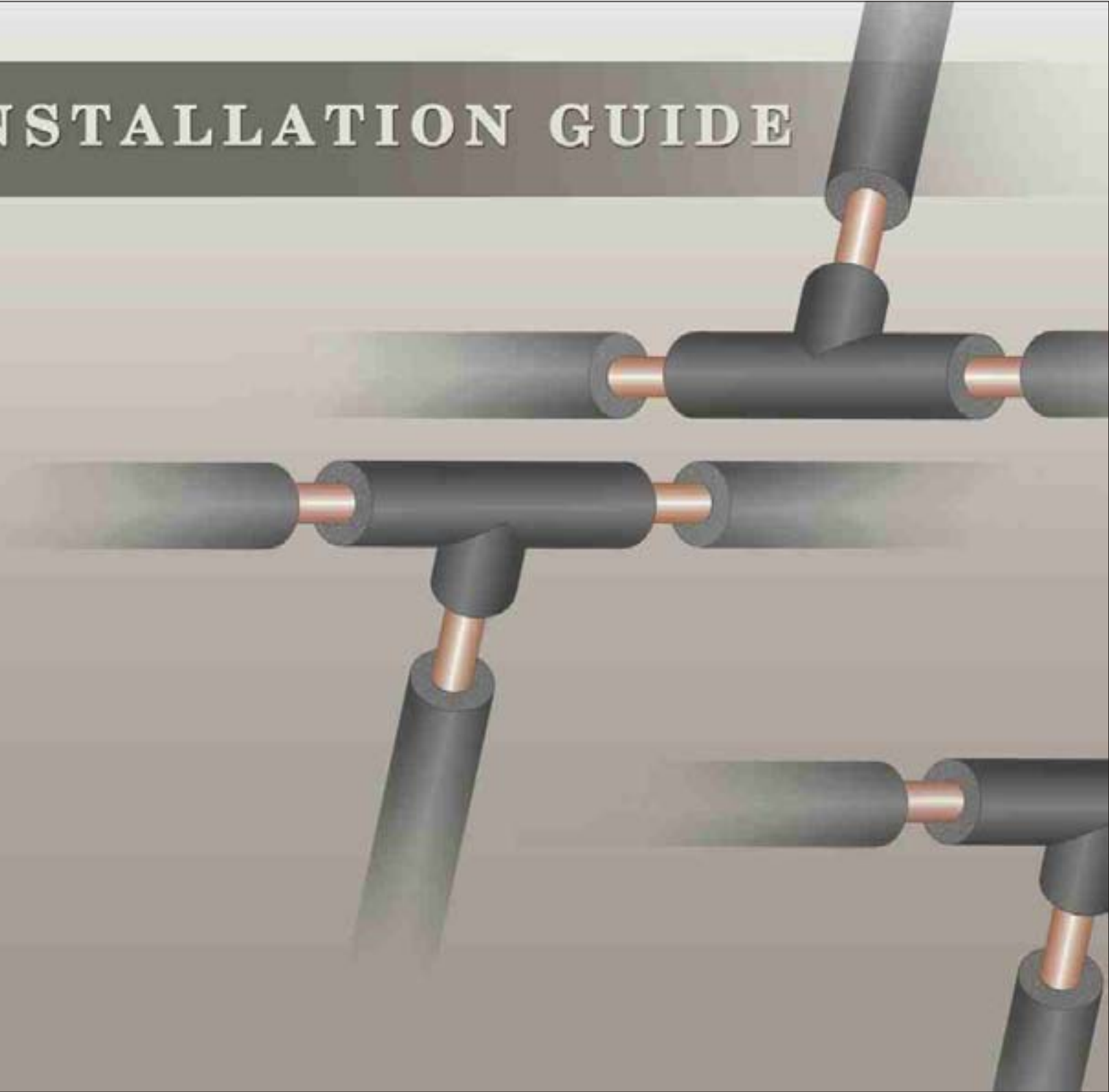
INSTALLATION GUIDE

INTERNATIONAL
INNOVATIVE
INSULATION S.A.



