

SLOVENSKI STANDARD

SIST EN 13546:2002+A1:2007

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Varovalna obleka – Varovala dlani, rok, prsnega koša, trebuha, nog, stopal in spolovil za vratarje pri hokeju na travi in ščitniki goleni za igralce hokeja na travi – Zahteve in preskusne metode

Protective clothing - Hand, arm, chest, abdomen, leg, foot and genital protectors for field hockey goal keepers, and shin protectors for field players - Requirements and test methods

Schutzkleidung - Hand-, Arm-, Brustkorb-, Unterleibs-, Bein-, Fuß- und Genitalschützer für Feldhockey-Torwarte und Schienbeinschützer für Feldhockey-Spieler - Anforderungen und Prüfverfahren

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Vêtements de protection - Protege-mains et bras, plastrons, protection abdominale, guêtres, sabots et coquilles de gardiens de but de hockey sur gazon et protege-tibias de joueurs - Exigences et méthodes d'essai

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EUROPEAN STANDARD
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Protective clothing - Hand, arm, chest, abdomen, leg, foot and genital protectors for field hockey goal keepers, and shin protectors for field players - Requirements and test methods

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This European Standard was approved by CEN on 25 March 2002 and includes Amendment 1 approved by CEN on 10 May 2007.

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Foreword

This document (EN 13546:2002+A1:2007) 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 document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2007 and conflicting national standards shall be withdrawn at the latest by December 2007.

This document includes Amendment 1, approved by CEN on 2007-05-10.

This document supersedes EN 13546:2002.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

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.

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

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Introduction

Protective equipment is worn on the shins by most field hockey players to reduce the severity of injuries from accidental impacts by the hockey ball, hockey sticks and other players. Goalkeepers' more extensive protective equipment is designed to be both playing equipment to stop the ball entering the goal and to return it into play in a controlled manner, and also to be protective equipment which reduces the severity of injuries from accidental impacts by the hockey ball, hockey sticks and other players on parts of the goal-keepers' body not normally used for playing the ball. Impacts on the playing surfaces of the goal-keepers' equipment may be considered deliberate as they are part of the way the game is played. Such playing surfaces should have protection behind them that as far as possible eliminates the risk of injury in normal play at the level of competition for which the products are designed.

Genital protectors are worn by some adult players to protect against hockey ball impacts. Similar products are used in other ball sports such as cricket and lacrosse, but these will not be appropriate for field hockey unless tested to the same or greater severity than is required in this standard.

It has been assumed in the drafting of this standard that the execution of its provisions is entrusted to appropriately qualified and experienced people, for whose guidance it has been prepared. The apparatus described should only be used by competent persons and requires safeguards to prevent, as far as is reasonably practicable, injury to the operator and other persons.

This standard does not cover helmets, face masks and throat protection.

A1) The impact energies for shin protectors to be used to test different performance levels of equipment as specified in Table 17 have been modified to encompass ergonomic requirements like comfort and mass for field hockey players.

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It also reflects experience of test laboratories and manufacturers. **A1)**

1 Scope

This standard specifies the general requirements for the ergonomics, performance, innocuousness, sizing and coverage of field hockey goal keepers' equipment, providing protection to the hands, arms, chest, abdomen, legs, feet and genitals, and field players' shin protectors. Requirements for the marking of equipment and the information to be supplied by the manufacturer are given. Test methods are described and performance levels are defined.

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 dated references, 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 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.*

ISO 3758, *Care labelling code using symbols.*

ISO 8559:1989, *Garment construction and anthropometric surveys — Body dimensions.*

3 Terms and definitions

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

3.1 General

3.1.1 coverage

area of the body which is covered by the whole of the protective equipment and its attachments

3.1.2 field hockey

team game played on a natural or artificial turf surface between goals with sticks and a round hard ball

3.1.3 performance level

number designating the category of the protection that it is intended the product should provide. This number is used in designating the test severity to which the product is to be subjected

NOTE Annex B contains informative guidance on the meaning of performance levels and the choice of equipment.

3.1.4 protective equipment

clothing and specific devices worn on the body, hands and feet, that are intended to reduce the severity of injuries from hockey balls, hockey sticks and other players

3.1.5 zone of protection

area of protective equipment that is intended to provide protection, and is subject to specific testing

3.2 Protective equipment

3.2.1 abdominal protectors

devices worn by goal-keepers to protect their abdomens below the waist from impacts. These devices may incorporate genital protectors

3.2.2 breast protectors

devices worn by female goal-keepers to protect breast tissue from impacts and shearing forces. These devices are normally intended to be worn beneath chest protectors, and only then to provide the intended protection

3.2.3 chest protectors

devices worn by goal-keepers to protect the anterior of their chests down to at least their waist level

