REGULATION 12. PROVISIONS RELATING TO PLAYERS' DRESS

For all matches, Unions, Associations, Rugby Bodies, Clubs, Players and Persons must ensure that the provisions relating to Players' dress, set out in this Regulation, and the specifications set out in Schedule 1, are complied with in full. The Council may, from time to time, supplement, amend and/or modify, in whole or in part, the provisions relating to Players' dress set out in this Regulation and/or the specifications set out in Schedule 1.

Below are the two World Rugby Approved Clothing labels. Both are valid and on display on the World Rugby Player Welfare website (www.worldrugby.org/playerwelfare).

World Rugby Approved Clothing Labels

SCHEDULE 1. SPECIFICATIONS RELATING TO PLAYERS' DRESS

LAW 4 – PLAYERS' CLOTHING

1. Additional items of clothing

(b) Shin Guards

A player may wear shin guards worn under the socks with padding incorporated in non-rigid fabric with no part of the padding thicker than 0.5cm when compressed.

(d) Fingerless Mitts

Coverage of the fingers and thumbs be permitted to the outer joint but no further. The mitt zone of coverage should not continue beyond the wrist.

The body of the mitt should be of a stretch type material with the grip material being made of a soft rubber/synthetic compound not exceeding a depth of 1mm.

No part of a mitt should contain buttons or potentially dangerous items.

(e) Shoulder Pads*

A player may wear shoulder pads, made of soft and thin materials, which may be incorporated in an undergarment or jersey provided that the pads cover the shoulder and collar bone only. No part of the pads may be thicker than 1cm when uncompressed. No part of the pads may have a density of more than 45 kilograms per cubic metre.

(f) Headgear*

A player may wear headgear made of soft and thin materials provided that no part of the headgear is thicker than 1cm when uncompressed and no part of the headgear has a density of more than 45 kilograms per cubic metre.

2. Special additional items for women

Chest Pads*

Besides the previous items, women may wear chest pads made of soft and thin materials which may be incorporated as part of a garment provided that the pads cover the shoulder and/or collar bone and/or chest only with no part of the pads thicker than 1cm when uncompressed and no part of the pads having a density of more than 45 kilograms per cubic metre.

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* *Shoulder Pads, Headgear, Chest Pads (Women) must conform to the Standard Performance Specification for Specific Items of Players' Clothing (Appendix 1 hereto).*

3. Studs

Studs of players' boots must conform to the "Safety Aspects of Rugby Boot Sole Design" set out below:" (Appendix 2 hereto).

4. Banned items of clothing

(g) A player must not wear any item of which any part is thicker than 0.5cm when uncompressed or is denser than 45 kilograms per cubic metre unless specified within this Regulation 12/Law 4. Where this overall thickness consists of padded material covered by fabric, 0.5 cm is the maximum measured thickness for the combination of the uncompressed padding and the fabric. The fabric can contribute up to a maximum measured thickness of 1 mm on each side of the padding.

When Designation: IBR/REG12/Iss 1/2005 Standard Performance Specification for Specific Items of Players' Clothing

The above designation is set. The number immediately following World Rugby indicates the year of issue while the letter designates the issue of that year. At all times the latest issue applies.

This standard concerns manufacturers and testers of Rugby players' clothing and should be read in conjunction with the current version of the World Rugby's LAW 4 concerning players' dress and Regulation 12. Particular attention is drawn to Regulation 12, Schedule 1, Clause 4.4 (g) – set out below.

4.4 (g) Banned items of clothing

A player must not wear any item of which any part is thicker than 0.5 cm when uncompressed or is denser than 45 kilograms per cubic metre unless specified within this Regulation 12/Law 4. Where this overall thickness consists of padded material covered by fabric, 0.5 cm is the maximum measured thickness for the combination of the uncompressed padding and the fabric. The fabric can contribute up to a maximum measured thickness of 1 mm on each side of the padding.

Introduction

Rugby is a contact sport with intrinsic hazards. Padding equipment is worn by rugby players to reduce the severity and frequency of injuries from impacts with other players or the playing surface. The intent of this standard is to specify requirements for rugby headgear, shoulder padding and breast padding without compromising the form or appeal of the game.

1. Scope

This standard sets requirements for headgear, shoulder padding and breast padding. General requirements relating to the ergonomics, construction, sizing and design of the equipment are specified. Performance requirements relating to impact attenuation and retention

system strength and effectiveness (headgear only) are also provided, and the corresponding test methods are described. In addition, requirements for product marking and instructional literature are included.

2. Terminology

Padding – that padding worn on the body and head.

Headgear – that worn on the head by players.

Shoulder Padding – that padding worn on the shoulder area.

Breast Padding – that padding worn on the breast and axillary tail area.

Zone of Coverage – the area of padding that is intended to provide coverage.

Retention System – that which is used to secure the headgear or garment to the body.

Chin Strap – a strap that passes under the wearer's chin or lower jaw and is intended to retain the headgear on the head.

g – the acceleration due to gravity. g (standard) = 9.80665 m/s^2.

gmax – the maximum value of g encountered during impact.

3. Requirements – Headgear

3.1 Ergonomics

Headgear should be designed and constructed to minimise discomfort for the wearer. All normal playing movements shall not be impeded by wearing the headgear.

3.2 Construction

3.2.1 Construction Materials

It is the manufacturer's responsibility that all materials used in the construction of the headgear should not be significantly affected by ultra-violet radiation, water, dirt, perspiration, toiletries, household soaps and detergents. All materials coming into contact with the wearer's body will not be of the type known to cause skin disorders and shall not cause abrasion of either the wearer or other players.

3.2.2 Padding Materials

Padding materials must be homogeneous padding facing towards the wearer should be the same texture, hardness and density as that facing the opponent). Foam padding of sandwich construction is not allowed.

3.2.3 Finish

Headgear shall be so constructed that it is unlikely to cause any injury to the wearer or other players during play. There shall not be hard or sharp

edges, seams, buckles or other items on the surface of the product that could harm the wearer or other players during normal use.

3.3 Design

3.3.1 Zones of Coverage

The headgear must have zones of coverage that cover the crown, temple, forehead (sweatband area) and ear areas. The zones of coverage shall fulfil the requirements of the impact performance specification (Section 3.4.1) and have a maximum padding thickness of 10mm+2mm tolerance band plus an additional allowance of 1mm on each side for fabric. The typical dimensions of the zones of coverage are given in Table 1. Areas outside designated zones of coverage do not have to meet impact requirements but must be of soft foam or leather and be less than or equal to 5mm in thickness. Where this overall thickness consists of padded material covered by fabric, 0.5 cm is the maximum measured thickness for the combination of the uncompressed padding and the fabric. The fabric can contribute up to a maximum measured thickness of 1 mm on each side of the padding. All padding materials must have a density not greater than 45 kg/m^3 + 15 kg/m^3 tolerance band.

Table 1.
Typical Dimensions of Zones of Coverage for Headgear

Dimensions	XXS mm	XS mm	S mm	M mm	L mm	XL mm	XXL mm
B	56	58	63	70	75	75	75
C	81	85	89	97	104	106	108
D	132	136	140	147	155	158	160
E	50	50	50	50	50	50	50
F	> 25	> 25	> 25	> 25	> 25	> 25	> 25
G*	25 to 30	25 to 30	25 to 30	25 to 30	25 to 30	25 to 30	25 to 30

**see Ear Aperture section 3.3.2*

Figure 1.
Typical zones of Coverage for Headgear

Sizes are based on the following:

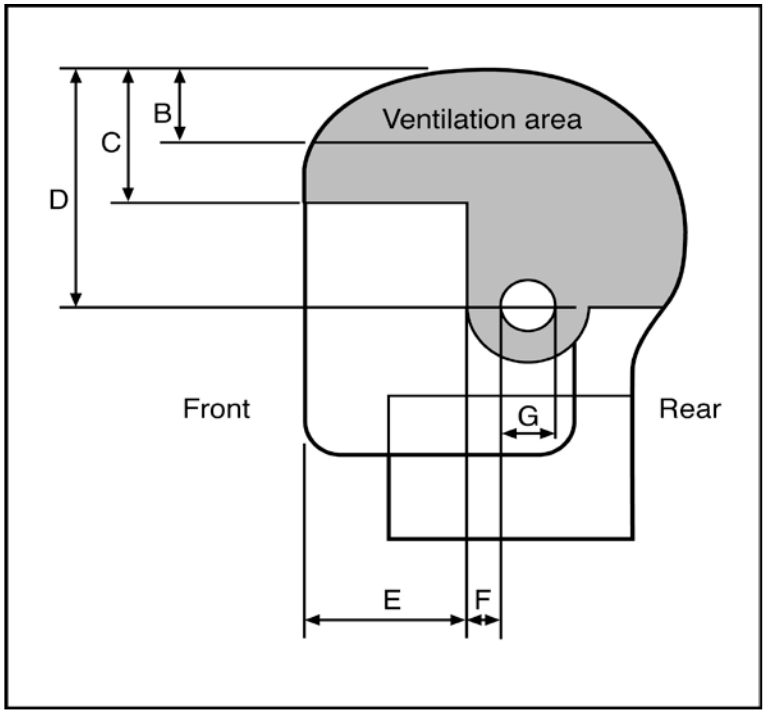


Table 2.
Head sizes

Diameter (cm)	50 51	52 53	54 55	56 57	58 59	60 61	62 63
Size	6 ¼ 6 ⅜	6 ½ 6 ⅝	6 ¾ 6 ⅞	7 7 ⅛	7 ¼ 7 ⅜	7 ½ 7 ⅝	7 ¾ 7 ⅞
	XXS	XS	S	M	L	XL	XXL

3.3.2 Ear Aperture

The ear aperture of the headgear shall have a linear dimension (G) not less than 25mm and not more than 30mm. It may have a cross mesh or similar design characteristic but this must not significantly affect the hearing of the wearer. Where a cross mesh is used, the linear dimension of any ear apertures shall not exceed 30 mm.

