



Wingfoil Equipment Registration Scheme Phase III - Measurements

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1. Overview

World Sailing, along with the Formula Wingfoil Class, runs and manages a Scheme to register equipment and confirm its eligibility for use at events. The Scheme covers Hydrofoils and Wings - this document defines the standard measurements required to register.

If in any doubt of measurement points or processes for any equipment please contact the World Sailing Technical Office to have the measurements approved before submitting measurements.

2. Equipment being registered

To be registered with the system and eligible for use at an event, new equipment will need to be:

- a) registered more than 30 days before the start of an event and
- b) commercially available for unrestricted purchase via the manufacturer's e-commerce system (website) or distribution network of retailers

In order to ensure that no changes have been made to the equipment in use, and that equipment being produced is within tolerance, measurers must be able to perform measurement control when necessary. This document outlines the measurements used for registration by manufacturers and equipment control when at events.

3. World Sailing Logo Positioning

The requirement to have the World Sailing Logo positioned on equipment shall only apply to Wings and Hydrofoil masts. The Logo does not need to be applied to gliders, Front Wings, Rear Wings and Fuselages. The Logo shall always be easily legible and must not be cut, covered or obscured in any way. If at any point the logo becomes damaged or lost, the competitor should contact the class who will then verify the model and dimensions with the WS office.

If in any doubt contact the World Sailing Technical Office to have the position approved.

The logo shall be positioned as follows

- **Wings** – on the underside of the canopy, to the Port side of the Centre Strut close to the trailing edge and legible when viewed from behind.
- **Foil Masts** – On the Port side of the foil mast, centred to the mast, as high as possible whilst still clearly legible.



Figure 1 – World Sailing Logo Position on Wing



Figure 2 - World Sailing Logo Positioning on Foil-Mast

4. Foil System measurements

The hydrofoil system encompasses the following components:

- Front Wing
- Rear Wing (Stabilizer)
- Fuselage
- Mast
- Glider System

Hydrofoil system components are usually made from machined aluminium or carbon fibre, so tolerances can be quite small and still allow for normal manufacturing deviations.

Measurements for each hydrofoil component are as laid out in the following pages.

Hydrofoil gliders have been split into 3 main types – single piece gliders, split gliders and component type gliders.

Single Piece glider – glider where the Front Wing, Rear Wing and Fuselage are all a single, continuous piece with no way of separating the glider out into components.

Split glider – glider that can be broken down into multiple sections without a dedicated, separate fuselage; this could be a Frontwing– Fuselage with a separate Rear Wing, Rear Wing – Fuselage with a separate Front Wing or a Front Wing – Rear Wing split fuselage.

Component glider – glider that is made from 3 completely separate components – i.e. a front wing, rear wing and separate fuselage.

Front Wing

Span (b) – Greatest transverse distance measured between extreme foil tips.

Projected Area (A) – 2D area formed by the outline of the foil when viewed from above, excluding any additional area used to connect the wing to the fuselage.

Aspect Ratio – Result of dividing span by projected area, $AR = \frac{b^2}{A}$. when calculating span, ensure all measurements are of the same type (ie all measurements in cm or all measurements in mm).

Chord at Centre of Fuselage– Distance from the leading edge to the trailing edge of the wing, taken parallel to the fuselage at it's centre-line.

Weight – Weight of the front wing in grams, excluding fittings.

Length – Distance from the Forwardmost point of the Wing to the aftermost edge of the connection point taken along the Foil centreline. For component gliders only.

