

# ADVANCED SUPPORT FOR WELL OPTIMIZATION



# WHATEVER YOUR CHALLENGE, WE HAVE THE SOLUTION

Across all applications, from conventional and unconventional fields, offshore and onshore, to special applications such as geothermal, we support you with competitive and innovative solutions and grades, and help you select the products and services you need.

## OUR EXPERTISE

### MATERIAL SELECTION

- Extensive testing data base
- Normative material support
- Benchmark testing facilities
- Failure analysis
- Application modeling

### WELL DESIGN

- Mechanical and thermal analysis
- Connection selection
- Torque & drag support
- Software-friendly Vallourec product data base

### PRODUCT DEVELOPMENT

- Fit-for-purpose product development including design, testing, industrial trial
- Special products such as Risers, Expendables, Vacuum Insulated Tubing, upset pipes

### INNOVATION DRIVER

- Participation in key Joint Industry Projects and R&D with main IOCs
- Cooperative-development mindset with extensive expertise

### ADVANCED PRODUCT ANALYSIS

- Casing wear performance analysis
- Individual pipe data
- On demand FEA and testing
- Heat transfer & fracture mechanics
- Fatigue assessment (CWD, Riser...)

### TESTING AND VALIDATION

- Applicative and testing normative expertise APICT5, ISO 13680, ISO 13679, NACE MR, NORSOK, RP96, I3E, TWCEP

## YOUR CHALLENGES

### COST OPTIMIZATION

- Reduce overall project cost by product optimization

### OPERATIONAL SAVINGS

- Running time reduction
- Stock optimization
- Standardization

### CRITICAL WELLS

- Fit-for-purpose product development to make your project possible

### RELIABILITY

- Normative and regulatory compliance
- Integrity risk reduction
- Field-proven solutions

## ENERGY TRANSITION APPLICATIONS

### GEOHERMAL

- Connection selection and testing
- Special products such as coating, liners, Vacuum Insulated Tubing

### CCUS

- Material selection
- Connection validation for injection wells

### HYDROGEN STORAGE

- Material selection
- High-pressure components
- Storage solutions



# SERVICES TO EMPOWER YOUR BUSINESS

**Vallourec's** integrated services offering accompanies you along the entire value chain, combining both traditional services and digital solutions, boosting efficiency and reducing costs.

## ENGINEERING SUPPORT

- From engineering-assistance to training, we support you throughout your project, partnering with you to evaluate load cases, safety factors and design scenarios. We accompany you in the selection of the best materials, grades and connections to reduce costs and enhance well integrity.

## SUPPLY CHAIN

- **Tubular Sourcing & Resale:** reduce your working capital and your environmental footprint. New procurement solutions increase flexibility, shorten lead times and manage surplus, leveraging Smartengo digital solutions.
- **Material Management & QA/QC:** benefit from inspection services and obtain full visibility of your supply chain. Thanks to the digital solution Smartengo Inventory, reduce your stock and improve stock rotation by 30% using unique traceability ID barcodes and real-time data.

