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1 Introduction

- 1.1 This document defines the rules that govern an **AC40 Class Yacht**.
- 1.2 This **AC40 Class Rule** shall be read and interpreted in conjunction with the **AC Technical Regulations**, which together form the **AC40 Class Rules**.
- 1.3 An **AC40 Class Yacht** shall comply with the **AC40 Class Rule** when racing, and at other times as required by the **AC40 Class Rule**.
- 1.4 This **AC40 Class Rule** is a closed rule: anything not specifically permitted is prohibited.
- 1.5 An **AC40 Class Yacht** must match the **AC40 Specification** when racing.
- 1.6 **Competitors** are ultimately and solely responsible for inspecting and maintaining their **AC40 Class Yachts**. No express or implied warranty of safety shall result from compliance with the whole or any part of the **AC40 Class Rules** and **AC40 Specification**.

2 General arrangement

2.1 Most components of an **AC40 Class Yacht** are supplied by licensed manufacturers nominated by **COR/D-ACP**.

2.2 An **AC40 Class Yacht** has the following **one-design** components:

Component	Supplier
one hull	McConaghy Boats
two foils	McConaghy Boats
one rudder	McConaghy Boats
one mast	Southern Spars
one set of standing rigging	Southern Spars
one jib with hardware	North Sails
one mainsail with hardware	North Sails
one mainsail buoyancy system	Yotti New Zealand
control and instrumentation systems	McConaghy Boats
media equipment	AC Media
other one-design components	McConaghy Boats

2.3 In addition to the above **one-design** components, an **AC40 Class Yacht**:

(a) shall have:

- (i) running rigging, detailed in the **AC40 Specification**; and
- (ii) safety equipment, detailed in Rule 2.6;

and

(b) may have:

- (i) branding, permitted by Section 6;
- (ii) **woollies**, permitted by Rule 7.11;
- (iii) chafe protection tape on hoses and lines;
- (iv) modifications and additions permitted by Section 11;
- (v) halyard tails; and
- (vi) VHF radios.

2.4 Nothing shall be onboard an **AC40 Class Yacht** except:

- (a) the components listed in Rules 2.2 and 2.3;
- (b) any crew ballast required by Rule 3.7; and
- (c) crew, their **carried equipment** and any **crew media equipment**, detailed in Section 10.

2.5 Components must be assembled and installed to form an **AC40 Class Yacht** in accordance with the **AC40 Specification**.

2.6 The following items shall be secured within each **cockpit**, within arm's reach of each crew member's normal sailing position:

- (a) a knife, with a blade between 50 mm and 150 mm in length; and
- (b) a personal air supply that:
 - (i) contains compressed air equivalent to at least 40 litres uncompressed volume; and
 - (ii) does not require the use of hands when in use.

These items are included in the **platform** mass during measurement, but may be worn or carried by the crew during racing.

2.7 Inspection hatch and access covers shall be securely fastened to prevent water ingress to the **hull**.

2.8 Drainage fairing flaps shall be closed, except that when there is water in the cockpits, the drainage fairing flaps shall be opened as soon as practical to drain that water, and thereafter closed.

3 Mass

- 3.1 The table below (the *mass table*), lists component masses and centres of gravity (CG). Except for the **mast**, the CG is the distance forward of the transom datum; for the **mast**, it is the distance along the **mast** above the **mast** rotation point.

The *mass table* includes allowances for paint and vinyl finishes permitted by Rule 6.9.

Component	Mass (kg)	CG (m)
Yacht assembly	2118-2126	5.64
Platform	*1832	*5.79
Hull and other parts or components	—	
Rudder	*38	
Port foil	*361	
Foil arm	143.5	
Foil wing/flap /systems	217.5	
Starboard foil	*361	
Foil arm	143.5	
Foil wing/flap /systems	217.5	
Platform -weighed Mast and Mainsail hardware	—	
[†] Media equipment	—	
Mast (excluding parts weighed with platform)	*160	*7.85
Mast tube and attached components, etc.	133	
Standing rigging	24	
Strops, running rigging, etc.	—	
[†] Media equipment	—	
Mainsail (excluding parts weighed with platform)	*109	
Jib	*17-25	
Crew, carried equipment & crew media equipment	*360	
Total	2478-2486	