3.3.3 Vision

Horizontal field: the headgear shall provide peripheral vision clearance of at least 105° to each side of the longitudinal vertical line (median plane) when the headgear is positioned in accordance with the Manufacturer's Instructions (see Figure 2). Vertical field: the headgear shall provide

peripheral vision clearance of 25° above the Apex plane when the headgear is positioned in accordance with the Manufacturer's Instructions. Vision will not be hindered below the Apex plane (see Figure 3).

Figure 2.
Horizontal Field of Vision Requirement

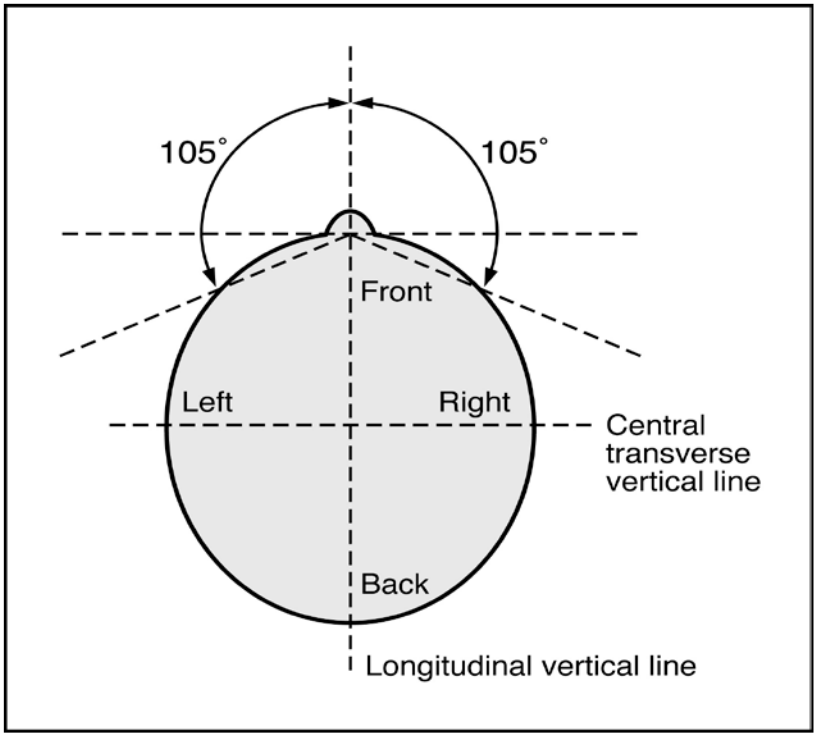
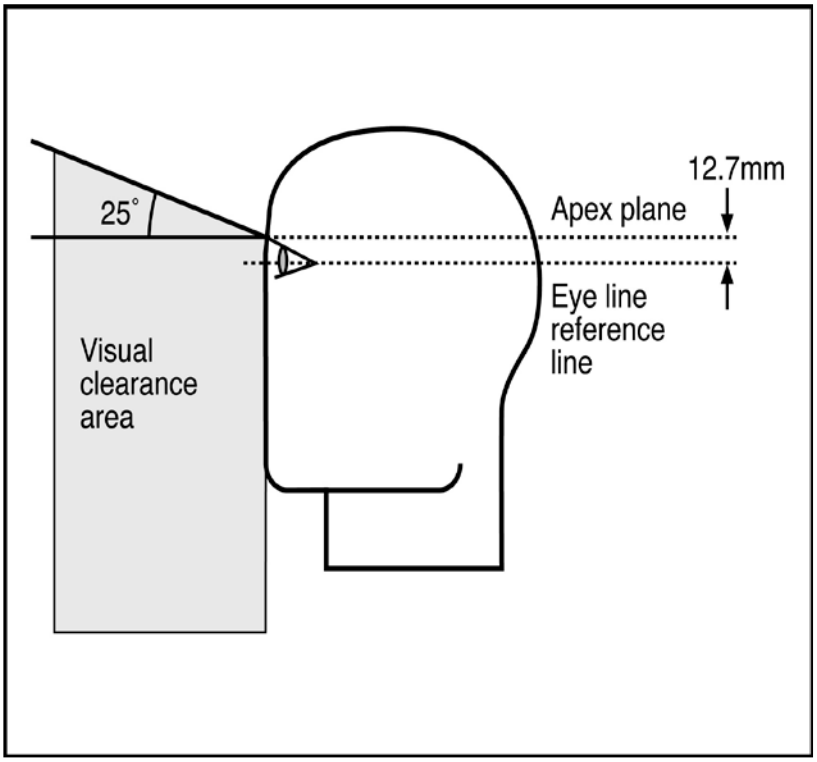


Figure 3.
Vertical Field of Vision Requirement



3.3.4 Ventilation

It is the manufacturer's responsibility to provide for adequate ventilation in the headgear design.

3.3.5 Retention System

The retention system should be attached so that the headgear remains in its normal position during play. The chin strap that secures the headgear should be affixed to both sides of the headgear and pass under the lower jaw in close proximity to the jaw and the neck. The minimum width of the chin strap shall be 15 mm. Buckles or similar hard fixings may not be used. Rubber buttons or Velcro® type fixing materials are acceptable.

3.4 Performance Requirements

3.4.1 Impact Attenuation

When tested in accordance with the procedures specified in Section 4.3, the peak acceleration of impacts delivered to test locations shall not be less than 200g.

3.4.2 Retention System Strength

When tested in accordance with Section 4.4, the strap should stay intact and closed when loaded with a 7 kg mass but should fail when strained dynamically by an additional mass of 10 kg allowed to fall through 300mm.

3.4.3 Retention System Effectiveness

When tested in accordance with the procedures specified in Section 4.5 the headgear may shift but not roll off the wearer's head when initially subject to a static load of 3 kg followed by an additional dynamic load exerted by a 4 kg load falling through 175mm.

4. Test Methods and Procedures – Headgear

4.1 Sampling

Three (3) test specimens of each size shall be submitted by Manufacturers, complete with 'Information supplied by the Manufacturers' (see section 9). Two specimens shall be used for impact attenuation testing at the various conditions and one for retention system testing.

4.2 Conditioning of Specimens

Prior to impact testing, one specimen will be exposed to ambient conditions and another to high temperature conditions as follows:

(i) Ambient Temperature - one sample is conditioned by exposing it to a temperature of 20°C +/- 2°C and relative humidity condition of rh60% +/- 5% for a period of between 4 and 24 hours.

(ii) High Temperature - the second is conditioned by exposing it to a temperature of 50°C +/-2°C and relative humidity condition of rh60% +/- 5% for a period of between 4 and 24 hours.

All testing shall be conducted within 5 minutes of removal from the conditioning environment.

4.3 Impact Attenuation Testing

4.3.1 Principle

The headgear is mounted on the test headform so that the headform can be oriented in different positions and dropped onto a flat impact surface. The acceleration and time history of the impact are recorded using a tri-axial accelerometer and appropriate instrumentation. Peak acceleration and time duration data obtained using the methods specified in Section 4.3.4 are used to determine the impact characteristics of the headgear.

4.3.2 Apparatus

The apparatus for the impact attenuation test shall consist of the following (also see Figure 4):

Headforms – All headforms used will be to EN 960, be of metal and have a low resonance frequency (but not lower than 3kHz).

