

# **2.4 NORLIN ONE DESIGN CLASS RULES**

**2013-04-10**

The Norlin mark III design for the 2.4mR Class, which was adopted as an international class in 1993, was designed in 1987 by Peter Norlin.

The Norlin mark III design was chosen to be the 2.4 Norlin One Design boat. The 2.4 Norlin One Design Class was introduced as a Class in 2011

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# INTRODUCTION

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These Class Rules apply to 2.4 Norlin One Design boats. These boats may race in both open 2.4mR Class events and in closed 2.4 Norlin One Design events such as Paralympics, IFDS World Championships or other events, which have been given such status.

The 2.4 Norlin One Design hulls, rudders and rigs supplied by the Licensed Builder are manufacturing controlled. Rigs and sails are measurement controlled as well as boats built before 2011-03-01

The 2.4 Norlin One Design hulls and rudders shall only be manufactured by Licensed Builders – in the class rules referred to as licensed hull builder. Equipment is required to comply with the 2.4 Norlin One Design Construction Manual and is subject to a manufacturing control system approved by the ICA.

2.4 Norlin One Design hulls, rudders, rigs and sails may, after having left the manufacturer, only be altered to the extent permitted in Section C of these Class Rules.

Owners and crews should be aware that compliance with rules in Section C is NOT totally checked as part of the fundamental certification.

Rules regulating the use of equipment during a race are contained in Section C of these Class Rules, in ERS Part I and in the Racing Rules of Sailing.

This introduction only provides an informal background and the International 2.4 Norlin One Design Class Rules proper begin on the next page.

*In House Certification, IHC, will be applied in this class for hulls, rudders, rigs and sails.*

# PART I – ADMINISTRATION

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## Section A – General

### A.1 LANGUAGE

- A.1.1 The official language of the class is English and in case of dispute over translation the English text shall prevail.
- A.1.2 The word “shall” is mandatory and the word “may” is permissive.

### A.2 ABBREVIATIONS

- A.2.1 ISAF International Sailing Federation
- MNA ISAF Member National Authority
- ICA International 2.4mR Class Association
- NCA National Class Association
- ERS Equipment Rules of Sailing
- RRS Racing Rules of Sailing

### A.3 AUTHORITIES

- A.3.1 The international authority of the class is the ICA.
- A.3.2 No legal responsibility with respect to these class rules, or accuracy of measurement, rests with:
  - the ISAF,
  - the MNA,
  - the ICA,
  - a NCA,
  - a class measurer.

No claim arising from these class rules can be entertained.

- A.3.3 Notwithstanding anything contained herein, the ICA (certification authority) has the authority to withdraw a **certificate**.

### A.4 ADMINISTRATION OF THE CLASS

- A.4.1 The ICA will have the administrative functions of the class.
- A.4.2 The ICA will be the certification authority. The ICA may delegate this administration to an NCA.

### A.5 ISAF RULES

- A.5.1 These **class rules** shall be read in conjunction with the ERS and RRS.
- A.5.2 Except where used in headings, when a term is printed in “**bold**” the definition in the ERS applies and when a term is printed in “*italics*” the definition in the RRS applies.

## **A.6 CLASS RULES VARIATIONS**

- A.6.1 At Class Events – see RRS 89.1.d) – ISAF Regulation 26.5(f) applies. At all other events RRS 86 applies.
- A.6.2 At international Class Championships the sailing instructions may vary these **class rules** only with the agreement of the ICA.

## **A.7 CLASS RULES AMENDMENTS**

- A.7.1 Amendments to these **class rules** are subject to the approval of the ICA.

## **A.8 CLASS RULES INTERPRETATION**

- A.8.1 Interpretation of **class rules** shall be made in accordance with the ISAF Regulations.

## **A.9 INTERNATIONAL 2.4MR CLASS FEE AND ISAF BUILDING PLAQUE**

- A.9.1 The licensed hull builder shall equip the boat with a 2.4mR Class ISAF plaque.

## **A.10 2.4 NORLIN ONE DESIGN LICENSE FEE AND 2.4 NORLIN ONE DESIGN CLASS STICKER**

- A.10.1 The licensed hull builder shall pay the License Fee to the ICA as stated in the License Agreement between the hull Builder and the ICA.
- A.10.2 The ICA shall, after having received the License Fee for the hull, send the 2.4 Norlin One Design Class sticker to the licensed hull Builder.
- A.10.3 An owner of a hull built before 2011-03-01, which has been approved to comply with these rules, shall send this documentation to the ICA together with the registration fee.
- A.10.4 The ICA shall, after having received the registration fee and documentation according to A.10.3, send the 2.4 Norlin One Design Class sticker to the owner.

## **A.11 SAIL NUMBERS**

- A.11.1 Sail numbers shall be issued according to the International 2.4mR Class Rules clause A.10. (The same series of numbers).

## **A.12 MEASUREMENT**

- A.12.1 All measurement shall be carried out by a 2.4 Norlin One Design Class Measurer
- A.12.2 Class Measures shall be either,
  - (a) An **Official Measurer** or
  - (b) Appointed by the ICA. The appointment shall be renewed annually
- A.12.3 The ICA may refuse to accept measurement reports made by an Official Measurer or a Class Measurer who has misused the trust of their title by poor measurement work.

## **A.13 CERTIFICATION**

- A.13.1 ICA is the authority that **certify** 2.4 Norlin One Design boats.

