MYA CLASS MEASURER TRAINING

class specific training material - Marblehead

1.3 version

This document is intended to help candidate measurers to find the documents and methodology to measure a Marblehead 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 Marblehead 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 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

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

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

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.

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

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

Section A – General

A.1.4 Two special definitions are created in the Marblehead class rules. These are rig and spar. Wherever these terms are used underlined they have the meanings defined in A.1.4.

The ERS define **rig** as the spars, fittings and rigging, but without **sails**. The Marblehead class rules also refer to the **rig** in this way. However, rig is defined like this in A.1.4 because it is normal to refer to the spars, fittings and sails unit as a rig.

The current ERS define **spar(s)** as the main structural part(s) of the **rig** to which **sails** are connected. The definition includes the **spar's** fittings and any corrector weights. The definition of **spar** that existed when the Marblehead class rules were first written using ERS terms did not include fittings. This worked perfectly with the various Marblehead class rules that applied at the time and, in order to keep the rules much like they were before, the current class rules define spar as the main structural part of the **rig** to, or from, which **sails** are attached and/or supported.

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**.

However, Section C rules become applicable at an event and are applicable while *racing*. Section C rules are generally those that deal with items the competitor is free to change at any time and with the way in which he uses equipment when *racing* so it is impractical to check it during **fundamental measurement**. At an event it is **equipment inspection** that checks compliance with Section C rules. This subject is covered at length at the end of this document.

Section D – Hull

D.1.4 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** clearly and legibly with a minimum height of 20 mm" is a Section C rule and not part of **certification** measurement.

D.2.1 See IRSA Q&S relating to multiple **deck limit marks**.

D.2.2 (b) Although it is not intended for the Marblehead class, for a good clarification of what the 13 mm elastomer section should cover, see the Q&A section on IMCA website.

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

The same logic applies to the Marblehead class although with a larger dimension.

D.2.3 (b)

Item 1 Note this prohibition applies to voids (holes) rather than hollows (concavities) in the datum waterplane (the transverse plane established using the Length Restriction Gauge). A section of the boat through the datum waterplane is a boat shape that usually has a void in the middle (formed by trunking for the **fin**) and a void aft (formed by trunking for the **rudder** stock). When the boat is afloat these contain water and are specifically permitted. Other voids are prohibited.

This means that a tube running from deck to the **hul**l bottom that houses a swivel line for the **headsail boom** is not permitted unless it is closed at the lower end.

Item 2 Note this applies to hollows in the plan view of the **hull**, the view from above as if from infinity, and it applies to the profile view under the datum waterplane.

The shape viewed from above 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**.

` Note the IRSA Q&A concerning hollows in the profile view.

Item 3 This considers transverse hollows in the under surface of the **hull** when tested parallel to the datum waterplane, i.e. the transverse hollows that lie under the gunnel as depicted in drawing J.4 regardless of where the datum waterplane falls.

D.2.4 **Hull** length is checked for compliance using the Length Restriction Gauge. Note that figure J.3 defines the gauge and figure J.2 defines the datum waterplane.

Hull beam has a minimum value of 100 mm. The reason for this is that the Depth Restriction Gauge defined in J.1 will not function if **hull beam** is below 100 mm.

` Note the IRSA Q&A concerning **hull beam** less than 100 mm.

Section E – Hull Appendages

E.2.1 Materials.

ERS H.6 states that unless prescribed by the class rules there is no requirement to check materials.

Section F – Rig

F.1.2 (a) Anything that adds windage to the rig will propel the boat when sailing downwind. This rule is intended to prevent unreasonably large plates or flaps that may add to the propulsive power of the rig. It is difficult to be totally objective in its application because there can always be argument about how large a fitting needs to be to function reasonably.

` Note the IRSA Q&A concerning a rotating head fitting.

F.1.2 (b) Modern construction methods permit fittings to be made as an integral part of the spar. As there is a limit to the size of a spar, but no restriction (except as in F.1.2 (a)) for the size of the fitting, there needs to be a means of determining what is spar and what is fitting. It is difficult to be totally objective in its application because there can always be argument about how 'faired into' the spar any fitting is.

