FENCING
IRELAND

# Material Rules

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# RULES FOR COMPETITIONS

# BOOK 3. MATERIAL RULES

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# BOOK 3. MATERIAL RULES

## *PART 1. FENCERS' WEAPONS AND EQUIPMENT*

### *Chapter 1. WEAPONS*

**CHARACTERISTICS COMMON TO ALL WEAPONS**

m.1

1 There are three types of weapon: foil, épée and sabre.

2 All weapons are authorised providing only that they conform to these regulations.

3 The weapon should be so constructed that it cannot normally injure either the user or his opponent. All methods of treating a blade between the guard and the tip (button) including the groove, by grinding, filing, heating or other methods, are forbidden.

4

**General description**

m.2 All weapons are composed of the following parts.

1 A flexible steel **blade** completed at its forward extremity by a **button** and at the rear by the **tang** (the latter included in the handle when the weapon is mounted).

2 A **handle** within which the tang of the blade is fixed and which enables the fencer's hand to hold the weapon. It may be composed of one or several parts: in the latter case it is divided into a **grip** (which is normally held in the hand) and a pommel (rear portion of the handle which locks the handle onto the tang).

3 A metal **guard** fixed (with the convex face towards the front) between the blade and the handle, serving to protect the sword hand. For foil and épée, the guard must contain a **padding** or cushion (cf. m.5/2) to reduce the effect of blows. It will also contain a **socket** to which the **bodywire** can be connected.

**Dimensions** (cf. m.7ss, m.15ss, m.21ss)

m.3 Each weapon has its particular design and measurements.

1 The **length** of the blade includes the button and everything which is added in front of the convex surface of the guard whether or not it is fixed to the latter.

2 The **total length** of the weapon and its various parts corresponds to the distances between lines (planes) drawn parallel to each other and perpendicular to the axis of the blade. These lines are situated:

a) A at the forward extremity of the weapon

b) B at the point where the blade leaves the front, convex, surface of the guard

c) C at the back of the aforesaid guard

d) D between the grip and the pommel

e) E at the rear extremity of the handle

3 The **total length** of the weapon is the distance between lines A and E; the **length of the blad**e that between A and B; the **length of the handle** that between B and E; and the **depth of the guard** that between B and C.

4 The **maximum total length** of the weapon must be less than the greatest permissible length for the blade and the handle added together. These two latter lengths must, therefore, complement each other to arrive at the total length of the weapon.

5 In order to **measure** either the total length of the weapon or the length of the blade, it is essential that the latter should be without any curve. When measurements are being made, the blade should therefore be held straight on a flat surface.

6 Only the **pommel or the locking nut** may be placed between lines D and E.

**The handle**

m.4

1 **The maximum length** of the handle at foil and épée is 20 cm, measured between lines B and E, and 18 cm, measured between lines B and D. At sabre the maximum length of the handle is 17 cm (see Figures 8, 9 and 13).

2 The handle must be able to pass through the same **gauge** as the guard. It must be so made that normally it cannot injure either the user or his opponent.

3 All types of handle are allowed providing that they conform to the regulations which have been framed with a view to placing the various types of weapons on the same footing. However, at **épée**, orthopaedic handles, whether metal or not, may not be covered with leather or any material which could hide wires or switches.

4 The handle must not include any device which assists the fencer to use it as a **throwing weapon**.

5 The handle must not include any device which can increase in any way the **protection** afforded to the hand or wrist of the fencer by the guard: a cross bar or electric socket which extends beyond the edge of the guard is expressly forbidden.

6 If the handle (or glove) includes any **device** or **attachment** or has a **special shape** (orthopaedic) which fixes the position of the hand on the handle, the handle must conform to the following conditions.

a) It must determine and fix one position only for the hand on the handle.

b) When the hand occupies this one position on the handle, the extremity of the thumb when completely extended must not be more than 2 cm from the inner surface of the guard.

The guard (cf. m.9, m.17, m.24)

m.5

1 The **convex face** of the guard must have a shape and surface which is both smooth and not too shiny. It must be so made that it can neither hold nor catch the opponent's point. It must not have a raised rim.

2

a) For foil and épée, inside the guard there must be a cushion (padding) sufficiently wide to protect the electric wires from the fencer's fingers. The padding on the inside of the guard must be less than 2 cm thick and must be arranged in such a way as not to increase the protection which the guard affords the hand.

b) **The connections** must be so arranged that it is impossible for the fencer to break or make contacts while fencing.

c) On **foils**, the wire must be protected by an insulating sheath.

d) On **épées**, the two wires must be protected by two insulating sheaths, one on each wire.

e) Both the **wire** and the **insulating sheath** must go right up to the socket.

f) In no case may **uninsulated wires** project beyond the point where they are attached to the socket (cf. m.29, m.31).

3 Any system of attachment inside the guard is allowed, provided that it conforms to the following requirements.

a) It must be **easy to detach** or **attach** the bodywire.

b) It must be possible to **check it**

c)
d) It must have a **security device** which prevents the bodywire from becoming unplugged during the bout. In the absence of a security device being fitted to the weapon, a security device must be fitted to the plug of the bodywire.
e) It must ensure the **complete connection** of the electric wires; it must be impossible for even a momentary break of contact to occur while the plugs are connected.
f) It must not include any part which allows electrical contact to be made between the plug sockets.

4
a) The maximum **electrical resistance** allowed for foil and épée is 2 ohms and for sabre 1 ohm.

5
a) At foil and épée, only traditional or homologated pointes d'arrêt are accepted.
b) In order that the registering of hits by the contact of the point on the opponent be correctly registered by the scoring device, the pointes d'arrêt must be clean. The electrical resistance measured in ohms must not exceed the limit of two ohms (m.5.4.a).
c) The blades and the guards at épée, foil and sabre must be totally of metal. Apart from at sabre where the part of the guard next to the pommel is insulated (insulating sheath), their exteriors must not be covered by any material (plastic or other).
The guard may not feature any advertising. This is also the case for the insulated part of the sabre guard.

**FOIL**
**Weight**

m.6
The **total weight** of the foil ready for use must be less than 500 g.

**Length**

m.7
The **maximum total length** of the foil is 110 cm.
The blade

m.8
1 The blade, which is **rectangular in section**, must be made of steel complying with the safety standards described in these Rules.
2 The **edges** must be smoothed off so that they cannot cut, and must be chamfered at an angle of 45° (± 5°), 0.5 mm on each side (± 0.1 mm), so that they will neither cut nor become capable of cutting.
3 The blade **is mounted** with the widest face placed horizontally.
4 The **maximum length** of the blade is 90 cm (cf. m.3).
5 The blade should have a **flexibility** equivalent to a bend of minimum 5.5 cm and maximum 9.5 cm measured in the following way.
a)
b)
c)
d)
6 The blade should be as straight as possible. **Any curve** of the blade must be uniform and the maximum bend must in any case be less than one cm; it is only permitted in the vertical plane and must be near the centre of the blade.
The curve of the blade must be measured as follows:
i) the blade is placed on a flat surface so that the curve is uppermost;

ii) the maximum distance between the flat surface and the blade is measured: this distance is deemed to be the curve of the blade (cf Fig 8).

### The guard

m.9

1 The **guard** must be able to pass through a straight cylindrical gauge having a diameter of 12 cm and a length of 15 cm, the blade being parallel with the axis of the cylinder.

2 **T**he blade must pass through the centre of the guard. The diameter of the guard must be between 9.5 cm and 12 cm.

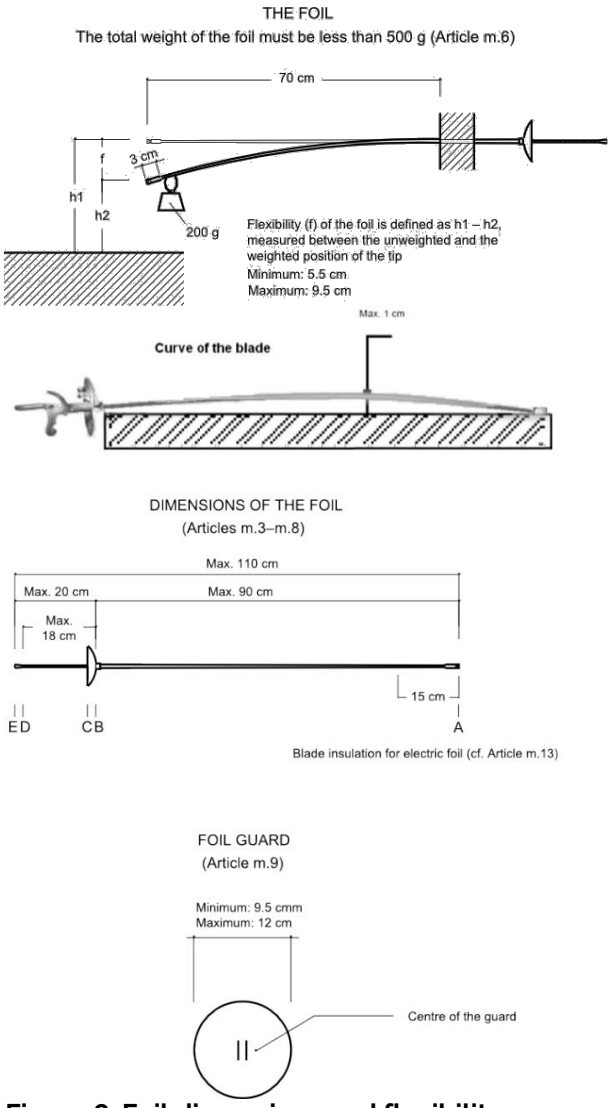



**Figure 8. Foil dimensions and flexibility**

**This diagram is for guidance purposes only. In case of any doubt the wording of the appropriate text takes precedence**

### Electric wire

m.10

The foil has a single **wire**, glued in a groove cut the whole length of the blade, which permanently connects the pointe d'arrêt to the corresponding socket inside the guard.

**Point d'arrêt**

m.11

1 The diameter of the **pointe d'arrêt** is between 5.5 mm and 7 mm; the diameter of the body of the button including its exterior insulation must not be more than 0.3 mm less than that of the pointe d'arrêt.