*Measured, [†]**Event** dependant

- 3.2 Where component masses and centres of gravity in the *mass table* are marked with an asterisk, the components shall meet the specifications within the tolerances specified in the **Measurement Procedures**.
- 3.3 The **platform** and **mast** shall be weighed in their respective measurement conditions specified by the **Measurement Procedures**, whereby:
- (a) the **platform** mass and centre of gravity in Rule 3.1 are intended to represent the mass and longitudinal centre of gravity of the heaviest **AC40 Class Yacht**;
 - (b) the **mast** mass and centre of gravity in Rule 3.1 are intended to represent the mass and *vertical* centre of gravity of the heaviest **mast**;
 - (c) the **Measurement Committee** shall calculate the mass required as ballast, to the nearest 1.0 kg, to add to any **platform** or **mast** to bring it to the specified mass. Any such ballast must be attached as specified in the **Measurement Procedures** to match the respective centres of gravity; and
 - (d) if an **AC40 Class Yacht** is damaged during an **event** and the repair results in an estimated addition of over 2.0 kg then the **AC40 Class Yacht** may be weighed and the ballast adjusted to account for the change in mass and centre of gravity of this **AC40 Class Yacht**.
- 3.4 Components listed in Rule 2.3 that have been added to the **yacht** shall be included in the **platform**, **mast** or sail weights as appropriate.
- 3.5 In the event that manufacturing differences or approved repairs according to Rule 5.2 place a component mass outside of the permitted tolerance:
- (a) the **Measurement Committee** shall publish an updated *mass table* for an **event**, increasing component masses and totals by the minimum amount that would enable all **yachts** to compete;
 - (b) ballast shall only be added to the **platform** or **mast** to equalise **yachts**; discrepancies in **appendage** masses shall be accommodated by tolerances specified in the **Measurement Procedures** and an adjustment to the **platform** ballast;
 - (c) sail masses shall match the values specified in the mass table, with no accommodation for repairs beyond the tolerances permitted by the **Measurement Procedures**; and
 - (d) the maximum that the **Measurement Committee** shall increase the indicated masses by shall be:
 - (i) for the **platform**: 50 kg; and
 - (ii) for the **mast**: 5 kg.
- Should a repair require a larger mass change to be made to equalise the fleet, the impact on the **yacht's** design loadcases should be investigated, and an amendment to this Rule made if appropriate.
- 3.6 The combined mass of crew, **carried equipment** and **crew media equipment**, must not exceed the value specified in the *mass table*.
- 3.7 After crew weigh in, ballast in the form of bags of lead shot shall be added up to the value for "Crew, **carried equipment & crew media equipment**" specified in the *mass table*. This will be attached to the seat plinths of each crew member. Ballast will be distributed between bags to achieve a centre of gravity position of crew and ballast combined, when the crew are sitting in their respective seats, that is as close as possible to the equivalent of four crew members each of 90 kg (including carried/supplied equipment) sitting in the seats.
- 3.8 Ballast or other equipment shall not be moved for the purpose of changing trim or stability.
- 3.9 The mass of the **platform** shall not be less than, or more than 5.0 kg greater than its mass in **platform** measurement condition.
- 3.10 Variations to the *mass table* may be published for a particular **event** by the **Measurement Committee** to allow for different **media equipment** weights, crew requirements or other factors.

4 Meeting the AC40 Specification

- 4.1 **AC40 Class Yacht** components must match the **AC40 Specification** and be in the same condition and configuration as they were received from the manufacturer, except where modifications or repairs are expressly permitted or required by the **AC40 Class Rule**.
- 4.2 The **one-design** components listed in Rule 2.2:
- (a) shall be marked by the relevant manufacturer indicating that they have been built to the **AC40 Specification**. Specifically:
 - (i) the **hull, foil arms, foil wings, rudder**, and **mast** shall have an alloy identification tag glued on and laminated over;
 - (ii) the sails shall have a North Sails order entry number on them; and
 - (iii) elevators shall have an identification number written inside the **rudder** foot rebate;
 - (b) may have branding added as permitted by Rule 6;
 - (c) may be repaired as permitted by Rule 5.2;
 - (d) may be replaced as permitted by Rules 4.4, 4.5 and 5.4; and
 - (e) may not be modified except where explicitly permitted by the **AC40 Class Rule**.
- 4.3 If an **AC40 Class Yacht** component has been deliberately modified beyond the limitations permitted by this **AC40 Class Rule** then it shall be reverted to its original configuration prior to racing. If it cannot be restored to its original configuration:
- (a) the component shall be presented to the **Measurement Committee** for approval, prior to the next **event**, who must be satisfied that any remaining changes will have no significant weight or performance implications; otherwise
 - (b) it shall be replaced.
- 4.4 Except as permitted by Rules 4.5 and 5.4, **AC40 Class Yacht** components may only be replaced with identical spares:
- (a) supplied directly from the component manufacturer where those components are listed in the document referenced by Rule 13.1 (d); or
 - (b) supplied by the official AC40 suppliers listed in Rule 2.2;
- 4.5 **AC40 Class Yacht** components whose geometries are included within the “3D Printed Parts” folder referenced by Rule 13.1 are permitted to be replaced with 3D printed components sourced or manufactured directly by **Competitors**, provided they are built to the following specification:
- (a) Material: Nylon 12 / Nylon PA12
 - (b) Process: MJF, SLS or other process that produces similar quality
 - (c) Supplier: Any; www.weerg.com is recommended.

