MYA CLASS MEASURER

class specific study material - IOM

Draft Version 2.3

Revised February 23rd in line with 1st March 2022 version of class rules.

This document is intended to help candidate measurers to find the documents and methodology to measure an IOM class boat. It gives useful tips and explanation on the items that may not be made clear within the class rules or certification control forms. It is also a valuable aid memoire to those who have been measuring IOM class boats for several years.

Terminology

For the sake of clarity terms used in their ERS defined sense are used in **bold** in the remainder of this document.

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

The MYA approved method for correcting/calibrating weighing scales can be found here:

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

The **class rules** for the International One Metre Class are **closed class rules** in which anything not specifically permitted by the **class rules** is prohibited. Individual rules may require, limit or permit as necessary.

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 D – Hull

D.1.4 (a) The **hull** registration number is required for **certification** and may be incorporated into the builder's label (as photo below) or applied independently.

Be aware that the requirement to display the **hull** registration number "on the external surface of the **hull** shell or deck clearly and legibly with a minimum height of 20 mm" is a Section C rule and not part of **certification** measurement.

D.2.2 (b)

Item 1 Note this prohibition applies to voids (holes) rather than hollows (concavities) in the **waterplane** (the plane through the **waterline**, ERS C.6.3 (d)). At the floating draft the **waterplane** is a boat shape with a void in the middle (formed by trunking for the **fin**) and a void aft (formed by trunking for the **rudder** stock). These are specifically permitted. Other voids are prohibited.

Item 2 Note this applies to hollows in the plan view of the **hull**, the view from above as if from infinity. The shape viewed will be that created by the maximum beam of the **hull** which may be at the deck edge or some other vertical point at each section along the **hull**. Hollows are prohibited in order to prohibit foil shaped parts being created in the plan view of the **hull**.

Item 3 See IRSA Q&A for Marbleheads for a diagram that helps explain the same rule. Note that, whereas for the Marblehead the datum waterline is established by a template, for an IOM the **waterplane** is the actual **waterplane** found by flotation.

Item 4 This considers transverse hollows in the under surface of the **hull** when tested parallel to the **waterplane**, i.e. the transverse hollows that lie under the gunnel as depicted in drawing H2 regardless of where the **waterplane** falls.

D.2.2 (c) For a clarification of what the 10mm elastomer section should cover, see the Q&A section on IOMICA website.

D.2.4 (c) All fittings shall be inboard of the **hull** shell and deck. Check shroud take off points are not on the outside of the **hull**.

There may be some ambiguity in this rule and a Q&A has been issued to address this. Please see:

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

Section E – Hull Appendages

E3.2. Clarification on the **rudder** as a single element is detailed in the Q&A section on IOMICA website.

Section F – Rig

F.2.4 (c) Check that ball and roller bearings are not incorporated into fittings other than where permitted (kicking strap fitting, gooseneck fitting, **mainsail boom sheet** blocks, **headsail boom sheet** blocks and **headsail boom** swivel). Previous examples of fittings that are not now permitted include; **mast** head fittings with rotating **mainsail** support, **mainsail tack** fittings.

F.2.4 (d) Earlier examples of kicking strap and/or gooseneck fittings that are not now permitted include items where the parts measured perpendicular to the axis of rotation were greater than 20mm.

F.4.2 **Boom** spar chamfer is only permitted in the last 10mm at either end.

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.

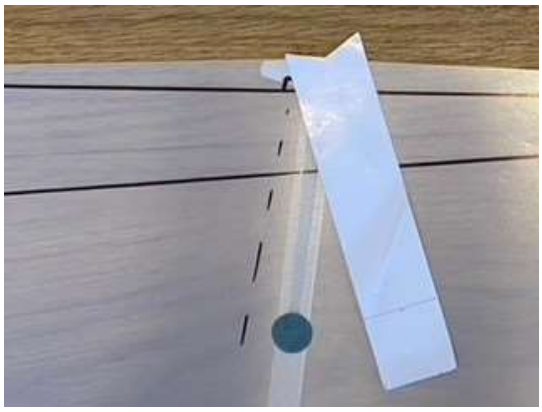
G.3.3 Some general advice on sail measuring

