

# SLOVENSKI STANDARD

## SIST EN 13158:2009

01-julij-2009

Nadomešča:  
SIST EN 13158:2000

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**Varovalna obleka - Varovalni jopiči, ščitniki telesa in ramen za uporabo v konjeništvu: za jahače, voznike vpreg in vse, ki delajo s konji - Zahteve in preskusne metode**

Protective clothing - Protective jackets, body and shoulder protectors for equestrian use: For horse riders and those working with horses, and for horse drivers - Requirements and test methods

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Schutzkleidung - Schutzjacken, Körper- und Schulterschützer für den Reitsport: Für Reiter, Personen, die mit Pferden arbeiten und für Gespannfahrer - Anforderungen und Prüfverfahren

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Vêtements de protection - Vestes, gilets de protection et protege-épaules pour activités équestres destinés aux cavaliers et personnes travaillant avec des chevaux ainsi qu'aux conducteurs d'attelage - Exigences et méthodes d'essai

**Ta slovenski standard je istoveten z: EN 13158:2009**

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**ICS:**

13.340.10	Varovalna obleka	Protective clothing
97.220.40	Oprema za športe na prostem in vodne športe	Outdoor and water sports equipment

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 13158**

March 2009

ICS 13.340.10

Supersedes EN 13158:2000

English Version

**Protective clothing - Protective jackets, body and shoulder protectors for equestrian use: For horse riders and those working with horses, and for horse drivers - Requirements and test methods**

Vêtements de protection - Vestes, gilets de protection et protège-épaules pour sports équestres: Pour cavaliers, pour personnes travaillant avec des chevaux et pour meneurs d'attelage - Exigences et méthodes d'essai

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This European Standard was approved by CEN on 10 January 2009.

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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 CEN Management Centre has the same status as the official versions.

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**EN 13158:2009 (E)****Foreword**

This document (EN 13158:2009) 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 2009, and conflicting national standards shall be withdrawn at the latest by September 2009.

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

This document supersedes EN 13158:2000.

Annex C provides details of significant technical changes between this European Standard and the previous edition: EN 13158:2000.

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 the United Kingdom.

## Introduction

Protective jackets, body protectors and shoulder protectors are worn by horse riders, those working with horses, horse drivers and passengers in horse driven vehicles, so that they will have some protection from impacts consequent on falling from horses or vehicles. Such impacts may be against soft or hard ground, or objects such as trees, vehicles, posts or rails. Fallen riders, drivers and passengers, and those working with horses will also have some protection from injury from being kicked, trodden on, or crushed by a horse or vehicle.

Falls from horses and vehicles 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. Further information is given in 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.

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**EN 13158:2009 (E)****1 Scope**

This Standard specifies the requirements and test methods for the coverage, sizing, adaptability and adjustability, restraint, ergonomics, construction, innocuousness, and performance under impact to be provided by protective jackets, body and shoulder protectors to be worn by children, youths and adults of either sex while riding horses, working with horses, driving horses or being a passenger in a horse driven vehicle. Such protectors are intended to provide some protection against impacts due to falls from horses and vehicles, and impacts while on the ground due to a fall, or while working with a horse. Impacts may be against the ground or objects such as trees or vehicles, or impacts may be due to kicks, being trodden on or being crushed by a horse. The protectors covered by this Standard are not intended to provide complete protection against injuries in accidents involving severe torsion, flexion, extension or crushing of the body. Requirements for marking and the provision of information are given.

**2 Normative references**

The following referenced documents are indispensable for the application 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 340, *Protective clothing – General requirements*

**3 Terms and definitions**

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

**3.1 Horse rider's protective clothing**

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**3.1.1 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

**3.1.2 body protector**

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

**3.1.3 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

NOTE 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.

**3.2 Body dimensions****3.2.1 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



**3.2.2****bust girth**

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

**3.2.3****under bust girth**

the maximum horizontal girth measured during normal breathing with the subject, wearing normal underclothing, and standing upright and the tape-measure passing immediately below the breasts

**3.2.4****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

NOTE 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.