3.2.4 elbow and forearm protectors

devices worn by goal-keepers to protect their elbows and forearms from impacts. Normally the cuffs of gloves will overlap these protectors

EN 13546:2002+A1:2007 (E)**3.2.5
Genital protectors**

**3.2.5.1
hard genital protectors**
devices worn to protect the male or female genitalia from impacts

**3.2.5.2
soft genital protectors**
soft foam containing devices sometimes used by women instead of the hard protectors

**3.2.6
gloves**

**3.2.6.1
glove and hand definitions**
the definitions in EN 1082-1 and the following shall apply

**3.2.6.2
goal-keepers' gloves**
the gloves are handed. They may be five digit or two digit designs, or may be hand enclosing protectors

**3.2.6.3
the left or flat glove**
is used palm forwards to play the ball. Padding is provided on the anterior of the wrist and hand and on the finger tips, and on the lateral surface of the hand

**3.2.6.4
the right or stick-holding glove**
is used to grip the hockey stick and is provided with padding to protect the outside or backs of the fingers, the thumb, and the anterior of the wrist

**3.2.7
kickers**
devices worn by goal-keepers over their hockey boots or shoes, for the purposes of play or protection, and covering the fronts, the tops (instep), and sides of the feet

**3.2.8
leg protectors**
devices worn by goal-keepers to block the ball entering the goal. The leg protectors are intended to be worn with kickers and to provide protection with the kicker, from the ankle to above the knee

**3.2.9
shin protectors**
devices worn by field players providing limited impact protection to their tibias and ankles. Type A protectors include some medial and lateral ankle joint protection, but Type B protectors do not

**3.2.10
shoulder and upper arm protectors**
devices worn by goal-keepers to protect the anterior aspects of their shoulders and upper arms from blows by hockey balls. The protection generally extends over the lateral surfaces of the arm and the upper surfaces of the shoulders. These protectors may be attached to chest protectors or may be independent garments

**3.2.11
thigh and hip protectors**
padding usually worn by goal-keepers as parts of trousers ending just above the knees. These trousers may incorporate genital protectors and abdominal protectors

3.3 Body dimensions

3.3.1 bust girth

maximum horizontal girth measured during normal breathing with the subject standing upright and the tape-measure passed over the scapulae under the armpits and across the breasts: normal underclothing to be worn

3.3.2 chest girth

maximum horizontal girth measured during normal breathing with the subject standing upright and the tape-measure passed over the scapulae under the armpits and across the chest

3.3.3 stature

(Height) vertical distance between the crown of the head and the ground, measured with the subject standing upright without shoes and with their feet together

3.3.4 total crotch length

lower trunk length. Length measured from the centre of the front of the waist as defined above through the crotch to the side of the genitalia, to the centre of the back of the waist

3.3.5 under bust girth

horizontal girth of the body immediately below the breasts measured as for the bust girth

3.3.6 waist girth

maximum horizontal girth measured during normal breathing with the subject standing upright and the tape-measure passed around the body in the plane of the waist, 50 mm above the supra-cristal plane which is at the level of the highest points of the iliac crests. The dimension of 50 mm refers to a subject of 178 cm tall and should be scaled *pro rata* with the height of the actual subject

3.3.7 waist to waist over the shoulder length

maximum length measured from the plane of the waist, as defined above, over the shoulder to the plane of the waist. The tape-measure crosses the shoulder at the mid point between the point of the shoulder and the junction of the shoulder to the neck. Anteriorly the tape measure passes over the chest (or bust) to a point 90 mm lateral to the midline of the body on the plane of the waist. Posteriorly the tape measure follows the shortest distance to a point 90 mm lateral to the midline of the body. The distances of 90 mm refer to a subject with a waist girth of 85 cm and should be scaled *pro rata* with the waist girth of the actual subject. Normal underclothing to be worn for the measurement

4 Requirements

4.1 Innocuousness

Protective clothing and equipment for field hockey players shall meet a general requirement that the product is safe to use and fit for its purpose. It shall be designed and manufactured to provide protection when used according to the manufacturer's instructions, without endangering the user or other players. There shall not be hard or sharp edges, seams, buckles or other items on the surfaces of the products that could harm the user or other players during normal use. Examination shall be made according to 5.4.

Construction materials and incorporated substances, shall not harm those coming into contact with them. The manufacturer shall list in the Information supplied with the product, the substances used in the main components of the product, and shall label any product containing substances or preparations generally known to be hazardous.

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Information about determining the chemical innocuousness of protective clothing and equipment is given in informative annex A.

4.2 Ergonomic requirements

Hockey players' protective equipment shall be designed to minimise discomfort and impediment while wearing it. The designs should permit all normal playing movements. The equipment shall not render accidents such as trips and falls more likely. The equipment shall be assessed according to 5.5.