2 The pointe d'arrêt must be **cylindrical; its front surface** is flat and perpendicular to its axis.
Its edge will either be rounded with a radius of 0.5 mm or have a chamfer of 0.5 mm at 45˚.

3 The **pressure** required on the pointe d'arrêt, in order to break the contact and cause the apparatus to register a hit, must be more than 500 g, that is to say that this weight must be lifted by the spring of the point. The weight of 500 g supplied by the Organising Committee may have a tolerance of ± 2 g.

4 The **course** or travel of the pointe d'arrêt required to cause the electrical apparatus to register a hit, called the *lighting stroke*, may be infinitesimal: the total travel of the pointe d'arrêt must not be greater than 1 mm. The gauge used should have a tolerance of a maximum of +/- 0.05mm.

5 The pointe d'arrêt must be **retained in the button** in at least two places equidistant from each other, or by any other method which has been approved by the SEMI Committee of the FIE.

6 When not depressed the pointe d'arrêt is in contact with the **earth circuit of the foil**. When a hit is made, this contact must be broken.

**Method of affixing the button**

m.12

1 The **base** of the button must be screwed onto the end of the blade, which must be cut and threaded for this purpose respecting the following conditions.

2 Normally, only **fixing** by metal-to-metal is allowed. However, fixing by any material of great mechanical strength may be allowed provided it has been authorised for FIE competitions by the SEMI Commission of the FIE.

3 All methods of **soldering or brazing** or in general any heating which may affect the temper of the blade are forbidden.

4 The end of the blade before cutting the thread must not have a **diameter** at any point of **less** than 3.5 mm, and this without anything being wrapped round it, a process which is strictly forbidden.

5 The diameter of the **core of the thread** must not be less than 2.7 mm (thread SI 3.5 x 0.60). The threading must be very tight.

6 The **part of the blade** on which the button is fixed should be of a length of 7–8 mm entirely covered by the button. It is recommended that only the half of this length at the extremity of the blade be threaded. For the other half the button will have a smooth surface of 3.5 mm diameter into which it should take some force for the corresponding part of the blade to be introduced.

7 At the point at which the wire passes into the button, the **width of the groove** must not exceed 0.5 mm, and its depth must not exceed 0.6 mm measured on the diameter of the core of the thread, in order to weaken as little as possible the section of the blade.

8 Only the members of the **Directoire Technique** can require the verification of the above points.

**The insulation of the button, the blade and the handle**

m.13

1 The body of the button and the foil blade for a length of 15 cm +/- 1cm from the button must be entirely covered with **insulating material** (insulating tape, gummed paper, Sellotape, plastic material or varnish).

2 The **flange** of the sleeve which slides in the base of the point and within which is fixed the pointe d'arrêt must be of a smaller diameter than the insulated head of the pointe d'arrêt itself, to obviate an accidental contact being made with the conductive jacket when a hit is made.

**EPEE**

**Weight**

m.14

The **total weight** of the épée ready for use is less than 770 g.

**Length**

m.15

The **total maximum length** of the épée is 110 cm (cf m.3).

The blade

m.16

1 The blade, which is **triangular in section** without cutting edges, is made of steel and must comply with the safety standards described in these Rules.

2 It should be as straight as possible and mounted with the groove uppermost. **Any curve of the blade** must be uniform and the maximum bend must in any case be less than 1 cm; it is only permitted in the vertical plane and must be near the centre of the blade.

The curve of the blade must be measured as follows:

i) the blade is placed on a flat surface so that the curve is uppermost;

ii) the maximum distance between the flat surface and the blade is measured: this distance is deemed to be the curve of the blade (cf Fig 9).

3 The **maximum length** of the blade is 90 cm. (cf. m.3).

4 The **maximum width** of any of the three sides of the blade is 24 mm.

5 The blade should have a **flexibility** equivalent to a bend of 4.5 cm minimum and 7 cm maximum .

a)

b)

c)

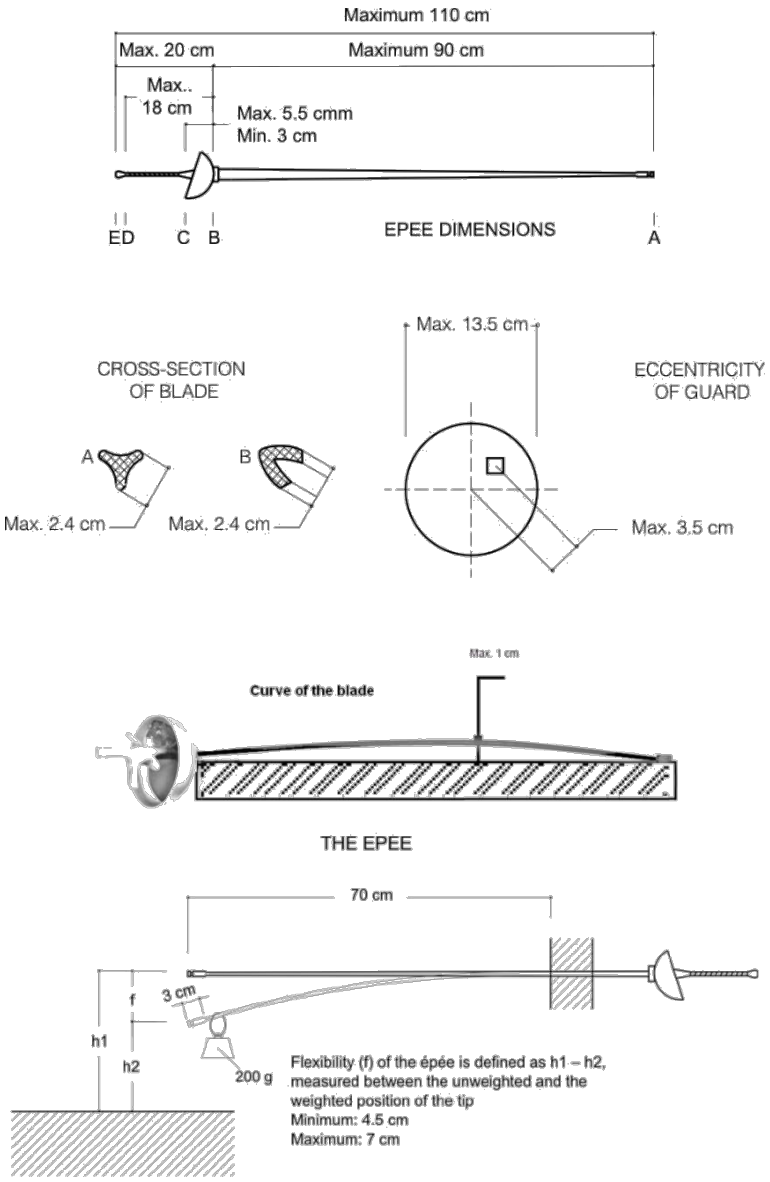



**Figure 9. Epée dimensions and flexibility**

**This diagram is for guidance purposes only. In case of any doubt the wording of the appropriate text takes precedence**

### The guard (cf. m.5)

m.17

1 The **guard**, which must have a circular edge, must be able to pass through a cylindrical gauge having a diameter of 13.5 cm and a length of 15 cm, the blade being parallel to the axis of the cylinder. The depth of the guard (the distance between lines B and C) must be between 3 cm and 5.5 cm (cf. m.3).

2 The **total length** between lines A and C must never be greater than 95.5 cm (cf. m.3).

3 **Eccentric mounting** is allowed provided the distance between the centre of the guard and the point where the blade passes through the guard does not exceed 3.5 cm.

### Electric wires

m.18

1 The épée has **two electric wires**, glued in a groove in the blade, which connect the button to two of the three sockets situated inside the guard and which form

the active circuit of the épée. The earth circuit of the épée is connected to the third socket.

2 The handle must have, at the end which is in contact with the guard, a notch of 2 mm minimum depth, which allows the electric wires and their insulating sheaths to pass towards the sockets inside the guard without being squashed. (cf m.31.7)

3 The socket inside the epee guard must have two separate holes in the block, so that the two wires pass through the block separately and then connected to the terminals.

**Pointe d'arrêt and button**

m.19

1 The electric button is completed by a **pointe d'arrêt** which must conform to the following specifications.
It must be easy to apply the pointe d'arrêt of the opponent's weapon to the earth circuit connected to the blade.

a) The pointe d'arrêt is **cylindrical. Its front surface** is flat and perpendicular to its axis. Its edge will either be rounded with a radius of 0.5 mm or have a chamfer of 0.5 mm at 45˚ (see Figure 10).

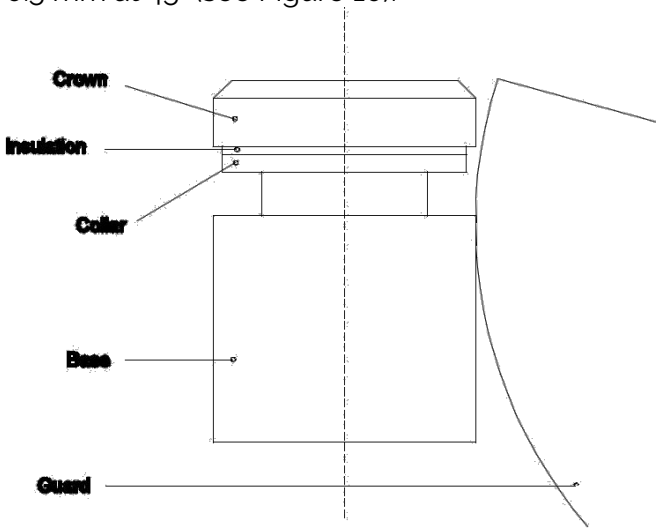



**Figure 10. Epée: details of the electric button**
**This diagram is for guidance purposes only. In case of any doubt the wording of the appropriate text takes precedence**

b) The **diameter** of the crown of the pointe d'arrêt is 8 mm with a tolerance of ± 0.05 mm. The diameter of the base must not be less than 7.7 mm.

c) The **flange** (collar) which guides the pointe d'arrêt as well as the insulating washer must be sufficiently recessed in relation to the crown (it is recommended that it be reduced in diameter by 0.3–0.5 mm in relation to the crown) so that it shall not be possible to cause a hit to be registered merely by sliding the depressed pointe d'arrêt against the convex surface of the guard (see Figure 11) (cf. t.67.a).