**3.2.5****waist to waist over-the-shoulder length**

The maximum length measured from the plane of the waist on the anterior of the body, as defined in 3.2.4, over the shoulder to the plane of the waist on the posterior of the body

NOTE 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.

**3.3 Horse drivers**

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**3.3.1****horse driver**

person on a wheeled or skid-mounted vehicle controlling a horse or horses pulling the vehicle

**3.3.2****passenger**

person on or in a wheeled or skid mounted vehicle pulled by a horse or horses but not controlling the horse or horses

**3.4****performance levels of protective jackets, body protectors and shoulder protectors**

number that designates a particular category or range of performance by which the results of testing can be graded

NOTE The performance levels of the protective clothing are defined by the test performance criteria given in 4.6.

Level 1 products are subjected to the lowest test severity, and higher level products to more severe tests. Protective clothing designed to conform with Performance Level 1 is specifically designed for professional racing applications and such garments are required to be marked in accordance with Clause 6.

See Annex A for details of horse riders' accidents, injuries and the role of protective equipment. Performance levels are considered in particular in A.4.4 and A.4.5.

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## 4 Requirements

### 4.1 Requirements for protectors for horse riders, those working with horses, and for horse drivers and passengers

The requirements in 4.2, 4.3, 4.4, 4.5, 4.6 and 4.7 apply to protectors for horse riders, for those working with horses, and for horse drivers and passengers with the exceptions that apply only to protectors for horse drivers and passengers given in 4.2.2.2 and 4.6.2.

### 4.2 Coverage to be provided by protective jackets, body protectors, and shoulder protectors, and the dimensions of protective material in the protectors

#### 4.2.1 General

Protective jackets, body protectors and shoulder protectors for horse riders, those working with horses and for horse drivers and passengers shall provide the coverage, and shall have the minimum and maximum dimensions of protective material given below, measured on the garments as described in 5.4 and 5.7.2. 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 4.2.4.

NOTE See A.5 and A.6 for information on body coverage, fitting and sizing of protectors.