- 4.6 From time-to-time, the **AC40 Specification** may be amended as permitted by the **AC Technical Regulations**. Each amendment shall include a notice in the 'Amendment Notices' folder, indicating the location of any supporting documents, and whether the change is:
- (a) mandatory, meaning it must be applied to all **AC40 Class Yachts**, either by purchase of a replacement component, or by modification of an existing component according to specified procedures;
 - (b) optional, whereby a **Competitor** can decide whether or not to apply the change to an existing component; or
 - (c) optional, but specific to new **AC40 Class Yacht** components, whereby:
 - (i) all new components of that component type will be built to the updated specification; but
 - (ii) **Competitor** are permitted to continue using an older component built to the original specification, or may use a new component built to the updated specification.

For any mandatory change, the time frame within which the change must be made shall be stated in the notice.

5 Repairs

5.1 Any damage to an **AC40 Class Yacht** component shall be repaired or replaced according to the rules in this section, which shall apply instead of the repair rules specified in the **AC Technical Regulations**.

5.2 Repairs can be *major* or *minor*, where:

(a) *major* repairs include repairs that:

- (i) restore the structural load path of any damaged component; or
- (ii) change the mass of the damaged component by more than 0.1%;

and

(b) *minor* repairs are repairs that are not *major* repairs, for example:

- (i) surface finish repairs, including those permitted by Rule 6;
- (ii) other maintenance where the shape, range, mass and function of the repaired component is not significantly changed; and
- (iii) local surface patching and application of chafe protection on the surfaces of sails,

where these examples are only *minor* repairs if neither sub-clause in Rule 5.2 (a) is met.

Procedures relating to *major* repairs must be specified by the relevant manufacturer and notified to the **Measurement Committee** prior to the next race or **event**. *Minor* repairs may be carried out without the need for specification or notification.

5.3 Repairs permitted by Rule 5.2 shall, where possible, restore components to their original condition. If this is not possible, and the component cannot be replaced, any changes to the repaired component shall:

- (a) be as small as reasonably possible; and
- (b) provide no significant performance advantage.

5.4 **AC40 Class Yacht** components or systems may, as a temporary measure for racing, be modified or replaced with non-identical spares, where:

- (a) they are damaged or malfunctioning and cannot be satisfactorily repaired according to Rule 5.2 or replaced according to Rule 4.4, prior to the next race;
- (b) the replacement or modified components or systems provide no significant performance or weight advantage; and
- (c) the replacement or modified components or systems are approved by the **Measurement Committee** in consultation with **COR/D-ACP**.

5.5 If a temporary repair made during an **event** does not restore a component to its original condition, and a more complete repair is possible, the component shall be subsequently repaired:

- (a) as soon as possible during the **event**, if feasible; otherwise
- (b) before the next **event**.

Any subsequent repair shall follow the principles of Rule 5.3.

5.6 Any permitted replacement, modification or repair shall not allow for additional water retention by the **AC40 Class Yacht**.