A.13.2 A **certificate** shall record the following information:

- (a) Class
- (b) ICA (Certification authority)
- (c) Sail number issued by the 2.4mR Class **certification authority**
- (d) ISAF Building Plaque Number
- (e) Builders details and hull number (hull number not needed for boats built before 2011-03-01)
- (f) 2.4 Norlin One Design Class Sticker Number
- (g) Date of measurement report and name of measurer
- (h) Date of issue of initial **certificate**
- (i) Date of issue of **certificate**
- (k) Date of flotation check according to B.2.
- (l) Type of rudder (only for boats built before 2011-03-01)
- (m) Specific data of the boat according to the certificate form

#### **A.14 INITIAL HULL CERTIFICATION**

A.14.1 For a **certificate** to be issued to a hull built after 2011-03-01 not previously **certified**:

- (a) **Certification control** shall be carried out by the builder as “in house certification”, IHC. The ICA certification report form shall be used for the 2.4 Norlin One Design certificate, and the 2.4mR measurement report form for the 2.4mR hull certificate. If the builder has not been approved for that, the **certification control** shall be carried out by class measurer who shall complete the appropriate measurement report. The ICA measurement report form shall be used for submission of the 2.4 Norlin One Design certificate
- (b) When the hull and the rig is supplied by two different builders, the rules in (a) shall apply for both builders.
- (c) The certification and or measurement report(s) together with a copy of the 2.4mR certificate and **certification** fee shall be sent to the ICA (certification authority).
- (d) Upon receipt of a satisfactorily completed certification/measurement report, the copy of the 2.4mR certificate and **certification** fee, the ICA (certification authority) shall issue a **certificate** and send it to the owner. The ICA certificate form shall be used

A.14.2 For a certificate to be issued to a hull built before 2011-03-01 not previously certified:

- (a) **Certification control** shall be carried out by a class measurer who shall complete the appropriate measurement report. The ICA measurement report form shall be used.
- (b) The measurement report(s), a copy of the 2.4mR certificate, and **certification** fee shall be sent to the ICA (certification authority).

- (c) Upon receipt of a satisfactorily completed measurement report , a copy of the 2.4mR certificate, and **certification** fee the ICA (certification authority) may issue a **certificate** and send it to the owner. The ICA certificate form shall be used.

## **A.15 VALIDITY OF CERTIFICATE**

A.15.1 A **certificate** becomes invalid upon:

- (a) significant repair or replacement to the **hull** and keel and the change to any items recorded on the **certificate** as required under A.12 (a) – (m).
- (b) withdrawal by the ICA (certification authority),
- (c) the issue of a new **certificate**,
- (d) the boat is given a new sail number (e.g in case of export of an old boat).
- (e) The flotation check is older than 5 years.

## **A.16 RE-CERTIFICATION**

A.16.1 The ICA (certification authority) may issue a **certificate** to a previously certified **boat**:

- (a) when it is invalidated under A.15.1(a), after receipt of the old **certificate** and if needed appropriate documentation given by a class measurer, and **certification** fee if required.
- (b) when it is invalidated under A.15.1 (b), at its discretion.
- (c) when it is invalidated under A.15.1 (d )
- (d) in other cases, by application of the procedure in A.14.

A.16.2 A certificate that has been invalid due to A.15.1(e) will be valid when confirmation is done on the certificate according to B.2.2.

## **A.17 RETENTION OF CERTIFICATION DOCUMENTATION**

A.17.1 The ICA (certification authority) shall:

- (a) retain the original relevant certification report or measurement report upon which the current **certificate** is based, and a copy of the certificate.

# **Section B – Boat Eligibility**

For a **boat** to be eligible for *racing*, it shall comply with the rules in this section.

## **B.1 CLASS RULES AND CERTIFICATION**

B.1.1 The boat shall:

- (a) be in compliance with the **class rules**.
- (b) have a valid 2.4 Norlin One Design **certificate**.
- (c) have valid **certification marks** as required in the 2.4mR Class Rules
- (d) have been certified according to The Int 2.4mR Class Rules

## **B.2 FLOTATION CHECKS**

- B.2.1 The 2.4 Norlin One Design **certificate** shall carry a satisfactorily flotation check confirmation.
- B.2.2 The confirmation shall be done by a class measurer or a person authorised by the NCA stating date of the check.
- B.2.3 A flotation check is valid maximum five (5) years from the date of the previous check. The check shall be accomplished according to Section L.

## **B.3 CLASS ASSOCIATION MARKINGS**

- B.3.1 A 2.4 Norlin One Design Class Association Sticker according to A.10.2 shall be affixed to the hull in the cockpit on the port side.
- B.3.2 An ISAF Plaque shall be fixed to the inside of the hull in the cockpit on the port side.
- B.3.3 Boats measured and certified before 1<sup>st</sup> July 1994 according to the International 2.4mR Class Rules and provided with a plaque issued by the Scandinavian Sailing Federation may have that plaque instead of the ISAF Plaque, (B.3.2).

## **B.4 2.4 NORLIN ONE DESIGN CLASS MEMBERSHIP**

- B.4.1 For a boat to be eligible for racing in an international Class Championship of the 2.4 Norlin One Design Class, its owner or its helmsman for the race must be a current member of the ICA, either directly or by the relevant NCA.



## PART II – REQUIREMENTS AND LIMITATIONS

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The **crew** and the **boat** shall comply with the rules in Part II when *racing*. In case of conflict Section C shall prevail.

The rules in Part II are **closed class rules**. **Certification control** and **equipment inspection** shall be carried out in accordance with the ERS except where varied in this Part.

### Section C – Conditions for Racing

#### C.1 GENERAL

##### C.1.1 RULES

- (a) RRS 50.4 and 52 shall not apply.
- (b) The ERS Part I – Use of Equipment shall apply.
- (c) The ERS Part III – Rules governing equipment control and inspection shall apply with the following amendment of H.5.1 Condition of sail: Battens may be left in the sail unless the measurer requires otherwise making it possible for him to measure the sail.

#### C.2 CREW

##### C.2.1 LIMITATIONS

- (a) The **crew** shall consist of one person.
- (b) In normal positions of the crew both the legs and the main part of the torso shall be below deck and inside the sheer line.

#### C.3 PERSONAL EQUIPMENT

**Personal equipment** is optional.

#### C.4 ADVERTISING

##### C.4.1 LIMITATIONS

Advertising is unrestricted according to ISAF Regulation 20.

#### C.5 PORTABLE EQUIPMENT

##### C.5.1 MANDATORY

- (a) NOT FOR USE
  - (1) Towing rope minimum 9m long of not less than 5mm in diameter and of material that floats.

