



SAIL MEASURER supplementary notes

Release Version 1.1

This document contains supplementary material relating to the **certification** of **sails** for the classes used in the UK that require an **Official Measurer** for this purpose.

This document is intended for use by those appointed as **Sail Measurers** to enable them to **certify sails** for classes they may have not been involved with before.

Prior reading of the section relating to the class you will be **certifying** will be useful. Please keep the notes available as handy reference when **certifying sails**.

In all cases a basic knowledge is assumed of the method of checking and measuring **sails** in classes where the Standard Class Rules and Equipment Rules of Sailing terminology are used.

The variations employed by the various classes are highlighted.

Currently those classes are:

- IOM – International One Metre
- M – International Marblehead
- 10R – International Ten Rater
- A Class – International A Class

Supplementary material will become available in the future specifically relating to the **certification** of **sails** for the 6M and FS classes. In preparation.

- 6M – Six Metre
- FS M – Free Sailing Marblehead
- FS A – Free Sailing A Class

The 36" Class rule do not require the use of an Official Measurer.

Errors and corrections?

Please report any links in this document that no longer work, or any errors, to the following e mail address.

tech-officer@mya-uk.org.uk

One Metre

Class rules and **certification control** forms will be found on the IOMICA website.

urls for Q&As relevant to the IOM Class on the IRSA, IOMICA and MYA websites:

<https://www.radiosailing.org/classes/one-metre/question-answers>

<https://www.iomclass.org/iom-questions-and-answers-qa-2/>

<https://www.mya-uk.org.uk/questions-and-answers/>

The Equipment Rules of Sailing, International Measurers' Manual and other guidance material may be found here:

<https://www.radiosailing.org/documents/category/304-equipment-rules-of-sailing>

The IRSA Supplementary Class Rules may be found here:

<https://www.radiosailing.org/classes/marblehead/class-rules>

Except where noted below it is taken that the **class rules** are un-noteworthy for the following reasons:

- The **class rule** requires no further explanation
- The **class rule** is in line with normal ERS ([Equipment Rules for Sailing](#)) and SCR ([Standard Class Rules](#)) practices
- No class specific equipment is required to confirm compliance

Section G – Sails

G.2.2. Ideally **sails** should be checked before they are fitted to the **spars** but this is not essential – D2.5 (a) (1).

Once measured they shall be **certified** by signing and dating by the measurer. It is normal to do this on starboard side tack area adjacent to the sailmaker's mark keeping it a neat and tidy size.

G.3.1 (a) (1) Sails shall be **soft sails**. See the test for this is ERS G.1.4 (c).

It is clear that all film sails would be creased if folded flat and owners would not be very happy should you actually carry out this test to establish that no more damage than this occurred.

This is not a problem peculiar to the IOM class and it is hoped this problem can be solved for all classes including the M and A Classes.

The real issue at stake in the IOM class is that very effective battens can be made from thick Mylar film that are the size of batten pockets.

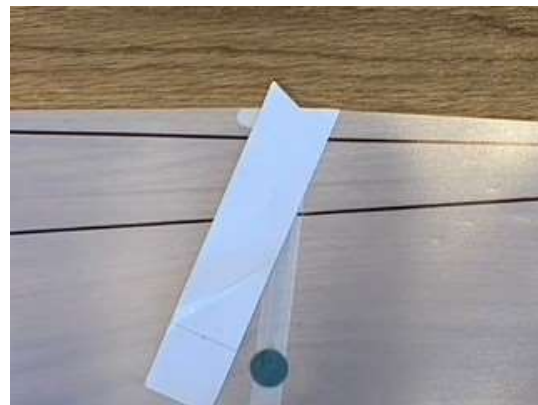
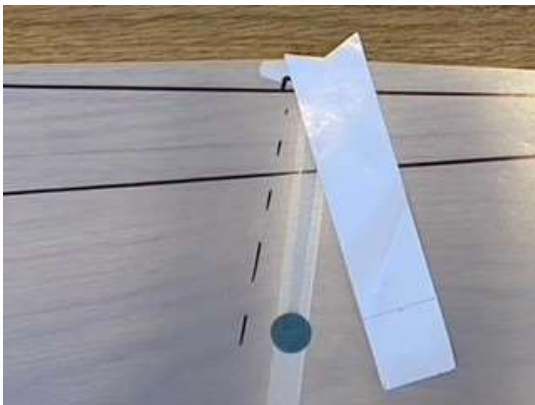
If you are doubtful that a **sail** does not comply with the **soft sail** requirement, request a sample of the material to test and only **certify** the **sail** after being satisfied it is compliant.

