VPRS Weigh-day guide

This document is a subset of the full measurement guide and is intended to provide a quick-reference guide to weighing and measurements to take on the day. ***Please don't hesitate to contact us for advice*** - if there is anything that you are unsure about. Weighing yachts is time-consuming and can be costly, so it's important to get a good result.
Ensure that during lifting, insurances for both the vessel and public liability are in place.

Using load cells

When using a load cell to weigh a yacht, please note the following requirements:

- the vessel must be in the 'empty weight' condition - see definition below
- the load cell must have a valid certificate of calibration, and a copy acquired
- the load cell calibration error should not exceed +/-0.5% at the measurement point
- the load cell should be able to resolve changes of +/-0.25% at the measurement point
- if either load-cell tolerance is not met, any measurement error must not exceed 0.75%
- the yacht must be hanging freely from a single-point lift
- the yacht must be at rest
- lifting equipment engines should be shut down
- authenticated weights can only be recorded by a VPRS measurer

Weighing can only be undertaken in calm weather. Wind speeds in excess of 10 knots are likely to introduce an offset error on account of windage. Gusting winds will make the readings unstable. The aim is to determine the boat weight to within 1%, taking into account errors arising from the conditions and from the accumulated load-cell errors.

Definition of empty weight

For compatibility, this is similar to IRC, with the vessel prepared as described below:

Vessel to be fully rigged (spars, standing rigging, running backstays) **and dry:** the bilges, any other sumps, any raised sections of the hull interior structure, and any sinks and toilets, must be empty.

In addition, the empty weight ...

includes: all halyards, main and mizzen sheets, spinnaker pole, bow sprit, engine (installed or on board), batteries, fixed internal ballast and wash boards. Also includes all permanent fixtures and fittings for the accommodation - which must be in place. Where any of these items are on board, they must also be on board when racing.

excludes: all sails, headsail sheets and guys, spare rigging, the contents of all tanks (including ballast tanks), anchors and cables, tools and spares. Additionally, all removable equipment (gas bottles, cooking and catering utensils, safety equipment including life rafts), all clothing and bedding, and personal effects, must be removed from the vessel.

Tankage note: where the capacity is stated, or can be readily determined, tanks may instead be pressed up. In cases where it is straightforward to determine the volume of the contents, no action need be taken. The additional weights will be calculated with reference to capacities and specific gravities, and the total will be subtracted from the recorded weight.

Measurements to take whilst the boat is empty

Having the boat prepared in the 'empty weight' condition provides a good opportunity to measure the bow, stern and topside overhangs, the transom height and the freeboard (see definitions below).

Measure the overhangs by hanging a plumb-bob from the bow, stern and toe rail, and use a wooden ruler (or any ruler that floats) to measure from the plumb-line to the hull.

Establishing the draught: it is also possible to take a measurement whilst alongside to allow the draught to be established – measure the vertical distance from a datum point on the topsides/deck edge, to the surface of the water. The vertical distance from the bottom of the keel to the chosen datum should be measured prior to launch, although if this is forgotten, then it can of course be taken at next refit.

Measurement definitions

Linear dimensions should be taken to the nearest centimetre.

Bow overhang The horizontal distance from the point where the stem cuts the water to the forward limit of the hull length (excluding any fittings), with the boat in the empty weight condition.

Stern overhang The horizontal distance from the point where the hull meets the water, ignoring any skeg, to the aft limit of the hull length (excluding any fittings), with the boat in the empty weight condition.

Topside overhang Measured where the beam is at a maximum (this will be a point located on the topside for a yacht with tumblehome). The horizontal distance perpendicular to the centre-line taken from the point where the side of the hull meets the water, to a point vertically below the point of maximum beam, with the boat in the empty weight condition and upright. Best taken as an average of port and starboard measurements to reduce the error arising from any list.

Stern height The vertical height from the surface of the water to the aft-most point on the hull moulding, with the boat in the empty weight condition. If the aft-most point is underwater, record a stern height of zero. For yachts with an outward-sloping transom which is out of the water, first drop a vertical line from the aft-most point of the hull. Then project the underside of the hull and mark the point where it intersects with the vertical line. Measure the vertical height from the water to this point.

Freeboard The vertical height of the hull topsides, adjacent to the mast, measured from the surface of the water to the edge of the deck with the boat in the empty weight condition. If not submitted, the freeboard will be estimated using a formula based upon the hull length.

Draught The maximum depth below the surface, including the keel, with the boat in the empty weight condition. If the boat has a lifting keel, the draught should be given with the keel fully down.