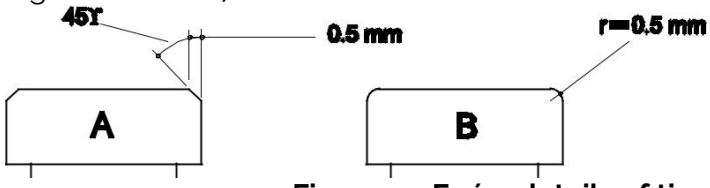



**Figure 11. Epée: details of tip of point**
**This diagram is for guidance purposes only. In case of any doubt the wording of the appropriate text takes precedence**

2 The **pressure** required on the pointe d'arrêt in order to complete the circuit in the épée, and thus cause the apparatus to register a hit, must be more than 750 g, that is to say that this weight must be lifted by the spring of the point.

3 The **weight** used to check competitors' épées on the piste consists of a metal cylinder drilled part of the way along its axis with a hole parallel to its sides; this hole, into which is inserted the end of the blade, must have an insulating lining to prevent its metallic parts coming into contact with the earthed mass of the épée which might then give a false result to the test.
This weight of 750 g, which is supplied by the Organising Committee, may have a tolerance of ± 3 g, i.e. 747–753 g.

4

a) The **course** or travel of the pointe d'arrêt required to complete the circuit in the épée and thus cause the apparatus to register a hit, called the *lighting stroke*, must be greater than 1 mm. The further course which the pointe d'arrêt may travel must be less than 0.5 mm. (This requirement is just as essential as that for the lighting stroke). The gauge used should have a tolerance of a maximum of +/- 0.05mm.

b) The **total course** or travel of the point must be greater than 1.5 mm (cf. t.43). The gauge used should have a tolerance of a maximum of +/- 0.05mm.

c) Adjusting the lighting stroke by means of **screws or any other external fixing device**, once the point has been assembled on the weapon, **is forbidden** (cf t.44.3).

d) An external screw or similar fixing device is only allowed if it is actually part of the assembling of the point.

e) The **head of the screw** or fixing device must never project beyond the flat top surface of the point and its housing in the flat surface may not exceed 2 mm in diameter.

5 The pointe d'arrêt must be **retained in the button** at at least two points equally spaced, or by any other system approved by the SEMI Committee of the FIE.

**Method of affixing the button**

m.20

If **the base of the button** is not made in one piece with the blade, or if it does not permit the flattened inset piece at the tip of the blade to be retained, the button must be screwed onto the end of the blade, which must be cut and threaded for this purpose respecting the following conditions.

1 Normally, only **fixing** by metal-to-metal is allowed. However, fixing by any material of great mechanical strength may be allowed provided it has been authorised for FIE competitions by the SEMI Commission of the FIE.

2 The end of the blade, **before cutting the thread**, must not have a diameter at any point which is less than 4 mm and this without anything being wrapped round it, a process which is strictly forbidden.

3

a) The **diameter of the core** of thread at the end of the blade must not be less than 3.05 mm (thread SI 4.0 x 0.70).

b) The **part of the blade** on which the button is fixed should be of a length of 7–8 mm entirely covered by the button. It is recommended that only the half of this length, at the extremity of the blade, be threaded. For the other half the button will have a smooth surface of 4.0 mm diameter into which it should take some force for the corresponding part of the blade to be introduced.

4 The **groove** necessary to enable the wires to enter the button must be cut in such a way that it weakens as little as possible the section of the blade.

5 Only the members of the **Directoire Technique** can require the verification of the above points.

**SABRE**
**Length**

m.21 The total maximum length of the sabre is 105 cm (cf m.3).

**Weight**

m.22 The **total weight** of the sabre ready for use is less than 500 g.

**The blade (see Figure 13)**

m.23

1 The blade, which must be of steel, is **approximately rectangular** in section. The **maximum length** of the blade is 88 cm. The minimum width of the blade, which must be at the button, is 4 mm; its minimum thickness, also measured immediately below the button, must be at least 1.2 mm.

2 The end of the blade must be folded over onto itself or be fashioned in one piece to form a **button** which, viewed end on, must have a square or rectangular section of 4 mm minimum and 6 mm maximum. The maximum dimension must be not more than 3 mm from the end of the blade.

3 If the blade has a **curve**, it must be a distinct curve which must be continuous, and the deflection must be less than 4 cm. Blades with sharply bent extremities or which curve in the direction of the cutting edge are forbidden.
The curve of the blade must be measured as follows:

i) the blade is placed on a flat surface so that the curve is uppermost;
ii) the maximum distance between the flat surface and the blade is measured: this distance is deemed to be the curve of the blade (cf Fig 13).

4 The sabre blade must have a **flexibility** equivalent to a bend of minimum 4 cm and maximum 7 cm .

a)
b)
c)

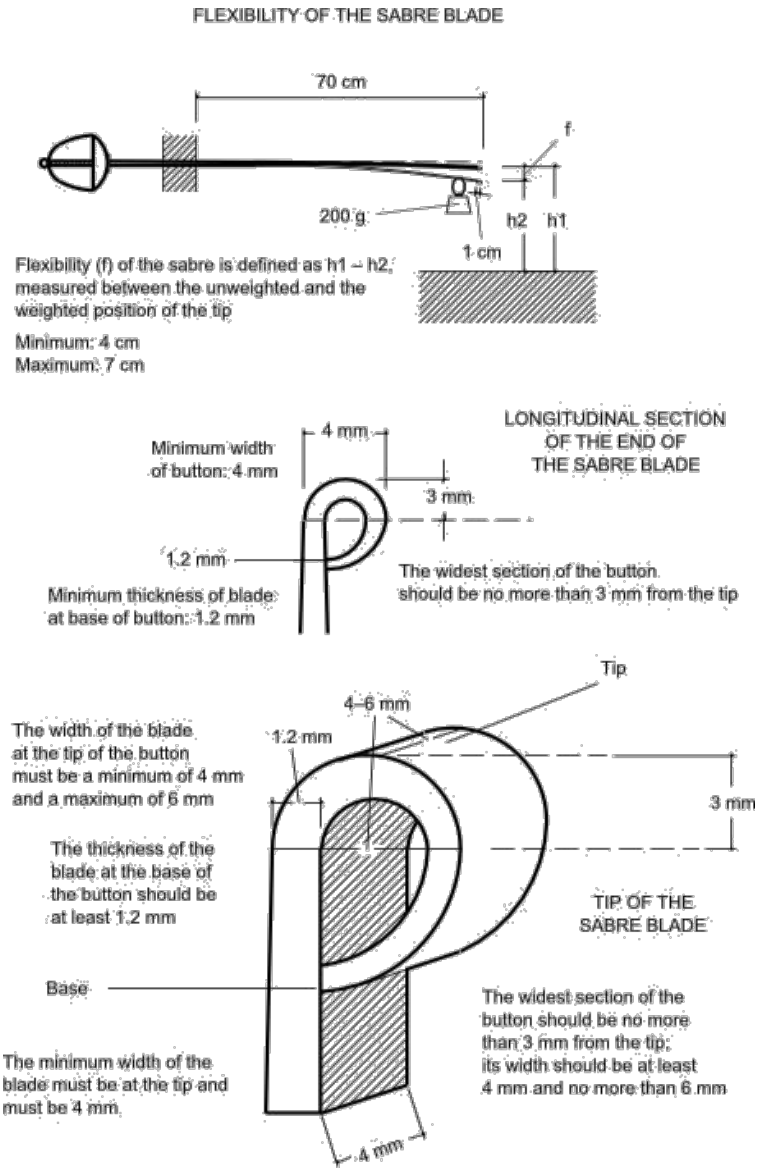



**Figure 12. Sabre dimensions and flexibility**
**This diagram is for guidance purposes only. In case of any doubt the wording of the appropriate text takes precedence**

### The guard

m.24

1 The **guard** must be full in shape, made in one piece and externally smooth. It must have a convex form which is continuous, without rim or holes.

2 It must be able to **pass through** a rectangular gauge measuring 15 cm by 14 cm in section, with a length of 15 cm, the blade being parallel with the longitudinal axis of the gauge.

3 Inside the guard there must be a **socket** into which the bodywire is plugged, whatever system is used.

4 The two sockets of the bodywire plug must be in **direct contact** with the body of the guard, making a closed electrical circuit through the bodywire, the spool and the cable connecting the spool to the scoring apparatus.