G.3.1 (a) (2) **Body of sail** shall consist of the same **ply** throughout - also see Q&A section on IOMICA website.

G.3.1 (a) (6) The **mainsails** shall have class insignia fitted on each side - see H1 and IRSA Supplementary Class Rules.

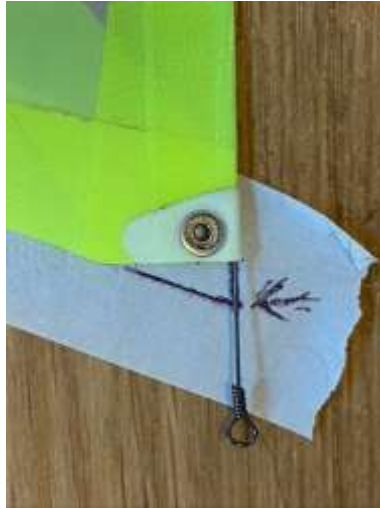
Inked on lines indicate a method of finding the measurement points. See also ERS G.5.4.

- Use the leech stiffening zone template – photos below - to swing through an arc about its datum point to check that it covers the **primary reinforcement** and **stiffening**. At some point all the **primary reinforcement** and **stiffening** shall be covered by the template.
- Note the **flutter patch** on the **leech** - seen partially in the photo – it is exempt from this template test because it is **secondary reinforcement** as defined in ERS G6.2. **Flutter patches** shall have a dimension no more than 50mm (which implies they shall fit in a 50 mm diameter circle) and other **secondary reinforcement** limits are detailed in G.3.3. The circular reinforcement at the inner end of the batten, however, is **primary reinforcement** and shall be covered by the template.



*Leech stiffening zone template. Note its datum point (the tip of the Vee) is placed over the batten point defined as the intersection of the **leech** and (a) the extended centreline of the batten or (b) a line of minimum length 20 mm marked on the **leech** if there is no batten. The dashed line here represents the **quarter width** measurement – the **foot** of the **sail** is to the right.*

- If necessary extend the lines of the **foot** and **luff** to obtain **tack point**.



*Edges of the **sail** shall be extended to find the **measurement points**. See ERS G.4. where there are cutaways in that region.*

- The **tack** and **clew** may have one eyelet but be aware that more eyelets are permitted in the **luff**.
- Two eyelets are allowed at the **head** and, again, more are allowed in the **luff**.

Section H – Illustrations

H.3.2 It is important to make an accurate leech stiffening zone template; use card or plastic. Protect from damage.

End of One Metre class related material

Marblehead

Class rules and **certification control** forms will be found on the IMCA website.

<http://marbleheadclass.org/>

url for Q&As MYA websites:

<https://www.mya-uk.org.uk/questions-and-answers/>

The Equipment Rules of Sailing, International Measurers' Manual and other guidance material may be found here:

<https://www.radiosailing.org/documents/category/304-equipment-rules-of-sailing>

The IRSA Supplementary Class Rules may be found here:

<https://www.radiosailing.org/classes/marblehead/class-rules>

Except where noted in this document it is taken that the **class rules** are un-noteworthy for the following reasons:

- The **class rule** requires no further explanation
- The **class rule** is in line with normal ERS ([Equipment Rules for Sailing](#)) and SCR ([Standard Class Rules](#)) practices
- Commonly raised questions about the class rules that do not require an interpretation are covered by Q&As on the IRSA or MYA websites.
- No class specific equipment is required to confirm compliance

NB

Whereas the IRSA was the authority for the Marblehead class rules when this document was first drafted, the International Marblehead Class Association (IMCA), is now the responsible authority. It may take a while before all the relevant class rules material is moved from the IRSA website to the IMCA website.

Section G – Sails

G.2.2 Ideally **sails**, with the exception of **double luff sails** and **sails** where the **luff** is set in a track in the spar, should be checked before they are fitted to the **spars** but this is not essential – G.2.4 (a) (2).