#### 4.2.2 Coverage

##### 4.2.2.1 Protectors for horse riders and those working with horses

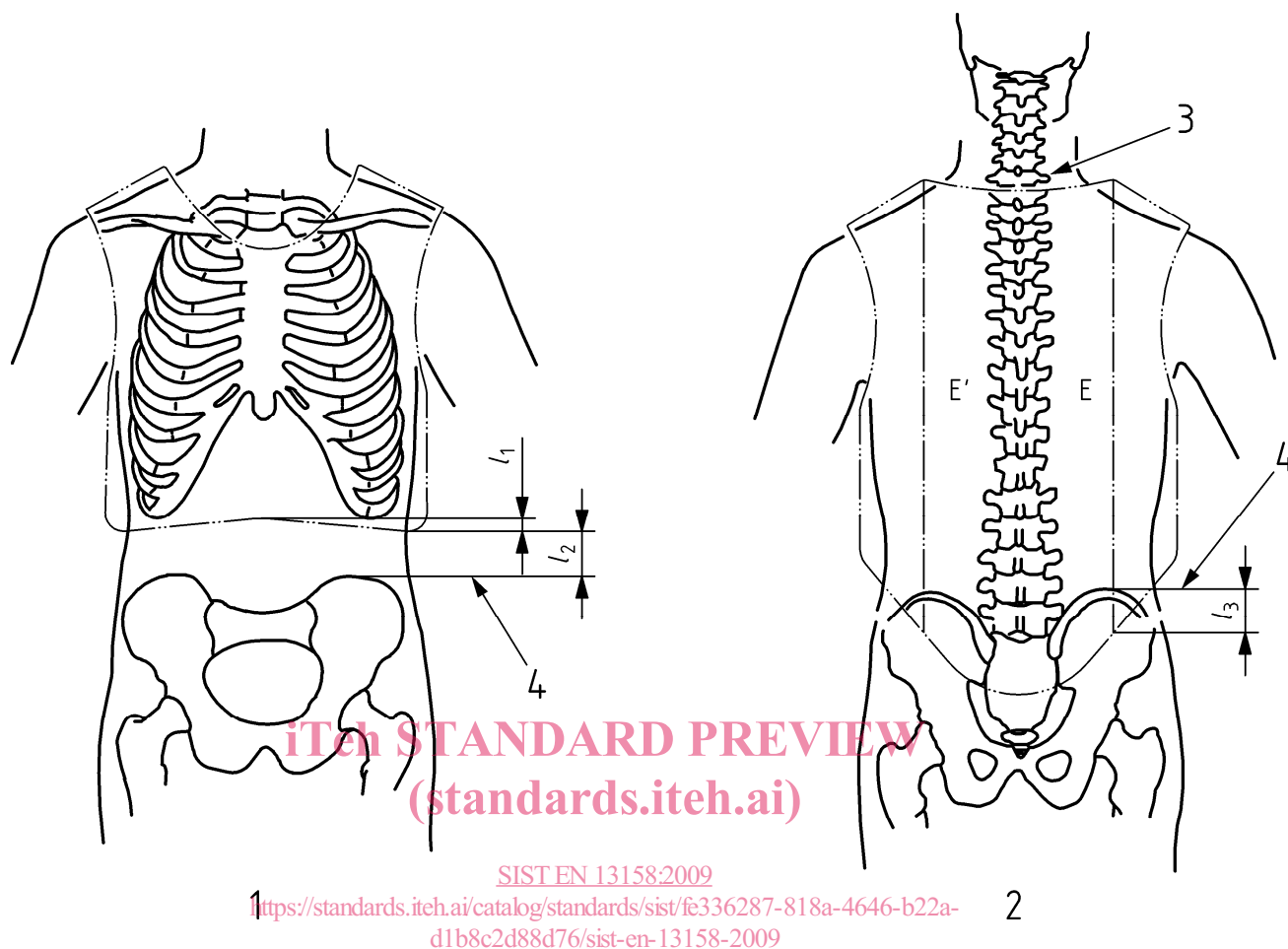
When correctly worn a protective jacket, or a body protector for horse riders and those working with horses shall cover the following area of the body as shown in Figure 1. The numerical dimensions are for a user with an over-the-shoulder length of 1 000 mm and shall be scaled *pro rata* for users with different over-the-shoulder lengths.

- a) The whole circumference of the torso.
- b) The bottom edge of the protector shall be not less than 25 mm below the rib cage anteriorly, and shall reach a level not more than 30 mm above the iliac crests of the pelvis at the side of the body. Posteriorly the bottom edge at the points the lines E and E' (see 4.2.3) intercept it, shall be not less than 50 mm below the level of the iliac crests.
- c) The top of the protective material on the back shall just reach the level of the seventh cervical vertebra (the prominent bone at the base of the neck).
- d) The top of the protective material on the chest shall reach to within 25 mm of the top of the sternum.
- e) The shoulder straps of a body protector or protective jacket shall cover the central 50 % of the clavicle (collar bone).

When correctly worn the protective material in the shoulder of a protective jacket or in shoulder protectors, shall cover the point of the shoulder and extend as follows:

- f) To cover the lateral 75 % of the clavicle.
- g) To cover the upper 25 % of the lateral aspect of the humerus.
- h) To cover the anterior of the shoulder joints (glenohumeral and acromioclavicular joints).
- i) To cover the posterior of the shoulder joints.

Testing shall be carried out according to 5.7.2.