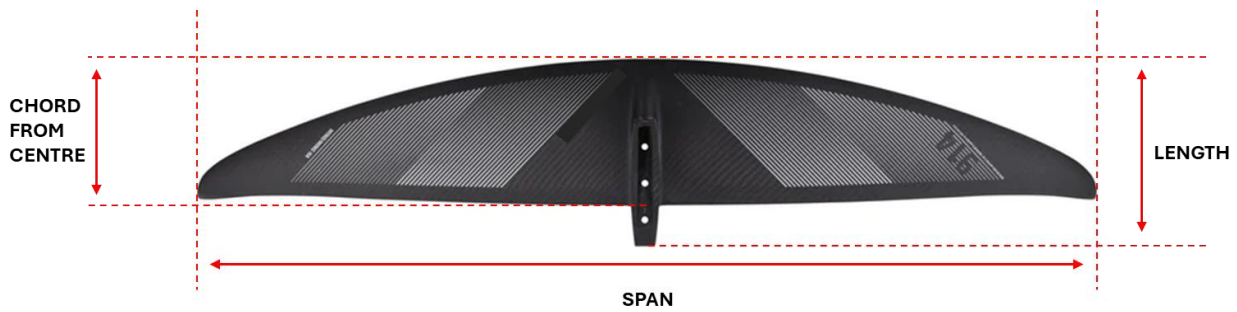


Figure 3 - Hydrofoil Front/Rear Wing Main Dimensions



Figure 4 – Hydrofoil Wing Projected Area

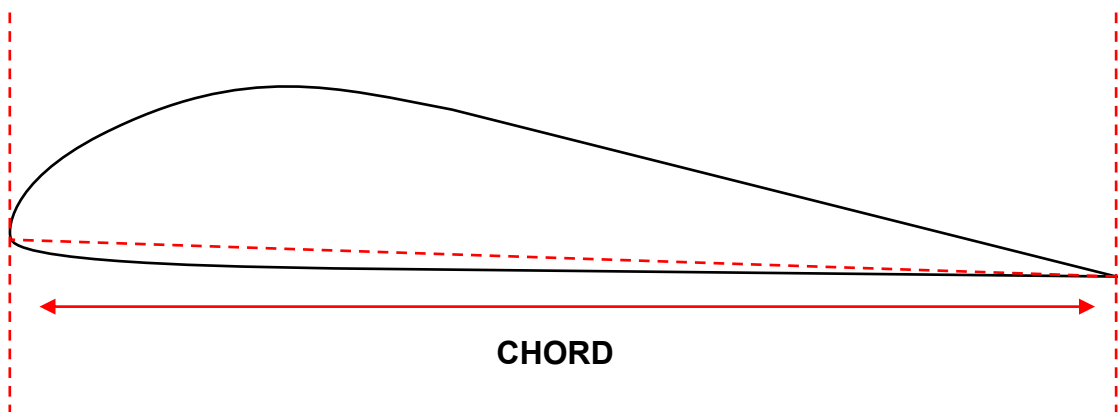


Figure 5 - Hydrofoil Wing Chord

Rear Wing

Rear wing measurements for **Span, Projected Area, Aspect Ratio** and **Weight** to be taken in the same way as the front wing.

Chord at Centre of Fuselage – distance from the leading edge of the wing beside the attachment point to the trailing edge of the wing, taken parallel to the fuselage at it's centre-line.



Figure 6 - Rear Wing Length

Length – Distance from the Forward most edge of the connection point to the Aftermost point of the wing, taken along the centreline. For component foils only.

Fuselage

For Component (separate) Glider Fuselages

Effective Length – longitudinal distance between the forwardmost and aftermost points of the central fuselage body, excluding connection points.

Length – Longitudinal distance between the forwardmost and aftermost extreme points of the fuselage.

