

2.4 NORLIN ONE DESIGN CLASS RULES

2015-09-01



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

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 2.4 Norlin One Design Class Rules proper begin on the next page.

These Rules are “Closed Rules”. Anything not specifically allowed by these rules is “Prohibited”

PART I – ADMINISTRATION

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 –ruled by ISAF– ISAF Regulation 28.1.3 applies. At all other events RRS 87 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 or its accredited representative 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 or its accredited representative 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 The sail number shall be the one assigned to the boat in its 2.4mR certificate.

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)
- (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**
- (l) Type of rudder (only for boats built before 2011-03-01)
- (m) Specific data of the boat according to the measurement 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 a 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.13 (a) – (m).
- (b) withdrawal by the ICA (certification authority),
- (c) the issue of a new **certificate**,

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) in other cases, by application of the procedure in A.14.

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.

A.18 BUOYANCY FLOATATION FORM

A.18.1 The ICA Buoyancy Certificate shall state the ISAF plaque number, the date of confirmation and the name and signature of the confirming individual.

A.18.2 The confirmation of the ICA Buoyancy Certificate shall be done by a class measurer or a person authorised by the NCA stating the date of the check.

A.18.3 A flotation check is valid maximum five (5) years from the date of the confirmation.

A.18.4 The flotation check shall be accomplished according to Section L.

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
- (e) have a valid Buoyancy Certificate according to A.18

B.2 FLOTATION CHECKS

- B.2.1 A race committee may require that a boat shall pass a flotation test according to Section L.

B.3 CLASS ASSOCIATION MARKINGS

- B.3.1 A 2.4 Norlin One Design Class Sticker shall be fixed 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 1st 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 helmsman for the race must be a current member of the ICA, either directly or by the relevant NCA.

PART II – REQUIREMENTS AND LIMITATIONS

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 them to be removed in order to properly 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) Towing rope minimum 9m long of not less than 5mm in diameter and of material that floats. This may not be used for any other purpose than towing.

C.5.2 OPTIONAL

- (a) One electrical pump with battery.
- (b) Paddle, bailer, mooring lines, fenders, current stick, portable anemometer, tools, spare lines and spare blocks 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.
- (c) Extra sails.
- (d) The use of electronic navigation equipment is permitted. Timing devices are permitted. Hand held communication devices (cell phones, pagers, radios, etc.) are permitted but may be prohibited or restricted in the notice of race or sailing instructions.

C.6 BOAT

C.6.1 WEIGHT

(a)

	minimum	maximum
The weight of the boat 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, portable equipment in C.5.2 (a)

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 on the underside of the deck not more than 200 mm aft of the mast.

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.6.1 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 minimum 35kg lead ballast placed 1350mm \pm 100 mm from the hull datum section defined in D.2.4(b).
- (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 A.18.

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. To exclude electrical pump and adherent hoses and cables, the weight of these may not exceed 1.5 kg.

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
Limit mark width	10mm	15mm
Mast spar curvature at a distance of 2700 mm from the mast datum point (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.2.5 (c)).
- (3) Rotating masts are not permitted.

C.9.6 BOOM

(a) DIMENSIONS

	minimum	maximum
Limit mark width	10mm	15mm
Outer point distance		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
Foretriangle base		1560 mm
<i>Forestay height</i> (see F.2.4 (a))		3750 mm
Distance from hull datum section to forward end of the foretriangle base	3516 mm	3536 mm

(b) USE

- (1) Whilst racing upwind 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 have both sides tight to their upward limit 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 deck
- (b) Rudder
- (e) Ballast
- (d) 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.14)