##### C.5.2 OPTIONAL

- (a) One electrical pump with battery.
- (b) Any other portable equipment may be carried on board above the floor (See Section J for floor definition).

The total weight of this optional portable equipment shall not exceed 2,0kg. In addition extra sails may be carried on board.

## C.6 BOAT

### C.6.1 WEIGHT

(a)

	minimum	maximum
The weight of the <b>boat</b> in dry condition	253 kg	254 kg

The weight shall be taken including one jib and one mainsail and portable equipment as listed in C.5.1 (a) and C.5.2 (a) but excluding portable equipment in C.5.2 (b).

The seat may be excluded if it fulfils the requirement according to D.6.2(b). The approval of such a seat shall be marked on it by a class measurer.

(b) The horizontal distance between the balance point (centre of gravity) of the boat, when its baseline (waterline) is horizontal, and section 0 shall not be more than 1371mm or less than 1343mm. See also Section M.

### C.6.2 CORRECTOR WEIGHTS

- (a) **Corrector weights** of lead shall be securely fixed to the hull when the **boat weight** is less than the minimum requirement.
- (b) Corrector weights shall be placed in the cockpit area; 50% on the forward bulkhead above the floor (in front of the steering pedals), and 25% each side under the forward end of the aft deck.

## C.7 HULL

### C.7.1 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) The **hull** shall comply with the templates as defined in section J\_with tolerances according to section K.2
- (b) Application of fillers to the hull for fairing is not allowed in order to change the shape of the original hull.
- (c) Routine maintenance such as painting and polishing is permitted without re-measurement and re-**certification**.
- (d) Repair of hull damages is permitted, see D.2.4 (e).
- (e) Corrections of ballast weight in order to comply with C.6.2 will be permitted. It will also be permitted to remove the ballast pigs from the keel for certain reasons (transportation, cleaning etc). However the ballast shall be restored such that the boat complies with C.6.1.
- (f) The interior of the boat may be modified.

### C.7.2 FLOTATION

- (a) The **boat** shall float in an approximate horizontal position when flooded and loaded with an extra 35kg lead ballast (when tested in salt water)

placed 1350mm  $\pm$  100 mm from the hull datum section defined in D.2.4(b). In fresh water the extra lead ballast may be 28 kg.

- (b) **Hulls** with water tight compartments shall be checked according to (a) with the compartments filled with water. See also Section L.
- (c) For flotation check confirmation see B.2.

### C.7.3 BALLAST

- (a) Ballast pigs shall comply with D.8.
- (b) The maximum weight of the ballast, including any equipment placed below the floor.(e.g. battery)( See Section J for floor definition), but excluding electrical pump and adherent hoses and cables, is 181kg.

## C.8 RUDDER

### C.8.1 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) The rudder shall comply with the templates as defined in section J with the following tolerances. The maximum permitted distance between outer shape template and rudder is 0 to 5mm, and between cross section templates and rudder is 0 to 2mm, and between templates for leading and trailing edges and rudder is 0 to 1mm.
- (b) Routine maintenance such as painting and polishing is permitted without re-measurement and re-**certification**.
- (c) Repair of rudder damages will be permitted if the rudder complies with (a).

### C.8.2 LIMITATIONS

- (a) Only one **rudder** shall be used during an event of less than 8 consecutive days, except when a **rudder** has been lost or damaged beyond repair.

### C.8.3 USE

- (a) Boat built before 2011-03-01, which is not equipped with the deep standard rudder, may have the small standard rudder. This shall be stated on the certificate. Dimensions of the small rudder shall comply with templates and specifications given in Section J.

## C.9 RIG

### C.9.1 CONSTRUCTION

- (a) All spars shall comply with Section F.

### C.9.2 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) Routine maintenance such as painting and polishing is permitted.

### C.9.3 FITTINGS

- (a) All mandatory fittings and their positioning shall comply with Section F. Other fittings are optional.

C.9.4 LIMITATIONS

- (a) Only one set of **spars** and standing **rigging** shall be used during an event of less than 8 consecutive days, except when an item has been lost or damaged beyond repair.

C.9.5 MAST

(a) DIMENSIONS

	minimum	maximum
<b>Limit mark width</b> .....	10mm	
<b>Mast spar curvature</b> at a distance of 2700 mm from the <b>mast datum point</b> (See F.2.4 (a)).....		30mm

(b) USE

- (1) The **spar** shall be stepped in the mast step in such a way that the heel is not capable of moving more than 10mm athwart ships. The mast may be movable in fore-and aft direction.
- (2) The **mast datum point** shall not be above the *deck measurement point*. (See D.2.4 (c)) (3). Rotating masts are not permitted.

C.9.6 BOOM

(a) DIMENSIONS

	minimum	maximum
<b>Limit mark width</b>	10mm	-
<b>Outer point distance</b>		1960mm

(b) Positioning

- (1) The intersection of the aft edge of the mast **spar** and the top of the boom **spar**, each extended as necessary, shall not be below the upper edge of the mast **lower limit mark** when the boom **spar** is at 90° to the mast **spar**.

C.9.7 WHISKER POLE

(a) DIMENSIONS

	minimum	maximum
Whisker pole length		2106mm
Whisker pole cross section	22mm	

C.9.8 HEADSAIL BOOM

(a) CONSTRUCTION

Materials, dimensions, construction and fittings are optional

## C.9.9 STANDING RIGGING

### (a) DIMENSIONS

	minimum	maximum
<b>Foretriangle base</b>		1560 mm
<i>Forestay height</i> (see F.2.4 (c))		3750 mm
Distance from hull datum section to the intersection of the centreline of the forward end of the <b>foretriangle</b> base	3521 mm	3536 mm

### (b) USE

- (1) Whilst racing the mast is not permitted to be adjusted in an athwart ships plane to windward of a plane perpendicular to the deck. On boats with adjustable shrouds it shall be possible to tighten the shrouds to their upward limit on both sides at the same time..

