

Protective clothing— Protective jackets, body and shoulder protectors for horse riders — Requirements and test methods

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 31 and a back cover.

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

This European Standard 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 standard.

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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

Horse riders' protective jackets, body protectors and shoulder protectors are worn by riders so that they will have some protection from impacts consequent on falling from horses. Impacts may be against soft or hard ground, or objects such as trees, vehicles, posts or rails. Fallen riders may also be kicked, trodden on, or crushed by a horse. The products may also be appropriate for use by persons handling horses and at risk of being kicked.

Falls from horses involve high levels of energy dissipation. Injuries cannot be entirely prevented by material in protective clothing but should be reduced in severity. Injuries will not be prevented by the protective clothing in accidents involving severe torsion, flexion, extension or crushing, of the body. Spinal protection is not provided by protective jackets and body protectors. Further information is given in informative Annex A.

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.

1 Scope

This standard specifies the coverage to be provided by protective jackets, body and shoulder protectors to be worn by children, youths and adults of either sex while riding horses. The standard contains the requirements for the performance of the protectors under impact and details of the test methods. Requirements for sizing, marking and the provision of information are given.

2 Terms and definitions

For the purposes of this standard, the following terms and definitions apply:

2.1 horse riders' protective clothing

2.1.1 protective jacket

a short sleeved or long sleeved item of clothing incorporating materials meeting the requirements for body protectors and shoulder protectors covering the defined areas of the torso, lower back and shoulders and designed to reduce injury from blunt impacts, falls and kicks.

2.1.2 body protector

a sleeveless item of clothing covering defined areas of the torso and lower back and consisting of one or more layers of material and designed to reduce injury from blunt impacts, falls and kicks.

2.1.3 shoulder protector

a device considered to be an item of clothing that covers the lateral aspect of the shoulder and defined areas of the front, back and top of the shoulder and is designed to reduce injury from blunt impacts and falls on the shoulder. Shoulder protectors may be inserted in protective jackets, attached to body protectors or be part of a separate garment such as a shirt or jersey.

2.2 body dimensions

2.2.1 chest girth

the 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.

2.2.2

bust girth

the 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 for the measurement.

2.2.3

under bust girth

the maximum horizontal girth measured during normal breathing with the subject standing upright and the tape-measure passing immediately below the breasts: normal underclothing to be worn for the measurement.

2.2.4

waist girth

the 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 1 780 mm tall and should be scaled *pro rata* with the height of the actual subject.

2.2.5

waist to waist over the shoulder length

the 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 850 mm and should be scaled *pro rata* with the waist girth of the actual subject. Normal underclothing to be worn for the measurement.

3 Performance levels of protective jackets, body protectors and shoulder protectors

The performance levels of the protective clothing are defined by the test performance criteria given in 4.5.

Level 1 products are subjected to the lowest test severity and higher level products to more severe tests.

See Annex A (informative) for details of horse riders' accidents, injuries and the role of protective clothing.

4 Requirements

4.1 Dimensions of protective material in protective jackets, body protectors, and shoulder protectors

4.1.1 General

Horse riders' protective jackets, body protectors and shoulder protectors shall have the minimum and maximum dimensions of protective material given below, measured on the garments as described in 5.4. Protective jackets shall contain protective materials meeting the minimum and maximum dimension requirements for both body and shoulder protectors. Certain exceptions to these dimensions which are permitted for ergonomic reasons are given in 4.1.3.

NOTE: See Annex A (informative) A.5 and A.6 for information on body coverage and fitting.

4.1.2 Body protectors and protective jackets

Protective material in body protectors and protective jackets shall have an area greater than that defined by the dimensions listed below, illustrated in Figure 1b) and specified in Table 1.

- A: The mid value of chest girths or bust girths given by the manufacturer.
- B: Mid value of waist girths given by the manufacturer.
- C: Mid value of the over-the-shoulder lengths given by the manufacturer.
- A¹: Internal girth of the garment below the armholes.
- B¹: Internal girth of the garment at the waist.
- D and D¹: Vertical lines on the chest separated by a distance of 25 % of A.
- E and E': Vertical lines on the back separated by a distance of 25 % of A.
- F: The centre back length.
- G: The height of the side below the armhole.
- H: The centre front length.
- I: The minimum width across the back between the armholes measured at a level half-way down the armhole opening.
- J: The minimum width across the chest between the armholes measured at a level half-way down the armhole opening.
- K: The width of the back at a distance equal to 50 % of Dimension C from the neck inlet.
- L: The circumference of the armhole.
- M: The distance below the centre of the back of the neck of the garment at which Dimension K is measured.
(M = 0,5 C).

The requirements for the minimum area of continuous protective material are given in Table 1.

Table 1 - Requirements for dimensions of protective material in protective jackets and body protectors.