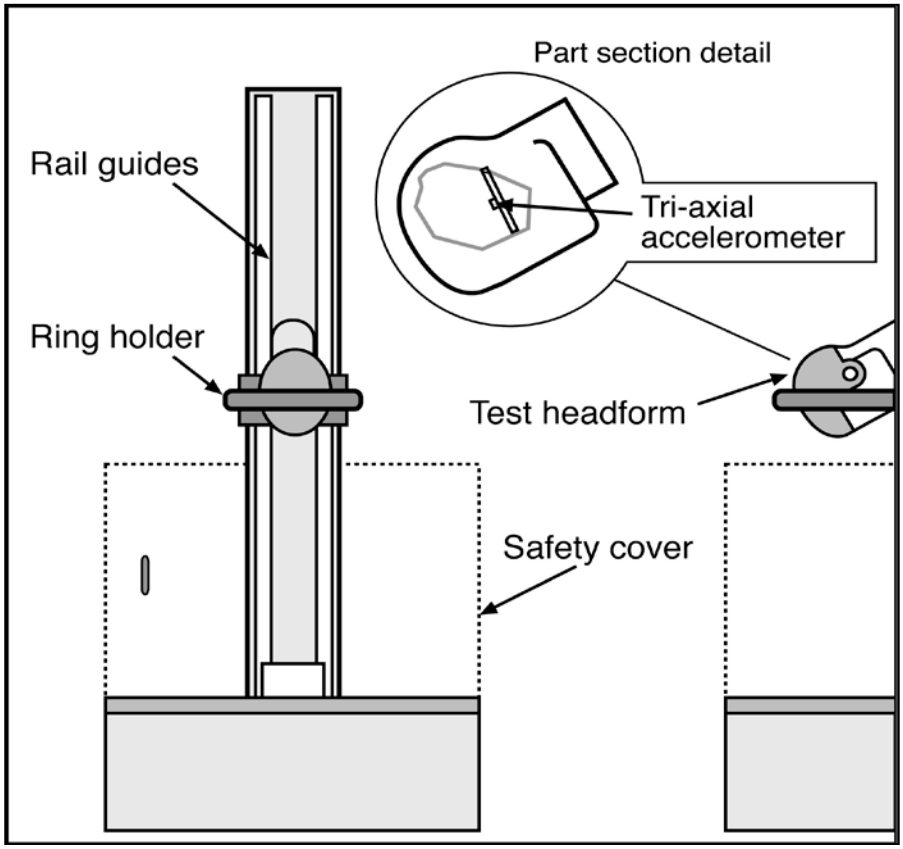
Anvil – the anvil shall consist of a flat steel surface of diameter 130mm +/-3mm and not have a resonance frequency liable to affect measurements. The centre of mass of the drop head form shall lie over the centre of the anvil.

Guide Assembly – a headform shall be attached to a free fall or rail guided drop assembly carriage by an adjustable mounting or other means that will allow impacts to be delivered at any prescribed point on the headgear.

Accelerometer – a set of three accelerometers in a three axis array are mounted at or close to the centre of gravity of the test headform when the headform is mounted in the free fall carriage assembly.

Impact Recording and Displaying Instrumentation – the impact shall be recorded and displayed on a storage oscilloscope with specified deflection factors, sweep speed per division and bandwidth for each of the accelerometers and be capable of resolving the gmax of the headform. Equivalent instrumentation capable of recording, displaying and storing the impact signal from the accelerometers shall meet this requirement.

Figure 4.
Typical apparatus for Impact Testing of Headgear



4.3.3 Reference Testing

A flat MEP (modular elastomer programmer) reference surface will be used measuring 150mm diameter, 25mm thick mounted on a matching steel base. The headform will be dropped onto the MEP impact surface from a distance 300mm +/- 5mm. Resolved gmax values recorded by the accelerometer on three successive drops shall lie within +/- 10g of the mean.

4.3.4 Impacting

The headgear is matched for best fit to the testform according to the manufacturers recommendations. Each headgear is impacted where additional padding has been applied within the specified zones of coverage (crown, forehead and temple/sweatband areas). An energy level of 13.8J will be used for impact. This is equivalent to the 'J' headform falling through 300mm. The height of fall will be adjusted for each headform mass.

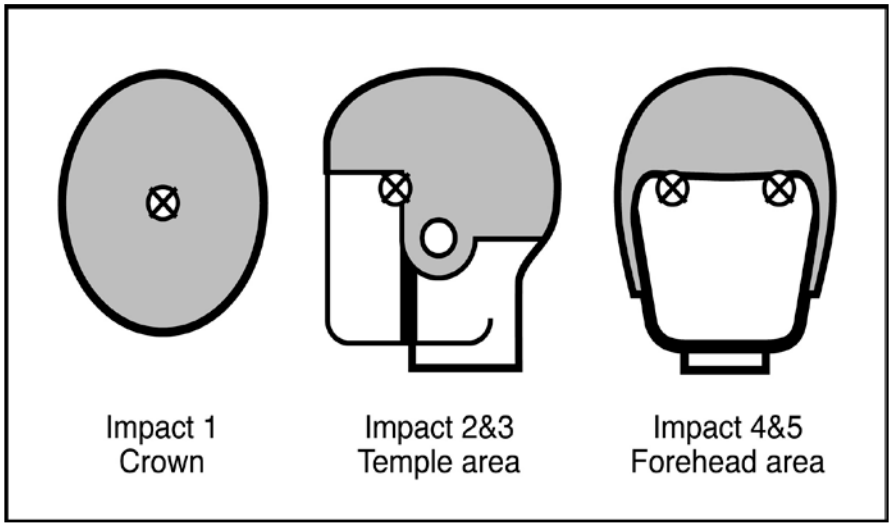
Note: Mass of headforms used are

A - 500 mm - 3.1Kg ± 0.10
E - 540 mm - 4.1Kg ± 0.10
J - 570 mm - 4.7Kg ± 0.14
M - 600 mm - 5.6Kg ± 0.16
O - 620 mm - 6.1Kg ± 0.18

The impact zones will be:

Once, where crown padding is provided.
Twice where forehead padding is provided.
Twice where temple padding is provided.

Figure 5.
Impact locations on Headgear



4.3.5 Calculations

Maximum acceleration
The maximum peak acceleration is calculated by measuring the perpendicular distance to the trace baseline from the midpoint of the resultant trace at maximum excursion and multiplying by the sensitivity factor. The sensitivity factor is defined as g per division deflection of the trace.

4.3.6 Duration of Impulse

Determine the duration of the pulse by measuring the total width of the trace along the 150g line in milliseconds.

4.4 Retention System Testing – Strength

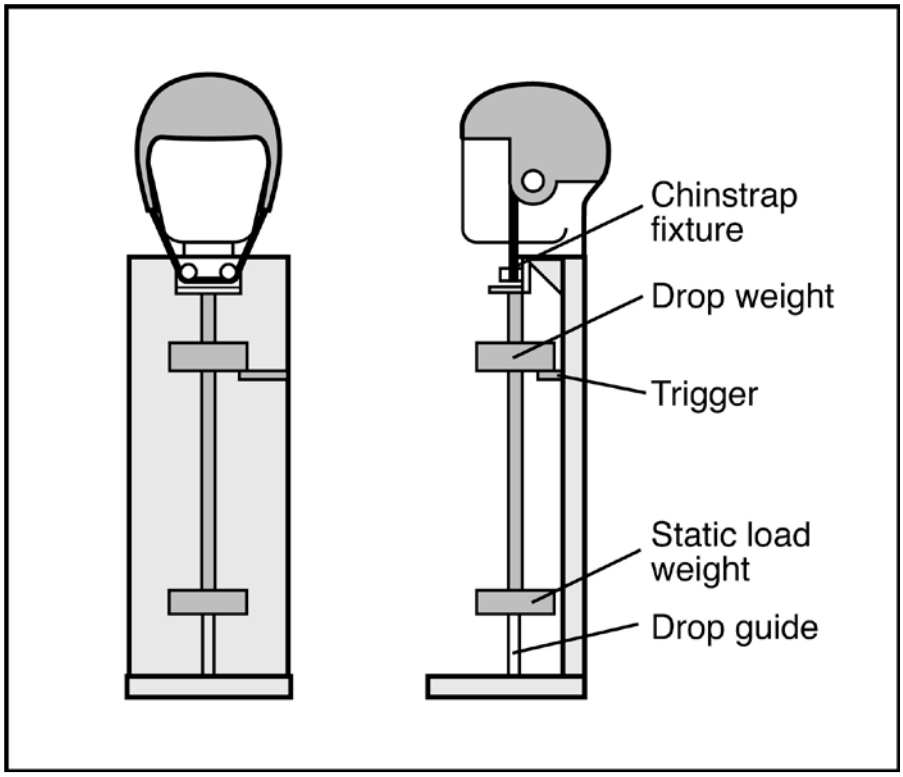
4.4.1 Principle

The chin strap of the headgear is subjected to two loads. The first a static load of 7 kg to which the strap will not open or break. The second is an additional load which falls dynamically to apply a sudden downward load causing the strap to open or break.

4.4.2 Apparatus

A suitable set-up is shown in Figure 6. The headgear is positioned on a test headform (to EN 960 and without hair). A support is provided for the headform. A vertical guide assembly with anvil is attached below the headgear with two round pins of diameter 12mm and 76mm apart (between centres). The total mass of the guide assembly with anvil is 7 kg +/- 0.02 kg. A drop weight of 10 kg +/- 0.02 kg can be moved up the guide assembly and dropped onto the anvil in a substantially frictionless fall through a distance of 300 mm +/- 5 mm.