Weight – Weight of the fuselage in grams, excluding fittings

Max Width – Transverse distance between two outermost points of the fuselage

Max Height – Vertical distance between two outermost points on the fuselage

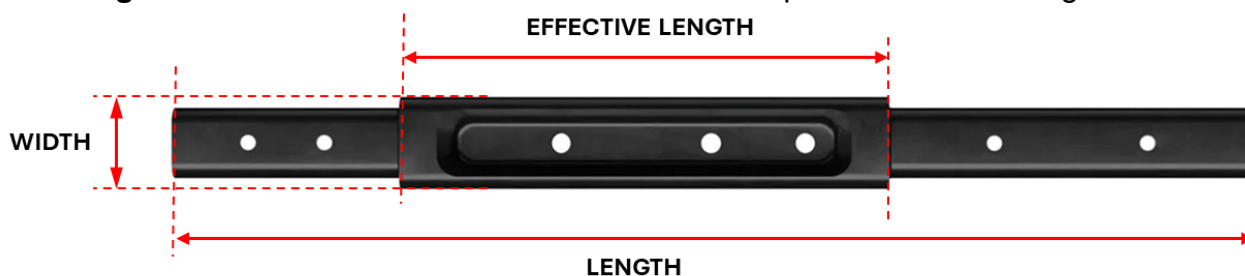


Figure 7 – Component Fuselage Main Dimensions

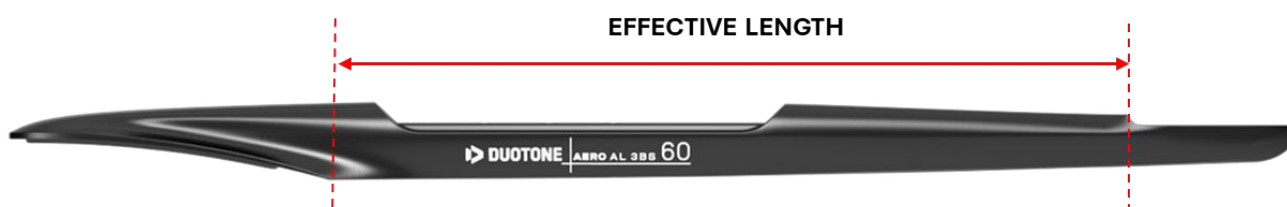


Figure 8 – Fuselage Effective Length

One Piece Gliders

Rear and front wing dimensions are the same as for component gliders, excluding the length and weight measurements

Glider Length – Length from the Leading Edge of the Frontwing to the Trailing Edge of the Rearwing, taken along the centreline.

Glider Weight – Weight of Complete Glider in grams

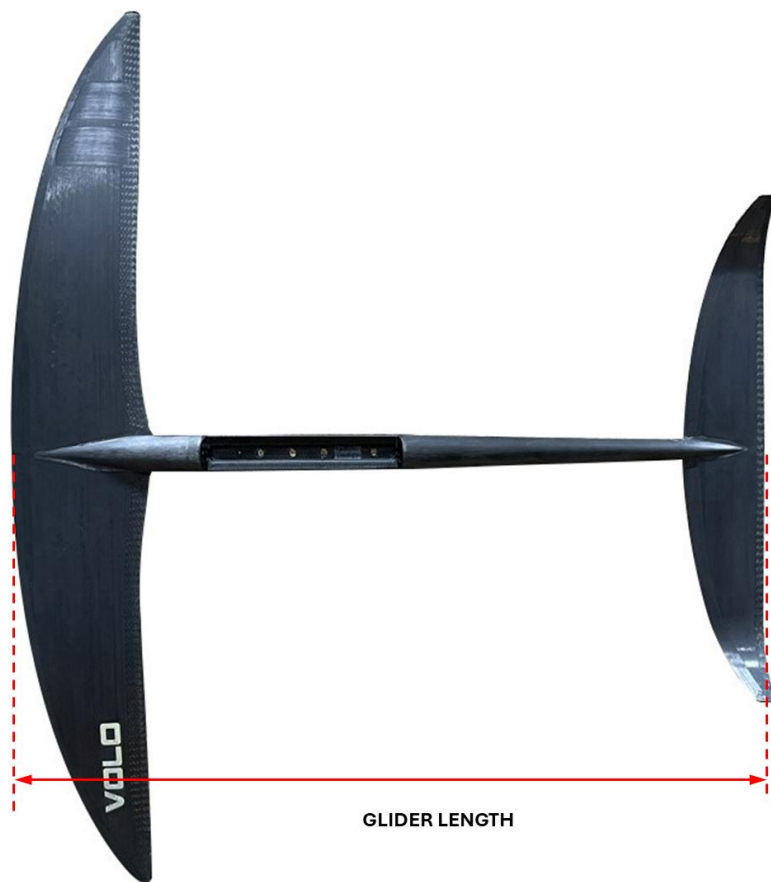


Figure 9 - Single Piece Glider Length

Split fuselage Gliders

Forward Fuselage Length– Distance from the Forwardmost point of the Frontwing to the Aftermost point of the connection joint of the fuselage taken along the centreline.

