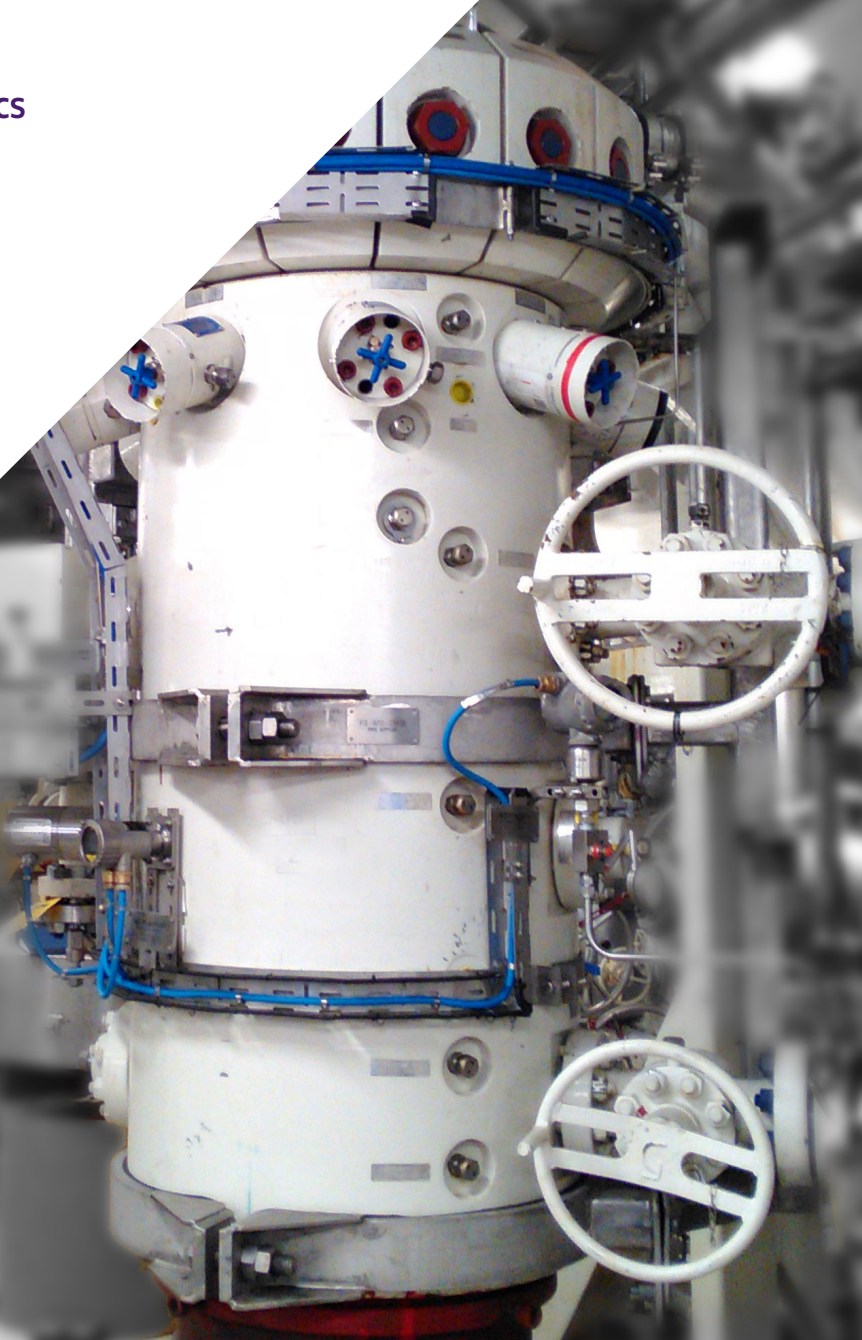


# UH-3 Unihead<sup>®</sup>

Standardised solutions  
improving well economics





# Surface Technologies

**Surface Technologies is a market leader in the design and delivery of products and services to the oil and gas industry. We are defined by technological innovation, reliability, product quality and integrated services, making us the partner of choice.**

# Technology delivering customer success

Industry leading wellhead technology

TechnipFMC has a proven track record focusing on customers, challenging conventions, minimising non-productive time and delivering sustainable and successful economics with our standardised solutions.



