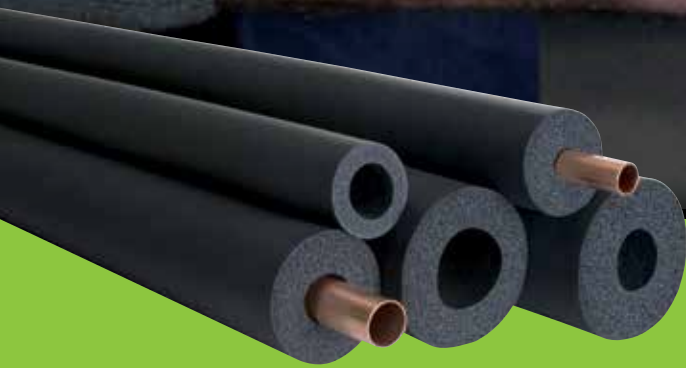


ARMAFLEX® **APPLICATION MANUAL**



Armaflex®



armacell®

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General.....	04
Working with Armaflex®	04
Tools for installing Armaflex®	04
The correct use of Armaflex® adhesive*	05
• Armaflex® 520.....	05
• Armaflex® HT625.....	05
• Preparing for work	05
• Pipes with corrosion protection	05
• Application.....	05
Wet sealing butt joints	06
Outdoor use of Armaflex®	07
Advice for insulating refrigeration and a/c equipment	08
Insulating stainless steel pipes	08
Pipes and Fittings	09
Insulating pipes using Armaflex® tubes.....	09
• Cutting Armaflex® tubes	09
• Insulating new pipework using sleeve-on technique	10
• Insulating existing pipework using snap-on technique.....	11
• Insulating pipes with Armaflex® self-seal tubes	12
• Multi-layer insulation of pipework.....	13
• Using the Armaflex® template	14
• Bend with 90° angle using Armaflex® tube	14
• Bend with 45° angle using Armaflex® tube	14
• Segment bend with 1 middle part - 2+1 using Armaflex® tube.....	14
• Segment bend with 2 middle parts - 2+2 using Armaflex® tube	15
• Segment bend with 3 middle parts - 2+3 using Armaflex® tube	15
• Crosspiece joint using Armaflex® tube	15
• Y-tube using Armaflex® tube.....	16
• Swept t-piece using Armaflex® tube	16
• T-piece using Armaflex® tube	16
Insulating coupling pipe joints.....	17
• Method 1: oversized 90° bend.....	17
• Method 2: smooth finish 90° bend	17
Angle T-piece (off-set) using Armaflex® tube	18
• Method 1	18
• Method 2	18
Pipe reducer using Armaflex® tube	19
Insulating pipes with Armaflex® sheet	20
Two-part bend with Armaflex® sheet	21
Valve insulation with Armaflex® sheet	23
Insulating neck-T / pipe-T / spindle neck of valve with Armaflex® sheet.....	24
Insulating valves with D-box made of Armaflex® sheet	26
Offset angle & pipework bend angle joints	29
Strainers, strainer valves & inclined seat valves	30
Flange boxes	32
Concentric reducers	34
Excentric Reducer.....	35
Two-part bend made of Armaflex® sheet with extension	35
Strainer valve insulation with Armaflex® sheet.....	36




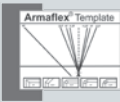











One-part T-piece with Armaflex® sheet	38
Insulating victaulic couplings with Armaflex® sheet	38
Insulating pumps with Armaflex® sheet	39
Installing Armafix® FRV pipe supports	40
Insulating “over” pipe supports (encapsulating)	41
Insulation of other pipe supports.....	42
• Schematic cross-section of a connection of Armaflex® tubes with a clamp made of PU rigid foam	42
Ducts.....	43
Insulating rectangular ducts with Armaflex® sheet	43
Insulating rectangular ducts with Armaflex® self-adhesive sheet	44
Insulating duct brackets with Armaflex®	45
• Insulating duct brackets using Armaflex® tubes	45
• Insulating duct brackets using Armaflex® sheet	46
Insulating circular ducts with Armaflex® sheet	46
Vessels and tanks	47
Insulating vessels and tanks with Armaflex® sheet	47
• Draw up a cutting schedule	47
• Compression joints.....	48
• Adhesion	48
• Multi-layer application	48
• Complex shapes	48
• Outdoor installations.....	49
Insulating small (ø < 1.5 m) tanks and vessels using Armaflex® sheet	49
Key basic application procedures for large vessels ø > 1.5 m	51
Additional application advice	52
Armaflex® with additional metal cladding	52
Armaflex® installed in the soil.....	52
Installation of Armaflex® insulation on plastic pipes	53
References.....	54
• Insulation of stainless steel with Armaflex®	54
• Corrosion protection in thermal and refrigeration insulation on technical operating systems	54
• Armaflex® cold work application guidance	54
• Gluing Armaflex® onto cellular glass	54
• Other application guides	54
Calculation tools.....	54
• ArmWin	54
Armaflex® products	55
• Armaflex® FRV	55
• Armaflex® FRV Paircoil	55
• HT/Armaflex®	55
• NH/Armaflex®	55
• Armaflex® Solar.....	55
• Armafix® pipe support.....	55
• Armaflex® accessories	55

General

Working with Armaflex®

- Use good quality tools, in particular sharp knives, fresh Armaflex® adhesive, Armaflex® cleaner and brushes.
- Oval tubes should always be split on the flat side.
- Use clean Armaflex® material – with no dust, dirt, oil or water on the surface. If present clean with Armaflex® cleaner.
- Use correctly dimensioned material! Never pull glued joints when sealing them, always push them together.
- Never insulate plant and systems that are in operation! Wait 36 hours before starting insulated plant - the adhesive is then fully cured.
- In general an additional use of Armaflex® tape is not necessary. Self-adhesive Armaflex® tape should not be used as the sole fixing for butt and longitudinal joints and seams. If required it should only be applied to joints and seams that have previously been glued with Armaflex® adhesive and only after 24, 36 and 72 hours to allow complete outgasing of the adhesive solvent.
- Armafinish 99 paint can be applied immediately after the insulation has been installed, with a second coat of paint applied within 7 days, to provide UV protection (see “Outdoor use of Armaflex®” on page 07).
- Armaflex® (with the exception of HT/Armaflex®) must not be exposed to the weather without protection for more than 3 days.

Tools for installing Armaflex®

	Folding rule / tape measure		Straight edge
	Chalk for marking irregular shapes		Template (printed on every Armaflex® tube)
	Silver ink marker pen		Scissors
	Dividers		Brushes with short, firm bristles
	Callipers		Smooth spatula
	Short knife* 75mm		Sharpened pipe ends for the most common pipe diameters
	Long knife* 300mm		Rollers for surface gluing
	Sharpening stone*		Gluemaster

* These three knives and sharpening stone is available from Armacell as a cutting set.

The correct use of Armaflex® adhesive*

ARMAFLEX® 520

Armaflex® 520 was specially developed to bond Armaflex®. It joins the surfaces reliably and safely at medium temperatures of up to +105 °C. The bond is resistant to weathering and aging.

ARMAFLEX® HT625

Armaflex® HT625 was specially developed to bond HT/Armaflex® insulation for medium temperatures of up to +150 °C. Armaflex® HT625 can be used for all Armacell elastomeric insulation material. However, HT/Armaflex® elastomeric foam must be adhered using only Armaflex® HT625.

PREPARING FOR WORK

Check condition of Armaflex® adhesive. Cans of Armaflex® adhesive should have been stored in a cool environment wherever possible. Cans must also have been kept free from frost.

For detailed information about transport, storage and shelf-life see the Product Data Sheet.

1. Where installation surfaces are soiled with dust, dirt, oil or water, all of these contaminants must be removed and, where applicable, the surfaces must be cleaned with Armaflex® cleaner before starting work. In addition all surfaces to be joined must be dry before gluing begins.
2. Pay close attention to the installation instructions on the adhesive can. Use small cans during work so that the adhesive does not thicken too quickly. Refill from larger cans when necessary and keep closed when not in use to avoid thickening.
3. The ideal installation temperature is 15 °C to 20 °C. Do not use adhesive under 0 °C. If the adhesive is too cold, it can be warmed in a bucket of hot water. At temperatures below 5 °C, condensation can appear on the surfaces to be glued or the adhesive film. If this occurs, it is very difficult to glue the materials.
4. Stir adhesive well after opening (applies to adhesives Armaflex® 520, Armaflex® HT625). If left to stand for longer periods of time, heavier components in the adhesive may settle on the bottom of the can. These must be periodically mixed thoroughly before use in order to effectively activate the adhesive.

PIPES WITH CORROSION PROTECTION

Check that the adhesive will adhere to any rust-inhibiting primer that has been used to protect pipes. Standard Armaflex® adhesives should be compatible with all coating systems based on epoxy resin or polyurethane. Armaflex® adhesive may not adhere to asphalt, bitumen or red lead.

APPLICATION

1. Use a brush with short, stiff bristles and keep clean. For larger areas a (non-foam) paint roller or the Armaflex® Gluemaster may be used to speed up application.
2. Always apply material under compression. Avoid tension on the seams.
3. Apply Armaflex® adhesive thinly and evenly onto both surfaces to be glued.
4. When adhering Armaflex® to other materials (e.g. metal), first apply the adhesive to the Armaflex® and then to the other clean surface.
5. Allow the adhesive to 'tack dry'. The time required will vary according to the ambient conditions. The correct initial drying time may be determined by the 'fingernail test': touch the surface with a fingernail, if the fingernail does not adhere to the surface and the surface itself does not feel tacky, the joint may be closed. The maximum adhesive force will be obtained when two tack-dry surfaces are brought together.
6. The glued surfaces should be pressed together, not stretched. Do not leave glued seams on the top of the insulation in external locations. When working outdoors, always turn the glued seams away from the sun.

7. When gluing joints under compression, with no gaps present, the wet adhesive method should be used. Pull the seam apart slightly and apply Armaflex® adhesive thinly and evenly with a brush to both surfaces and press together. No open time is needed in this case.
8. Use Armaflex® cleaner to clean your tools, contaminated metal surfaces and surfaces where talc has been applied.
9. Curing time for Armaflex® Adhesive 520 and HT625 adhesives: 36 hours.

Note: Do not use Armaflex® cleaner to thin adhesives. To make the adhesive easier to apply in cold environments, warm it over a bowl of hot water.

APPLICATION IN HOT AND HUMID ENVIRONMENTS

High atmospheric humidity and high temperatures lead to faster evaporation of the solvent in Armaflex® adhesive. This means that a film of moisture may appear on the surface of the adhesive. Consequently the reliability of the adhesive seam cannot be assured as the surfaces to be joined may not bond together.

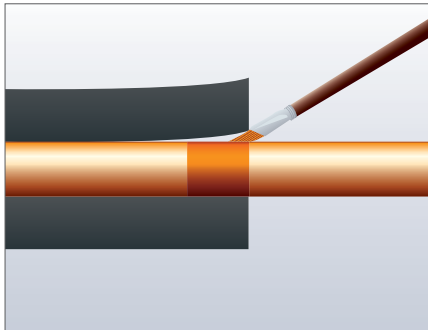
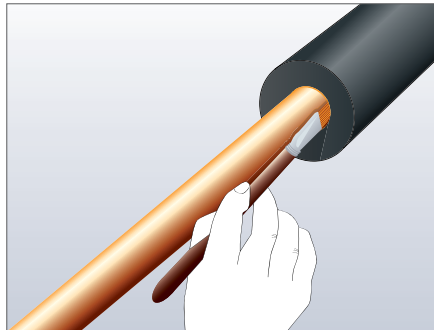
Under these conditions, the following points may be observed as an alternative to our installation instructions:

- Apply Armaflex® adhesive as normal in a thin uniform film on both surfaces.
- Unlike normal bonding, the surfaces to be glued should be held together under pressure whilst wet.

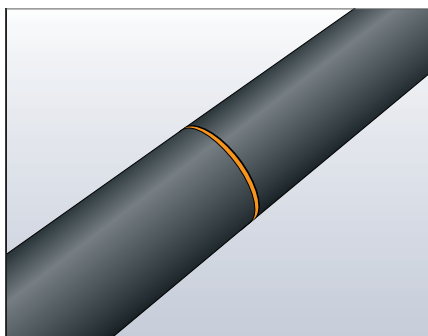
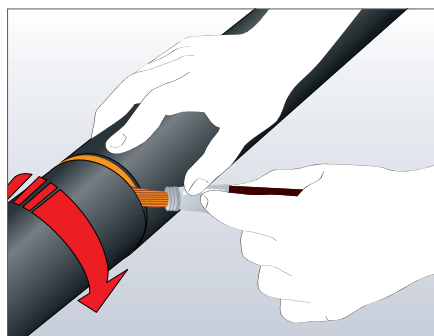
Note: Due to the shorter curing time, adhesive can only be applied to a limited area at a time. Depending on the atmospheric humidity, temperature, material thickness and practical installation conditions, we recommend a tube length of around 1 m as a guideline.

- To avoid tension within the material and to prevent the trapped solvent from opening the seam, seams should be held in place with Armaflex® adhesive tape immediately after gluing. Apply the adhesive tape at right angles to the glued seam every 20 cm or so.

Wet sealing butt joints



1. On all cold lines, use Armaflex® adhesive to glue the ends of the Armaflex® sheets/tubes to the pipe surface.
2. The adhesive should be applied in a width at least equal to the insulation thickness.



