

## Specification for Above Ground Pre-Insulated Pipe

### Pre-insulated pipe

All thermally insulated pipe work shall be 'Permapipe' pre-insulated carrier pipe encapsulated in rigid polyurethane insulation to required thickness with protective outer casing. The pre-insulated pipe system shall be of Australian manufacture and under certification of ISO 9001:2008 quality system.

### Carrier Pipe

The pipe shall be suitable for the specified pressure and temperature. All ends of all pipes shall be suitably prepared for connection.

### Outer Casing

The protective outer casing shall be selected as to provide an adequate level of mechanical protection to the insulation and carrier pipe when installed and be rigid enough to allow bracketing of the pipe work directly to the casing. Unplasticised PVC (PVC-U) or lock seam galvanised steel are recommended. Rolled sheet metal saddles may be required to spread the load point when lock seam galvanised steel is utilised and the pre-insulated pipe sits on a channel section.

### Insulation

Insulation shall be CFC free rigid polyurethane foam, machine injected into the annular void between the carrier pipe and outer casing by a factory process. A high pressure injection machine with constant chemical temperature control and an impingement mixing head shall be utilised. The insulation shall have the following physical properties:

*Density – 45kg/m<sup>3</sup>*

*Thermal Conductivity - .022 w/mK at 20°C*

*Compressive Strength – 270 kPa*

*Closed Cell Content - >90% by volume minimum*

### Thickness of Insulation

Insulation thickness shall be as per the Building Code of Australia section J5.4 requirements or of such thickness as to prevent condensation forming on the outer casing at a minimum.

### Fittings

Bends, tees, reducing joins and straight joins shall be site insulated using two part rigid polyurethane foam. All fittings shall be metal sheathed or encased in the same material as the outer casing. Site insulation shall only be carried out by trained personnel. Alternatively, all fittings may be factory insulated to the above specification, leaving only straight joints for site reinstatement.

### PIPING & INSULATION SYSTEMS

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### Pressure Testing

Ensure all pipes are pressure tested to the requirements of the contract specification. Any leaks are to be identified and repaired prior to the reinstatement of exposed fittings.

### Site Welds

Carrier pipe and fittings should be welded in accordance with the project specification. Heat shields must be used during welding to avoid damaging the exposed polyurethane ends.

### Site Reinstatement of Fittings

Fittings are to be reinstated only after the pressure test has been signed off.

Follow the following procedure when reinstating fittings on site. Adequate PPE is required to be worn when using polyurethane foam on site.

1. Ensure welds/connections have been pressure tested and signed off.
2. Install sheet metal or alternative material casing around fitting and seal ends with tape
3. Use a holesaw to drill a 32mm hole in the fitting casing
4. Mix parts A & B to the required quantity and pour polyurethane mixture into the fitting casing
5. Clean off excess foam once expanded

Contact Permapipe Systems for more detailed instructions if required.

Permapipe Systems provide the site reinstatement kits as our standard system. Due to the challenging nature of site conditions, this system gives the contractor the most flexibility, guaranteeing the quickest possible lead times to ensure project deadlines are achieved.

Alternatively, Permapipe Systems can provide carrier fittings fully insulated, leaving only straight joints for site reinstatement.

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