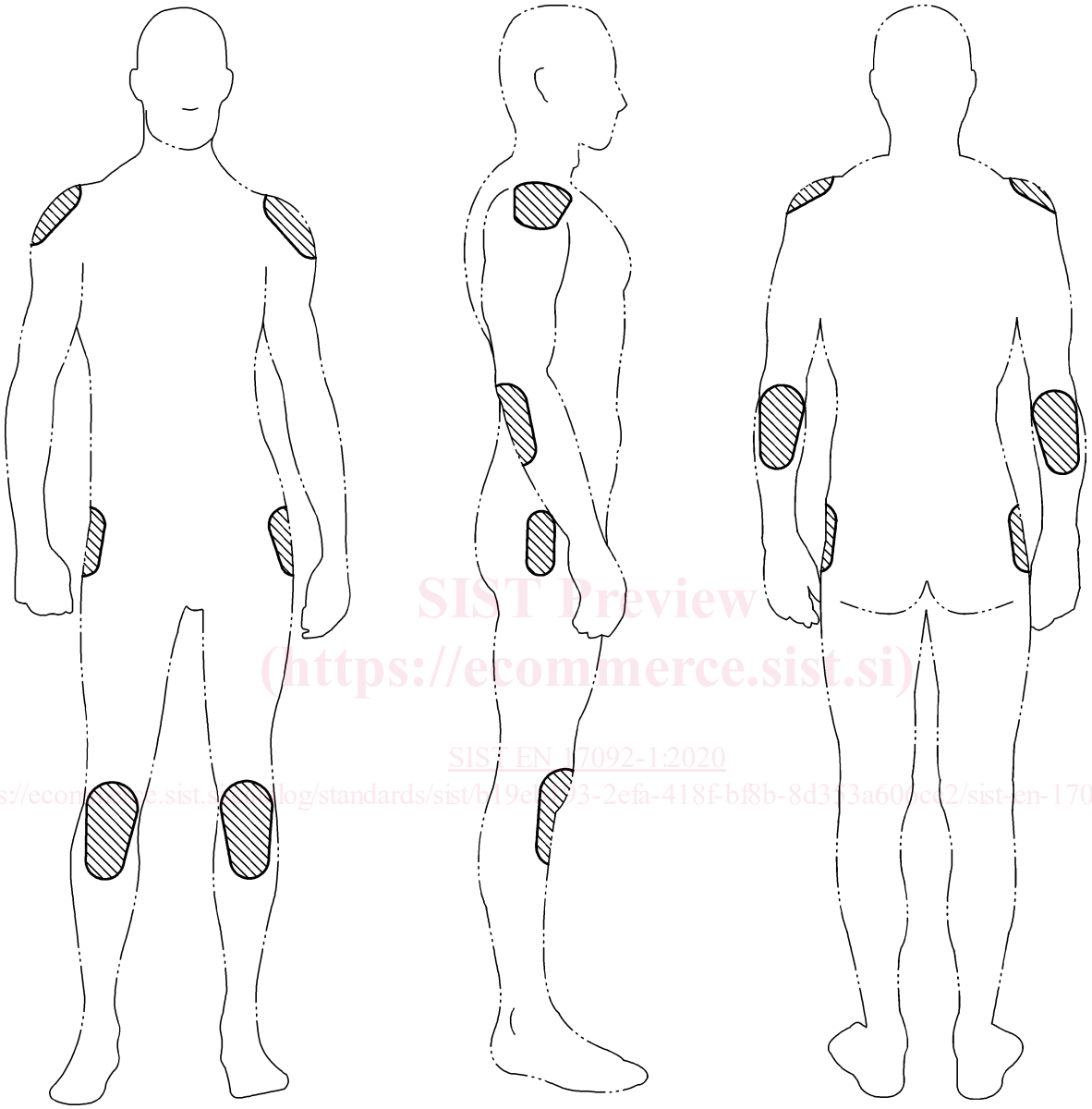
class AAA garments (see 5.2.3.5). All areas inside these boundaries are considered Zone 1. See Figure 1 for an illustration of typical Zone 1 template placement.

As class C garments may be partial garments i.e. short trousers or short sleeved shirts or vests, in those cases the zoning procedure is performed on the available area of the garment.



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Key

zone 1

Figure 1 — Typical placement of Zone 1 templates

5.2.3 Determination and demarcation of risk category Zones 2 and 3

5.2.3.1 Confirmation of primary reference point locations

Using Figures 1 and 2 as a guide, mark the primary reference points according to Table 2. To accomplish this have a person of suitable size as described in the manufacturer's information notice for users, don the garment and assume a natural standing position, as permitted by the garment, and then mark the

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location of primary reference points A through E and G through H as appropriate on the outside of the garment. Reference point F is then marked while the assessor is sitting upright with a 90 ° bend at the knees and hip.

The reference point for the “waist” and subsequent measurements for garments (except trouser separates) are based on locating the “waistline”, whereas, the reference point for the “waist” and subsequent measurements for trouser separates (only) are based on locating the “beltline”. See the definitions at 3.2 and 3.3.

NOTE See Annex A for additional information with regard to the location of the primary reference points and tolerances.

Table 2 — Location of the primary reference points

Primary Reference Point	Location shall correspond to:	
A	The centre of the neck (suprasternal point, anterior)	
B	The centre of the shoulder articulation (the centre of “r1” of the relevant EN 1621-1:2012 impact protector template).	
C	The centre of the elbow articulation (point of elbow)	
D	The terminal point, at the wrist, of a line which is drawn from the centre of the larger radius of the installed EN 1621-1:2012 elbow template (“r1”), when positioned according to 5.2.2, and which intersects “r2” of the elbow impact protector template.	
E	For garments (except trouser separates)	The centre of the waistline (anterior).
	For trouser separates (only)	The centre of the beltline (anterior).
F	The centre of the knee articulation (anterior - the centre of “r1” of the relevant EN 1621-1:2012 impact protector template)	
G	The centre of ankle articulation (point of ankle bone at outside of the ankle)	
H	The centre of the crotch.	

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In the case of suit legs or trouser legs, with or without cuffs, that do not reach the ankles because they are designed to be worn inside of boots, reference point G is located on the assessor’s body and a vertical line, perpendicular to the floor, is projected upwards to the edge of the trouser leg or cuff and the reference point is marked at this location on the trouser leg or cuff.