Material properties

Aluminium and the green urban ferry

By Shapes editorial, Hydro
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We have been working on a project known as the Urban Water Shuttle. It is a Norwegian project that aims to realize a zero-emission and high-speed passenger ferry made of aluminium. We like to call this project the Tesla of the Seas.

The Fjellstrand shipyard along with the cluster NCE Maritime CleanTech West is developing the ferry. NCE is one of the most complete maritime commercial hubs anywhere. Norway also has companies like Hydro, who are expert in developing and manufacturing aluminium products for offshore and maritime applications. So it is an exciting collaboration. We can create this vessel, test it in Norwegian waters and then export it to other countries with the opportunity to make public transport green the world over.

Clean business

There is no doubt that the market for environmentally friendly technology is immature in many segments and part of that has to do with the lack of regulations. There are other gaps, too, like lack of finance, lack of infrastructure for new fuels, and also more institutional barriers, where decision makers and the contractual regime in the industry only consider investment costs and not operational costs.

The main strategy in strengthening the cluster partners' competitiveness, is to increase innovation. We are doing this by establishing joint innovation and demonstration projects where new technologies and solutions are introduced, and where the partners bring in their different expertise.

Besides the Urban Water Shuttle, we have worked on the world's first battery-driven ferry, called Ampere, and we have contributed to offshore vessels, fishing vessels and also tourist boats that use electric and hybrid systems – and aluminium.

Light and sustainable

Let’s get back to the Urban Water Shuttle. This vessel is going to be built in low weight, with sustainable materials like aluminium, and propelled using the latest hybrid technologies, a combination of fuel cells and battery power.

The project objectives are reduced urban congestion, reduced emissions and reduced city infrastructure costs. This vessel could be realized in cities located close to water and waterways, rendering the concept relevant for many cities. It fits perfectly the goals of the European Union for zero emission and for the reduction of dangerous gases.

Aluminium is right

There are many reasons why aluminium is perfect for this particular vessel. Here are the most important ones.

Weight. Other materials may be lighter than aluminium, but you need to look at the weight of the finished boat, not of the hull alone. And aluminium definitely benefits high-speed boats.

Strength. Aluminum has good properties in relation to the cold. In fact, its strength increases at low temperatures.

Fire. Because it is non-combustible, aluminium meets the requirements of having non-combustible materials in the structure. Newer composite materials are admittedly competitive, but here in this area, fire is an uncertainty.

Durability. Aluminium boats last. As an example, the first boat that Fjellstrand built in aluminium is now 50 years old and almost as good as new.

Quality. It is simple to run calculations on aluminium and one can easily verify quality by known NDT methods both on record and route. This is not fully so verifiable with newer materials.

Repairs. Aluminum is very easy to repair and not very time-consuming, and it is easy to verify its quality. Composites are also possible to repair, but the procedures are slightly more demanding and comprehensive in order to achieve good quality.

Lifetime. As mentioned earlier, what determines the choice of material is the lifetime of the structure – and the positive effect of aluminium recycling. Composites are not possible to recycle for reuse as a material in new vessels.

This is what makes aluminium preferable as a material in the vessel.

Interested in learning more?

If you are interested in learning more, then please contact us and we will put you in touch with the right expert.