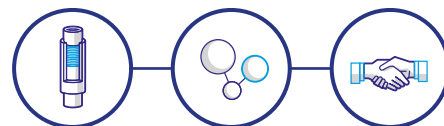


GEOTHERMAL APPLICATIONS



CONNECTIONS

MATERIALS

SOLUTIONS



Your challenges,
OUR SOLUTIONS

EXPLORATION
PRODUCTION
INJECTION

BRINGING HEAT FROM THE GROUND

GEOTHERMAL?

Geothermal wells extract heat in the form of water or steam to generate electricity or feed district heating. A low-cost, renewable energy, Geothermal is a rapidly growing sector but operators face numerous challenges to capitalize the natural resource efficiently.

HOW CAN WE HELP?

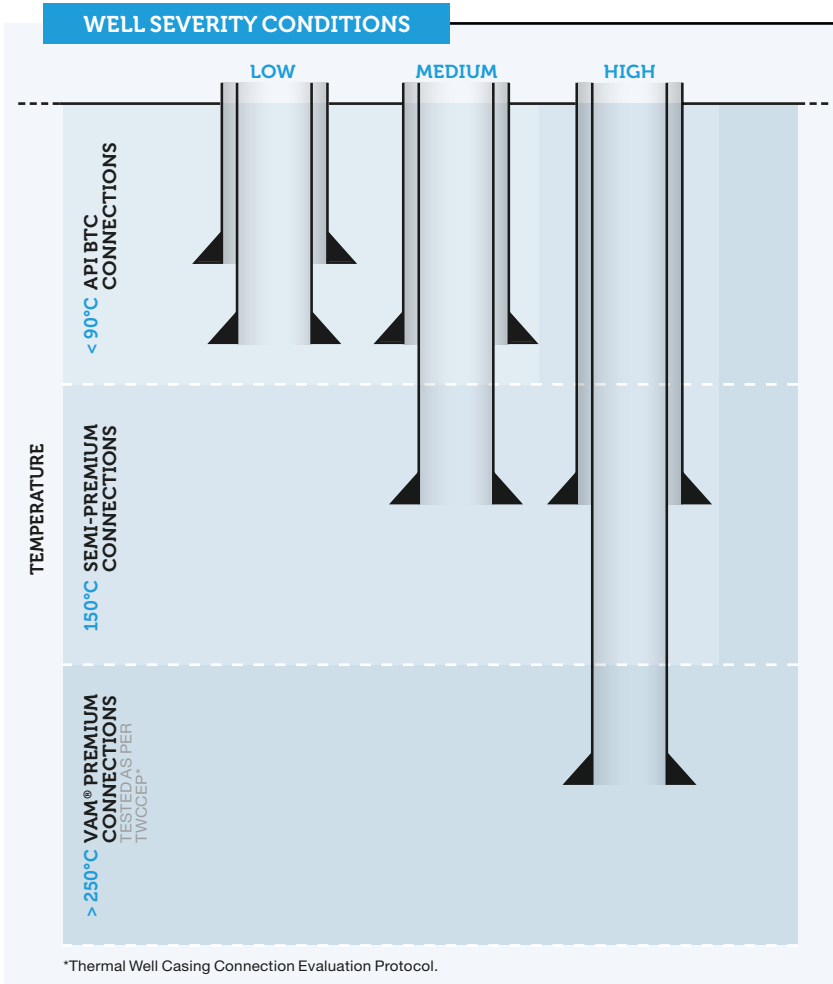
We've been developing solutions for Geothermal projects for over 30 years and we understand the challenges. We optimise the overall cost of the well by a smart design, technological excellence and cost-effectiveness.

"OUR AMBITION is to provide you with the right products and services for your geothermal wells."

OUR ANSWER IS A VERY COMPETITIVE RANGE OF TUBULAR SOLUTIONS FOR EVERY ENVIRONMENT

Thanks to our international footprint we have a competitive offer for every market. Moreover, we are able to apply our Oil & Gas expertise to the service of Geothermal operators to overcome the challenges of high temperature, high pressure, corrosion and unstable formations.

A RANGE OF PRODUCTS TO SUIT YOUR SPECIFIC PROJECT



SERVICES

THERMAL SIMULATION
Vacuum Insulated Tubing (VIT) in field properties and thermal impact on production.

FIT FOR PURPOSE TESTING
Dedicated material and connection testing facilities.

TECHNICAL SUPPORT
Our experts help you select the right connections and materials.

MATERIALS

COMPETITIVE GRADES
Full range of API 5CT grades with PSL2 as standard on all quenched and tempered grades.

HIGH STRENGTH GRADES
We offer proprietary high yield grades up to 150 ksi and high collapse grades with guaranteed collapse ratings up to 130 ksi.

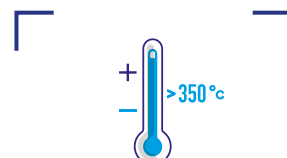
SOUR SERVICE AND HIGH ALLOY GRADES
Our sour service grades offer improved performance in sour environments. For wells with high concentrations of CO₂ and H₂S, chromium grades ensure a long lasting well life.

CONNECTIONS**			
BIG OMEGA® Large diameter surface casing. Fast make-up.	DWC/C - IS Optimized for fatigue cycles and high compression.	VAM TOP® Most widely used premium connection.	VAM® 21 Highest performance connection, integrity tested up to 350°C according to TWCCEP guidelines.
SEMI-PREMIUM		PREMIUM	

**Non-exhaustive list.

YOUR CHALLENGES IN GEOTHERMAL?