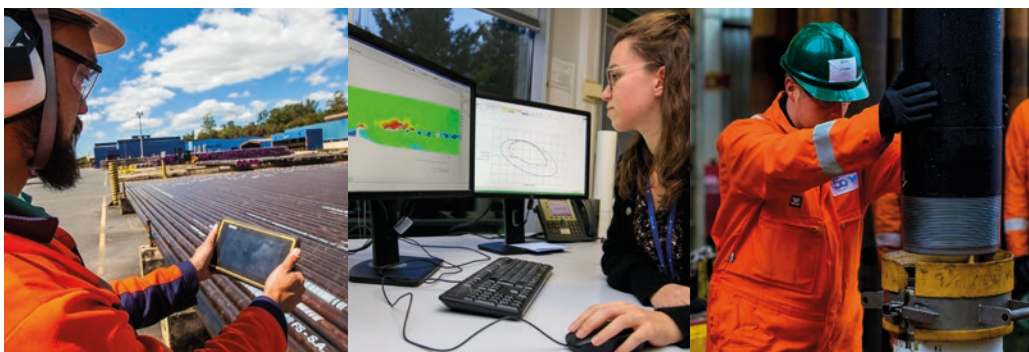
## WELL CONSTRUCTION

- **Tubular Running QA/QC:** ensure well integrity and running performance. Digital solution Smartengo Running Expert optimizes the sequencing of pipes on drilling rigs and eliminates the risk of errors and costly delays. Running supervision services are guaranteed by VAM® Field Service on-site or remotely, depending on the nature of your operations.
- **Rental Equipment:** lower your capital expenditures, reduce maintenance cost of tooling and avoid idle assets with rental services for tubular equipment and accessories.
- **Pipe Data Service:** optimize pipe sequence, fine-tune running and cementing operations and build advanced well construction tools leveraging actual pipe data provided by Vallourec.

## LIFE OF FIELD

- Leverage Vallourec's advanced digital solutions, actual pipe data and new innovative equipment to go one step closer to the modeling and digital monitoring of your well during its lifetime.

VISIT OUR E-COMMERCE WEBSITE  
[SMARTENGO.VALLOUREC.COM](https://SMARTENGO.VALLOUREC.COM)



## A COMPLEX ENVIRONMENT

The Oil and Gas market is vast with multiple applications. While we have chosen to present three of them, Vallourec provides advanced solutions for all applications, and has the capabilities to meet any challenge you may face.

We leverage innovation and digital technology to develop ever more sophisticated, higher performing, and when required, customized solutions for enhanced operations.

# HPHT/DEEP WATER



## CHALLENGES

- Normative qualifications
- Well integrity
- Temperature, pressure & clearance

## CLEANWELL®

CLEANWELL® is a non-polluting dope-free technology developed by VAM®, applied in the mill to threaded connections replacing both storage and running compounds. The "rig-ready" joints reduce handling and pipe preparation operations as well as associated safety risks, both in the yard and on the rig. While providing outstanding sealability and anti-galling & corrosion resistance, it also reduces back-out, rejects and overall running time, thus improving rig operations.

The result is a lower operating cost and increased efficiency throughout the entire supply chain.

## SOLUTIONS

CP 36"  
Surface Casing  
**22" 1.25# - X80**  
Intermediate Casing  
**18" 117# - VM 125 HC**

EXTREME COLLAPSE GRADES

**VAM SLIJ-3**

From 7 5/8" to 16 1/4"

**MAX SEALABILITY  
STANDARDIZATION**

**10.05" 72# -  
VM 130 HCMS**

**7 5/8" 47.10# -  
VM 125 13ECRSS**

Production Tubing  
**5 1/2" 23# -  
VM 110 13ECRSS**

**VAM BOLT-III**

From 10 1/8" to 18"

**CLEARANCE  
OPTIMIZATION  
EXTERNAL PRESSURE  
RESISTANCE**

SOUR SERVICE GRADES

**16.08" 111# - VM 140 CYHC**

**14.15" 127.5# - VM 140 CYXC**

**11 7/8" 71.8# - VM 125 XCSS**

**VAM 21  
CLEANWELL**

**MAXIMUM  
SEALABILITY  
ENVIRONMENTALLY  
FRIENDLY**

## OTHER SOLUTIONS

### GRADES

Corrosion Resistant Alloy  
Enhanced Sour VM 125 ESS  
Chromium Grades VM XX 13CR

