# DETAILED SPECIFICATION

## Hi-Temp System to 149°C *(300°F)* with PVC jacket for above grade

## 1. GENERAL

It is critical that all field installed components of a Hi-Temp 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 could flash off as steam, permanently damaging the insulation and jacketing.

The pipe shall be insulated using the unique U.I.P.® factory insulation process, as supplied by GF Urecon. The insulation of associated joints, fittings and accessories shall be as per GF Urecon's recommendations. The product shall be manufactured in accordance to ISO 9001 standards.

## 2. PIPE PREPARATION

Pipe shall be cleaned of surface dust or dirt to ensure adhesion of the foam to the pipe.

## 3. INSULATION

a) Material: Rigid polyurethane foam, factory applied.
b) Thickness: 50.8 mm *(2 in)*.
c) Density: (ASTM D1622) 38 to 56 kg/m³ *(2.4 to 3.5 lbs/ft³).*
d) Closed cell content: (ASTM D6226) 90%, minimum.
e) Water absorption: (ASTM D2842) 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)*.
g) Temperature range: - 45°C to 149°C *(-49°F to 300 °F).*

## 4. SYSTEM PROPERTIES

a) System compressive strength: (modified ASTM D1621 with casing jacket) approximately 690 to 1379 kPa *(100-200 lbs/in²),* varies with pipe diameter;
b) Service temperature range: the overall factory insulated system limitations are dependent on the core pipe type, the insulation, the PVC jacket and the application.
c) Temperature limitations: minimum ambient installation temperature 0 °C *(32°F)*

## 5. PVC CASING OUTER JACKET

The outer protective jacket on the PVC jacketed system shall be manufactured from type 1, Grade 1 PVC (cell classification 12454-B) conforming to ASTM resin specification D1784, and shall incorporate a UV inhibitor to ensure long term performance for above ground applications. The PVC jacket wall thickness varies with pipe diameter and urethane foam thickness required, ranging from 1.60 to 12.34 mm *(0.063 to 0.486 in*) for nominal 25.4-609.6 mm (*1 to 24 in*) diameter core pipe.

## 6. INSULATED PIPE JOINTS

Insulated pipe joints shall consist of field foamed in place Hi-Temp polyurethane foam supplied complete with Canusa Superseal® WTD heat shrink wrap with closure seal, as supplied by GF Urecon. The heat-shrink sleeves shall overlap the insulation jacket by a minimum of 76.2 mm *(3 in)* on either side of the joint.

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## 7. INSULATION FOR FITTINGS

### 7.1 Field applied insulation

a) Insulation for fittings shall consist of polyurethane 'foamed in place' insulation with the following characteristics:

i. Density (ASTM D1622) 27 to 32 kg/m 3 *(1.7 to 2.0 lbs/ft$^3$).*
ii. Compressive strength (ASTM D1621) 131 to 158 kPa *(19 to 23 lbs/in$^2$)*.
iii. Closed cell content (ASTM D6226) 90%, minimum.
iv. Water absorption: (ASTM C272) 4.0% by volume.
v. Thermal conductivity: (ASTM C518) 0,027 W/m°C, *(0.19 Btu • in/ft$^2$ • hr • °F).*
vi. Thickness, to match pipe insulation thickness.

b) Jacket for fittings: The insulation shall be waterproofed with 101.6 mm *(4 in)* wide Canusa heat shrinkable tape Wrapid Tape® HCA spiraled around the entire fitting allowing a 50% overlap onto itself and shall extend onto the adjacent insulated pipe jacketing a minimum of 76.2 mm *(3 in);* Canusa Superseal® WTD heat shrink wrap with closure seal may be used for below grade on the straight sections.

### 7.2 End seals

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

### 7.3 Anchor points assembly

Shall be supplied by GF Urecon and shall be 'foamed in place' as described above, then double sealed against moisture ingress using Canusa K-60-B heat shrink wrap for the inner layer, then Canusa high ratio heat shrink wrap for the outer seal; concrete shall then be poured as per project requirements. Refer to the anchor point assembly schematic detail for more information.

Note: *Physical characteristics are nominal and may vary depending on pipe type and diameter.*


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