6 Surface finishes and branding

- 6.1 All component surfaces shall retain their original finishes, except:
- (a) for *minor* repairs, described by Rule 5.2, to surfaces that remain out of the water in foiling and displacement sailing modes;
 - (b) where otherwise permitted.
- 6.2 Surfaces may be sanded, polished and cleaned, provided that:
- (a) the shape of the surface remains within tolerances specified in the **Measurement Procedures**;
 - (b) the surface material is not fundamentally changed (e.g. from paint to a bare finish), except where otherwise permitted; and
 - (c) no substances remain on the surfaces when the **AC40 Class Yacht** is afloat, other than:
 - (i) the component's original surface finish; or
 - (ii) a finish explicitly permitted by the **AC40 Class Rule**.
- 6.3 **Foil arm drums** may be faired to the external surface of the **hull**, but the external surface of the **hull** shall not be otherwise modified.
- 6.4 **Foil wing** actuator access hatches and lever access hatches may be:
- (a) potted to align them with the shape of the **foil wing** upstand; and
 - (b) faired around the perimeter line and over fasteners.
- 6.5 Minor paint touch-ups are permitted, and must be applied using an approved paint specified in Rule 6.6.
- 6.6 Approved commercial paints are:
- | Manufacturer | Products |
|----------------|--|
| Alexseal | HS Base Coat; HS Clear Coat |
| Awlgrip | Awlcraft 2000; Topcoats G/H-Line; HDT Clearcoat |
| Cromax | 3050S ChromaClear; Centari 600 Basecoat |
| GRS Deltron BC | Global Refinish System Deltron Basecoat |
| MaxMeyer | Matt Semi-Gloss Clear 1-360-0710/ 1-360-0750 |
| Nautix | L2; NX194 |
| Resene | Durepox; Durepox Extreme Clear; Durepox High Performance Clear |
| Spies Hecker | 480 Hi Tec; 8650; Plastic automotive paint; Permasolid HS Automotive Topcoat 27* |
- *This excludes the Permasolid Texture Component SA 101 and SA 102 that are part of the Spies Hecker Plastic system.*
- 6.7 Non-skid products or coatings may be applied on areas of the **hull upper** where crew operate when racing or preparing to race.
- 6.8 Surface areas of the **hull** and sails may be reserved for **event** branding, as notified by the event authority.

- 6.9 Outside of any **event** reserved areas, the following **AC40 Class Yacht** components may have ink, paint or plastic film applied, subject to the 'Permitted finish' below, provided it is not used for the purpose of altering the structure of the boundary layer. Any applied finish shall have a mass that falls within the limits below:

Component	Permitted finish	Mass limit
hull	plastic film	5 kg
mast	clear paint* or plastic film	2 kg
foil arms	plastic film	250 g (per foil arm)
foil wings	Resene Durepox (black)	entire foil wing surface
mainsail	ink, paint* or plastic film	2.5 kg (per sail skin)
jib	ink, paint* or plastic film	3 kg
rudder	paint*	500 g

**must be an approved commercial paint specified in Rule 6.6.*

- 6.10 **Competitors** shall permit the **Measurement Committee** to take samples of paint or plastic film from components of the **yacht** to ensure compliance with Rule 6.9.
- 6.11 **Yacht hulls** are supplied white for heat rejection. It is the responsibility of the **Competitor** to ensure any permitted additions do not adversely affect the thermal integrity of their **yacht hull**.

7 *Rig, sails and rigging*

- 7.1 **Competitors** shall prepare and install running rigging according to the **AC40 Specification**, including the Running Rigging Cut-sheet referred to by Rule 13.1 (c). No other running rigging, such as bungee cords, is permitted on the **yacht**.
- 7.2 Where given in the **AC40 Specification**, running rigging line lengths shall fall within the indicated tolerances, and shall be inspected by the **Measurement Committee**. In particular, it is prohibited to adjust the length or configuration of lines to affect the range of motion of control systems such as the **mast** rotation.
- 7.3 All running rigging shall remain fully led according to the **AC40 Specification**.
- 7.4 The **mast** and standing rigging shall be positioned and tensioned on the **hull** according to the dock tune procedure prescribed by the **AC40 Specification**, and shall not be adjusted except as permitted by Rule 7.10.
- 7.5 One **jib** and one **mainsail** shall be hoisted and configured as described in the **AC40 Specification**.
- 7.6 The sailing instructions for a particular **event** may indicate that the choice of **jib** for each race will be specified by the Principal Race Officer, to be determined by the expected wind speed range; otherwise, any **jib** may be hoisted.
- 7.7 The **one-design mainsail** buoyancy system must be positioned and inflated according to the **AC40 Specification**.
- 7.8 The gantline may be moused using a 2 mm mouse line provided it can be retrieved without crew going aloft.
- 7.9 The winches used for hoisting the sails shall be removed from the **yacht** for racing.
- 7.10 The only permitted adjustments of the **mast**, rigging and sails are:
- (a) by the following hydraulic rig control systems controlled from the cockpit:
 - (i) **mast** rotation system;
 - (ii) traveller;
 - (iii) mainsheet;
 - (iv) **mainsail** cunningham;
 - (v) **mainsail** clew adjuster;
 - (vi) **jib** cunningham;
 - (vii) **jib** inhaul; and
 - (viii) **jib** sheet;
 - (b) manual adjustment of leech and foot lines;
 - (c) manual backwinding of the **jib**; and
 - (d) incidental movement due to contact with the crew, **hull**, deck gear, rigging or other items attached to the **hull**.
- 7.11 Any number of **woollies** may be added to a **jib** or **mainsail** outside of areas designated for **event** branding.
- 7.12 Running rigging may be replaced during an **event** with the approval of the **Measurement Committee**.