### CONNECTIONS

**VAM EPIC**  
**CLEANWELL**  
**VAM HP**

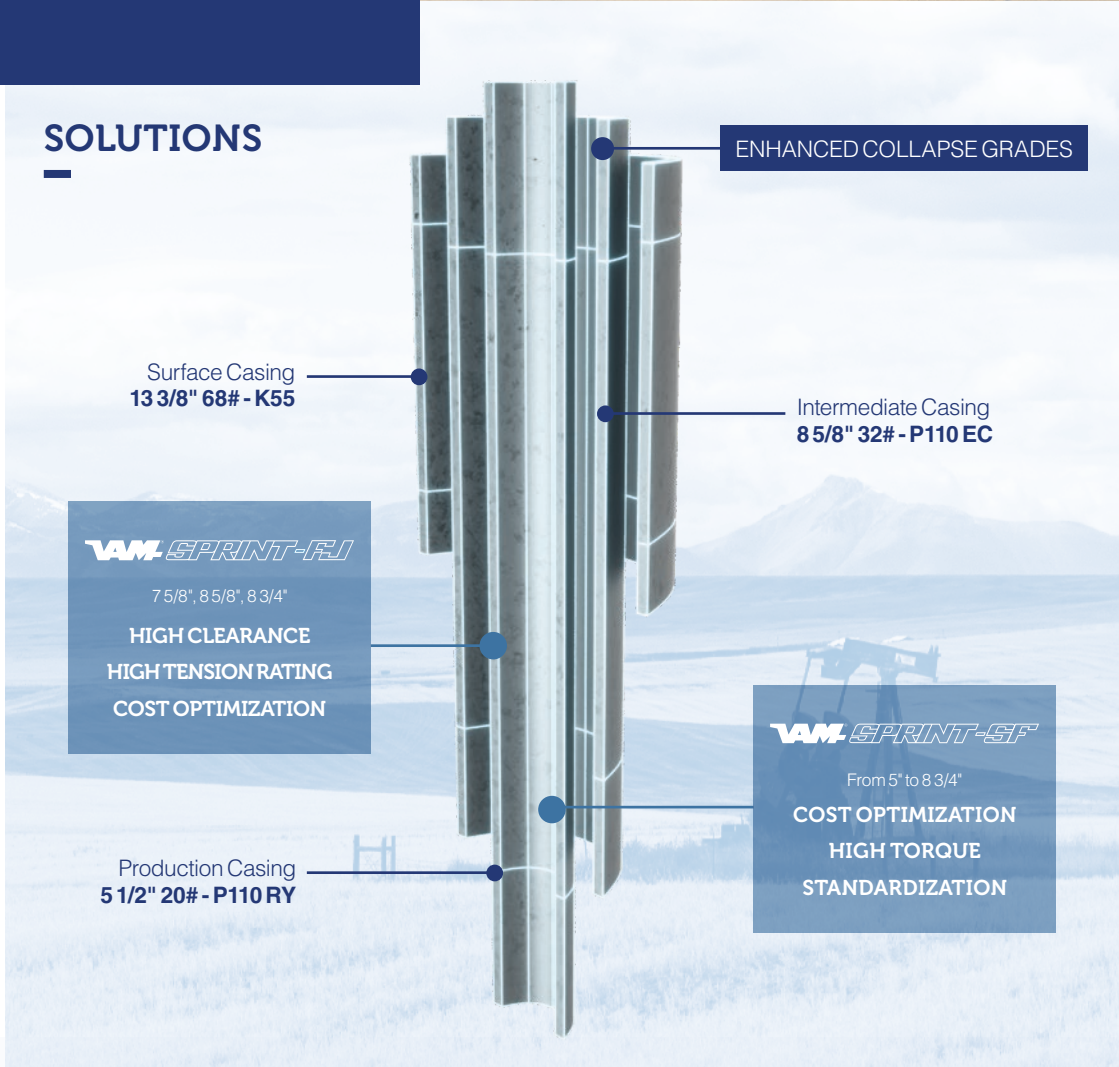
# UNCONVENTIONAL



## CHALLENGES

- Standardization
- Operational efficiency
- Product ruggedness

## SOLUTIONS



Surface Casing  
13 3/8" 68# - K55

ENHANCED COLLAPSE GRADES

Intermediate Casing  
8 5/8" 32# - P110 EC

**VAM SPRINT-FJ**

7 5/8", 8 5/8", 8 3/4"

HIGH CLEARANCE  
HIGH TENSION RATING  
COST OPTIMIZATION

**VAM SPRINT-SF**

From 5" to 8 3/4"

