

Minimum Planing Speed

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There are a number of traditional 'milestones' that can be used to predict the speed necessary for a boat to fully plane. You can expect a boat to be on a plane above a speed/length ratio of somewhere between 3 and 5, which non-dimensionally is above a Froude number (Fn) of 0.9 to 1.5. Similarly, a volumetric Froude number (Fv) of 2.5 to 5 is often cited for minimum planing speed.

As you can see, 'critical' planing velocities cover a broad range. Differing hull parameters - particularly the aspect ratio of the planing surface - all affect the planing performance and the ease with which a boat gets up on plane. Here at HydroComp, we have worked up a rule-of-thumb formula that has shown good correlation with actual vessels. The formula is:

$$V(ks) = \frac{k * LCG}{\sqrt{B}}$$

where,

k = 4.0 for feet and 7.2 for meters,

LCG = longitudinal center of gravity from the transom, and

B = the planing beam.

This formula accounts for the efficiency of the planing area due to the relationship between planing beam and LCG.

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