Figure 6.
Apparatus for Test of Retention System Strength



4.4.3 Procedure

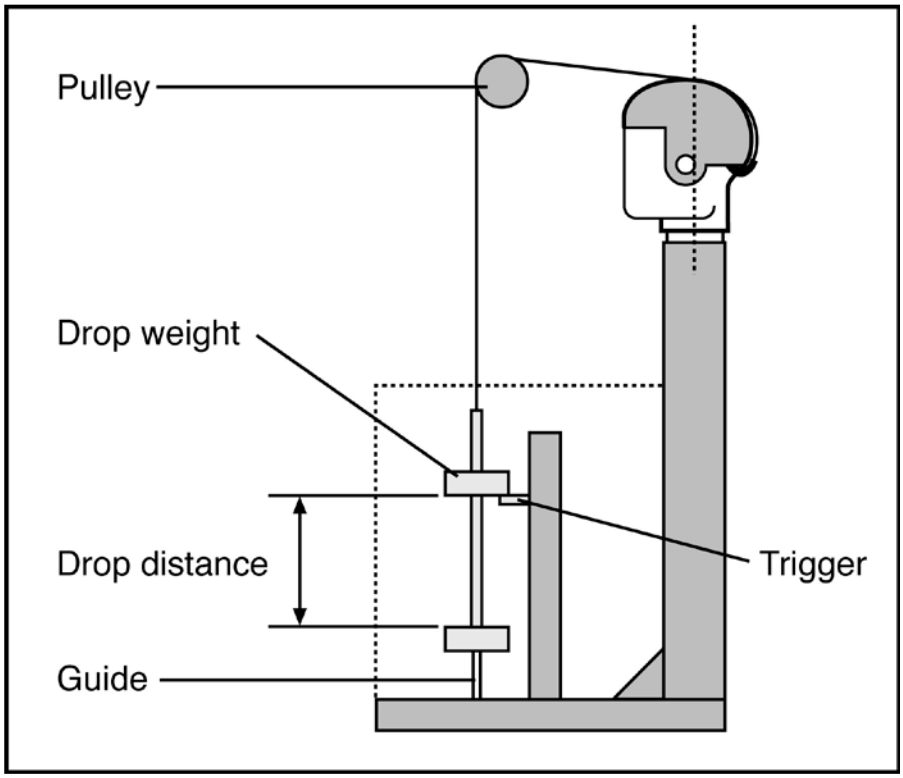
The headgear is mounted on the test headform and the retention system is adjusted so the headgear is securely positioned. The guide assembly is attached to the chin strap of the headgear. The mass falling through 300mm to the guide assembly anvil exerts a dynamic force under which the strap fails. If the strap fails under the static load, it will be deemed 'failed'. If the strap fails when additionally subjected to the dynamic load it will be deemed 'passed'. If the strap does not fail under both static and dynamic load it will be deemed 'failed'.

4.5 Retention System Testing – Effectiveness

4.5.1 Principle

The headgear positioned on a headform is subjected to a tangential force at the rear edge of the headgear in a forward direction. The resulting shock places a rotational load on the headgear. The headgear may be shifted but must not roll off.

Figure 7.
Typical Apparatus for Retention System Effectiveness



4.5.2 Apparatus

A typical apparatus is shown in Figure 7. The headform (to EN 960 without hair) is mounted on a stand in the upright position. To this is fitted the headgear according to manufacturers instructions. A vertical guide assembly weighing 3 kg +/- 0.02 kg in total is attached via a cable or strapping* to a hook which attaches to the rear of the headgear. A drop weight of 4 kg +/- 0.02 kg can be moved up the guide assembly and dropped onto the anvil in a substantially frictionless fall through a distance of 175 mm +/- 5 mm.

*Note: The cable or strapping shall be of a material having an elongation of no more than 5mm per 300mm when loaded with a 22 kg weight in the free hanging position.

4.5.3 Procedure

The headgear is mounted on the headform and the retention system adjusted so as to obtain the best fit. The hook is attached to the rear of the headgear to which is attached the guide assembly weighing 3 kg. The drop weight of 4 kg falls through 175mm +/- 5mm before it hits the anvil. The headgear may be shifted but must not roll off the headform. The retention system is readjusted and the test is repeated one more time. If the headgear rolls off, the test will be deemed a failure.

5. Requirements – Shoulder Padding

5.1 Ergonomics

Shoulder padding shall be designed and constructed so that all normal playing movements can be carried out without hindrance or discomfort.

5.2 Construction

5.2.1 Materials

It is the manufacturer's responsibility that all materials used should not be adversely affected by water, dirt, perspiration, toiletries, household soaps and detergents. All materials coming into contact with the wearer's body will not be of the type known to cause skin disorders and shall not cause abrasion of either the wearer or other players.

5.2.2 Padding Materials

Padding materials must be homogeneous (i.e. padding facing towards the wearer must be the same texture, hardness and density as that facing the opponent). Foam padding of sandwich construction is not allowed.

5.2.3 Finish

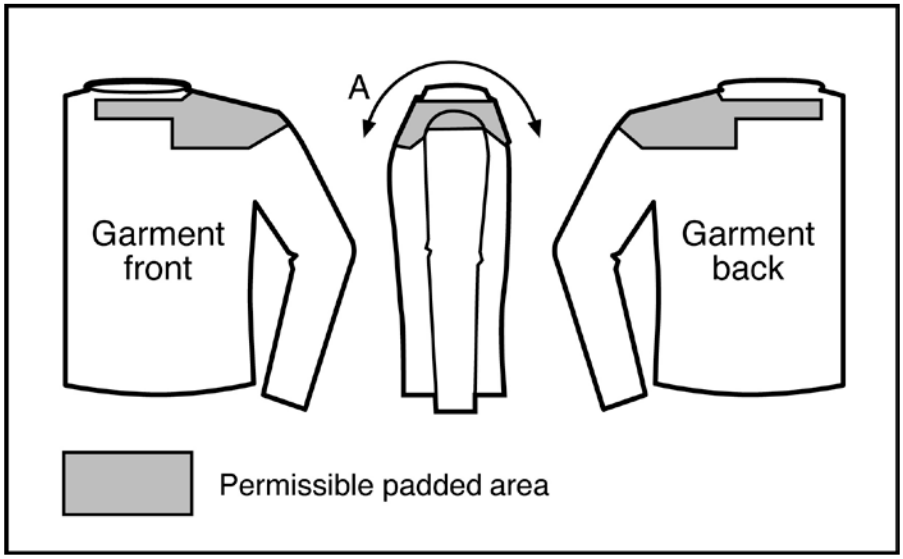
All edges shall be smooth and rounded. There shall be no rigid projections on the inside or outside of the product that could harm the wearer or other players during normal use.

5.3 Design

5.3.1 Zone of Coverage

Shoulder padding shall have a maximum zone of coverage about the sternoclavicular (SC-), acromioclavicular (AC-) and glenohumeral (GH-) joints.

Figure 8.
Shoulder Padding – Zone of Coverage



Shoulder padding will cover the shoulder and collar bone only and extend from the neck to a maximum of 2cm down the upper arm. An allowance for padding to cover the SC joint is made to a maximum depth of 60mm and at the back of the neck to a maximum depth of 70mm. The padding will have a maximum thickness of 10mm +2mm tolerance band plus an additional allowance of 1mm on each side for fabric. Figure 8 illustrates a garment providing this coverage. The shoulder padding shall have a maximum zone dimension 'A' given in Table 3. The padding shall fulfill the impact performance specification (Section 5.4). All padding materials must have a density not greater than 45 kg/m^3 + 15 kg/m^3 tolerance band. Areas outside the designated zones of coverage do not have to meet impact requirements but must comply with Regulation 12, Schedule 1, 4.4(g) – set out below:

Table 3.
Maximum Dimensions of the Zone of Coverage for Shoulder Padding

Dimension	A (Max)
Size	*mm (in)*
XS	175 (7”)
S	200 (8”)
M	230 (9”)
L	250 (10”)
XL	300 (12”)
XXL	350 (14”)

4.4(g) Banned items of clothing

A player must not wear any item of which any part is thicker than 0.5 cm when uncompressed or is denser than 45 kilograms per cubic metre unless specified within this Regulation 12/Law 4. Where this overall thickness consists of padded material covered by fabric, 0.5 cm is the maximum measured thickness for the combination of the uncompressed padding and the fabric. The fabric can contribute up to a maximum measured thickness of 1 mm on each side of the padding.

5.3.2 Retention System

Shoulder protectors may be secured to the body by a tight fitting undergarment where the protectors are sewn in or may be inserted into compartments in the undergarment or jersey. Harness type retention systems can be used. The undergarment should be capable of being attached to the body using adhesive tape if necessary.

5.3.3 Sizing

Shoulder pads will be sized according to wearer’s chest girth. Manufacturers may allocate their products to nominal sizes each of which covers a range of actual sizes (see Table 4).

Table 4
Chest Dimensions for Nominal Sizing

	XS *cm* *(in)*	S *cm* *(in)*	M *cm* *(in)*	L *cm* *(in)*	XL *cm* *(in)*	XXL *cm* *(in)*
Men's Chest	91 (36)	96.5 (38)	102 (40)	107 (42)	112 (44)	117 (46)
Women's Chest	81 (32)	86 (34)	91 (36)	96.5 (38)	102 (40)	107 (42)

5.4 Performance Requirements

5.4.1 Impact Attenuation

When tested in accordance with the procedures specified in Section 6.3, the peak acceleration of impacts delivered to test locations shall not be less than 150g.