COST OPTIMIZATION  
HIGH TORQUE  
STANDARDIZATION

Production Casing  
5 1/2" 20# - P110 RY

## OTHER SOLUTIONS

### GRADES

API Grade L80, K55  
Enhanced Collapse API HCE  
Mild Service P 110 MS

### CONNECTIONS

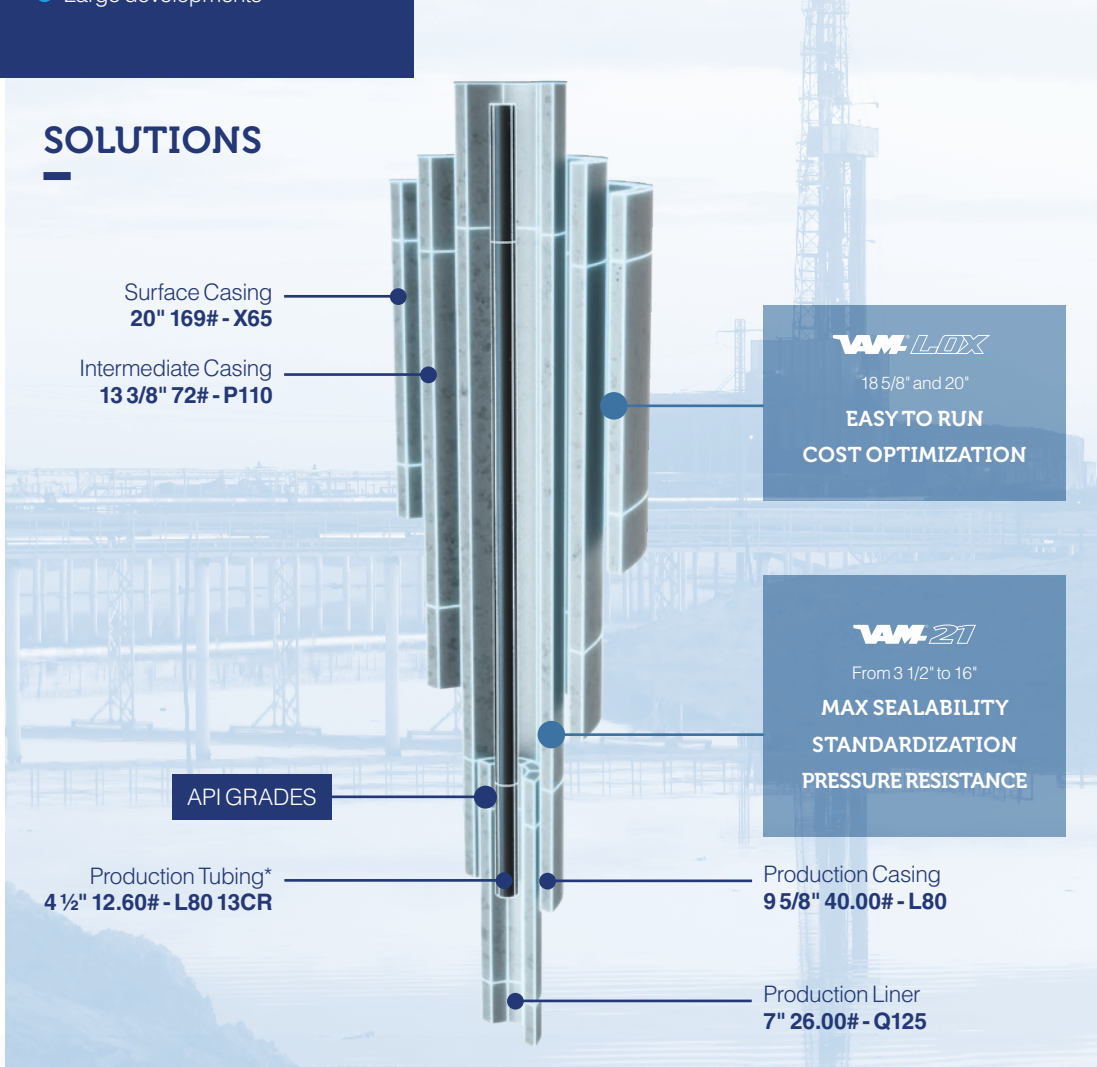
**VAM 21HT**  
**VAM SPRINT-TC**  
**DWC/C**

# CONVENTIONAL

## CHALLENGES

- Optimize total cost of ownership
- Product supply ease
- Large developments

## SOLUTIONS



## OTHER SOLUTIONS

### GRADES

High Strength VM XX CY  
High Collapse VM XX HC  
eXtreme Sour VM XX XS

### CONNECTIONS

**VAM-TOP**  
**DWC/C**  
**DINO VAM**

## PROPRIETARY GRADES

VM

Vallourec Material

XX

SMYS

YY

Product application domain and performance

YY	DESIGNATION
CR	▶ Chromium
CRSS	▶ Super Chromium
CRM	▶ Modified Chromium
CY	▶ Controlled Yield
HC	▶ High Collapse
XC	▶ eXtreme Collapse
SS	▶ Sour Service
MS	▶ Mild Sour
XS	▶ eXtreme Sour
E	▶ Enhanced

\*Pipe grade selection depends on well environment. See material selection table on the right.

