Rowperfect

Software Algorithm

The Rowperfect software has been designed to give a "virtual boat speed", and therefore race and training results on the rowing simulator match, as closely as possible, to those in the boat. It has a weight correction factor, and a power to boat speed conversion factor built in.

The boat speed conversion factor is an empirical, composite, factor that is obtained by matching boat speeds of different boats to power levels achieved on the rowing simulator. This conversion factor therefore not only reflects the difference in friction levels of the various boat types, but also the efficiency of converting rowing simulator power into boat speed (e.g. the difference between a 4- and a 4x). It therefore also reflects difference in the efficiency (if any) of converting power into propulsion that might exist between female and male rowers.

At the time the Rowperfect software was designed in 1991 - 1993 using the world championships data then available, a marked gender related difference was suggested; hence different gender related conversion factors have been used in the software initially.

Since then more data has become available, which now suggest that female rowing technique apparently has got to the same efficiency level as male rowing.

This was the main reason to introduce the current version V4 of the software. In this version the speed conversion factors for male and female rowers are identical.

Because small differences in stroke profiles between male and female exist, and will continue to exist, the gender identification in the .ini file has been kept live, in order to be able to identify the gender of the athlete making stroke template curves.

Calculation Validity

Recently Casper Rekers did another check to test the validity of his calculation method for conversion of boat speeds from one boat class to another.

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The weight adjustment factor that the Rowperfect software uses is related to the relation between the variation in displacement of a certain boat type and its variation in wetted surface area. In the calculations the ratio of wetted surface area of a given boat type at different displacements is approximated considering the boat as a semi-cylinder of a given length.

To further validate this approximation he made a comparison between a coxed and a coxless pair with the same calculation procedure, and comparing the outcome to actual results. Input data were:

- for 2- : length 10.30 m, weight boat 27 kgs, weight oars 2.5 kg each.
- for 2+ : length 11 m, weight 32 kgs, weight oars 2.5 kg each, weight cox 55 kgs.

In Lucerne at the **World Rowing Championships, 2001** racing conditions were very stable. The coxed and the coxless pair races were both won by the UK crew of Cracknell and Pinsent in very tight races. The times they rowed in these two races were: 6:49.33 for the coxed pair and 6:27.57 for the coxless pair respectively. In their coxed pair race, Pinsent and Cracknell visibly eased-up a couple of strokes before the finish, which I estimate, may have slowed them down by one or two seconds. Assuming their weight at average 100 kgs each, the weight-corrected speed ratio between the coxless and the coxed pair, for this crew, I calculated from the above input at 1,0505.

From this one can make the following comparison, using the time of the coxed pair as a base, and calculating the theoretical time of the coxless boat, based on wetted area/ weight correction factor as used in Rowperfect.

Base	Actual	Calculated	Actual	Difference Calculated as
2+	2+	2-	2-	2 secs

Even without the "easing up" correction, I think this is as close as one would wish, and demonstrates clearly the validity of the "wetted surface" based weight correction factor. With the "easing up" correction of 2 seconds to bring the time for the coxed pair to 6:47.3 this would result in a calculated time for the coxless pair of 6:27.75 which is spot on.