#### Key

- 1 front view
- 2 back view
- 3 the seventh cervical vertebra
- 4 level of the top of the iliac crests
- $l_1$  minimum length of protective material below the ribcage (25 mm for a protector for a user with an over-the-shoulder length of 1 000 mm)
- $l_2$  maximum distance between the lower edge of protective material and the iliac crest at the side of the body (30 mm for a protector for a user with an over-the-shoulder length of 1 000 mm)
- $l_3$  minimum length of protective material below the level of the iliac crests at the points the lines E and E' (see 4.2.3) intercept the bottom edge of the protective material (50 mm for a protector for a user with an over-the-shoulder length of 1 000 mm)

**Figure 1 — Coverage to be provided by a horse rider's body protector**

#### 4.2.2.2 Protectors for horse drivers and passengers

When correctly worn, a protective jacket, or a body protector for horse drivers and passengers shall cover the following area of the body. The numerical dimensions are for a user with an over-the-shoulder length of 1 000 mm and shall be scaled *pro rata* for users with different over-the-shoulder lengths.

- a) The whole circumference of the torso.

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- b) The bottom edge of the protector shall be not less than 25 mm below the rib cage anteriorly, and shall reach a level not more than 30 mm above the iliac crests of the pelvis laterally. Posteriorly the bottom edge at the points the lines E and E<sup>1</sup> (see 4.2.3) intercept it, shall be not less than 30 mm below the level of the iliac crests.
- c) The top of the protective material on the back shall just reach the level of the seventh cervical vertebra (the prominent bone at the base of the neck).
- d) The top of the protective material on the chest shall reach to within 25 mm of the top of the sternum.
- e) The shoulder straps of a body protector or protective jacket shall cover the central 30 % of the clavicle (collar bone).

When correctly worn the protective material in the shoulder of a protective jacket or in shoulder protectors, shall cover the point of the shoulder and extend as follows:

- f) To cover the lateral 70 % of the clavicle.
- g) To cover the upper 25 % of the lateral aspect of the humerus.
- h) To cover the anterior of the shoulder joints (glenohumeral and acromioclavicular joints).
- i) To cover the posterior of the shoulder joints.

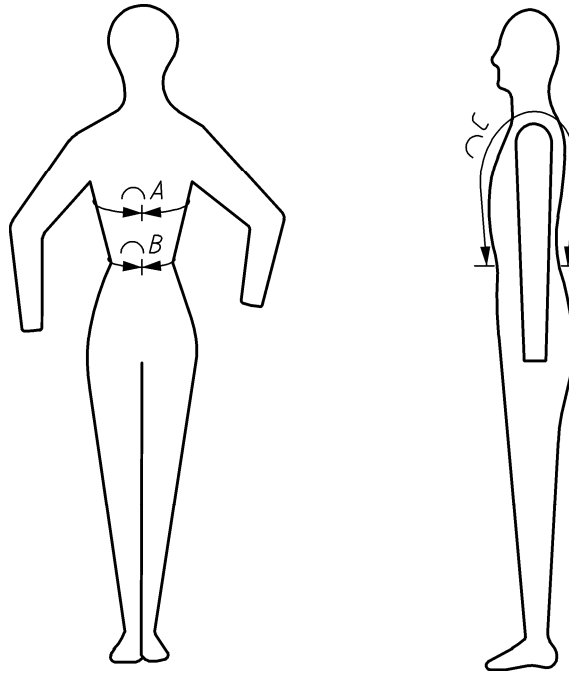
Examination and measurement shall be carried out according to 5.7.2.