## C.9.10 RUNNING RIGGING

### (a) MANUFACTURER

Manufacturer is optional

### (b) Materials

Materials are optional

### (c) Construction

#### (1) Mandatory

- (1) Mainsail halyard
- (2) Headsail halyard
- (3) Mainsail sheet
- (4) Headsail sheets
- (5) Boom vang
- (6) Backstay
- (7) Backstay control line

(2) Optional

- (1) Mainsail outhaul line
- (2) Mainsail tack and cunningham control lines
- (3) Mainsail traveller control lines
- (4) Mainsheet bridle system, fixed or with adjustment lines
- (5) Mainsail sheet fine tune
- (6) Headsail cunningham control line
- (7) Headsail fairleads or blocks adjustment lines
- (8) Whisker pole control lines
- (9) **Headsail boom** control lines
- (10) Forestay, backstay and shroud adjustment lines
- (11) Mast control lines fore and aft at deck
- (12) Mast control lines fore and aft at butt
- (13) Shock cords for whisker pole control
- (14) Shock cords for **Headsail boom** outhaul
- (15) Shock cord for Mainsail outhaul retention
- (16) Shock cord for backstay control line retention

(d) USE

- (1) The use of running rigging is optional.

## C.10 SAILS

### C.10.1 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) **Sails** shall not be altered in any way except as permitted by these **class rules**.
- (b) Routine maintenance such as repair of damage is permitted without re-measurement and re-**certification**.

### C.10.2 LIMITATIONS

- (a) Not more than 2 main sails and 3 jibs shall be used during an event of the status National Championship or higher and of less than 8 consecutive days, except when a **sail** has been lost or damaged beyond repair.

### C.10.3 MAINSAIL

(a) IDENTIFICATION

The national letters and sail number shall comply with these class rules.

(b) USE

- (1) The **sail** shall be hoisted on a halyard. The arrangement shall permit hoisting and lowering of the **sail** by the crew.

- (2) The highest visible point of the **sail**, projected at 90° to the mast **spar**, shall not be set above the lower edge of the mast **upper limit mark**. The intersection of the **leech** and the top of the boom **spar**, each extended as necessary, shall not be behind the fore side of the boom **outer limit mark**.
- (3) The **luff** bolt rope shall be in the **spar** groove or track.

#### C.10.4 JIB

##### (a) USE

- (1) The highest visible point of the **sail**, projected at 90° to the mast **spar**, shall not be set above the **forestay rigging point**.
- (2) The **sail** shall be hoisted on a halyard. The arrangement shall permit lowering the sail so that no part of it is above a plane 1800 mm above the mast datum point. From there it shall be possible to hoist it again to its original position.
- (3) The sail shall not be attached to any point on the boat that is in front of the forestay.
- (4) Headsail boom headsail shall only be used together with a **headsail boom**.

## Section D – Hull

### D.1 PARTS

#### D.1.1 MANDATORY

- (a) Hull shell including keel and internal structure
- (b) Deck
- (c) Rudder
- (d) Ballast
- (e) Buoyancy equipment

#### D.1.2 OPTIONAL

- (a) Seat
- (b) Parts used inside the boat
- (c) Parts to cover deck openings

### D.2 GENERAL

#### D.2.1 RULES

- (a) The **hull** shall comply with the **class rules** in force at the time of initial **certification**.
- (b) For approving Norlin mk III boats built before 2011-03-01 the hull shall comply with the class rules in extent according to Section K. The ICA Measurement Report form shall be used.

#### D.2.2 CERTIFICATION

(See A.13.1 (a))

#### D.2.3 MATERIALS

- (a) The hull shall be built from Glass Reinforced Plastic. Aluminium or stainless steel reinforcements are permitted where needed.
- (b) Where sandwich construction is used, the core material shall be of balsa, PVC or polyester or combinations thereof and shall be of density before lamination not less than 60kg/m<sup>3</sup> in average over a square with the sides 25mm.
- (c) Parts of the hull excluding hull shell, deck and keel may also be made from aluminium or stainless steel.
- (d) Parts that in no direction exceed the size 150 mm may be of any material if they stay above the floor level (see section J for definition of floor level). A structure of several such parts may not exceed the size of 150 mm in any direction.
- (e) Any soft material may be used to cover deck openings.

#### D.2.4 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) The hull shell and deck shall not be altered in any way except as permitted by these **class rules**.
- (b) Bulkheads and reinforcements may be modified.
- (c) Holes not bigger than necessary for the installation of fittings and passage of lines may be made in the deck and reinforcing parts. Slits longer than 60mm in the deck for shrouds are not permitted.
- (d) Routine maintenance such as painting and polishing is permitted without re-measurement and re-**certification**.
- (e) If any hull moulding is repaired in any other way than described in D.2.4(d), a class measurer shall verify on the **certificate** that the external shape is the same as before the repair, the repair has been done using materials according to D.2.3, and that no substantial stiffness, or other, advantage has been gained as a result of the repair. The class measurer shall also describe the details of the repair on the **certificate**.

#### D.2.5 DEFINITIONS

##### (a) HULL DATUM POINT

The **hull datum point** is a point on the centreline of the hull placed at the intersection of the underside of the hull and the aft surface of the rudderstock.

##### (b) HULL DATUM SECTION, (SECTION 0)

The vertical cross section transverse to the centre line through the datum point is defined as the *hull datum section* (section 0). This shall be permanently marked on starboard and port sides on both the sheer line and the deck near the sheer line.

##### (c) MEASUREMENT POINT OF THE DECK



The measurement point of the deck is a point, at the mast hole section, 36mm above the deck level, measured 15mm from the outmost part of the hull shell in this section.

#### D.2.6 IDENTIFICATION

- (a) The **hull** shall carry the ISAF Plaque, see B.3.2.
- (b) The **hull** shall carry the 2.4 Norlin One Design Class sticker, see B.3.1
- (c) The **hull** shall carry information of: builder, date built and the boat's sequential identification number permanently embossed or debossed into the hull shell.
- (d) **Hulls** built before 2011-03-01 are excluded from (c).