High temperatures, extreme pressure loads, reservoir environment, and also economic constraints? Solutions and a clever conception of the well are key for the long-lasting success of your geothermal project.



VAM® 21 CONNECTIONS HAVE BEEN TESTED UP TO 350°C



1 DEDICATED TESTING FACILITY FOR HIGH TEMPERATURE APPLICATIONS



MORE THAN 30 YEARS OF EXPERIENCE IN GEOTHERMAL PROJECTS

— YOUR CHALLENGES

COST EFFICIENCY

Competitive offer for tight budgets.

HIGH TEMPERATURE

Affects the yield strength of materials and induces high compression loads.

WELL INTEGRITY

Unstable formations such as geological faults can cause casing failures.

CORROSION / EROSION

Geothermal fluids charged with salts, acids and debris can cause serious damage.

— OUR SOLUTIONS

- An international footprint with production facilities in every continent in order to ensure the most competitive supply route for your project.
- A full range of connections and materials to help you find a cost effective solution ensuring well integrity over the lifetime of your project, whatever your budget.

- THERMOCASE® VIT to improve enthalpy of recovered fluids when cold aquifers are present. It can also be used for single well geothermal production systems using downhole heat exchangers enabling existing but non-producing wells to be salvaged.

- Proprietary high yield and controlled yield strength materials to manage yield strength derating.
- VAM 21®, the most advanced premium connection on the market, to provide full compression capacity, tested up to 350°C under thermal cycles.
- DW/C - IS and VAM TOP® connections to offer high compression resistance.

- Proprietary high collapse grades to guarantee the highest collapse values.
- Guaranteed sealability. VAM® connections are tested at high temperatures (gas-tight for premium, fluid-tight for semi-premium, or fit-for-purpose).

- A wide range of corrosion resistant steel grades from carbon steel sour service to chrome and corrosion resistant alloys (CRA) for injection and production wells.
- The flush internal connection profile of all VAM® connections to prevent flow turbulence and erosion in the pipe and to increase flow rate.



ENSURE WELL INTEGRITY WITH VAM® FIELD SERVICE

A worldwide network of specialized personnel, our technicians are available to supervise the correct installation and ensure integrity of your well. Providing pipe inspection services, make-up and running supervision on the rig, as well as technical assistance 24/7, VAM® Field Service has a proven track record for many Geothermal projects around the world.

TAKE THEIR WORD FOR IT

With more than 30 years experience, Vallourec tubulars have been used in Geothermal projects around the world.

LAKE ASSAL GEOTHERMAL POWER PROJECT, DJIBOUTI

For the government of Djibouti, geothermal energy represents a low cost, renewable and clean energy source which will generalize access to electricity for the population and promote economic development. The project to construct a 50MW geothermal power plant in the Fiale Caldera area of Lake Assal is due to come on-line in 2021. Vallourec has supplied OCTG for 4 exploration wells, drilled to a vertical depth of 2,500 meters, where temperatures can reach as high as 360°C.

"The extremely high temperatures induce very high compression stresses on the string. Our VAM® 21 and VAM TOP® HC (high compression) connections are perfectly adapted to the application and have been extensively tested to ensure sealability performance and integrity."

— ALVARO RODRIGUEZ, VALLOUREC GEOTHERMAL PRODUCT LEADER



COUNTRY	DJIBOUTI
CLIENT	Government of Djibouti
LOCATION	Djibouti
PROJECT	50MW power plant to generalize access to electricity for the population and promote economic development
FEATURES	4 exploration wells, up to 2,500 meters deep
TEMPERATURE	Up to 360°C
CONNECTIONS	BIG OMEGA®, VAM TOP® HC, VAM® 21
SERVICES	VAM® Field Service provided on-site assistance to ensure correct running of the casing and production strings



COUNTRY	GERMANY
CLIENT	Munich City Utilities (SWM)
LOCATION	Munich
PROJECT	Munich City Geothermal Heating plant to deliver district heating 80,000 citizens
FEATURES	6 deviated wells, up to 3,000 meters deep, 4,400 meters long
TEMPERATURE	120°C
CONNECTIONS	BIG OMEGA®, VAM TOP®, VAM® 21

MUNICH CITY GEOTHERMAL HEATING PLANT

"With its strong track record for geothermal projects in France and Germany, local production facilities and technical support, Vallourec is the supplier of choice for our geothermal wells."

— MUNICH CITY UTILITIES (SWM)



KS ORKA, INDONESIA

"Upon its successful connection test in accordance to TWCCEP, Vallourec (PT Citra Tubindo) has provided a higher level of integrity assurance for our geothermal well."

— KS ORKA DRILLING TEAM



COUNTRY	INDONESIA
LOCATION	Java Island
WELL DEPTHS	Up to 2,200 meters
TEMPERATURE	Up to 250°C
CONNECTIONS	BIG OMEGA®, NS, VAM TOP®, VAM® 21
FEATURES	- Tube manufactured from our plant in China - Heat treatment, threading and dedicated testing facilities from our local facilities in Batam, Indonesia

VALLOUREC, YOUR LEADING PARTNER FOR ALL YOUR PROJECTS

6 INTERNATIONAL
R&D CENTERS

15 ROLLING MILLS
AND 34 FINISHING
UNITS (EUROPE,
USA, BRAZIL
AND ASIA)

INTERNATIONAL
NETWORK OF
OVER 180 VAM®
LICENSEES

VAM® FIELD
SERVICES
AND SUPPORT



NEED MORE INFORMATION?

Information is available online on
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