This rule may be relevant when establishing where the line through the **headsail tack point** and **head point**, when extended, cuts the fore edge of the **mast** spar. This is a Section C rule.

F.2.1 Whereas counting the number of spars is simple, it may be more difficult to determine what are, and what are not, spars. Check the definition in A.1.4 where there is any doubt.

See the IRSA Q&A relating to the use of deck spreaders – spars that project from and outboard of the hull to which shrouds are attached.

F.2.2 (a)(3) Note that the depth of the junction shown in the figure J.5 Section A-A' sketch is not taken perpendicular to either spar. The angle at which the depth is taken is the angle at

which the dimension is a minimum. This depends on the angle between the axes of the two spars and the depth of each. The Certification Control Form for the Rig gives this angle should it be necessary to determine it precisely. In most cases it will not be necessary.

F.2.3 (c) Where the **mainsail luff** is substantially less than that recorded on the **certificate** for the rig in question, the **mast** will obviously not be long enough to place a **limit mark** at the appropriate position.

F.2.3 (d) The same may be true for the foretriangle height **limit mark**. However, the length of **mast** above the **forestay** attachment means this is less likely and it is not unreasonable to require a foretriangle height **limit mark** on reduced height C2 and C3 rigs.

F.2.4 Whereas the ERS define **fore and aft mast spar cross section**, **transverse mast spar cross section**, **vertical boom cross section** and **transverse boom cross section** the Marblehead class rules refer only to cross section. Therefore spar cross section dimensions taken at any angle shall comply with the maximum permitted.

See the IRSA Q&A relating to the use of square cross section spars.

F.2.5 **Headsail luff** spars are virtually unknown but, as they are not prohibited, their cross section is limited.

F.2.6 Note that the length of the junction is taken along the spar that continues past both ends of the junction.

Note that the depth of the junction shown in the figure J.5 Section A-A' sketch is not taken perpendicular to either spar. The angle at which the depth is taken is the angle at which the dimension is a minimum – hence 'minimum combined spar cross section'. This depends on the angle between the axes of the two spars and the depth of each. The Certification Control Form for the Rig give this angle should it be necessary to determine it precisely. In most cases it will not be necessary.

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 c**ertified** 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.

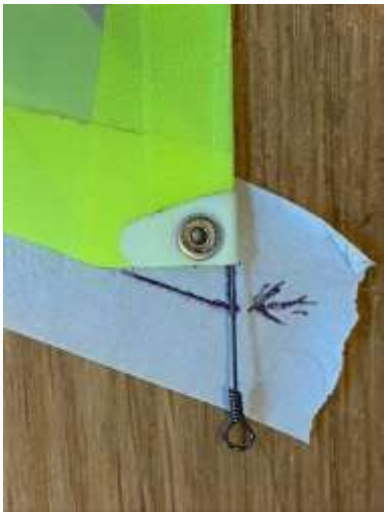
G.3.3 Some general advice on sail measuring

- 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.***

Section H – Measurement

H.1.1 Important to note that any measurments are rounded up to the nearest millimetre before use.

H.1.2 Limits in the **class rules** are absolute i.e. the 20 mm limit to spar cross section means the dimension shall be no more than 20 mm exactly.

H.1.3 & 4 These are largely redundant as the calculations are made by the certification software.

End of measurements required for **certification**.

Section J – Figures

J.1 Note how the Depth Restriction Gauge is moved along the hull and may be angled to pass over the **appendages** while remaining in contact with the **hull**.

J.2 For **equipment inspection** the Length Restriction Gauge is used to determine whether the **rudder** and parts of the rig project outboard the ends of the **hull**.

J.8 Although not labelled in figure J.8 the **top width** is taken from the **aft head point** to the **head point** which, in these cases, is a virtual point.

Note that the limit of the area of **stiffening** at the head is described by an arc whose centre is on the straight line from **aft head point** to **head point**.

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 certain aspects of the **boat** and its equipment comes with the responsibility to maintain the **boat** in compliance with the **class rules**. The owner is responsible for checking his **boat** remains in compliance after modification (or for any penalty he may be given). But he may ask an **Official Measurer** to carry out the task independently.

