

NEW ENERGIES



Vallourec® New Energies

Enabling opportunities in clean energy

With decarbonization become increasingly urgent, Vallourec has developed a strong offer in clean energy. Using our expertise in harsh environments, we have tested and qualified many of our products for new applications, while also pioneering solutions in areas such as geothermal and hydrogen storage.

The Vallourec® New Energies portfolio is a collection of tailored solutions designed to help customers accelerate their energy transition while benefiting from the company's decades of experience in the energy sector.



BIOMASS IN BRAZIL

Vallourec's sites in Brazil offer a wide product portfolio for biomass plants, with seamless carbon, and alloy steel grades for applications in ethanol and corn mills.

These tubes are used in boilers, pre-air heaters, and the supply is adapted for each project.

The proprietary steel grade VBRMo4 was developed exclusively for boiler pre-air heaters and its lifetime is at least four times longer than welded stainless tubes, depending on the operating procedure of the plant.

HYDROGEN: PIONEERING STORAGE AND TRANSPORT

Whether it's green, blue or white, hydrogen is the energy vector fueling tomorrow's decarbonized industry. With its strong technological expertise in materials, connections and welding, Vallourec is at the heart of the hydrogen economy value chain, offering field-proven solutions for safe H₂ transport and storage.

Safe pipeline transportation

Vallourec brings its expertise in pipe metallurgy and welding to support the deployment of safe and reliable hydrogen pipeline networks.

Products

- ▶ A portfolio of hydrogen-ready line pipe grades validated to resist H₂ embrittlement: X65, X80 as per ASME B31.12*
- ▶ Available in OD 2.375" to 18"
- ▶ Field-proven resistance to high pressure and corrosion, and unmatched solutions for demanding fatigue-sensitive applications

Services

- ▶ **Digitalize pipe welding & project management operations** to save time with cutting-edge tools Best Fit and Pipe Navigator

Underground storage

With its hydrogen-ready VAM® 21 connection, Vallourec delivers leading solutions for H₂ storage in salt caverns.

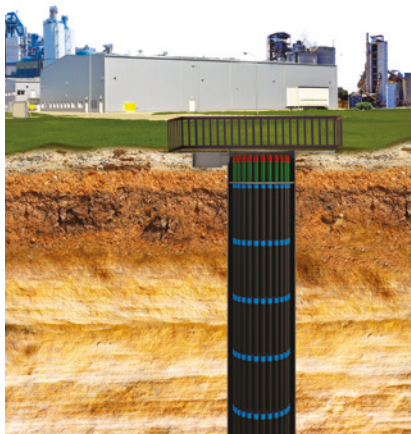
Products

- ▶ OCTG grades validated to resist hydrogen embrittlement: K55, VM80S, VM95S, VM110SS as per ASME B31.12
- ▶ Connection certified hydrogen-tight with superior sealability: VAM® 21 (OD 7 5/8" to 13 3/8") with dope free CLEANWELL® solution or dope

Services

- ▶ **Optimize stock management and running** with our Tubular Management Services, and by entrusting operations to highly skilled VAM® Field Service technicians

▶ FOR MORE INFORMATION ON
OUR HYDROGEN SOLUTIONS:



Unprecedented large-scale storage solution with Delphy

With heavy-emission industries turning to hydrogen-based technologies, hydrogen storage will be crucial to offer continuous availability and stable output. Vallourec's Delphy solution makes it possible to store compressed gaseous hydrogen on a large scale with a minimal surface footprint and increased safety.

- ▶ Storage capacity of 1 to 100 metric tons of H₂
- ▶ Withstands high pressures up to 500 bar / 7,300 psi
- ▶ Features hydrogen-qualified technologies
- ▶ Occupies up to 30 times less acreage than above-ground alternatives

CARBON CAPTURE, UTILIZATION & STORAGE (CCUS): SAFETY AND RELIABILITY

CCUS plays a crucial role in the worldwide effort to achieve net-zero emissions, and it is a key solution to decarbonize hard-to-abate sectors such as process industries (cement plants, gas/coal power plants, steel mills). With its strong track record in the USA, Europe, and the Middle East, Vallourec delivers tubular solutions that enable operators to transport and store CO₂ in underground reservoirs safely and cost-effectively.

CO₂ transport

Dense-phase CO₂ transport is the most efficient way to transport high quantities of CO₂ over long distances. Vallourec's proprietary pipeline products feature a unique homogeneous fine-grained steel microstructure that provides optimum corrosion resistance and prevents running ductile fracture propagation.

Products

- ▶ Seamless line pipes in OD 2.375" to 18", with a wide range of premium steel grades, coatings, linings and bends

Services

- ▶ **Enhance welding operation productivity and limit rejects** with optimum weld Hi-Lo, thanks to high-quality pipeline installation services from Serimax Welding and digital tools such as Best Fit
- ▶ **Simplify project management and documentation** with Pipe Navigator, a centralized web portal offering instant access to up-to-date pipe data and certificates



CO₂ sequestration

The injection and underground sequestration of CO₂ requires safe and reliable infrastructures. From highly corrosive environments to freezing temperatures, VAM® connections offer unmatched sealability and durability. Moreover, Vallourec provides expert services supporting project execution with optimized costs for operators.

