

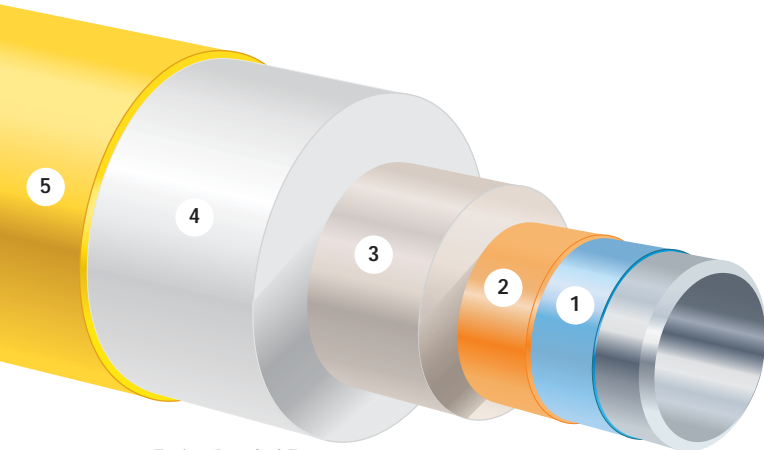
# Thermotite® Deep Foam (TDF)

## Subsea Thermal Insulation Systems



FLOW  
ASSURANCE

PRODUCT DATA SHEET



1. Fusion Bonded Epoxy
2. Adhesive
3. Solid PP
4. TDF
5. Outer Shield

### Product Description

Thermotite® Deep Foam (TDF) is an innovative subsea thermal insulation system that uses a specially formulated polypropylene blend to improve on current foam technology allowing for greater resistance to hydrostatic load in deep water at the design temperature of the flowline or riser.

### Applications



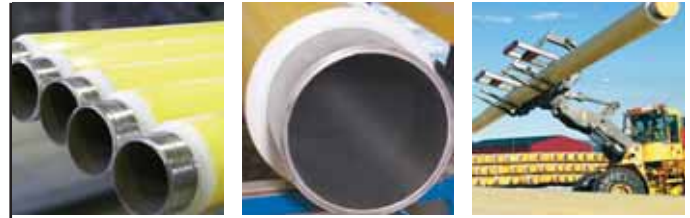
Oil & Gas  
Pipelines



Subsea  
Pipelines



Small Diameter  
Pipelines



### Minimize Compression and Creep

- Higher compressive strength for a given thermal conductivity means that TDF can be installed to water depths up to 2200 m (7218').

### Improved Thermal Performance

- TDF can be combined with syntactic polypropylene as an inner layer to improve creep resistance for higher temperature, deepwater applications.
- Also available in a low density version (LD TDF) which further improves thermal performance to water depths up to 800 m (2625').

### Thinner Insulation Compared to Traditional Polypropylene Foam

- A thinner coating for the same insulation as traditional polypropylene systems value improves seabed stability and may lower installation costs.
- Thinner field joints mean improved cooling and reduced cycle-time.

### Multi-layered Custom Designed System

- TDF can be applied as a 5, 7 or 9 layer system and customized to meet project specific requirements.
- The multi-layer TDF system may be designed with the highest density towards the steel surface for highest mechanical performance and the lowest density towards the outer surface for better thermal performance than traditional polypropylene systems.

### Proven Field Joint Technology

- The patented field joint insulation system minimizes the risk of disbonding in the field joint area as well as ensuring stiffness continuity.

Features & Benefits

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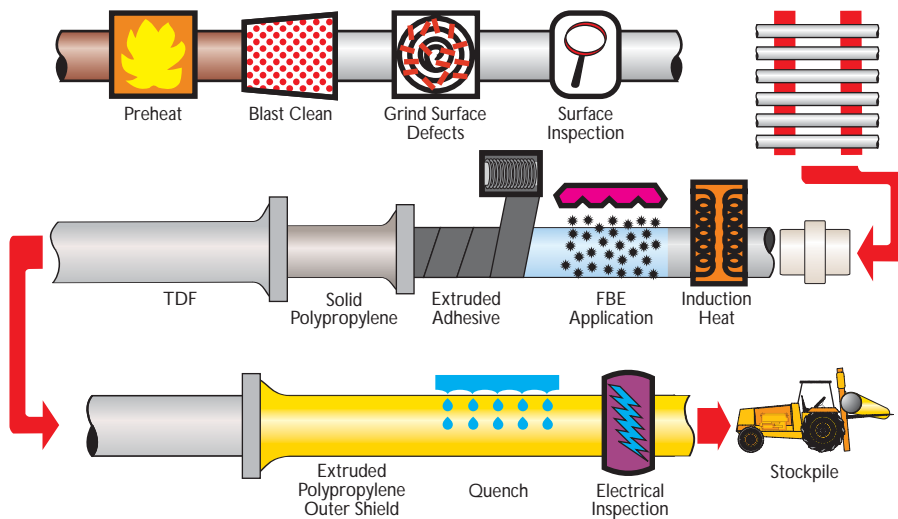
## Subsea Thermal Insulation Systems

### Typical Plant Capabilities and Product Properties

Capability/Property	Thermotite® LD TDF	Thermotite® TDF
Maximum Water Depth.....	800 m (2625')	2200 m (7218')
Maximum Operating Temperature.....	140°C (284°F)	140°C (284°F)
Density .....	620-700 kg/m <sup>3</sup>	700-850 kg/m <sup>3</sup>
Specific Heat Capacity.....	1800 - 3000 J/kg K	1800 - 3000 J/kg K
Thermal Conductivity.....	0.13 - 0.16 w/mk	0.16 - 0.19 w/mk

Values shown are typical and may vary from plant to plant. Consult Bredero Shaw for special requirements.

### Product Application Process



Thermotite® TDF\_rev020

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### Plants

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### About Bredero Shaw

Bredero Shaw is the global leader in pipe coating solutions. With more than 80 years of experience, the largest team of dedicated pipe coating professionals, the most extensive network of strategically located plants worldwide and with proven innovative coating technologies, the company has protected more pipelines in virtually every environment and operating condition than anyone in the industry.

Bredero Shaw offers technologically advanced solutions for anti-corrosion coatings, protective and weight coatings, thermal flow assurance coatings, internal coatings, custom coatings and field joints for both onshore and offshore applications. This broad range of products and services provides Bredero Shaw with the unique capability to service the full spectrum of pipeline protection and flow assurance requirements. Consult your Bredero Shaw representative for your unique project requirements.

The information contained herein is indicative of the types of coatings provided by Bredero Shaw, and is not intended to be a guarantee that a particular coating will be suitable for a given application. Since many unique environmental, operating, and design conditions must be considered, the user shall determine the suitability of the coating for the intended use and assume all the risks and liabilities in connection therewith. Bredero Shaw's liability is stated in our standard conditions of sale.