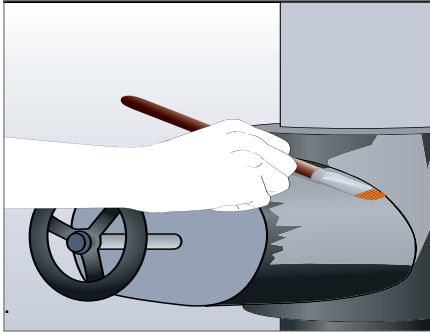
3. For the final wet sealing of the tube/sheet, use fingers to pull the joint apart and apply a thin, even film of adhesive to the two butt joint edges with a small brush.

4. Apply firm and even pressure to the glued joint using fingers and thumbs to finish.

Note: In addition, it is highly recommended that this procedure is followed for all other types of hot pipes located outdoors.

Outdoor use of Armaflex®

Whenever used, Armaflex® (with the exception of HT/Armaflex®) must either be painted, covered or clad within 3 days (first coat).

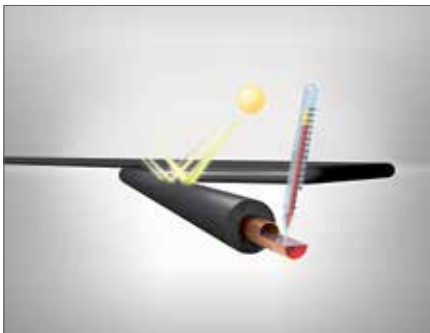


Armafinish 99 is a water-based protective paint. To provide UV protection, two complete coats must be applied.

The first coat can be applied immediately after the insulation has been installed. The second coat should be applied within 7 days.

Normal consumption

	l / m ²	m ² / l	wet film / mm	dry film / mm
1st coat	0.275	3.6	0.275	0.13
2nd coat	0.275	3.6	0.275	0.13
Total	0.550	1.8	0.550	0.26

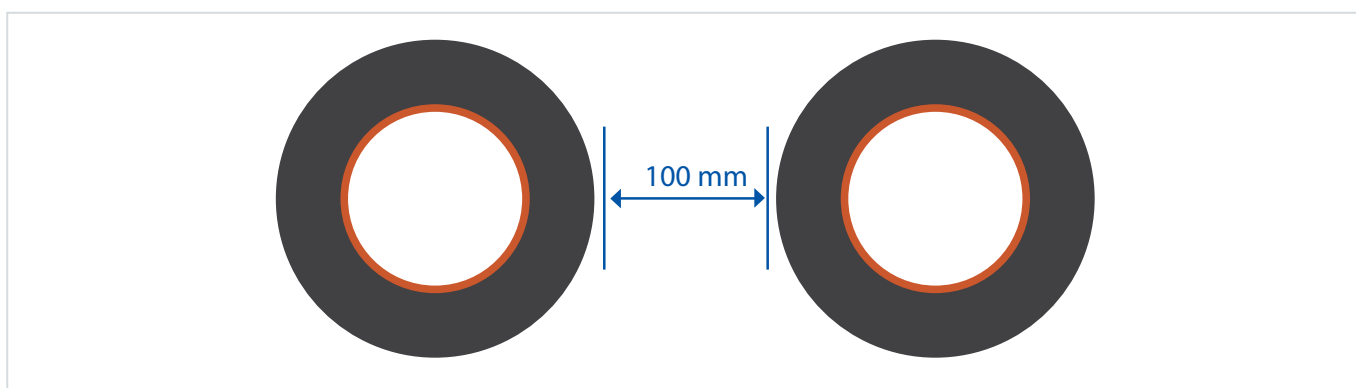


The UV-resistant **HT/Armaflex®** can be used for outdoor applications without any additional UV-protection.

If additional mechanical protection or protection against severe weather conditions is required, **Arma-Chek® covering systems** offer a non-metallic cladding option (HT/Armaflex® only with Arma-Chek® R; NH/Armaflex® with Arma-Chek® D or Arma-Chek® R). For installation details please refer to the Arma-Chek® installation manual.

Advice for insulating refrigeration and a/c equipment

- Surfaces of pipes and tanks must be sufficiently protected against corrosion before installing Armaflex®. In general anti-corrosion systems based on epoxy and polyurethane resin are compatible with Armaflex® adhesives. See the section "Pipes with corrosion protection" for more details on compatibility.
- In the case of conventional insulation systems, slight damage to the water vapour barrier can allow moisture to permeate throughout and underneath the insulation material. When using Armaflex®, this can be easily prevented by attaching each end of the Armaflex® tube to the pipe with Armaflex® adhesive, and making sure the adhesive joints are firm at critical points such as flanges, T-sections, elbows, supports, etc.
- By regularly adhering Armaflex® to the pipe in this way, the insulation system can be compartmentalised. Damage will therefore be limited to the specific section and can be easily detected.
- All connected items of equipment should be insulated with an equal thickness where practical.
- Never insulate chilled-water lines or refrigeration equipment if the sections to be insulated are too close together. Sufficient space should be allowed between insulated objects to ensure free convection, as air movement by free convection provides an additional safeguard against condensation on cold pipes.



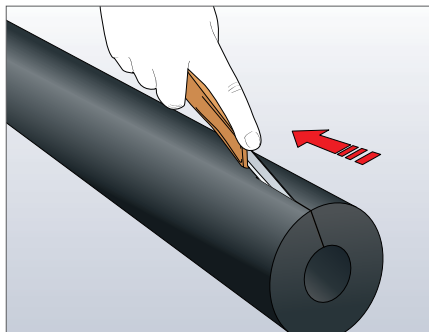
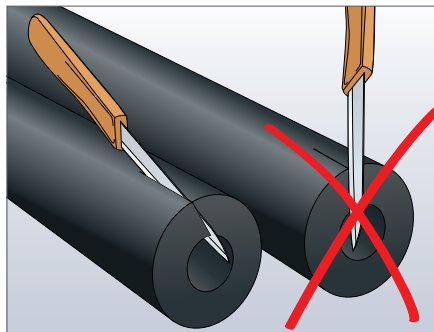
Insulating stainless steel pipes

When insulating stainless steel with Armaflex® please consult our Customer Service Department.

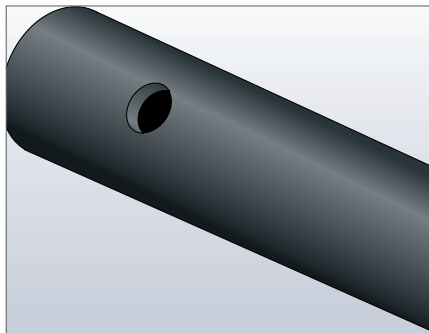
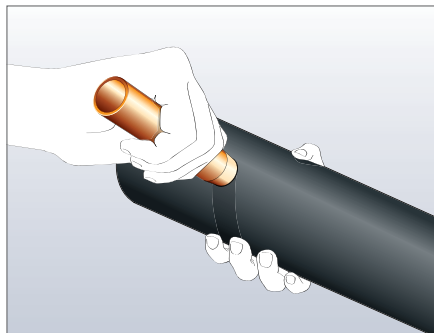
Pipes and Fittings

Insulating pipes using Armaflex® tubes

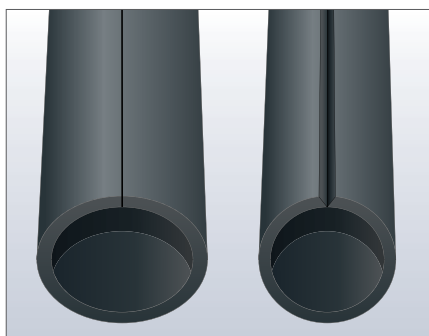
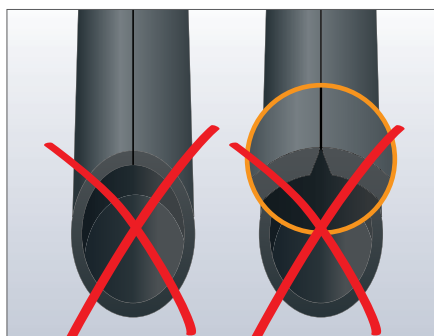
CUTTING ARMAFLEX® TUBES



1. Use a sharp knife. Keep knife at a low angle when slitting tube



2. Use sharpened off-cuts of pipes to make holes.



3. Always cut on the flat sides of tubes.

INSULATING NEW PIPEWORK USING SLEEVE-ON TECHNIQUE

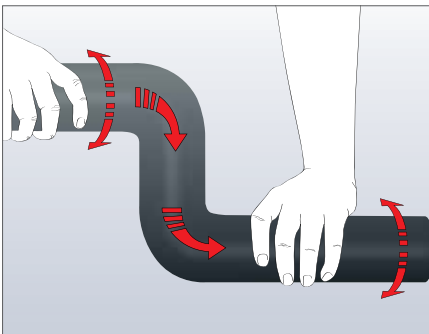
In principle, tube material can simply be slid round bends.

However, with tight bends (such as those likely to be encountered on small bore pipes) there is a risk that the insulation will kink in the throat of the bend, reducing insulation thickness.

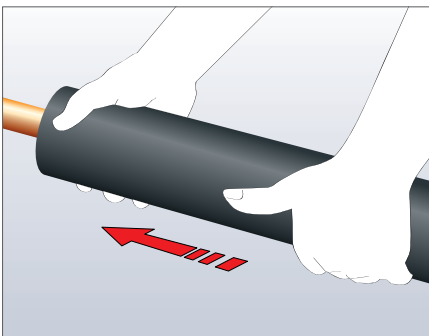
In the refrigeration/air-conditioning sector the calculated insulation thickness is then no longer achieved and condensation can occur on the surface of the insulation. When installing tubes with a self-adhesive seal, there is the additional risk of compression of the adhesive lining in the bend area, which can lead to seams coming apart.

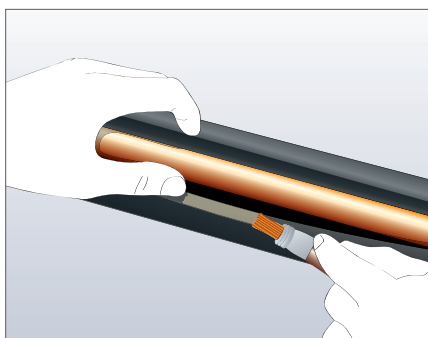
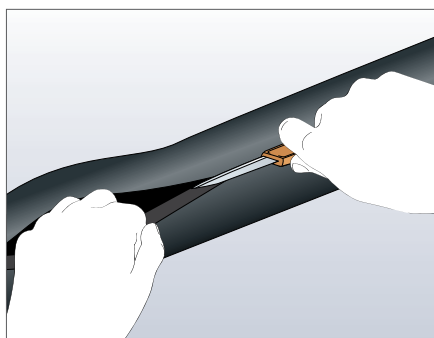
The following should be taken into account in these cases:

If the insulation kinks and the adhesive seam is compressed, the bends should be cut into segments to fit (see "Segment bend with 1 middle part - 2+1 using Armaflex® tube" on page 14). In such cases we only recommend the use of standard, non self-adhesive, tubes.

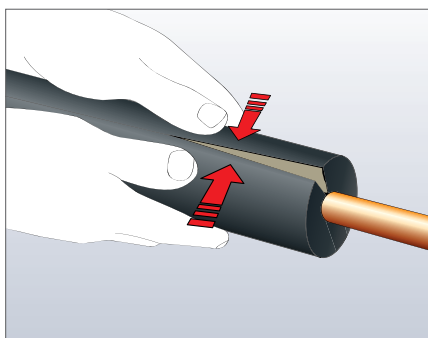
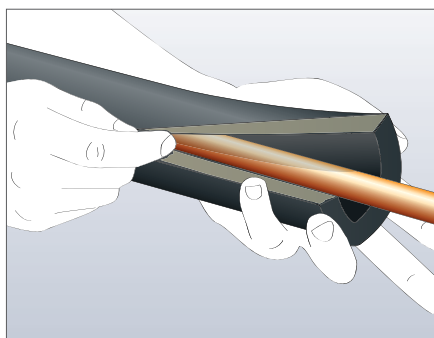


Note: Do not attempt to pull the Armaflex® tube along the pipe as this may cause the insulation to tear. Always push the Armaflex® tube over the pipe as shown.



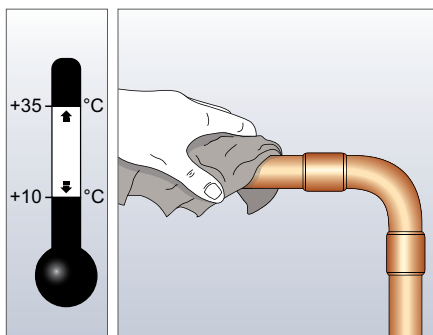
INSULATING EXISTING PIPEWORK USING SNAP-ON TECHNIQUE

1. With a sharp knife, slit the flat part of the unslit tube along the entire length.
2. Place the slit tube onto the clean pipe; apply a thin, even film of Armaflex® adhesive to the two cut edges using a short bristle brush. Apply the adhesive along the tube length.

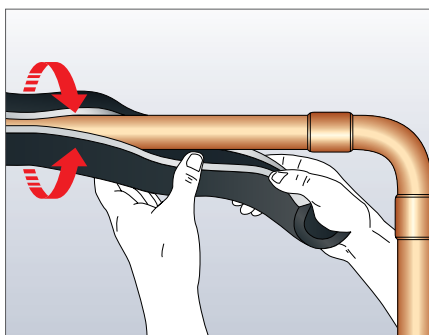


3. Allow the adhesive to tack dry, test with the fingernail.
4. Free the seams from the pipe where applicable, align the edges and press the seam detail with firm, even pressure to finish.