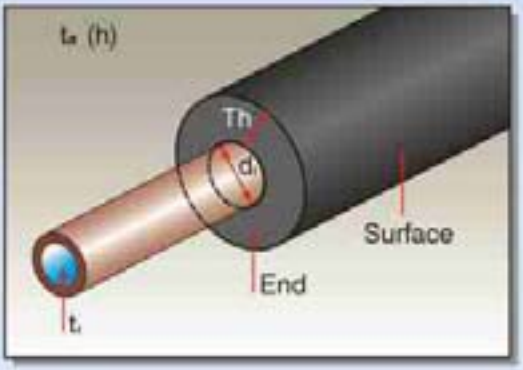
Terminology

Insulation= Isopipe Rubber closedcell flexible material in tubes or sheets
Pipe-line= is the main body of pipe work, can be copper, steel or plastic or composite pipes
Joints= screwed, welded, valves or any other part used to join pipe-lines
Pipe size= commonly referring to the external diameter of pipe
Internal Tolerance= referring to the min and maximum tolerances within the internal diameter of the insulation (d_i)
Clutch= the act of clamping a sliced insulation over a pipe

Insulation surfaces= the smooth flat side of the insulation, defined by length and width

End= is the thickness side of the insulation (picture), defined by thickness (Th)

Fitting cover= cut, slit and formed into shape parts of insulation, used for Joints and bends



Touch - Dry= After applying glue, the point in time where the solvent has evaporated and the glue partly dried, to a point when touched (finger) it will not come-off(stick) to the finger. Can range between 3-10 minutes depending on temperature and humidity

Line temperature= the temperature of the liquid inside the pipe (t_l)

Ambient temperature= the environmental temperature surrounding the pipe (t_a)

Relative humidity= the level of humidity surrounding the pipe (h)

Applications

Isopipe insulation is ideal for use in Dual-temperature systems. Due to its flexibility, insulation performance, good vapor barrier, and working temperature from -40 to 105 (peaks 120) It is ideal for application in Heating, plumbing, A/C, refrigeration, Solar systems.

Important notes before applying insulation

1. Always use the proper size insulation depending on application parameters, i.e. pipe size, fluid temerature, ambient temperature, relative humidity, and assure that the internal tolerances of the pipe are appropriate to the pipe been insulated. i.e. a pipe of External diameter 15mm would require internal diameter of 16mm 17,0mm, ensuring easy application and snug fit.

External pipe diameter	The ideal tolerances of insulation above the external diameter of the pipe
Φ 6 - Φ 64	+1,0mm - 2,0mm
Φ 67 - Φ 89	+1,0mm - 3,0mm
Φ 101 - Φ 139	+2,0mm - 4,0mm

2. Never stretch or compress Isopipe insulation.
3. Never insulate pipe-work that is in operation
4. Use clean Isopipe insulation on clean and dry pipe-work remove any water, powder, dust, dirt or oil from both insulation and Pipe.
5. Never Insulate 2 pipes together within the same insulation and always allow gap of at least 20mm between insulated pipelines for free air circulation.
6. Seal all seams, valves, and joints. Do not allow open ends.
7. Use sharp knives and fresh glue
8. Use adequate anti-corrosion protection on steel surfaces
9. Outdoor applications, eventhough ISOPIPE has good resistance against UV rays. For long term use it is imperative that it is enhanced with an external protection which should be periodically maintained.

- The best solution where possible is the use of ISOPIPE UV, which protects the rubber insulation with a Polymer membrane. There is no need for further protection, for a minimum of 5 years.
- ISOFINISH, offers an alternative protection against UV rays, it is advise that ISOFINISH be periodically re-applied depending on weather conditions
- Common Fastening tape is not recommended as a protective cover

ISOGLUE IMPORTANT INFORMATION

General instruction

1. Apply an even layer of glue on both ends of insulation
2. Allow to touch-dry
3. Bring together firmly.

- It is important that the layer of glue is even, without formed blots, as this may cause crystallization and not proper bonding
- ISOGLUE is flammable, so keep away when soldering or torching. Keep away from flame, sparks and heat
- Always, keep glue container tightly closed to prevent evaporation
- Isoglue bonds immediately upon contact, so ends must be put together accurately
- Allow for 36 hrs before operation (especially for hot temperature)
- Always keep cans tightly sealed, preferably use fresh glue and in small cans to avoid risk of glue thickening.
- Stir glue before opening.
- The tack time for ISOGLUE is 4-10 minutes, depending on temperature and humidity. The maximum adhesive performance is achieved when the glue's solvent has evaporated. This can be practically detected by touching the surface with a finger. If the glue does not stick to the finger, and the glue does not feel sticky, then the joint may be closed.
- The best installation temp. is between 15-20 degrees.
In cold temperature less than 5 degrees warm glue up in bucket of hot water.
- For cold pipe applications only, it is recommended to seal (glue) the pipe section ends onto the pipeline.