6 The **interior of the guard** must be completely **insulated** by means of insulating paint or a pad.

7 The **exterior of the guard** must be **insulated** for 7–8 cm from the pommel.

8 The **handle and the pommel** must be completely **insulated**.

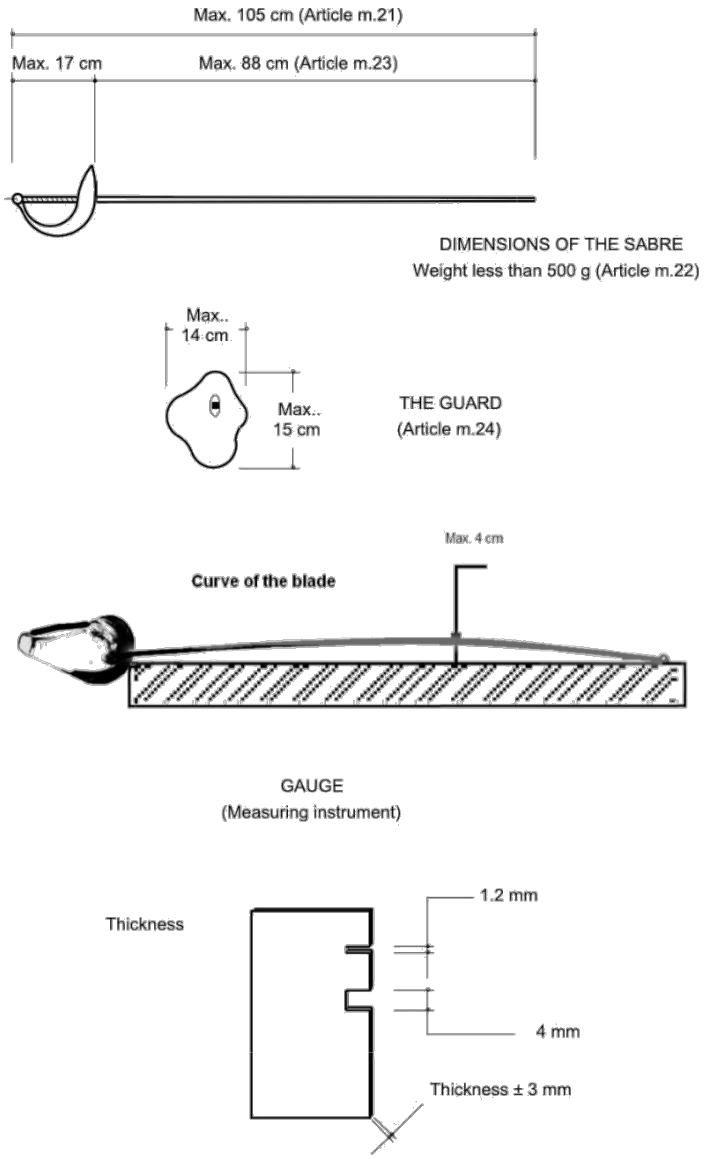



**Figure 13. Sabre dimensions (contd.)**

**This diagram is for guidance purposes only. In case of any doubt the wording of the appropriate text takes precedence**

## CHAPTER 2. EQUIPMENT AND CLOTHING

### GENERAL CONDITIONS

m.25

1 **Protection**: The equipment and clothing must provide the competitor with the **maximum protection** compatible with the freedom of movement necessary for fencing.

2 **Safety:** It must not be possible for the opponent to be **obstructed or injured** by the equipment, nor for it to have either buckles or openings in which the opponent's point may be caught up — except accidentally — and thus held or deflected. The jacket and its collar must be completely buttoned or done up.

3 **Characteristics of the clothing**

a) **The fencing uniform** includes the socks, the breeches and the jacket.

b) The material from which the equipment is made must not have a **surface which is smooth** enough to cause the pointe d'arrêt, the button or the opponent's hit to glance off (cf. m.30).

c) Jackets, breeches and trousers must be made entirely in cloth able to **resist a pressure of 350 Newtons.** Very particular attention must be paid to the way the seams under the armpits, if there are any, are made. The fastenings of the uniform, jacket and breeches, (typically zips), must be protected by a flap sewn to cover the fastenings in the direction of the fencer's armed arm (right handed from right to left – left handed from left to right). An **under-garment** consisting of a protective under-plastron covering the vital upper areas of the body (following the design given in Annexe A to these Rules, 'Safety norms for manufacturers') resistant to **800 Newtons** is also obligatory.

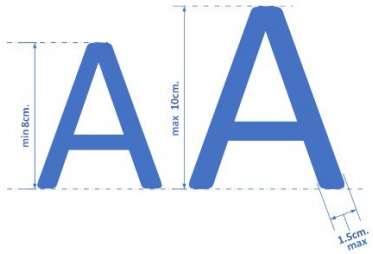
d) Fencers' clothing may be of different colours, **apart from black**.

e)

f)

g)

h) The family **name** of the fencer **may**be displayed on the back of the jacket, with the abbreviation of the national federation or club below it, at the level of the shoulder blades. They must be printed directly onto the jacket or onto a cloth entirely sewn onto the jacket. The letters must be in **dark blue**, in Roman capitals, between 8 cm and 10 cm high, and each stroke must be a maximum of 1.5 cm wide.




4 **Jacket**

a) At all weapons, for men and ladies, the lower edge of the jacket **must overlap the breeches** by at least 10 cm when the fencer is in the on-guard position (cf. m.28, m.34).

b) The jacket must include a **lining** making a double thickness of material for the sleeve down to the elbow of the sword arm and covering the flank up to the region of the armpit. At épée the fencer is required to wear a regulation jacket, which covers the whole of the surface of the trunk.

c) At all weapons, the use of a breast/chest protector (made of metal or some rigid material) is compulsory for women and optional for men. At foil, this breast/chest protector must be worn below the protective plastron.
At foil, the protector will have the following characteristics: The entire outside of the chest protector (the side facing the opponent) must be covered with a soft material such as E.V.A. (Ethylene-vinyl acetate) of four mm thickness and density of 22kg/m3. (The material can be attached to the current plastic models or incorporated into the manufacture of new chest protectors).

**5** **Breeches**

a) The **breeches** must be fastened below the knees.

b) With breeches, the fencer must wear **socks** which cover the legs right up to the breeches. These socks must be held up in such a way that they cannot fall down.

6 **Glove**

At all weapons, the **gauntlet of the glove** must, in all circumstances, fully cover approximately half the forearm of the competitor's sword arm to prevent the opponent's blade entering the sleeve of the jacket.
Under no circumstances should there be any hole in the hand of the glove, even to allow the passage of the body wire.
The closure of the glove should be from the middle of the wrist upwards towards the thumb.

7 **Mask**

a) The **mask** must be made with meshes (space between the wires) of maximum2.1 mm and from wires with a minimum gauge of 1 mm diameter. The mask must include two different safety systems at the rear.
Masks, at all weapons, must be made in accordance with the **safety standards** described in Annexe A to these Rules.

c) The mesh of the mask must be able to withstand, without permanent deformation, the introduction of a conical instrument, the angle of the surface of the cone being at 4° to the axis and at a pressure of 12 kg.

d)

e) The **bib** of the mask must be made with cloth resistant to 350 Newtons – **from the 2026/27 season** 1600N masks conforming with FIE mask regulations will be required for senior Irish competitions.

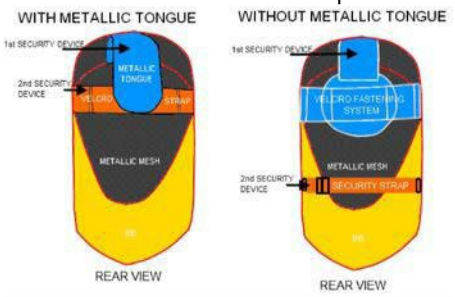
f) The **mask** must contain two different safety systems at the rear of the mask, with the two ends of the straps of the systems firmly affixed to the two sides of the mask. These straps must meet the following requirements approved by the SEMI Commission of the FIE and any retro-fitting to existing masks must be carried out by the original manufacturer.
Mask with metallic tongue

- The central band (strap) should not be less than 45 mm wide.
- The strap must be positioned low enough across the rear of the cervical region that the position of the strap on the head ensures that the mask cannot slide off.
- The band must be in solid material : when stretched the material should not sustain permanent plastic deformation and should quickly return to its original shape and size
- The fastening system must be doubled: it must be closed with a double security system (this means that the Velcro™ has to be attached at least twice).
- The Velcro™ must have a minimum breaking strain of 750 N/cm
- The tags to which the strap is attached by Velcro must be secured to each side of the mask with the same breaking strain.

Mask without metallic tongue

- The position of the main strap must be low enough to ensure that the mask cannot slide off; the correct distance should be decided by the manufacturer (typically 25/30 mm).
- The strap must incorporate 3 fixing points.
- The use of a magnetic strap, already existing, remains mandatory.

Please refer to the examples in the drawings below:




These images are only provided for information. When in doubt, the wording of the relevant text prevails.

**RULES SPECIFIC TO FOIL**
**Glove (cf. m.25)**

m.26

The **glove** may be slightly padded.

**Mask (cf. m.25)**

m.27

1 The **mesh of the mask** must not extend below the chin. It must be insulated internally and externally by a plastic material resistant to impact.

2 The part of the bib that is beneath a horizontal line 1.5 - 2 cm below the chin, must be entirely covered with a material that has the same conductive characteristics as the conductive jacket.

3 **Means of connection:** the electrical contact between the conductive jacket and the bib of the mask must be ensured by means of a white coloured or clear covered wire with two crocodile clips. The wire must be attached to the bib of the mask with one crocodile clip and to the jacket with the other. This wire must be between 30cm and 40cm long.
A coiled mask wire is not allowed.

The crocodile clips, the design and size of which must conform to the conditions laid down in Article m.29.2(c), must be soldered to the ends of the wire. In addition, the electrical resistance in this wire (between the two crocodile clips) must not exceed 1 ohm.

**Conductive Jacket**

m.28

1 The conductive surface of the **conductive over-jacket** which is worn over the protective jacket must cover the valid target of the fencer (cf. t.47) entirely and without omission when in the on-guard position. The jacket must have a conductive flap, minimum 2 cm by 3 cm, near the middle of the back, just below the collar, to which the crocodile clip from the mask can be attached.

2 Whatever the **means of fastening** used, the conductive material must cover a sufficient area to ensure that it covers the valid target in all positions of the fencer. The overlap must always be on the sword-arm side.

3 The interior of conductive jackets must be electrically **insulated** by a lining or by an adequate treatment of the conductive lamé material.

4 The conductive **collar** must have a minimum height of 3 cm and the foil conductive jacket must have a conductive flap, minimum 2cm by 3 cm, near the middle of the back, just below the collar, to which the crocodile clip from the mask can be attached.

5 The **lamé** material used must be of conductive thread in both warp and weft. As regards electrical conductibility it must conform to the following requirements.

a) The **electrical resistance** measured between any two points of the lamé material must not be greater than 5 ohms. The resistance will be measured by using a 500g conductive metal weight which has a hemispherical end with a radius of 4 mm. This weight, placed on this end and moved about on the lamé, must maintain continuous contact with a maximum resistance of 5 ohms.

b) In no circumstances must the use of a conductive jacket be allowed if it has **holes** in it, or **patches of oxidation** or other defects which may prevent the registration of a valid hit.