4.3 Sizing**4.3.1 General**

Protective equipment shall be marked with its size (see clause 6). The size shall be related to the body dimensions of the players the equipment should fit, and this shall be explained in the Information supplied by the manufacturer (see clause 7). The following body dimensions shall be used as the control dimensions in sizing particular items of protective equipment. Other dimensions may be used in addition. Definitions of some body dimensions are given in 3.3; others shall be determined by reference to ISO 8559.

Abdominal protectors shall be sized against the users' waist girth and total crotch length calculated from their waist girth.

Breast protectors shall be sized against either the users' bust girth or the users' under bust girth and the brassiere cup size that is normally worn.

Chest protectors shall be sized against the users' chest or bust girth and waist-to-waist over the shoulder length. In sizing chest protectors for female players allowance shall be made for the use of a breast protector inside the chest protector.

Gloves shall be sized against the users' hand length and hand breadth as described in EN 1082-1:1996, annex B, Table B1.

Kickers shall be sized against the users' total height (stature) or the size of boot or shoe over which the kicker is intended to fit.

Shin protectors, leg protectors, elbow and forearm protectors, shoulder and upper arm protectors, shall be sized against the users' total height (stature).

Thigh and hip protectors shall be sized against the users' waist girth and total height (stature).

Hard genital protectors shall be sized according to Table 1. Figures 1a to 1c give an explanation of the dimensions, and clause 5 contains details of the measurement procedure.

Soft genital protectors shall be sized against the user's waist girth.

Table 1 — Hard genital protector dimensions

Size designation	Dimensions shall be greater than these values			
	Dimension A Internal depth mm	Dimension B Internal length mm	Dimension C Internal width at widest part mm	Dimension D Volumes cm ³
Female size 1	20	100	55	70
Female size 2	25	110	65	110
Female size 3	30	120	75	150
Male size 1	40	120	85	170
Male size 2	45	130	95	225
Male size 3	50	140	105	300

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Dimension in millimetres

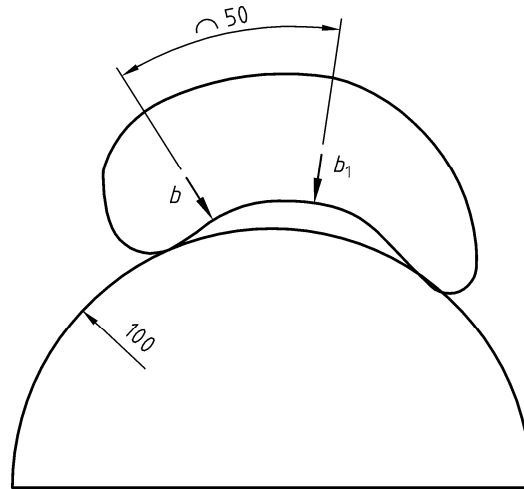


Figure 1a — Dimensions of hard genital protectors

A side view of a genital protector placed on the 100 mm radius half cylinder. Bearing area indicator marks are shown 50 mm apart (b , b_1).

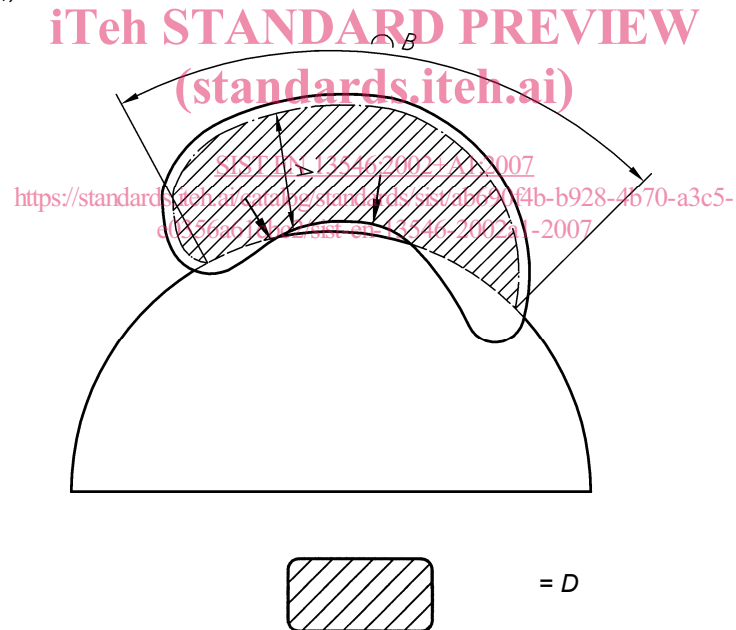


Figure 1b — Dimensions of hard genital protectors

A schematic side view of a genital protector trimmed to fit onto the 100 mm radius half cylinder. Dimensions A and B are shown.