## Global capabilities

TechnipFMC is a world class equipment and service provider. We offer the best solutions to help exploration, production, and service companies succeed in achieving their drilling, completion, efficiency and safety goals. We also offer a suite of complementary aftermarket services.

TechnipFMC's extensive commitment to producing the highest-quality equipment and systems through advanced designs and manufacturing techniques is on full display at each of our plants. We use lean principles to deliver zero-defect cost-effective solutions. And we constantly explore new ways to optimise our customers' success by reducing complexity and the cost of ownership.

We have the expertise, contacts and resources worldwide to help our customers 24/7.



Photographer/Aker BP

# Our drilling technology

Experience faster time to production, lower operating costs and reduced non-productive time through field-proven standardised drilling systems

## **Field proven from cost effective conventional to high performance Uniheads®**

TechnipFMC's structured and comprehensive portfolio delivers a broad set of standardised drilling products with cost and time efficient solutions, delivering the perfect balance of functionality and reliability for all our customers' well applications.

The technology is fully validated through rigorous test protocols that align with API standards, and when required exceed those limits providing a greater level of reliability for customer operations coupled with many years of field use, this ensures our technology meets our customer's requirements of reliability and quality.

We continually invest in research and development to meet the evolving needs of our industry. All innovations are subjected to exhaustive laboratory and field tests to ensure their reliability and integrity before they are released to the marketplace.

## **Safety and reliability**

TechnipFMC's standardised equipment and renowned sealing technology help eliminate the threat of working under suspended loads, minimise BOP manipulation, reduce installation risks and improve safety throughout the drilling process.

Our ability to address complex project challenges comes from a strong track record of project management expertise. We deliver projects on time, reducing installation risks and never compromising on quality or safety.

## **Shorter time to production**

Non-productive time (NPT) can have a major impact on well economics. Our drilling technology mitigates risks through our robust design verification and validation program, optimising well integrity and minimising NPT and the risks associated with the drilling and equipment installation process.

TechnipFMC's stocking programs ensure our standard components and sub-assembly products are available and ready to be installed to help boost your productivity and accelerate time to first oil.

We deliver top-rated field execution services 24/7, with trained, competent technicians to make sure the job is done right and safely.

# Surface wellhead systems

TechnipFMC offers a fit for purpose range of drilling products covering simple onshore and offshore drilling to complex operations in harsh well conditions and environments

## Onshore technologies

- ▶ Conventional wellhead
- ▶ Unihead® (UH-1, UH-2, UH-3, UH-4, UH-5)

Some systems can be installed on land and offshore platforms.

## Offshore technologies

- ▶ Conventional wellhead
- ▶ Unihead® (UH-2, UH-3, UH-4, UH-5)
- ▶ SPAR, TLP and SXS

System	Working pressure	Hanger / packoff retenion	Sealing technology	Nominal sizes	Temperature rating
Conventional	2,000 psi thru 20,000 psi	Lockscrew	Elastomer and Rough Casing Metal Seal (RCMS)	7 $\frac{1}{2}$ " thru 21 $\frac{1}{4}$ "	-75° F to 350° F
UH-1	5,000 psi, 10,000 psi	Lockscrew	Elastomer	11", 13- $\frac{5}{8}$ "	-75° F to 250° F
UH-2	5,000 psi, 10,000 psi	Internal latch	Elastomer	11", 13- $\frac{5}{8}$ "	-20° F - 250° F
UH-3	5,000 psi, 10,000 psi	Internal latch	Hybrid PI-metal end cap	11", 13- $\frac{5}{8}$ "	-75° F - 350° F
UH-4	5,000 psi, 10,000 psi	Internal latch	Single metal to metal	13 $\frac{3}{8}$ ", 18 $\frac{3}{4}$ "	-75° F - 250° F
UH-5	5,000 psi, 10,000 psi, 15,000 psi	Internal latch	Dual metal to metal	13 $\frac{3}{8}$ ", 18 $\frac{3}{4}$ "	-75° F - 400° F



