Emano and Apex: Certifying to global standards for a safe and sustainable energy future

Emano Kunststofftechnik GmbH, Germany

Client:
Emano Kunststofftechnik GmbH, Germany

End client:
APEX Energy Teterow GmbH, Germany

01. Customer
Emano Kunststofftechnik GmbH is a German plastics manufacturer with over 60 years experience, specialising in the use of rotational sintering to produce high quality, hollow body vessels.

02. The Requirement
Ensuring the quality and safety of an innovative green hydrogen storage vessel for Emano's client Apex Energy, to be installed at one of Germany's very first hydrogen power plants.

03. The Solution:
An end-to-end certification service across design, product and manufacturing, against international best practice including European Pressure Equipment Directive (PED) and American Society of Mechanical Engineers (ASME) standards.

In June 2020, the German government published its national hydrogen strategy, putting one of the world's most abundant elements at the heart of an ambition to be carbon dioxide neutral by 2050. Hydrogen, already widely used in industrial processes, is increasingly seen as key to meeting climate change goals, solving the problem of how intermittent sources of renewable energy - in particular solar and wind - can more closely match demand.

Using electrolysis powered by renewable sources, water is used to create green hydrogen to be stored for use on demand. Storing hydrogen, however, is inherently more challenging than other fuels Volumes are bigger, it ignites easily, combusts powerfully and carries risks to the components around it.

If hydrogen's potential as a green energy solution is to be fulfilled, storage and distribution risks must be effectively managed. Here, we examine the impact of LRQA's end-to-end inspection and certification capabilities on one of Germany's most ambitious hydrogen energy projects to date.

Certifying design innovation in green hydrogen storage.

As Germany turns towards hydrogen, manufacturing company Emano has collaborated with the Fraunhofer-Institute collaborated with the Fraunhofer-Institute and the Leibniz-Institute for Catalysis to develop hydrogen storage manufactured from a gas-tight plastic. This innovative design, combining plastics with a carbon fibre shell, offers both weight and price advantages, as well as improved risk performance in terms of fatigue properties.

The first of these tanks, designed for its client Apex Energy, will be installed at a new hydrogen power plant serving a small industrial development at Rostock-Laage, near the Baltic Sea. The plant is among the first of its kind in Germany.

“Green hydrogen’s emergence as a key pillar of Germany’s national energy strategy creates a major opportunity for Emano’s precision-engineered plastic storage solutions. Like any innovation, however, the challenge is to give our customers confidence that they can invest in innovation without any compromise on safety or quality.

“This is where the breadth of LRQA’s expertise, integrity and reputation have been invaluable. The result is a better engineering solution that is more cost-effective for our customers – an outcome that can only make it more likely that Germany will be able to make it’s green hydrogen strategy work and meet its climate change goals.”

Emano turned to LRQA to certify both the design and manufacturing of these safety-critical storage tanks, with LRQA’s surveyors required to look beyond European standards.

Heino Axnick, Technical Quality Manager at LRQA explains:

“Given hydrogen’s potential as a global energy solution, it made sense for Emano to take account of future export markets and new applications when considering safety and quality standards.

“Given our track record in design verification, testing and inspection and as the largest provider of ASME services outside of the US, LRQA was well placed to support certification not just to PED Module B and Module F, but also ASME Class I, Section 10, which specifically focuses on fibre reinforced pressure vessels.”

Certifying manufacturing and production.

With the capacity to produce up to 300 tonnes of hydrogen per year directly from water, the Rostock-Laage facility requires 40 of Emano’s newly certified hydrogen vessels enabling 200kg of hydrogen storage capacity. With the design and manufacture certified across European and US standards, Emano is able to target valuable export markets, as well as future applications for the technology, including domestic storage.

Monitoring and inspection.

With its design, manufacturing processes and end product certified, Emano’s innovative green hydrogen storage tanks have successfully been delivered and installed at Rostock-Laage. Apex Energy expects this ground-breaking hydrogen energy plant to become operational in late 2021 – at which point Emano’s engineering will be under scrutiny again, as part of Germany’s requirement for regular inspection of pressure equipment and monitoring of explosion protection and plant safety.

Get in touch

Visit **www.lrqa.com/uk** for more information

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