



COMINOFF

DEROGATION FOR 2014

Discipline	Offshore, X-Cat Series
Rule article n°	Part 4 tech Rules – art. 11
Subject	Canopy Rules & Crew Safety
Rulebook page	603

The Offshore rule change proposals n. 68 adopted at last General Assembly held in Auckland, New Zealand, on October 27th 2013, is derogated for the entire 2014 racing season due to non technical applicability

2014 RULE adopted at 86th GA

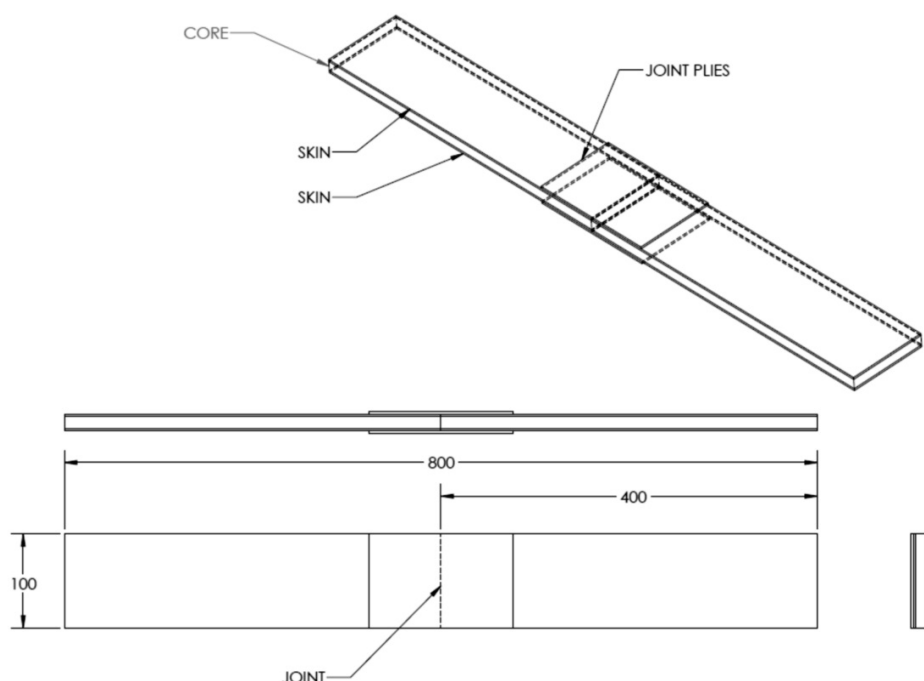
11. CANOPY RULES & CREW SAFETY

1. All XCAT boats must be equipped with a Reinforced Canopy/Cockpit, it is defined as a containment area for the crew and should be constructed as an integral part of the boat or suitably attached to boat if a drop in cell is fitted this should be complete with reinforced shield/crunch zones. This Reinforced Cockpit Area must be designed and constructed to a specification capable of withstanding the forces of a water impact when running at the highest design speed of the boat.

2. All canopies in XCAT boats manufactured after January 1, 2014 and all replacement canopies manufactured or installed after January 1, 2014 must be built by registered UIM cockpit builders. Constructors wishing to be registered must submit panels for test according to the following standards. Constructors meeting these standards will be registered as UIM registered cockpit builders.

UIM XCAT COCKPIT/CANOPY TEST STANDARD

Sample Construction Requirements



- q. Sample quantity must be 3, one of which must include a sample of the joint/bonding of the cockpit parts, transverse to the length of the sample.
- r. Trimmed sample size must be 100 mm ± 1.0 mm wide x 800 mm ± 5.0mm long, with the width being parallel.
- s. For fibre orientation the 800 mm length is to be parallel with the centerline of the boat.
- t. Sample must be laminated on a flat surface using the same manufacturing process, materials, and fibre orientations as the intended homologated cockpit construction.
- u. The sample must have a uniform thickness with no core crushing along any edges.
- v. The sample must have one moulded face and the other face being unmoulded, the moulded face will be taken as being the external surface of the cockpit during testing.
- w. The sample must be representative of the thinnest lay-up of the cockpit/canopy (excluding the *various flanges for windshields, hatches etc.*).
- x. The sample and cockpit must be manufactured using balanced or unbiased materials.