Once measured they shall be **certified** by signing and dating by the **official measurer**. Note that the **certified** area – see below - is to be noted on each **sail**.

On a **mainsail** the area to be noted is the area of the largest **mainsail** of the same rig group i.e. the area that will show on the **certificate**.

On a **headsail** the area to be noted is the area of the largest **headsail** of the same rig group i.e. the area that will show on the **certificate**.

Note that establishing **the luff perpendicular** measurements (B for **mainsail** and R for **headsail**) and entering those on the certificate entry data will give the maximum

permitted cross widths for the **quarter**, **half** and **three quarter widths** without excess on the **certificate** sheet. You can then simply check to see that the cross widths are less than the maximum permitted values (without excess). If they are equal or less there is no need to note the actual measurement. Only if the measurement exceeds the maximum permitted value (without excess) do you need to note the value and enter it in the certificate entry data.

Note the requirement to make these marks in the **tack** area where they will be adjacent to the sailmaker's mark. It is normal to do this on starboard side keeping it a neat and tidy size.

- G.2.4 (b) (1) This is a difficult dimension to take accurately if the **sail** is on a rig. The **luff perpendicular** is easier to take accurately if the **clew** is moved to flatten the **sail** completely at the **foot**. It is easier to take if the **sail** is remote from the rig and has a tube of the correct diameter inserted into the **double luff**.

See IRSA Q&A relating to the cross width measurements of a **mainsail** with a partial **double luff**.

- G.2.4 (b) (3) Use of a stiff rule permits the **mast** to be pushed firmly forward with the end of the rule while the **leech** of the **sail** near the **cross width** point is held firmly. This allows the measurement to be taken with confidence.

- G.2.4 (b) (6) ERS H.5.2 applies anyway but only requires hollows in the **leech** to be bridged. This addition makes it mandatory to bridge hollows in the **luff** too.

- G.2.4 (c) Note the need for a gauge as defined in J.6.

See the IRSA Q&A relating to a template to assist with measurement of Marblehead sails and rigs.

- G.2.4 (d) This exemption permits the parts of triangles of wire not covered by sailcloth to be excluded from the **sail** for measurement purposes.

- G.2.4 (e) ERS G.4 requires the **sails edges** near **sail corners** that are not well defined to be 'extended as necessary'. The term 'extended as necessary' is defined in ERS H.5.4 by prescribing the method normally used. However, Marblehead class rule G.2.4 changes ERS G.4 (and it should probably also exclude H.5.4) so that the same 900 mm radius gauge used to define the **leech** shape is used to extend the **sail edges**.

- G.2.5 (a) Sails shall be **soft sails**. See the test for this in ERS G.1.4 (c).

It is clear that all film **sails** would be creased if folded flat and owners would not be very happy should you actually carry out this test to establish that no more damage than this occurred.

This is not a problem peculiar to the MARBLEHEAD class and a solution is being sought for the classes concerned.

Note that areas of **sail reinforcement** do not have to comply with the **soft sail** test. The Marblehead class does not restrict the size of **sail reinforcement** – the whole **sail** could be covered with **sail reinforcement** making the requirement for the **sail** to be a **soft sail** pointless. Aside from this, very effective battens can be created using thick Mylar film anywhere that additional stiffening is sought in the **body of the sail**. As Mylar film is

widely accepted as **soft sail** material there is no accepted way of deciding that it is no longer **soft sail** material but **stiffening**.

If you are doubtful that a **sail** does not comply with the **soft sail** requirement, request a sample of the material to test and only **certify** the **sail** after being satisfied it is compliant.

- G.2.5 (c) There are three permitted rig groups, A, B and C, the dimensions of which may be recorded on the **certificate**.

The dimensions of the **sails** entered on the **certificate** for the A, B and C rig groups are the largest permitted dimensions of any **sails** in that rig group.

At an event the **boat** may use no more than three rigs in each permitted rig group, each with **sails** that comply with that rig group dimensions.

Additionally, at an event the **boat** may use no more than six rigs in total.

It follows that each **sail** of each rig shall be identified by the letter (A, B or C) of the group that it 'belongs' to. The requirement for the **sail** to be marked with the **certified** area as given on the **certificate** further identifies the **sail** and rig with the **boat** and its **certificate**.