D.2.3 MATERIALS

- (a) The **hull** and **keel** shall be built from Glass Reinforced Plastic. Aluminium or stainless steel reinforcements are permitted where needed.
- (b) The **hull** shell, **keel** and deck mouldings shall not weigh less than 3,6 kg/m².
- (c) 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/m³ in average over a square with the sides 25mm.
- (d) Parts of the **hull** excluding **hull** shell, deck and **keel** may also be made from aluminium.
- (e) Parts or a structure of several parts that in no direction exceed the size of 120 mm may be of any material if the weight is less than 0,3 kg.
- (f) Wiring, pumps and adherent hoses may be of any material.
- (g) Parts of the steering system may be of any material. Such parts shall not add structural strength to the hull(h) Hatches may be of any plastic material. The minimum weight of hatches in the deck shall be no lighter than the pieces of deck they replace. This includes the original hatch over the rudder.

- (i) Any soft material may be used to cover the cockpit. A hard cover shall be made of GRP.
- (j) Stainless steel may be used for mast foot and shroud leavers.
- (k) Parts intended to protect edges around holes according to D.2.4 (c) including mast hole may be of any material
- (l) Navigation instruments may be of any material.
- (m) In case a disabled sailor cannot sail without a specific part, that does not comply with these rules, a dispensation can be given by the ICA.

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. Modification of shroud holes are permitted within the limits defined in D.3.1(c).(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**.
- (f) One inspection hatch is permitted in the deck forward of the mast and one aft of the cockpit. This in addition to the hatch over the rudder post that is a part of the deck mould.
- (g) The mast opening in the deck may be modified. The forward edge of the mast hole shall not extend forward of 2093mm from station 0. Its width shall not exceed 64mm.
- (h) The deck mouldings may be modified to accommodate headsail boom with associated fittings.

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 **hull datum point** is defined as the *hull datum section* (section 0). This shall be permanently marked in the surface of the **hull** 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.
- (c) Position of **shroud** holes/slots in the **deck**.

Boats build after 2011-02-28	minimum	maximum
Distance to back end of shroud hole from section 0	1902mm	
Distance to front end of shroud hole from section 0		1982mm
Hole length		60mm
Distance from centreline to inner edge of hole	240mm	
Distance from centreline to outer edge of hole		268mm
Hole width		12mm

Boats build before 2011-03-01	minimum	maximum
Distance to back end of shroud hole from section 0	1812mm	
Distance to front end of shroud hole from section 0		1982mm
Slot length		60mm
Distance from centreline to inner edge of hole	230mm	
Distance from centreline to outer edge of hole		280mm
Hole width		14mm

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.
- (b) 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 (3)
 - (2) The total weight of the seat shall exceed 4 kg.
 - (3) 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 measured 1350mm forward of section 0.
 - (4) 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 eye(s) each dimensioned to take 500 kg of load.
- (3) Rudder post
- (4) One manual bilge pump permanently installed which may discharge through hull shell or deck. The pump shall have a minimum capacity of 0.5 litre/stroke out of the boat.
- (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

- (2) Fittings on deck
- (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 permitted)

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. See also C.8.3 (a)

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

F.2.3 CERTIFICATION

(a) No **certification** of **spars**, 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

	minimum	maximum
Mast spar cross section at upper point		
fore-and-aft	28mm	66mm
transverse	24mm	
Mast spar cross section between a point 400 mm below the mast datum point and a point 3500mm above		
fore-and-aft	56mm	66mm
transverse	38mm	

	minimum	maximum
Mast spar cross section between upper point and the point 3500mm above the datum point may have a fair rounding taper		
Mast limit mark width	10mm	15mm
Lower point height	340mm	350mm
Upper point height	4990mm	5000mm
Lower point to upper point	4630mm	4650mm
Forestay height	3750mm	3750mm
Shroud height	3770mm	4000mm
Spreader;		
length	200mm	350mm
height	1950mm	2050mm

F.3. 5 WEIGHTS

	minimum	maximum
Mast weight	6.5kg	
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
Boom spar cross section between mast and outer point ;		
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
Whisker pole length		2106mm
Whisker pole cross section	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.