8 *Control system and electronics*

8.1 **AC40 Class Yachts** are supplied with:

- (a) a hydraulic system that includes:
 - (i) rig control systems listed in Rule 7.10;
 - (ii) a foil cant system that controls the cant rotation of **foils**; and
 - (iii) a flight control system that controls **foil** flap angles and **rudder** rake;
- (b) a PLC;
- (c) an inertial navigation system;
- (d) a ride height sensor;
- (e) an autopilot system;
- (f) a wind wand;
- (g) an instrumentation and logging system; and
- (h) information and display systems.

8.2 Hydraulics may be maintained but shall not be modified. Hydraulic oil shall only be replaced with mineral hydraulic oil with classification HLP32 or HVLP32.

8.3 Pressure relief valves shall not be adjusted.

8.4 The latest official versions of the **one-design** software, as advised by **COR/D-ACP**, shall be installed on:

- (a) the PLC;
- (b) the batteries; and
- (c) the display screens.

8.5 The inertial navigation system shall be calibrated such that the **yacht**, when levelled to the satisfaction of the **Measurement Committee**, reads zero trim and zero heel. The calibration shall not be adjusted after measurement.

8.6 The ride height sensor shall measure ride-height correctly to the satisfaction of the **Measurement Committee**.

8.7 Crew members shall not carry electric or electronic components except:

- (a) standalone devices, such as basic wristwatches, that are incapable of measuring or receiving any information on the position, orientation, velocity or state of the **AC40 Class Yacht**; and
- (b) spare display screens permitted by Rule 10.4.

8.8 Control circuits, electronics and software shall not be modified.

9 *Media equipment*

- 9.1 **Media equipment** supplied for an **event** shall be the same for all **yachts**.
- 9.2 **Media equipment** shall be installed by **AC Media** and may not be removed without their permission.
- 9.3 The **crew media equipment** shall be the same for all crews competing in the same race and shall be worn in a manner directed by **AC Media** to the satisfaction of the **Measurement Committee** unless otherwise notified in the Notice of Race. **AC Media** shall indicate the periods in which **Media equipment** must be worn and switched on.
- 9.4 **COR/D-ACP** will publish details of an *official onboard communication system*, which shall be the only communication system permitted to be used on the **yacht**.
- 9.5 **Competitors** that install the *official onboard communication system* themselves shall do so according to the **AC40 Specification**, and may then use the system when racing. Otherwise, **AC Media** will require **Competitors** to remove any other communications systems and will install the *official onboard communication system* for racing.

10 Crew

- 10.1 There shall be four crew members, unless reduced by accident, who shall all be human beings.
- 10.2 The Notice of Race of an **event** may provide restrictions on the crew such as gender or age.
- 10.3 Each crew member shall wear:
- (a) a buoyancy aid that meets the flotation standard of ISO 12402-5 or ISO 12402-6 (CE 50 Newtons) and that is capable of being removed or deflated in the water within five seconds;
 - (b) a helmet that:
 - (i) meets a minimum standard of CE EN 1077, CE EN 966, ASTM 2040, or Snell S-98;
 - (ii) fits entirely within an ellipsoid whose principal axes have lengths of 300 mm, 300 mm and 400 mm;
 - (iii) has at least 300 cm² of the exterior surface brightly coloured; and
 - (iv) when placed on a flat surface with the neck opening facing downwards, at least 100 cm² of the brightly coloured region is visible when viewed in parallel perspective from all angles above the surface and aft of a transverse plane through the centre of the helmet;
 - (c) a pocket for carrying **crew media equipment** with minimum dimensions 80 mm x 200 mm x 30 mm; and
 - (d) **crew media equipment** as required by Rule 9.3.
- 10.4 Each crew member may carry one spare display screen, provided:
- (a) it is of the same specification as the **one-design** display screens, and has the same software installed;
 - (b) it has been measured and approved by the **Measurement Committee**;
 - (c) it is at all times carried by the crew member, in a pocket or similar, such that the screen is not visible to any crew members, unless there is a failure of another onboard screen;
 - (d) it shall not be used to provide information to any crew members that would not have clear visibility of that same information from their normal sailing positions.
- 10.5 The total mass of **carried equipment** worn or carried by each crew member shall be a maximum of:
- (a) 5.0 kg, when dry; and
 - (b) 8.0 kg, when soaked and allowed to drain for 1 minute according to procedures issued by the **Measurement Committee**.
- 10.6 Any **crew media equipment** or **carried equipment** brought aboard by a crew member must be worn or carried by that crew member at all times when racing, except that a carried spare display screen may be mounted on the **yacht** in the event of a failure of another display screen.
- 10.7 Crew members shall be weighed at crew weighs organised by the **Measurement Committee**, where:
- (a) crew shall be dressed in full gear with all **carried equipment** including **crew media equipment**;
 - (b) crew weighs shall take place at times published by the **Measurement Committee**; and
 - (c) the **Measurement Committee** will use the weights recorded at crew weighs to determine the required ballast. Recorded weights will be updated at each subsequent crew weigh and the required ballast redetermined accordingly.
- 10.8 Clothing and equipment shall not be designed to retain water for the purpose of increasing mass.