ISOTAPE adhesive tape 38x66

It can be applied over glued ends/joints 36 hours after application, when the glue has totally dried and solvent completely evaporated.
Should not be used as the sole joining.
ISOTAPE or any tape should not be tight or compress the insulation, as compression may compromise the insulating effectiveness.

ISOFINISH

ISOFINISH, offers an alternative protection against UV rays, it is advisable that ISOFINISH be periodically re-applied depending on weather conditions
It can be applied over the glue as soon as it has dried.

Measuring the circumference

When using a tape measure , make sure to allow for considerable length equivalent to cover the thickness of the insulation itself. A practical approach is to use a strip of insulation of the same thickness to measure the circumference, and mark where the two ends overlap.

TOOL KIT

1. Tape measure

2. Calipers

3. Compass

4. Knife

5. Brush

6. Miter box or angle diagram, for cutting angles

Application on new pipe installations

1. Wipe clean any dust, dirt or grease from the pipe.

2. Cut the insulation as long as or slightly longer than the length of the pipe-section been installed.

3. Slide the Isopipe insulation gently through the pipe; push the insulation over the pipe rather than pull.

For pipes over 114mm it is recommended to use ISOROLLS, ISOSHEETS

Joining lengths of ISOPIPE

1. Apply glue on both ends of insulation
2. Allow glue to touch-dry

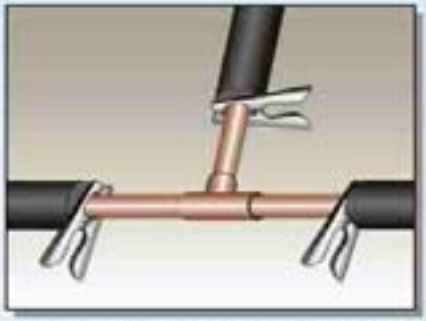
3. Bring together firmly

For additional sealing at the ends of pipe sections, for cold applications only to reduce risk of condensation, seal by gluing the insulation onto the pipe

Bends

Isopipe insulation is very flexible and can easily be slided over bends and turns.
However, on sharp bends and joints kinking and stretching of insulation may occur which will affect the insulation performance.

It is advised in this instance to cut and glue pipe as picture below, relieving the stress on the pipe at sharp bends.



Fittings, connectors

GENERAL INFORMATION

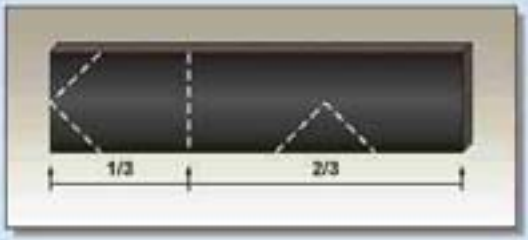
1. Bring the insulated-pipes sections together to be soldered- fitted,
2. Gently pull back the insulation and hold away with clamps, apply clamps on pipes and never on insulation.
3. Solder or fit pipes
4. After fitting has cooled, remove clamps and bring insulation back to position
5. Test the line
6. Apply joint over fitting and join with ISOGLUE. See forming Joints

For 90 degree bends, T-Joints and all other joints, cut, slit and form shape of joint (right angle, T-joint etc), glue joint together and with main pipe insulation.

