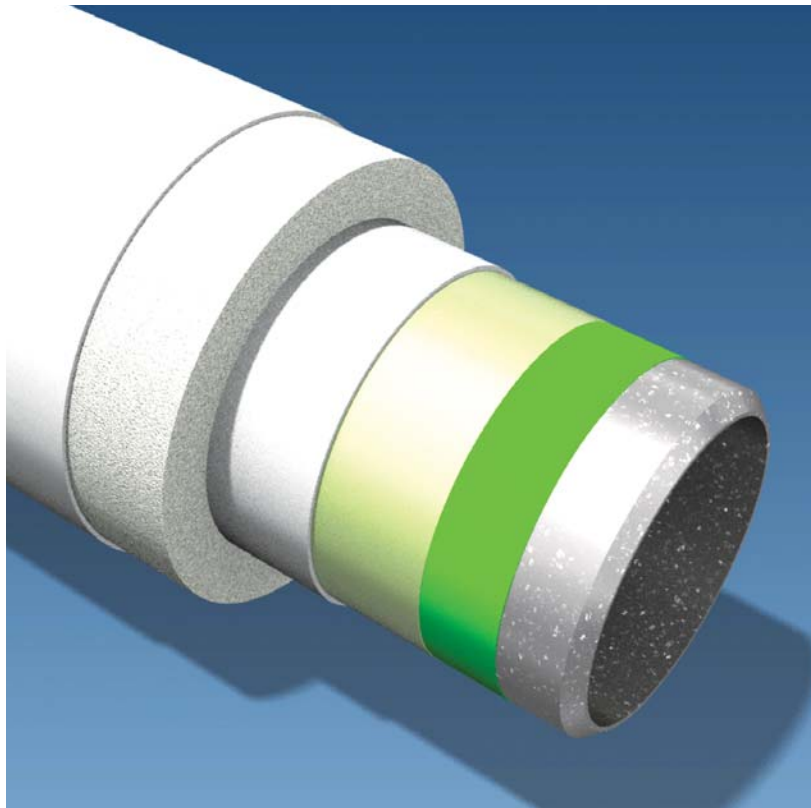
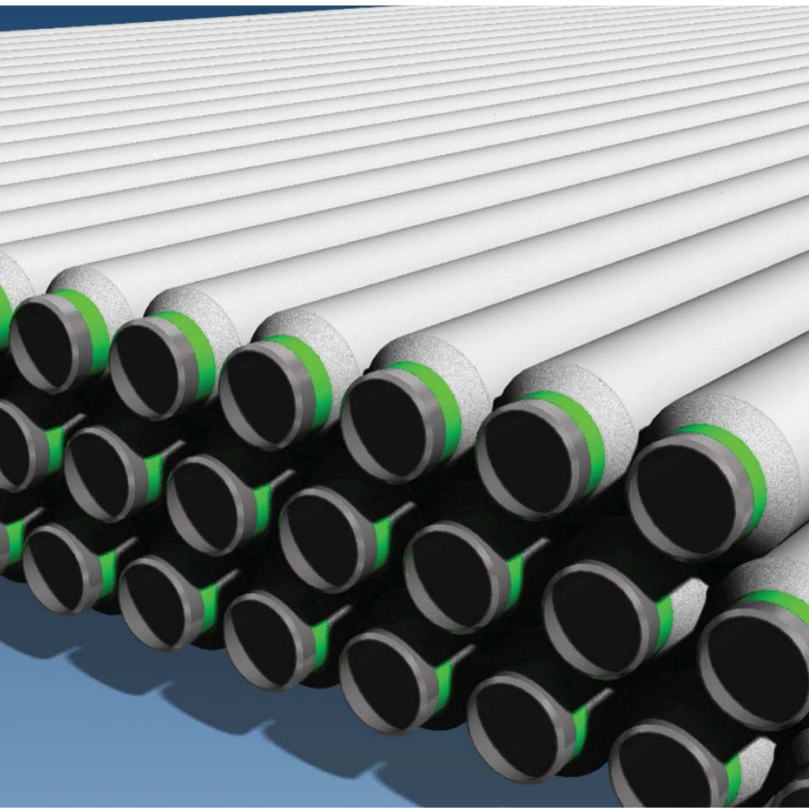


MULTI-LAYER POLYPROPYLENE COATINGS

Insulation systems for thermal management of flowlines for offshore applications



MULTI-LAYER POLYPROPYLENE COATINGS

Multi-Layer Polypropylene (Solid, Foam and Syntactic) Flow Assurance Coating

Polypropylene insulation systems are used for the thermal management of flowlines for offshore applications. Insulation can take the form of solid, foamed or syntactic polypropylene, as well as multi-layer combinations of these three materials designed specifically for each project.

Typical Properties

Description	Typical Value*
Thermal conductivity	0.14 to 0.22 W/m·K
U value range	2 W/m ² ·K and higher
Water depth range	0 to 4500 m
Minimum pipe diameter	80 mm (3 in)
Maximum pipe diameter	600 mm (24 in)
Minimum pipe length	9 m (30 ft)
Maximum pipe length (double joint)	13 m
Minimum operating temperature	-20 °C (-4 °F)
Maximum operating temperature	140 °C

*Typical values are quoted and vary with the grade of material selected.

Applications and Standards

The products are applied by a side extrusion process. Various layers are employed to achieve the desired thermal and buoyancy requirements. Materials are applied in accordance with project specific requirements.

SURF 9035™

SURF 9035™ material, a fully compounded polypropylene based resin, is ideal for the production of syntactic polypropylene systems for thermal management of flowlines for offshore applications. The material is designed to perform at high service temperatures specifically in deep water. Its matrix is a base polymer designed by Basell and final formulation is performed by Wasco Coatings Group insulation technology.

Typical Processing Conditions

Melt temperature range: 180 °C - 220 °C

Features

- Excellent processability
- Good impact strength
- Excellent softness
- Low permeability to water vapor

Typical Applications

Thermal insulation pipe coating for deep water

Properties and Operating Temperatures for SURF 9035™

Typical Properties	ASTM Method	Unit	Value*
Physical Properties			
Melt flow rate (230 °C, 2.16 kg)	D 1238 L	g/10 min	3.5
Specific gravity	D 1505	g/cm ³	0.9
Melting point	D 3418	D 3418	>160
Vicat softening point (9.8N)	D 3418	°C	140
Mechanical Properties			
Flexural modulus	D 790	MPa	>900
Tensile strength	D 638	MPa	>12
Elongation	D 638	%	>400
Hardness Shore	D 2240	Points	>60

*These are nominal values. They are not to be considered as specification limits.

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