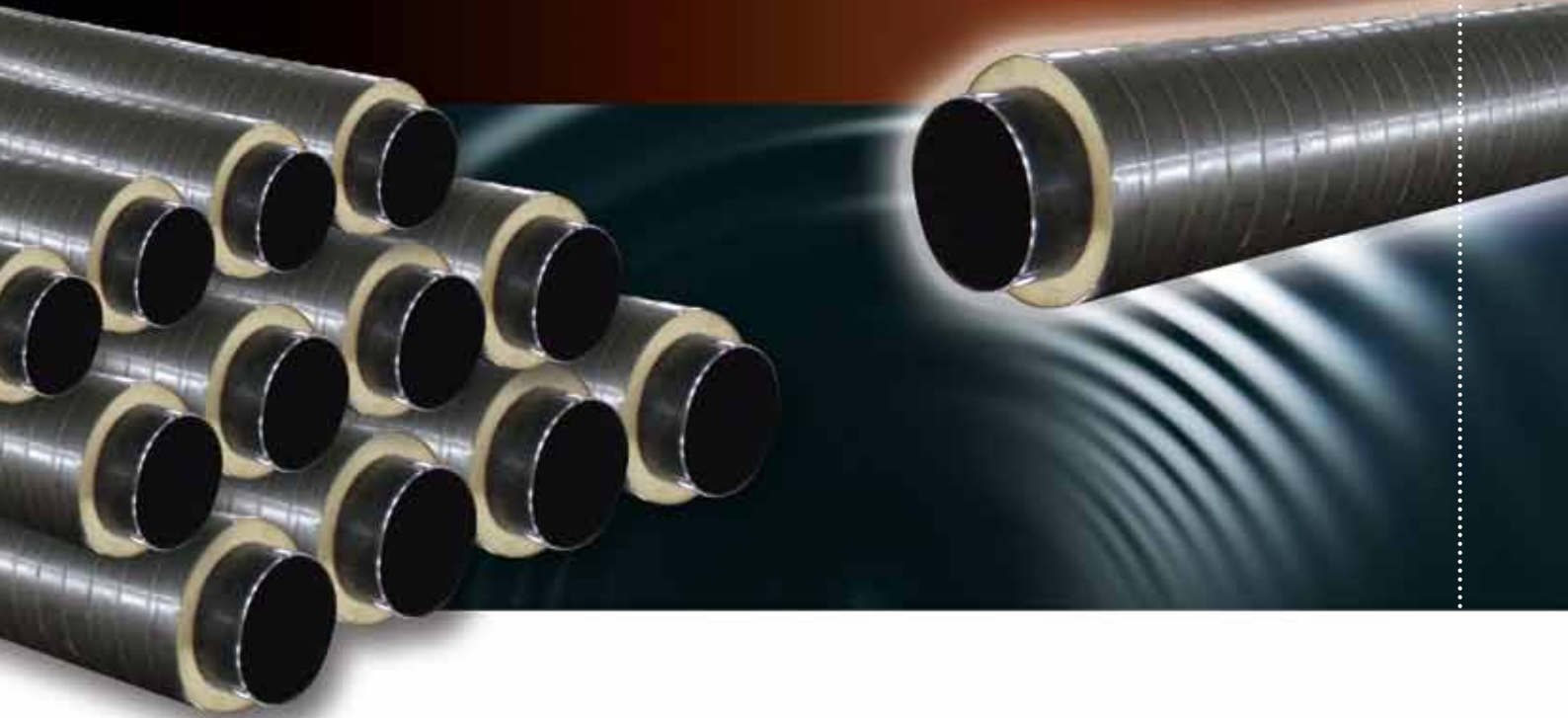


INSUTECH-PIP[®]

PRE-INSULATED PIPING SYSTEM

- Excellent Insulation Efficiency
- Environmental Friendly: CFC, HCFC and HFC free
- Fire Rating to BS476-6, BS476-7 and BS476-20
- Suitable for Air-Conditioning and Refrigeration Use



Pre-insulated Piping System

Pre-insulated pipes are widely used in air-conditioning and refrigeration system. They consist of a carrier pipe, normally black steel pipe ; an insulating layer and an outer casing.

The main purpose of pre-insulated pipes is to maintain the temperature of fluid inside the pipes when transporting the chilled water from the chiller plant to various location inside the building.

Advantage of using PIP System

- **Excellent Insulation Property**

The pre-insulated pipe has an excellent insulation property compared with other thermal insulation materials.

- **Easy Installation**

The pipes are pre-fabricated in the factory thus saving time and cost for on-site installation.

- **Environmental Friendly**

The insulation material used has zero ozone depleting chemicals.