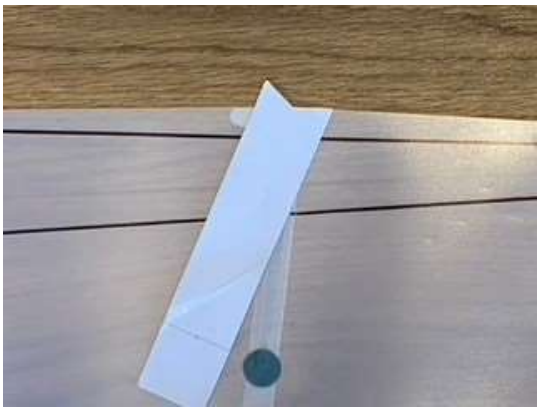
- Know the proper definition of **quarter leech point**, **half leech point** and **three-quarter leech** points and how to find them. This can be by folding the **sail** (**head point** to **clew point**, **head point** to the **half leech point** and **clew point** to **half leech point**) or as shown by the black pen marks opposite (don't worry, this sail had been trashed!).
- Many **sails** will have been marked at these points by the sailmaker during construction. This makes checking that their position is correct somewhat easier.
- 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** so you remove any bunching. **Sails** that have been rolled for storage or delivery may also have wrinkles in **leech** and **luff**.

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.

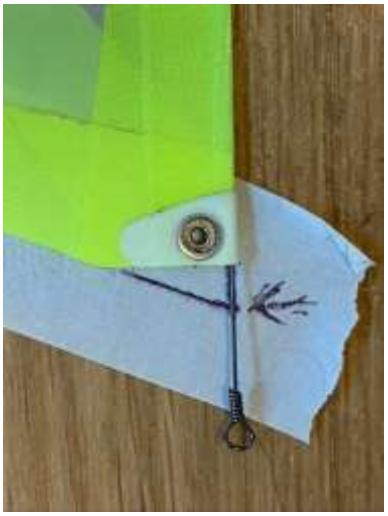
Flutter patches shall have a dimension no more than 50mm (which implies they shall fit in a 50 mm diameter circle) and other **secondary reinforcement** limits are detailed in G.3.3. The circular reinforcement at the inner end of the batten, however, is **primary reinforcement** and shall be covered 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 measurements required for **certification**.

Section C – Conditions for Racing

It is not necessary to check compliance with Section C rules as part of **certification control** carried out to issue a **certificate**. *

The reason for this is that after **certification** owners are free to amend the factors that determine compliance with Section C rules without having to have the equipment **certified** again. This saves them having to engage an **Official Measurer** each time they alter something.

Many owners will appreciate you checking that their boats comply with Section C **class rules**. Nothing prevents an **Official Measurer** from providing this service if he is content to provide it.

The freedom to amend the weights and positions of equipment comes with the responsibility to maintain the boat in compliance. Without access to accurate scales and, possibly, a flotation tank it may be difficult for an owner to establish that his boat remains compliant after making alterations. This does not, however, absolve the owner from carrying out that checking process (or any penalty he may be given) which may be accomplished by anyone including an **Official Measurer** who has the necessary equipment and uses it appropriately.

All these checks are normally made at IOMICA European and World Championships. **Equipment Inspection**, which need not be carried out by **Official Measurers**, is also carried out at national, ranking and lower level events to ensure fair racing for all the competitors.

The following notes are included here to assist **Equipment Inspectors** and **Official Measurers** with that process.

** Apparently this may come as a surprise to many who have learned that everything is checked when a **boat** is **certified**. More on this matter is added in Appendix 1.*

C.3.1 ADVERTISING

The restrictions on advertising are simple to check and advise the owner about if necessary. See WS Advertising Code (Regulation 20) and the IRSA Q&A under sail identification. The extract below covers manufacturer and sail maker marks:

Hull - On each side of the **hull**, and may include the name or mark of the designer or builder - One mark to fit within a rectangle measuring 15% of **hull length** x 150mm.

Spars and Equipment - On each side of **spars** and on each side of other equipment - One mark not exceeding 50mm length.

Sails - On each side of **sails** - One mark to fit within a 50mm diameter circle.

A template gauge cut in plastic sheet or tough card is a useful aid.

C.4.2 WEIGHT

It makes sense to check the weight of the **boat** before carrying out any checks with the **boat** afloat.

Weight of **boat** in dry condition, with battery but without wind indicator if one is fitted, shall be a minimum 4000g. If this is checked after the **boat** has been floated ensure the **boat** is properly drained and dried paying attention to any water that may be retained in the fin trunking.

Even with the most accurate scales there are many variables that may cause a different reading to be obtained the next time a **boat** is checked, perhaps at a major event. With this in mind it may be unreasonable for the owner to target the **boat** weight to be exactly 4000 grams. Usually a **keel** will be adjusted to weigh 1 to 2 grams under to avoid having to drill lead out at an event to account for the above. And usually a **boat** will be adjusted to weigh 1 to 2 grams over to avoid having to add ballast at an event.

Currently there is no IRSA prescribed system for calibration of the weighing equipment. Please use the MYA approved system which describes the equipment required in detail and how it shall be used to calibrate the weighing equipment and take readings.

Have a cradle that takes the lead and holds the **boat** vertical and steady during the process.

A simple but effective cradle.

