



IRC NOTICE 2020-01

PRESCRIPTIONS relating to the USE of "FOILS" on IRC boats

September 2020

The aim of the IRC rule is to have different boats racing together.

The IRC does not wish to oppose the increase in speed potential of "Archimedean" boats rated by the IRC rule, either by their architectural forms, or by using lift appendages such as Foils, provided that the effect of the lift appendages is controlled.

IRC has decided to limit the lift provided by the active surface of the external lifting appendages (Annex 1).

The calculation of the lift (vertical) will be made from this planar active surface. To calculate the Lift taken into account, the IRC rule will add the projected surfaces of ALL the lift appendages inventoried and authorized by the rule (Annex 1).

This limitation will be set at 30% of BW * 9.81 expressed in Newtons.

BW being the empty Boat Weight (Kg) as described in IRC rule 17.

The IRC rule will not limit the design of hulls that provide lift.

In order for a boat equipped with lifting appendages (foils + possibly additional surfaces) as defined in Annex 1, to be eligible for IRC, the total active surface of these appendages must be less than or equal to "S" below:

$S_{max} = 0.0046 * (BW / LWP).$ **With BW in Kg, LWP in metres, S in m²,**

Annex 1: The lifting appendages, the active surfaces of these appendages

Foil shapes are identified by a few common names: DALI, DSS, CHISTERA, etc.

Definition of the active surface of a lifting appendage

The IRC foil dimensions are defined in IRC definitions. The active surface is produced by the projection of the shape of the lifting appendage (outer limit of its shape) on a horizontal plane, the boat being "upright" (heel 0°).

However, regardless of its shape, only one lifting appendage must be operational during sailing.

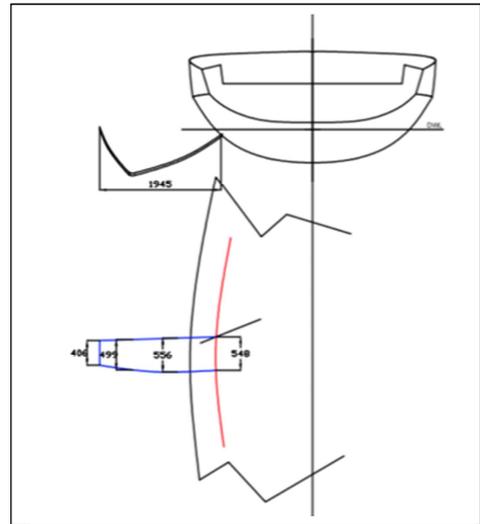
However, three exceptions are accepted in addition to one lift appendix:

- The Canting Keel (75% of the projected surface on a horizontal plane is taken into account in the calculation, the boat being "upright").
- Some off-centred daggerboard or centerboard designs (100% of the projected surface on a horizontal plane is taken into account, the boat being "upright").
- A horizontal plane regulator installed on the rudder(s) provided that the "aerodynamic" profiles used are symmetrical (the projected surface on a horizontal plane is not taken into account, because the horizontal plane regulator generates lift or downforce. The horizontal plane regulator acts as a flight attitude regulator only. However, as the horizontal plane regulator contributes to improve the speed potential, it may be taxed).

Remarks:

The central (fixed) keel is not considered as a lifting appendage.

If the lifting appendage is retractable, its active surface shall be determined when fully extended.



See Annex 2 for other examples of projected surfaces

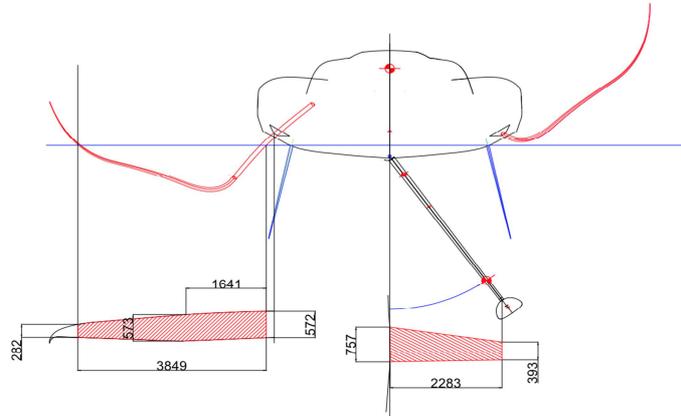
Eligibility Criteria for External Lifting Appendices

The critical speed used by IRC for the calculation of the Lift is: $V_c = F_n * (g * LWP)^{0.5}$

Where the Froude number (F_n) is equal to 0.65 and $g = 9.81 \text{ m/s}^2$. LWP is expressed in m and V_c in m/s.

Lift expressed in Newtons (N) is calculated on the basis of 1025 kg/m^3 for water and 0.3 for C_z .