Rear Fuselage Length– Distance from the Aftermost point of the connection joint of the fuselage to the Aftermost point of the rearwing taken along the centreline.



Figure 10 - Split Fuselage Glider Lengths

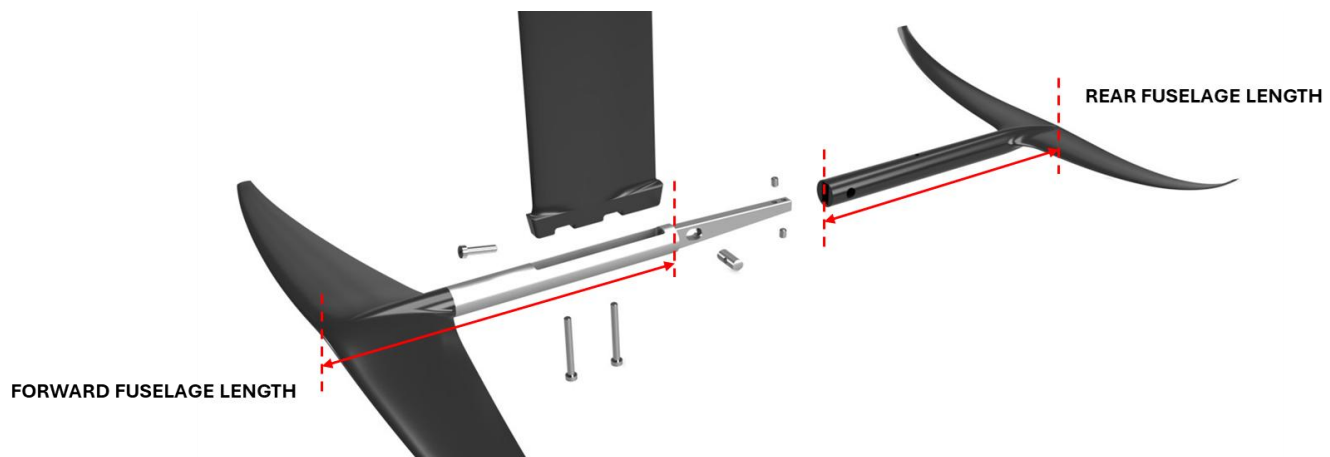


Figure 11 - Alternative Split Fuselage Glider Lengths

Foil Mast

Connection Type – The type of connection used to secure the mast to the board (tuttle, plate or other)

Length – vertical distance between the lower surface of the hull and the lowermost point of the mast, measured perpendicular to the lower surface of the hull, all components installed without shims.

Weight – weight of the mast in grams, excluding fittings

Minimum Chord - minimum distance from the leading edge to the trailing edge of the mast, measured parallel to the fuselage connection.

Profile Thickness at Minimum Chord – thickness measurement taken at point of minimum chord.