Weigh the **boat** with each of the three **rigs** in turn to check that it is 4000 grams or over in each case.

If it is not, then additional **corrector weight(s)** will be needed for the **hull**, or one or more **rigs**.

C.4.3 CORRECTOR WEIGHTS

Note that **corrector weights** shall be fixed in/on the **hull**.

Owners normally use car wheel balance weights - each strip weighs 60g and has 15 g & 5g increments. Rather than use the self adhesive pad (there is a backing that can be peeled off to expose the sticky section) they should be bonded in the **hull** with a couple of blobs of silicon sealant. That way they are fixed and in future can be easy to remove if further correction is necessary. There is no rule on where they should be placed. Usually they are placed in the **hull** each side of the fin casing.

C.6.4 WEIGHTS (for keel and rudder)

Keel excluding fasteners to the **hull**	minimum 2200g	maximum 2500g
Rudder		maximum 75g

The same scales that are used for weighing the **boat** and **keel** are suitable for weighing the **rudder** too. Note most **rudders** weigh about half this weight - 38 to 40g.

C7.3 CORRECTOR WEIGHTS

The class rules permit **rigs** to have **corrector weights** added so the **boat** may be the same weight whichever **rig** it is using.

Note the details of positioning and a MINIMUM density of rig **corrector weight** is prescribed for weights placed above the **lower point**. The minimum density requirement is so that additional lightweight **mast** stiffening cannot be added.

C7.4 MAST

The **lower point** to the **deck limit mark** as defined in D.1.5 shall be a minimum of 60 mm and a maximum of 100 mm. Within these limits the variation in height of the **lower point** or a **rig** shall vary by no more than + or – 5mm at an event. It is not necessary for each rig to have the same **lower point** to the **deck limit mark** dimension.

C.4.1 DIMENSIONS (of boat)

Draft (fresh water)	minimum 370mm	maximum 420 mm
Hull depth		maximum 60 mm
Hull length		maximum 1000 mm

There are several styles of tank.

One type has a weir set at 420 mm so it will automatically lose water via a drain to remain at 420 mm depth when the **boat** is added.

Another type is an ordinary tank that will accept the **boat**, typically 1250 mm x 500 mm x 500 mm with a depth gauge on the side. In this type try using a small rectangular block placed on the tank bottom and, with the **boat** floating in the tank, adjust the water depth by adding or removing water until 420 mm is obtained.

Topping up the water level to achieve the correct water depth. The block at the bottom of the tank is just visible.

Provided the **boat** will pass over the block without touching then it is clear the boat complies.

A smear of candlewax or Vaseline prevents the meniscus forming on the rule and allows an accurate measurement.

HULL DEPTH

To obtain the **hull** depth, place the **boat** fully rigged for sailing in the tank and note the height of the bow and stern relative to the water surface.

Just touching at the bow and 5mm forward of the transom.

Use this information as described below to find the **hull** depth.

Alternatively, if the tank is fitted with an inspection panel on one side it is possible to check **hull depth** directly while floating. To do this arrange for a horizontal line to be marked on the far side of the tank 60 mm below the water plane and score a horizontal line 60 mm below the water plane on

the inspection panel. View across the tank lining up the lines to check whether the rocker line of the hull is above or below the line. Usually this position is coincident with the fin.

LENGTH

This is most easily checked if the tank is constructed accurately to have vertical ends that are truly parallel planes just over 1000 mm, say 1010 mm, apart. With the **boat** floating with the bow or stern hard up against one end it is then a simple matter to check that a 10 mm wide gauge will pass between the other end of the **boat** and the end of the tank.

Note that the **boat** shall have its centreline perpendicular to the tank ends when this check is made – it is the **hull length** as defined in ERS D.3.1 and H.3.4 that is restricted to 1000 mm.

Where the tank is not so constructed, place the stern of the yacht hard up against the end of the tank and with a rule placed across the tank, parallel to and 1000 mm from the end, to ensure the **boat** length is 1000 mm or less in length.

Rudder overhang

Check that the **rudder** does not overhang the stern i.e. it is the stern of the **boat** that should touch the end of the tank, not the **rudder**.

HULL DEPTH

Suggested method if not done with the **boat** floating.

Remove the **boat** from the tank then, with the **rig** removed, place the keel fin horizontally on a 1050 mm long x 300 mm wide flat surface. The 1050 mm long edge nearest the **hull** should be straight.

If it is possible to adjust the **boat**'s position so the **waterline** ending points observed in the tank are 60 mm from the straight edge without the **hull** touching the straight edge, then the **hull** depth is compliant.