- G.2.5 (f) **Sails** are permitted two basic types of **foot** roach profile – curved as in figure J.7 or approximately triangular as in figure J.9.

In the former case note the method of checking **foot irregularity** is given in ERS G.8.3. However, the method of checking prescribed in ERS G.8.3 may be difficult to use where the **sail** is attached to a rig. In such cases trace round the **foot** of the **sail** onto a sheet of paper or other stable material, cut along the traced line and use the method in ERS G.8.3. If there is reasonable doubt that the **sail** is not in compliance, insist that the **sail** is removed from the rig sufficiently to allow the **sail** itself to be tested.

In the latter case it is essential to use a Foot Roach Gauge as shown in figure J.9. **Tack point** and **clew point** shall touch the edge of the gauge and, when the edges of the gauge are outside of the **foot**, or tangential to it, the maximum depth between the straight line from **tack point** and **clew point** and the Foot Roach Gauge shall be no more than 25 mm. Note that the **foot** profile may comprise straight edges and curves and may have cutaways – the Foot Roach Gauge limits the **foot** profile but does not prescribe it.

- G.3.1 (b) The **certification** control form will not accept the A dimension of the rig groups in any other order. Attempting to do otherwise will lead to an error message.

G.3.3 Some general advice on sail measuring

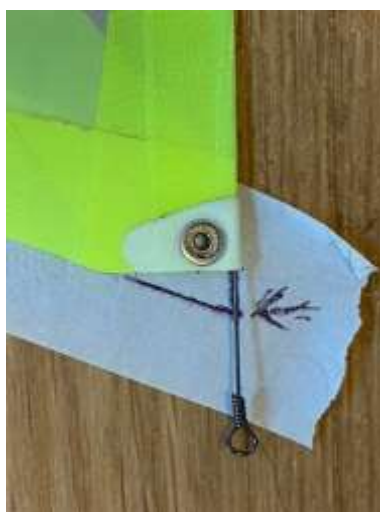
- Know the proper definition of **quarter leech point**, **half leech point** and **three-quarter leech** points and how to find them. This can be by folding the **sail** (**head point** to **clew point**, **head point** to the **half leech point** and **clew point** to **half leech point**) or as shown by the black lines marked on the sail below.
- Many **sails** will have been marked at these points by the sailmaker during construction. This makes checking that their position is correct somewhat easier. But don't assume the sail maker will have got it right.
- Tape the **sail** down with masking tape with just sufficient tension to remove wrinkles that may exist across the lines of measurement ((ERS H5.1 (e))). This is particularly

necessary if a jack stay is fitted to the **mainsail luff** and when measuring the **headsail** to remove any bunching. **Sails** that have been rolled for storage or delivery may also have wrinkles in **leech** and **luff**.



*Inked on lines (for illustration purposes only) indicate a method of finding the measurement points.
See also ERS G.5.4.*

- If necessary extend the lines of the **foot** and **luff** to obtain **tack point** and **clew point**.



*Edges of the **sail** shall be extended as necessary to find the **measurement points**. See ERS G.4. where there are cutaways in that region. In the Marblehead class the leech profile gauge - see G.2.4 (e) - is used to extend the local edges to find the **measurement points**.*

End of Marblehead class related material

Ten Rater

<https://www.radiosailing.org/classes/tenrater/question-answers>

A description of the measurement method for rig and sails can be found at the following link.

<https://www.radiosailing.org/classes/tenrater/class-rules/category/149-measurement>

Except where noted below it is taken that the **class rules** are un-noteworthy for the following reasons:

- The **class rule** requires no further explanation
- The **class rule** is in line with normal ERS and SCR practices
- No class specific equipment is required to confirm compliance

NB

Whereas the IRSA was the authority for the Ten Rater class rules when this document was drafted, the International Ten Rater Class Association (ITCA), is now the responsible authority. It may take a while before all the relevant class rules material is moved from the IRSA website to the ITCA website.

Section G – Sails

G.1 Note the definition of rig is specific to this class rule, as defined in A.1.4, and how it varies from the ERS definition of **rig**. Both terms are used as appropriate.

G.1.2 (a) **Certifying** of a sail is normally carried out by the official measurer signing and dating the sail using an indelible pen.

See the Q&A concerning **certification** of **sails** smaller than the **sails** of the **certified rig**.

