

2022 RSHYR: Reaching Sail Setting Restrictions: ORCi and IRC

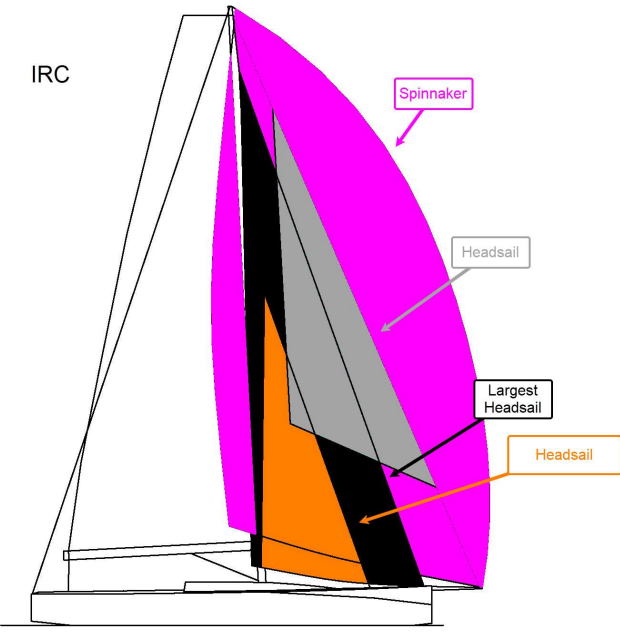
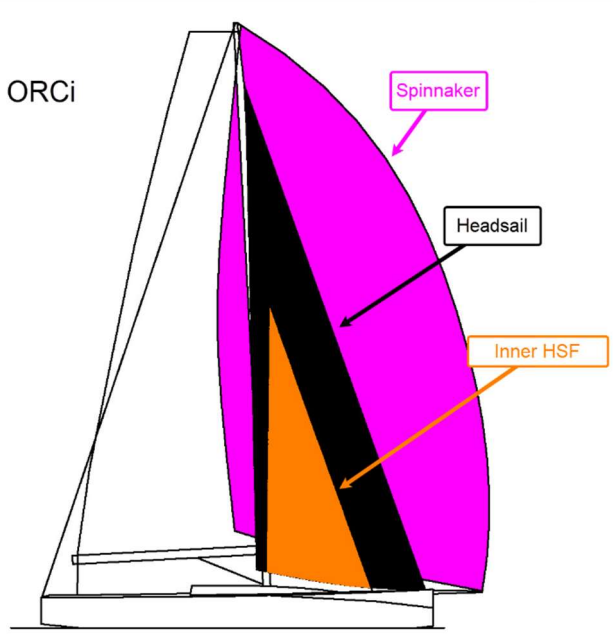
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1. The Situation.

The 2022 RSHYR had divisions for yachts with IRC ratings and ORCi handicaps. Whilst yachts could enter both divisions, the regulations for setting off-wind sails are different between the two systems.

Two configurations seen during the race define the issue.

IRC permits the use of the grey headsail (flown forward of the forestay) with the Spinnaker, ORCi does not.

<p>Whilst a Spinnaker is set, IRC permits any number of Headsails to be set. (See Appendix B)</p>	<p>Whilst a Spinnaker is set, ORCi permits any number of Headsails and Headsails Set Flying to be set <u>on or aft of the forestay</u>. (See Appendix A Rule 208.2)</p>
	

2. Sail Wardrobe Implications

2.1 ORCi

Loose luffed Headsails, tacked forward of the forestay with mid width less than 75% are popular sails, they generate higher driving force than the conventional jib set on the forestay, they are easily handled with furling systems and can be used for cruising and racing.

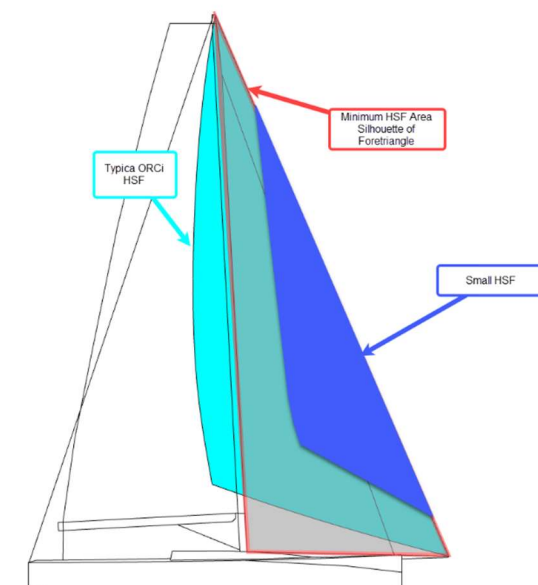
When these sails appeared on ORCi handicapped yachts the ORC developed a scheme to include them in the VPP. This sail type is a “Headsail Set Flying” (HSF). Each sail of this type carried on board is measured individually. The effect of each sail on the sailing speeds at the apparent wind angles where the sail can be used effectively are calculated. It is based on the following inputs.