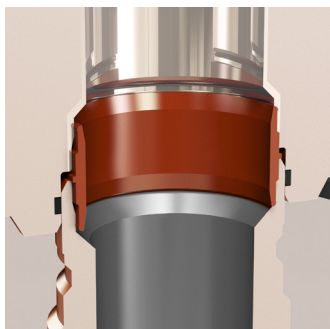
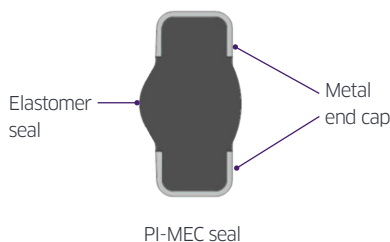
# UH-3 Unihead®



# UH-3 sealing technology

The foundation of any wellhead system is the sealing technology and its integrity over the productive life of the well

TechnipFMC has a solid track record of investing in the development of new seal technologies both metallic and non-metallic to handle all well conditions from low pressure oil wells to high pressure and high temperature gas wells. Our seal technologies are reliable, robust and practical, delivering trouble-free seal integrity throughout the life of the well. Our seal capabilities cover 2,000 psi through 20,000 psi and temperatures from -75°F to 400°F.



Straight Bore Metal Seal (SBMS)

**Within the UH-3 product family we offer the Pressure Intensified Metal End Cap (PI-MEC) seal as the primary seal technology to cover more demanding well conditions where gas tight sealing and resistance to rapid gas decompression are key requirements:**

- ▶ PI-MEC seal technology is an evolution of PI-Seal technology, part of our drilling and completion portfolio for more than 20 years
- ▶ Elastomer seal elements designed in-house using our own advanced elastomer compounds
- ▶ Secondary/test seals are proprietary TechnipFMC S-Seals
- ▶ Extensive qualification testing performed from -75° F to 350° F
- ▶ Immersion testing conducted using a variety of drilling, completion and other oilfield chemicals
- ▶ SBMS seal for gas tight sealing between the tubing hanger neck and Christmas tree
- ▶ Fire testing performed on metal-to-metal seals

Both metallic and non-metallic seals have been qualified in accordance with API 6A PR2F.

# UH-3 Unihead® systems

A compact and unitised wellhead system that offers rig time savings, better well control, and safer operations

The UH-3 Unihead® system is identical to the UH-2 Unihead® system with one critical exception: The UH-3 comprises the Pressure Intensified Metal End Cap Seal (PI-MEC Seal) as its annular packoff for the tubing and surface casing hanger packoffs.

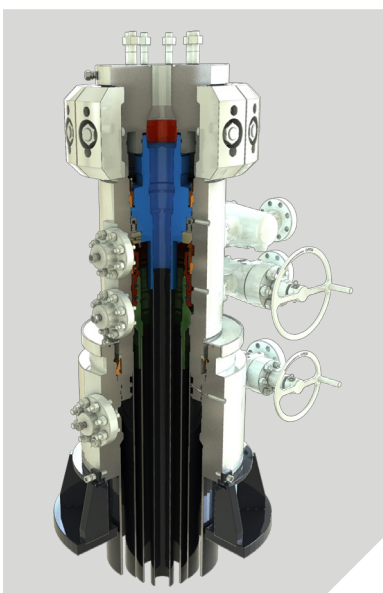
This patent protected seal uses TechnipFMC's superior elastomer technology combined with an ingenious seal energising design to provide an annular seal assembly that behaves like a metal-to-metal seal due to its high bulk modulus. This prevents gas from entering the elastomeric seal during well operations. This robust seal will help maximise the well's uptime and minimise non productive time, providing a long and reliable life in extreme conditions.