# LARGE PORTFOLIO TO MEET ALL YOUR NEEDS

- Thanks to our material expertise and manufacturing know-how, we provide a complete portfolio of steel grades, used and approved by all major Oil and Gas companies, including proprietary high-yield grades – up to 160ksi – for all well environments.
- Our experts can help you select the most appropriate material for your application, simplifying your supply process and optimizing the associated costs.



FOR MORE INFORMATION ON OUR GRADES VISIT: [WWW.EXPERTISE.VALLOUREC.COM](http://WWW.EXPERTISE.VALLOUREC.COM)

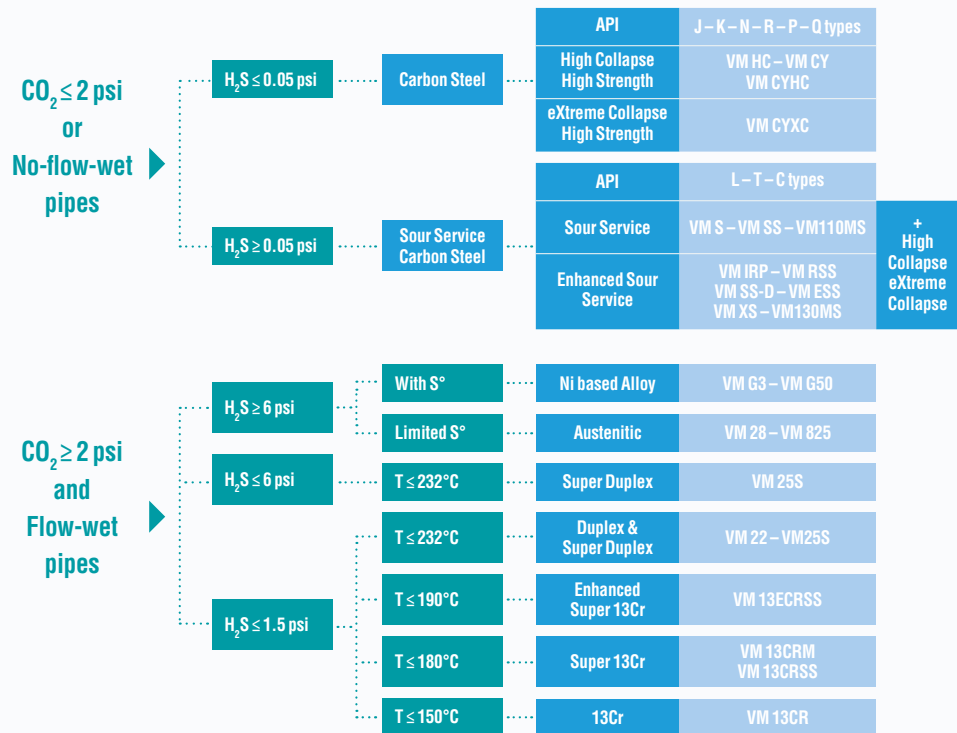
- In 1965, Vallourec invented VAM®, a key breakthrough innovation for tubing and casing.
- Every year VAM® designs new connections, extends product lines and qualifies new sizes to the most stringent specifications to meet the increasing complexity of accessing reservoirs and to adapt to new user requirements.



FOR MORE INFORMATION ON OUR CONNECTIONS VISIT: [WWW.VAMSERVICES.COM](http://WWW.VAMSERVICES.COM)

## MATERIAL SELECTION

For standard applications and the most severe environments.