Sample Test Method

- g. The sample will be supported across the full width perpendicular to the 800 mm edges by two parallel 25 mm Steel bars at a distance of 500 mm apart. The load will be applied equally through two 25 mm. Steel bars, each a distance of 167 mm parallel from each support.
- h. The moulded face of the sample will have the load applied and the unmoulded face will support the sample.
- i. The load will be applied at 0.4 mm/sec and the deflection will be measured at the two 25 mm Steel bars applying the load within 2minutes.

Sample Test Requirements

- g. The sample when loaded with a force of 10000 Newtons must have no more than a maximum deflection of 25 mm without the sample failing.
- h. The sample weight in gm/sq m will be calculated, skin thickness and sample thickness will be measured to enable inspection and comparison of damaged homologated cockpits/canopies.
- i. Further non-destructive test analysis methods may be used to compare test samples with registered cockpits during the life of each cockpit/canopy.

Sample Manufacturing Information Requirements

- r. Ply laminating sequence (stating which ply is the moulded face).
 - s. Ply materials.
 - t. Ply weave styles.
 - u. Ply material weight in gm/sq m (dry weight ie. Without resin).
 - v. Ply orientation (where 0° is parallel with the 800 mm edges).
 - w. Core material and density in lbs/cu ft or kg/cu m.
 - x. Manufacturing method (stating vacuum, pressure, and temperature).
 - y. A 100 mm x 100 mm sample of all materials used (resin samples not required).
 - z. The completed questionnaire for offshore cockpits (available on the UIM web site) along with the supporting analysis for the question on "Primary Structure Strength".
- Samples as per sample construction requirements must be sent to the UIM appointed person.

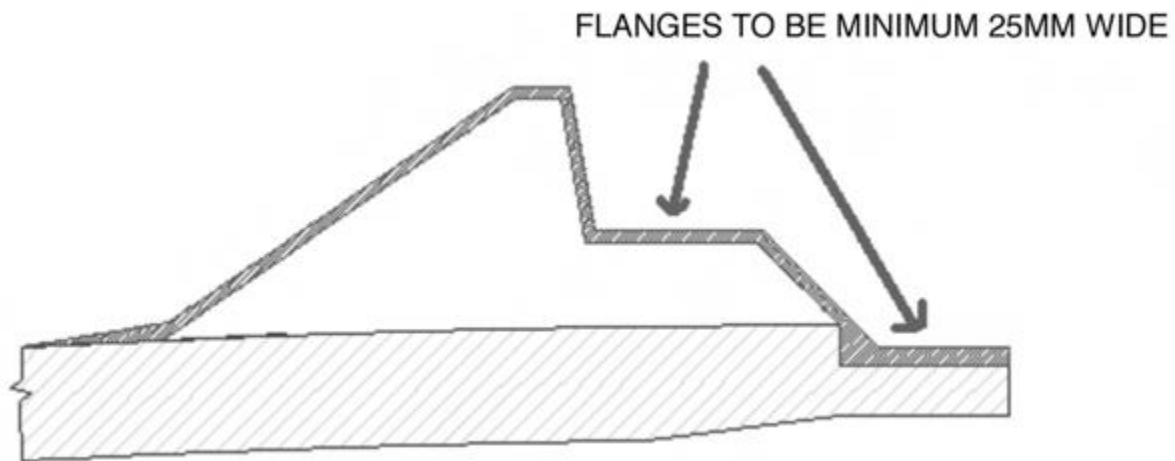
RULE TEXT FOR 2014 SEASON - NOT MODIFIED

11. CANOPY RULES & CREW SAFETY

1. All XCAT boats must be equipped with a Reinforced Canopy/Cockpit, it is defined as a containment area for the crew and should be constructed as an integral part of the boat or suitably attached to boat if a drop in cell is fitted this should be complete with reinforced shield/crunch zones. This Reinforced Cockpit Area must be designed and constructed to a specification capable of withstanding the forces of a water impact when running at the highest design speed of the boat.
2. XCAT all new boats built after January 2010 must conform to the current UIM rules, All current boats to be assessed if water deflectors and crunch zones can be fitted. Any boat failing to carry out the Technical recommendations will not be eligible to race. All other canopy rules apply to the current boats.
3. New build manufacturers should contact the UIM for any planned rule updates due to the development program of canopy structure and safety designs.
4. As a recommended target for design and construction an impact pressure 20 tones per square meter should be met or exceeded, with the highest importance given to protecting the crew in the event of severe accident. Any specification or safety device over and above the requirements will be assessed and supported as required.
5. The extremity of a Reinforced Cockpit comprises of a canopy, forward and rear bulkheads, sides, floor, and water deflectors. Additionally the cockpit is to be protected by a reinforced shield fitted into the boat surrounding the cockpit with a cavity between to form a 'crunch zone'.

