

## HIGHLY INSULATED PIPE-IN-PIPE



### PERFORMANCES

- U value as low as 0.4 W/(m<sup>2</sup>.K).
- Cooldown times up to 60 Hrs.
- Layrates of 2.5 to 4 km/day in J & S-lay.

### COST SAVINGS

- Highly compact insulation → use of smaller diameter outer pipe.
- Load bearing insulation → No centralizers required.
- Fast layrates → shorter installation + Minimized offshore risk.

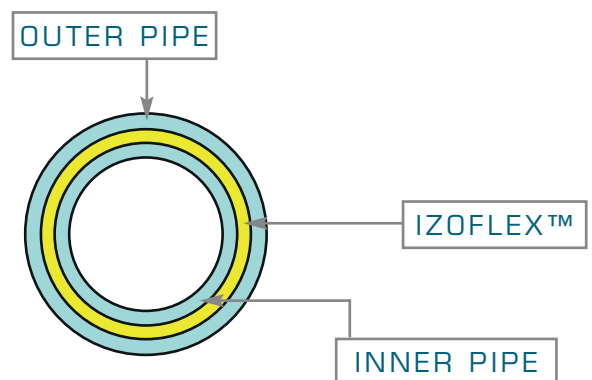
### SUITABLE FOR

- S & J-lay, Reeling, and all water depths (up to 3000m).
- Local content manufacturing (skills & know how transfer)

### IZOFLEX™ INSULATION.

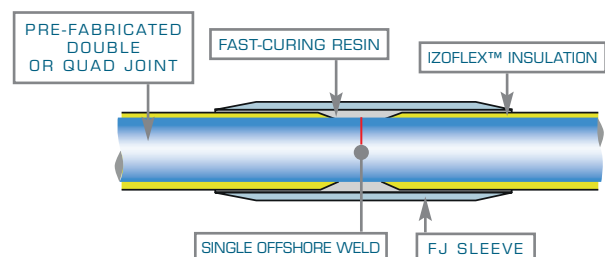


- Izoflex™ : Inert / Non ageing.
- As installed thermal conductivity < 7 mW/(m.K).
- Compliant to -200 °C to 900 °C.
- Compressively strong → No need for discrete centralizers.



### RAPID FIELD JOINT TECHNOLOGY.

- Field joint is an insulated PiP sleeve.
- Thermal & Bending stiffness continuity.
- Single offshore weld (as per simple pipe).
- Field Joint sleeve cycle time ± 5 min.
- Integrated buckle arrestors & water stops.
- Reduced offshore wastes & risks.



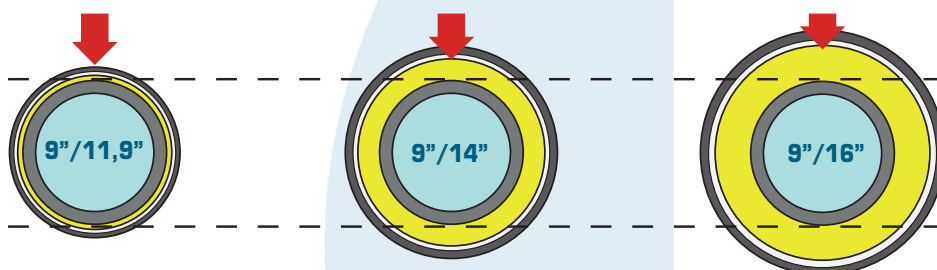
## THERMAL PERFORMANCES

Insulation materials	Izoflex™ technology	Aerogels (with spacers)	PU Foam (with spacers)	Wet insulation
Thermal conductivity in mW/(m.K) (as installed value)	7	16-20	25-30	100-150

## MOST COMPACT PIP FOR A GIVEN U VALUE.

Ex on 9" inner pipe → What's the outer pipe diameter required to achieve a U-value of 0.6 W/(m².K) ?

Insulation materials	Izoflex™ technology (acts as spacers)	Aerogels (with spacers)	PU Foam (with spacers)
Outerpipes Ø required	10 mm thick ⇒ 11.9" (100 kg/m)	+37 mm ⇒ 13.5" (150 kg/m)	+75 mm. ⇒ 15.2" (200 kg/m)



## INSTALLATION VERSATILITY

- Can be S-laid, J-laid, in single, double, or quad joint.
- Can be reeled, or bundled (continuous annulus).
- Suitable for majority of installation vessels.



## ITP's PIP : A PROVEN & RECOGNIZED PIPE IN PIPE TECHNOLOGY :

- 400 km of flowline already installed in several locations.
- Design Temperature of 155°C on Shell Etap project (1998).
- Best U ever achieved on an installed line of 0.55 W/(m².K) (Total Tchibeli project).
- Already installed on several projects of 1500 m water depth in Nigeria & Angola.
- Manufactured in local content in UK, Peru, Nigeria, Congo, Angola.
- More than 15,000 Rapid Field Joints Sleeves already installed