The UH-3 Unihead® system can be used as an alternative to TechnipFMC's conventional spooled systems or the UH-1 Unihead® system, and has superior sealing technology to the UH-2 Unihead® system.

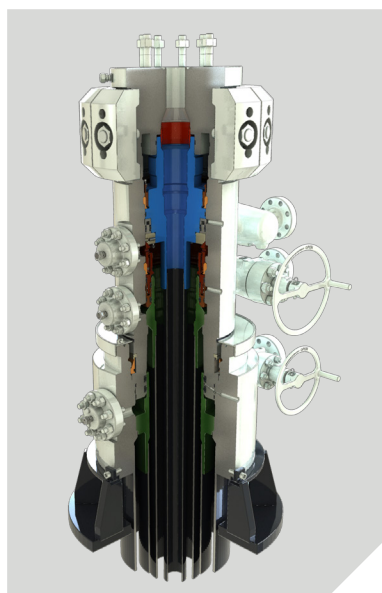
## Advantages

- ▶ PI-MEC sealing capability provides top-rated elastomer sealing technology with a metal sealing performance
- ▶ Design caters for twin or single stack BOPs and reduces the BOP manipulation
- ▶ Saves up to 40 hours of rig time per well while improving safety
- ▶ Improves pressure integrity with fewer through-wall penetrations

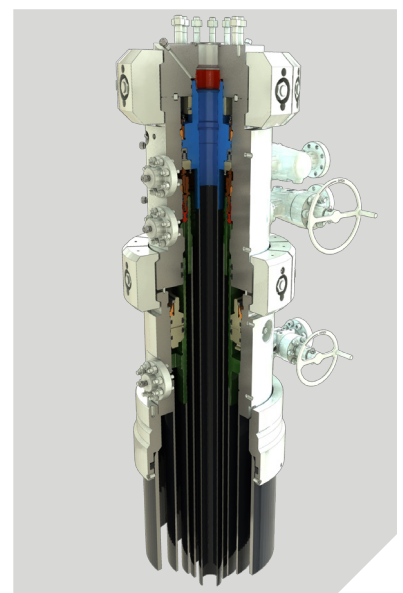
Available with light or heavy casing programs:



Onshore / Basic  
(Available in 5,000 psi or 10,000 psi)



Onshore / Medium  
(Available in 5,000 psi or 10,000 psi)



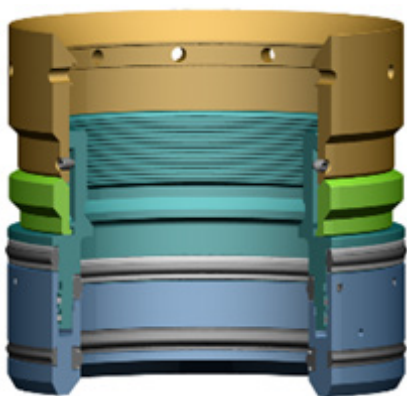
Offshore / Advanced  
(Available in 10,000 psi)



# UH-3 PI-MEC seal internal latch packoff

In the PI-MEC, the intensified compression of the elastomer prevents the ingress of gas. The packoff behaves more like a metal seal than an elastomer, ensuring that leakage does not occur and eliminating the possibility of explosive decompression. It also increases the cold temperature performance of the packoff.

The packoff uses an expanding latch ring retention mechanism identical to the UH-2 system, which replaces the need for lockdown screws. The latch ring can be run from the rig floor through the BOP stack, saving significant rig time compared to a system with lockdown screws. The latch ring, once engaged, then becomes an independent load shoulder for the next hanger.