6. Mandatory Water impact deflectors surrounding the cockpit, designed with a shape and structure so that the water is diverted around the cockpit and away from the crew in the event of the boat being breached to be fitted. There shall be no openings within the exterior confines of the impact shield/crunch zone allowing the forced ingress of water.

7. A continuous fitted structural framework inside the cockpit must be installed reducing the unsupported panel area sizes of the cockpit cell lining. The framework will incorporate roll bars fore and aft of the hatch with extensions to support the screen aperture divisions, the rear bulkhead directly behind each seat and the top escape hatch flange. The flange is to be a minimum of 25mm width (New build boats must have a minimum of 50mm) measured across the flange recess, with the hatch opening measuring 0.55m by 0.825m at the widest points. The canopy apertures should be cut with all corners having a radius of minimum 25mm. The radius should be constant and have a smooth finish to relieve stress. The canopy aperture must have a 20 mm wide (minimum) fluorescent orange band around the opening. All boats are recommended to use the double flange method of installation as per the graphic below. All new build boats 2010 onwards must use the double flange installation.



8. There must be a minimum of 1 compression strut installed to support the canopy.

9. The main hatch being directly above the crew's helmets and its supporting flange must have further reinforcement to maintain its shape under stress and be able to withstand the impact of the water and retain its ability to function. The hatch thickness must be maintained throughout and not reduced at the flange where possible. The hatch should be protected by water deflectors incorporating internal and external method of prizing open the hatch caused by water pressure or binding to assist in emergency underwater rescue and escape.

10. The hatch shall be fitted with a catch which has a positive open and positive close mechanism and should hold the hatch against lateral forces. These catches shall be able to be opened from both inside and outside the cockpit and must have a second emergency mechanism to allow the rescue team to easily remove the hatch from outside if necessary. The hatch should be fitted with hinges with large bases and backing plates to spread the load and short release pins. This is important, because long pins invariably bind the hinge. It should be considered that the hinge centers be as far apart as possible. The release mechanism or hinges must not encroach within the canopy aperture area, and must not in any way hinder the exiting of crew members when fully race fitted. It is recommended that the catch have at least 2 locking points as far apart as possible, whilst still maintaining head clearance. It should be operated by a single handle with the addition of individual mechanisms internally in case of jamming. The hatch must be removable when the quick release hinge pins are removed. The locking mechanism must protect against both forward and aft stuffing.

11. Mandatory secondary tunnel escape hatch, it is strongly recommended that polycarbonate windows are applied to the tunnel hatch to help illuminate the cockpit for ease of escape. Alternatively a waterproof light which is activated by water and/or being inverted with its own power source is fitted.

12. Canopy hatches and release handles, must be painted fluorescent orange or have a fluorescent orange background panel to identify them, with directional arrows to indicate the method of opening must be provided both inside and out.

13. There should be one or more divers' grab handles fitted to the outside of the top hatch.

14. The clearance between and around the crews helmet and the canopy must be a minimum of 120mm.

15. It is mandatory to close the canopy hatch, and for the hatch to remain closed during all racing and practice.

16. Raised sections above deck level, including hatches and openings, connected to the canopy, at least to the extent of the mandatory water deflection zones must be structural and comply

17. With the 'Reinforced cockpit area' rule. Any hatch within this area must have the same strength as the main cockpit hatch.

18. Cockpit seating must be side by side seating only.

19. The Cockpit should have flood tubes or other means of flooding the cockpit to equalize the pressure quickly in an accident. The floor of the cockpit should be as airtight as possible when in an upturned position. It is mandatory that sufficient buoyancy is provided in the boat, or in the material used for its construction, to ensure that the boat floats if capsized or holed, the hull should float as parallel with the surface of the water as is practical, to help in rescue accessibility. If extra buoyancy is needed, the buoyancy system described by the designer should be verified by the Measurer. This added buoyancy must be in at least four separate flotation units.