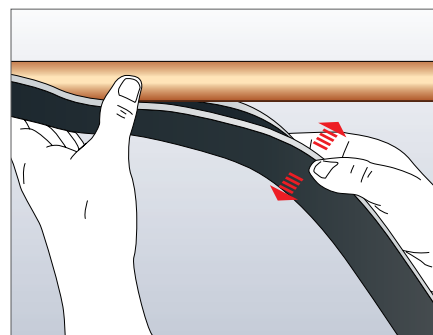
INSULATING PIPES WITH ARMAFLEX® SELF-SEAL TUBES



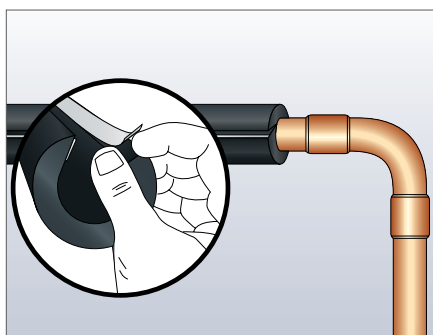
1. Clean all dust, dirt, oil and water from pipework using Armaflex® Cleaner where necessary. Install Armaflex® when ambient temperature is between +10 and +35 °C.



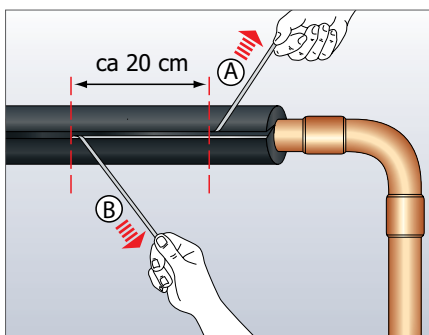
2. Open pre-slit Armaflex® and snap onto pipe (the release paper is still protecting the self-adhesive strip)



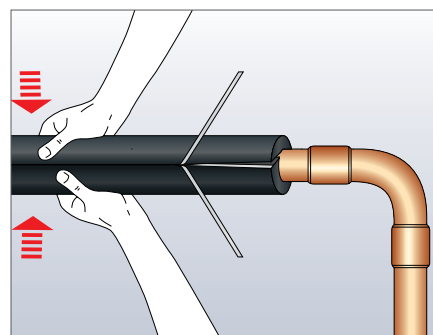
3. Adjust fitted Armaflex® to ensure slit is easily accessible.



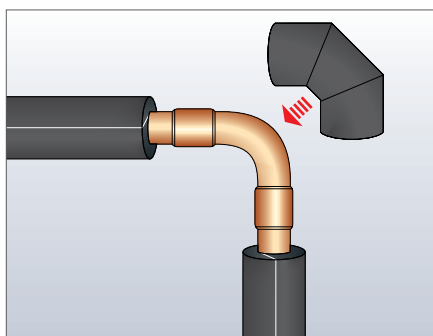
4. Locate the end of white release paper for the self-seal strip.



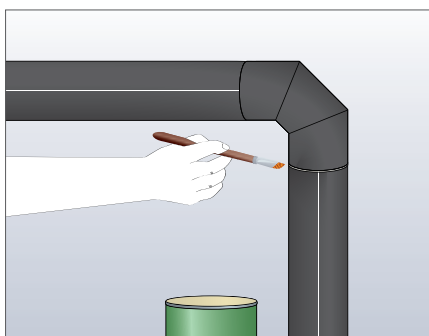
5. Remove the white protection paper strip on both sides, by drawing it away from the insulation. Please note: remove protective release paper strip from both sides!



6. Close the slit seam and press together firmly to ensure a permanent seal.



7. Insulate all other straight pipe sections following the procedure described previously. Finally, insulate all elbows, T-pieces etc. (see "Segment bend with 1 middle part - 2+1 using Armaflex® tube" on page 14)



8. Seal all joints with Armaflex® adhesive. Do not stretch when sealing joints. When gluing joints under compression, with no gaps present, the wet adhesive method should be applied.

MULTI-LAYER INSULATION OF PIPEWORK

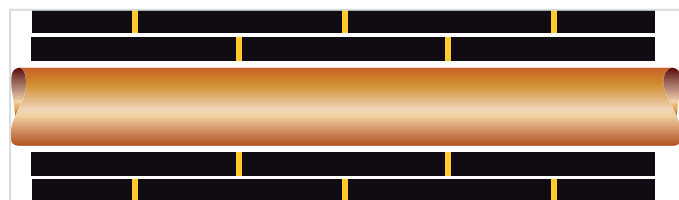
Staggering on pipework: cross-section view



Multi-layer insulation with tubes

The inner diameter of the second oversize tube should be selected according to the maximum outer diameter of the first layer.

Staggering on pipework: longitudinal view



Yellow lines indicate glued seams

Multi-layer insulation as a combination of tubes and sheets

If the outer diameter of the first layer is large enough (see “Insulating pipes with Armaflex® sheet” on page 20), we recommend that the second layer is made with sheet material, since this can be adapted exactly to the outer diameter of the first layer.

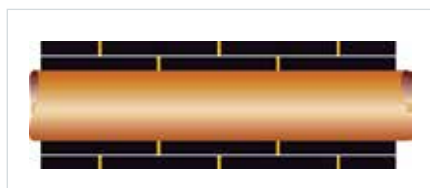
Multi-layer insulation of pipework with sheets

In general the insulation of pipes with sheet material is possible at an outer diameter of 89 mm. Select layer insulation thickness combinations as appropriate depending on the outer diameter of the object (see “Insulating pipes with Armaflex® sheet” on page 20).

Note: The ends of the tube or sheet of the second layer should be adhered to the first layer of Armaflex®. If there is a risk of the insulation on the underside of the pipe sagging, it should be fully adhered to the underlying layer. When the piping diameter is above 600 mm, all-over adhesive coverage is necessary on both surfaces.

To prevent corrosion under the insulation (CUI), all-over adhesive coverage is recommended.

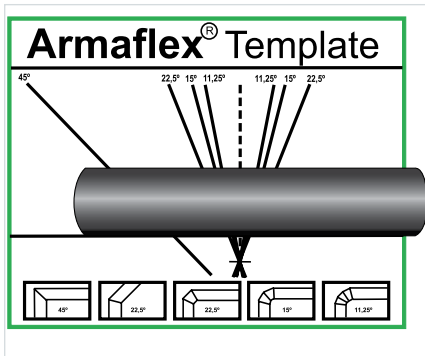
Multi-layer insulation of flat surfaces with sheets



Yellow lines indicate glued seams

In the case of multi-layer insulation, the first layer should be applied using all-over adhesive coverage. The second layer should be adhered to the previous layer of Armaflex®. Insulation on the underside of flat objects should be applied using all-over adhesive coverage for all layers. In general the butt joints and the longitudinal seams of the second layer should be staggered to those of the first layer.

USING THE ARMAFLEX® TEMPLATE

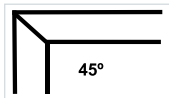
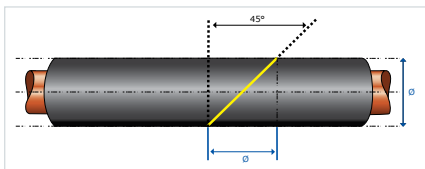


The fabrication of bends and tees using Armaflex® tube material requires tubes to be cut to different angles. In order to make this process easier and quicker, the Armaflex® template is provided on every box of Armaflex® tube insulation.

1. Place a copy of the Armaflex® template face up on a table or worktop.
2. Align an Armaflex® tube across the template parallel to the horizontal base line.
3. Select the required angle cut from the template and cut along this line. Make sure that the tube piece does not slip. Stick cut form piece together and install.

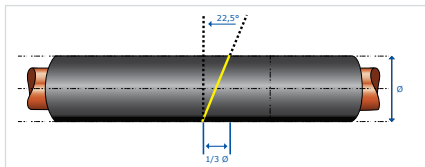
Additional copies of the Armaflex® template is available on request (contact your local Armacell representative for more information).

BEND WITH 90° ANGLE USING ARMAFLEX® TUBE



Note: Yellow lines indicate where cuts are to be made. For correct angle measurements please use the Armaflex® template located on each tube box.

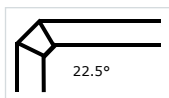
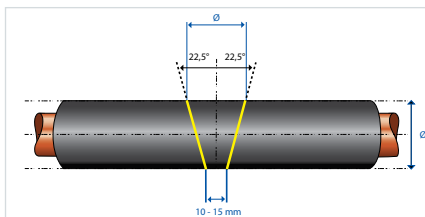
BEND WITH 45° ANGLE USING ARMAFLEX® TUBE



* The Ø details to achieve the 45° angle are approximate values!

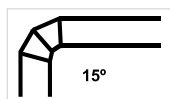
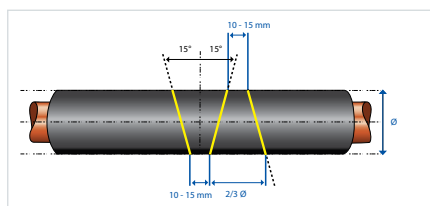
Note: Yellow lines indicate where cuts are to be made. For correct angle measurements please use the Armaflex® template located on each tube box.

SEGMENT BEND WITH 1 MIDDLE PART - 2+1 USING ARMAFLEX® TUBE



Note: Yellow lines indicate where cuts are to be made. For correct angle measurements please use the Armaflex® template located on each tube box.

SEGMENT BEND WITH 2 MIDDLE PARTS - 2+2 USING ARMAFLEX® TUBE

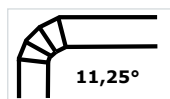
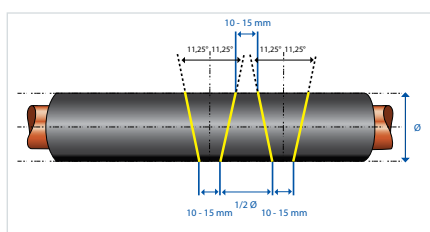


Note: Yellow lines indicate where cuts are to be made. For correct angle measurements please use the Armaflex® template located on each tube box.

To the videos

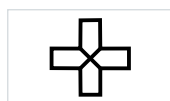
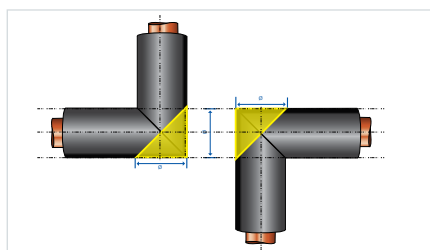


SEGMENT BEND WITH 3 MIDDLE PARTS - 2+3 USING ARMAFLEX® TUBE



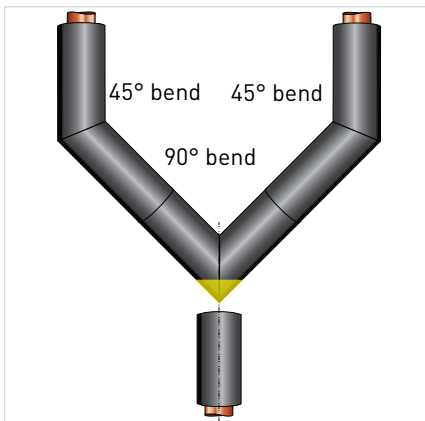
Note: Yellow lines indicate where cuts are to be made. For correct angle measurements please use the Armaflex® template located on each tube box.

CROSSPIECE JOINT USING ARMAFLEX® TUBE



Note: Yellow lines indicate where cuts are to be made. For correct angle measurements please use the Armaflex® template located on each tube box.

Y-TUBE USING ARMAFLEX® TUBE



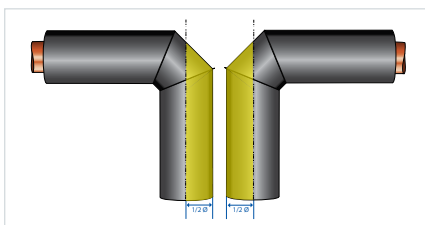
Note: Yellow lines indicate where cuts are to be made. For correct angle measurements please use the Armaflex® template located on each tube box.

Further fabrication of the 45° bend (two) and the 90° bend (one).

To the video



SWEPT T-PIECE USING ARMAFLEX® TUBE



Note: Yellow lines indicate where cuts are to be made. For correct angle measurements please use the Armaflex® template located on each tube box.

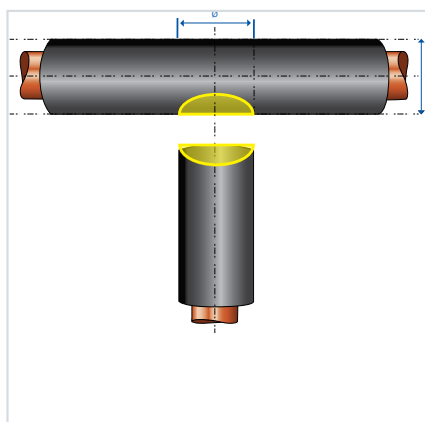
To the video



T-PIECE USING ARMAFLEX® TUBE

Method 1 - The “Punched Hole” T Piece

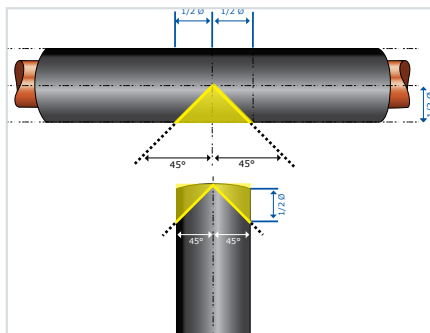
Note: Yellow lines indicate where cuts are to be made.



1. Punch a hole in the tube with a sharpened section of a copper pipe of the right diameter, forming the crossbar of the “T”.

