

Urecon SunPipe® for Solar Thermal PRE-INSULATED PIPE DETAILED SPECIFICATION

Polyethylene cased jacket with Hi-Temp system to 150°C (300°F)

1) General

This product is recommended for either above or below ground hot water solar thermal installations.

It is critical that all field installed components of a Hi-Temp polyisocyanurate foam piping system be installed with special care and attention, ensuring that the system is not only insulated properly, but *completely waterproof* as well. Should moisture be trapped in the system by any means after commissioning, the moisture will flash off as steam, permanently damaging the insulation and jacketing.

Urecon's engineers shall review all pipe system layouts during the quoting stage to address expansion/contraction considerations, as well as system limitations. The pipe shall be insulated using the unique U.I.P.® two-fill factory insulation process, as supplied by Urecon, 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. All exposed ends of insulation shall be bagged with plastic or sealed with waterproof sealant prior to leaving the factory to prevent moisture ingress during shipping and storage. The product shall be manufactured in accordance to ISO 9001-2000 standards, or approved equal.

2) Pipe and casing preparation

- a) Pipe and casing shall be cleaned of surface dust or dirt and treated, if necessary, to insure a positive bond of the foam to the entire pipe and casing surface.
- b) Pipe shall be type L, M or K copper in standard industry lengths and diameters. Supplied by Urecon or customer.

3) Insulation

- a) Material: rigid polyisocyanurate foam, factory applied.
- b) Thickness: Nominal 25 mm (1 in) to 50 mm (2 in) or as required (varies with core pipe size)
- c) Density: (ASTM D 1622) 38,4 to 56 kg/m³ (2.4 to 3.5 lbs/ft³).
- d) Closed cell content: (ASTM D 2856) 90%, minimum.
- e) Water absorption: (ASTM D 2842) 4.0% by volume.
- f) Thermal conductivity: (ASTM C518) 0,020 to 0,026 W/m °C (0.14 to 0.17 Btu • in/ft² • hr °F).

4) 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) Pipe service temperature range: from -45° to 149°C (-49° to 300°F); the overall factory insulated system limitations are dependant on core pipe type and application. Call your Urecon representative for details.

5) Outer jacket; PE cased system

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

- a) Cell classification =234360C for PE, ASTM D3350
- b) Minimum 2% carbon black, well dispersed
- c.) Manufactured in accordance with ISO 9001:2000 Quality Management Program

6) Insulated pipe joints (above ground and/or buried) Insulated pipe joints shall consist of prefabricated rigid polyisocyanurate foam half shells supplied complete with heat shrink wrap with closure seal, as supplied by Urecon. The heat-shrink sleeves shall overlap the insulation jacket by a minimum of 75 mm (3 in) on either side of the joint.

7) Insulation kits for fittings

a) Above ground

Insulation kits for fittings shall consist of rigid polyisocyanurate 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 to seal between pipe and insulation kit.

* Factory insulated fittings also available for above ground use - as per 7b) below.

- a) 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 D2842) 4% by volume.
 - .5 Thermal conductivity: (ASTM C 518) 0,027 W/m⁰C, (0.19 Btu • in/ft² • hr • °F).
 - .6 Thickness, to match pipe insulation thickness.
- b) Polymer Coating, Urecon BL-75-20EP
 - .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 1,9mm (75 mils) outside surfaces, 0,51 mm (20 mils) inside surfaces.

b) Below ground

Canusa[®] PLX-65 heat shinkable end seals shall be field installed at all pipe insulation exposed ends at thrust blocks, building entries, etc.

Insulation for all buried fittings shall be factory insulated complete with hi-temp foam and PE casing complete with extension legs ... creating pipe joints to be insulated as per item 6 above.

Expansion/contraction pads shall be installed as per specifications; consult Urecon for design assistance if required.

Anchor point assemblies, if required, shall be supplied by Urecon and shall be 'foamed in place' as described above, then double sealed against moisture ingress using Canusa Superseal® heat shrink wrap for the inner layer, then Canusa WLOX® high ratio heat shrink wrap for the outer seal; concrete shall then be poured as per specification.

Note: -Physical characteristics are nominal and may vary depending on pipe type and diameter. (Revised Feb. 2011)