#### D.2.7 BUILDERS

- (a) The **hull** shall be built by a builder licensed by the ICA.
- (b) All moulds shall be approved by the ICA.
- (c) **Hulls** built before 2011-03-01 are excluded from (a) and (b) and shall comply with the rules in Section K.

### D.3 HULL SHELL INCLUDING KEEL AND DECK

#### D.3.1 CONSTRUCTION

- (a) As specified in the Construction Manual
- (b) Boats built before 2011-03-01 are excluded from D.3.1 (a), However any additional filler on the external hull extension of the hull (for example in the stern or the stem or the keel) shall be removed to the original shape of the hull. See Section K.

### D.4 INTERIOR STRUCTURE

#### D.4.1 CONSTRUCTION

- (a) Optional.

### D.5 BUOYANCY

#### D.5.1 CONSTRUCTION

- (a) Buoyancy equipment shall comprise of rigid non-communicating air cell foam plastic incorporated into the boat inside the bulkheads.
- (c) Water tight Compartments shall be inspectable by an opening of minimum 100 mm in diameter. The highest point of the opening shall be placed no more than 50mm below the underside of the deck.

### D.6 SEAT

#### D.6.1 MATERIALS

- (a) In addition to what is specified in D.2.3 any soft material that does not take up significant amounts of water.

#### D.6.2 CONSTRUCTION

- (a) Seat included in **boat weight**
  - (1) Construction is optional.

- (b) Seat excluded from the **boat** weight
  - (1) Construction is optional except for what is given in (2)
  - (2) When the seat is placed in its position for sailing, the centre of gravity of the seat, shall be located not more than 300mm below the sheer line level in section 2, 1350mm forward of the hull datum section, see D.2.5(b).
  - (3) The approval of the seat shall be marked on it by a class measurer.

## **D.7 ASSEMBLED HULL**

### **D.7.1 FITTINGS**

#### **(a) MANDATORY**

- (1) A suitable fitting or system in the bow area to enable the boat to be towed. The fitting/system shall be easy to access by rescue craft, and shall be able to handle line of at least 5mm in diameter.
- (2) Lifting eyes
- (3) Rudder post
- (4) One manual bilge pump permanently installed which may discharge through hull shell or deck
- (5) A suitable fitting or device shall be installed in the deck level, in order to prevent the mast to move astern of that position, which corresponds to the **Foretriangle base**, 1560mm.

#### **(b) OPTIONAL**

- (1) Fittings placed inside the hull are optional.

#### **(c) CONSTRUCTION**

- (1) No fittings may be attached to the outside of the hull shell (This means that
  - for example that plastic flaps between hull and rudder are not allowed)

## **D.8 BALLAST**

### **D.8.1 RULES**

- (a) The ballast shall comply with the current class rules.

### **D.8.2 MATERIALS**

- (a) The density of the **ballast** materials shall not be greater than the density of lead.

### **D.8.3 CONSTRUCTION**

- (a) The **ballast** shall be internal in the **boat** and shall be removable from the inside of the **boat**.
- (b) The ballast shall be divided in lead pigs consisting of minimum 8 pieces and maximum 16 pieces. The maximum weight of one pig is 30kg. In addition a battery may be one piece.
- (c) Ballast pigs shall have their primary dimension in horizontal direction.

## Section E – Rudder

### E.1 PARTS

#### E.1.1 MANDATORY

- (a) **Rudder blade**
- (b) **Rudder stock**

### E.2 GENERAL

#### E.2.1 RULES

- (a) **The rudder** shall comply with the current **class rules**.

#### E.2.2 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) The **rudder** shall not be altered in any way except as permitted by these **class rules**. See also C.8.1.
- (b) Routine maintenance such as polishing and painting is permitted without re-measurement and re-certification. See also C.8.1.

#### E.2.3 MANUFACTURERS

- (a) Manufacturers of the rudder shall be a licensed builder. See D.2.7.
- (b) Boats built before 2011-03-01 may use a small standard rudder according to section J.

#### E.2.4 MATERIALS

- (a) As specified in the Construction Manual

#### E.2.5 CONSTRUCTION

- (a) As specified in the Construction Manual.

#### E.2.6 DIMENSIONS

- (a) As specified in the Construction Manual
- (b) Diameter of rudder stock is 25mm

#### E.2.7 POSITION

- (A) In accordance with the Construction Manual

#### E2.8 FITTINGS

- (a) The fitting for attaching steering lines or other arrangement to the rudder stock is optional.

## Section F – Rig

### F.1 PARTS

#### F.1.1 MANDATORY

- (a) **Mast**
- (b) **Boom**
- (c) Standing **rigging**
- (d) Running **rigging**

#### F.1.2 OPTIONAL

- (a) **Whisker pole**
- (b) **Headsail boom**

### F.2 GENERAL

#### F.2.1 RULES

- (a) The **spars** and their fittings shall comply with the **class rules**.
- (b) The standing and running **rigging** shall comply with the **class rules**.

#### F.2.2 MODIFICATIONS, MAINTENANCE AND REPAIR

- (a) **Spars** shall not be altered in any way except as permitted by these **class rules**.
- (b) Routine maintenance such as polishing and replacement of fittings is permitted without re-measurement and re-**certification**.

#### F.2.3 CERTIFICATION

- (a) The class measurer shall **certify** the mast **spars** and shall sign and date the **certification mark**.
- (b) The ICA may appoint one or more persons at a manufacturer to measure and **certify spars** produced by that manufacturer in accordance with the ISAF In-house Certification Guidelines.
- (c) No **certification** of standing and running **rigging** is required.

#### F.2.4 DEFINITIONS

##### (a) **Mast datum point**

The **mast datum point** is a point on the forward side of the mast 3750mm (Forestay height) below the forestay rigging point. The **mast datum point** shall be marked by a punch.

#### F.2.5 MANUFACTURER

- (a) No licence is required.

### F.3 MAST

#### F.3.1 MATERIALS

(a) The **spar** shall be of aluminium alloy.