G.1.2(b)(c) The area of the **mainsail** and the **headsail** of the **certified rig** are determined by the calculation carried out using the certification software.

Round those figures to three decimal places and add them to the **sails** of the **certified rig** as well as all alternative **sails**, each according to its parent **sail**.

Note At an event it will be easy for the **equipment inspectors** to check that the **sails** in each rig group offered by the competitor truly belong to that rig group and **certificate**. See Q&A.

G.1.4(b) Where the **mainsail** has a **double luff** some care is required to measure the **cross widths** as it is the half girth of the **sail** that shall be measured (as if the spar were not present and the pocket were flattened)

G.1.4(f) This is a variation to the ERS handling of headboards which are normally considered to be part of the **sail** for measurement purposes.

G.1.4(g) Where the **sail luff** is in a track in the **mast** the cross widths are taken to the aft side of the spar.

G.1.4(i) The ERS prescribes that the **clew point** may be found by extending the **sail edges** where the **sail** is cut away in that area. This system, and the WS/RYA system of using a batten of a certain stiffness, is replaced by the requirement to extend the **sail edges** using the

same gauge used for controlling the upper and lower **leech** profile in the Marblehead class. See Figure L.2.0.

A gauge with an accurately made 900 mm radius of length at least 200 mm (a gauge for the Marblehead class will normally be circa 400 mm long) is required to carry out this check.

- G.1.4(j) The ERS prescribes that the **tack point** may be found by extending the **sail edges** where the **sail** is cut away in that area. This system, and the WS/RYA system of using a batten of a certain stiffness, is replaced permitting a mark to be placed on the luff to define the tack point.

Note this permission only applies if any part of the **sail** does not extend more than 25 mm below the **tack point** when tested as shown in Figure L.2.0.

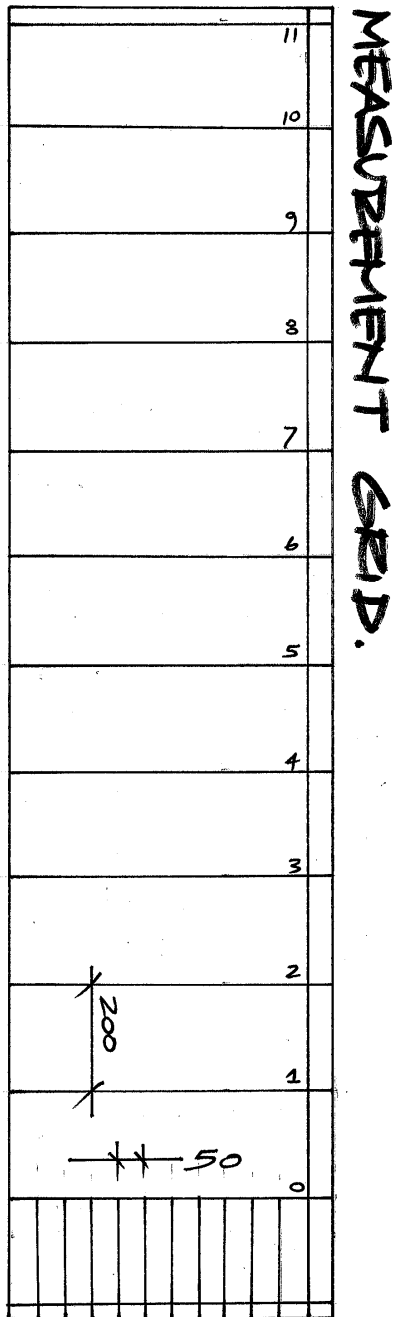
- G.1.4(k) Where no part of the **sail** extends more than 25 mm below the applied mark, the **tack point** is found as shown in the lower diagram of Figure L.2.0.

Note *These procedures to establish the **tack point** are associated with the need to unambiguously identify the **tack point** and achieve a strict upper limit on the height of the tallest **sail**.*

Sail Measurement Grid

A sail measurement grid should be constructed on a material that is stable with heat and moisture. Suitable materials are 100 micron or thicker Mylar film and worktop laminate if space and portability permit.

The layout and dimensions are shown in the sketch below. It is important that the lines are correctly spaced and on orthogonal axes. The width of the grid needs to be large enough to handle the maximum likely luff perpendicular – 550 mm is suggested.