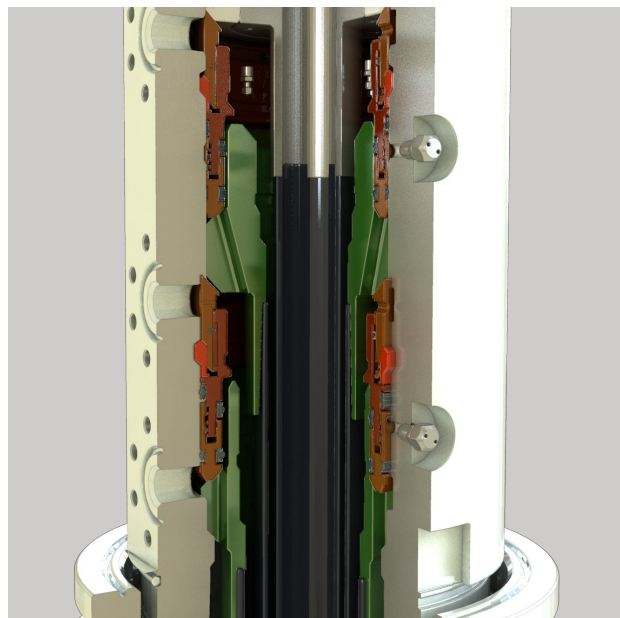


## Function

- ▶ The PI MEC Seal operates on the basis of Pascal's principle, the same principle used in the function of hydraulic jacks.
- ▶ The technologically advanced and patented pack off performs better when subjected to higher pressure and temperature.
- ▶ Eliminates the risk of seal failure due to rapid gas decompression (RGD), making the seal safe and reliable in gas applications.
- ▶ Qualification tested in accordance with API 6A PR2F plus extended hot and cold cycles.
- ▶ Qualified at 10,000 psi from -75° F to 250° F and 0° F to 350° F.

## The PI-MEC Seal internal packoff features include:

- ▶ Uses PI-MEC elastomeric technology to produce performance characteristics of a metal seal
- ▶ Eliminates lockdown screws, reducing leak paths
- ▶ Installs through the BOP, improving safety
- ▶ Creates an independent load shoulder
- ▶ Fits all hanger sizes
- ▶ Available in separate contingency packoffs



# UH-3 offshore system

Available only in a standard 10,000 pressure rating, the UH-3 Offshore system caters to a wide range of casing programs. Typically the most common casing program is 30" x 20" x 13 $\frac{3}{8}$ " x 9 $\frac{5}{8}$ " x Tubing. The 10 $\frac{3}{4}$ ", 18 $\frac{5}{8}$ " and 14-inch also can be accommodated while employing the UH-3 elastomer sealing packoff.

Full-hole and slimhole casing programs are catered to in the full range of conductor sizes.

The 13 $\frac{5}{8}$ -inch offshore system is primarily designed for a single stack 18 $\frac{3}{4}$ -inch BOP, but a starter head with a 20-inch bowl is available to allow a two-stack BOP configuration or mudline suspension system (MLS).

## Features and benefits

### Flexibility and reduced installation time

- ▶ 10,000 psi maximum working pressure
- ▶ 20-inch Sliploc or buttress starter heads
- ▶ Option for larger bowl if using MLS
- ▶ Starter head upper connection 20 $\frac{3}{4}$ -inch, 3,000 psi Speedloc®
- ▶ Slimhole and full-hole casing program options
- ▶ 13 $\frac{3}{8}$ -inch casing hanger landed in starter head, run through BOP
- ▶ UH-3 Unihead® made up to starter head using 20 $\frac{3}{4}$ -inch, 3,000 psi Speedloc®
- ▶ Fluted casing hangers run through BOP, saving wait time on cement
- ▶ Emergency slip hangers available in case of stuck casing
- ▶ Facilitates BOP test with short bowl protector left in place

### Safety and reliability

- ▶ Internal latch UH-3 packoff
  - Eliminates lockdown screws, reducing leak paths
  - Ensures safe installation through the BOP
  - Creates independent load shoulder
  - Fits all hanger sizes
  - Available as separate contingency packoffs
- ▶ Eliminates J-slots on bowl protectors. Stab-in / stab-out design
- ▶ Pressure Intensified PI-MEC elastomeric packoffs use TechnipFMC seal technology.