Dimension	Control dimension	Requirement, as a percentage of the control dimension.
A ¹	A	> A
B ¹	B	> B
D	C	> 45
E	C	> 60
F	C	> 55
G	C	> 16
H	C	> 30
I	A	> 28
J	A	> 22
K	A	> 10
L	A	< 75

Body protectors and protective jackets that have removable shoulder protectors shall meet the requirements for torso protection without shoulder protectors fitted.

4.1.3 Exceptions to the requirements in 4.1.1

The exceptions listed in (a) to (e) below are permitted. The areas and dimensions relate to a body protector to fit a person with a chest girth of 1 000 mm. The areas and dimensions shall be graded *pro rata* with the size of the garment such that the actual areas equal the figures given below multiplied by the square of Dimension A of the garment divided by 100.

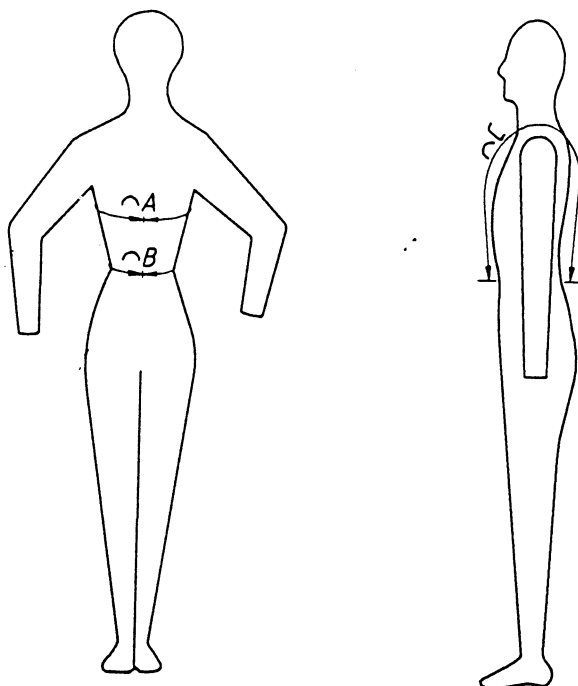
$$\text{Permitted area on a garment} = \text{Area stated below} \times \left(\frac{\text{Area chest girth in cm}}{100} \right)^2$$

Linear dimensions shall be graded proportionately with the actual Dimension A.

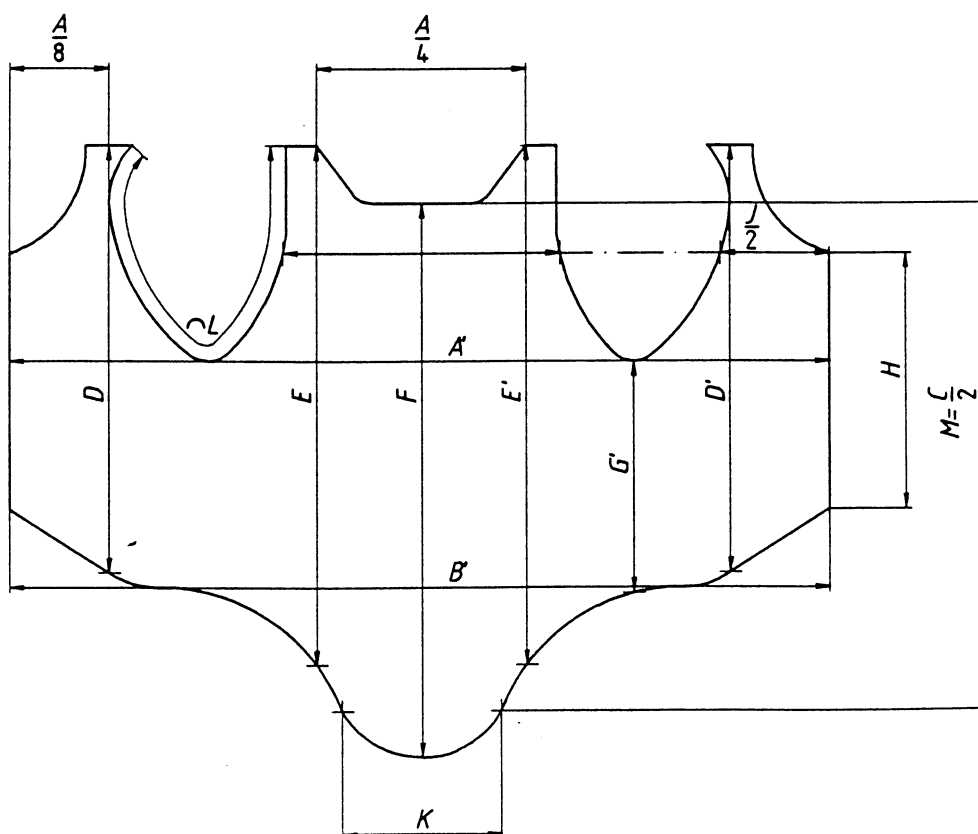
- a) Padding over the top of the shoulder may be reduced to 50 % of its normal thickness in an area not extending more than 50 mm along the over-shoulder dimension line from the top of the shoulder, to the front and to the rear.
- b) Padding below each arm hole may be reduced to 50 % of its normal thickness in an area not exceeding 30 cm².
- c) Padding may be reduced to 50 % of its normal thickness in areas at the side of the body, to permit adjustment of the girth of the garment provided that when the adjustment is set at its widest position, the total width of the area of reduced thickness of padding at each side, does not exceed 100 mm in total, and is not in addition to (b) above.
- d) Padding may be absent from torso areas of a protective jacket or body protector, that are overlaid by shoulder protectors provided that when an appropriate subject wears the jacket, or the body and shoulder protectors no gaps in protection open up between the shoulder and body protectors when the arms are raised laterally and outstretched to positions at angles of 60° to the torso and are swung forward and up to point straight ahead. The shoulder protectors in such combinations shall be irremovable, or the body protector shall carry a warning label that shoulder protectors have to be worn to provide the protection claimed for the garment.
- e) Perforations in padding are permitted providing the perforated padding meets the impact requirements in 4.5, and the maximum hole diameter is not above 15 mm.