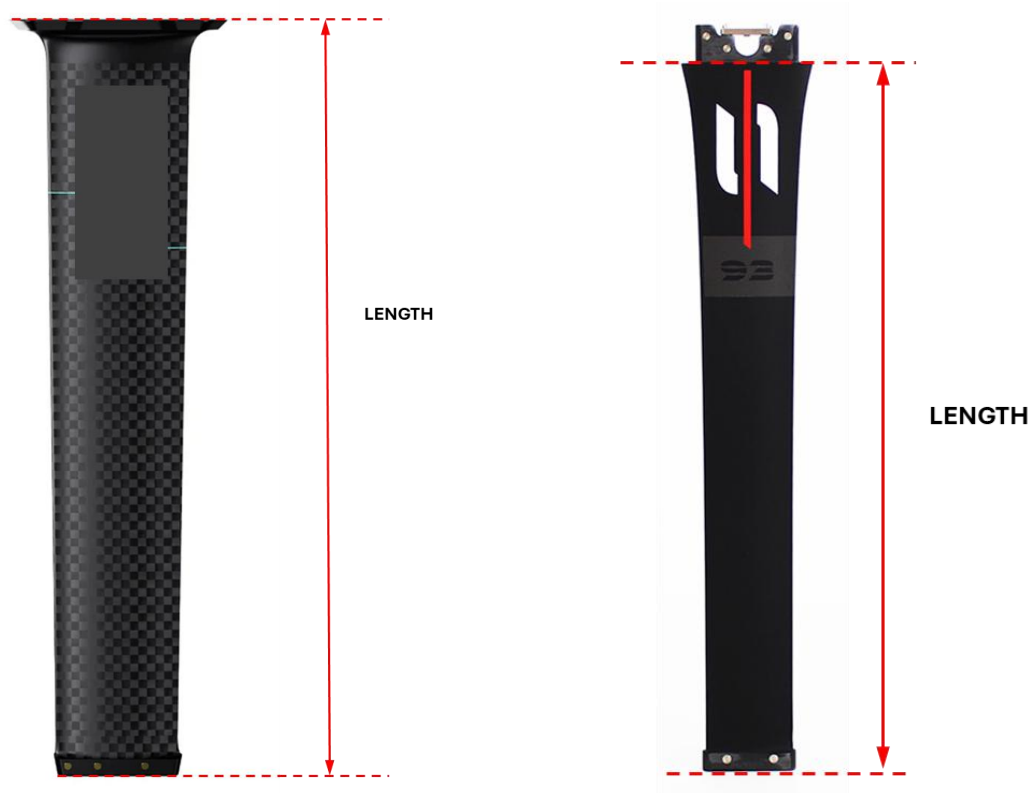


Figure 12 - Hydrofoil Mast Length

5. Wing Measurement System

All measurements taken with the wing inflated to “inflation pressure”. Centre Strut lay on the ground and wings supported so either tip is an equal distance off the ground, but without the weight of the wing being supported in any way.

Nominal Wing Area – Reported Area of wing for Sales Purposes (e.g. 6.0, 5.5, 4.0 etc)

Span (b) – Greatest transverse distance measured between extreme wing tips.
Manufacturer to provide inflation pressure.

Main Canopy and Tube materials – Main materials used in the outer shell – general description and material thickness/weight.

Nominal Inflation pressure – pressure to inflate wing to for measurement – value must be provided by manufacturer.

Projected area - 2D area formed by the outline of the wing when viewed from above.

Aspect Ratio - Result of dividing span by projected area, $AR = \frac{b^2}{A}$. when calculating span, ensure all measurements are of the same type (i.e. all measurements in cm or all measurements in mm).

Centre Chord - longitudinal distance between the forwardmost and aftermost points along the centre strut. Measured at nominal inflation pressure.

Number of Handles – The number of handles on the main fuselage of the wing, excluding the handle on the front of the wing.

Minimum Window Size – Total area of window(s) taken from a singular side of the wing, if more than one window per side, individual window areas should be added to find the total area. Measured as per ERS. Minimum visible area to be quoted where more than one window ply has been used due to multiple skins.

Window Material – the material that the window ply is made from, used to check transparency is sufficient. Manufacturer to provide pictures of the material intended to be used with form 1.

Wing Weight – Weight of the wing in grams (uninflated), excluding optional fittings (i.e. leashes), but including any removable handles.

Image of completed wing – Used to check the window transparency and to identify the wing etc.

Outline of wing – to be defined in drawings – viewed from both above and below. Major dimensions included. Can be included in the same file as the images.