# UH-3 onshore system

Available in 5,000 and 10,000 Ppressure Rratings, the UH-3 Onshore system caters tofor a wide range of casing programs, the most common being 30" x 20" x 13 $\frac{3}{8}$ " x 9 $\frac{5}{8}$ " x Tubing. A wide range of Cconductor sizes also can also be used.

## Features and benefits

### **Flexibility and reduced installation time**

- ▶ Drilled with two stack BOP (13 $\frac{3}{8}$  and 20 $\frac{3}{4}$  inch)
- ▶ 5,000 psi and 10,000 psi maximum working pressure
- ▶ Slimhole and full-hole casing program options
- ▶ Basic system and medium system. Unihead® has quick stab connect into starter head
- ▶ Internal latch UH-3 packoff is heart of system
- ▶ Eliminates of J-slots on bowl protectors. Stab-in / stab-out design
- ▶ Pressure Intensified PI-MEC elastomeric packoffs use TechnipFMC seal technology
- ▶ Facilitates BOP test with short bowl protector left in place

# UH-3 value proposition

## Value proposition

- ▶ Superior PI-MEC sealing Unihead® with all the flexibility, safety, performance and operating cost benefits of a metal sealing Unihead® at a lower cost.
- ▶ Saves up to 40 hours of rig time compared to conventional:
  - Sliploc starter head and unihead to riser connection using TechnipFMC proprietary connections
  - Mandrel hangers eliminate the need to wait on cement with no requirement to cut casing
  - No need to lift BOP due to UH-3 Unihead® housing surface casing hanger and tubing hanger
  - Field proven PI-MEC packoff with superior installation and testing
- ▶ Safer than conventional wellheads due to fewer BOP manipulation and not working under suspended load to cut casing
- ▶ Globally standardised and field proven UH-3 Unihead® system
- ▶ Standardised tool pool available globally

## Common features across the UH-3 Unihead® range

- ▶ Pressure Intensified PI-MEC elastomeric packoffs using TechnipFMC seal technology, providing a metal-seal performance in harsh environments and where gas is present
- ▶ Internal latch with no lockdown screws; Independent load shoulders
- ▶ Fast make up with TechnipFMC Speedloc clamps
- ▶ Flexible design facilitated by standardised products across slimhole and full-hole casing programs
- ▶ Onshore and offshore configurations
- ▶ Design features improving safety

# Global service and aftermarket support

**Service has long been a key differentiator for TechnipFMC. We sustain our customers with a full range of services and aftermarket support 24/7 worldwide.**

TechnipFMC supports client operations from our strategically located field bases, providing responsive service, quality equipment and local expertise. Competent technicians deliver superior service including installation, repair, maintenance and asset management. We offer extensive local inventories and rental options.

Our commitment to HSE, value and service excellence helps our clients maximise their potential.



