

VAhyper – THE PRODUCT OF CHOICE FOR HYDROGEN UNDERGROUND STORAGE OPERATIONS WORLD-WIDE

Explore the currently most wanted customized solutions for hydrogen applications.

Companies involved in the production and storage of hydrogen approached voestalpine Tubulars to develop a product solution for their hydrogen applications. The reasons: they were searching for a partner who can provide safe and reliable product solutions, who has the essential know-how regarding threaded pipe connections and steel grades and who has the testing capabilities to design the optimal product solution in a timely manner. All these parameters are a prerequisite for safe handling with hydrogen in any way.

With its long-term experience in connection development and manufacturing for the oil and gas industry, its certified quality, safety and numerous other management systems, its experience in steel and tube production, its on-site R&D team and testing facilities, voestalpine Tubulars met all these conditions.

voestalpine Tubulars transferred its know-how from decades of product development and experience within the oil & gas segment to develop **VAhyper, the hydrogen-tight Premium Connection**, increasing safety for hydrogen applications.

6,070 ft of 4 ½" x 12,60 ppf Tubing with VAhyper thread connections had been used for a hydrogen storage project in the Netherlands in Europe in 2021/22, where the first snubbing operations (removal of tubing from a pressurized well-bore) world-wide had been performed successfully with 100% hydrogen.

Project key data	
Location	Netherlands, Europe
Application	Hydrogen storage project
String Length	6,070 ft (1.85 km)
Material used	4 ½" x 12,60 ppf VA-H2-L80-1 VAhyper





VAhyper

The hydrogen-tight
Premium Connection

The first pipes shipped to the customers withstood storage pressures of 2,900 psi (200 bar) over a long period of time at field conditions. In addition, the pipe connection VAhyper had been tested successfully at a pressure of up to 10,150 psi (700 bar) under 100% hydrogen in the load frame.

Beside a hydrogen-tight premium connection, also a **tailor-made steel grade for hydrogen applications** was needed. For current demands, **VA-H2-L80-1** was the solution of choice and tested against susceptibility to hydrogen embrittlement in gaseous atmosphere and in more severe aqueous near-reality test solutions, both up to 150 bar H₂ partial pressure. Additionally, an immersion specimen for testing the hydrogen uptake was implemented under these environments. Further grades up to higher material strength levels are available and will be tailored to the characteristics of the specific application.

To complete the product range, the **line pipe grades L360N or X52N and L360Q or X52Q** were tested for hydrogen applications, hence we can also offer a **tailor-made solution for distribution lines**.



PRODUCT CHARACTERISTICS AND BENEFITS

- » **Safe and reliable**
 - › Prevents end users from troubles
 - › Proven by long-term know-how and experience
- » **Tailor-made**
 - › Exceeds the customer requirements
 - › Fits for the characteristics of the specific application
- » **Tested directly on-site**
 - › Provides an essential advantage regarding (fast) development time
 - › Acts as a proof for the optimal product solution

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