Fitting cover and joints
"Sweat fitting", use same diameters insulation as pipe-line
" Screwed fittings", use a large enough insulation pipe diameter to cover and overlap the insulation of the pipe-line, by at least 25mm

T-JOINTS

For similar dimension pipes, soldered joints or sweat fittings



1. Separate by Cutting from the same pipe a 1/3 length

2. From the short length cut a 45% point

3. From the long length cut a 45% indent

4. Apply glue on the angled cut ends of both lengths,
allow to touch dry, and form the T-Joint

5. Carefully slice the T-joint in half, and place on pipes

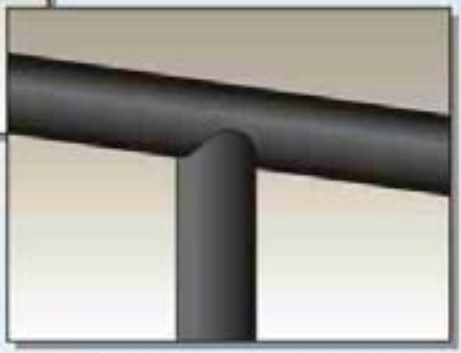
Alternative method for different diameter pipes

1. With a piece of the pipe (cut-off), punch (drill) out a hole in the insulation

2. Slice the insulation and clutch over pipe top vertical part of T-joint

3. To join with the horizontal pipe, cut a indented curve from the insulation, with a sharp knife

4. Slice insulation if necessary
5. Apply glue on ends and allow to touch dry



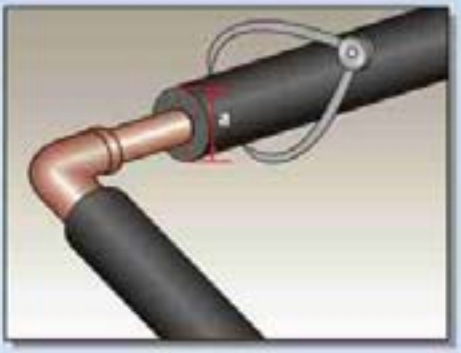
6. Bring Horizontal insulation to meet with vertical insulation

Alternatively where the joints diameter is different from the pipeline or for screwed fittings.

1. Bring line insulation as close as possible to Joint

2. Measure the outer diameter of the insulated pipe line (a)

3. Choose a pipe insulation with an internal diameter to cover the insulated pipe line along with the joint.



4. Measure and cut an insulation length to cover besides the joint also the insulation and overlap it by at least 25mm.

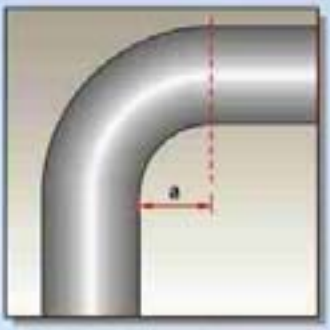
5. Form a corner

6. Clutch insulation over joint and insulated pipe

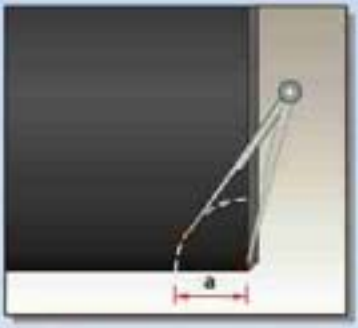
7. Apply glue on end and on the overlapping surface

8. Allow to touch-dry and bring together firmly

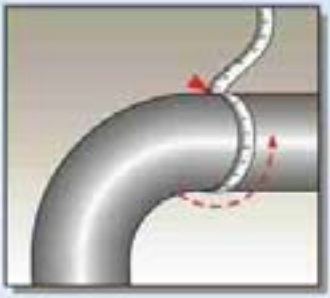
Curve insulation



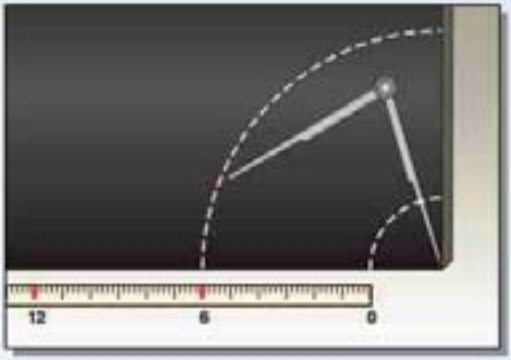
1. Measure the length of the internal curve (a)



2. With the assistance of a compass, at the length of the internal curve. draw out and cut the inner arc



3. Measure the circumference of the pipe and mark the half point



4. With the assistance of a compass, at the length of the half point of circumference, draw out and cut the outer arc

5. Using the cut-out arched piece, carefully draw and cut another copy of the same dimensions

6. Apply glue on both ends of the long arced sides, allow to touch dry and bring pieces together, beginning from the edges

