

# VPRS performance based yacht rating – developed for club racing

## A modern calculator: ratings from a VPP (velocity prediction program)

VPRS (velocity prediction rating system) uses a VPP and a set of measurements to predict the sailing performance of a yacht, from which the rating is directly calculated. The measurements are used to determine the resistance to motion presented by the hull, and the drive (and drag) generated by the sails. A rating calculation for a yacht uses the VPP many times to produce a matrix of predicted speeds for several wind strengths and points of sail. A weighted average is then taken; this is biased towards upwind performance to reflect a typical windward/leeward course. The rating is a scaling of the weighted average, expressed as a familiar 4-digit TCC (time correction coefficient).

## Rating (yacht performance) ... vs. handicapping (race results)

Close racing results are the defining goal of handicap systems – these include rating systems which apply corrections, overtly or otherwise. This is not the aim for pure rating systems, like VPRS, which effectively 'remove the boat from the race' to give results which reflect the crew performance and tactical decisions. One-design class events (all ratings equal) clearly illustrate this point; the racing is frequently anything but close.

## Yacht Clubs now racing with VPRS

Parkstone Yacht Club	Hayling Island Sailing Club
Royal Motor Yacht Club	Hardway Sailing Club
Poole Yacht Club	Castle Cove Sailing Club
Lilliput Sailing Club	Royal Western Yacht Club
PYRA (Poole Yacht Racing Association)	SilaVetra Cruiser Racing (Mediterranean)
Chichester Cruiser Racing Club	FVOBA (Bahia Ocean Racing, Brazil)

## Some real advantages ...

- ◆ A scientific rating system costing just £20 for any boat – is now accessible to everyone.
- ◆ Ratings are universally applicable because they do not depend on local adjustments.
- ◆ Modern boats, classic yachts, day boats and sports boats can all be rated.
- ◆ Certificates which include the rating data are published on the website; it is easy to check the measurements for any boat held on the system.
- ◆ A new VPP (giving a rigorous assessment of performance) uses a straightforward set of clearly defined measurements.
- ◆ Performance gains from laminated and low-cut sails, as well as losses from more cruising orientated sails and furling gear, are reflected in the ratings; any combination of these is possible.
- ◆ All boats are individually assessed; departures from class norms are accounted for and significant changes made during a manufacturing run can be captured.
- ◆ Ratings are direct predictions of boat performance and they depend entirely on measurement.
- ◆ TCCs for both strict no-spinnaker classes and for mixed fleets are included on the certificate.
- ◆ Capability proved over the last 5 years - with increasing numbers and widening interest.

**Using VPRS ... for more information see: [www.vprs.org](http://www.vprs.org)**

The on-line guide lists and illustrates the measurements required, which are similar to those needed for other rating systems. Yacht ratings can usually be issued without some of the measurements as they can often be found on the web, or taken from sister ships – and good estimates can normally be generated. Application forms can be downloaded and returned either via email or by post.

Two free trial ratings are available every year to allow the impact of any proposed changes on the rating to be seen – with certificate re-issue if required.

### **Development, refinement and feedback**

New ideas are always welcome and if they're widely beneficial and pragmatic then we'll include them for the next season. The overriding aim is to take proper account of differences in boats and equipment to give a fair rating – and equitable racing. The main change for 2019 has been to adjust the calculation of no-spinnaker ratings to ensure that spinnaker and no-spinnaker boats can race fairly together.

The mathematical models in the VPP have been continually refined and extended since the original design and VPRS can now rate boats between 5m and 35m with displacements ranging between 300kg and 50 tonnes.

### **Origins**

VPRS was developed in 2009 – in response to an invitation by PYRA to address the dissatisfaction with the rating systems used in Poole Harbour. One system was considered too expensive for many, whilst another was considered to be flawed. As a result, PYRA races were divided across two rating systems which reduced the class sizes and made the racing less competitive, and hence less attractive. Comparisons across the split fleet were impossible, the scoring was onerous, and the fleet was reducing in size. Similar problems were also evident at club level.

VPRS has its origins in a private research project which started in 2007. The aim was to take a scientific approach to the problem of predicting yacht performance whilst limited to a restricted set of measurements. Development was verified against speed-polar data which had been logged for a variety of conditions whilst racing. Originally designed to model a single yacht, the scope of the development was extended and it was made generic to give predictions for other yachts. Subsequent testing then showed accurate modelling for a diverse range of craft, and a comparison with IRC ratings revealed a close correlation.

In 2009 PYRA expressed an interest and sponsored further development. This was undertaken in consultation with the Poole racing community, and a successful trial was conducted during 2010. As a result, a large majority voted at the PYRA AGM to adopt VPRS for the entire fleet – replacing both IRC and PHHS. This change allowed class structures to be simplified - and with fewer classes came the prospect of much more competitive and attractive racing.

### **The future**

All of the clubs which raced with VPRS in 2018 are returning in 2019, and several others are considering adoption. As an entirely independent design by engineers with racing experience, it is a fair and objective rating system that has wide appeal.

As VPRS grows, there will be greater opportunities to simplify class structures and to continue making club racing more competitive and inclusive.