Note: For larger hole cut-outs use a pair of dividers to “mark out” and cut using a small sharp knife.

2. Slit this section of the tube open (half through the hole) and slide it over the pipe.
3. Cut a semi-circular recess in the end of the branch section of tube. It is better to have a cut which is a little too deep rather than too shallow.
4. Attach the branch section to the pipe and join the two halves of the “T”. Adhere all seams with Armaflex® adhesive.



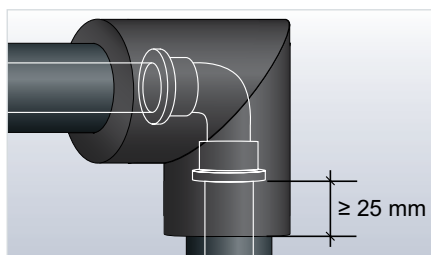
Method 2 "Mitre-Block" T-Piece

Note: Yellow lines indicate where cuts are to be made.

1. Cut two 45° angles at the end of the tube section for the branching pipe as shown, using either a mitre block or the Armaflex® template.
2. Cut a 90° wedge into the tube section covering the primary pipe. This should correspond to the outer diameter of the branching tube.
3. Join pre-cuts parts with adhesive to form a "T".
4. Slit the formed piece sideways with a sharpened knife, apply adhesive to seams, fit when tack dry.

Insulating coupling pipe joints

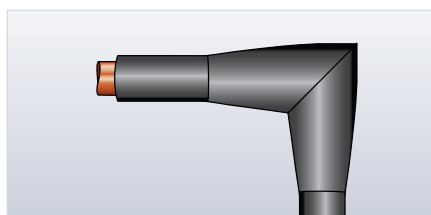
METHOD 1: OVERSIZED 90° BEND



Insulate up to the pipe fitting using Armaflex® tube and secure to the pipe using adhesive

1. Provide a minimum overlap of 25 mm on each side (increase the distance of the overlap to match the insulation wall thickness if this exceeds 25 mm). The fitting may be made up using any of the methods described on page (see "Bend with 90° angle using Armaflex® tube" on page 14).
2. Slit in the throat, apply adhesive to seams, fit when tack dry. Wet seal overlaps.

METHOD 2: SMOOTH FINISH 90° BEND

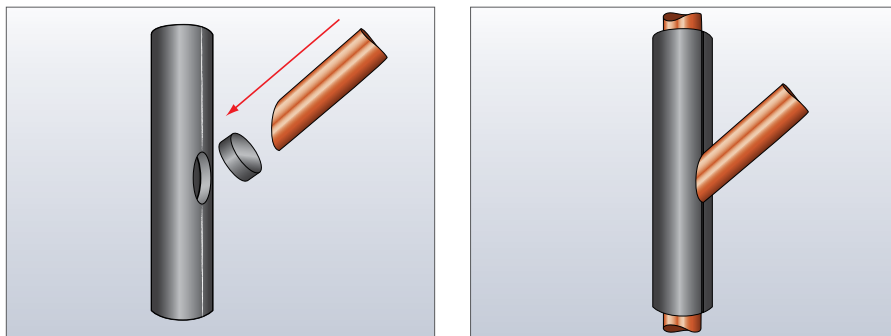


1. The fitting cover is made from tube material, the inner diameter of which corresponds to the diameter of the screwed fitting. Provide at least a 40 mm overlap beyond the end of the fitting.
2. For pipes up to 35 mm, cut two wedge-shaped pieces at 180° to each other, from top and bottom at each end of the fitting. For large inner diameter tubes cut four wedges, one at each end of the fitting. The wedges should taper back to the points where the fitting would start. The inner diameter of the Armaflex® reduces to the outer diameter of the incoming pipe in the reducing sections.

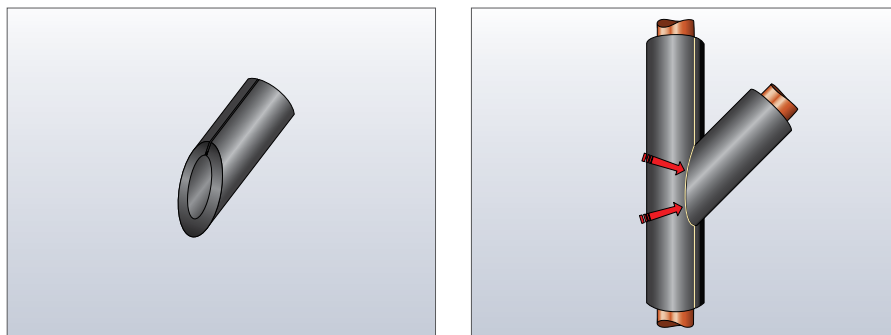
3. Slit in the throat, apply adhesive, allow to tack dry, then fit. To complete, wet seal butt joints with Armaflex® adhesive.

Angle T-piece (off-set) using Armaflex® tube

METHOD 1



1. Using a sharpened section of copper pipe of the correct diameter, punch a hole in the tube used to cover the main pipe. Make sure that the angle corresponds to that of the branch pipe.

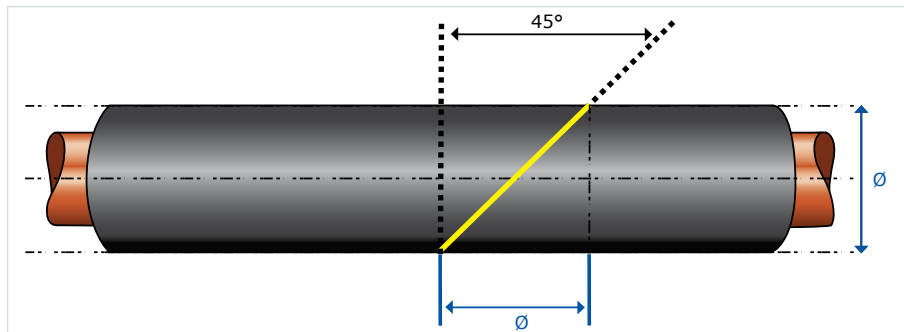


2. Cut a 45° angle at the end of the tube sections for the branch pipe. Parallel to the cut, use a sharpened knife to cut a semi-circular recess in the end of the branch section of tube. It is better to have a cut which is slightly too deep rather than slightly too shallow.
3. Glue both pieces together using Armaflex® adhesive.
4. Slit the shaped piece, apply adhesive to seams and fit when tack dry.

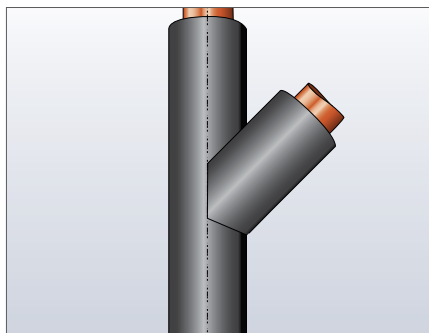
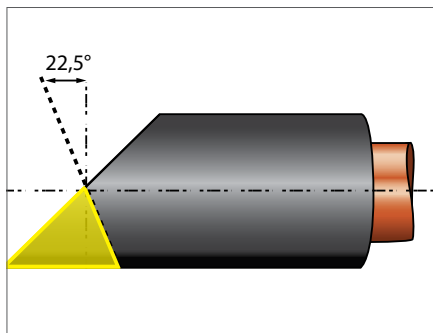
METHOD 2

Note: Yellow lines indicate where cuts are to be made. For correct angle measurements please use the Armaflex® template located on each tube box.

1. Make a 45° cut as shown above

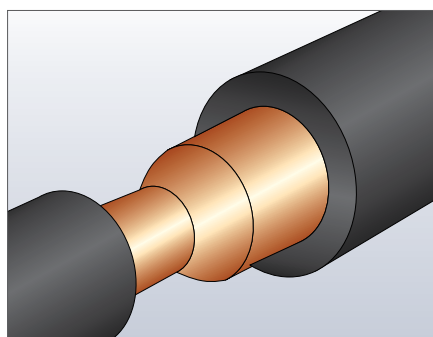


Note: Yellow lines indicate where cuts are to be made. For correct angle measurements please use the Armaflex® template located on each tube box.

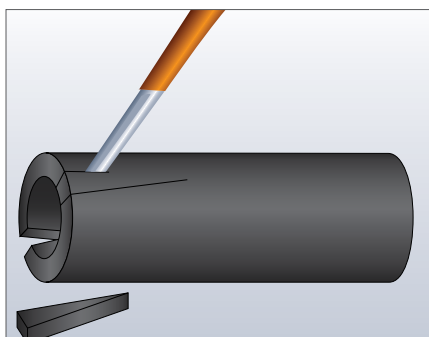


2. Use the piece of the tube with the 45° angle, mark a 22.5° angle and cut off as shown above.
3. Chamfer the inside of the tube where it touches the insulation around the straight pipe.
4. Wet seal all seams.

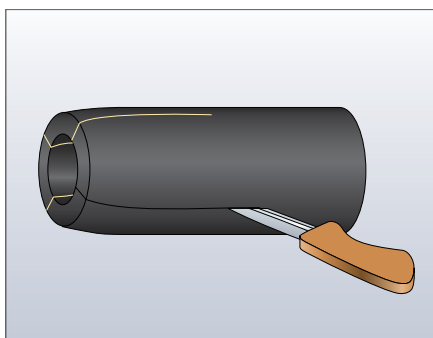
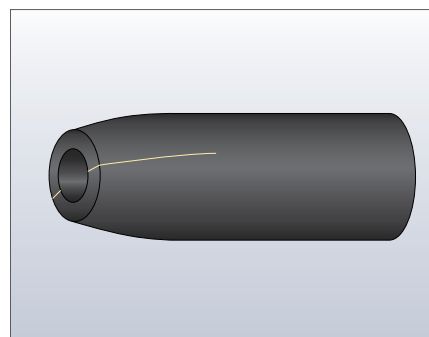
Pipe reducer using Armaflex® tube



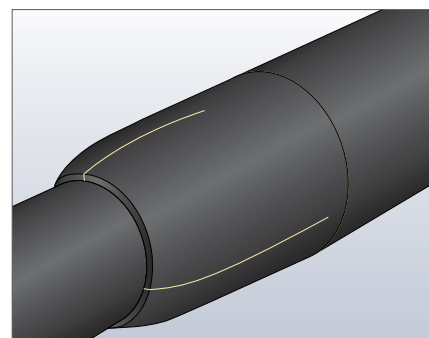
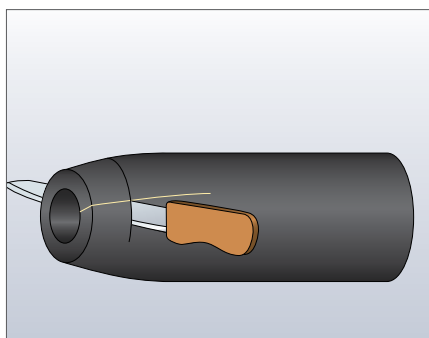
1. Pipe reducer to be insulated.



2. Cut out segments from a tube of the larger diameter and glue seams with Armaflex® adhesive.



3. Cut reducer to size - allow compression of 5 mm at each end. Slit fitting on the flat side.



4. Install and glue seam and butt joints.

To the video



Insulating pipes with Armaflex® sheet

Armaflex® FRV tubes are available for pipes with outer diameters up to 168 mm, HT/Armaflex® and NH/Armaflex® tubes are available for pipe with outer diameters up to 89 mm. Larger pipes and ducts as well as tanks should be insulated with Armaflex® sheet, and all-over adhesive surface coverage is required for pipes with an outer diameter above 600 mm.

It is often advantageous to insulate smaller pipes using Armaflex® sheet, even when correctly dimensioned tubes are available. Care should be taken to ensure that the stresses in the seams, caused by the bending in the sheet, do not become too great.

These stresses rise as the insulation thickness increases and as the pipe diameter decreases. Please consult the table below to gauge the applicability of different thicknesses of Armaflex® sheet (recommendations may vary for HT/Armaflex® and NH/Armaflex®).

The ambient temperature during installation will also impact on the levels of stress likely to be encountered.

For advice on installing Armaflex® sheet in ambient temperatures $\geq 5^{\circ}\text{C}$ please see following table.

Armaflex® FRV	Pipe Outer Diameter / mm				
	≥ 88.9	≥ 114	≥ 139	≥ 159	≥ 408
FRV-9MM / FRV-9MM/E	•	•	•	•	•
FRV-13MM / FRV-13MM/E	•	•	•	•	•
FRV-19MM / FRV-19MM/E	•	•	•	•	•
FRV-25MM / FRV-25MM/E		•	•	•	•
FRV-32MM / FRV-32MM/E			•	•	•
FRV-38MM / FRV-38MM/E					•

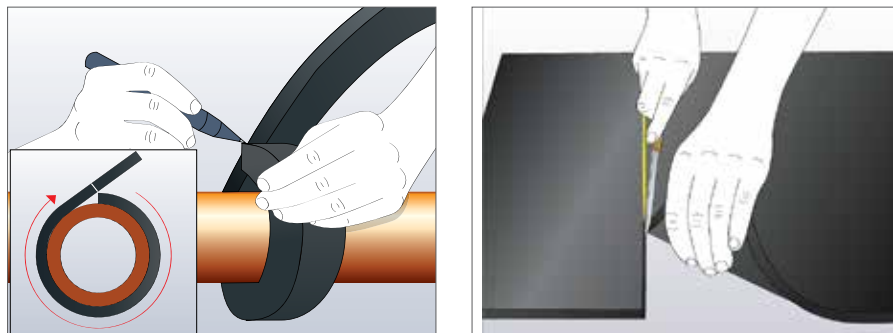
HT/Armaflex® NH/Armaflex®	Pipe Outer Diameter / mm			
	≥ 88.9	≥ 114	≥ 139	≥ 159
6 mm	•	•	•	•
10 mm	•	•	•	•
13 mm	•	•	•	•
19 mm	•	•	•	•
25 mm			•	•
32 mm				•

* HT/Armaflex® sheets are not available in 6 mm and 32 mm thickness

Insulating large pipes with Armaflex® sheet

1. Determine the circumference of the pipe.

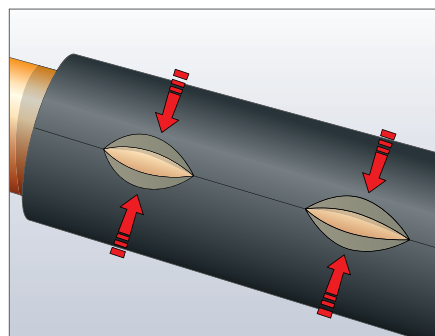
Important: Always measure with a strip of Armaflex® of the thickness to be used for the insulation.