20. The various components that constitute the Reinforced Cockpit shall be properly maintained to ensure reliable operation of all components, with emphasis being placed on the canopy release mechanisms, emergency air supply and restraint systems, in accordance to the UIM cockpit guidelines.

Windscreens

1. Polycarbonate (Acrylic will not be accepted) areas are strongly recommended to be as small as possible, while still maintaining that the pilot and co-pilot have clear, safe and undisturbed visibility ahead at sea level whilst racing. It is strongly recommended that these polycarbonate areas are built using 12 mm thickness, or more.

2. The combined visibility the pilot and co-pilot must be through a horizontal arc of 225 degrees (112.5 degrees either side of the centre line of the boat).

3. These polycarbonate panels are to be recessed into the composite structure and should be bonded using a suitable bonding agent, and/or "bobbins" (Bonding the Windscreen is the recommended method of fitment. Boats built after January 2010 must use bonding only, to fit the windscreen no bobbins will be allowed)

4. It is highly recommended that there is also a through bolted outer flange for the fitting of the polycarbonate panels.

5. Screen flanges should be a minimum of 50 mm, if bobbins are to be used they should be fastened every 100 mm it is recommended to use metal bobbins" with heads, as opposed to the recessed plastic type.

6. The outer polycarbonate area of the flange fitting must not be painted, so that the measurer / scrutineer may monitor any discrepancies.

Seats and Seatbelts Side of head protection

1. Cockpits must be fitted with rear and side of head protection for each crew member. This must be an integral part of the seat, which must be attached directly to the structure of the Restraint Compartment. The head protection must be a minimum of 0.2m wide and extend at least 80% of the height of the safety helmet as worn by the crew whilst in the normal seating position. There must be a minimum of 0.12m vertical and lateral clearance between the canopy and each of the crewmembers when in the normal seating position.

2. The Restraint System must consist of a 5 or 6 strap harness and should utilize a 75 mm lap belt, a 50 mm strap over the shoulder harness rated at 4,100kg (9,000 lb.) and grommets to prevent chafing or cutting of the belt.

Harness straps must be attached directly to the cockpit structure. Those straps close behind the driver's head and neck must be 100 mm to 150 mm apart at point of attachment. The shoulder harness should be installed at 90 degrees to the spine at shoulder line to minimize compression injuries under high "G" loading.

All straps must be free to run through intermediate loops or clamps/buckles.

All anchor point bolts must be fitted with backing plates of 10cm minimum width. The driver harness attachment bolts in reinforced cockpits must consist of minimum grade EN8 bolts, with an 8 x 1.25 mm thread and locked nuts.

There must be a spacer and plain washers on each bolt. The spacers must be glued to the cockpit structure. Intention of these spacers is to prevent buckling of surface material near bolts. This always leads to local delamination which easily spreads out over cockpit structure, when it is under stress.

3. On the sides of the structure, which has to take up the force on the attachment bolts, there must be a stainless steel plate (washer of minimum 3 mm thickness and 100 cm² area).

4. When using seats with suspension, and therefore not using a bulkhead restraint anchorage, drawings must be lodged with the National Authority of the measurer and approved prior to boat measurement.

5. All restraint systems must have a common method of release. The single lever method (sometimes called the NASCAR type) or rotary type, are both acceptable restraint release systems. Both types of restraint release must be examined for satisfactory operation by the scrutineer before every race.

6. The shoulder harness should be installed 90 degrees to the spine at shoulder line to minimise compression injuries and the high "G" loading. 75 mm minimum/maximum to Centre line of Lap Belt at Seat Back, Seat Bottom junction. Lap Belt should continue in straight line to anchorage.

JUSTIFICATION

The Offshore rule change proposals n. 68 (XCAT Section 4 – art. 11) adopted at last General Assembly held in Auckland, New Zealand, on October 27th 2013, is derogated for the entire 2014 racing season due to non technical applicability. Furthermore the 2013 rule will be applied.

SIGNATURE

Monaco 22.01.2014

**President of Cominoff
Per Benson**