

IRC Safety and Stability Indices (SSI)

SSSN, STIX, and AVS

Since the late 1980s, IRC certificates have incorporated a SSS Numeral for use by race committees in determining suitability of a particular boat for a race. When the information is available, they now in addition carry a STIX (**ST**ability **I**nde**X**) value and **AVS** (**A**ngle of **V**anishing **S**tability). For further information on these latter, see the Q&As

SSSN

An SSS Numeral value, specific to that particular boat, is printed on each boat's IRC certificate issued by the IRC Rating Authority. A high value indicates that the system evaluates a boat as being more seaworthy. SSSN is the sum of Base Value and Adjustment Value with the two values arrived at as follows.

The Base Value for the hull, rig and appendages is computed from the boat's dimensions and rated parameters. It is the product of several factors, each representing a different safety related feature. A Base Size factor, calculated from the boat's principal dimensions, is modified by each of the other specific factors to take account of variations from the norm. The modifying factors are: displacement/length, beam/displacement, sail area/displacement, beam/length, self righting, rig, keel, engine, and dayboat.

SSSN Adjustment Value (Table 1) allows for recognition of safety related features, principally compliance with a Category of ISAF Offshore Special Regulations (SR), not already evaluated by the rated parameters. Its application is optional and a zero value will be applied unless a request is made by an owner.

Table 1

Full compliance with SR Category	may be rewarded by Adjustment Value (unless restricted as shown by Table 2)
4	+ 3
3	+ 5
2	+ 6
1	+ 7
0	+ 8

Owners may only apply for adjustment based on one of the above SR Categories if the boat complies all the time when racing IRC. Alternatively, if the boat does not comply fully with any SR Category, adjustment for compliance with the specific features described on the application form may be claimed. The maximum adjustment in this case is +3. A maximum limit determined by the calculated base value is imposed on the extent of adjustment, as shown by Table 2.

Table 2

Base Value range	Maximum Adjustment Value
less than 8	zero (no adjustment allowed)
8 - 14	+ 3
15 - 23	+ 5
24 - 32	+ 6
33 - 41	+ 7
more than 41	+ 8

STIX and IRC STIX

When the data is available, either as STIX assessed by a notified body or as IRC STIX calculated by the IRC Rating Authority following submission of data by a boat's owner, STIX and AVS will be printed on each boat's IRC certificate. In a similar manner to SSSN, STIX or IRC STIX is a number representing the perceived 'seaworthiness' of the design, with again a higher value reflecting a more 'seaworthy' boat.

Each boat's STIX or IRC STIX is calculated in accordance with ISO 12217 Part 2 by the combination of factors related to dynamic stability, inversion recovery, knockdown recovery, displacement-length, beam-displacement, wind moment and downflooding, using the following data and methods.

IRC STIX Numbers are calculated using declared or measured IRC data. Each boat shall have its stability assessed in accordance with IRC Rating Authority procedures or by an approved alternative method except that boats of approved one-design classes may use class standard stability data and true sisterships of designs already assessed may make use of sistership data. In such cases, stability data may be reduced. Subject to approval by the IRC Rating Authority, a lines plan from any reasonable source may be used for the calculation of hydrostatic data.

Owners are responsible for the supply of righting moment data from a source acceptable to the IRC Rating Authority in the form required by ISO 12217, Part 2, Paragraph 6. In addition to IRC STIX, certificates will show the angle of vanishing stability as calculated by the boat's designer or other qualified person.

Application of SSI by Organising Authorities

Important Notice

Organising Authorities may incorporate a minimum qualifying SSSN value and/or STIX/AVS and/or IRC STIX/AVS for entry to a race. Responsibility for selection of which is to be used, for the minimum qualifying value(s), lies with the Organising Authority for a race. It is not possible for the IRC Rating Authority, nor any other body remote from the organisation of a race, to lay down firm recommendations or guidance. Only the organisers of a race can be fully aware of the circumstances of a particular race.

SSSN or STIX or IRC STIX?

For many races, SSSN will continue to be an entirely valid method by which Organising Authorities may screen the suitability of particular boats for a race.

Qualification for RORC organised races will depend on the ISAF Offshore Special Regulations Category of the particular race and also the age of the boat as follows:

- Cat 1 and 2 races:** Boats with series date of 1995 and later will be categorised under STIX only.
Boats with series date before 1995 may be categorised under either STIX or SSSN.
- Cat 3 races:** Boats with series date of 2000 and later will be categorised under STIX only.
Boats with series date before 2000 may be categorised under either STIX or SSSN.
- Cat 4 races:** Boats may be categorised under either STIX or SSSN.

Organising Authorities are therefore recommended whenever possible to incorporate qualification for races using STIX and AVS into their race rules, particularly for races of a more onerous

nature, or if there is doubt as to the suitability of a boat, or when it is wished to apply more rigorous criteria, including in every case some direct knowledge of a boat's stability.

SSS Numerals

As examples only, the RORC typically uses the SSSN values shown in Table 3 as default values. There are however circumstances when the RORC will use different SSSN minima for a variety of reasons. These qualifying values for RORC organised races were reviewed for 2006 onwards and in the cases of category 1 and 2 races increased slightly. Additionally, no RORC recommendation is now made for category 0 races, these being considered to be so specific that no general guidance can be offered

Table 3

Minimum SSSN	Typical course	Example/ISAF Race Category
10	Short day race usually with time limit	Typical Solent race/Cat 4
20	Passage race along or near populated coast	RORC cross Channel races/Cat 3
34	Between 250-600 miles	Fastnet Race/Cat 2
43	1000 miles in all weather	Plymouth to Gibraltar/Cat 1

STIX and IRC STIX

ISO 12217 Part 2 defines 4 Design Categories broadly related to ocean, offshore, coastal and local sailing. These 4 Design Categories are analogous (but not directly related) to the ISAF Offshore Special Regulations Categories. The minimum permitted values of STIX and AVS for each design category is shown by Table 4, below. IRC STIX is directly compatible with STIX.

ISAF Offshore Special Regulations note that: *ISO 12217-2 is expected to be capable of being used as a guide to general suitability for competition in Special Regulations race categories.* This comparison is also shown by Table 4.

Table 4

ISO Design Category	A	B	C	D
Minimum STIX or IRC STIX:	32	23	14	5
Minimum AVS	130-0.002*m	130-0.005*m	90	75
SR Category	1-2	3	4	N/A

Where m is the boat's Minimum Sailing Weight.

It must be clearly noted that if categorisation of races is by definition of the required ISO design category (A, B, C, or D), that boats must satisfy **both** the STIX and AVS requirements for that design category. Alternatively, Organising Authorities may instead specify the numerical minimum qualifying requirements for STIX and AVS.