6. Test Methods and Procedures – Shoulder Padding

6.1 Sampling

Two (2) test specimens of one size (the larger size if possible) and one test specimen of all other sizes shall be submitted by manufacturers, complete with Product marking (clause 8) and Instructional literature (clause 9). Both specimens shall be used for impact attenuation testing at the various conditions.

6.2 Conditioning of Specimens

Prior to impact testing, one specimen will be exposed to ambient conditions and another to high temperature conditions as follows:

(i) Ambient Temperature - one sample is conditioned by exposing it to a temperature of 20°C +/- 2°C temperature and a relative humidity of rh60% +/- 5% for a period of between 4 and 24 hours .

(ii) High Temperature - the second is conditioned by exposing it to a temperature of 50°C +/- 2°C and a relative humidity of rh60% +/- 5% for a period of between 4 and 24 hours..

All testing shall be conducted within 5 minutes of removal from the conditioning environment.

6.3 Impact Attenuation Testing

6.3.1 Principle

The shoulder pad is mounted on a cylindrical test anvil. A mass with flat striking surface is dropped onto it. The peak acceleration and time history of the impact are recorded using an accelerometer and appropriate instrumentation. Peak acceleration and time duration data obtained using the methods specified in Section 6.3.4 are used to determine the impact characteristics of the shoulder pads.

6.3.2 Apparatus

The apparatus for the impact attenuation test shall consist of the following (also see Figure 9):

Drop Assembly - a dropping mass shall be attached to a free fall or rail guided drop assembly carriage. The mass shall be 5 kg +/- 0.02 kg. The dropping mass shall have a flat striking face of diameter 130mm +/- 2mm.

Anvil- the anvil shall consist of a horizontal steel cylinder with a diameter of 115mm +/- 2mm and shall not have a resonance frequency liable to affect measurements. The centre of mass of the drop mass shall lie over the centre of the anvil.

Accelerometer - an accelerometer is mounted at or close to the centre of gravity of the drop mass.

Impact Recording and Displaying Instrumentation - the impact shall be recorded and displayed on a storage oscilloscope with specified deflection factor, sweep speed per division and bandwidth for the accelerometer and be capable of resolving the gmax of the drop weight. Equivalent instrumentation capable of recording, displaying and storing the impact signal from the accelerometer shall meet this requirement

6.3.3 Reference Testing

An MEP (modular elastomer programmer) reference surface with a convex face will be used, measuring 150mm diameter, 25mm thick at the centre and mounted on a matching steel base. The drop weight will be dropped onto the MEP impact surface from a distance 300 +/- 5mm. Resolved gmax values recorded by the accelerometer on three successive drops shall lie within +/- 10g of the mean.

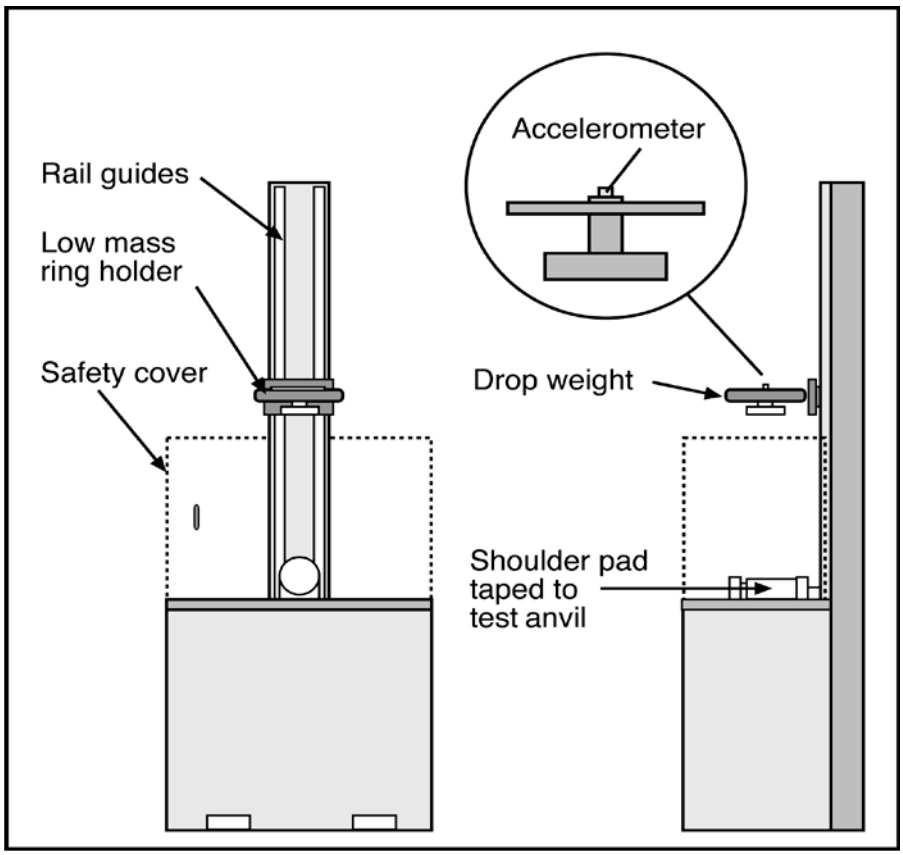
6.3.4 Impacting

Each shoulder pad is impacted at two locations providing the size of padding allows a distance of not less than 3cm apart and at least 2 cm from the periphery of the padding. Where size of shoulder pad does not allow this than a single location for each padding is permitted.

It is important that the maximum length of impact area is equivalent to the diameter of the drop weight striking surface. The impacting energy will be 14.7J (which is equivalent to a 5 kg drop weight falling through 300mm)

The time interval between each impact shall not be less than 30 seconds nor more than 2 minutes.

Figure 9.
Apparatus for Impact Testing of Shoulder Pads



6.3.5 Calculations

Maximum acceleration

The peak acceleration is calculated by measuring the perpendicular distance to the trace baseline from the midpoint of the trace at maximum excursion and multiplying by the sensitivity factor. The sensitivity factor is defined as g per division deflection of the trace.

6.3.6 Duration of Impulse

Determine the duration of the pulse by measuring the total width of the trace along the 150g line in milliseconds.

7. Requirements – Breast Padding

7.1 Ergonomics

Breast padding is specific to female players and should be designed and constructed to minimise discomfort for the wearer. All normal playing movements shall not be impeded by wearing breast padding.

7.2 Construction

7.2.1 Materials

It is the manufacturer's responsibility that all materials used in the construction of breast padding should not be significantly affected by water, dirt, perspiration, toiletries, household soaps and detergents. All materials coming into contact with the wearer's body will not be of the type known to cause skin disorders and shall not cause abrasion of either the wearer or other players.

7.2.1.1 Padding Materials

Padding materials must be homogeneous (i.e. material facing towards the wearer must be the same texture, hardness and density as that facing the opponent and not of sandwich construction). All padding materials must have a density not greater than 45 kg/m^3 + 15 kg/m^3 tolerance band.

7.2.1.2 Semi Rigid Breast Cups

Where cups are part of the garment, it is important that these must be of a semi-rigid material and that this is limited to the front area about the nipple, as shown in Figure 10. The cups shall not exceed a perpendicular 4mm thickness from the front surface at any point.

7.2.2 Finish

Breast padding shall be so constructed that it is unlikely to cause any injury to the wearer or other players during play. There shall not be hard or sharp edges, seams, buckles or other items on the surface of the product that could harm the wearer or other players during normal use.

7.3 Design

7.3.1 Extent of Coverage

The extent of coverage shall include at least all the area shown in Figure 10 below.

7.3.2 Zones of Coverage

Breast padding shall have an area which covers the soft tissue and the axillary tail. Outline dimensions of the area of coverage shall be based onthe under bust girth measurement with brassiere cup size or, bust girth measurement. The typical dimensions of the area of coverage are given in Table 5.

