



DETAILED SPECIFICATION
PE extruded jacket
with U.I.P.[®] System

1) General

The pipe shall be insulated using the unique U.I.P.[®] factory insulation process, as supplied by Urecon Ltd., complete with integral conduit for electric heat trace cable (*if required*). Insulation of associated joints, fittings and accessories shall be as per Urecon's recommendations, depending on the size and type of pipe involved. The product shall be manufactured in accordance to ISO 9001-2008 Standards, or approved equal.

2) Pipe and casing preparation

Pipe and casing shall be cleaned of surface dust or dirt, if necessary, to insure adhesion of the foam to the pipe and casing surface. The pipe and/or polyethylene casing may be treated by sand blasting, application of a chemical foam-bonding compound, or by flame to enhance adhesion, as deemed necessary by Urecon and project requirements.

3) Heat tracing conduit(s)

Heat tracing conduit(s) shall consist of an extruded molding and shall be applied to the pipe prior to application of the insulation. The conduit(s) will be securely fastened to the pipe to prevent the ingress of foam therein during the insulation process. All conduit shall be checked after insulating to insure they are not plugged. The ends shall be sealed prior to shipping to prevent any foreign material from entering the conduit while in transit or during installation.

4) Insulation

- a) Material: rigid polyurethane foam, factory applied.
- b) Thickness: 50 mm (2 in.) or as required.
- c) Density: (ASTM D 1622) 35 to 48 kg/m³ (2.2 to 3.0 lbs/ft³).
- d) Closed cell content: (ASTM D 6226) 90%, minimum.
- e) Water absorption: (ASTM C272) 4.0% by volume.
- f) Thermal conductivity: (ASTM C518) 0,020 to 0,026 W/m⁰ C (0.14 to 0.17 Btu • in/ft² • hr • °F).

5) System properties

- a) System compressive strength: (modified ASTM D 1621 with casing jacket) approximately 690 to 1379 kPa (100-200 lbs/in²), varies with pipe diameter.
- b) Core pipe service temperature range: from -45° to 93°C (-49° to 200°F); the overall factory insulated system limitations are dependant on core pipe type and application. Call your Urecon representative for details.



6) Outer PE jacket

a.) PE casing:

The outer protective jacket on the casing system shall consist of black PE, UV inhibited, factory applied as per the following specifications:

- i) Cell classification 234360C for PE as per ASTM D3350
- ii) Minimum 2% carbon black, well dispersed
- iii) Jacket thickness shall be 3.81 mm (150 mil) to 7.62 mm (300 mil) depending on pipe diameter and PE casing availability from supplier.

b.) PE extruded:

The outer protective jacket on the casing system shall consist of high density polyethylene copolymer black PE, UV inhibited, factory applied as per the following specifications:

- i) Minimum cell classification 435560A for PE as per ASTM D 3350
- ii) Minimum 2% carbon black, well dispersed
- iii) Density 0.953 gm/cc ASTM D 4883
- iv) Tensile Strength at yield (50 mm(2 in.) /min) 26 MPa (3,700 psi), ASTM D 638.
- v) Minimum recommended PE extruded jacket thicknesses **for above grade applications-**

Jacket OD	≤ 300 mm (12 in)	@ 3,17 mm (125 mil)
Jacket OD	350 mm (14 in) to 600 mm (24 in)	@ 3,81 mm (150 mil)
Jacket OD	≥ 600 mm (24 in)	@ 4,44mm (175 mil)

*other jacket thicknesses are available upon request

- vi) Minimum recommended PE extruded jacket thicknesses **for below grade applications-**

Jacket OD	to 400 mm (16 in)	@ 1,27 mm (50 mil)
Jacket OD	>450mm (18") to 600 mm (24 in)	@ 1,90 mm (75 mil)
Jacket OD	≥ 600 mm (24 in)	@ 2.54 mm (100 mil)

*other jacket thicknesses are available upon request

7) Insulated pipe joints

Insulated pipe joints shall consist of prefabricated rigid polyisocyanurate or urethane foam half shells supplied complete with either:

- i) Canusa K-60 heat shrink wrap for **below grade applications**
- ii) a.) Urecon Slipjoint® allows for expansion and contraction by having one end fixed while the other end is free to slide. It is comprised of 3,17 – 4.41 mm (0.125 to 0.175 in.) wall split PE casing, stainless steel bands and band-it clips **for above grade applications only.**
 b.) Should a water proof seal be required **for an above grade application,** specify Urecon supplied Canusa SuperSeal heat shrink wrap complete with closure to provide the primary seal, complete with 3,17 – 4,41mm (0.125 to 0.175 in.) thick PE with stainless steel bands and Band-It clips supplied to suit. This outer PE jacket protects the sealed shrink wrap from the



damaging effects of the sun's UV rays.

- iii) Urecon Mec-seal[®] joint kit, which a heat-shrinkable expanded cross linked polyethylene casing with trumpeted ends, integral polyamide adhesive and butyl mastic sealant for more demanding waterproof above or below grade applications.

8) Insulation for fittings

a.) Field applied insulation kits:

Insulation kits for fittings shall consist of rigid polyisocyanurate or urethane foam insulation with a fully bonded polymer protective coating on all exterior and interior surfaces, including ends. Kits to be supplied complete with silicone caulking for seams, stainless steel attachment straps and clips, and heat-shrink sleeves or butyl mastic tape to seal between pipe and insulation kit.

- i) Rigid Polyisocyanurate or urethane foam insulation
 - .1 Density (ASTM D1622) 27 to 32 kg/m³ (1.7 to 2.0 lbs/ft³).
 - .2 Compressive strength (ASTM D1621) 131 to 158 kPa (19 to 23 lbs/in²)
 - .3 Closed cell content 90%, minimum.
 - .4 Water absorption: (ASTM C272) 4.0% by volume.
 - .5 K factor: (ASTM C 518) 0,027 W/m⁰C, (0.19 Btu • in/ft² • hr • ⁰F).
 - .6 Thickness to match pipe insulation thickness.
- ii) Polymer Coating, Urecon BL-100-20EP
 - .1 Two component high density polyurethane coating, black in color.
 - .2 Density 1170 kg/m³ (73 lbs/ft³).
 - .3 Durometer D scale 60.
 - .4 Tensile strength 11,100 kPa (1610 lbs/in²).
 - .5 Tear strength 26,5 N/mm (151 lbs/in).
 - .6 Thickness 2.54mm (100mils)outside surfaces; 0,51 mm (20 mils) inside surfaces.

b.) Factory insulated fittings-

Fittings to be factory insulated must either be bell X spigot in configuration or have adequately long legs on each end to allow for joining in the field.

Each fitting shall be insulated with urethane foam as described in section #4 above, and the jacket shall be either-

- 2.54mm (100 mil) polymer coating with the physical characteristics as described in (8 a.ii) above
- OR-**
- mitered / fused PE casing with a minimum thickness as the PE jacket on the factory insulated pipe.

9) Electric Tracing System

The electric tracing system and associated controls shall be as per the manufacturer's recommendations with particular attention being paid to the watt densities applied through conduits on plastic pipes. All tracing cables and related accessories to be CSA approved and comply with CSA heat-tracing standard C22.2 No. 130.2-93. Standard of acceptance is Urecon's Thermocable or approved equal. Please contact your Urecon representative for further details and design assistance.

Note: -Physical characteristics are nominal and may vary depending on pipe type and diameter (Revised Feb. 2012).