

# X80 GRADE FOR RISERS AND FLOWLINES



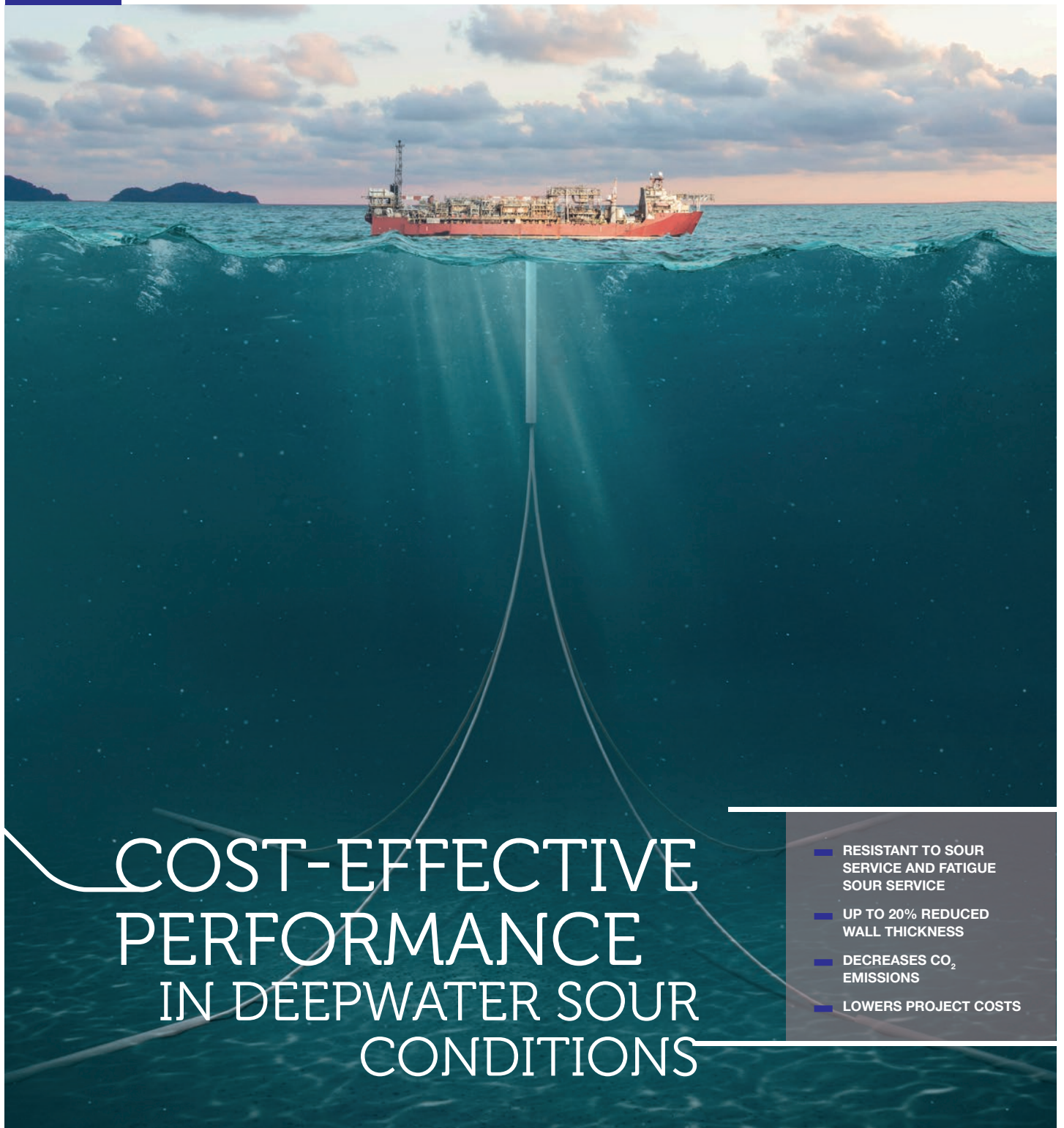
LIGHTER  
WALL  
THICKNESS



REDUCED  
WEIGHT



GREATER  
FLEXIBILITY



COST-EFFECTIVE  
PERFORMANCE  
IN DEEPWATER SOUR  
CONDITIONS

- RESISTANT TO SOUR SERVICE AND FATIGUE SOUR SERVICE
- UP TO 20% REDUCED WALL THICKNESS
- DECREASES CO<sub>2</sub> EMISSIONS
- LOWERS PROJECT COSTS