Figure 10.
Breast Padding – Zone of Coverage Outline

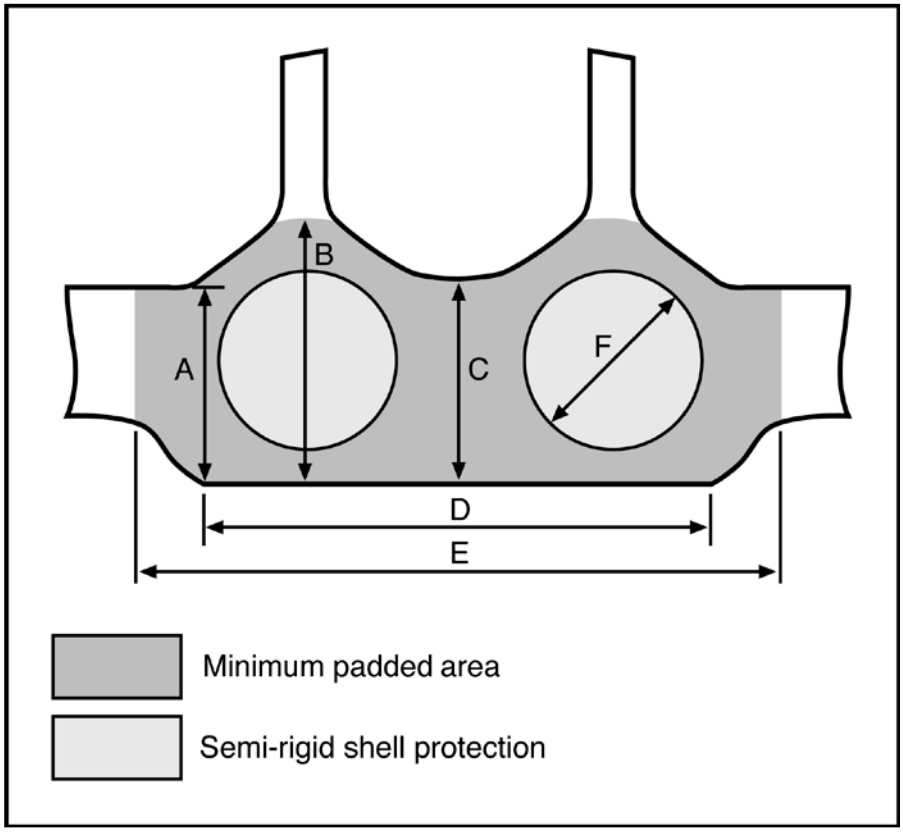


Table 5.
Typical Outline Dimensions for Breast Padding

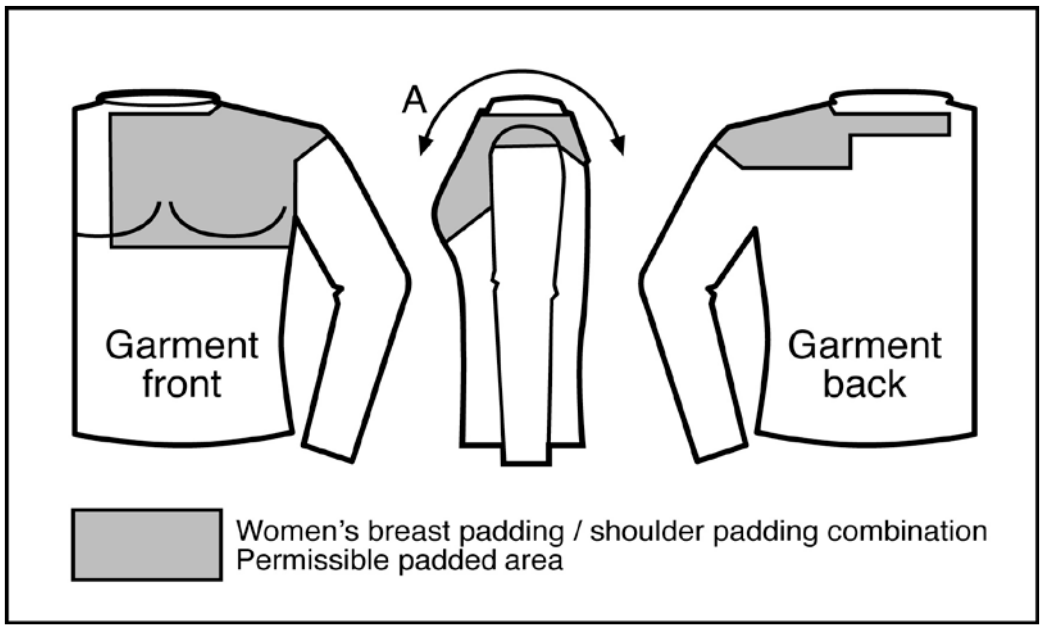
Size	Under Bust Girth *mm* *(inches)*	A	B	C	D	E
1	660 – 711 (26-28)	87 (3.43)	123 (4.84)	68 (2.68)	234 (9.21)	284 (11.20)
2	762 – 813 (30 - 32)	109 (4.29)	154 (6.05)	85 (3.35)	292 (11.51)	356 (14.00)
3	864 - 914 (34 - 36)	131 (5.15)	184 (7.26)	102 (4.02)	351 (13.8)	427 (16.80)
4	965 - 1016 (38 - 40)	152 (6.00)	215 (8.47)	119 (4.69)	410 (16.12)	498 (19.60)
5	1067 - 1118 (42 - 44)	174 (6.86)	246 (9.68)	136 (5.36)	468 (18.42)	596 (22.4)

Dimension F: The cups will correspond to internationally recognised brassiere cup sizes and may be inserted into the garment to suit.

7.3.3 Breast Padding with integral shoulder padding

Breast Padding with integral shoulder padding is allowed. The shoulder sections will be subject to the same constraints of design and testing as shoulder padding alone. Allowance is made for shoulder padding to meet breast padding at the front of the garment.

Figure 11.
Breast Padding with shoulder padding -
Zone of Coverage Outline



8. Product Marking

Padding equipment shall be permanently marked with the following information by the manufacturer:

– Name or trademark of the manufacturer.

– Size or size range for proper fit.

– Instructions on cleaning.

– Notification (once approval has been secured) that the clothing meets the minimum requirements of the World Rugby Standard.

– CE mark where garment is sold into the EC, it is the responsibility of the manufacture to comply with the PPE directive.

9. Instructional Literature

Padding equipment shall be accompanied by at least the following information:

– Instructions that describe proper fit and position.

– Instructions to replace after damage.

– Instructions on cleaning.

– Warning concerning improper use of cleaning agents, etc. or any other factors affecting the integrity of the equipment

– Notification (once approval has been secured) that the clothing meets the minimum requirements of the World Rugby Standard.

– Size or size range for proper fit.

SCHEDULE 2. SAFETY ASPECTS OF RUGBY BOOT SOLE DESIGN. GENERAL DESIGN GUIDANCE

World Rugby REGULATIONS – LAW 4.3

Studs/cleats of player's boots must conform with World Rugby Specifications (Regulation 12), must not be longer than 21 mm, and must not have any burring or sharp edges.

To refer to 'General Design Guidance' as follows:

GENERAL DESIGN GUIDANCE

GUIDANCE FOR SHOE AND STUD/CLEAT MANUFACTURERS

CONTENTS

RISK ASSESSMENT

Three main injury mechanisms are prevalent during play:

(a) Glancing

(b) Raking

(c) Stamping

In each case one or more studs/cleats on the boot sole may contact the other player depending on circumstances.

The worst-case scenario in any event will be when a single stud/cleat, normally one toward the edge of the sole, makes contact alone.

The main factors regarding individual stud/cleat design are: shape, profile, length, radius of edges, hardness, propensity to burring, and rate of wear (the latter being with respect to exposing other internal materials/components).

The design of studs/cleats needs to be considered in both plan and profile view, and also with respect to both contact area and radius of curvature. Contact area relates to contact pressure and hence the risk of bruising to, and penetration of, a player's skin. Radius or sharpness of edges relates to risk of cutting the skin.

In addition, there are whole sole design factors to consider including sole rigidity and edge profile.

Table 1 summarises many of the potential risk factors that should be considered - the list is not exhaustive.

Attention is also drawn to legislation such as the EU General Product Safety Directive (92/59/EEC), which applies to all products sold within the European Union. Equivalent or similar legislation may apply in other countries or regions of the world.

Table 2.
Risk Assessment of Rugby Boot Sole Design with respect to Injury to Other Players

Design & Dimensions	Strength & Durability of Materials & Construction	Performance Tests	Labelling & User Instructions
Assessment against geometric parameters. **This approach can be used to assess conventional conical stud designs.** **For assessing other stud designs testing may be appropriate.**	(1) Impact resistance with respect to risk of stud/cleat breakage. (2) Impact resistance with respect to risk of a stud/cleat detaching during play and leaving a dangerous protrusion or edge. (3) Risk of damage to studs/cleats resulting from the process of fixing and removing them (and/or (blanking plates) from the boot and that could introduce an injury risk. (4) Wear resistance with respect to risk of burring or exposing dangerous internal components	(1) Glancing skin injury – before and/or after real or simulated wear. (2) Raking – before and/or after real or simulated wear. (3) Stamping – before and/or after real or simulated wear.	Instructions on: (1) Attaching/ removing studs/ cleats, if appropriate. (2) Fixing blanking plates, if appropriate. (3) Care and maintenance respect to safety (4) Replacing studs/cleats at wear limit, if appropriate. Assess and report any other risks not covered by the above.