#### F.3.2 CONSTRUCTION

(a) The **spar** extrusion shall include a fixed sail groove or track, which may or may not be integral with the **spar** but shall be of aluminium alloy.

#### F.3.3 FITTINGS

##### (a) MANDATORY

- (1) Boom attachment fitting
- (2) Shroud attachments
- (3) A set of spreaders
- (4) Mainsail halyard sheave
- (5) Headsail halyard sheave

##### (b) OPTIONAL

Other fittings and instrumentation are optional

#### F.3.4 DIMENSIONS

	<b>minimum</b>	<b>maximum</b>
<b>Mast spar cross section at upper point</b>		
fore-and-aft	28mm	66mm
transverse	24mm	
<b>Mast spar cross section</b> between a point 400 mm below the <b>mast datum point</b> and a point 3500mm above		
fore-and-aft	56mm	66mm
transverse	38mm	
<b>Mast spar cross section</b> between upper point and the point 3500mm above the datum point may have a fair rounding taper		
Mast limit mark width	10mm	12mm
Lower point height	340mm	350mm
Upper point height	4990mm	5000mm
<b>Lower point to upper point</b>	4630mm	4650mm
Forestay height	3750mm	3750mm
Shroud height	3900mm	4000mm
<b>Spreader;</b>		
length	250mm	350mm
height	1950mm	2050mm

F.3.5 WEIGHTS

	minimum	maximum
<b>Mast weight</b>	6.5kg	7.5 kg
Mast tip weight	2.0kg	

**F.4 BOOM**

F.4.1 MATERIALS

(a) The **spar** shall be of aluminium alloy.

F.4.2 CONSTRUCTION

(a) The **spar** extrusion may or may not include a fixed sail groove or track which may or may not be integral with the **spar** but shall be of the same material.

F.4.3 FITTINGS

(a) Fittings of the boom are optional

F.4.4 DIMENSIONS

	minimum	maximum
<b>Boom spar cross section</b> between mast and <b>outer point</b> ;		
vertical		75mm
transverse	27mm	55mm

**F.5 WHISKER POLE**

F.5.1 MANUFACTURER

(a) Manufacturer is optional.

F.5.2 MATERIALS

(a) The **spar** shall be of aluminium alloy.

F.5.3 CONSTRUCTION

Construction is optional

F.5.4 FITTINGS

(a) Fittings are optional.

F.5.5 DIMENSIONS

	minimum	maximum
<b>Whisker pole length</b>		2106mm
<b>Whisker pole dimension</b>	22mm	

**F.6 HEADSAIL BOOM**

F.6.1 MANUFACTURER

(a) Manufacturer is optional.

F.6.2 MATERIALS

(a) Materials are optional.

F.6.3 CONSTRUCTION

(a) Construction is optional

F.6.4 FITTINGS

(a) Fittings are optional.

F.6.6 DIMENSIONS

(a) Dimensions are optional

**F.7 STANDING RIGGING**

F.7.1 MATERIALS

(a) The standing **rigging** excluding backstay and forestay shall be of stainless steel.

(b) Material of the backstay and forestay is optional.

F.7.2 CONSTRUCTION

(a) MANDATORY

(1) **Forestay**

(2) Upper **shrouds**

(3) Upper **shrouds** and lower **shrouds** if present shall go through the same holes/slots in the deck. The holes/slots shall be situated according to section J.

(a) OPTIONAL

(1) Lower shrouds

F.7.3 FITTINGS

(a) Fittings are optional

F.7.4 DIMENSIONS

(a)

	minimum	maximum
<b>Forestay</b>	2,5 mm	
Upper <b>shroud</b>	2,5 mm	

(b) Other dimensions are optional

## **F.8 RUNNING RIGGING**

### **F.8.1 MATERIALS**

- (a) See C.9.

### **F.8.2 CONSTRUCTION**

- (a) **MANDATORY**  
See C.9.10.
- (b) **OPTIONAL**  
See C.9.10.

### **F.8.3 FITTINGS**

- (a) Fittings are optional

### **F.8.4 DIMENSIONS**

- (a) Dimensions are optional

## **Section G – Sails**

### **G.1 PARTS**

#### **G.1.1 MANDATORY**

- (a) Mainsail
- (b) Headsail

### **G.2 GENERAL**

#### **G.2.1 RULES**

- (a) **Sails** shall comply with the **class rules** in force at the time of **certification**.

#### **G.2.2 CERTIFICATION**

- (a) The class measurer shall **certify** mainsails and headsails in the **tack** and shall sign and date the **certification mark**.
- (b) An MNA may appoint one or more persons at a sail-maker to measure and **certify sails** produced by that manufacturer in accordance with the ISAF In-house Certification Guidelines.

#### **G.2.3 SAILMAKER**

- (a) No licence is required.

### **G.3 MAINSAIL**

#### **G.3.1 IDENTIFICATION**

- (a) The class insignia shall conform with the dimensions and requirements as detailed in the diagram contained in Section H.
- (b) The class insignia of the International 2.4mR class may also be used as an alternative.
- (c) As an alteration to RRS APPENDIX G 1.3, the Insignia may be placed on the starboard side only.



- (d) The national letters and sail numbers shall comply with the RRS, but as an alteration to RRS APPENDIX G1.2 b), the national letters and sail numbers shall be of the following minimum dimensions:

Height	250mm $\pm$ 20mm
Thickness	30mm $\pm$ 10mm
Space between adjoining letters and numbers	45mm $\pm$ 10mm

### G.3.2 MATERIALS

- (a) The **ply** fibres material are optional  
 (b) Materials of **stiffenings**, cornerboards, reinforcements and battens are optional

### G.3.3 CONSTRUCTION

- (a) The construction shall be: **soft sail, single ply sail**.  
 (b) The **body of the sail** shall consist of **single ply**.  
 (c) The **sail** shall have 4 equally spaced batten **pockets** in the **leech**. These equal parts shall be within the tolerances  $\pm$  50mm  
 (d) The following are permitted: Stitching, glues, tapes, bolt ropes, corner eyes, headboard with fixings, Cunningham eye or pulley, **batten pocket patches**, batten pocket elastic, batten pocket end caps, mast and boom slides, leech line with cleat, one **window**, tell tales, sail shape indicator stripes and items as permitted or prescribed by other applicable *rules*.  
 (f) The **leech** shall not extend aft of straight lines between:  
 (1) the **aft head point** and the intersection of the **leech** and the upper edge of the nearest **batten pocket**,  
 (2) the intersection of the **leech** and the lower edge of a **batten pocket** and the intersection of the **leech** and the upper edge of an adjacent **batten pocket** below,  
 (3) the **clew point** and the intersection of the **leech** and the lower edge of the nearest **batten pocket**.