Vallourec grades for Special Applications				
Unconventional	Arctic	Riser	Expandable	Corrosion mitigation
Enhanced API	Low temperature			
EC - HCE - RY T95 E - P110 MS	VMLT	VMR - RSS	VMET - 13ET	VM 1CR - 1CRHC - 3CR GRE liner

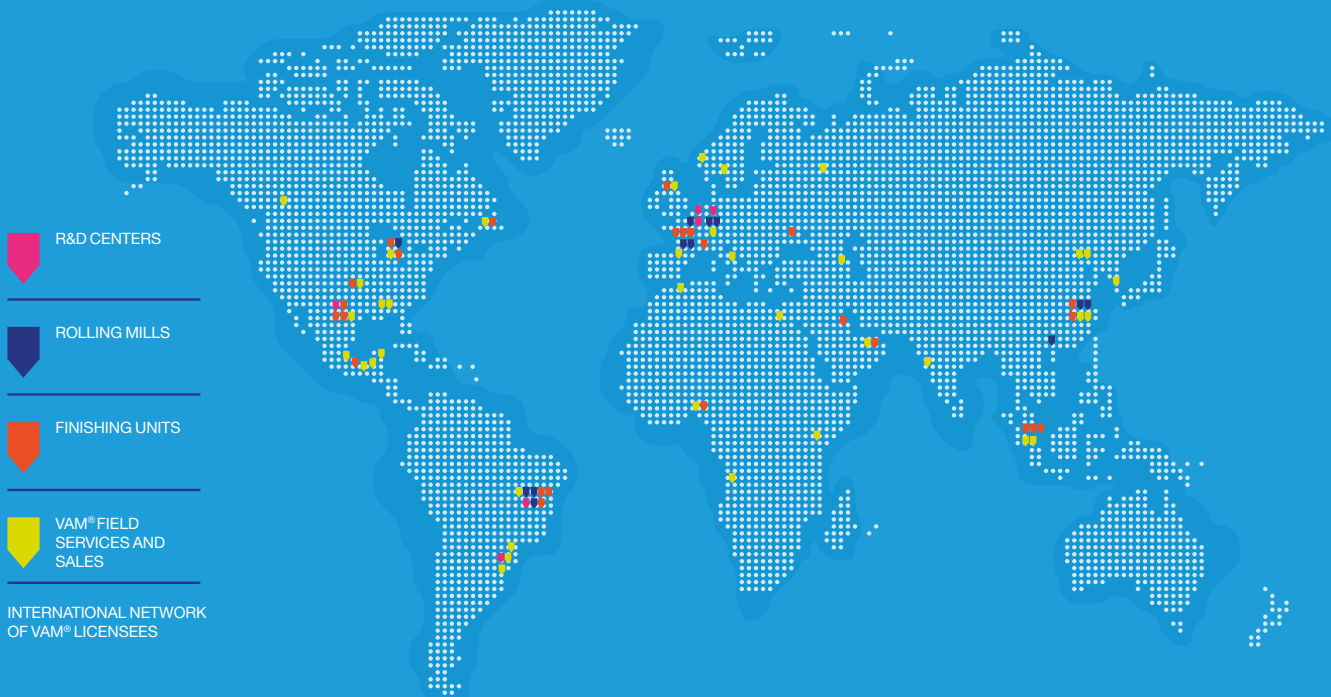
## VAM® PRODUCT LINE

Our VAM® Research & Development teams can customize connection designs to new sizes or specific requirements.

	THREADED & COUPLED	SEMI-FLUSH	FLUSH
PREMIUM	VAM 21		
	VAM 21HT ●	VAM SLIJ-3	VAM BOLT-III
	VAM TOP	VAM SLIJ-III	VAM HTF-NR ●
	VAM TOP HT	VAM EPIC	VAM F-JL
	VAM TOP HC ●	VAM EDGE SF	
	VAM HP		
	VAM HTTC ●		
	VAM LOX		
	VAM TTRHW		
	VAM DRHW		
SEMI-PREMIUM	VAM SPRINT-TC ●	VAM SPRINT-SF ●	VAM SPRINT-FJ
	big O		
	DINO VAM		
	DWC/C		

● High Torque

# YOUR PARTNER, SETTING THE PACE FOR INNOVATION AND PERFORMANCE EVOLUTION



## NEED MORE INFORMATION?

Information is available online on [solutions.vallourec.com](http://solutions.vallourec.com) or by scanning the following QR code.



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