- 10.9 Crew shall not promote the ingress of water into the volume of the **hull**, for instance by capsizing. In the event of a capsize, the volume of the **hull** shall be checked to ensure it is empty of water before the start of the next race.
- 10.10 While the **yacht** is foiling, crew shall remain in the cockpit and entirely inside the **perimeter line** of the **yacht**, unless by accident. If the crew intentionally leave the cockpit:
- (a) the **yacht** must be in displacement mode;
 - (b) they shall attempt to return to the cockpit prior to the **yacht** taking off;
 - (c) they must not contact the **foils**; and
 - (d) they shall not enter the watertight volume of the **hull**.

11 Permitted modifications

- 11.1 This section describes optional modifications that may be made to **AC40 Class Yacht** components. Any modifications not specifically listed here or elsewhere in the **AC40 Class Rule** are prohibited when racing.
- 11.2 Modifications required for the installation of **media equipment** by **AC Media** are permitted.
- 11.3 The following holes may be drilled through the **hull** for the installation of cameras, provided those cameras are removed for racing:
- (a) two holes in the **hull lower** that shall be:
 - (i) centred at coordinates $xyz = (7.054 \text{ m}, \pm 0.356 \text{ m}, -0.180 \text{ m})$;
 - (ii) circular and have no larger than 40 mm diameter; and
 - (iii) sealed by installed hardware that must remain watertight under a static pressure head of 70 kPa, must be bonded only to the inside surface of the **hull**, and must not extend beyond the fair surface of the **hull**;and
 - (b) a single hole in the **hull upper** that shall be:
 - (i) centred at coordinates $xyz = (8.950 \text{ m}, 0.000 \text{ m}, 1.018 \text{ m})$;
 - (ii) circular and have no larger than 70 mm diameter; and
 - (iii) sealed by installed hardware that must remain watertight under a static pressure head of 10 kPa, must be bonded or bolted to the inside surface of the **hull**, and must not extend beyond the fair surface of the **hull** by more than 3 mm.
- 11.4 Holes of no greater than 40 mm diameter may be drilled in the **hull internals** to provide passage for development systems. However, advice should be sought from the supplier regarding the structural implications of any such holes.
- 11.5 The following modifications to the **hull upper** and its hardware are permitted:
- (a) a lightweight deflection device may be attached to either side of the **jib** car to prevent the **jib** inhaul line from becoming tangled around the car when slack, providing it is no larger than necessary to achieve this purpose;
 - (b) miscellaneous waterproofing devices may be added on or below the **hull upper** to reduce water ingress to the **hull**, for instance a neoprene closure around the **jib** inhaul sheave box. Any devices added shall weigh no more than a total combined weight of 1.0 kg, but need only be weighed by the **Measurement Committee** if they estimate that they may exceed that limit.

11.6 The following modifications to hardware within the cockpits are permitted:

- (a) crew seats may be replaced with alternative seats of the same mass with the approval of the **Measurement Committee**;
- (b) one drink bottle holder may be installed in each cockpit, which may not be used for any other purpose than holding a crew member's drink bottle. Drink bottles shall not be carried when racing;
- (c) a strip of mylar or similar material may be taped onto the dashboard to overhang the displays and reduce water drips on the screens;
- (d) grip tape may be added to the steering wheel;
- (e) the surfaces of control or protest buttons may be marked, painted, or modified with braille or similar tactile feedback finishes to aid button identification;
- (f) Samsung S22+ display screens may be replaced with any Samsung Galaxy S-series smartphone, model S22 or later, including standard and 'plus' variants;
- (g) Samsung displays may be sealed around the edge of the glass screens to prevent the build-up of salt crystals below the bezel;
- (h) display mounts for S22+ display screens may be replaced with:
 - (i) mounts suitable for other permitted display screens;
 - (ii) Dual Lock to attach the displays directly to the yacht; or
 - (iii) commercial waterproof cases attached to the yacht with Dual Lock.
- (i) static visual reference material may be mounted in each cockpit, provided it:
 - (i) only conveys information to crew and is incapable of performing any other function; and
 - (ii) has no moving or electrical components.