- The tack position of the sail forward of the mast
- The hoist height (ISP)
- The sail area,
- The mid width/foot ratio

The Spinnakers and HSF’s commonly have other smaller sails set inside them at the same time, and these are not included in the VPP calculation. To cover the situation where a small HSF set to the bowsprit end, in



in conjunction with other, sails aft of this, if the HSF area is less than the silhouette area of the foretriangle, this area is used as the effective HSF sail area. As discussed later this permits a typical IRC triple head rig to compete in ORCi without prejudice.



Because ORCi:

- accommodates Headsails Set Flying of any mid width/foot ratio, and
- uses an effective according to the silhouette area of the foretriangle defined by the luff of the most forward sail, and
- only modifies the handicap polar curves at the appropriate True Wind Angle

Typical reaching sail plans look like this.



When the True Wind Angle widens to allow a spinnaker to be set, Rule 208.2 requires that no Headsails may be set forward of the forestay. This rule was introduced at the same time as the VPP changes to accommodate HSF's. This prevented an arms race where a spinnaker and HSF (possibly tacked part way along the bowsprit) were set simultaneously.



2.2 IRC

IRC rates yachts based on the area of the largest sail, Mainsail, Headsail (which includes Flying Headsails as defined by IRC) and Spinnaker.

In response to growing use of loose luffed sails the “Flying Headsail” sail type was introduced.

but using a different lexicon for the dimension abbreviations.

- Spinnakers, a sail with a half width greater than 75% of its foot length.
- Headsails, any sail set forward of the mast that is not a spinnaker.
It may be tacked and hoisted to any point on the boat centreline.
- Flying Headsails, a sail with a foot length between 62.5% and 75% of its foot length.
It may be hoisted to any point of the mast, but it must be tacked so that it has an overlap of 25% J.

The rating is sensitive only to the largest area of each type of sail, but places no limit on:

- The number of headsails in the inventory
- The number of headsails that may be set simultaneously
- The position of the jib tack.

The 25% J overlap requirement for the Flying headsail means this sail, if carried will:

- probably be the largest area headsail.
- have a limited range of apparent wind angle
- attract a rating penalty that outweighs its performance gain.

Consequently IRC yachts racing offshore have adopted a double or triple head rig that uses the largest area Headsail in conjunction with another sail of slightly smaller area set forward of the forestay, and a “staysail”. Flying these smaller area sails attracts no rating penalty.





3. Harmonization?

ORC and IRC technical staff have discussed this situation. Both agreed that the divergence of approach between competitors in ORC and IRC was unhelpful to competitors and race organisers, and agreed to work together on the issues during 2023. To reach a satisfactory conclusion both systems will be obliged to make changes.

The ORC will review rule 208.2 and any attendant VPP updates that might be needed to properly assess different sail configurations.

The IRC Technical Committee will, I understand, review rating the number of Headsails carried, and the half width limit of 62.5% of Foot Length.

The aim is to reach a point where neither rule imposes sail setting requirements not permitted by the other. However identical sail combinations will, inevitably, continue to attract different rating adjustments due to the different nature of the two rules.



4. Appendix A: ORCi Rules.

208 Headsails

208.1 Headsails may be set on the forestay or **set flying**.

208.2 Headsails set flying may be tacked:

a) in front of the forestay, where

i) it shall be tacked approximately on the boat's centerline, except when it is tacked on a bowsprit that is recorded as movable sideways in accordance with IMS F7.3.

ii) it shall not be used when any spinnaker is set

iii) it shall be set within **ISP** and **TPS** as recorded according to the IMS rule G4.1(a)

b) between the forestay (included) and the mast, where

i) it shall have $HLP \leq 1.1 * J$

ii) it shall be tacked inside a spinnaker, whenever one is set

iii) it may be tacked out of the boat's centerline

208.3 Two headsails may be set on the same tack point, but only if no spinnaker is in use.

208.4 Headsails may be sheeted:

a) to any part of the deck or rail

b) to a fixed point no higher than $0.05 * MB$ above the deck or coach roof

c) to the main boom

d) to the spinnaker pole or the **whisker pole** in accordance with RRS 55.3(a).