### G.3.4 DIMENSIONS

	minimum	maximum
<b>Leech length</b>	4900mm	5150mm
<b>Half width</b>		1333mm
<b>Three-quarter width</b>		804mm
<b>Upper width at upper leech point 500mm from head point</b>		372mm
<b>Top width</b>		72mm
<b>Foot median</b>		5050mm
<b>Batten pocket length:</b>		

	minimum	maximum
<b>Leech length</b>	4900mm	5150mm
uppermost pockets: outside		480mm
<b>intermediate and lowermost pockets: outside</b>		680mm
<b>Batten pocket width: outside</b>		60mm
<b>Primary reinforcements</b>		800mm
<b>Secondary reinforcements</b>		800mm

## G.4 HEADSAIL

### G.4.1 MATERIALS

- The **ply** fibres material is optional.
- Materials of **stiffenings**, cornerboards, sail reinforcements and battens are optional.

### G.4.2 CONSTRUCTION

- The construction shall be: **soft sail, single ply sail**.
- The **body of the sail** shall consist of single **ply**.
- The following are permitted: Stitching, glues, tapes, corner eyes, hanks, batten pocket elastic, **batten pocket patches**, batten pocket end caps, leech line with cleat, **windows**, tell tales, sail shape indicator stripes and items as permitted or prescribed by other applicable *rules*.

### G.4.3 TYPES OF HEADSAILS

- Standard headsail. No limitations of use.
- Headsail boom headsail. Use is limited to together with a headsail boom.

### G.4.4 DIMENSIONS STANDARD HEADSAIL

	minimum	maximum
<b>Foot length</b>	mm	1716mm
<b>Three-quarter width</b>	mm	437mm
<b>Half width</b>	mm	827mm
<b>Top width</b>	-	40mm
<b>Number of battens</b>		3
<b>Batten length outside:</b>		400mm
<b>Batten pocket width outside:</b>		60mm
<b>outside</b>	-	60mm
<b>Head point to intersection of leech and centreline of uppermost batten pocket</b>	700mm	mm
<b>Clew point to intersection of leech and</b>	700mm	mm

	minimum	maximum
<b>centreline of lowermost batten pocket</b>		
<b>Primary reinforcement</b>		600mm
<b>Secondary reinforcement:</b>		600mm

#### G.4.4 DIMENSIONS HEADSAIL BOOM HEADSAIL

	minimum	maximum
<b>Foot length</b>	mm	1482mm
<b>Three-quarter width</b>	mm	468mm
<b>Half width</b>	mm	850mm
<b>Top width</b>	-	40mm
<b>Number of battens</b>		3
<b>Batten pocket or batten length outside</b>	-	400mm
<b>Batten pocket width outside</b>	-	60mm
<b>Head point</b> to intersection of leech and centreline of uppermost <b>batten pocket</b>	700mm	mm
<b>Clew point</b> to intersection of leech and centreline of lowermost <b>batten pocket</b>	700mm	mm
<b>Primary reinforcement</b>		600mm
<b>Secondary reinforcement</b>		600mm

