SLOVENSKI STANDARD
SIST EN 1621-3:2019

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Varovalne obleke za motoriste pred mehanskimi vplivi - 3. del: Ščitniki prsnega koša za motoriste - Zahteve in preskusne metode

Motorcyclists' protective clothing against mechanical impact - Part 3: Motorcyclists' chest protectors - Requirements and test methods

Motorradfahrer-Schutzkleidung gegen mechanische Belastung - Teil 3: Brustprotektoren für Motorradfahrer - Anforderungen und Prüfverfahren

Vêtements de protection contre les chocs mécaniques pour motocyclistes - Partie 3 : Protecteurs de poitrine pour motocyclistes - Exigences et méthodes d'essai

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13.340.10	Varovalna obleka	Protective clothing
43.140	Motorna kolesa in mopedi	Motorcycles and mopeds

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EUROPEAN STANDARD
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ICS 13.340.10

English Version

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 1621-3:2018) 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of an identical text or by endorsement, at the latest by June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

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 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 89/686/EEC and Regulation (EU) 2016/425.

EN 1621 consists of the following parts, under the general title “Motorcyclists’ protective clothing against mechanical impact”:

— Part 1: Motorcyclists' limb joint impact protectors - Requirements and test methods

— Part 2: Motorcyclists' back protectors - Requirements and test methods

— Part 3: Motorcyclists' chest protectors - Requirements and test methods

— Part 4: Motorcyclists' inflatable protectors - Requirements and test methods

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Motorcyclists' chest protectors are devices worn within or on top of other protective clothing, covering the chest of the rider.

The performance requirements have been chosen as a best practical compromise between protection, comfort, and ergonomic requirements. Protectors that are too stiff or heavy will not be worn. The test methods are designed to provide information on protection against impacts against edges such as kerbstones or corner of car roofs. The force levels in the tests do not compare directly with the forces to which riders are exposed in accidents, but experiences have shown that products meeting the requirements of this European Standard may reduce the incidence and severity of injuries.

This standard accommodates two different typologies of protector, which are offered to encourage the adoption of certified protection within the different disciplines of motorcycling and the type of rider. These are namely the divided and full protector, the definition of which are provided in Clause 3.

Two performance levels are specified for motorcyclists' chest protectors against impacts. These are level 1 for soft protectors which fulfil only the force transmission requirements, and level 2 for more rigid protectors which fulfil both the force transmission and force distribution requirements. There may be, however, weight and restriction penalties associated with providing level 2 protection.

1 Scope

This document specifies the minimum coverage to be provided by motorcyclists' chest protectors. The standard contains the requirements for the performance of the protectors under impact and details of the test methods, dimensions, ergonomic requirements, and requirements for innocuousness, labelling and the provision of information.

This document defines a product which provides limited protection against mechanical impacts and falls on the chest. If the product is only intended to protect against lofted stones (commonly used in off-road riding) then EN 14021 will be used. Where a product is intended to protect against mechanical impacts and lofted stones this document will be used.

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 14021, *Stone shields for off-road motorcycling suited to protect riders against stones and debris - Requirements and test methods*

ISO 6487, *Road vehicles — Measurement techniques in impact tests — Instrumentation*

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

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

3.1
chest protector
protector with dimensions and form to protect the rider's chest to reduce the severity of injuries caused by mechanical impacts and falls to the chest

3.2
full chest protector
protector designed as a single piece with dimensions and form to protect the rider's chest

3.3
divided chest protector
protector designed in two separate halves with dimensions and form to protect the rider's chest

3.4
zone of protection
specific area of the protective equipment that is intended to provide protection and this area is subject to specific testing

3.5
Type A protector
protector of smaller dimension; these are more commonly (although not exclusively) optimised for use with smaller riders

3.6
Type B protector
protector of larger dimension; these are more commonly (although not exclusively) optimised for use with larger riders

4 Requirements

4.1 General

Motorcyclists' chest protectors shall meet an overall requirement that they are safe to use, comfortable to wear and fit for their purpose.