6 The conductive jacket **must be so made** that when it is laid flat there is a straight line between the point of junction of the lines of the groin and the two points corresponding to the tops of the hip bones (ilium).

7 The band of **non-conductive material** passing between the legs must be at least 3 cm wide (see Figure 14).

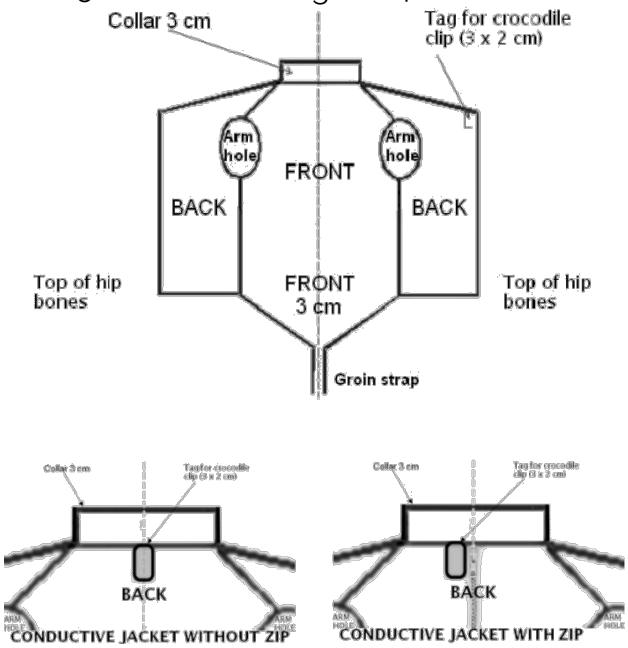



**Figure 14. Foil: conductive jacket**

**This diagram is for guidance purposes only. In case of any doubt the wording of the appropriate text takes precedence**

### Bodywire and attachment plugs

m.29

1

a) The conductive wires of the **bodywire** (the fencers' personal equipment) must be well insulated electrically from each other, twisted or joined together, and not be affected by humidity.

b) This bodywire has a **connecting plug** at each end. In the absence of a security device being fitted to the weapon, a security device must be fitted to the plug of the bodywire.

c) The **electrical resistance** of each of these conductive wires (plug to plug and plug to crocodile clip) must not exceed 1 ohm.

2

a) At the **spool end** the three-pin male plug, which must comply with the conditions of manufacture and assembly laid down in Article m.55, will be attached to the wires in the following manner:

- the pin at 15 mm from the centre pin to the conductive jacket;
- the central pin to the wire in the weapon;

— the pin at 20 mm from the centre pin to the foil earth circuit or the conductive piste.

b) The wire which joins the rear connection of the bodywire to the conductive jacket by a **crocodile clip** must be separate for at least 40 cm. This wire must be soldered to the crocodile clip and this soldering must not be covered by any insulation or any material whatsoever. However, any method of fixing which presents the same guarantees as soldering may be used, provided it has been accepted by the SEMI Committee.

c) The crocodile clip must be robust and ensure **perfect contact** with the conductive jacket. Its width at the point of contact must be at least 10 mm; the inside of the clip must leave a free space at least 8 mm long by 3 mm high. It must be clipped onto the back of the conductive jacket on the **sword-arm side**.

3

a) **At the end nearest the foil**, inside the guard, any method of attachment is allowed but the method adopted must always conform to the specification laid down in Article m.5.

b) In addition, the pins of the plug must in no circumstances be able to **touch the metal part** of the guard.

c)

**RULES SPECIFIC TO EPEE**
**Mask**

m.30

1 The mask must not be covered, in whole or in part, by **conductive material or** material which can **cause the point to glance off** (cf. m.25).

2 The mask must be so shaped that the **bib** reaches below the prominences of the collar bones (clavicles).

**Bodywire**

m.31

1

a) The **conductive wires** of the bodywire must be well insulated from each other, insensitive to humidity, and either joined or twisted together.

b) The maximum **electrical resistance** allowed for each of these conductive wires from plug to plug is 1 ohm.

2 The bodywire has a **connecting plug** at each end. In the absence of a security device being fitted to the weapon, a security device must be fitted to the plug of the bodywire.

3 At the **spool end**, a three-pin male plug is connected to the wire as follows:

a) the pin 15 mm from the centre pin to whichever wire is most directly connected to the pointe d'arrêt;

b) the centre pin to the other wire on the épée;

c) the pin 20 mm from the centre pin to the épée's earth circuit and to the conductive piste.

4 This plug must conform to the conditions of manufacture and mounting specified in Article m.55.

5 **Inside the guard** the choice of system is free but the system chosen must comply with the conditions of Article m.5.

6 In addition, the pins of the plug must not on any account permit **contact with the metal** of the guard.

7 The two wires coming from the tip must be protected by **two insulating sheaths**, one for each wire, from the point where they enter the guard right up to the two insulated connections on the plug socket. Uninsulated wires should not extend beyond the plug connections (cf. m.5, m.9).

## RULES SPECIFIC TO SABRE

### Mask

m.32

1 The **metal mesh of the mask** must not be insulated and must ensure electrical conductivity.

2 The **bib and any trim** must be entirely covered with conductive material with the same electrical characteristics as the conductive jacket.

3 The **trim** may also be made of conductive material.

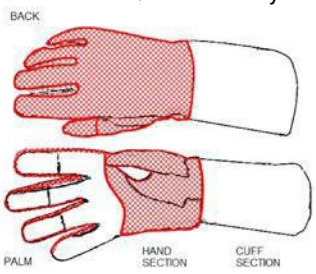
4 The **electrical contact** between the conductive jacket and the mask must be ensured by means of a white coloured or clear covered wire with two crocodile clips. The wire must be attached to the mask with one crocodile clip and to the jacket with another crocodile clip. This wire must be between 30cm and 40cm long. A coiled mask wire is not allowed.

5 The **electrical resistance** between the crocodile clip and any point on the mask must be less than 5 ohms. The crocodile clips, the design and size of which must conform to the conditions laid down in Article m.29.2(c), must be soldered to the ends of the wire. In addition, the electrical resistance in this wire (between the two crocodile clips) must not exceed 1 ohm.

### Glove

m.33

1 The material of the fencing glove must have a level of protection of 800N on the areas shown in the diagram below, the seams a minimum strength of 200N and cuff a level of protection of 350N. The conductive material, which can be removable or fixed, must cover all of the gauntlet of the glove down to below the external cubital styloid (small prominent bone of the wrist), both when the fencer is in the 'on-guard' position and when the sword arm is straight. Inside the glove there must be fixed the FIE quality label, granted after the homologation procedure, with the year of manufacture and stating 800N.




**This diagram is for guidance purposes only. In case of any doubt the wording of the appropriate text takes precedence**

2 The **conductive material** must be turned over into the inside of the gauntlet to a depth of at least 5 cm.

3 In order to guarantee **a good contact** with the sleeve of the conductive jacket, it is necessary to use an elastic band, a popper button or any system which will guarantee conductivity and which has been approved by the SEMI Committee. When a conductive overlay is worn, the overlay must contain a device which fixes the position of the overlay on the arm so that its position on the arm cannot be changed during the bout.

4 The conductive tissue (lamé) must satisfy the specified control conditions (cf m.28.5)

### Conductive jacket

m.34

1 The fencer must wear, over his jacket, a **conductive over-jacket**, the conductive surface of which must cover entirely and without omission the valid surface of

the body above a horizontal line which, when the fencer is on guard, joins, round the fencer's trunk, the tops of the two hip bones.

2 The **conductive surface** must cover the arms as far as the wrists. The jacket must have a collar which is at least 3 cm high. The jacket must have a conductive flap, minimum 2 cm x 3 cm in the middle of the back, just below the collar, to which the crocodile clip from the mask can be attached.

3 Whatever means of **fastening** is used, the conductive material must be ample enough to guarantee covering the valid target area in any position.

4 The **conductive material** (lamé) must satisfy the conditions laid down for testing (cf. m.28).

5 The **sleeves** of the conductive jacket must be fixed at the wrist by means of an elastic band. There must be a strap passing between the fencer's legs to keep the jacket in place (see Figure 15).

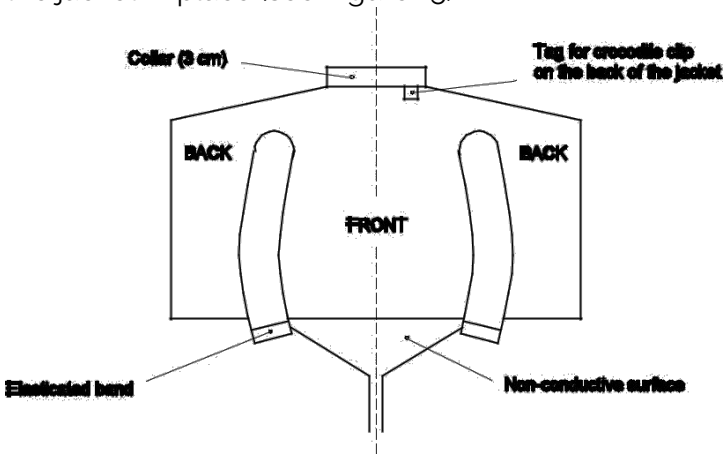



**Figure 15. Sabre: conductive jacket**
**This diagram is for guidance purposes only. In case of any doubt the wording of the appropriate text takes precedence**

### Bodywires and plugs

m.35

The fencer must use the bodywire specified for foil, plugged into the guard plug socket by means of any system which conforms with the conditions for manufacture and assembly laid down in Articles m.5, m.29 and m.55.

## CHECKING OF FENCERS' EQUIPMENT

m.37

1 In all Fencing Ireland competitions **the fencers are responsible** for their equipment (including weapons and clothes) at the moment they present themselves on the piste.

2 In particular blades, masks and clothing must all meet the standards set out in these Rules.

3 **The forms of checking** laid down by these Rules are only intended to help organisers who must apply the Rules and fencers who must always respect these Rules. These checks can, therefore, in no way absolve any fencers who break the Rules from responsibility.