Warning: Do not stretch the strip.

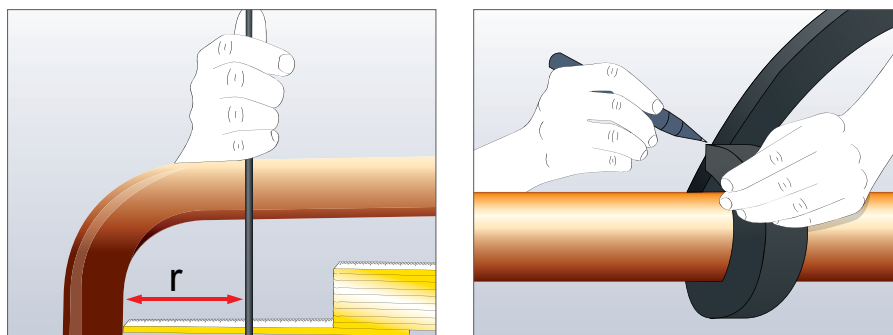
2. Cut Armaflex® sheet to the required size - apply Armaflex® adhesive to the cut surfaces in a thin layer, allow to tack dry.
3. Press together at the ends and then in the middle. Close the entire seam starting from the middle.

Note: In order to prevent the seam from re-opening, ensure that the adhesive has been fully applied to the edges of the seam and ensure that the correct amount of adhesive has been applied.

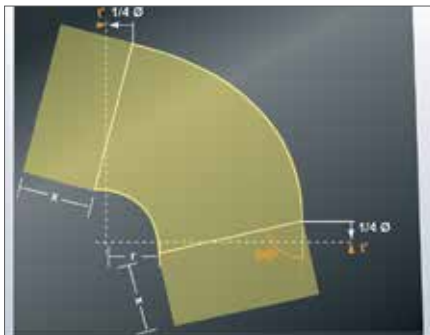


Check the open time of the adhesive to ensure it is still fit for use.

Two-part bend with Armaflex® sheet



1. Establish the inside radius, "r", by dropping a perpendicular line to meet a horizontal line from the outside of the two welds. The point where these two lines intersect gives the origin for the radius, r. This is the throat radius.
2. Measure in a trimming allowance (determined by the insulation thickness) along both vertical and horizontal edges then transfer to the sheet as indicated.
3. Determine the circumference of the pipe using a strip of Armaflex® of the thickness to be installed

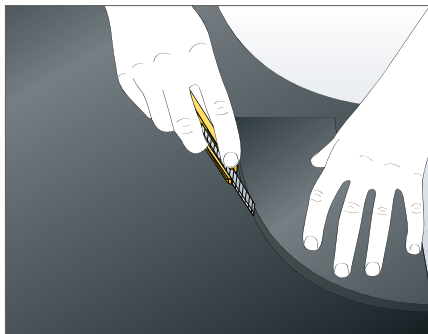
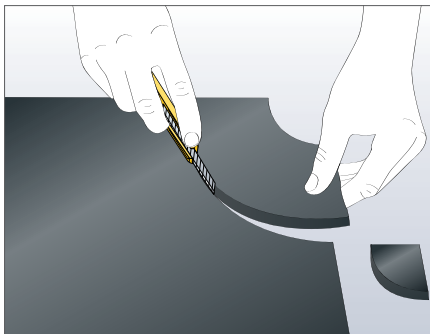


r = inside radius of bend

$\frac{1}{2} c$ = half of pipe circumference

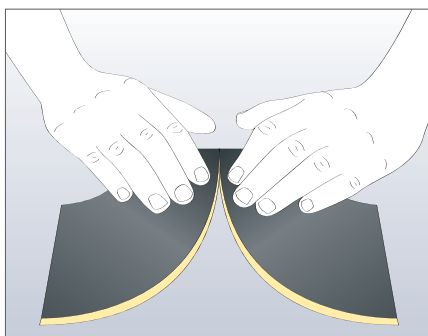
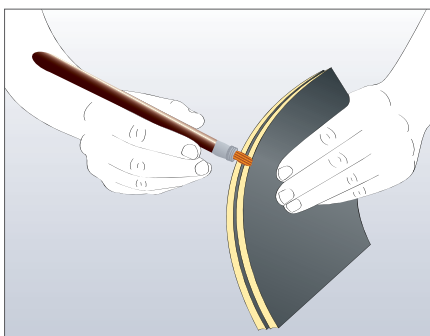
I = intersection point

t = insulation thickness (in mm)



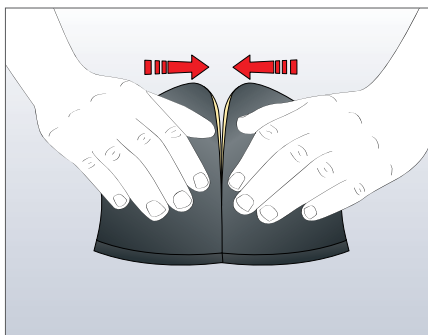
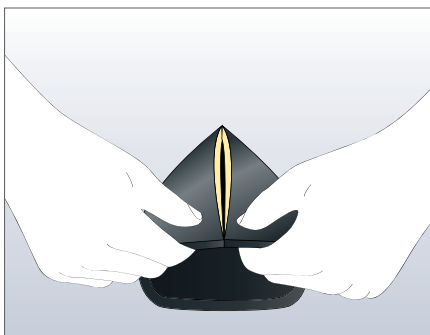
4. Cut out the first half-section of the elbow.

5. Use the first half-section as a template to cut out the second half-section of the elbow.



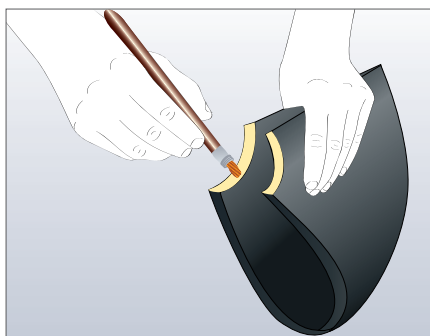
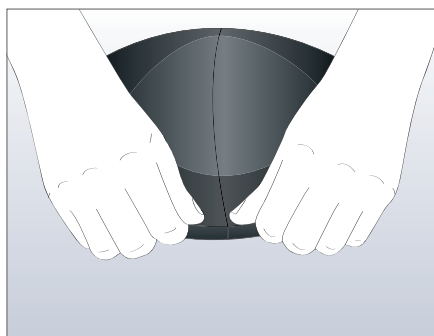
6. Place the sections together with the rough surfaces inwards. Apply Armaflex® adhesive to the outer edges.

7. Allow the adhesive to tack dry (fingernail test) then press the two sections together at one side to make a short seam.



8. Next, press the opposite sides together, also making a short seam. Working towards the centre.

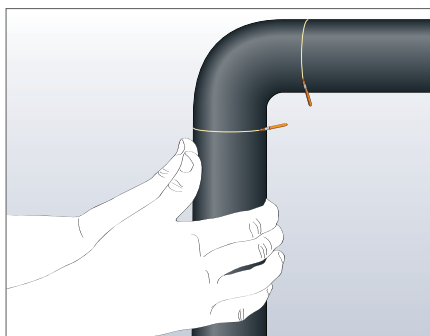
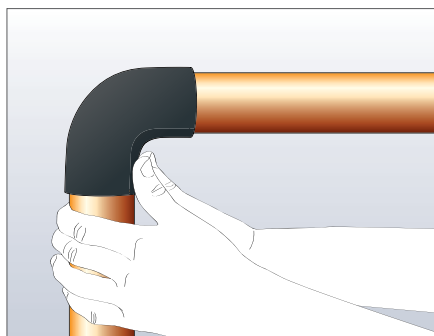
9. Press the remainder of the joint firmly together.



To the video

10. Turn the assembly over and press the seam firmly together from the inside, so that a good adhesive joint is achieved across the entire wall thickness.

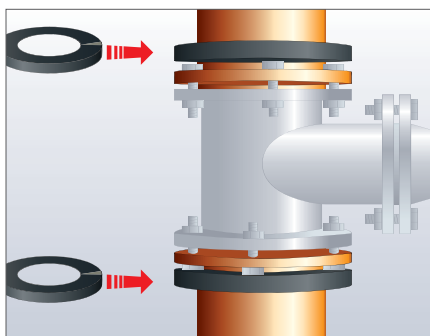
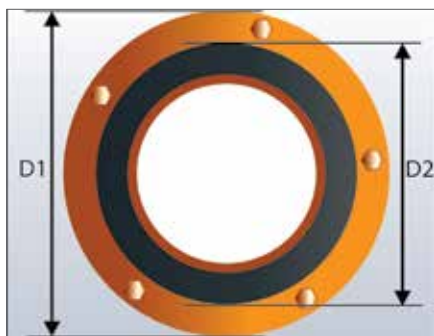
11. Apply Armaflex® adhesive to the inner joint edges.



12. Place the insulation cover over the pipe bend. Allow the adhesive to tack dry, then press the joint faces firmly together.

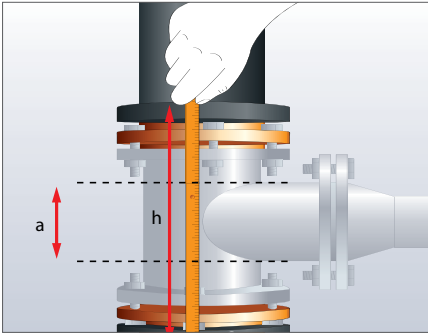
13. Wet seal jointing details with adhesive, fitted under slight compression, to complete the bend.

Valve insulation with Armaflex® sheet



For greater stability, the valve body can be strengthened by covering with a pre-cut metal or plastic part.

1. Insulate the pipe up to the flange. Determine :
 D1 = depth of flange ring
 D2 = circumference of insulated pipe
2. Fabricate two end discs:
3. With the corresponding radius of D1 mark a circle on Armaflex® sheet material, with the radius D2 mark the cutout.
4. First cut out the whole disc, then the cutout.
5. Cut the discs on one side and glue together again on the insulated pipe.



6. Fabricate the valve body. Measure:

h = height between the outer faces of the two rings.

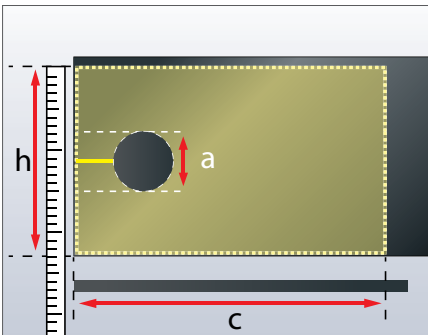
a = diameter of spindle neck

c = circumference of the rings

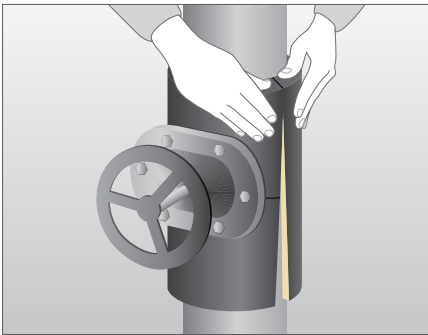
Important: Always measure with a strip of Armaflex® material that has the same insulation thickness to be installed. Do not stretch the strip.

7. Transfer height (h), circumference (c) and diameter of spindle neck (a) to the Armaflex® sheet and mark the cutouts for the spindle neck.

Note: Cutouts should always be made 5 mm less than measured.



Note: For valve spindles without connecting flanges it is recommended that the cutouts are marked in the first quarter of the Armaflex® sheet.

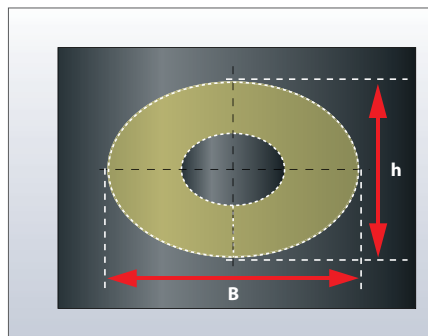
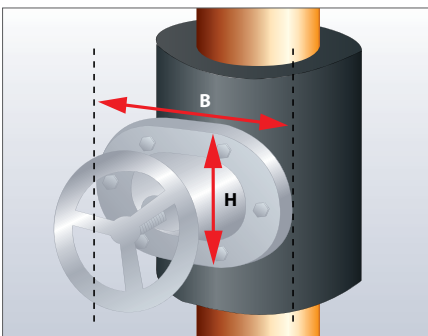


8. Cut the valve jacket and fit on the valve. Then apply a thin coat of Armaflex® adhesive to all seams of the valve cover. Allow to tack dry (fingernail test), fit, then press together firmly.