Chest protectors shall be provided with means of restraint and/or adjustments capable to ensure that the protector is maintained in position during use. This requirement is not applicable for protectors to be inserted or incorporated into garments. Testing shall be carried out according to 5.7.

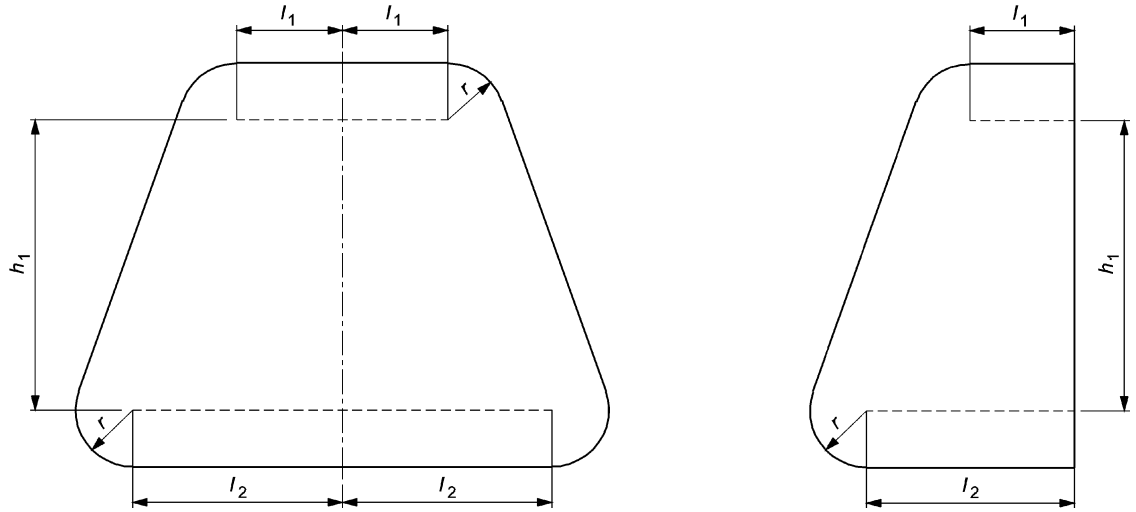
4.2 Innocuousness

The innocuousness shall comply with the requirements of EN 1621-1.

4.3 Minimum dimensions of zones of protection

4.3.1 General

Motorcyclists' chest protectors shall provide a minimum zone of protection. For full chest protectors this is defined in Figure 1a, and for divided chest protectors in Figure 1b. Dimensions are provided in Table 1.



a) Full Chest Protectors **b) Divided Chest Protectors**

Figure 1 — Minimum zone of protection

Table 1 — Minimum zone of protection - Dimensions

Type	Dimensions of Figure 1 in mm			
	r	l_1	l_2	h_1
A	25	42	84	118
B	30	50	100	140
NOTE The type B protector dimensions are intended to cover the needs of most motorcycle riders. However, for ergonomic reasons, in certain cases the type B protectors may be unsuitable. In such cases, the alternative type A protectors can be chosen by the user.				

4.3.2 Levels of protection

— Level 1 Protectors: Protectors made of soft material providing impact attenuation but not impact distribution.

— Level 2 Protection: Protectors made of more rigid material providing impact attenuation and impact distribution.

NOTE Level 2 protectors give improved protection; however, they can be heavier and have restriction penalties associated.

4.4 Impact Attenuation

This requirement is applicable to level 1 and level 2 protectors.

When impact attenuation is tested in accordance to 6.3 with samples conditioned to 6.5.1 (ambient impact test), and repeated with samples conditioned to 6.5.2 (wet impact test) and, if required, 6.5.3 (high temperature impact test) and/or 6.5.4 (low temperature impact test), the transmitted force shall record an average peak force ≤ 18 kN and no single value shall exceed 24 kN. The average for each group of impacts conducted from 6.5.1 to 6.5.4 and the individual peak forces are reported.