4 The **Organising Committee** will appoint one or more persons to be responsible for this checking.

**Presentation of equipment to the Weapon Checking Centre**

m.38

1 Fencers are obliged to **present themselves** at the Weapon Checking Centre, at the time advised in the timetable of each official competition, with the equipment to be checked. The number of articles handed to the Checking Centre is limited to four weapons, three bodywires, two conductive jackets, two masks and three mask-to-jacket leads per fencer.

2 Equipment is stored by the Weapon Check staff in the order in which it arrives, and is checked in the same order.

3

4

5 If any equipment is found to be **defective** at the first check a form is attached indicating the fault: e.g. the length of the blade, the insulation, the spring of the point, cutting edges, etc. This form is completed at the second check. However, when a weapon is rejected, it must go through the entire cycle again.

m.39

1 If material or equipment presented to the Checking Centre appears **to have been assembled** in such a way that the fencer can control at will the registering of hits or the malfunctioning of the judging apparatus, the competition organisers may, after the examination of the irregular items, require a penalty against the person who submitted them.

2

3

**Body responsible for checks**

m.40

1

2

m.41

The items of equipment which have been thus checked will be **distinctively marked**. A fencer must not, on pain of penalties (cf. t.120), use any equipment which does not bear this check mark.

**Personnel and equipment for checking**

m.42

1 In order to allow those carrying out the checking to fulfil their task, the organisers are required to make available the **equipment** and the personnel necessary to carry out the work.

2 The Organising Committee must provide those responsible for checking the weapons and equipment with **the following apparatus as appropriate for the equipment to be checked:**

a) Two **gauges** allowing the lengths of blades and the depths and diameters of the guards at all weapons to be measured quickly.

b) Devices for measuring the **flexibility of blades** and the **resistance of the mesh** of masks.

c) An electrical checking device to check quickly that the electrical **resistance** and that the bodywire and the weapon are **correctly assembled.**

d) **Weights** of 750 g and 500 g to test the springs of the points in épée and foil, in the workshop and at each piste.

e) A device allowing the **lighting stroke** and **residual travel** of épée points to be accurately measured, in the workshop and at each piste.

f) **Labels** to indicate that a weapon has been checked and that it satisfies the regulation, or has been rejected.

g)

h) The organisers must provide a **special stamp** to be affixed to each conductive jacket to enable the referees to verify that it has been checked by the Weapon Check . Nevertheless, this compulsory checking mark is not sufficient to justify the use of the jacket. In effect, it is the task of the Referee to check, before each event, that the conductive jacket, having been checked and marked, entirely covers the valid target area, and accordingly to make the final decision whether it may be used.

i) A special **ink or paint** must be provided to mark the guards, blades and points of weapons which have been checked. Nevertheless, those responsible may use other methods to mark weapons or conductive jackets.

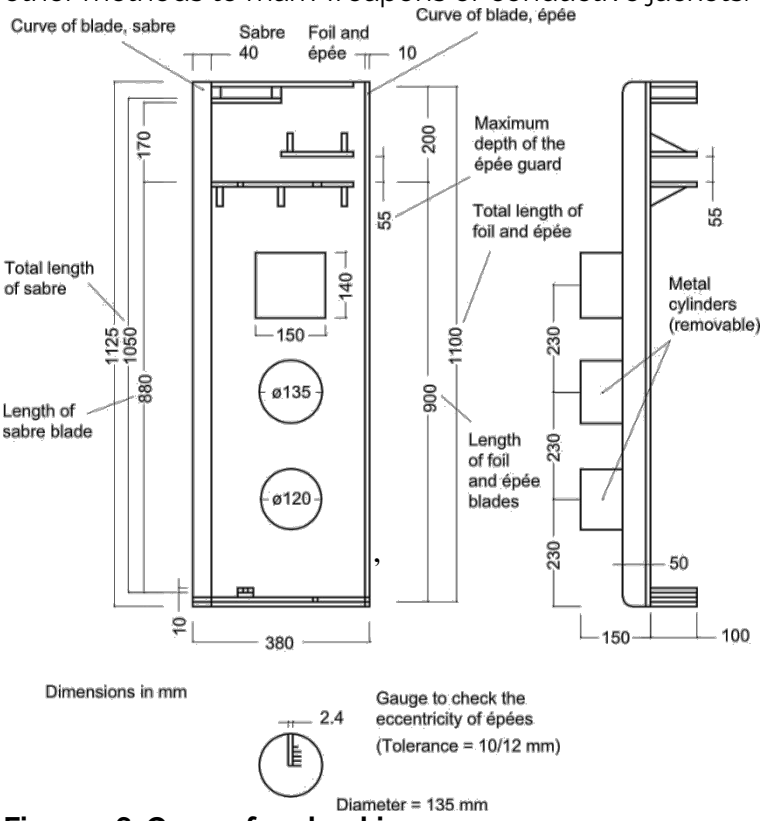



**Figure 16. Gauge for checking weapons**

## PART 2. FITTINGS AND MATERIAL PROVIDED BY THE ORGANISERS

### Introduction

m.44

1 All **electrical judging equipment** includes, in addition to the equipment provided by the fencers themselves, the material provided by the organisers of a competition, which is:

2 The **central judging apparatus**, with extension lamps (cf. m.51, m.59, Annexe B);

3 The **spools**, with cables and connections, or cables suspended overhead (cf. m.55);

4 The **conductive piste** which neutralises hits made on the ground (cf. m.57);

5 The **source of electrical current** should be 12 V DC via AC/DC converter or through VRLA (valve-regulated lead-acid) batteries **(cf. m.58).**

6

**CHAPTER 1. SCORING APPARATUS**
**Authorised designs**

m.45

Only electrical apparatus designed with **wires connecting** the fencers to the central apparatus and registering hits by light signals with auxiliary sound signals are authorised, except for apparatus without wires using encoded waves authorised by the SEMI committee of the FIE. This **excludes other apparatus based on wireless waves** and those which register sound signals only.

**Requirements for all electrical equipment (cf. Annexe B)**

m.51

1 A hit made on the **conductive piste or on the metallic parts of the weapon** must not be registered by the apparatus, nor may it prevent the registering of a hit made simultaneously by the opponent. At foil a hit made on a part of the foil may register if an uninsulated part of the weapon of the fencer is in contact with his conductive jacket.

2 The apparatus must not have any device whereby anyone other than the person detailed to supervise it **can interrupt its working** during a bout.

3 Hits are registered by **light signals**. The signal lamps must be placed on the top of the apparatus, in order that they may be visible to the Referee, the competitors and the superintendent of the apparatus. They must be so positioned that they show clearly from which side the hit was made. It must be possible to attach **extension lamps** to the exterior of the apparatus, in order to increase the visibility of the signals.
At foil, when using the apparatus it should be noted that:

a) If a **non-valid hit** has been scored the apparatus will not register a possible valid hit scored on the same side of the apparatus.

b) The apparatus does not indicate whether there is any **priority in time** between two or more hits which it registers simultaneously.

4 Once the signal lamps are alight, they must **so remain** until the apparatus is reset, without having any tendency to go out or flicker either when subsequent hits are made or if the apparatus is subjected to vibrations.

5 The visual signals must be accompanied by **audible signals** (cf. Annexe B).

6 The **resetting switches** must be placed either on top of or on the front part of the apparatus.

**Number and quality of judging apparatuses**

m.52

1 For official Fencing Ireland competitions, the organising committee must provide a **minimum number of electrical judging apparatuses** equal to the number of pistes plus at least two spares.

## CHAPTER 2
## SPOOLS, CABLES AND THEIR CONNECTIONS

m.55

1 The maximum **electrical resistance of each wire of the spool**, measured from socket to socket, must be 3 ohms.

2 There must be no **interruption of electrical contact** even when the spool is being rotated at full speed. To ensure this the contact rings must have double brushes. The wire connected to the earth circuit of the weapon will be connected to the frame of the spool.

3 The spools should allow 20 m of cable to be **unwound** without straining the springs.

4 The socket which terminates the spool cable, and is designed to receive the plug of the bodywire at the fencer's back, must include a **safety device** which fulfils the following requirements:

- that it is impossible to use it unless the plug is correctly put in;
- that it is impossible for it to become separated during the bout;
- that it is possible for the competitor to verify that the two foregoing requirements are satisfied.

5 The **resistance** of each of the three wires in the connecting cables must not exceed 2.5 ohms.

6 The plugs used to **connect the bodywire** to the spool wire and the connecting cables to the spools and to the apparatus must have three pins of 4 mm diameter arranged in a straight line. The outer pins must be spaced 15 and 20 mm respectively from the centre pin. The bodywire and the connecting cables

have plugs, the spool wires and the central electrical apparatus have sockets to them.

7 The use of **suspended cables** instead of spools is permitted, provided that the conditions already mentioned are satisfied.

m.56

1 The organisers should ensure that the spools have cables of at least **20 m in length** so that they do not get ripped out in the event of a flèche made at the end of the piste.

2 The **spools must be placed** close to the pistes, but outside them so that fencers do not trip over them.

3 The **cables** connecting the spools to the apparatus should be of the three core type and be covered with rubber to protect them from humidity and blows.

4 Conductive pistes **should be earthed** at the centre of the piste.

## CHAPTER 3. CONDUCTIVE PISTES

m.57

1 The **conductive piste** must be made from metal, metallic mesh or some substance that is conductive. The resistance of the piste, from one end to the other, should not exceed 5 ohms.

2 The conductive piste must **cover** the whole of the length and breadth of the piste including its extensions, in order to neutralise floor hits.

3

a) When the piste is mounted on a **platform** the conductive piste must cover the whole width of the platform.

b) The platform must not exceed **50 cm in height**, and must be wider than the fencing piste itself by at least 25 cm on each side. Each end of the podium must be equipped with a **gentle slope** right down to ground level.

4 Because the amount of wire which the spools can carry is limited, the conductive piste is designed for use on a **piste 14 m long**; an extension of 1.50–2 m is added at each end of the piste to allow the fencer crossing the rear limits of the piste to retire on an even and unvarying surface. The conductive piste must therefore have a length of 17–18 m.