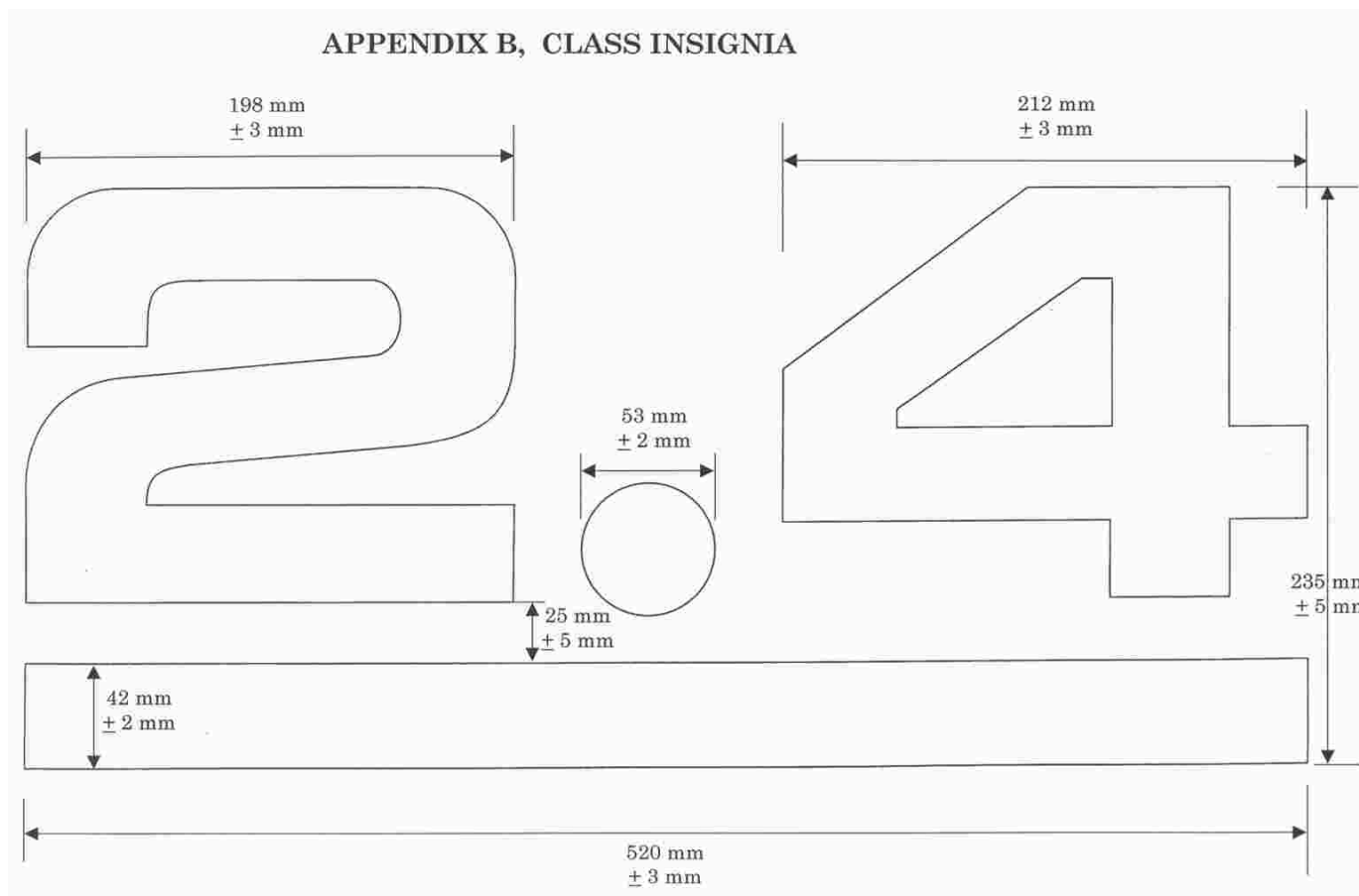
# PART III – APPENDICES

The rules in Part III are **closed class rules**. Measurement shall be carried out in accordance with the ERS except where varied in this Part.

## Section H - Class Insignia

### H.1 CLASS INSIGNIA DIAGRAM

Will be amended



### H.2 INSIGNIA COLOURS

The class insignia shall be in blue colour. Current and former champions may have the horizontal line in the insignia in a different colour:

International Champion -	Gold
Continental Champion -	Orange
National Champion -	Green



## Section K – Requirements for old Norlin mark III boats built before 2011-03-01

### K.1 SCOPE

In order to be approved as a 2.4 Norlin One Design Boat, the **hull** shall meet the following requirements:

- 1 The **hull** shall have been built before 2011-03-01.
- 2 The **hull** shall have been built in moulds which were produced from the first “Master Plug Boat” of the Norlin Mark III design.\*
- 3 The boat shall have a valid 2.4mR Certificate
- 4 Section C.6, C.7, C.8, C.9, D, E, F and K.  
\*Hulls built in moulds which were produced from a properly built hull according to 2 above may even be accepted.

### K.2 CHECKS OF THE HULL BY TEMPLATES.

The templates and their positions are defined in Section J.  
Only templates approved by the ICA shall be used.

Clearance to templates at:	minimum	maximum
Section 0 Template placed perpendicular to the water line	2	4mm
Section 2 Template placed perpendicular to the water line	2	4mm
Section 4 Template placed perpendicular to the water line	2	4mm
Underside of keel at section 2		
Template placed perpendicular to the water line	1	4mm
Keel profile at 75mm below the base line		
Template placed parallel to the water line	1	5mm
Keel profile at 400mm below the base line		
Template placed parallel to the water line	2	5mm
Aft most part of stern foil template		
Template placed on the stern $\pm$ 100 from centre plane	0	2mm
Trailing edge of the keel	0	1mm
Small rudder profile template	1	5mm
Small rudder cross section templates 1 and 2	2	5mm
Trailing edge of the small rudder	0	1mm
Standard rudder profile template	1	5mm
Standard rudder cross section templates 1, 2 and 3	2	5mm
Trailing edge of the standard rudder	0	1mm

### K.3 ADDITIONAL CHECKS

The draught shall be checked by taking the chain girth measure at cross section 2 from the sheer line on one side round the keel to the sheer line on the other side:  $\leq 2752\text{mm}$

Visual checks shall be made to see that the hull shape has not been changed by application of fillers or by grinding. In such cases the hull shape shall be restored to its original shape. When in doubt even templates in the sections A, 1 and 3 shall be checked, where relevant. The same tolerances as for cross sections 0, 2 and 4 apply.

## **Section L – FLOTATION CHECK**

### **L.1 CONDITION OF THE BOAT**

The boat shall be in racing condition according to Rule C.6.1 (a) and with an additional weight of 35kg when the check is done in salt water placed 1350mm from section 0. The weight may be altered to 28kg when the check is done in fresh water.

Hatches to watertight compartments, if any, shall be opened in order to let the tanks to be filled with water.

### **L.2 EXECUTION OF THE CHECK**

The boat shall be filled with water and tilted over to starboard, to port, to the bow and to the stern in order to let the air enclosed under deck and other parts of the hull to come out.

### **L.3 REQUIREMENTS**

The boat shall float in an approximately horizontal position. Neither the stern nor the bow shall have tendencies to sink under the water level.



## **Section M – Procedure when measuring centre of gravity of the boat**

### **M.1 CONDITIONS**

The boat shall be in the same condition as when weighing it according to C.6.1 (a). The mast shall be placed in its position for racing. The boom shall be attached to the mast and be placed with its aft end on deck in the centre plane of the boat. The main sail shall be placed parallel to the boom and the jib placed on the fore deck. The boat shall be hanging in a lifting rope going between the two lifting eyes.

### **M.2 MEASURING PROCEDURE**

The position of the hook on the lifting rope shall be adjusted in order to have the boat hanging in a horizontal position. This can be checked by placing a water level in the centre plane of the boat from the forward cockpit frame to the aft cockpit frame with a 10mm shims plate between the water level and the aft frame.

A plummet is hung in the hook as low as possible near the floor. The centre of gravity is measured horizontally from the section 0, which is permanently marked on the sheer line, to the line of the plummet.

The location of corrector weights may be a mean to give the boat the right centre of gravity.

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