7. Apply glue on both ends of internal arc, allow to touch dry

8. Bring around pipe and join

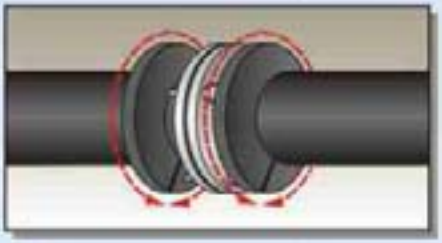
9. Trim insulation if necessary

Joints / flanges

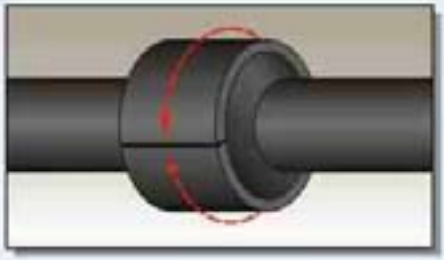
1. Bring line insulation as close as possible to flange
2. Measure the outer diameter of the insulated pipe line

3. Measure the outer diameter of the Joint/flange

4. With the use of a compass, draw and cut out 2 side pieces



5. Cut an opening, and bring around pipe and adjacent to joint/flange
6. Measure the circumference of the Joint/flange and cut



7. Measure and cut the required width to cover the joint and extend over the side pieces
8. Apply glue on ends, allow to touch dry and bring around Joint

Valves

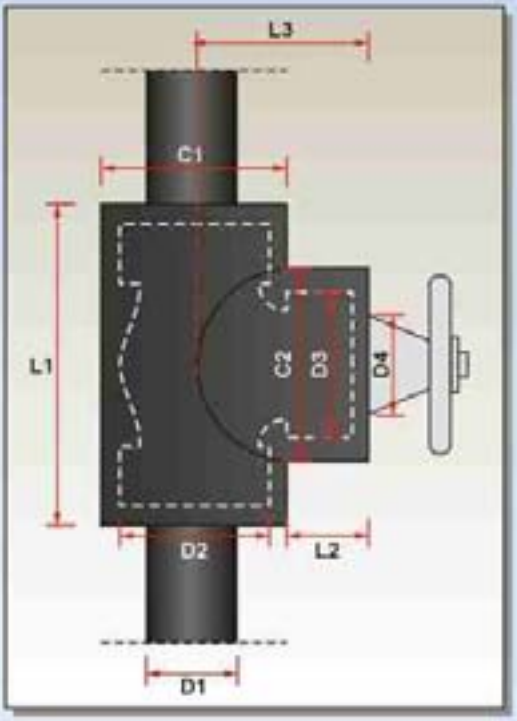
1. Bring line insulation as close as possible to Joint

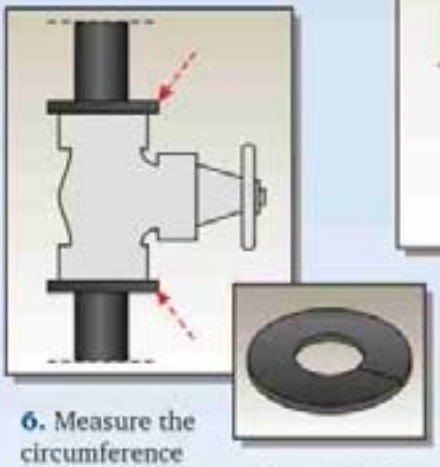
2. Measure the outer diameter of the insulated pipe line (d^1)