- **Fire Safety**

The pre-insulated pipes together with metal jacket is rated by BS476 Part 6, BS476 Part 7 and can withstand 2 hours in BS476 Part 20, therefore no fire ring is necessary when penetrating wall and floor opening.



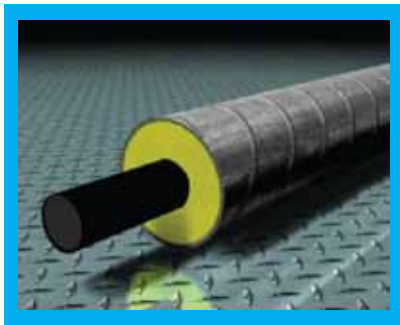
Pre-insulated Pipes Materials

Cladding

To ensure minimum insulation thickness is achieved, the cladding material has to be specified and sized accordingly.

Standard cladding material to be used:-

- Galvanized Steel
- Aluminium
- Stainless Steel Grade 304
- Stainless Steel Grade 316



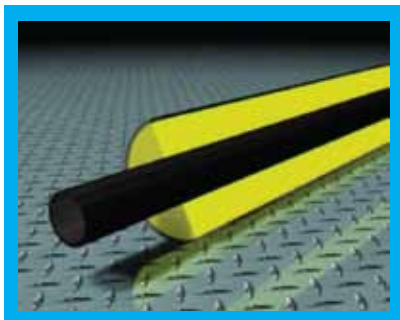
Carrier Pipe

Black steel pipe to BS EN10217-1 and BS EN10255 will normally be used as the inner carrier pipe.

Alternative material such as stainless steel and copper pipes can be supplied upon request.

The black steel pipes shall be supplied with plain ends / bevelled end for butt welding on-site.

The pipes will be delivered in standard length of 6 metres.

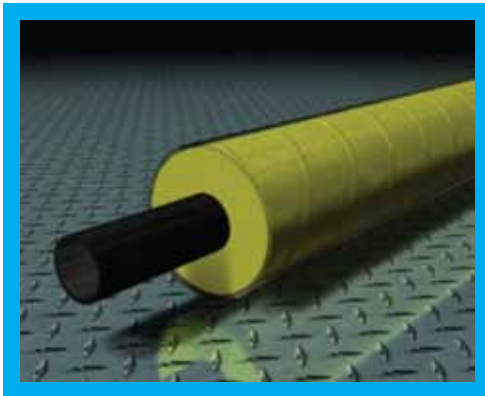


Insulating Layer – Polyurethane Foam

Insulation inside the pre-insulated pipes is the most important part in the system. This insulating layer prevents heat loss and gain from the carrier pipes, saves energy and improves effectiveness throughout the system.

To reduce the environmental impact, the chemicals isocyanate and polyol used to produce polyurethane foam has to be CFC free. Nowadays, the requirement has been upgraded to CFC, HCFC and HFC free.

Our polyurethane foam chemicals is supplied by BASF, the world's leading chemicals supplier, have zero impact on the ozone layer and green house effect.



The Chemical Company

The world's leading Chemical Company public listed in Germany with Production, Research & Development, Sales and Technical Service of Polyurethane System certified in accordance with ISO 9001* and ISO 14001*.

* Certificates available upon request.

Physical Properties:

Density:	48 kg/m ³ (up to 60 kg/m ³ as per requested)	
Strength:	300 kPa	
Thermal Conductivity:	0.0216W/m°C at 10°C mean temperature	
Closed Cell Content:	95% minimum	
Fire Rating:	BS476 Part 6	Fire propagation, I<12 ; i<6
	BS476 Part 7	Surface spread of flame Class 1
	BS476 Part 20	120 minutes integrity
Ozone Friendly:	CFC, HCFC and HFC Free	

Pre-insulated Pipes Materials

Dimensions

The Steel Pipes used in pre-insulated pipes are according to BS EN10217-1 and BS EN10255 .

Nominal Size of Pipe	Outer Diameter of Pipe	Nominal Size of Pipe	Outer Diameter of Pipe
DN	(mm)	DN	(mm)
15	21.3	250	273.0
20	26.9	300	323.9
25	33.7	350	355.6
32	42.4	400	406.4
40	48.3	500	508.0
50	60.3	600	610.0
65	76.1	700	711.0
80	88.9	800	813.0
100	114.3	900	914.0
125	139.7	1000	1016.0
150	165.1	1100	1118.0
200	219.1	1200	1219.0

Insulation Thickness

According to manufacturer's recommendation, all chilled water pipes should be insulated with insulation thickness in accordance with the below table (chilled water taken as at 5°C):