4.1.4 Shoulder protectors and protective jackets

Shoulder protectors and the shoulder regions of protective jackets shall contain protective padding in an area that exceeds the template shown in Figure 2. The dimension r_1 is one twelfth of the mid value of the range of chest girths or under bust girths (Dimension A), of the riders the manufacturer states the shoulder protectors will fit, and $r_2 = 0,5r_1$. Shoulder protection may be shaped or have cut away segments for ergonomic reasons, provided coverage in the area covered by the template is complete when the upper arm is at 30° to the torso and in the same plane as the torso. Figure 3 shows a sketch of the normal position of a shoulder protector. The design and testing of shoulder protectors that attach to body protectors and protective jackets may take the presence of the shoulder foam in such garments into account.

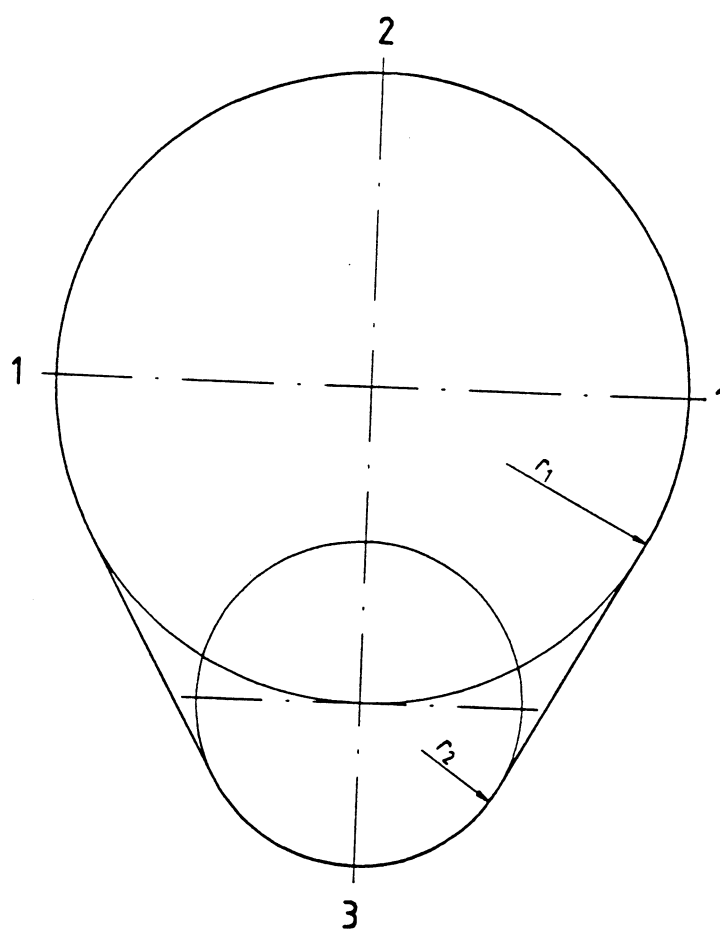


- a) The positions for measurement of the control Dimensions A, B and C stated by the manufacturer and used in sizing the protective clothing.



- b) The positions for measuring the dimensions of protective material in body protectors and the torso regions of protective jackets. A' and B' are measured on the inside of the protective clothing. D-K are measured on the outside of the protective clothing.

Figure 1 - Dimensions of protective material in the torso region of protective jackets and body protectors



- Key
- 1 Front or back
 - 2 Neck
 - 3 Arm

Figure 2 - Shape of the template for examining the extent of protective material in shoulder protectors