3. Measure the outer diameter of the Valve (d^2)

4. With the use of a compass, draw and cut out 2 side pieces

5. Cut an opening, glue and bring around pipe and adjacent to Valve

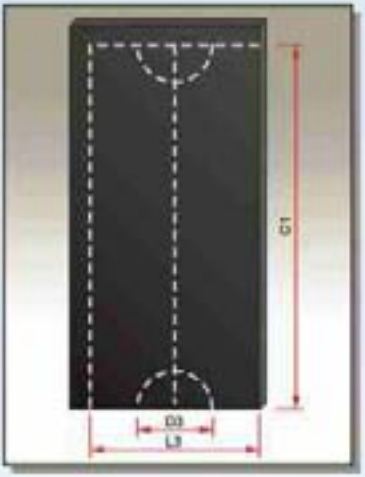




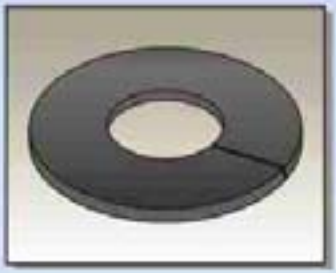
6. Measure the circumference of the side pieces, using a strip of insulation of the same thickness

6. Measure the length between & including side pieces to calculate the width (L_1)

7. Measure the top neck of the valve (d_3) and with the use of a compass cut 2 semi circles out from the insulation length



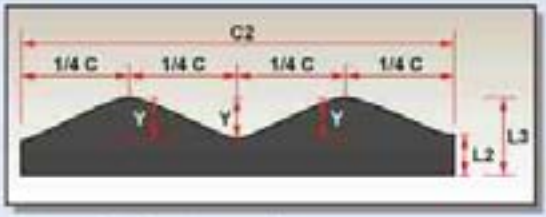
9. Apply glue on ends, allow to touch dry and bring around Valves Body
10. Measure the outer diameter of the bottom part of the Valve head (d_3)
11. Measure the outer diameter of the top part of the Valve head (d_4)



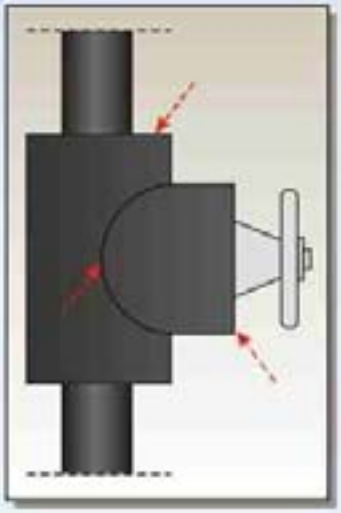
12. With the use of a compass, draw and cut out the top piece

13. Measure the shortest length (L_2) and the longest length (L_3) from the Top piece insulation and the insulated valve body (width)

14. Measure the circumference of the Valve head using a strip of insulation of the same thickness and cut out a rectangle piece at the longest length

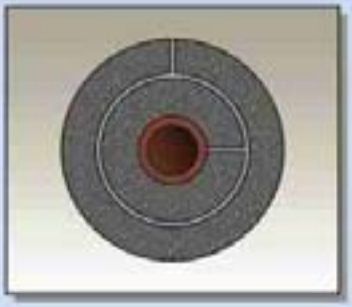


15. Divide the rectangle piece in 4 equal sections, and mark the short length and long length, beginning and ending from the short length



16. Cut carefully curving wave-like between the lengths
17. Apply glue and wrap around neck of valve
18. Seal all contact edges

Multi-layer insulation of pipes



1. The inside diameter of the outer overlapping pipe should be enough to cover the maximum outside diameter of the inner pipe. If the maximum diameter of the inner pipe is too large, then ISOROLLS should be used.

2. Apply glue to entire surfaces of both the inner and outer pipe; allow to touch dry before positioning.

Isopipe insulation on existing pipe installations

Used on pre-installed and connected pipes.
Assure pipes are not in operation.

Use a sharp knife to carefully slit the length of one side of the tube.

Clutch the insulation over the pipe.
Apply evenly a thin layer of Isoglue on both slit ends.
Keep the 2 slit ends detached until the glue has tacked dry

Apply pressure to seal the slit.

Pre-slit Self-adhesive ISOPIPE

1. Proper size, measure and cut the length of insulation
2. Clutch the insulation over the pipe.
3. Remove the plastic cover from the ends (?)
4. Bring together firmly

Application of sheets

ON large bore pipes (over 114mm)

1. Clean surfaces of insulation and surface; remove dust, water, dirt etc.

2. Measure correctly the circumference of the pipe, and cut to size. For measurement it is recommended to use the insulation itself or a strip, of the same thickness.