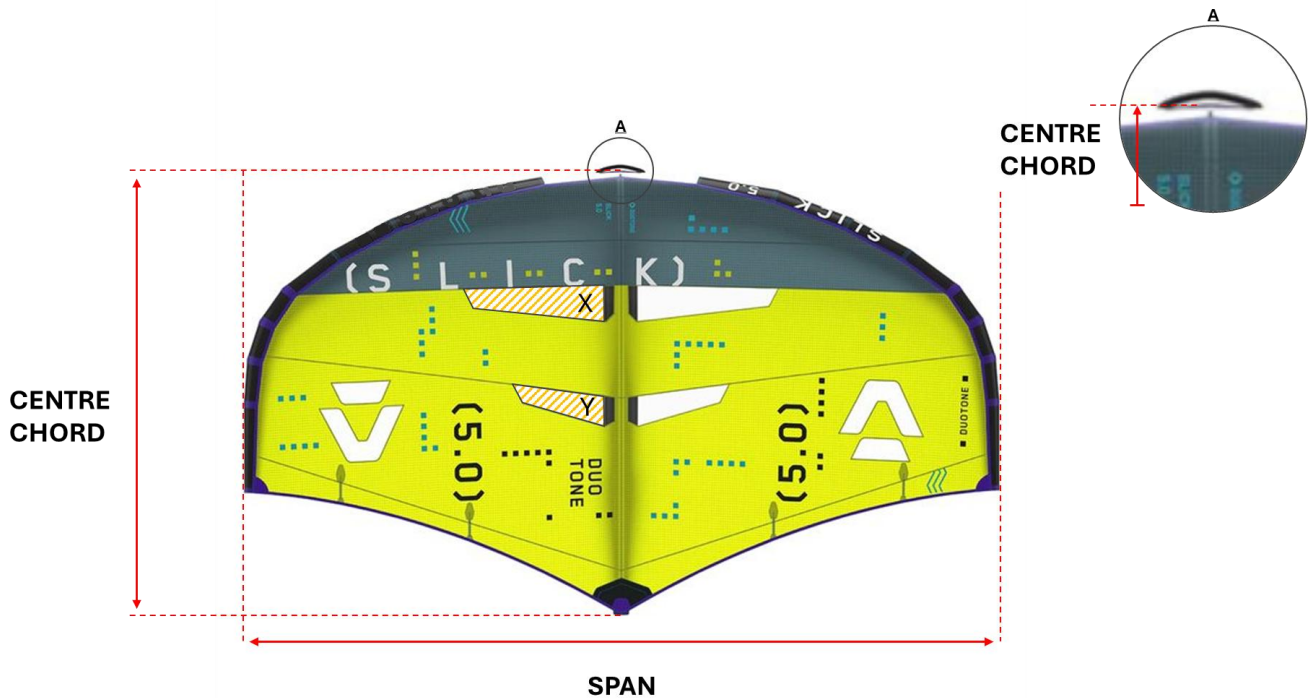


Figure 13 - Wing Dimensions

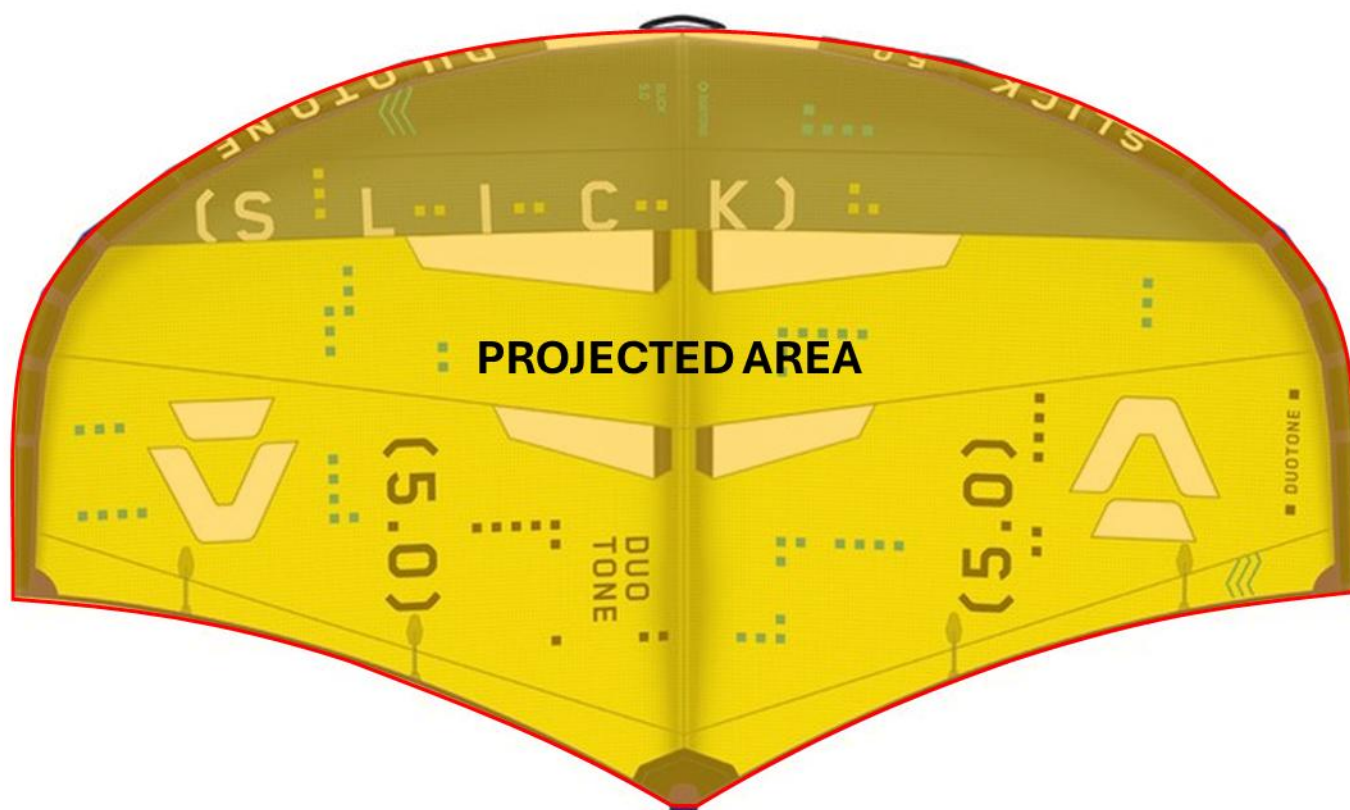


Figure 14 - Wing Projected Area