6 The **paint** used to draw the lines on the conductive piste must not prevent its electrical conductibility, so that a hit made on it at a point where a line occurs is also neutralised.

8 There must be no roller or any sort of **obstacle** at the ends of the conductive pistes which could prevent the fencers from retreating normally.

**ANNEXE A TO THE MATERIAL RULES**

**Manufacturers' Safety Standards for Fencers' Weapons, Equipment and Clothing**

# EQUIPMENT

## 2. STANDARDS FOR THE MANUFACTURE OF FENCING MASKS

### 2.1. MESH OF FENCING MASKS

## STANDARDS FOR THE MATERIALS FOR THE MESH OF FENCING MASKS

### *1. Purpose*

These specifications concern the technical quality of the round cold-drawn wire of carbon stainless steel intended for the manufacture of the mesh of fencing masks, the processes of its production, and the controls and tests to carry out in its use.

2.1.2. MASKS THAT ARE COLOURED OR DECORATED WITH DRAWINGS

Masks may feature coloured designs on condition that they are approved by the **FIE Executive Committee**. They are then published on the FIE website.

2.2. SHAPE, DIMENSIONS AND METHODS OF PRODUCTION OF THE ELEMENTS OF FENCING MASKS

TECHNICAL SPECIFICATION FOR THE MANUFACTURE OF FENCING MASKS

### *1. Purpose*

These technical specifications concern the shape, the dimensions, the methods of production of the essential constituent elements of protective fencing masks, as well as the technical quality of the materials intended for their manufacture.

### *2. General conditions*

All the materials of which fencing masks are made and the corresponding manufacturing processes must ensure an excellent mechanical resistance, a high degree of visibility and comfort for the fencer and a sufficient resistance to wear and tear and ageing.

### *3. Shape and dimensions of masks*

The shape of masks is indicated schematically in Figure A.3 (viewed from the front, from the side and from above). The dimensions of the frontal grille depend on the dimensions of the mask. Those of the side grille must be as follows: the height corresponding to 3/4 that of the front grille; the width being between 10 and 12 cm.

### *4. Essential constituent elements*

The essential elements of the mask, as shown in Figure A.3, are:

(a) frontal grille protecting the face;
(b) lateral grille protecting the neck and the nape of the neck;
(c) strip for reinforcement and to connect the grilles;
(d) bibs.

The other parts, such as the interior protecting facings, padding, elastic bands and the safety retaining devices, whose production is entrusted to the manufacturer, must entirely conform to the conditions required for their use.

In particular, the rear fixing devices must ensure that the mask is located in the correct position on the fencer's head and that it remains in a perfect position, even after blows or shocks (see details in M.25.7).

Mechanical systems for this rear device are not allowed at the moment.

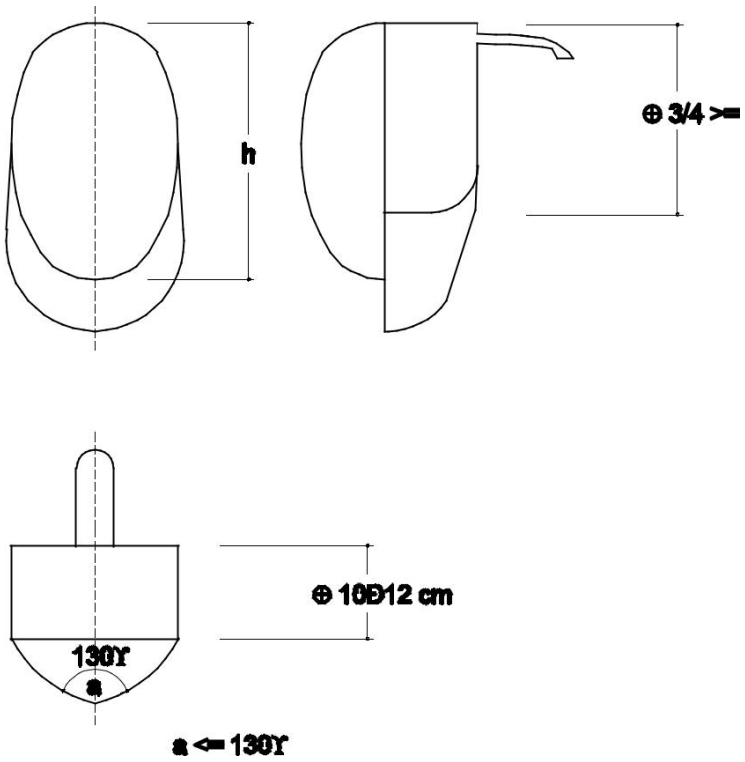



*Figure A.3. Design of masks*

### 4.1. Front and side mesh

The mesh must be made of woven material with a square aperture, with an opening of 1.9 mm, made entirely of round stainless steel wire CrNi 18-10 (the technical quality of the wire for which is addressed in Table V on page 64).

In the curved zone of the grille the presence of mesh with an opening greater in size than that specified is permissible, on condition that it does not exceed 2.1 mm. The frontal grille must form an interior angle of <= 130˚, corresponding to the fold of the centre line.

### 4.2. Junction of the frontal and lateral mesh to the reinforcement band

The joining of the frontal mesh to the lateral one, by the reinforcement band, can be accomplished by a mechanical joining (for example metal wire stitching, use of rivets), or by solder.

In the case of solder, which in any case must be done using the usual techniques for stainless

steel, the operation must be completed by a careful mechanical polishing of the soldered area, to eliminate slag and residues. The mesh must be entirely covered in paint with a polymer base. Any heat treatments to harden and stabilise the paint must be carried out at a temperature of <= 400°C.

#### 4.3. Bibs

The bib must be formed from several layers of cloth firmly fixed to each other, of which at least one on the inside must be made of Kevlar fibre or a similar substance; in any case the cloth so formed must ensure a high degree of resistance to penetration equal or greater than 1600 Newtons, to be tested by the methods described in 3.1, below; it must also hinder the forming of stiff creases or the rolling up of the bib itself.

The bib must be fixed to the exterior of the grille starting from the reinforcement band onwards and extending as protection for the neck for a total height of the order of 10–12 cm.

# 3. CLOTHING

*STANDARDS FOR THE MANUFACTURE OF CLOTHING*

For the manufacture of fencing clothing it is obligatory to use material which is able to resist perforation by a force of at least 350 Newtons.

## 3.1. RESISTANCE OF CLOTH AGAINST PERFORATION STANDARDS FOR TESTING THE

**RESISTANCE OF CLOTH AGAINST PERFORATION**

### 1. *Generalities*

The method which is the subject of this standard is intended to determine the resistance against perforation of cloth used to make up fencing uniforms.

The perforation load is defined as the maximum value of impact registered before the sample of cloth is perforated by the test probe: the load is ex-pressed in Newtons or else in kilogrammes of force to one decimal place.

## 3.2. PARTS OF THE FENCER THAT IT IS VITAL TO

PROTECT *Extract from the Minutes of the Medical Committee of the FIE*

After discussion the Medical Committee considers that the following ought to be considered as 'parts that it is vital to protect'.

— *Above*

The plastron, which is included in the jacket, must protect the neck under the bib (overlapping with this latter), the two hollows above and below the collar bone, the region surrounding the armpit of the sword arm, and that covering the heart.

— *Below*

Protection included in the trousers must cover the abdomen, the groin and the genital organs (by means of a protective cup).

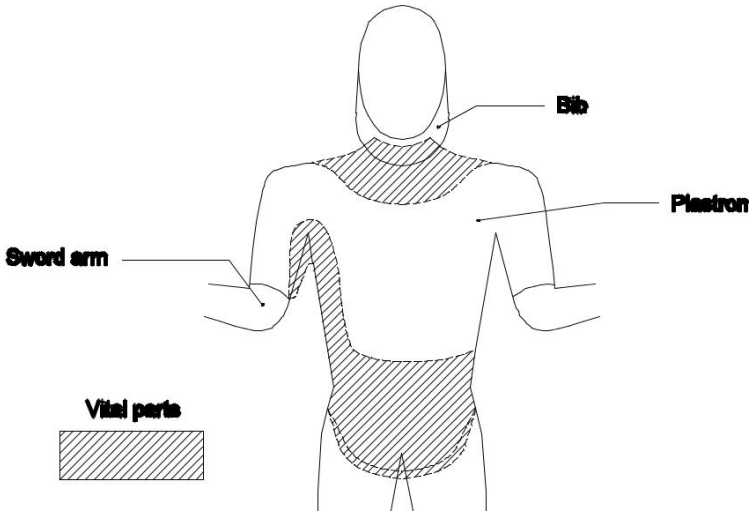



*Figure A.6. Vital parts*

4. LABEL OF QUALITY

1. The quality label is required on plastrons and sabre gloves:
   - must be indelible,
   - must be circular in shape with a diameter of 25 mm for the mask and 50 mm for the uniform,
   - and must include the following data: the emblem of the manufacturer; the date (year and month) of manufacture; the FIE emblem.

