



Multi One Attitude  
Foundation

RACE FOR WATER

## **REDUCING THE WATER FOOTPRINT: A CHALLENGE FOR NAVAL CONSTRUCTION**

**What is the water footprint? It's the amount of water needed to manufacture a product. Even boats have a water footprint... which the boatyards can reduce if they improve their industrial processes.**

You need 140 litres of water to fill a coffee cup. You need 2,700 litres to manufacture a T-Shirt, if you take into account the whole process from the cotton plantation to the shop which has sold you it. To measure the amount of clean water necessary to manufacture an object or commodity is to measure your "water footprint" and hence its impact on the resource.

Raising public awareness about this matter is one of the two challenges that the Multi One Attitude Foundation is hoping to take up. During its forum entitled "Ocean racing, a platform for sustainable development?", held on 25 March at the Cité de la Voile Eric-Tabarly in Lorient, it asked Dimitri Caudrelier, from the management consultancy firm Quantis, to explain this notion, so as it can be taken into account and integrated by those involved in sailing and naval construction.

"The calculation for CO<sub>2</sub> [the carbon balance] is no longer the only criteria for assessing environmental impact, explains the expert in product lifecycle assessment (LCA). 97.5% of the water available on earth is saltwater. Just 2.5% is made up of freshwater, of which just 30% is available in ground water." Specialists estimate that mankind will need an additional 40% of drinking water in the next 20 years.

Hence the importance of measuring your water footprint... so as to better contain it and even reduce it. Of the numerous initiatives underway to calculate this footprint, Dimitri Caudrelier retains those related to the Water Footprint Network and ISO, the international standardisation organisation, which gathers together 75 countries around a common standardisation plan. "Referred to as ISO 14046, the latter is likely to be available in two years' time", he reckons.

To gauge the amount of water used to produce a product or foodstuff, you initially have to make an inventory of the water consumption from the beginning of the process through to its final user. You then apply a weighting in relation to the local water stress. "Consuming 1,000 litres of water in Iceland, a country where there is a great abundance of the resource, won't have the same impact as in Morocco, explains Dimitri Caudrelier. At this stage, we already have a clear vision of its water footprint. However, it is possible to add a third stage to this evaluation, by using the LCA to measure the consequences of the consumption of water on the human health, ecosystems and climate change, etc."

It is still the case that few companies have integrated the notion of a water footprint in their environmental specifications. However, the Multi One Attitude Foundation has decided to take the plunge for its MOD70 trimaran "Race for Water", the first in a series of MOD70s, which will participate in the Multi One Championship. The results of the study entrusted to Quantis are as follows: for a year of use, the yacht will consume 1,336 m<sup>3</sup> of water. Moreover, it will have a carbon balance equivalent to 82 tonnes of CO<sub>2</sub>.

"What's interesting is that the direct impact of the boat (namely its use) is only 6%, whilst its indirect impact, which is linked to raw materials and end-of-life is 94%. As such, ultimately its environmental impact is fairly limited" observes Dimitri Caudrelier.

Of all the construction materials implemented in the construction of the MOD70, it's the carbon which 'weighs' heaviest in terms of the water footprint: it is manufactured in Japan, where electricity is essentially of nuclear origin. As such a huge amount of water is needed to cool the power plant reactors. Once the construction is complete, it's the use of the rib, used to get the boat in and out of port, as well as the plane rides for the crew and the public relations staff, which really bump up the trimaran's carbon balance and water footprint. The rather onerous ecological balance of the MOD70 is offset by its 10 year lifespan, which is exceptional for a competitive race boat.

How do you improve on the quality of the water footprint for naval components? "Composite materials already exist in nature", replies Christophe Baley, from the Laboratory of Materials Engineering of Brittany (LIMATB). Marine eelgrass, a fibrous plant, could be used to manufacture natural composite materials. "However, the development of marine-based fibres won't be a reality within the next 20 years," the researcher reckons.

Another option is to use agricultural-based materials. Several fibres, such as hemp or flax are proving to be a source of interest for the LIMATB. "You have to be careful though, as farming doesn't always respect the environment", comments Christophe Baley. However, he thinks that by mimicking certain ecosystems, you could reduce the consumption of energy and water in the design of boats.

With his monohull made from flax fibre, naval architect Julien Marin proved that it was possible to reduce the water footprint by opting for natural materials. Skippered by Thibault Reinhart, "Araldite" is already sailing in the bay of Douarnenez, NW Brittany. Objective: to take the start of the Mini Transat 6.50m in September 2011. "The competitions should enable the strength of flax observed during mechanical tests to be confirmed" says a hopeful Julien Marin. Thanks to this experience and research, the sailboats of tomorrow could be manufactured from natural recyclable materials, which use less water and are able to be composted. Just like coffee grounds in fact!

For further information: [www.multioneattitude.com](http://www.multioneattitude.com)



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