Section K – Sail Area

K.1 Note that the **certified** sail area is one of the two components of the **certified rig** area. The other component is the **certified rig** area.

certified rig area = **certified** sail area + **certified rig** area

K.2.1 Most **sails** requiring measurement for the purpose of determining the rating of the boat and issuing a **certificate** will be **soft sails** that do not have a **double luff**. Their measurement is described in K.2.2.

See the Q&A concerning the possibility of a ‘virtual’ largest **sail**, large enough for alternative smaller **sails** to comply with.

Mainsails with a smaller **luff** length, used in stronger winds, often have a **double luff**. The measurement of these, and other **sails** that are not **soft sails**, is described in K.3.

- K.2.2(c) The **sail** is marked at **luff** and **leech** to show where the uppermost cross width is taken.
- K.2.2(f) ERS H.5.2 require hollows in the **leech** to be bridged when taking measurements. In addition the Ten Rater **class rules** requires hollows in the **luff** and the **foot** to be bridged in the same way. See figure L.2.5.
- K.3.2(c) The **sail** is marked at **luff** and **leech** to show where the cross widths are taken.
- K.3.2(d) For a **mainsail** with a **double luff** it is the skin girth that is measured. Half the skin girth is equivalent to the cross width of the **sail** taken with the **mast spar** removed and the **double luff** flattened. See Figure L.3.4.

Note how a multiple element **sail** is measured in Figure L.3.1 – each element is treated as a separate part.

The skin girths of other possible shapes are shown in Figure L.3.4 and L.3.5.

End of Ten Rater class related material

A Class

url for Q&As relevant to the A Class Class on the IRSA website.

<https://www.radiosailing.org/classes/a-class/question-answers>

A description of the measurement procedure for the A Class can be found at this link.

<https://www.radiosailing.org/classes/a-class/class-rules/category/147-measurement>

Except where noted below it is taken that the **class rules** are un-noteworthy for the following reasons:

- The **class rule** requires no further explanation
- The **class rule** is in line with normal ERS and SCR practices
- No class specific equipment is required to confirm compliance

Section G – Sails

G.2.2 (a) **Certifying a sail** is normally carried out by the **official measurer** signing and dating the **sail** using an indelible pen.

See the Q&A concerning **certification** of smaller **sails** – all **sails** are to be **certified**.

G.2.2(b) Each **mainsail** is marked with the smallest B dimension with which the **sail** complies.

The **certification** control software has a calculation that will determine this B dimension for any **sail** from its **quarter, half and three-quarter width**.

G.2.2(c) Each **headsail** is marked with the smallest J dimension with which the **sail** complies.

The **certification** control software has a calculation that will determine this J dimension for any sail from its **half width**.

Note At an event it will be easy for the **equipment inspectors** to check that the **sails** for the boat offered by the competitor comply with the **certificate**.

G.2.3(b)(1) Where the **sail luff** is in a track in the **mast** the cross widths are taken to the aft side of the spar.

G.2.3(b)(4) **Mainsails** exist with full length **luff** and heavily reduced upper cross widths designed to reduce area, lower the vertical centre of effort and provide a fairing 'tail' behind the **mast** above the useful part of the **sail**.

Such hollows are treated in the normal way, ERS H.5.2. The correct placement of battens remains related to the true **head point** of the **sail** and not the much lower effective head.

G.2.3 (c) The ERS prescribes that the **clew point** may be found by extending the **sail edges** where the **sail** is cut away in that area. The ERS system, and the WS/RYA system of using a batten of a certain stiffness, is replaced here by permission to define the **clew point** by a mark on the **sail edge**.

G.2.3 (d) Ditto for the **tack point**.

- G.2.3 (e) This is a variation to the ERS handling of headboards which are normally considered to be part of the **sail** for measurement purposes.
- G.3.2 (e) Note the definition of batten pocket point in A.1.4.

End of A Class related material

FS M and FS A Class

For the differences between the rc and FS Marblehead and A Class sail measurement, relating to spinnaker measurement, please see separate document – Class Specific Study material – FS.

6 Metre

In preparation.

Credits

Valuable input from Lester Gilbert, Janice Uttley and Roy Stevens is acknowledged in the preparation of this document. Steve Taylor is acknowledged as the source of some photographs.