Products

- ▶ CCUS-validated premium connections VAM® 21 and VAM TOP® qualified for CO₂ injection application
- ▶ Large selection of OCTG proprietary alloys including Carbon Steel, S13Cr, and Corrosion-Resistant Alloy grades: VM25S (80 or 125 ksi) which can be run with dope & our dope-free CLEANWELL® solution

Services

- ▶ **Optimize well safety & integrity** thanks to our Well Design & Material Selection services, which account for the project-specific environment, load cases and design scenarios of your CCUS project
- ▶ **Boost project efficiency** with our Tubular Management Services and Tally Vision digital running tool
- ▶ **Get peace of mind** by using VAM® Field Service technicians to deploy and check connections

▶ FOR MORE INFORMATION
ON OUR CCUS SOLUTIONS:



GEOTHERMAL: INNOVATIONS FOR HARSH ENVIRONMENTS

Vallourec develops solutions for the specific conditions of geothermal drilling and exploitation in order to optimize the Levelized Cost of Energy (LCOE) and reduce installation costs. Today, its portfolio features a large range of tubular products equipped with key features, including:

- **Resistance to extreme temperatures and high compression** thanks to proprietary higher-yield and controlled yield strength materials combined with VAM® 21 connections (TWCCEP-certified up to 350°C)
- **Corrosion resistance** with grades ranging from carbon steel sour service to chrome and corrosion resistant alloys (CRA)
- **High collapse grades** with cost-effective casing for well integrity in deep geothermal wells or in case of unstable formations (salt domes)

Products

- Casing sizes OD 7" to 16", with options for large OD +16"
- All API 5CT grades from K55 to Q125, plus High Collapse and Sour Service grades for the most challenging wells
- Semi-premium and premium VAM® connections adapted to performance needs

Services

- **Extend well lifetime** through engineering services such as Well Design Optimization, Material Selection, Thermal Analysis, and Casing Wear, Torque and Drag Analysis
- **Increase operational efficiency** with Tubular Management Services including pipe storage, rig preparation and repair support
- **Improve running operations** with digital tools and expert support from VAM® Field Service technicians



➤ FOR MORE INFORMATION ON
OUR GEOTHERMAL SOLUTIONS:

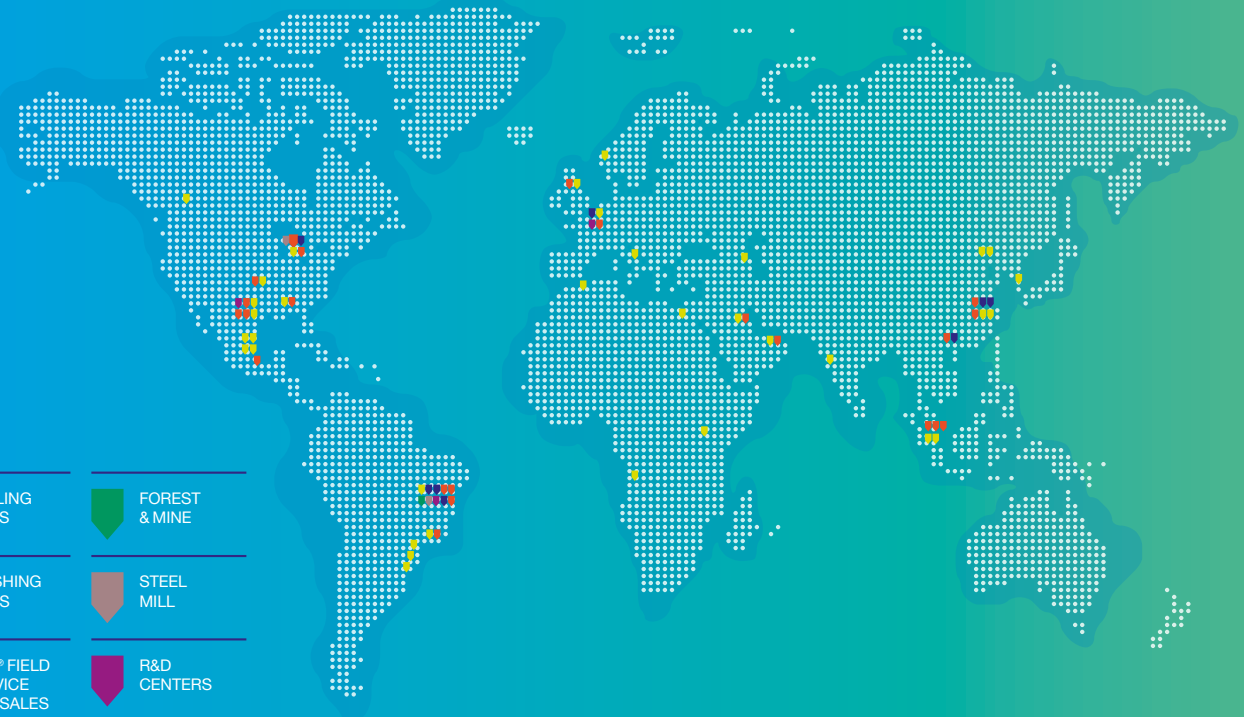
THERMOCASE® VIT enables the development of advanced geothermal systems

Used in oil and gas projects for several decades, THERMOCASE® Vacuum Insulated Tubing (VIT) is a field-proven solution for closed-loop geothermal systems. Thanks to outstanding insulation properties, it enables hot and cold fluids to co-exist in close proximity. Operators benefit from minimized fluid heat loss, a better use of resources, and an increase in the well's overall power output.

- Heat loss is reduced by up to 95% compared to standard tubing, with an energy loss factor between 0.030 to 0.076
- Designed with API grades: 3Cr, 13Cr and CRA materials available
- Tubing and casing sizes



EXTENSIVE GLOBAL TRACK RECORD IN HYDROGEN, GEOTHERMAL, AND CARBON STORAGE



NEED MORE INFORMATION?

Information is available online on
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