11.7 The following modifications to the **rig** are permitted:

- (a) vinyl sail stripes on the **mainsail** and **jibs** may be removed;
- (b) within 800 mm of a head point of any **mainsail skin**:
 - (i) the luff tape may be replaced with an equivalent product;
 - (ii) the luff tape may be extended; and
 - (iii) the luff flare may be adjusted;
- (c) a hose may be added to the **mast** base to allow the injection of grease to the **mast** ball cup without removal of the **mast** from the **yacht**, providing that installation of the hose is compatible with the requirements of any **one-design media equipment**;
- (d) the mainsheet cylinder anti-rotation device attached to the top end of the mainsheet cylinder may be replaced with an equivalent foam device or removed;
- (e) sails may differ from the current **AC40 Specification** provided they were launched in **AC37** and comply with the version of the **AC40 Specification** in effect at the end of **AC37**;
- (f) the forestay may have a 3D printed part attached for the sole purpose of aligning the **jib** lock when hoisting the **jib**. This part shall be 3D printed in any material provided the total assembled weight is less than 0.080 Kgs This part shall be defined by either:
 - (i) AC40JibLocksupportGB.stp; or
 - (ii) AC40JibLocksupportLR.stp;and
- (g) lubricants (but not low-friction tape) may be applied to the **mainsail** luff, the **mast** luff track and battens;
- (h) the port and starboard **luff** fairings that fair the lower part of the **mainsail luff** may be attached to the **yacht** inside the **hull**, immediately aft of the **mast** bulkhead, instead of being installed in their designed location on the **mast**.

11.8 The following battery modifications are permitted:

- (a) battery handles may be modified as described in the AC40 User Manual; and
- (b) battery cables and interconnects may be replaced with equivalent quick connect cables or terminations, provided:
 - (i) the wire gauge of the links between batteries is a minimum of 25 mm² or AWG4; and
 - (ii) the additional mass of the cables, couplings and terminations is no more than 1.6 kg.

11.9 The following hydraulic modifications are permitted:

- (a) the original mast rotation hydraulic cylinders may be substituted for a Mk II design, in which the BSPP fittings on the gas side are replaced by NPT fittings;
- (b) hydraulic hoses may be wrapped with tape, spiral wound plastic sheathes, or similar, in way of terminations, penetrations or other high-wear areas, to protect from chafe or damage by bending. Any such protection shall weigh no more than a total combined weight of 1.0 kg, but need only be weighed by the **Measurement Committee** if they estimate that they may exceed that limit; and
- (c) The pump suction hose #604_201 (Transfer Oil Push-On 107, DN12 size -8) from oil reservoir #604 to pump #201 can be substituted with a suction hose of next size up DN 16, size -10 but having the same length of approximately 1.2 m. The identification label of the larger hose shall be #604_201_A. The hose specification must be similar in every respect to one of the following two options with ID 16.2 mm / DN16 / size -10:
 - (i) Transfer Oil Push-On 106; or
 - (ii) Transfer Oil Push-On 107

Required changes of adapters and fittings associated with an increased hose ID are permitted, but must be of no more restriction than the current adapters and fittings used for the connection of hose #604_201.

11.10 The following modifications to **foil wings** are permitted:

- (a) the channel containing hydraulic tubes and electrical cables in the upstand of the **foil wing** may be filled with sealant in the vicinity of the **foil arm** trailing edge access panel and the actuator access panel;
- (b) the gap between the top of the **foil wing** upstand and the bottom of the **foil arm** may be filled with a flexible sealant which may be left unpainted, or painted according to Rule 6.5;
- (c) a drain port sealed with a grub screw or similar may be added to the **foil wing** actuator hatch to allow draining of the internal cavity without removal of the hatch;
- (d) composite **foil wing** actuator hatches and cover plates may be replaced with substitution wet lay-up covers of the same geometry and similar mass; and
- (e) the upstand of the **foil wing** may have stripes painted on to assist crew members in judging immersion.