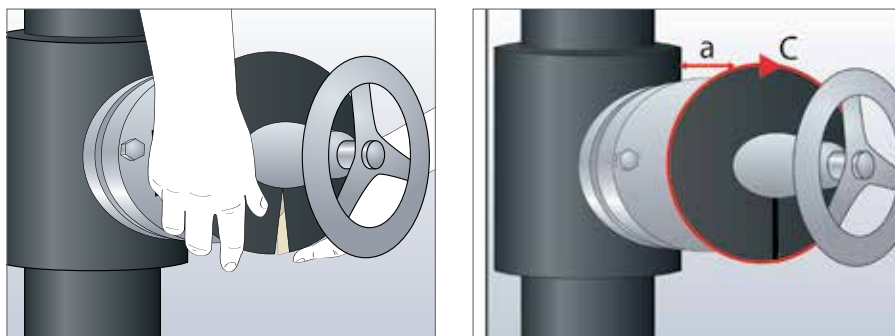
Note: The valve body should always be insulated after the pipe.

To increase the security of the seams, pre-fabrication of the valve cover on the workbench is recommended based on accurate measurements.

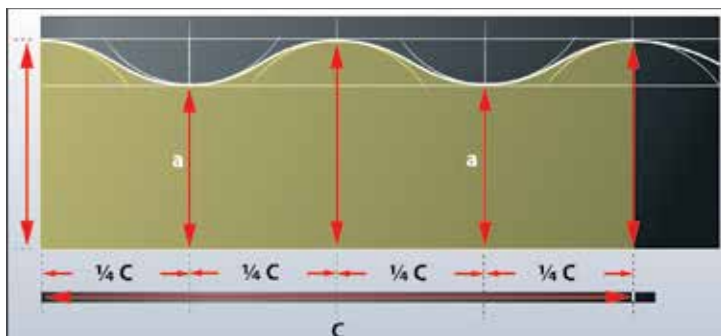
Insulating neck-T / pipe-T /spindle neck of valve with Armaflex® sheet



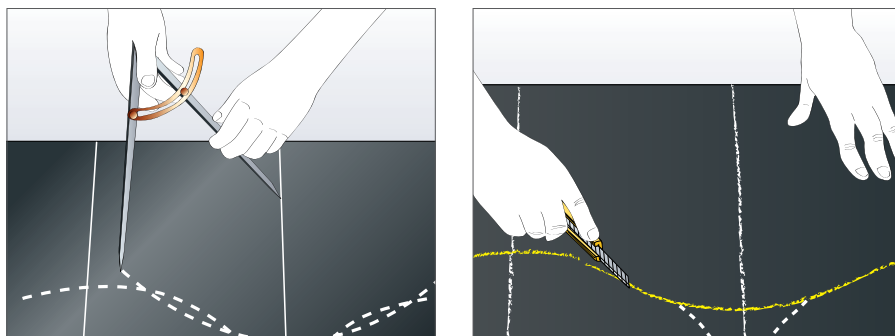
1. Measure the height of the spindle housing flange and its width, and fabricate an end disc.



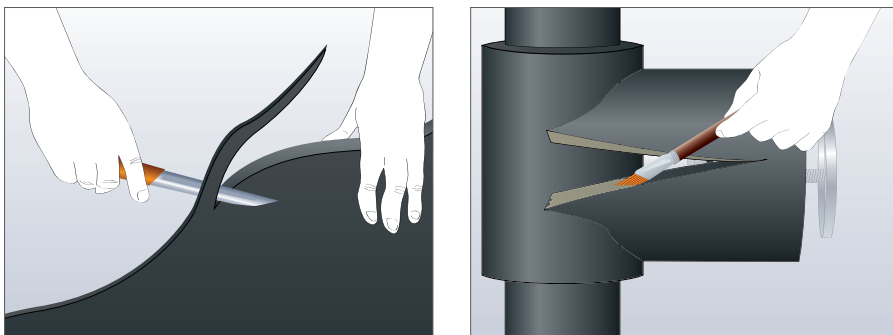
2. Cut through the disc on one side, apply adhesive to the cut edges, allow to tack dry. Re-join the end disc after placing it over the spindle neck. Measure the circumference of the end disc with a strip of Armaflex and transfer the measurement to the sheet material.



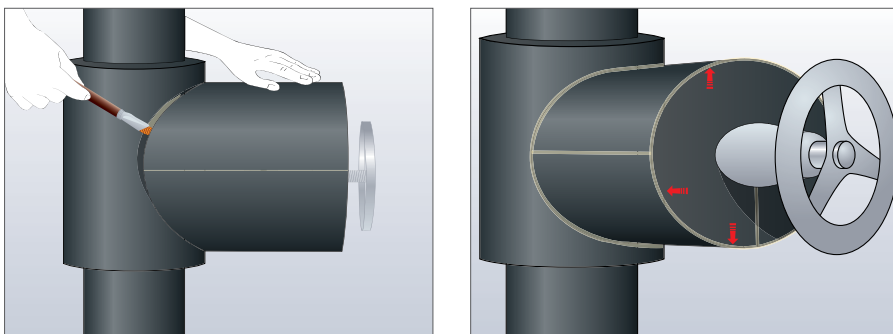
3. Dividing the circumference into four equal parts has resulted in five lines. Set the dividers to the radius of the insulated valve body and draw two circles at the top end point of each of the distances a (The second and fourth lines from the left.)
4. Using the same radius and starting from lines 1, 3 and 5, determine the tangential points of the first two circles by drawing three arcs.



5. The resulting line above the tangential points of the five circles marks where the sheet rests against the side of the valve body. Cut the cover out along this line.



6. Chamfer away the inside surface at the highest point (where the sheet rests against the side of the valve body). Apply adhesive to the longitudinal seam, allow to tack dry, then seal round the spindle housing.



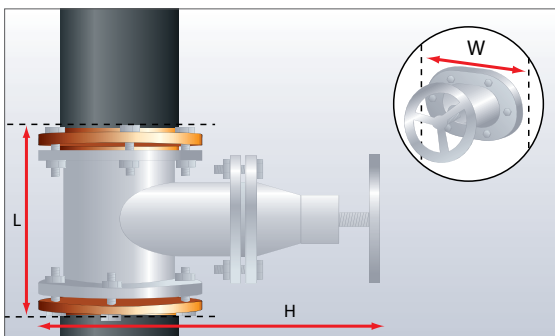
Important: Secure bonding in the area of the spindle neck penetration is essential.

Note: Armaflex® tape may be applied to the spindle neck in the area of the penetration to provide additional protection.



To the video

Insulating valves with D-box made of Armaflex® sheet

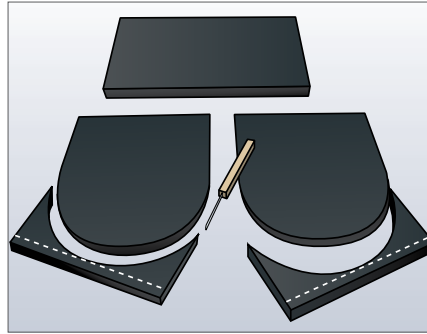
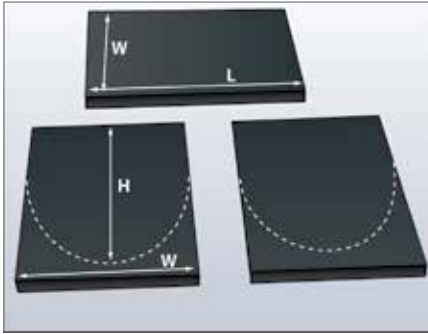


1. Establish the following measurements:

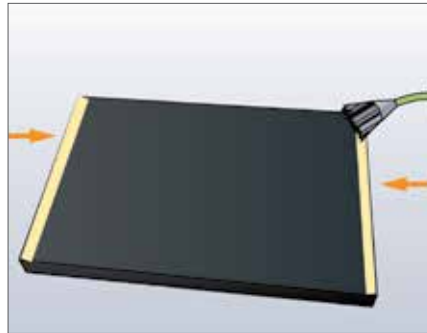
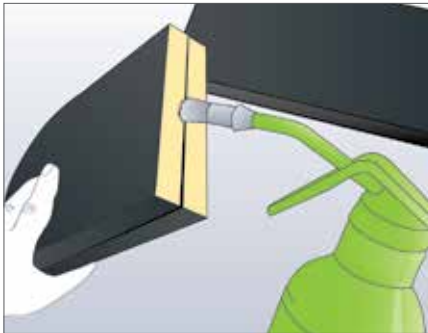
L = length of valve + 2 x thickness of insulation

H = height of valve + 2 x thickness of insulation

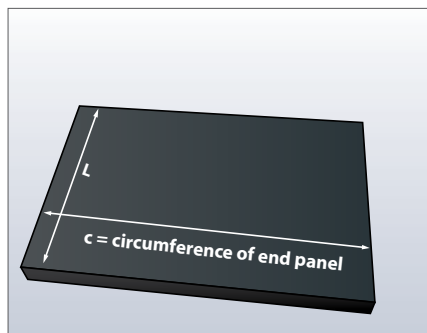
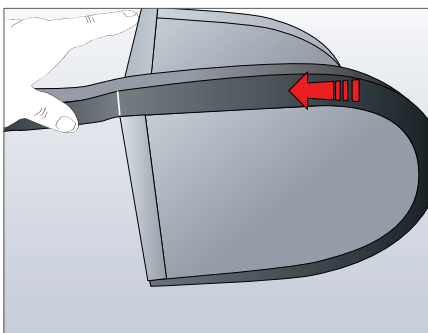
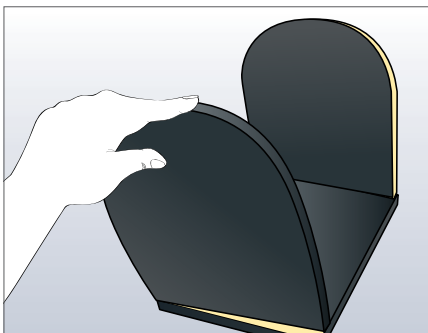
W = \varnothing (diameter) + 10mm



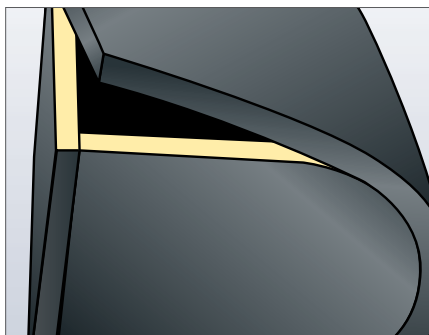
2. Mark out and fabricate 2 end panels and 1 top panel using the measurements taken in the previous step. Cut cleanly using a small sharp knife.



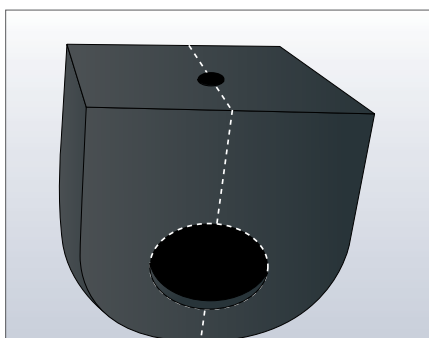
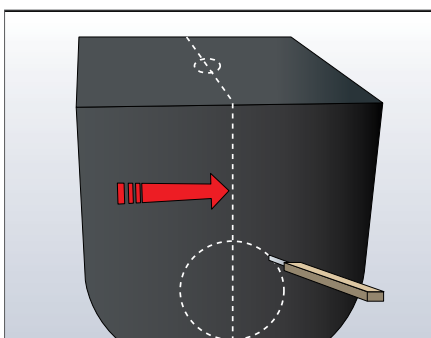
3. Apply Armaflex® adhesive along the edges as indicated.
Note: The glue line must be as wide as the thickness of the Armaflex® used.



4. Glue the top edges of the end panels and the top panel edge.
5. Secure the end panels to the top panel making sure the edges are aligned.
6. Use a strip of Armaflex® (used thickness) to determine the circumference around one end panel (including the top panel).
7. Mark measurement L and circumference and cut the body panel to size. Apply Armaflex® adhesive to the body panel end and the body panel edges as shown.



8. Gently roll the body panel edges around the end panels until the cover panel resembles a box.
9. Fix down the square 90° edge as shown. Ensure the edge is aligned and neat. Continue to secure all edges in this way.



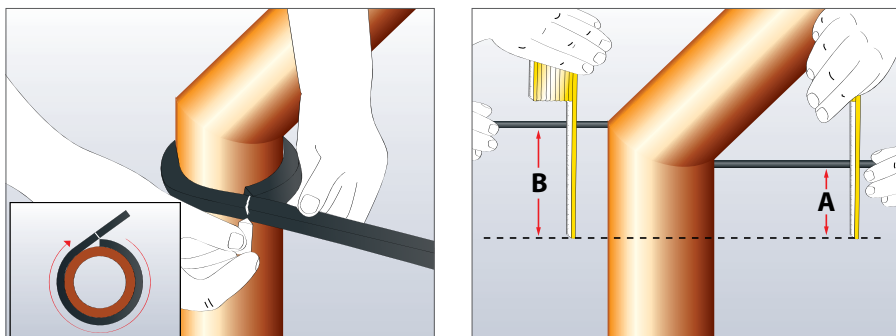
10. Cut holes for the insulated piping connections on each of the end panels and a final cutout for the valve spindle connection at the top.
11. Split the box into two halves and fit around the valve.
12. To finish, apply Armaflex® adhesive to the seams, allow to tack dry and join the seams.
Vapour seal the connections (joints) to the linear insulated pipes using Armaflex® adhesive.