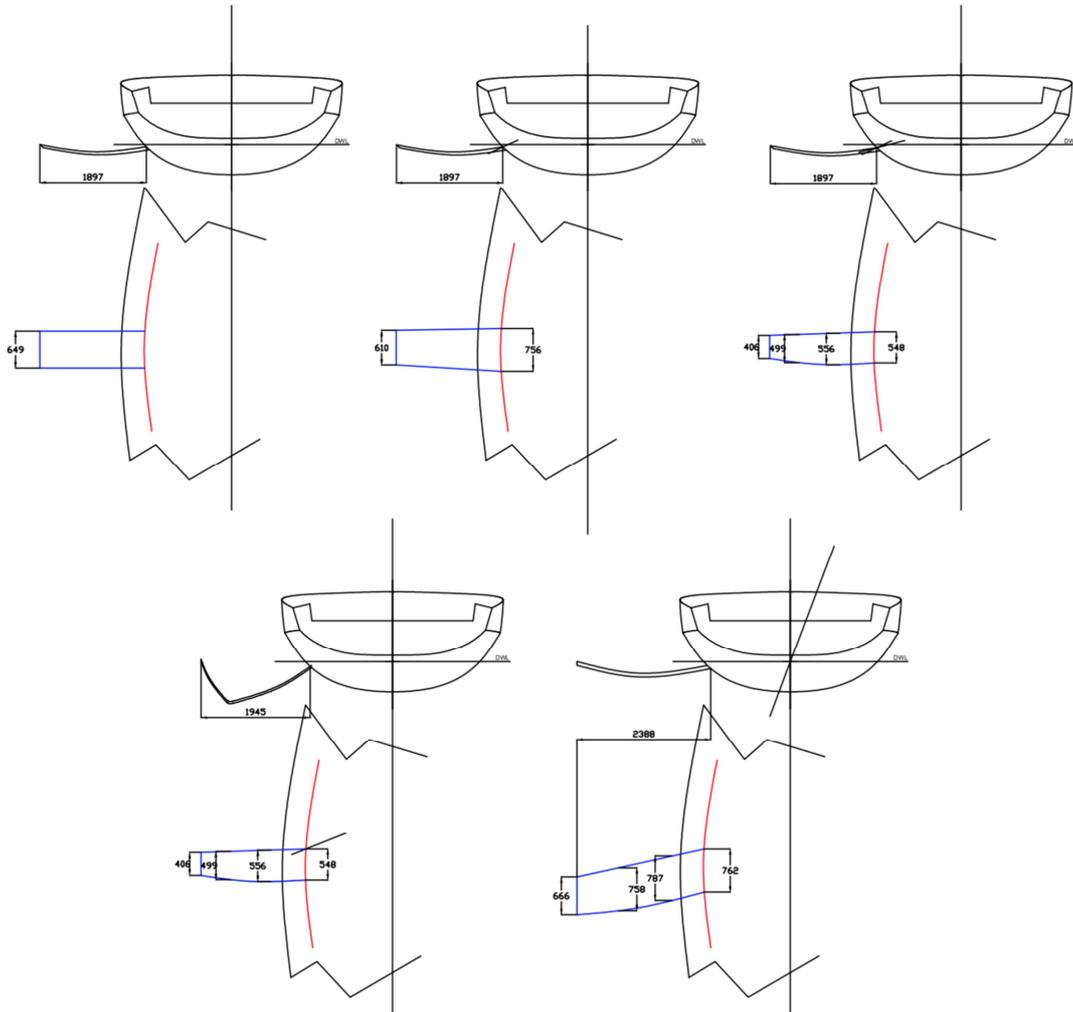
The active surface is expressed in m^2 (active surface in red color in the drawing opposite).

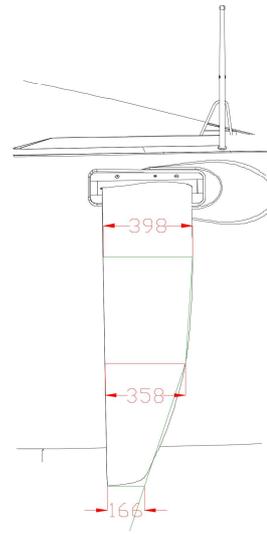
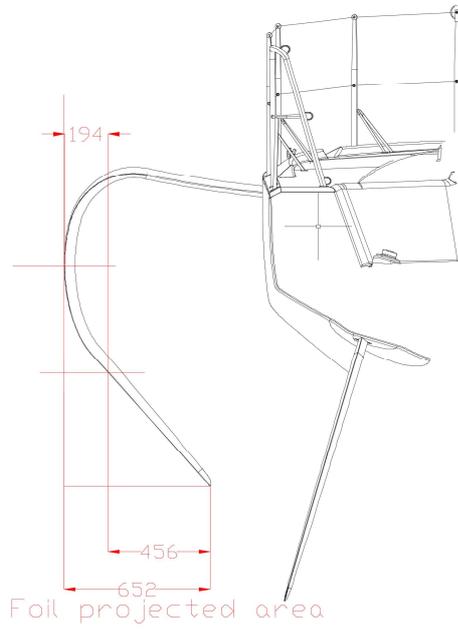


IRC constraints:

- a) A lateral fin, whether straight or curved, is a lifting appendage provided that, when fully extended, its angulation is more than 20° with respect to the vertical axis of the boat.
- b) A horizontal plane regulator with a symmetrical profile on the rudder(s) is allowed. It may be drawn with a dihedral.
- c) In the case of twin rudders, the angle formed by the axes of rotation of the rudders shall be permanently less than 40° . The curve passing through the focal points of the hydrodynamic profiles of the rudder (profiles obtained by cuttings perpendicular to the axis of rotation of the rudder, or of both rudders) must be on the same plane as the rudder bit.

Annex 2: Examples of identification of references of projected surfaces.





IRC Technical Committee
September 2020