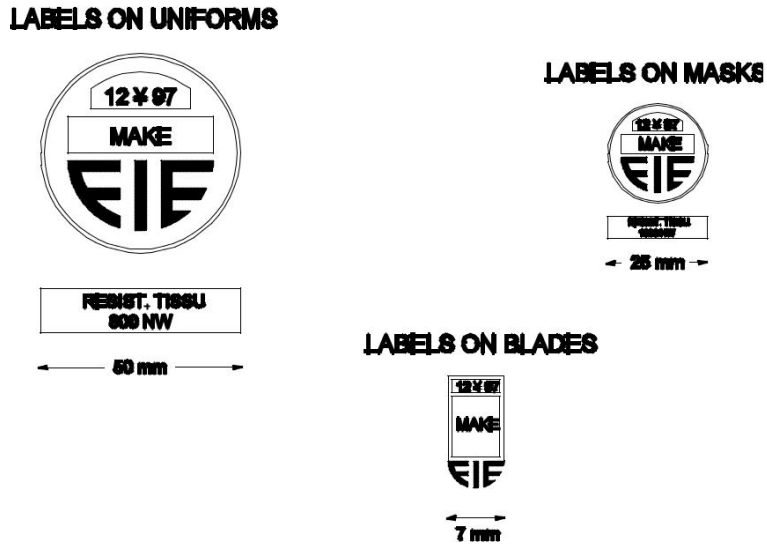



*Figure A.7. FIE quality labels (not to scale)*

## ANNEXE B TO THE MATERIAL RULES

### Characteristics of Scoring Apparatus

*The clock must always be able to measure the time to a hundredth of second throughout the match and it must transmit the time in hundredths of second to the video refereeing system.*

*During the last 10 seconds of each period or bout of the match (both individual and teams) it must display the time:*

- *to a tenth of second when the judging apparatus is running*
- *to a hundredth of second when the judging apparatus is stopped*

*The timer should be equipped with a small remote control, which can be fixed onto two fingers of one hand. The remote control for the referee should be provided with a single start/stop control and a LED light to show that the device is working.*

*The connection between the remote control and the clock will operate with encrypted radio frequencies: see the specific handbook concerning the radio frequencies.*

# A. FOIL

## 1. *THE CENTRAL JUDGING APPARATUS (cf. m.51)*

**(a) Principles**

1. The apparatus registers when a break occurs in the circuit of the foil, that is to say that the electrical current which is circulating permanently in the foil circuit is broken when a hit is made.
2. The apparatus will show a red signal on one side and a green signal on the other when a hit is registered on target; white signals on either side will indicate hits off the target.
3. The audible signals will consist either of a short ring, or of a continuous note which will be automatically limited to two seconds. Either sort of sound will occur

   whenever a visual signal appears. The sound signal must be identical for both sides of the apparatus.
4. After registering a hit, whether on target or off target, the apparatus must no longer be able to register a subsequent hit on the same side of the apparatus.
5. No priority must be indicated between a hit registered against one competitor and a hit registered against his opponent.
6. After a period of time of 300 ms (± 25 ms tolerance) after the first hit signalled by the apparatus (this period of time bears no relationship to 'fencing time' which is the basis of judging according to the conventions governing foil fencing), the latter must ignore all signals for subsequent hits.

### (b) *Sensitivity and regularity*

1. Any hit must cause a signal whatever the resistance of the circuits external to the apparatus. The duration of the break of contact which must always ensure that a signal is registered is 14 ms (± 1 ms).

   Depending on the increase in the resistance, the apparatus may register:

   (1) a valid hit only;

   (2) a valid hit and a non-valid hit simultaneously;

   (3) a non-valid hit only.

   The resistance must always be less than 500 ohms for (1) and (2).

2. The registering of a valid hit must be guaranteed when there is a break of contact of 13–15 ms, when the exterior resistance is between 0 and 500 ohms.

3. The contact time is the same for valid and non-valid hits.

   A break of contact of duration of 14 ms (± 1 ms) must always ensure that a signal is registered, when the exterior resistance is between 0 and 200 ohms.

4. The apparatus must be capable of tolerating an increase in the resistance in the closed circuit of the foils of up to 200 ohms, without causing a 'non-valid' signal to register.

5. Even if the resistance of the foil earth circuit is increased up to 100 ohms, none of the following irregular phenomena must occur:

   — that hits are registered on the guard or on the piste;

   — that it is possible to register a hit merely by contact of the blade or the pointe d'arrêt (without depressing it) on the conductive jacket of either competitor.

6. When the blades are in contact, irrespective of the resistance in ohms between them, the apparatus must be capable of registering normally the hits exchanged, valid and non-valid.

7. A specific programme of tests of apparatus under different conditions can be supplied on request by the SEMI Committee of the FIE.

8. A specific programme of tests also includes the checking of the functioning of the yellow lamps.

9. The Congress of the FIE has authorised this Committee to modify or add to the above requirements whenever technical improvements allow the construction of apparatus which can ensure the better operation of the electrical foil judging apparatus.

### 2. ANTI-BLOCKING TYPE CENTRAL JUDGING APPARATUS

This apparatus must conform to the requirements of the rules set out in Articles m.44–m.51 inclusive, as well as paragraphs (a) 'Principles' and (b) 'Sensitivity and regularity' above, with the exception of point 6 of paragraph (b).

Even if a fault in the insulation in a fencer's equipment causes a short between his conductive jacket and his weapon, the apparatus should still be capable of registering both valid and non-valid hits.

Depending on the resistance of the return circuit of the opponent's foil, the apparatus must register a valid hit up to 200 ohms and non-valid hits above this value.

The apparatus must be equipped with two yellow lamps regulated as follows. The yellow lamp on the side of either fencer must automatically light up and remain alight as soon as the resistance between the conductive jacket of that fencer and his weapon is less than 450 ohms. When this resistance is in excess of 475 ohms, the yellow lamp should never light up.

These yellow lamps serve only to indicate insulation faults.

If one or both of the yellow lamps remain lit up, the Referee must stop the bout and call the technical experts on duty to eliminate the fault.

The yellow lamps need not indicate any contact between the fencer's conductive jacket and the conductive piste.

## *B.* EPEE

### (a) *Principle*

The apparatus registers when contact is established between the wires forming the circuit in the épée, thus completing the circuit.

### (b) *Timing*

The apparatus must register only the first hit which is made. If the interval of time between two

hits is less than 40 ms (1/25th of a second), the apparatus must register a double hit (both signal lamps must light up simultaneously). When the interval is greater than 50 ms (1/20 of a second) the apparatus must register only one hit (only one signal lamp is lit). The tolerance allowed for timing the apparatus is that between these two limits (1/25th and 1/20th of a second).

### (c) *Sensitivity*

When the external resistance is normal, that is 10 ohms, the apparatus must register hits when these are made with a duration of contact of 2–10 ms. With an exceptional external resistance of 100 ohms the apparatus must still register a hit, but without any specific duration of contact.

The apparatus must not register signals of less than 2 ms duration.

### (d) *Non-registration*

The apparatus must not register hits which are made on the earthed material (on the guard or on the conductive piste), even when there is a resistance of 100 ohms in the earth circuit.

### (e) *Visual signals*

1. Visual signals include at least two signal lamps on each side of the apparatus, so designed that if one lamp does not function it does not prevent the other from lighting up nor cause an excessive current through the latter.
2. The signal lamps should give a red signal on one side of the apparatus and a green signal on the other.
3. The apparatus should have a pilot light to show that it is switched on. This light should be dim and not coloured.
4. The apparatus may include lights which indicate short circuits to earth. These should be orange in colour.
5. The light-bulbs which show when hits are registered are usually covered with translucent shades. It must, however, be possible to remove these shades and use naked lights, when the light conditions in the locality make it desirable to do so (strong sunlight or, exceptionally, in the open air).

### (f) *Audible signals*

The apparatus must have a loud sound signal. The apparatus may include a device which allows the sound signal to be stopped before the apparatus is reset.

## C. SABRE

### (a) *Principles*

1. The apparatus works by contact between any uninsulated part of the sabre and the conductive surface of the opposing fencer's jacket, glove and mask.
2. For hits made on these valid conductive surfaces, the apparatus shows a red light on one side and a green light on the other.

   If the guard or blade of a fencer's sabre is in contact with the conductive surface of his own equipment (signalled by a yellow light), a valid hit made by that fencer must still register.
3. The audible signal will consist of either one short ring or a continuous note lasting 1–2 seconds, simultaneous with the light signals. The sound will be the same for both sides of the apparatus.
4. Hits made on non-conductive surfaces must not be signalled.
5. The apparatus must be equipped with two yellow lamps, one on each side, which will indicate a contact between the guard or blade of a fencer's sabre and the conductive surface of his

own equipment.

6. The apparatus must be equipped with two white lamps, identical to those on a foil apparatus which, if permanently illuminated, accompanied by a sound signal, indicate any abnormal electrical change in circuits B and C of the fencer at fault.

7. The apparatus must not signal a hit made by the blade whipping over to hit the opponent while in contact with his blade or guard.

8. After a hit has been registered, a subsequent hit made by the other fencer will only be registered if it occurs within a maximum of 170 ms (± 10 ms).

9. When the two blades touch, all the other rules should be strictly applied.

10. The SEMI Committee of the FIE reserves the right to change the rules governing the apparatus, either to simplify or to improve its performance.

### (b) *Sensitivity and regularity*

1. The duration of contact during which a signal should be ensured should be 0.1–1 ms. These times may be varied in the light of experience and of laboratory tests carried out by the SEMI Committee.

   An apparatus will be rejected if a hit can be registered with a duration of contact of less than 0.1 ms (time subject to modification).

2. The apparatus should allow an increase in the exterior resistance of the connections up to 100 ohms without any drawbacks.

3. Should a fault in the insulation, down to 0 ohms, cause a leakage of current between a fencer's valid conductive surface and his weapon, the apparatus should still be capable of registering all hits exchanged. The insulation fault will be signalled by the illumination of the yellow lamp on the side of the fencer whose equipment is at fault when the resistance is between 0 and 450 ohms.

   The registering of a valid hit on the guard or blade of the fencer at fault will be allowed provided that the electrical resistance between the guard or the blade and the valid surface is less than 250 ohms.

4. The apparatus should still function when the blades are in contact, or if there is contact between the blades and the guards, or between the two guards.

5. If the contact between the blade and the opponent's target takes place 'through the blade', the apparatus:

   — will register the hit between 0 and 4 ms (+ 1 ms);

   — will prevent the hit being registered between 4 and 15 ms (+ 5 ms), on condition that the contact between the two blades is not interrupted more than a maximum of 10 times in the interval.

6. Should there be a hit made by the whipping over of the blade which has not been signalled, whatever method has been used to prevent the signalling, after 15 ms (± 5 ms) from the contact of the blade with the valid target (the time for the registering of the whip) and unless there has been another hit, the apparatus should allow the normal registering of any subsequent hits.

7. A break in the control circuit (defined as more than 250 ohms) for 3 ms ± 2 ms will be signalled by the illumination of the white lamp on the side of the fencer at fault.

**NOTE: INDEX OMMITTED**