Important: Secure bonding in the area of the spindle neck penetration is essential.

Note: Armaflex® tape may be applied to the spindle neck in the area of the penetration to provide additional protection.

Offset angle & pipework bend angle joints

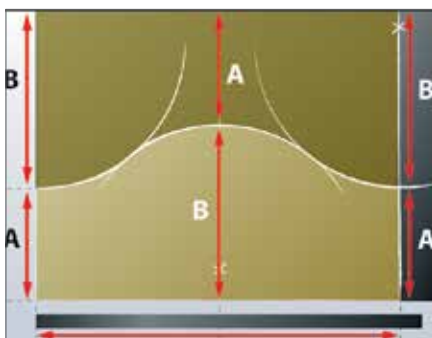
The following illustrations show the various stages of work when insulating a mitre angle or bevel joint in a pipe. The procedure when insulating a right angle pipe joint is effectively the same.



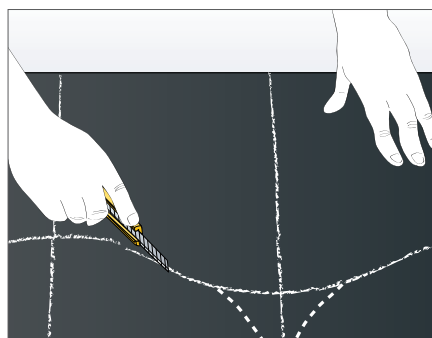
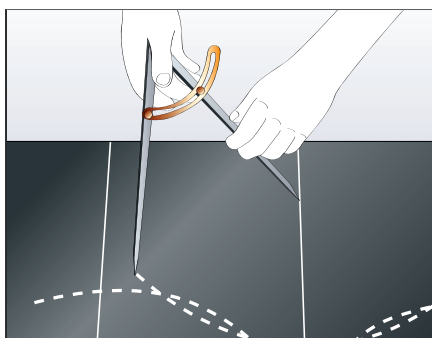
1. Determine the circumference of the pipe (C)

Important: Always measure with a strip of Armaflex® material that has the same insulation thickness to be installed.

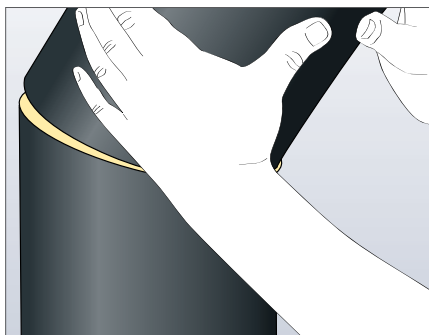
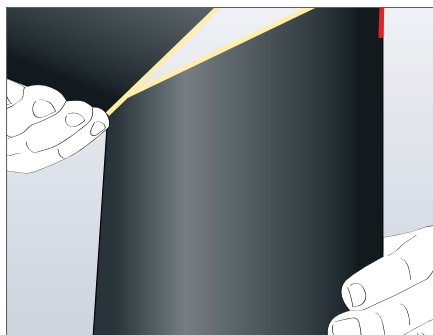
2. Measure the outer height (B) and the inner height (A) of the mitre joint.



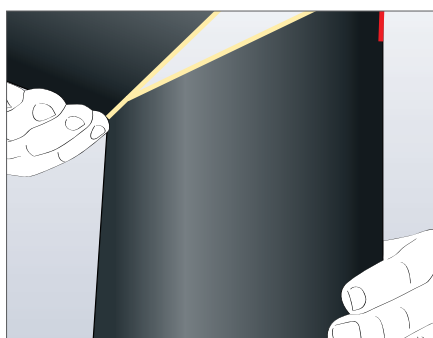
3. Transfer the circumference to the Armaflex® sheet and mark the centre line.
4. Transfer the outer and inner height to the Armaflex® sheet.



5. Using the radius of the pipe circumference draw an arc from the centre line and the opposite corners. The circles must only touch at one point (the tangential point). Cut out the fitting cover along the marking. When offset by 180° the top and bottom part form the two matching parts of the bevel joint.



6. Apply Armaflex® adhesive to the longitudinal seam, then to the connecting seam.



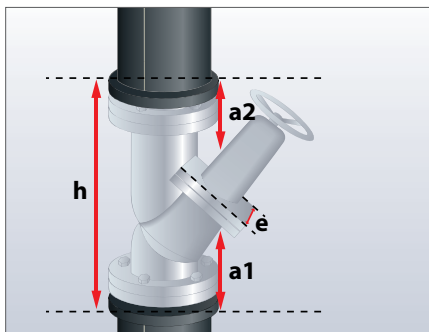
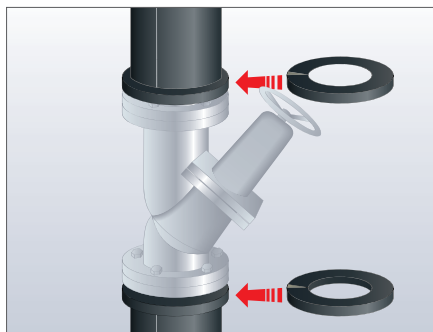
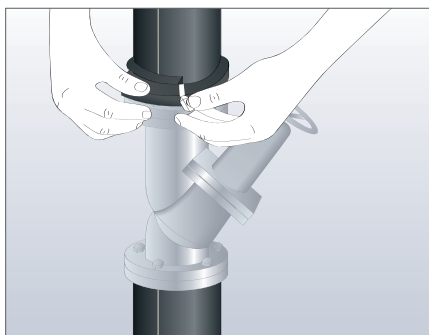
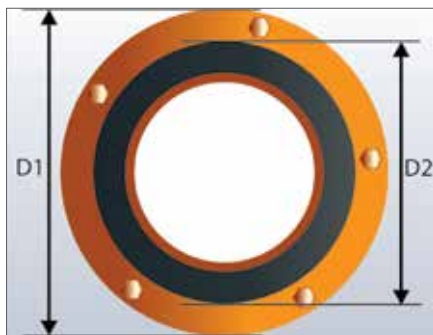
The insulation is now complete.

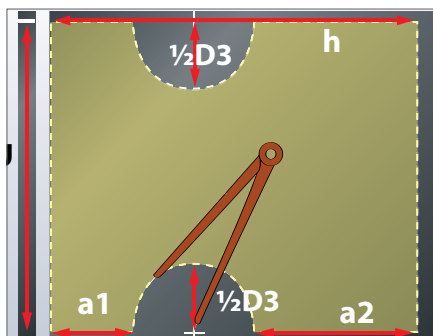
To the video



Strainers, strainer valves & inclined seat valves

The work involved in insulating a strainer valve or an inclined seat valve is similar (some measurements need to be extended) except that an end disc may be required.





1. Insulate the pipe up to flange. Determine:

D1 = diameter of the flange ring

D2 = diameter of the insulated pipe

h = distance between the outer surfaces of the two Armaflex® strips applied to the flange

U = circumference of the Armaflex® strip or the end disc

a1 = distance from the lower flange to the spindle neck

a2 = distance from flange to spindle neck

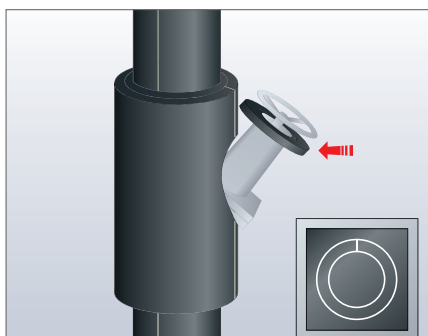
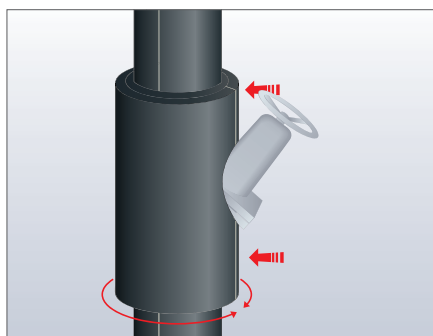
D3 = diameter of the spindle neck

e = diameter of the strainer

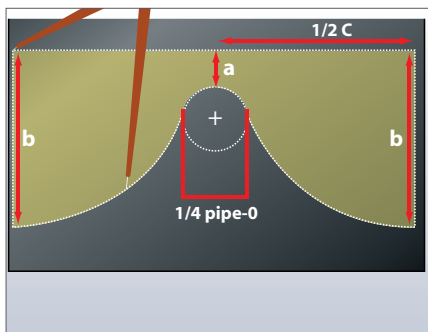
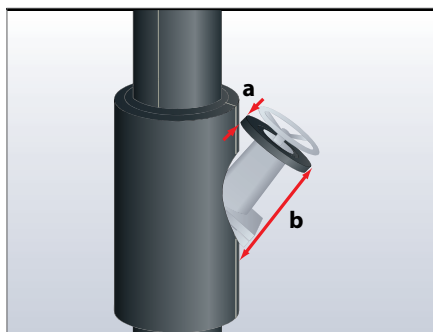
2. With the radii of D1 and D2 transfer arcs to the Armaflex® sheet, thus drawing two end discs. Cut the end discs out then cut them open on one side. Apply Armaflex® adhesive to the ends of the end discs and glue together over the flanges.

Note: If the flange has the same diameter as the insulated pipe, it is not necessary to fabricate end discs. In this case, use a strip of Armaflex® to double up on the pipe insulation towards the flange. Apply the Armaflex® strip with the foamed skin upwards.

3. Next transfer the dimensions U, h, a1, a2 and D3 to a sheet of Armaflex® and cut out the valve body.



4. Apply a thin coat of Armaflex® adhesive to the longitudinal seam, allow to tack dry, place the fitting cover around the valve body and press the seams together.
5. Then fabricate an Armaflex® end disc whose outer diameter is at least equal to the diameter of the valve housing and whose inner diameter is equal to the valve housing (valve spindle).

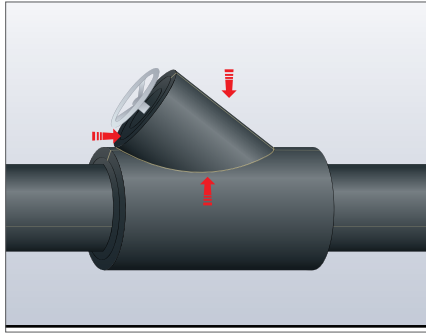
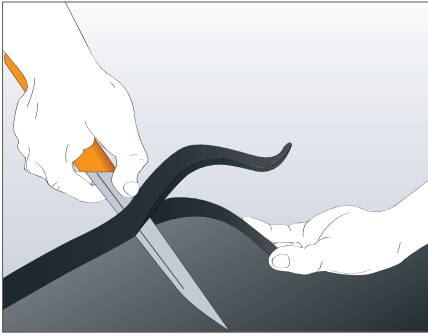


6. Determine

a = shortest distance between the Armaflex® end disc and the insulated valve body

B = greatest distance between the Armaflex® end disc and the insulated valve body

7. Determine the circumference of the end disc using a strip of Armaflex® and cut out the Armaflex® sheet accordingly. Draw in the centre line.
8. Mark the distance B on the outer boundary line and the distance a on the centre line. Determine the diameter of the insulated valve body. Draw an arc through the end point a with a quarter of this diameter.
9. Now position the dividers in such a way that an arc is drawn between point B and the circle tangent. (Set the radius of dividers at half of the circumference.)

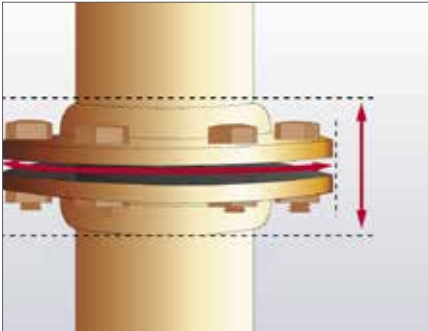


10. Cut the remaining section of sheet. Chamfer the sheet away where it is to touch the insulation around the strainer body. Apply a thin coat of Armaflex® adhesive to the longitudinal seam and allow to tack dry. Sleeve the fitting cover over the spindle wheel and glue the pieces together tightly.

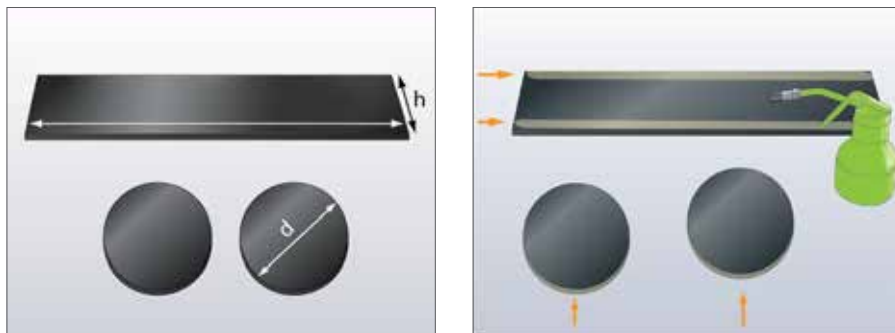
Flange boxes

The following section shows the installation techniques for insulating flanges.