EQUIPMENT MARKING AT AN EVENT

The method used for **hull depth** measurement will also allow the **fin** position/angle and **ballast** cant to be measured if desired. These relationships may not be changed during an event and may be recorded so that any alteration may be detected at **equipment inspection** that is repeated during the event. However, where there appears to be scope to change these relationships during an event, it is usual to use a permanent marker pen (those filled with silver or gold ink work especially well as they work well on gloss surfaces of any colour) to sign/mark the placement of **fin** in **hull**, **ballast** on **fin** and serve as a record of the equipment that was presented for **equipment inspection**.

C.5.2 IDENTIFICATION

The requirement to display the **hull** registration number "on the external surface of the **hull** shell or deck clearly and legibly with a minimum height of 20 mm" is in addition to the requirement to paint, engrave, bond or mould the same number in/on the **hull** (D.1.4).

Hull *registration number displayed on the external surface of the* ***hull*** *shell or deck.*

End

Credit

Valuable input from Lester Gilbert and Steve Taylor is acknowledged in the preparation of this document. The images were provided by Steve Taylor.

Appendix 1

Since at least as early as 2002 all the IRSA Class rules, including the IOM class rules, have divided the **class rules** into the following Parts and Sections

Part 1
A ……. Administration
B ……. Boat Eligibility
Part 2
C ……. Condition for Racing
D …….Hull
E ……. Hull Appendages
F ……. Rig
G……. Sails
Part 3
Additional Sections as required to cover Rating, Definitions, Figures

This is the format used for **class rules** written to the World Sailing Standard Class Rules (SCR) format. There are many advantages to using this common format as well as use of definitions for the common sailing equipment terms given in the Equipment Rules of Sailing (ERS). The sailors, measurers, equipment manufacturers and those running events can easily find class rules relating to any specific piece of equipment. Familiarity with just one set of **class rules** will provide confidence about where to find similar **class rules** for another class. Words used in their ERS sense (denoted by use of bold text) will have the same definition wherever they are found.

A major benefit of the SCR format is that those rules that are of concern to the sailor who wants to know what he can and cannot do with the equipment of the **boat** can all be found in Section C which is placed near the front of the **class rules** document. This reflects the structure of the Racing Rules of Sailing where the rules the sailor needs to know are found in Parts 1 and Part 2.

The Section C rules contain all those rules that are applicable to the way **sails** are set on the **rig**, and how the **rig**, **hull appendages**, and other equipment relate to the **boat** as a whole. These are all things the sailor has direct control over when sailing the **boat** – as such they are not things that can be checked for **certification**, and compliance with Section C rules is specifically excluded from the **certification** process.

Examples of this for the IOM class are **boat** weight, **hull length**, **hull depth** and **draft**. While these measurements must remain compliant with the permitted limits, owners are free to change the rc equipment used on board at any time between events. Its weight and placement, and that of any compensating internal ballast, may be varied and this is taken for granted as a freedom that is permitted within the IOM class. A moment's thought will make it clear that the weight and placement of the rc equipment and corrector weight affects the boat's flotation attitude and hence its length measured parallel to the waterplane and draft measured perpendicular to it. Because the weights (**boat**, **keel**, **rudder**, **corrector weight**), length and drafts are not **certified** the owner is not required to return to an **Official Measurer** to have his **boat** re-certified after any such changes. The **boat** shall still comply with the Section C rules at an event so, while it is not a **certification** matter, the sailor is responsible for ensuring his **boat** complies with the **class rules** when racing.

Note that there has been no fundamental change to the **class rules** in this respect for two decades. Nothing has changed regarding the division of responsibility between owner and **Official Measurer** for establishing compliance with Section C and the other class rules. However, awareness of this matter may not have been well established in the past.

How does this work in practice?

Many owners have suitably accurate scales on which to check the weight of their boat and its appendages. Most do not have a tank for length and drafts but these, once established as correct for a given weight will remain very constant. If safely within the limits at the outset, they will remain safely within the limits when weight and centre of gravity placement varies little. On the other hand a change to the fin, the way it fits in the hull, the ballast on the fin, or the rudder, may quite likely change the flotation and hence the length and/or draft, and whether the rudder overhangs the transom. Checking may be essential and is certainly wise after any such changes.

Most measurers will have access to suitably accurate scales and to a tank allowing them to check compliance with these Section C class rules. Owners who do not have their own measuring equipment will rely on the builder or an Official Measurer to carry out these checks at the certification stage and perhaps at other times when they have made changes to their boat's equipment.

Checking Section C Class rules for the owner

Many owners will appreciate you checking that their boats comply with Section C **class rules**. Nothing prevents an **Official Measurer** from providing this service if he is content to provide it. However, it should be appreciated by **Official Measurers** that **certification** of a **boat** does not depend on compliance with Section C rules. It is also wise for **Official Measurers** to remind owners that their signature on the certification control form indicates their agreement to take responsibility for maintaining their boat in compliance with the class rules.

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