#### 4.2.3 Protective material dimensions in protective jackets and body protectors

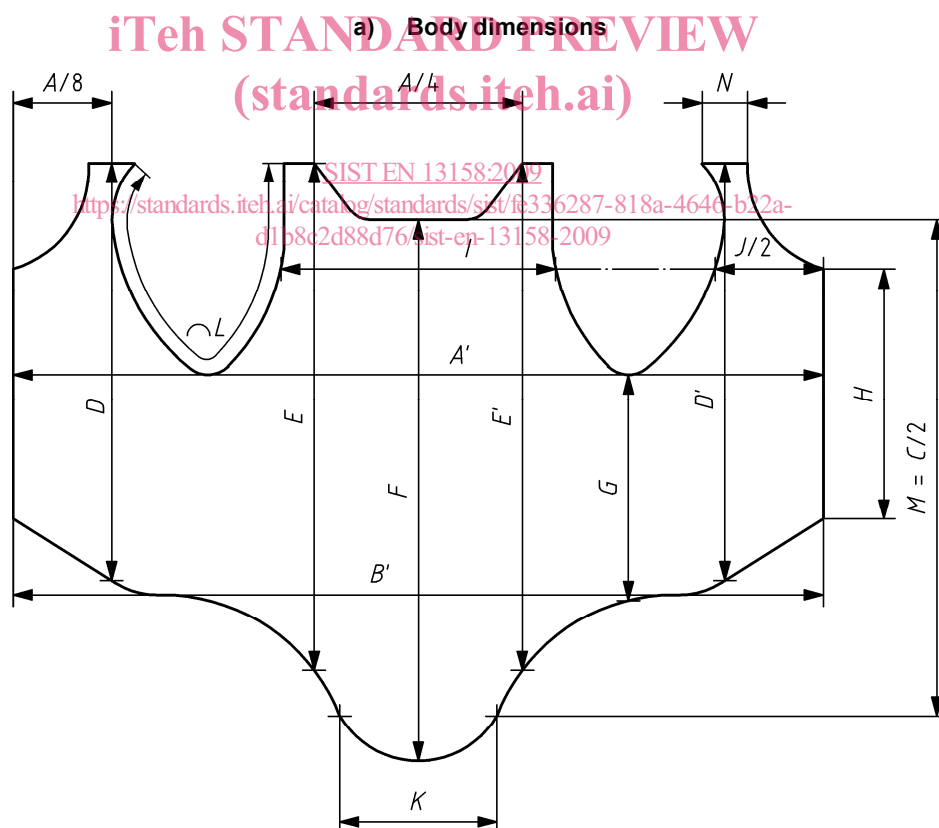
Protective material in protective jackets and body protectors shall have an area greater than that defined by the dimensions listed below, illustrated in Figure 2b and specified in Table 1. Where garments are made with two or more layers of foam or other impact attenuating material, the defined area is required to contain all the layers at their full thickness. Examination and measurement shall be carried out according to 5.4.

Protective jackets and body protectors that have removable parts such as tail pieces or shoulder protectors shall meet the requirements for torso protection without the removable parts or shoulder protectors fitted.

The central 200 mm wide section (the value of 200 mm is for a user with dimension  $A_{\max}$  of 1 000 mm and shall be scaled *pro rata* for other sizes) of the back panels corresponding to minimum dimension  $F$  of body protectors and protective jackets shall be constructed so that they cannot be taken apart or shortened by a user except by the cutting of material or other destructive process not sanctioned by the manufacturer (see 7 I). Removable tail-pieces extending the back beyond the required length of dimension  $F$  are permitted providing the garment has a back length exceeding  $F$  without the tail-piece fitted.



NOTE 1 The positions for measurement of the control dimensions A, B and C stated by the manufacturer and used in sizing the protective clothing.



NOTE 2 The positions for measuring the dimensions of protective material in body protectors and the torso regions of protective jackets.  $A^l$ ,  $B^l$  and  $L$  are measured on the inside of the protective clothing.  $D$  to  $K$ ,  $M$  and  $N$  are measured on the outside of the protective clothing.