- (a) OPTIONAL
 - (1) Lower shrouds

F.7.3 FITTINGS

- (a) Fittings are optional

F.7.4 DIMENSIONS

- (a)

	minimum	maximum
Upper shroud	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 dimensions:

Height	250mm ± 20mm
Thickness	30mm ± 10mm
Space between adjoining letters and numbers	45mm ± 10mm

G.3.2 MATERIALS

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

G.3.3 CONSTRUCTION

- (a) The construction shall be: **soft 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 ± 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, **windows**, tell tales, **sail reinforcements**, **tabling**, **battens**, sail shape indicator stripes and items as permitted or prescribed by other applicable *rules*.

G.3.4 DIMENSIONS

	minimum	maximum
Leech length	4900mm	5150mm

	minimum	maximum
Leech length	4900mm	5150mm
Half width		1333mm
Three-quarter width		804mm
Upper width at upper leech point 500mm from head point		372mm
Top width		72mm
Foot median		4900mm
Hollows shall be bridged when measuring.		
Batten pocket length:		
uppermost pocket: outside		480mm
intermediate and lowermost pockets: outside		680mm
Batten pocket width: outside		60mm
Batten length		
uppermost batten:		480mm
intermediate and lowermost battens:		680mm
Primary reinforcements		800mm
Secondary reinforcements		800mm

G.4 HEADSAIL

G.4.1 MATERIALS

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

G.4.2 CONSTRUCTION

- (a) The construction shall be: **soft sail**.
- (b) The **body of the sail** shall consist of **single ply**.
- (c) 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 reinforcements**, **tabling**, **battens**, sail shape indicator stripes and items as permitted or prescribed by other applicable *rules*.

G.4.3 TYPES OF HEADSAILS

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

G.4.4 DIMENSIONS STANDARD HEADSAIL

	minimum	maximum
Foot length		1716mm
Three-quarter width		437mm

	minimum	maximum
Half width		827mm
Top width		40mm
Number of batten pockets		3
Batten pocket length outside		450mm
Batten pocket width: outside		60mm
Number of battens		3
Batten length:		400mm
Head point to intersection of leech and centreline of uppermost batten pocket	700mm	
Clew point to intersection of leech and centreline of lowermost batten pocket	700mm	
Primary reinforcement		600mm
Secondary reinforcement:		600mm

G.4.4 DIMENSIONS HEADSAIL BOOM HEADSAIL

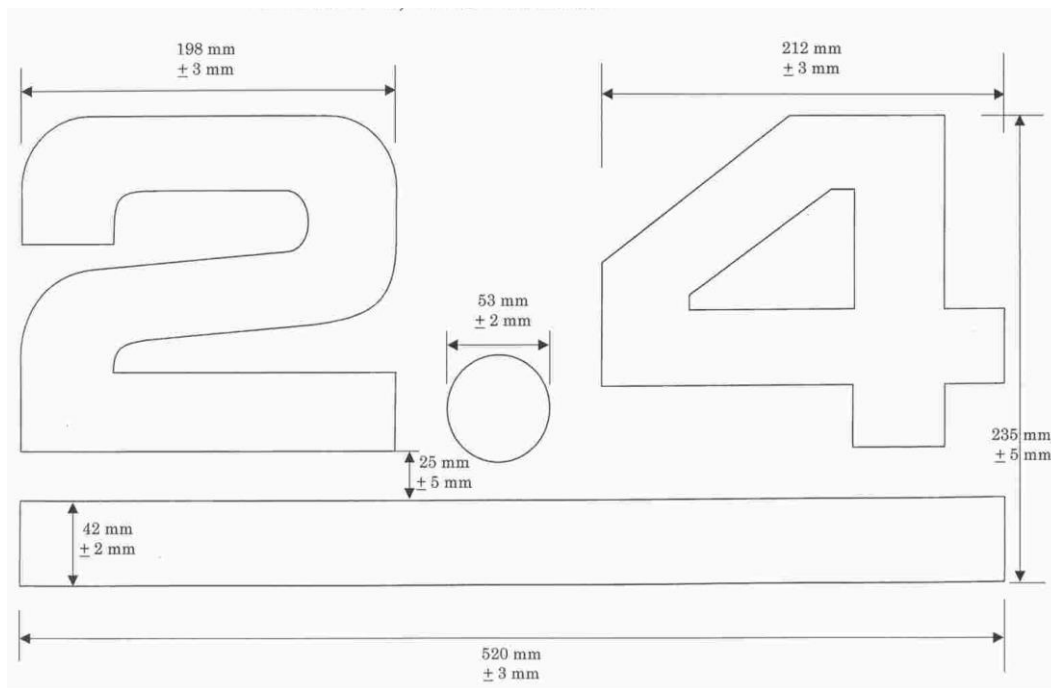
	minimum	maximum
Foot length		1482mm
Three-quarter width		468mm
Half width		850mm
Top width		40mm
Number of batten pockets		3
Batten pocket length outside		450mm
Batten pocket width: outside		60mm
Number of battens		3
Batten length		400mm
Head point to intersection of leech and centreline of uppermost batten pocket	700mm	
Clew point to intersection of leech and centreline of lowermost batten pocket	700mm	
Primary reinforcement		600mm
Secondary reinforcement		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