D = The volume to be measured, A_1 dimension D A_1

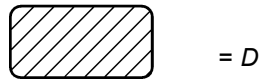
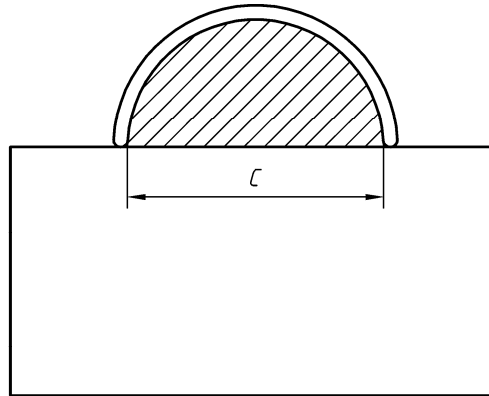


Figure 1c — Dimensions of hard genital protectors
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A schematic cross section of a genital protector on the 100 mm radius half cylinder.

D = The volume to be measured, dimension D

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Figure 1

4.3.2 Nominal sizes of certain products

In addition to sizing based on the users' body dimensions as required in 4.3, manufacturers may, if appropriate, allocate their products to nominal sizes each of which covers a range of actual sizes. If nominal sizing is used the ranges and numbers in Table 1 shall be used. Sizing shall be verified as described in 5.6.

Table 2 — Values of body dimensions for nominal sizing

Nominal size	Items of protective equipment and the relevant body dimensions		
	Shin protectors Leg protectors Elbow and forearm protectors Shoulder & upper arm protectors Kickers	Chest protectors Breast protectors	Abdominal protectors Thigh and hip protectors Soft genital protectors
	Stature, cm	Chest girth, cm	Waist girth, cm
1	116 to 134	72 to 84	68 to 80
2	134 to 152	84 to 96	80 to 92
3	152 to 170	96 to 108	92 to 104
4	170 to 188	108 to 120	104 to 116
5	188 to 206	120 to 132	116 to 128

4.4 Minimum dimensions of zones of protection

4.4.1 General

All protective equipment shall have a zone, or zones, of protection, the dimensions of which shall be related to the size of the largest user the equipment is intended to fit. The dimensions and positions of the zones of protection, relative to the coverage provided by the equipment, shall be given in the Information supplied by the manufacturer, (see clause 7). Methods for determining the dimensions of the zones of protection are described in clause 5. In principle, apart from hard genital protectors, the outer surfaces of the protectors are marked to show the areas in which blows directed towards the underlying skeletal structures will fall on particular constructions. These will be compared to the dimensions given below. The dimensions are those on the outer face of the product. When a product is bent around part of the body such as the lower leg, the thickness of the product has a significant effect on the fraction of the circumference of the limb protected. Values of transverse dimensions of such products require scaling if the thickness of the product is unusual. If the thickness of the product differs from the following by more than 15 %, scaling is necessary. The following thicknesses have been assumed:

- Shin protectors - 15 mm,
- Leg protectors - 50 mm,
- Kickers - 40 mm (only relevant on toe to heel dimensions),
- Thigh and hip protectors - 30 mm, elbow and forearm protectors - 15 mm,
- Shoulder and upper arm protectors - 20 mm,
- Chest protectors, abdominal protectors and gloves do not require protective zone dimensions to be scaled for thickness.

The dimensions of zones of protection shall be verified as described in 5.7. Areas outside zones 1, 2 or 3 do not have to meet impact or dimensional requirements and are designated zone 0. The zones, of the dimensions given below, will be subject to impact testing in accordance with 5.9 to establish compliance with the performance requirements.

4.4.2 Shin protectors

Shin protectors shall be of two types. Type A shall be as described below and shown in Figure 2. Type B shall be as Type A but shall not be required to include the Zone 1 area shown in Figure 2 and specified in Table 3. Dimensions *B*, *J* and *K* shall not apply to Type B.

Shin protectors shall have minimum and maximum dimensions of the zone of protection as given in Table 3 and illustrated in Figure 2. There may be three zones of protection defined by their impact performance. The zones where lower performance is required may have the same construction as the higher performance zones. A central zone is defined that shall have a central rectangular area on all shinguards. Triangular areas are defined beside the central area. It is only required that these cover the medial aspect of the front of the shin. A symmetrical shinguard may be worn on either leg. A left leg protector shall have an area shown by the solid line in Figure 2 and a right leg protector shall have an area shown by the dotted line in Figure 2. The corners of the central high performance zone shall have radii of curvature not exceeding the value of dimension *O*.

Asymmetrical shin protectors shall be marked Left or Right or otherwise identified, (see clause 6).

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