## X80 ENABLES A MORE COST-EFFICIENT CONFIGURATION

AN OPERATOR WAS PLANNING AN OFFSHORE PROJECT WITH A RISER MADE OF 41 MM-THICK PIPES IN X65 STEEL.

This would require the use of buoyancy modules in what is known as a steel lazy wave riser (SLWR) configuration.

By replacing the X65 grade with X80, the operator was able to reduce the wall thickness of the riser pipe to 32 mm. This, in turn, eliminated the need for buoyancy modules.

Thanks to this steel catenary riser configuration (SCR), the X80 helps to lower project installation costs. The reduced wall thickness helped the operator eliminate more than 2,000 tons of steel production, which translated to cost savings of around \$2 800/ton.

In addition, installation time was shortened by a full 12 days, saving up to 3,500 metric tons of CO<sub>2</sub> emissions, as estimated along the entire value chain (i.e. from the raw material supply to the transport to final destination), according to the EPD International PCR 2012:01 standard (2012).

WITH X80, THE  
OPERATOR SAVED  
OVER 2,000 TONS OF  
STEEL, LOWERING  
INSTALLATION COSTS  
AND CO<sub>2</sub> EMISSIONS





# TAKING OFFSHORE WELLS EVEN DEEPER

## A PROPRIETARY GRADE FOR STRINGENT CONDITIONS

Ultra deepwater offshore projects of 1,500 meters or more present very specific engineering challenges.

The extreme depths cause high hydrostatic pressure, which can lead to collapse issues or buckling during installation phases. Longer risers must cope with increased loads, heightening the risk of fatigue during their lifetime. And ultra deep field development demands complex layouts and installations with specific welding expertise and more accessories, such as buoyancy modules. These extra requirements generate higher project costs.

To meet these particularly challenging line pipe conditions, Vallourec has developed the X80 grade. Thanks to its unique engineering, the X80 allows **wall thickness to be reduced by up to 20%** compared to standard X65 line pipe grades at similar design pressures.



# UNPARALLELED PERFORMANCE IN ANY ULTRA-DEEPWATER ENVIRONMENT

## ONE LINE PIPE X80 DESIGN FOR MILD AND INTERMEDIATE SOUR CONDITIONS

Over the last 10 years, Vallourec has developed and optimized the X80 in close collaboration with end users as well as with engineering, procurement and construction (EPC) partners to deliver proven performance in the mild and intermediate sour environments of NACE regions 1 and 2.

### X80 FOR SOUR SERVICE APPLICATIONS

#### Seamless pipe body:

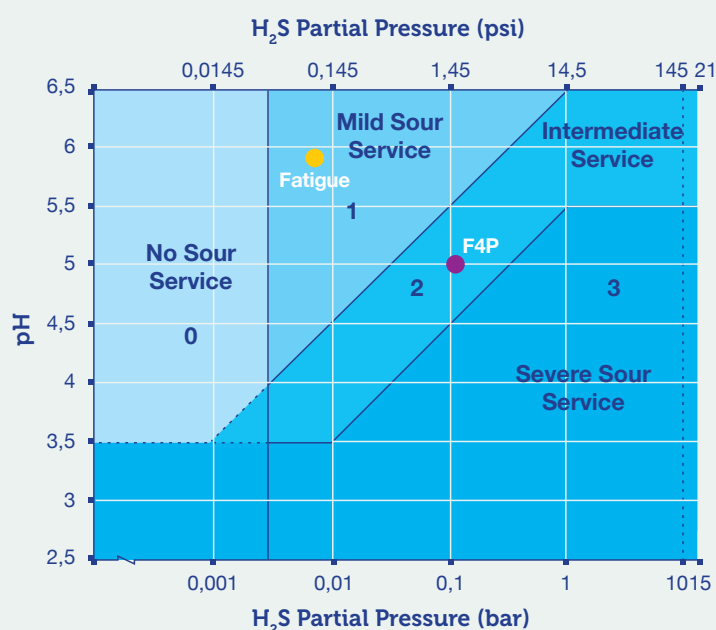
- Resistant to Mild and Intermediate Sour environments (NACE Regions 1 & 2).
- Hardness below 290 HV10 (as per DNV-ST-F101).
- Average toughness 300J at -30°C.
- Range: OD 219.1-406.4 mm (NPS 8-16"), WT up to 40 mm (1.57").
- Possible use of grade X80 for Mechanically Lined Pipes to withstand the most corrosive environments.

