

## Q & A

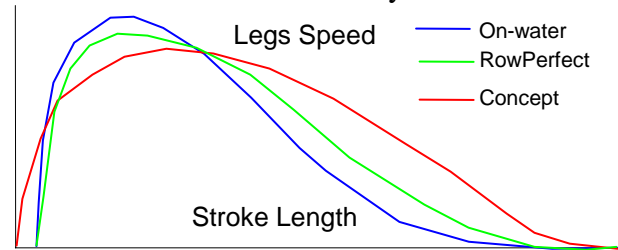
**Q:** We received a number of questions about differences and similarities of ergo and on-water rowing. These are some of them: What are the main differences between on-ergo and on-water rowing technique? How do they affect each other? How to use an ergo better for selection of the rowers? What is the biomechanical difference between stationary Concept-II and mobile RowPerfect ergos?

**A:** We already published a comparison of biomechanical features of rowing on-ergo and on-water (RBN 2003/10). Here we will try to give a more practical explanation of the facts.

It is obvious that rough mistakes in a rower's technique, such as "bum shooting" or early body opening at catch should be seen on both ergo and on-water. It is also obvious, that an ergo can not reproduce arms and shoulders movement, vertical movement of the handle, feathering and squaring of the blade. Below are six main biomechanical differences between these two sorts of exercises:

1. Stroke rate on-water is always 10-15% higher than on stationary ergo, because the recovery phase is longer, which is affected by higher inertia forces. Mobile ergo eliminates this difference.
2. Rowers usually execute 3-5% longer stroke on stationary ergo, which occurs by means of 8-10% longer leg drive. The reason is the rower's inertia, which helps to bend knees passively at catch. This factor can increase risk of injuries. Also, it is doubtful that the longer drive can be translated into a boat, which requires active flexibility at catch and faster leg drive. Mobile ergo eliminates this difference as well.
3. Handle speed curve is more rectangular on-ergo and has a more peaky shape on-water. This difference affects the rower's feeling of the handle acceleration and is related to the difference in gearing ratio. This difference is NOT eliminated on a mobile ergo.
4. Difference in magnitude and ratio of the stretcher and handle forces: on-water foot-stretcher's force is 30% higher than that of handle force, whilst on ergo they are nearly equal. This difference is NOT eliminated on a mobile ergo.
5. Difference in the timing of the stretcher and handle forces. Mobile ergo eliminates this difference.

6. There are differences in power production of the body segments. Legs execute more work on stationary ergo, but in slower static motion. On water legs work much faster at catch, when the force is not very high and, therefore execute less power. In this aspect a mobile ergo stands somewhere between a stationary one and on-water:



In general, there is about 60-80% similarity between ergo and on-water rowing, which depends on the type of ergo. Currently commercially available rowing machines can not simulate interaction of the rower with the handle and the stretcher and temporal structure of the drive in the boat (micro-phases, RBN 2004/1,2). This is key point, something that rowers call "boat feeling" and define as whether the boat is "going" or "not going".

Rowing on-water and on-ergo are two different sorts of exercises. Ergo should be considered as a cross-training in rowing. Obviously, ergo is much closer to rowing than running, cycling or weight-lifting, but it is still not rowing. This should be remembered when the ergo is used for testing and selection purposes. A good rower should achieve certain result on an ergo, which shows his/her sufficient physiological work-capacity. Other exercises (running, weights) can be used (and were used) for this purpose as well.

Higher results in cycling or weights can make an athlete a better cyclist or weightlifter, but can make him/her a poorer rower. Similarly, higher than certain standards performance on an ergo can make a faster "ergoer", but slower rower, i.e. on-water and on-ergo performance can have a negative correlation. A number of illustrations of this fact can be seen. One of the most known is a competition of Australian and UK men's pairs during the last Olympic cycle, where the Australians showed 10-12s slower results on-ergo, but beat the English pair on-water.

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