12 *Measurement*

- 12.1 The **Measurement Procedures** shall be issued according to Rule 13.4.
- 12.2 The **Measurement Committee** may place seals on equipment or otherwise mark equipment as part of the measurement process.
- 12.3 The **Measurement Committee** shall issue a measurement certificate for a **yacht** when they have:
- (a) concluded that she complies with the **AC40 Class Rule** and the **AC40 Specification**;
 - (b) received completed declarations and affidavits as required by the **AC40 Class Rule** and as additionally required by the **Measurement Committee** at their discretion; and
 - (c) received all documentation as required by the **AC40 Class Rule** and by other notices published by the **Measurement Committee**, and confirmed that the documentation is satisfactory.
- 12.4 Once a measurement certificate has been issued, some changes to the **yacht** shall be permitted without requiring re-measurement. The scope of these permitted changes shall be detailed in the **Measurement Procedures** and shall include changes such as routine maintenance on mechanical, hydraulic and electrical systems.
- 12.5 Compliance with control system and electronics rules may be determined by a combination of hardware inspection, software inspection, interviews and affidavits.
- 12.6 A **yacht's** measurement certificate may be withdrawn by the **Measurement Committee** at any time if they suspect she no longer complies with the **AC40 Class Rule** or the **AC40 Specification**.
- 12.7 If a **yacht** is unintentionally damaged and cannot be repaired in time for her next race, the **Measurement Committee** in consultation with **COR/D-ACP** may permit a measurement certificate to be issued or retained despite her no longer complying with the **AC40 Specification**, provided they are satisfied that no performance advantage could be gained.

AC40 Class Yacht

AC40 CLASS MEASUREMENT CERTIFICATE



Team	Mast
<i>Name</i>	<i>ID</i> <i>Mass</i> <i>kg</i>
<i>Yacht club</i>	Vertical Centre <i>m</i>
Certificate	Rudder
Certificate number	<i>ID</i> <i>Mass</i> <i>kg</i>
Supersedes number	Mainsail
Date	<i>ID</i> <i>Mass</i> <i>kg</i>
Mass	Jibs
Platform mass <i>kg</i>	J1
Longitudinal centre <i>m</i>	<i>ID</i> <i>Mass</i> <i>kg</i>
Hull	J2
<i>ID</i>	<i>ID</i> <i>Mass</i> <i>kg</i>
Port foil	J3
Foil arm stock <i>ID</i>	<i>ID</i> <i>Mass</i> <i>kg</i>
Foil wing <i>ID</i>	Starboard foil
Foil flap <i>ID</i>	Foil arm stock <i>ID</i>
Total Mass <i>kg</i>	Foil wing <i>ID</i>
	Foil flap <i>ID</i>
	Total Mass <i>kg</i>
Measurers	
<i>Measured and found to comply with the AC40 Class Rule:</i>	
<i>Name</i>	<i>Name</i>
<i>Signature</i>	<i>Signature</i>

Figure 12.1: AC40 Measurement certificate

13 Documents

13.1 **COR/D-ACP** has issued the following documents:

- (a) AC40 User Manual;
- (b) AC40 Commissioning Manual;
- (c) Running Rigging Cut-sheet;
- (d) AC40 Direct Purchase Parts List, itemising commercial components that may be replaced according to Rule 4.4 (a); and
- (e) 3D Printed Part geometries in STP format, within the folder “Rig & Sails/3D Printed Parts”.

13.2 **COR/D-ACP** has issued the following drawings:

Drawing	File path
Rudder interface	Appendages
Foil arm interface	Appendages
Electronics hardware schematics	Electrical
Exterior hull and deck geometry	Hull/031 400_AC40 Hull.igs
Hydraulics circuit diagram	Hydraulics/514 00 400C_AC40 overview circuit.pdf
Rig plan & loading	Rig & Sails/031 400 001A_Rig Plan.pdf
Mast and sail interface	Rig & Sails/North Sails data
Mast specification	Rig & Sails

13.3 The documents and drawings listed in Rules 13.1 and 13.2 form part, but not all, of the **AC40 Specification**, and shall be published in the **Official Repo**. They may be amended as permitted by the **AC Technical Regulations**.

13.4 The **Measurement Committee**, in consultation with the **Rules Committee** will issue the **Measurement Procedures** at least two months prior to the first **AC40 Class Yacht event**, and may amend them at any time.

14 *Agreement*

- 14.1 As further detailed in Section 14 of the **AC Technical Regulations**, the version of this document which is in force at any time is the latest released version in the main branch of the **Official Repo**.