#### Girth welds:

- Resistant to Mild and Intermediate Sour environments (NACE Regions 1 & 2).
- Hardness in Heat Affected Zone (HAZ) below 300 HV10.
- No SSC cracks at pH 5.0 / 2 psi H<sub>2</sub>S / 85% SMYS (NACE TM0177 Solution B) when testing four-point bend specimens with root left intact as per NACE TM 0316.
- Fatigue results in air exceeding BS 7608 class E target curve.
- Fatigue results in mild sour condition at pH 5.9 / 0.1 psi H<sub>2</sub>S (NACE Region 1) comparable to X65.



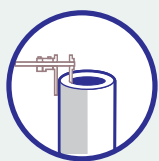
### PERFORMANCE IN SOUR SERVICE CONDITIONS



# REASONS TO CHOOSE THE X80

The X80 not only makes complex ultra-deepwater projects simpler to realize and execute; it also makes them faster, less costly and more ecologically responsible.

## BENEFITS OF THE X80 DESIGN



### LIGHTER WALL THICKNESS

X80 allows thousands of tons of steel to be saved and therefore reduces CO<sub>2</sub> emissions.



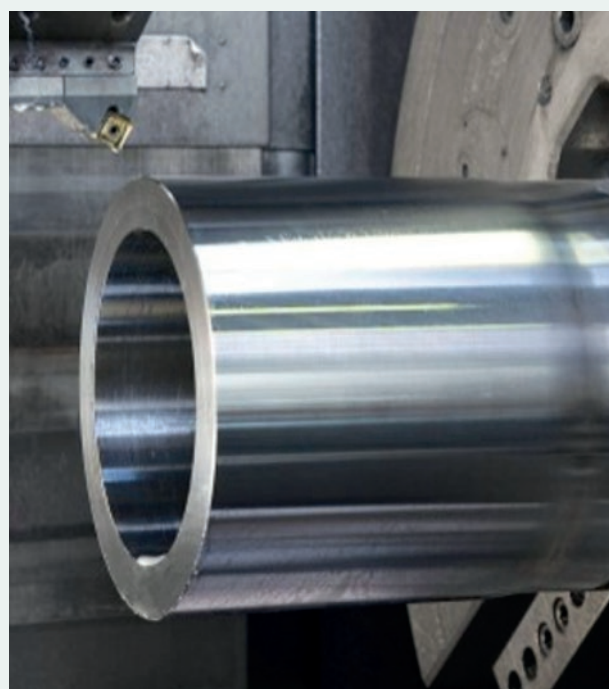
### REDUCED WEIGHT

Lighter pipes mean fewer buoyancy modules are needed, decreasing overall project costs.



### GREATER FLEXIBILITY

X80 delivers greater pipelaying flexibility on the installation vessel, reducing the number of installation days required.