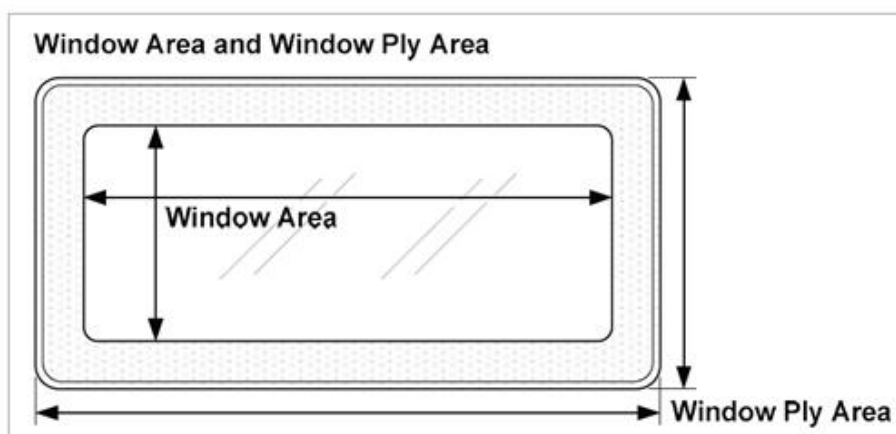


Figure 15 - Window Area Measurement taken from the "Equipment Rules of Sailing 2025-2028"