## Life-of-Field services

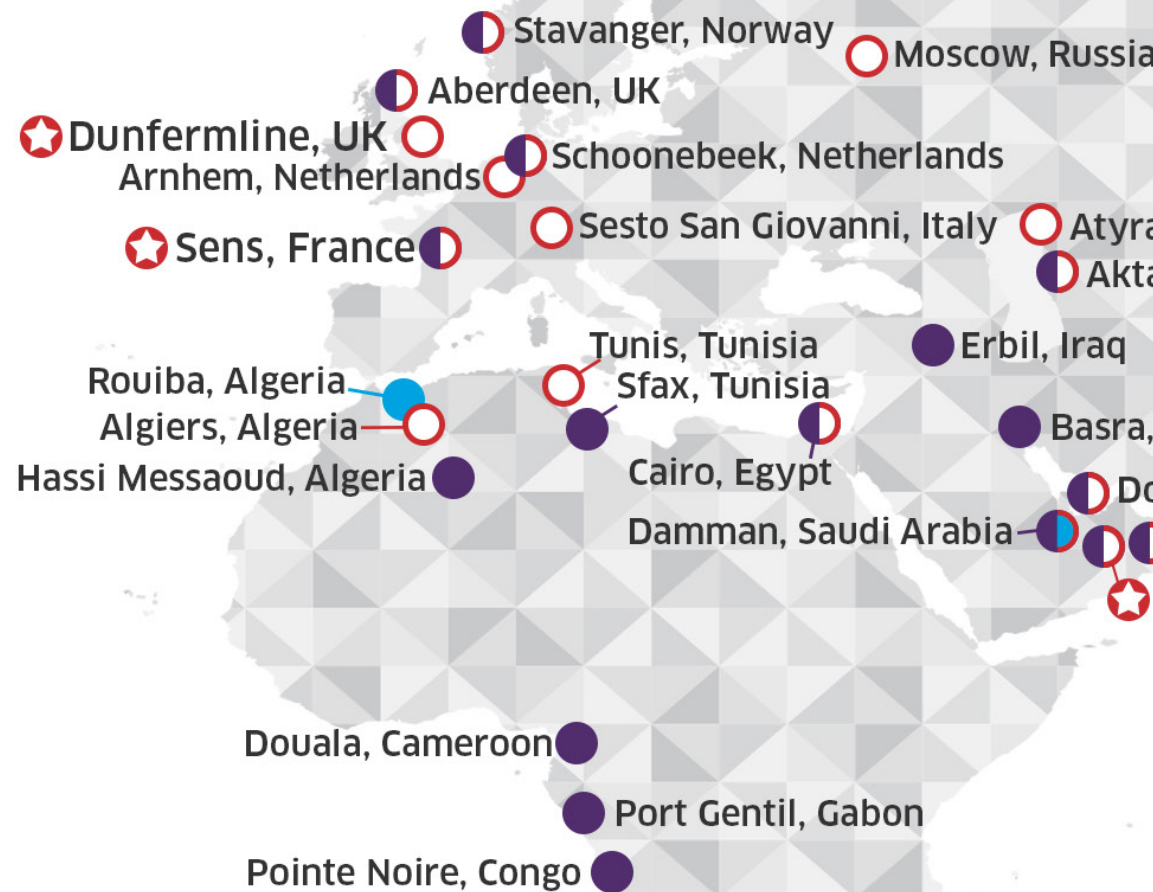
- ▶ Installation and workover support
- ▶ Cold casing cutting
- ▶ Bolting service
- ▶ Asset integrity and maintenance
- ▶ Wellhead and Christmas tree decommissioning

## Workshop services

- ▶ Inventory management
- ▶ Preservation, storage and maintenance
- ▶ Inspection, refurbishment and repair
- ▶ Torquing service on hangers and landing strings
- ▶ Systems integration testing