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 J – Hull, internal structure and rudder specifications, drawings and templates

J.1 HULL

(1)	Profile drawing	Drawing number	J 1
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- definition of base line
 - definition of floor and floor level
 - permitted long ships tolerances
 - placing of keel profile templates
 - placing of cross section templates of hull and keel
- (2) Cross section of hull and keel J 2
- definition of floor and floor level
 - permitted athwartship tolerances of internal structure
 - distance between mast step and deck measurement point
- (3) Cross section templates
- Templates at Section 0 and Section 4 J 3
- Templates at Section 2 J 4
- (4) Keel section templates J 5
- Vertical template
 - Horizontal template 75mm below Base Line
 - Horizontal template 400mm below Base Line
 - Trailing edge
- (5) Rudder templates J6
- Profile standard and small rudder
 - Cross section 200 standard and small rudder
 - Cross section 400 standard rudder
 - Cross section 600 standard and 400 small rudder
 - Trailing edge

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 following requirements must be met:

- 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 original “Master Plug Boat” of the Norlin Mark III design.*
- 3 The **boat** shall have a valid 2.4mR Certificate
- 4 The **boat** shall comply with 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 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 ± 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: $\leq 2752\text{mm}$

When checking dimensions against drawing J 1 and J 2 dimensions in brackets shall be used.

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 35 kg lead placed 1350 mm forward of section 0 (+- 100 mm). .

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 weight** shall be in accordance with C.6.1 (a).

The **mast** shall be at right angles to the **waterline**. The **boom** shall be attached to the **mast** and be on the centre line of the boat. The **mainsail** shall be placed alongside and parallel to the **boom** and the **headsail** placed on the fore deck.

M.2 MEASURING PROCEDURE

The boat shall be hung by a rope fixed in the two lifting eyes.

Using the friction of the rope over the lifting hook, the level of the boat should be adjusted. The boat shall hang with the **waterline** horizontal.

This can be checked by placing a spirit level on the centre line of the boat, with one end on the forward cockpit frame and the other on the aft cockpit frame. A 10mm shim should be placed between the spirit level and the aft cockpit frame. Other methods are, optical or laser levels on the **waterline**.

A plum bob is hung from the centre of the hook as close as possible to the floor. The centre of gravity is measured horizontally from the section 0 to the line of the plum bob. Section 0 is permanently marked on the sheer line.

The position of the ballast pigs or the corrector weights, may be used to adjust the centre of gravity to comply with rule C.6.1(b).

Effective Date: 2015-09-01

Published Date: 2015-11-07