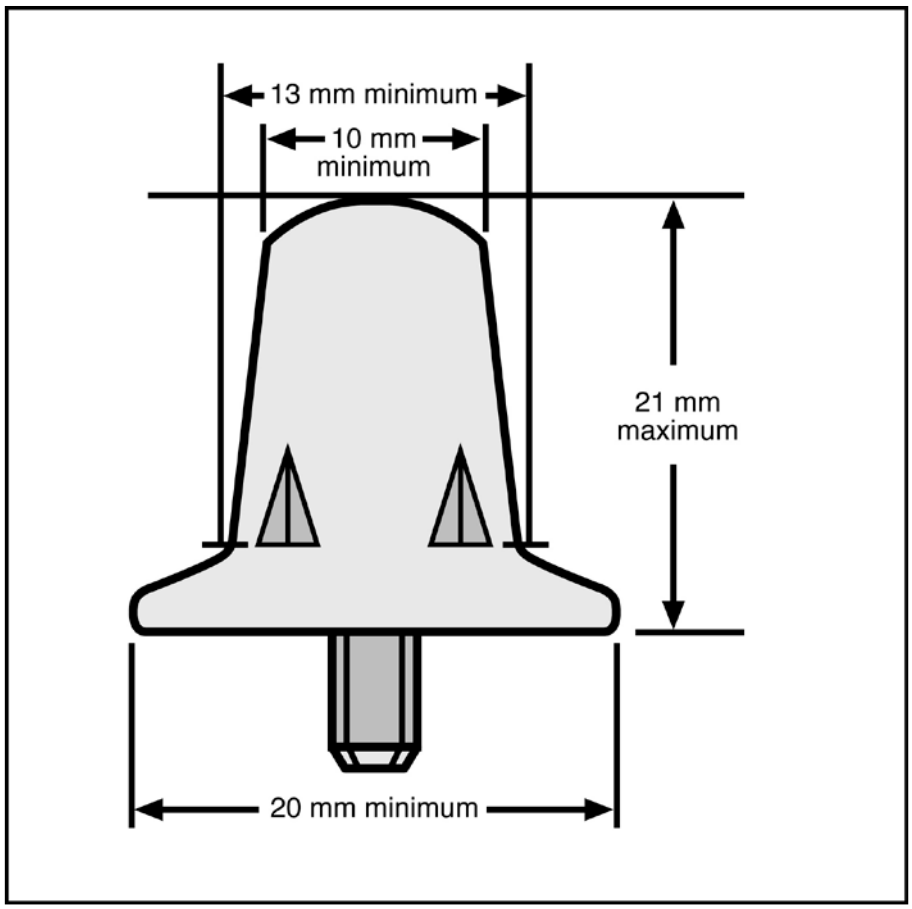
GENERAL GUIDANCE

The following guidelines provide guidance on the design, dimensions and performance of rugby studs/cleats. Suitable performance tests are suggested which can be used to evaluate the performance of new stud/cleat designs.

Materials	Materials used in the studs/cleats should be such that they do not give rise to hazards as a result of mechanisms such as abrasion or impacts in wear; or through any other form of damage or deterioration. Materials used in replaceable studs/cleats should be capable of repeated fixing and removal without creating a hazard. Nylon has been found previously not to be a suitable material due to its propensity to burring.
Shape and Dimensions	Stud/cleat length shall be no greater than 21 mm (see Law 4). Studs/cleats complying with the design and dimensions shown in Figure 1 should give satisfactory performance. The shape and dimensions of other stud/cleat designs should be such that they present a no greater risk of injury to another player than the stud/cleat shown in figure 1. Tests A and B can be used to assess comparative performance. The plan view cross-sectional contact area of the stud/cleat shown in Figure 1 at a plane 2 mm below the tip is 78 mm^2. Other studs/cleats having the same or greater contact area might be expected to give satisfactory performance dependent on minimum stud/cleat width in any direction. All edges of the studs/cleats should be finished smooth and rounded to a radius of not less than 1mm.
Construction and design	The edge profile of the sole unit itself should be rounded with no sharp edges. The studs/cleats should have no external projections on its surface except where text or a logo is desired. In such cases, the embossment details shall be no more than 0.3 mm proud of the surrounding material of the stud. The studs/cleats and their attachment should be capable of withstanding mechanical demands of service, including impacts and abrasive wear, without becoming damaged and creating a potential hazard. Performance can be assessed by means of tests C, D and E. In the case of studs/cleats incorporating a spigot or similar, it is recommended that: (a) when the attachment spigot is of a different material from the stud/cleat, a clearly visible warning should become evident when the stud/cleat has worn down to a length that gives a minimum of 2 mm cover to the end of the spigot. (b) Any flutes or other recesses for the fixing tool, should not extend nearer to the tip of the stud/cleat than the clearly visible warning mark. Replaceable studs/cleats should be designed in such a way that they can be fitted by a method that does not damage the stud/cleat and thereby introduce a cutting hazard or any other hazard.

Figure 1.
Correct size of stud

Acceptable dimensions for conical or cylindrical studs/cleats



Also the minimum diameter values together with the maximum length value also defines a “comparator” stud/cleat, made in aluminium, that can be used in performance tests to evaluate alternatively shaped studs/cleats.

PERFORMANCE TESTS – OPTIONAL

The principles for five tests are suggested:

Test A – Skin Glancing/Raking test
Test B – Skin Stamping test
Test C – Stud/cleat Impact test
Test D – Fitting of replaceable studs/cleats
Test E – Wear simulation

Tests A and B provide a direct method of assessing a stud/cleat's propensity to cause injury through glancing, raking or stamping mechanisms.

Tests C and D assess the mechanical strength of studs/cleats and their attachment to the boot and thereby assess the risk of product failure resulting in a stud/cleat or boot sole becoming damaged and creating a potential hazard.

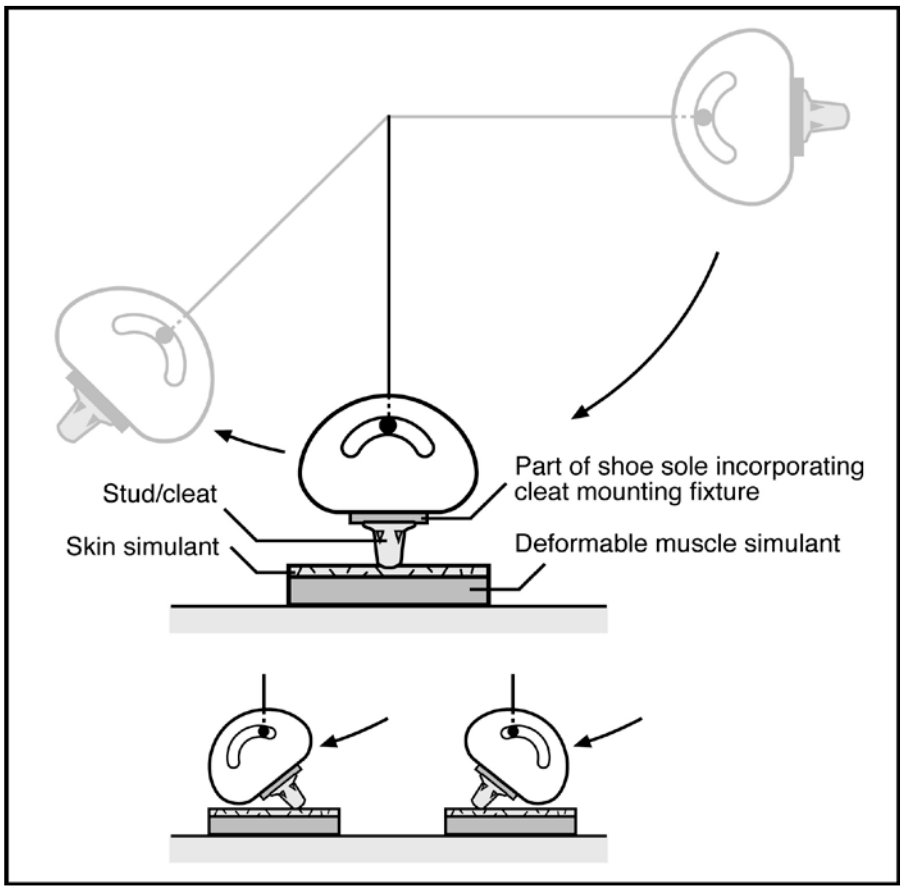
Test E provides a means of assessing how studs/cleats may change in-service due to wear and indicate whether or not there is an increase risk of injury.

A schematic illustration of the principle of each test is given below.

For tests A and B a suitable human flesh simulant is required comprising an artificial skin backed with a thick deformable muscle-like material. For example, a 1.5 mm thick poromeric shoe upper material having relatively low abrasion resistant may be used an artificial skin combined with gelatine, moulded into suitable form, as the deformable substrate.

