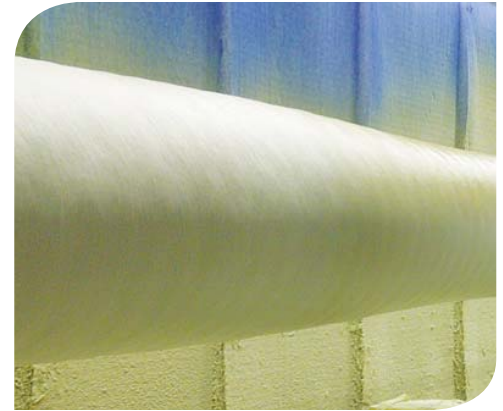
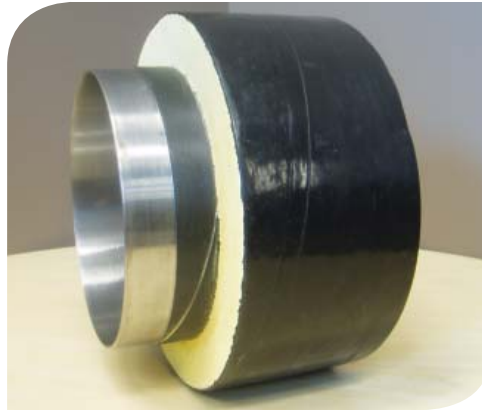


# Ultrafoam IISE

Thermal insulation with three layer polyethylene corrosion barrier

ENERGY & MINING



**Ultrafoam IISE** consists of a three layer polyethylene corrosion barrier (Fusion Bond Epoxy, polymeric adhesive, polyethylene jacket), spray applied polyurethane foam overcoated with a high integrity rubberized adhesive and/or tape followed by a durable polyethylene jacket. This polyurethane foam insulation system is designed to provide excellent thermal insulation and corrosion protection characteristics. Customer's may choose a standard 85°C version or a 100°C version dependent on their required maximum pipeline operating temperature.

## Product Features

- Designed for operating temperatures from -40°C to 85°C with a higher temperature version available for 100°C
- Polyurethane foam can be applied at thicknesses from 25.4mm (1 inch) to 76.2mm (3 inches)
- Field bendable to CSA Z662 Specifications
- Designed to provide excellent thermal insulation and corrosion protection for higher temperature buried pipelines

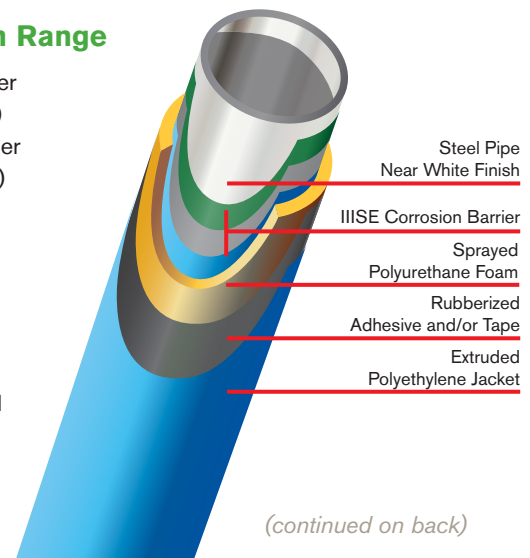
**Cold Weather Handling:** Precautionary measure must be exercised during handling and installation in cold temperatures (-25°C and colder). Please contact Bayou Perma-Pipe for more information on cold weather handling recommendations and procedures.

## Pipe Application Range

- Minimum Pipe Diameter
- 88.9mm (3.5 inches)
- Maximum Pipe Diameter
- 1067mm (42 inches)
- Minimum Pipe Length
- 5.5m (18 feet)
- Maximum Pipe Length
- 25m (82 feet)

## Compliance

IISE: CSA Z245.21 B1  
ISO 9001:2008



## Typical Properties and Performance Characteristics

### High Density Polyethylene Properties per CSA Z245.21-10

Property	Test Method	Requirements	Typical Values
Density	ASTM D1505	> 0.940 g/ml	0.949 g/ml
Elongation	ASTM D638	≥ 600%	650%
Tensile strength	ASTM D638	≥ 18.5 MPa	20 MPa
Hardness Shore D	ASTM D2240	≥ 60	64

### Coating Properties per CSA Z245.21-10 System B1

Test	Condition	Requirement	Typical Values
Peel adhesion	10mm/min @ 20°C	≥ 150 N	Average 350 N
Cathodic disbondment	28 days @ 20°C @ 1.5V	≤ 12mm radius	7mm radius
Cathodic disbondment	24 hours @ 65°C @ 3.5V	≤ 7mm radius	3mm radius
Flexibility	2.5 degrees @ -30°C	No cracking of PE	No cracking of PE
Impact resistance	-30°C	≥ 3.0 J/mm	5.0 J/mm
Gouge resistance	75 kilos @ -30°C with R33 Bit	Purchaser's specification	≤ 1.5mm depth No FBE exposed
Gouge resistance	50 kilos @ 20°C with R33 Bit	Purchaser's specification	≤ 1.5mm depth No FBE exposed
Outdoor Exposure	N/A	N/A	≤ 2 years

### Polyurethane Foam Properties

Density ASTM D1622	≥ 40 kg/m <sup>3</sup>
Compressive strength ASTM D1621	≥ 0.3 MPa
Open cell content ASTM D2856	≤ 12%
Thermal conductivity ASTM C518	0.03 W/mK

### External Jacket Properties

PE density ASTM D1505	> 0.940 g/cm <sup>3</sup>
Elongation ASTM D638	600% minimum
Tensile strength ASTM D638	> 18.5 MPa
Impact resistance ISO 179-1	≥ 3.0 kJ/m <sup>2</sup>
Outdoor exposure	≤ 2 years

### Dimensional Properties

#### Coating

FBE primer thickness	≥ 0.12mm (5 mils)						
Adhesive thickness	≥ 0.10mm (4 mils)						
Polyethylene thickness	≥ 1.00mm (40 mils)						
Foam thickness (Customer specified)	25.4mm (1 inch) to 76.2mm (3 inches) (-3/+10mm)						
Adhesive over foam and/or tape	Complete coverage						
External polyethylene jacket	<table border="0"> <tr> <td>≤ NPS 12</td> <td>≥ 1.0mm</td> </tr> <tr> <td>&gt; NPS 12 ≤ 20</td> <td>≥ 1.5mm</td> </tr> <tr> <td>&gt; NPS 20</td> <td>≥ 2.0mm</td> </tr> </table>	≤ NPS 12	≥ 1.0mm	> NPS 12 ≤ 20	≥ 1.5mm	> NPS 20	≥ 2.0mm
≤ NPS 12	≥ 1.0mm						
> NPS 12 ≤ 20	≥ 1.5mm						
> NPS 20	≥ 2.0mm						

#### BPPC Quality Plan

### Operating Properties

Maximum operating temperature	85°C (or 100°C)
Minimum operating temperature	-40°C*

\*Please see notes on cold weather handling on front of data sheet.

Girth Weld Protection: Bayou Perma-Pipe Canada, Ltd. can supply heat shrinkable sleeves and polyurethane foam half shells for completion of insulation system on field joint areas.

Note: For contractual purposes, the most recent edition of BPPC's Quality Plan shall apply, plus additional written agreements between the Customer and Bayou Perma-Pipe Canada, Ltd.



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