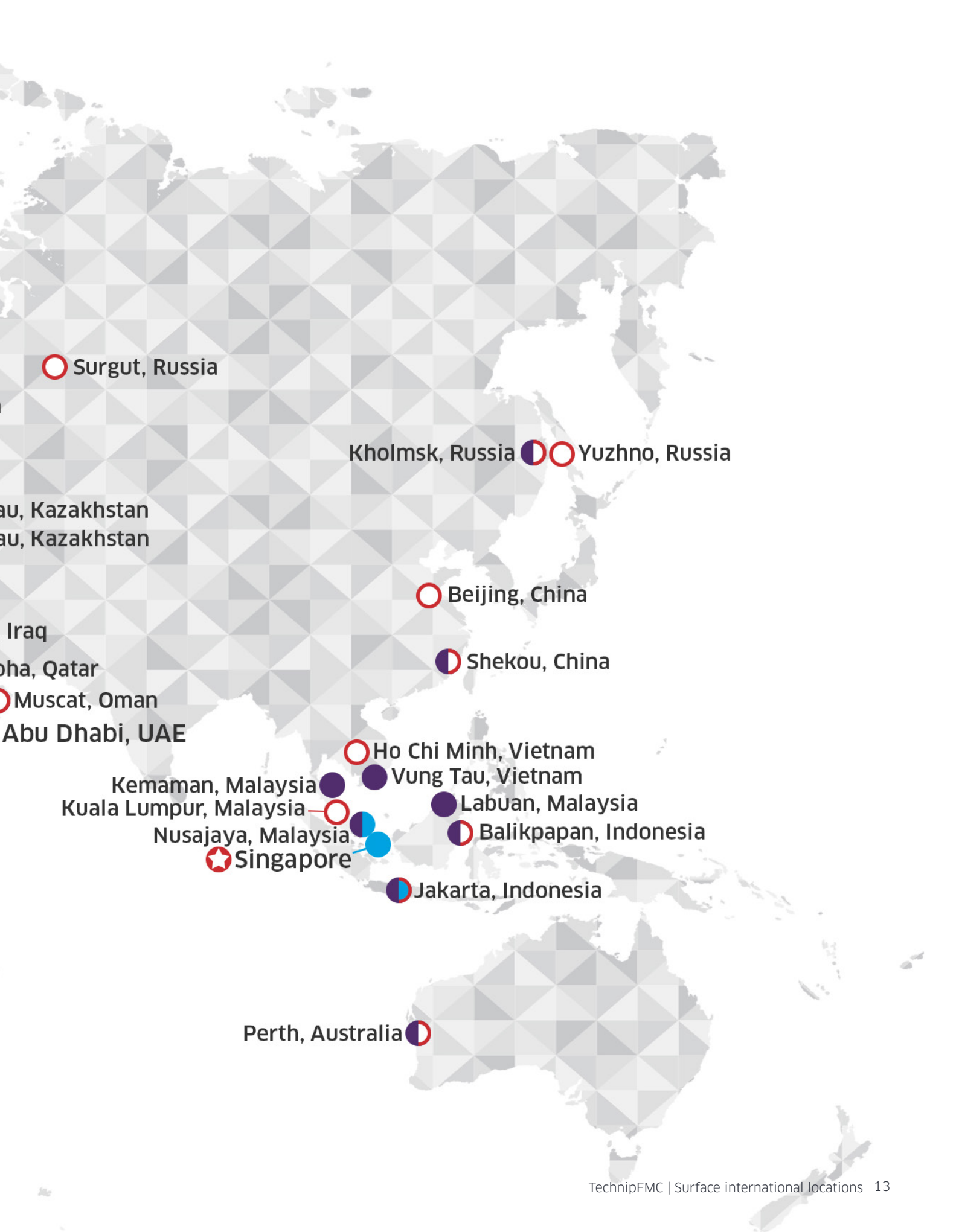


# Surface international locations



## Legend

- Service base
- Manufacturing
- Sales office
- ★ Geomarket headquarters



Surgut, Russia

Kholmnsk, Russia Yuzhno, Russia

au, Kazakhstan  
au, Kazakhstan

Beijing, China

Iraq

oha, Qatar

Shekou, China

Muscat, Oman

Abu Dhabi, UAE

Ho Chi Minh, Vietnam

Vung Tau, Vietnam

Kemaman, Malaysia

Labuan, Malaysia

Kuala Lumpur, Malaysia

Balikpapan, Indonesia

Nusajaya, Malaysia

Singapore

Jakarta, Indonesia

Perth, Australia

**USA**

11740 Katy Freeway  
Suite 100  
Houston Texas 77079 USA

**South Europe and Africa**

Route des Clérimois – ZI des Clérimois  
CS 10 705,  
Sens France 89107

**North Europe and CIS**

Pitreavie Business Park  
Dunfermline Scotland KY11 8UD

**Asia Pacific**

149 Gul Circle  
Singapore 629605

**Middle East**

Guardian Tower  
Sheikh Sultan bin Zayed First  
and Dhafeer Street  
PO BOX 7657  
Abu Dhabi United Arab Emirates (UAE)