Headsails shall not be sheeted to any other spar or **outrigger**.



G4 Headsail

G4.1 A headsail is a sail set forward of the mast, or of the foremost mast if there is more than one mast, and not qualifying as a spinnaker according to G6.1. The following measurements shall be taken:

HHB shall be the **top width**.

HUW shall be the **seven-eighths width**.

HTW shall be the **three-quarter width**.

HHW shall be the **half width**.

HQW shall be the **quarter width**.

HLU shall be the **luff length**.

HLP shall be the **luff perpendicular**.

The measurements can be reduced to the last two items for headsail measurements before 01/01/2009 or when the leech has a clear hollow and the headsail is not the largest in the sails inventory.

If there are battens on the headsails, this shall be recorded as "YES" and if not as "NO". If a headsail is **set flying**, this shall be recorded as one of the following:

- YES: Headsail is **set flying** tacked in front of the forestay.
- INNER: Headsail is **set flying** tacked between the forestay (included) and the mast
- NO: Headsail is set on the forestay.

An appropriate combination of hoists (*ISP*) and tack points (*TPS*) where headsails **set flying** are set shall be recorded.

G4.2 Any device or sail construction used to artificially shorten a **luff** shall be removed for the *HLU* measurement.

G4.3 The distance between **half foot point** and **half luff point** on the headsail shall be not greater than 55% of *HLU*.

G5 Mizzen Staysail

Mizzen staysails shall be three-cornered. The following measurements shall be taken:

YSHF shall be the shortest distance that can be measured from **head** to **foot**.

YSHW shall be the **half width**.

YSFL shall be the **foot length**.

G6 Spinnakers

G6.1 The **half width** of any spinnaker shall be 75% or more of the **foot length**.

G6.2 The symmetric spinnaker shall be symmetric in shape, material and cut, about a line joining the **head** to the center of the **foot**. The symmetric spinnaker shall not have adjustable leech lines. Any spinnaker not qualifying as symmetric shall be considered as asymmetric.

G6.3 Battens are not permitted on any spinnaker.

G6.4 The following measurements shall be taken on symmetric spinnaker:

SLU shall be the **luff length**.

SLE shall be the **leech length**.

SHW shall be the **half width**.

SFL shall be the **foot length**.

G6.5 The following measurements shall be taken on asymmetric spinnaker:

SLU shall be the **luff length**.

SLE shall be the **leech length**.

SHW shall be the **half width**.

SFL shall be the **foot length**.



5. Appendix B: IRC Rules.

IRC RULE 2023 ▶

A5 - SAILS – GENERAL

Spinnaker	ERS G.1.3(f) shall not apply. A <u>spinnaker</u> is defined as a sail set forward of the foremost mast spar with half width (measured as a <u>spinnaker</u>) equal to or greater than 75% of foot length and without <u>battens</u> . A <u>spinnaker</u> may be set reefed by any means while <i>racing</i> under IRC provided that when measured in any reefed condition it continues to satisfy the IRC definition of a <u>spinnaker</u> .
Flying Headsail	ERS G.1.3(d) shall not apply. A sail set flying tacked down forward of the <u>forestay</u> that does not meet the definition of <u>spinnaker</u> and without <u>battens</u> and with a half width (measured as a <u>spinnaker</u>) equal to or greater than 62.5% of foot length . A <u>flying headsail</u> shall be tacked down no greater than STLFHmax and approximately on the boat's centreline, except when it is tacked on a declared articulating bowsprit . A <u>flying headsail</u> may be entirely furled but shall not be set reefed while <i>racing</i> .
Headsail	ERS G.1.3(d) shall not apply. Any sail tacked down forward of the foremost mast which does not meet the definition of a <u>spinnaker</u> or <u>flying headsail</u> A <u>headsail</u> may be hoisted from above the <u>forestay rigging point</u> .

STLFHmax

The greatest horizontal distance from the forward face of the **mast spar**, ignoring any **fittings** and tracks, measured on or near the centreline of the **boat**, to the flying headsail tack point, calculated as follows:

- $STLFHmax = FSFL - (0.25 * J)$
- if the calculated STLFHmax is greater than STL, the flying headsail shall be tacked no greater than STL.
- if the calculated STLFHmax is less than J, the flying headsail shall be considered a headsail.