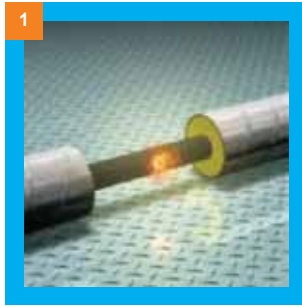
Recommended Thickness of Insulation (mm) for Chilled Water installation (Internal Condition) Thermal Conductivity up to 0.0216W/m°C			Recommended Thickness of Insulation (mm) for Chilled Water installation (External Condition) Thermal Conductivity up to 0.0216W/m°C		
Nominal Size of Pipe DN	Internal Condition up to 28°C 80% RH	Internal Condition up to 28°C 80% RH	Nominal Size of Pipe DN	Internal Condition up to 35°C 80% RH	Internal Condition up to 35°C 95% RH
	h=5.7	h=10		h=9	h=10
15	30	40	15	45	40
20	30	40	20	50	40
25	30	40	25	50	40
32	30	50	32	65	50
40	30	50	40	65	50
50	30	50	50	65	50
65	40	50	65	65	50
80	40	50	80	65	50
100	40	65	100	65	50
125	40	65	125	70	65
150	40	65	150	70	65
200	40	65	200	75	65
250	50	65	250	75	65
300	50	65	300	75	65

* Other insulation thickness can be supplied according to client's request.

* Specification for DN 350 & above can be supplied according to client's request.



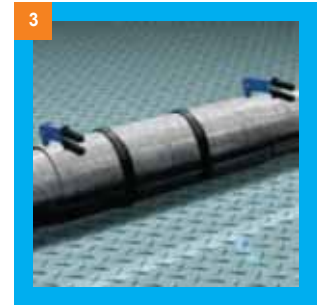
Site Insulation of Joints



1 Join the pre-insulated pipes ends by butt welding and ensure the pipes have been hydrostatic tested.



2 Place the galvanized iron sheet on top of the cladding.



3 Use rubber band to fix the galvanized iron sheet and nail the sheet outer edge.



4 Use crepe tape to prevent the foam leaking out from the edge of the sheet.



5 Drill a hole at the centre of the galvanized iron sheet for pouring PU chemicals.



6 After weighing the amount of Isocyanate and Polyol according to given ratio, stir thoroughly and pour into the drilled hole.



7 Foaming will start at around 30 seconds.



8 When the PU foam is about to reach the top of the hole, apply the rubber tape gently to cover the hole and let a little bit of foam leak out in order to squeeze out the air.

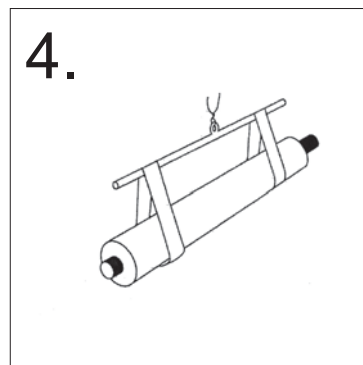
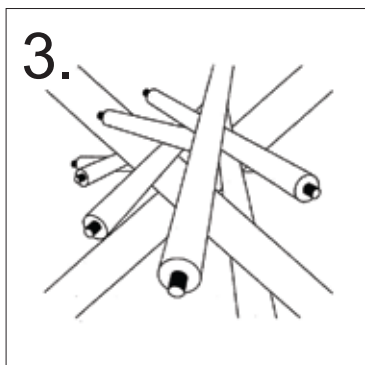
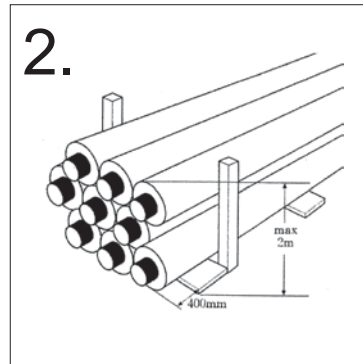
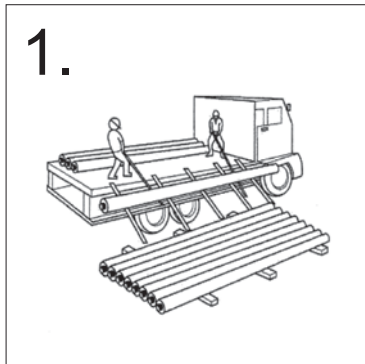


9 After 1 minute of foaming, cut the spilled foam and place a piece of galvanized iron sheet or moisture-proof tape on top of the hole.

Handling of Pre-insulated Pipes

Storage and Transportation of Pre-insulated Pipes

- 1) When unloading the pipes from the truck, using props or cranes is recommended to prevent the pipe from falling on to the ground.
- 2) Water penetration should be avoided when storage and the height of the stack should be limited as described in the figure to avoid overloading. For long term storage, pipes should be covered and stored under a shelter.
- 3) Stacking the pipes in such way is highly not recommended.
- 4) Use rope sling or nylon sling when transporting the pre-insulated pipes.





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