All these checks are normally made at IRSA/IMCA 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**. This matter is covered more fully in Appendix 1.*

C.3 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 HULL

C.4.2 IDENTIFICATION

The requirement to display the **hull** registration number “on the external surface of the **hull** 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.1.2).

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

C.4.3 FITINGS

Fittings shall not project outboard of the **hull**. This applies transversely as well as fore and aft. Check shroud take off points do not project outboard of the **hull**.

C.5 APPENDAGES

C.5.3 USE

In order to determine that an **appendage** is the same, and in the same position, as presented for **equipment inspection**, it is normal for the **equipment inspector** to mark the item and its position with some form of indelible pen. It is usual to use a permanent marker pen (those filled with silver or gold ink work especially well on gloss surfaces of any colour) to sign/mark the items used, the placement of **fin** in **hull**, and **ballast** on **fin,** and serve as a record of the equipment that was presented for **equipment inspection**.

C.6 RIG

C.6.1 LIMITATIONS

At major events the rigs that the competitor intends to use will be marked in some way (**event limitation mark**) to show that they have been inspected and to act as a record of that. The method of marking needs to be incapable of being duplicated except by event officials where required, for example in the case of permitted replacement of equipment after loss or damage.

C.6.3 DIMENSIONS

Note that the vertical height of a rig's **upper limit mark** above the deck **limit mark**, the G dimension, may vary by plus or minus 10 mm. Originally this was to permit a mast jack to be used but it also allows for minor changes caused by rake change and other adjustments. Nevertheless there remains an absolute limit for the **upper limit mark** to deck **limit mark** dimension of 2160. This means a G dimension of, say 60, for a rig with an A dimension of 2100, may vary by minus 10 to plus zero.

C.7 SAILS

C.7.3 IDENTIFICATION

Appendix E does not apply to the **sail** identification marks which are currently contained in the IRSA Supplementary Class Rules.

Note that while class rule C.7.3 (b) does not require the insignia to be on both sides of the **sail**, the Supplementary Class Rules do require the insignia to be placed on both sides.

C.7.4 USE

C.7.4 (b) See the IRSA Q&A relating to **tack point** and **lower limit mark** on **double luff sails**.

C.8 EQUIPMENT

C.8.2 USE

Although the weight of the **boat** is not a factor in the **class rules** for **certification** it becomes relevant at an event where change to the weight of the **boat** and its centre of gravity are prohibited by the Racing Rules of Sailing 51 and class rule C.8.2.

The only real way to monitor this, apart from carefully indentifying the **ballast**, its position on the **fin** and the position of the **fin** in the **hull**, would be to weigh the **boat**. Nevertheless, marking equipment and positions is the normal way to monitor this.

End

Credits

Valuable input from Lester Gilbert is acknowledged in the preparation of this document. Steve Taylor is acknowledged as the source of some photographs.

Appendix 1

Since at least as early as 2002 all the IRSA Class rules, including the Marblehead 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**. Consequently compliance with Section C rules is specifically excluded from the **certification** process.

Examples of this for the Marblehead class are depth of the appendages and which rigs (if the owner has more than six) may be used at an event.

A moment's thought will make it clear that the weight and placement of the rc equipment affects the boat's flotation attitude and hence the **waterplane** and its **draft** measured perpendicular to it. However, as the **appendage** depth is limited using the Depth Restriction Gauge that relates to the **hull** rather than the true **waterplane**, the owner is free to alter the length and placement of **fin**, and position and weight of **ballast** between events. This is taken for granted as a freedom that is permitted within the Marblehead class.

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?

Once the fin and ballast has been checked on the Depth Restriction Gauge and found compliant the owner can remain confident they will remain compliant thereafter. Where the Depth Restriction Gauge only just passes under the fin and ballast the owner should be made aware that any small adjustment to the position and/or attitude of the fin and ballast may take the fin and ballast out of compliance. Where owners want to push the limits it is normal for them to have their own Depth Restriction Gauge.

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.