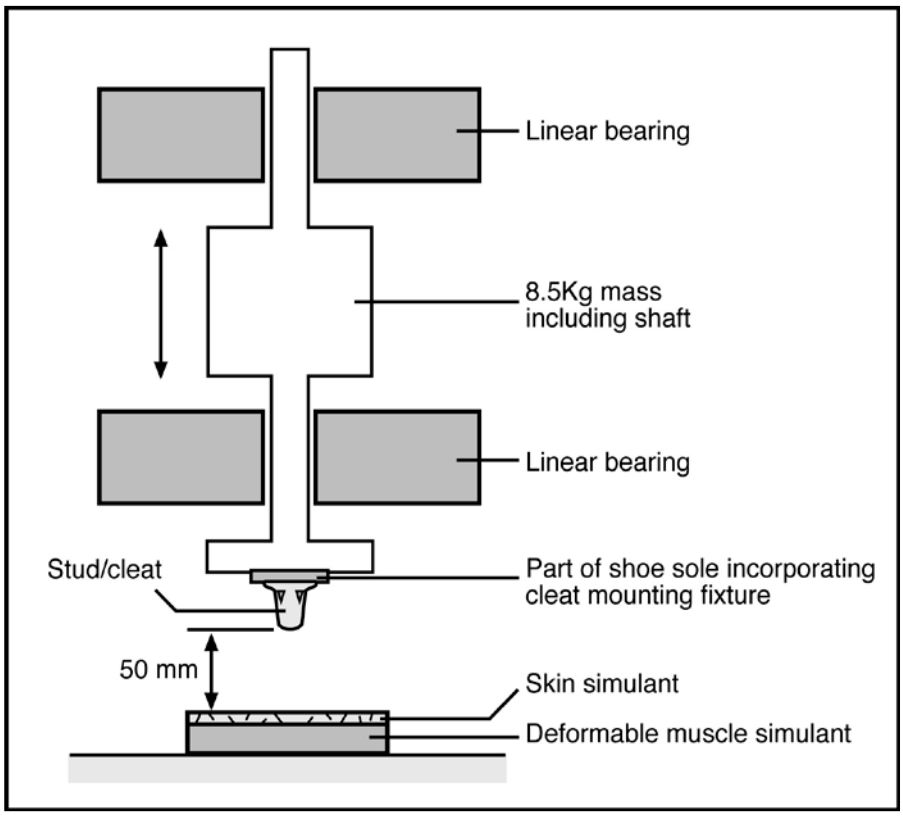
The performance criterion for tests A and B is that the stud/cleat be evaluated should cause no greater damage to the artificial skin than the reference stud/cleat defined in Figure 1 above.

Test A – Skin Glancing/Raking test



This test assesses the risk that a stud/cleat may cut or otherwise injure other players as it slides or rakes across the skin. A simulated skin surface is subjected to a series of glancing blows by the stud/cleat, which is attached to the underside of a pendulum or equivalent device. In the test the tip, the flank and any integral mounting or fixture points come into contact with the simulated skin over a sliding distance of at least 70 mm (a pendulum device might require a spring loaded mechanism to achieve the sliding distance). The amount of damage to the simulated skin is compared with that inflicted by the comparator stud (Figure 1). In addition, the follow through swing of the pendulum can be recorded as the energy absorbed by the contact.

Test B – Skin Stamping test



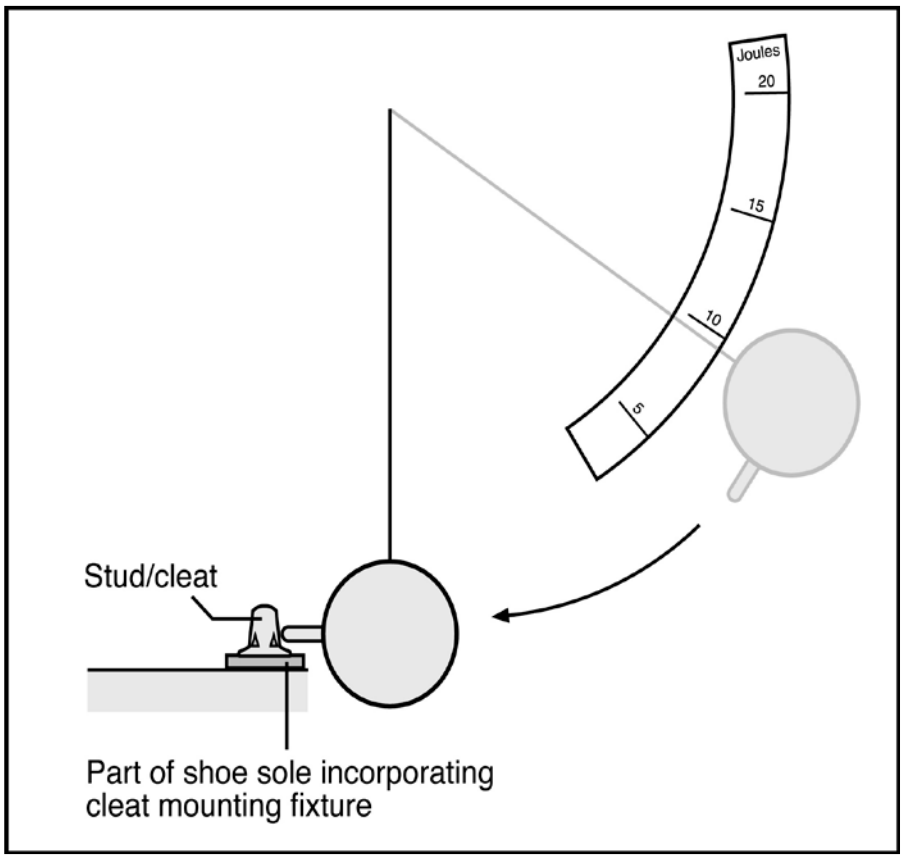
A falling weight impact test or equivalent means of replicating the impact forces at heel strike in running should be used. A mass of 8.5 kg dropped from a height of 50 mm would be a suitable approach.

The test rig should stand on a rigid, high mass base to eliminate energy losses through vibration.

The stud/cleat should be mounted securely by its base and including all parts of the mounting or fixing system, to either the moving or fixed part of the test in such a way that it impacts the skin/flesh stimulant (mounted on the other part) with the wearing face of the stud/cleat.

The depth of penetration of the stud/cleat into the artificial skin/tissue should be measured and compared with the value obtained with the comparator stud (Figure 1). Visual assessment of damage to the skin would also be made.

Test C – Stud/cleat impact test



A stud/cleat, mounted securely by its base and including all parts of the mounting or fixing system, is subjected to a series of measured blows to

its side from the striker of a ballistic pendulum or similar device. The energy of the blows is increased in steps until either the stud/cleat or its means of attachment fails or a specified energy level is reached without damage occurring.

It is suggested that when tested up to and including an impact energy of 8 J the stud/cleat tested shall:

(a) remain secured to the attachment system;

(b) not disintegrate or completely split;

(c) not show any fracture

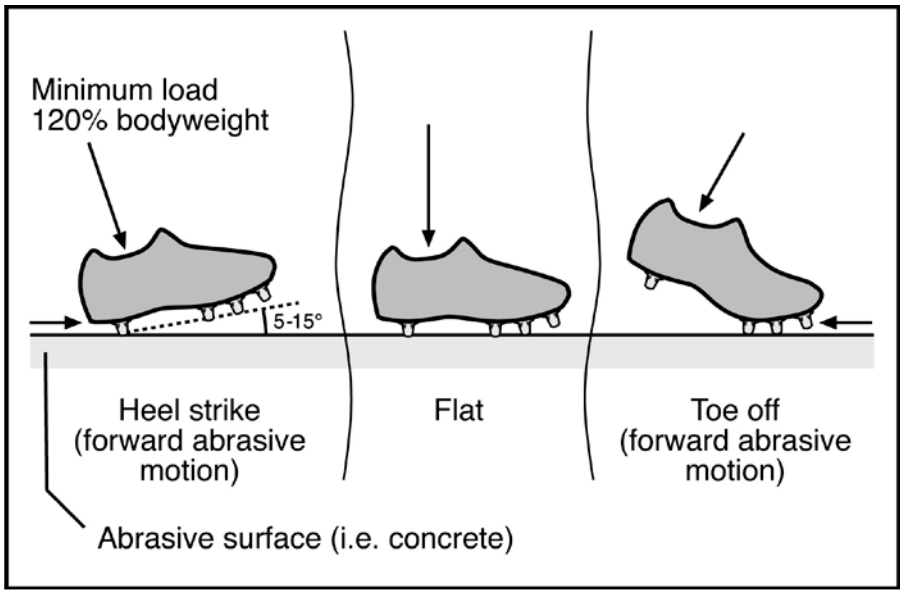
If the impact of 8 J causes fine hairline splits or cracks, the test should be continued in steps of 0.5 J. The stud should remain secured to the attachment system and not disintegrate or completely split at impacts up to 12 J.

Test D – Fitting of replaceable studs/cleats

If the stud/cleat is replaceable then it should be fixed to, and detach from, the boot sole at least ten times according to the manufacturer's instructions and using the tools provided, if any. Apply a torque or force level just over and above what might be considered 'reasonable' for a powerful rugby player. For example, a reasonable torque to apply to conventional screw-in studs is 1.5 N.m.

Inspect for any sign of damage that might increase the risk of causing injury in wear. Where such damage occurs, tests could be carried out according to tests A and B.

Test E – Wear simulation



The principle of this test should be based on replicating the biomechanics of gait such that it reproduces the correct contact angles and loads between the boot and ground that occur in wear. The test cycle commences with the heel striking the test floor at a predetermined angle, and the vertical load increasing as the 'leg' rolls forward over the shoe-ground contact point, eventually transferring contact to the forepart of the shoe and finally toe-off. The vertical load achieved during the cycle should be at least 120% bodyweight. The floor used should replicate an abrasive, man-made surface such as concrete or asphalt that might be expected to be found around rugby pitches or in clubhouses.

Alternatively simple trials, whereby players walk or run for say 400 m on a an abrasive, man-made surface, would suffice

Inspect each stud/cleat for any sign of damage that might increase the risk of causing injury in wear. Where such damage occurs, tests could be carried out according to tests A and B.