3. Allow an extra 5mm overlap, to allow adjacent insulation sheets to be pressed together.

4. Apply an even layer glue both ends insulation

5. Allow glue to tack dry (3-10 min)

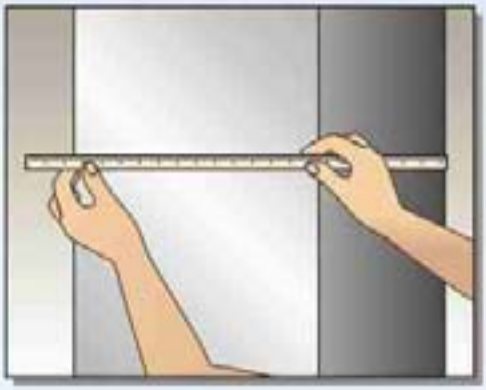
6. Line up insulation and press firmly to achieve a good bond, press together at the edges and seal ends starting from the middle

On flat surfaces or pipes over 600mm using ISOGLUE

It is recommended that only large thickness be used for large bore pipes.

1. Clean surfaces of insulation and surface; remove dust, water, dirt etc.

2. Measure correct dimensions length width allow an extra 5mm overlap, to allow adjacent insulation sheets to be pressed together.
For Ducts, cut the bottom side first, same width as duct, then cut the 2 side-pieces, so that they extend down over the edges of the bottom insulation. The Top piece should extend over the side insulation.



3. Apply an even layer glue, on both surfaces first the Insulation sheet and then onto metal surface, with a brush or roller
4. Allow glue to tack dry (3-10 min)

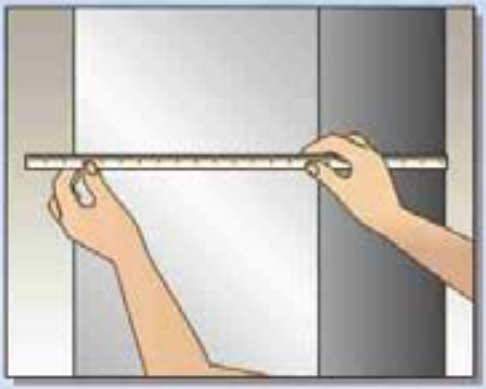
5. Line up insulation and press firmly to achieve a good bond
6. Fix the 2 opposite side of the duct first, then the remaining sides, taking into consideration the thickness of the sheets already installed, and also allowing for compression between adjacent sheets.
7. Apply glue on edges

For Tanks with dome top
1. Measure, cut and apply sheet as large-bore pipes
2. Measure the length-diameter of the oval top.
3. Cut a circle out
4. Apply glue on surface of insulation and on tank top. Also, apply glue on insulation ends
5. Put insulation in place and press firmly on Tank and join with side-insulation

On flat surfaces using Self-adhesive ISOrolls, Isosheet

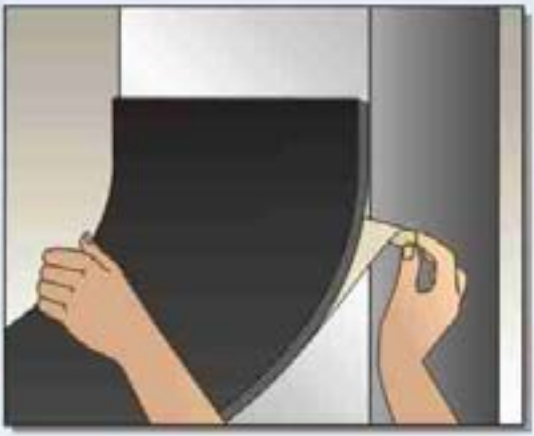
Not recommended for Pipes

1. Clean surfaces of insulation and surface; remove dust, water, dirt etc.
2. Measure correct dimensions length width



3. Peal back plastic cover
4. Line up insulation and press firmly to achieve a good bond

5. Keep insulation in line, pulling and removing plastic cover
6. At joints between sheets/ rolls allow an extra 5mm overlap, to allow adjacent insulation sheets to be pressed together



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The information included in this instruction manual should be used as a reference guide to dealing with most common insulation application. It is up to experienced installers to identify appropriate solutions to deal with the variety and complexity of the installation. 3i International Innovative Insulation SA, cannot be held liable for any defects occurring as a result of incorrect or installation of the insulation.

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