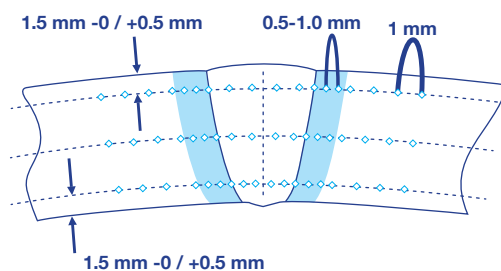


## DESIGNED FOR RAPID WELDING

**THE WELDABILITY OF THE X80 IS WIDELY RECOGNIZED BY EPCS AND PROVEN IN TESTS AND IN THE FIELD.**

- All welding can be performed using Gas Metal Arc Welding process at a minimum preheating temperature of 125° C.
- Hardness Survey proves structural integrity as per DNV-ST-F101 (Vickers method, 10 kg load).
- Overmatching is achieved with an optimized combination of filler material and pre-heat temperatures.

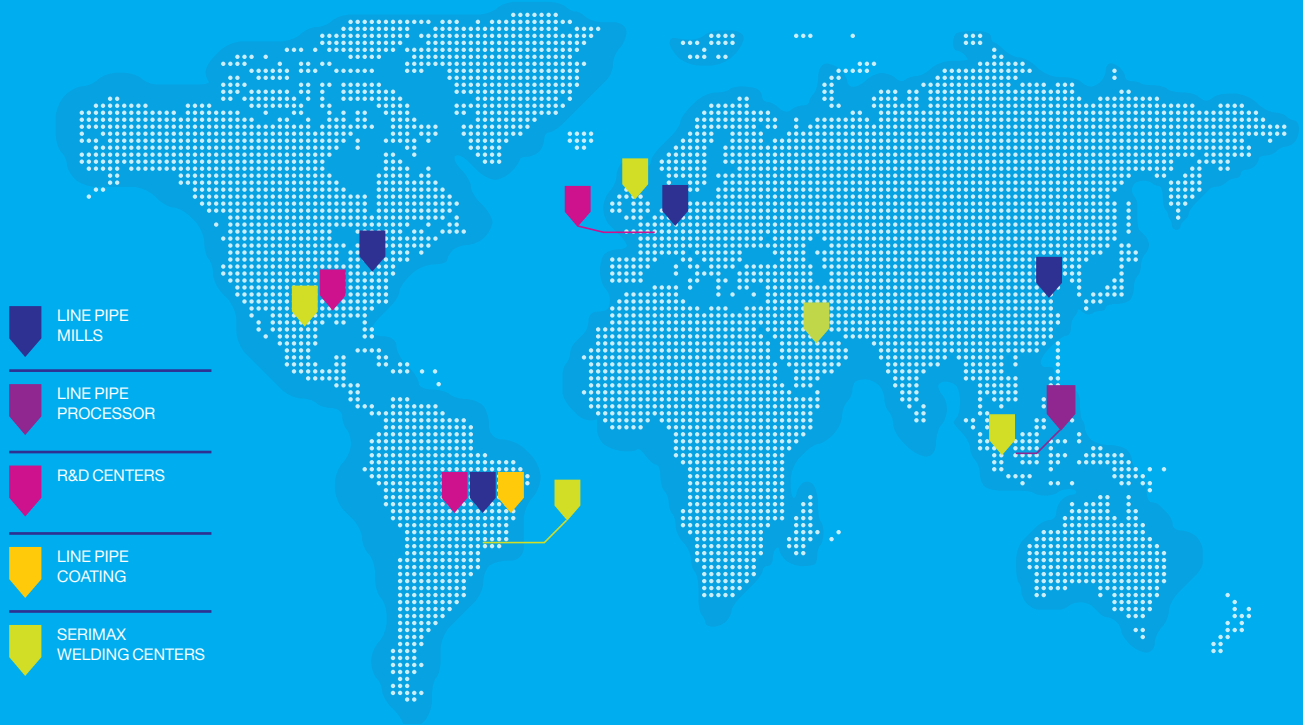
### THE X80 IS DESIGNED FOR EASE OF WELDING



IN-DEPTH TESTING  
CONFIRMS EXCEPTIONAL  
PERFORMANCE  
IN SOUR SERVICE  
ENVIRONMENTS



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



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