References

Sustainable solution for Denmark’s largest infrastructure project



Sustainable plastic replaces steel

Durable plastic tanks with a lifespan of 100 years will ensure a sustainable and economical solution to provide employees clean drinking water and good sanitary facilities 24
The Fehmarnbelt Tunnel linking the Danish island of Lolland with the German island of Fehmarn is Denmark’s largest ongoing infrastructure project. But it’s not just a construction site – it’s also a residence for approximately 1,300 employees. Durable Weholite tanks with a lifespan of 100 years will ensure a sustainable and economical solution to provide employees with clean drinking water and good sanitary facilities 24/7.

Project Facts:

Location
Rødby, Denmark

Completion
2021

Building Type
Transportation

Project Type
New building

Sustainable solution for Denmark’s largest infrastructure project

The Fehmarnbelt Tunnel linking the Baltic Sea regions of Denmark and Germany is one of Europe’s largest ongoing infrastructure projects. This combined road and rail tunnel will be 18 kilometres long, featuring a four-lane motorway and a double-track electrified rail line. Travel time across the Baltic Sea will be cut from 45 minutes by ferry to around 10 minutes by car and 7 minutes by train.

The immersed tunnel will consist of 89 individual elements. With a 17.6-kilometre submerged section, it will be by far the

longest immersed tunnel in the world. Its foundations will reach more than 40 metres below sea level, making it one of the deepest tunnels of this type as well. The tunnel is expected to be opened in 2029.

Facilities for 1,300 employees

Now, accommodation facilities are being established for the employees, who are gradually making their way to Lolland and their jobs for the next many years.

Esbjerg Maritime Service (EMS Aps), with Uponor as its subcontractor, was awarded the contract by the consortium Femern Link Contractors (FLC) for ensuring clean drinking water and sanitary conditions for the working staff. FLC is in charge of the design and construction of the tunnel, the portals and the ramps.

''This isn't just a construction site. It's also the residence for approximately 1,300 employees moving their lives to Rødbyhavn to work on the largest construction project in Danish history. It's essential to ensure that there's clean drinking water and good sanitary facilities 24/7,'' says Bent Rønfeldt, Project Engineer at Uponor Infra.

Uponor is manufacturing, delivering, and installing the plastic tanks needed for drinking water and wastewater solutions for staff accommodation, as well as for the factory where the employees work. The tunnel elements for the Fehmarnbelt link will be produced at a large purpose-built factory east of the coastal town of Rødbyhavn on Lolland Island. The factory will be equipped with a temporary new harbour where most of the raw material for element construction will be delivered by sea.

The port at Rødbyhavn will be the largest of its kind in Northern Europe. This also means that both drinking water and wastewater must be transported over long distances.

''This requires a lot of energy, especially when many smaller distribution points are used. Therefore, Uponor's task is to create a compact and optimised central solution that is more energy efficient,'' says Rønfeldt.

Prioritising the sustainable angle

EMS has prioritised the sustainable angle of the project infrastructure, an issue that's very important to Uponor, too.

''Uponor Infra Project Service has the expertise and knowhow from numerous previous projects to manage the task. It's exciting to be part of such a comprehensive project,'' Bent Rønfeldt says.

The original plan was to use steel tanks for drinking water and wastewater solutions. However, it soon became clear that lightweight and easy-to-handle plastic tanks will shorten both delivery and installation time.

"As a maintenance-free solution with an estimated lifespan of 100 years, the tanks will ensure a long-term sustainable solution for not only the Fehmarn project, but also future projects. This was in every way the most economical choice in both the short and long run,'' says Tom Sørensen, Project Manager at EMS Aps.

Plastic has undeniable advantages: it's a durable and flexible material, and when made of polyethylene or polypropylene, the tanks have no risk of corrosion. In addition to this, Sørensen points out that one significant advantage is that the control system and all the fittings of the tanks can be connected before delivery to the construction site.

Uponor delivered to the site a total of seven Weholite tanks with an inner diameter of 3,000mm. Three of the tanks are for drinking water with capacity of 100m3, the three tanks for sewage are of 100m3 and 75m^3. In addition to this, Uponor supplied a 20m^3 tank for process water. All the tanks have already been installed.

Excellent for industrial solutions

Plastic, with its long lifespan, high chemical resistance, and minimal need for maintenance, is often a better choice than steel, even in industrial solutions.

''EMS Aps is a supplier to the oil and gas sector, energy sector and wind energy, as well as power-to-X process plants.

The fact that they made the decision to use plastic solutions for the Fehmarnbelt project emphasises that various applications can be implemented with plastic in industrial sectors where steel has traditionally been the material of choice,'' says Bent Rønfeldt.

Once the workers' village in Rødbyhavn has been established, the new partners Uponor Infra and EMS Aps will move on to work on the factory where the tunnel elements will be produced. The collaboration between the two companies is the start of a forward-looking partnership that, in the long run, will serve many different industrial sectors.

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