**b) Diagram of the protective material in a protective jacket or body protector**

**Figure 2 — Body dimensions and dimensions of protective material in the torso region of protective jackets and body protectors**

**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	
		Protectors for horse riders and those working with horses	Protectors for horse drivers and passengers
$A_{\max}^I$	$A_{\max}$	> 103	> 103
$A_{\min}^I$	$A_{\min}$	< 107	< 107
$B_{\max}^I$	$B_{\max}$	> 102	> 102
$B_{\min}^I$	$B_{\min}$	< 110	< 110
$D$	$C_{\max}$	> 43	> 43
$E$	$C_{\max}$	> 57	> 48
$F$	$C_{\max}$	> 52	> 43
$G$	$C_{\max}$	> 15	> 15
$H$	$C_{\max}$	> 28	> 28
$I$	$A_{\max}$	> 27	> 27
$J$	$A_{\max}$	> 20	> 20
$K$	$A_{\max}$	> 20	No requirement
$L$	$A_{\max}$	< 74	< 74
$M$	$C_{\max}$	50	No requirement
$N$	$A_{\max}$	> 4	> 4

**Key to the dimensions**

$A_{\max}$  is the chest girth or bust girth given by the manufacturer for the largest user.

$A_{\min}$  is the chest girth or bust girth given by the manufacturer for the smallest user.

$B_{\max}$  is the waist girth given by the manufacturer for the largest user.

$B_{\min}$  is the waist girth given by the manufacturer for the smallest user.

$C_{\max}$  is the over-the-shoulder length given by the manufacturer for the largest user.

$C_{\min}$  is the over-the-shoulder length given by the manufacturer for the smallest user.

$A_{\max}^I$  is the maximum internal girth of the garment below the armholes.

$A_{\min}^I$  is the minimum internal girth of the garment below the armholes.

$B_{\max}^I$  is the maximum internal girth of the garment at the lower edge of the protective material.

$B_{\min}^I$  is the minimum internal girth of the garment at the lower edge of the protective material.

$D$  and  $D^I$  are vertical lines on the chest separated by a distance of 25 % of  $A$ .

$E$  and  $E^I$  are vertical lines on the back separated by a distance of 25 % of  $A$ .

$F$  is the centre back length.

$G$  is the height of the side below the armhole.

<i>H</i>	is the centre front length.
<i>I</i>	is the width across the back between the armholes measured at a level half-way down the armhole opening.
<i>J</i>	is the width across the chest between the armholes measured at a level half-way down the armhole opening.
<i>K</i>	is the width of the back at a distance equal to 50 % of dimension $C_{\max}$ from the neck inlet.
<i>L</i>	is the circumference of the armhole.
<i>M</i>	is the distance below the centre of the back of the neck of the garment at which dimension <i>K</i> is measured. ( $M = 0,5 C_{\max}$ ).
<i>N</i>	is the smallest width of the shoulder strap.

#### 4.2.4 Exceptions to the requirements in 4.2.3

The exceptions listed in (a) to (e) below are permitted. Examination and measurement of the exceptions shall be carried out according to 5.4. The areas and dimensions relate to a protective jacket or body protector to fit a person with a chest girth of 1 000 mm. Except where stated, the areas and dimensions shall be graded *pro rata* with the size of the protector:

- 1) linear dimension on a protector = length stated below  $\times$  actual largest user's chest girth in mm/1 000;
- 2) area on a protector = area stated below  $\times$  (actual largest user's chest girth in mm)<sup>2</sup>/1 000 000.

Protective material is permitted to be reduced to 50 % of its normal thickness in specified areas providing all layers are the same material. If the layers are of unequal thickness and the "50 % thickness" area is thinner than 45 % of the total, or the layers are of different construction or are of different composition, it shall be shown by impact testing that the "50 % thickness" construction meets the impact requirements when two layers (100 % thickness) are tested together.

- a) Protective material over the top of the shoulder may be reduced to 50 % of its normal thickness in two areas on each shoulder permitting adjustment of the shoulder by overlapping 50 % thickness areas by varying amounts. The maximum length of each area along the waist to waist over-the-shoulder dimension line shall not exceed 35 mm at maximum opening and 50 % thickness material shall not be present more than the distance specified in Table 2 from the shoulder top line when measured as described in 5.4.1.2. At maximum opening of adjusters there shall be at least 25 mm of overlapping 50 % thickness protective material in the centre of the adjuster in all sizes of protector (not scaled). This is illustrated in Figure 3.