After each test, there shall be no fragmentation of the sample and no sharp edges shall be formed. However, formation of cracks and loss of soft debris is permissible.

4.5 Impact Distribution

This requirement is applicable to level 2 protectors only.

When impact distribution is tested in accordance to 6.4 with samples condition to 6.5.1 (ambient impact test), and, if required, 6.5.3 (high temperature impact test) and/or 6.5.4 (low temperature impact test) the transmitted force shall record an average peak force ≤ 15 kN and no single value shall exceed 20 kN. The average for each group of impacts conducted in 6.5.1, 6.5.3 and 6.5.4 and the individual peak forces are reported.

After each test, there shall be no fragmentation of the sample and no sharp edges shall be formed. However, formation of cracks and loss of soft debris is permissible.

4.6 Ergonomic requirements

When examined and tested according to 5.7, chest protectors shall be found satisfactory for the use intended. The requirements are fulfilled if all answers to the questions in 5.7.2 are ‘yes’.

5 Test equipment

5.1 Dropping apparatus

The apparatus shall be such that a mass ("falling weight") can be released in order to drop along a guided vertical path onto the sample placed on a test anvil. The centre of the mass of the falling weight shall lie over the centre of the anvil.

5.2 Bar Impactor

A bar impactor which shall be rectangular with a length, h_1, equal to (160 ± 2) mm, a width, h_2, at the top, equal to (50 ± 1) mm and with a radius hemispherical face, R, equal to (12,5 ± 0,1) mm shall be provided, see Figure 3. The mass of the impactor and guided mass shall be (5 000 ± 50) g and its kinetic energy on impact shall be (50 ± 1,5) J.

5.3 Hemispherical Impactor

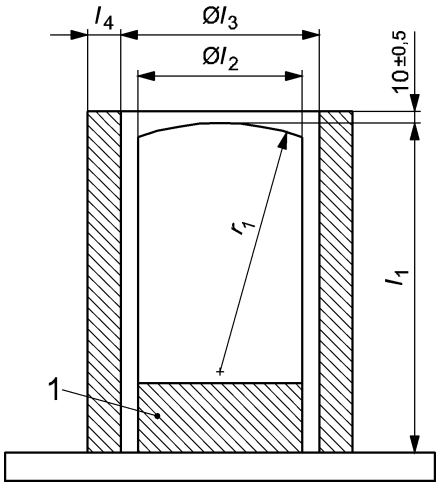
A cylindrical impactor of (25 ± 1) mm diameter and a hemispherical impact head shall be provided for the impact distribution tests. The mass of the impactor and guided mass shall be (5000 ± 50) g and its kinetic energy on impact shall be (50 ± 1,5) J.

5.4 Anvil

The anvil illustrated in Figure 2 shall be made of polished steel with the following dimensions l_1 equal to (190 ± 20) mm, l_2 equal to (100 ± 2) mm and r_1 equal to (150 ± 5) mm.

For the impact distribution tests the anvil shall be surrounded by a "guard ring". This ring shall have an internal diameter l_3 of (120 ± 2) mm, a wall thickness l_4 of (20 ± 1) mm. The guard ring shall be solidly placed onto the base around the piezoelectric load cell or force transducer. The top of the guard ring shall be positioned (10 ± 0,5) mm above the top of the anvil.

The anvil shall be attached through a piezoelectric load cell or equivalent force transducer to a mass of at least 500 kg. The load cell or force transducer shall be preloaded to the manufacturer's instructions.



Key

1 load cell or force transducer

l_1 (190 ± 20) mm

l_2 (100 ± 2) mm

l_3 (120 ± 2) mm

l_4 (20 ± 1) mm

r_1 (150 ± 5) mm

Figure 2 — Anvil with guard ring attached