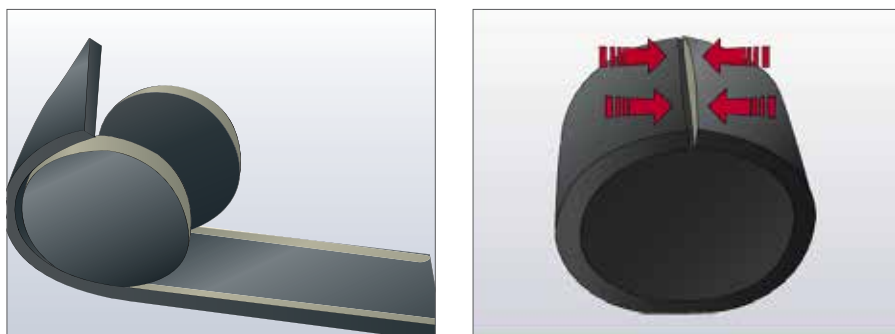
In chilled-water or refrigeration applications it is advisable to pack the gaps between the nuts with strips of Armaflex® insulation.



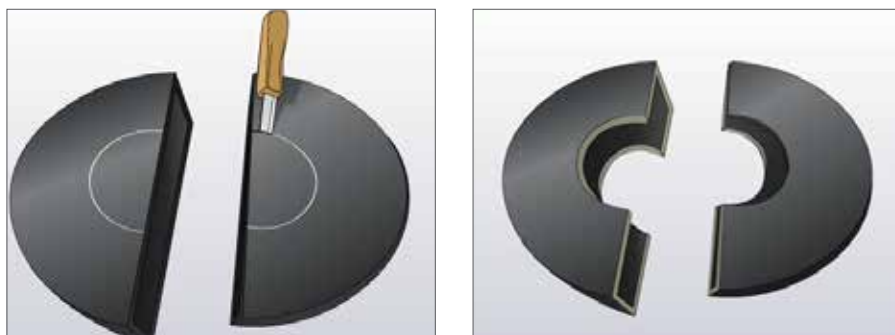
1. Using a pair of calipers, determine the diameter of the flange face. Add 10 mm to this measurement.
2. Measure the length of the flange (incl. bolts) and add 2x the insulation thickness of the sheet used.



3. Apply a thin coat of Armaflex® adhesive to the longitudinal seam, allow to tack dry, place the fitting cover around the valve body and press the seams together.
4. Then fabricate an Armaflex® end disc whose an outer diameter is at least equal to the diameter of the valve housing and whose inner diameter is equal to the valve housing (valve spindle).



5. Roll the body panel up and around the end discs, do not stretch during application. Check alignment throughout.
6. Place the edge to the edge of the adjoining seam opposite.

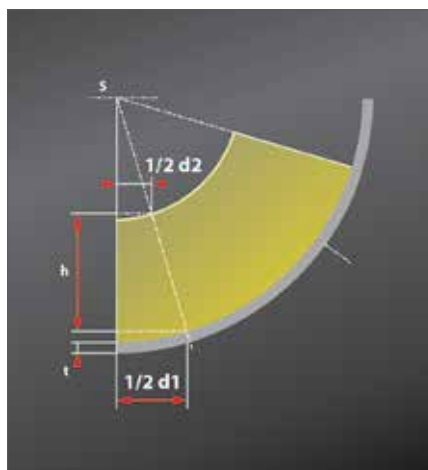
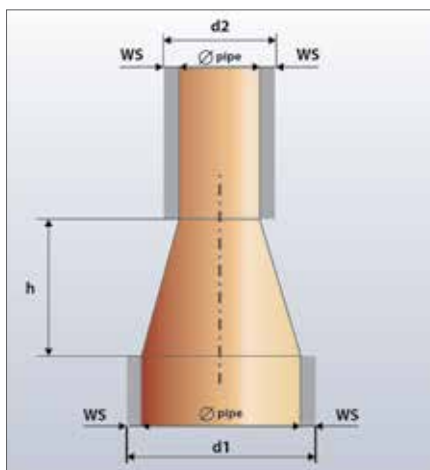


7. Using a small sharp knife cut out for the insulated pipe diameter.
8. To finish fit the two halves of the flange box around the flange and wet seal all seams and joints to the insulated pipe branch.



To the video

Concentric reducers

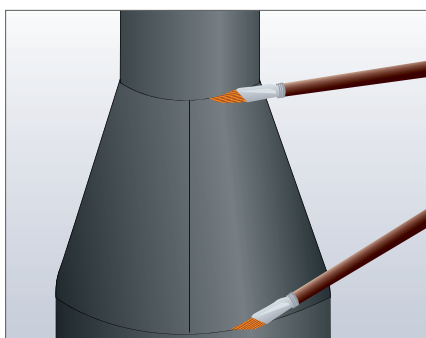
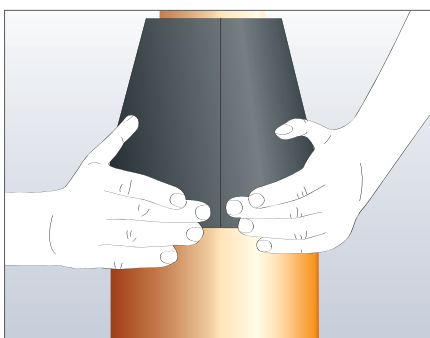


- Determine the following measurements
 h = height of the reducer, including both welds
 $d1$ = diameter of larger pipe + 2 x insulation thickness
 $d2$ = diameter of smaller pipe + 2 x insulation thickness
- Determine the circumferences by placing a strip of Armaflex® sheet material that has the same thickness as the insulation to be installed round the larger diameter pipe. Do not stretch the strip.

Thickness of Armaflex® sheet material

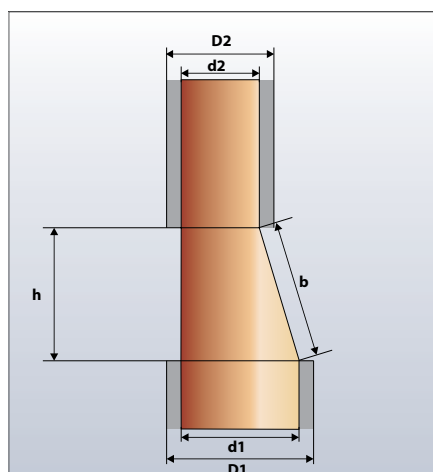
t	6 mm	10 mm	13 mm	16 mm	19 mm	25 mm	32 mm	50 mm
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- Transfer the measurements determined onto the surface of the Armaflex® sheet marked as shown in the picture. Minimise material waste by drawing the half-elevation on the edge of the Armaflex® sheet.
- Draw two arcs guided by the height (h) around the S point. Mark the measured circumference on the larger arc. Draw a line connecting the point marked for the circumference with the S point.
- Cut out the reducer piece with a sharp knife (yellow area indicates the cutting lines).

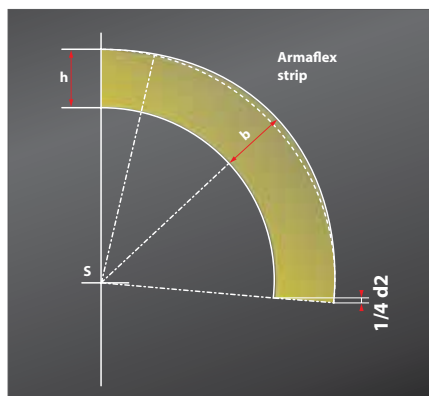
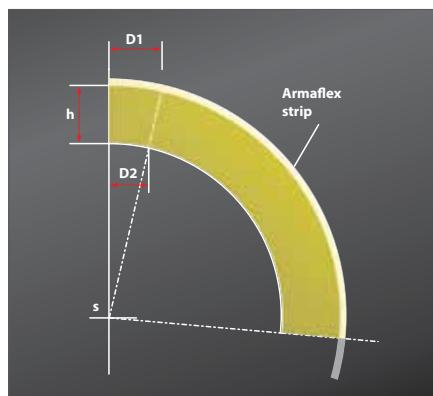


- Apply a thin coat of adhesive to the edges to be joined, allow to tack dry. Press together firmly at one end, then at the other end and complete the joint.
- Complete insulation by insulating the pipes on either side of the reducer and wet seal both butt joints.

Excentric Reducer



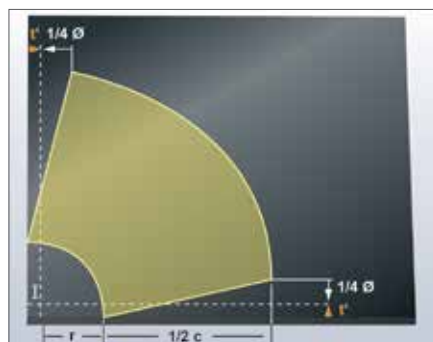
1. Determine the following measurements:
 h = height of the excentric reducer including both welds
 $D1$ = diameter of the larger pipe + 2x insulation thickness
 $D2$ = diameter of the smaller pipe + 2x insulation thickness
 b = true length of the reducer
2. Determine the circumference by placing a strip of Armaflex® sheet material that has the same thickness as the insulation to be installed round the larger diameter pipe.



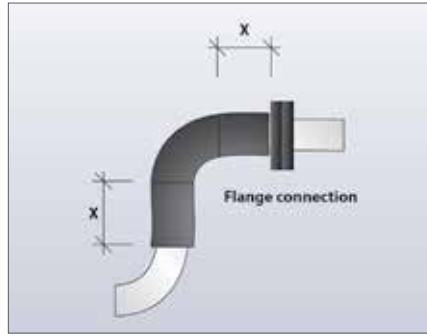
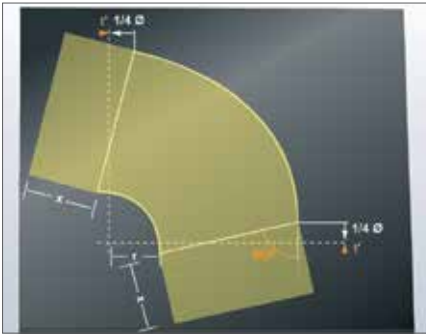
3. Transfer the measurement determined onto the surface of the Armaflex® sheet material, as shown in the picture.
4. Modify the pattern as appropriate.

Two-part bend made of Armaflex® sheet with extension

In some cases flanges, valves etc. are located in close proximity to bends. In such situations it is practical to insulate this area as a single operation:

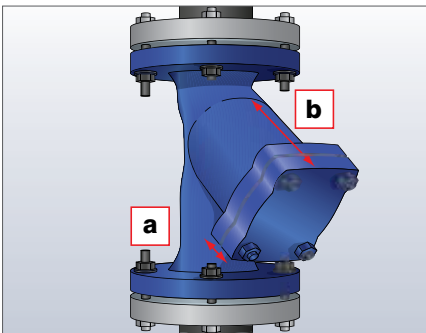


1. Fabricate a two-part bend [see "Two-part bend with Armaflex® sheet" on page 21]

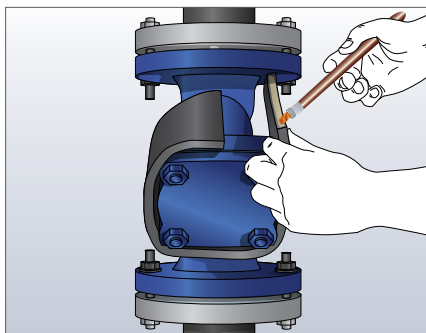
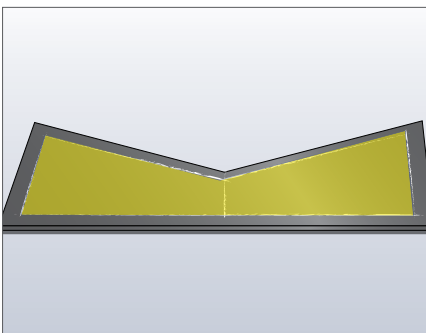


- At both ends of the bend, mark the required extension "x" at a 90° angle.
- Cut the first half-section of the extended elbow. Use the first half-section as a template to cut the second half-section of the elbow.
- Place the sections together and apply Armaflex® adhesive to the outer edges.
- Allow the adhesive to tack dry and glue the pieces together (see "Two-part bend with Armaflex® sheet" on page 21).
- Place the insulation cover over the pipe bend. Allow the adhesive to tack dry then press the joint faces firmly together.

Strainer valve insulation with Armaflex® sheet



- Insulate the incoming pipes up to the flange.
- Measure the shortest distance "a" and the longest distances "b" of the end of the strainer to the uninsulated strainer valve body.
- Determine the circumference of the removable cover of the strainer. Important: Always measure with a strip of Armaflex® material that has the same thickness as the insulation to be installed. Do not stretch the strip.

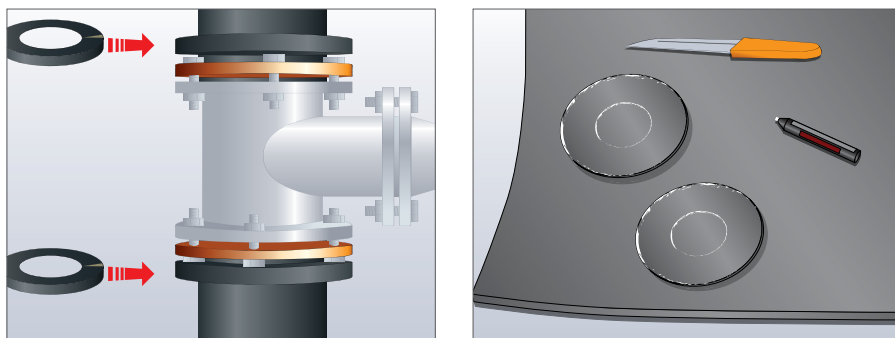


- Transfer the circumference to Armaflex® sheet and mark a centre line.
- At each end mark the longest distance "b" from the end of the strainer to the uninsulated strainer valve body and at the centre line mark the shortest distance "a".

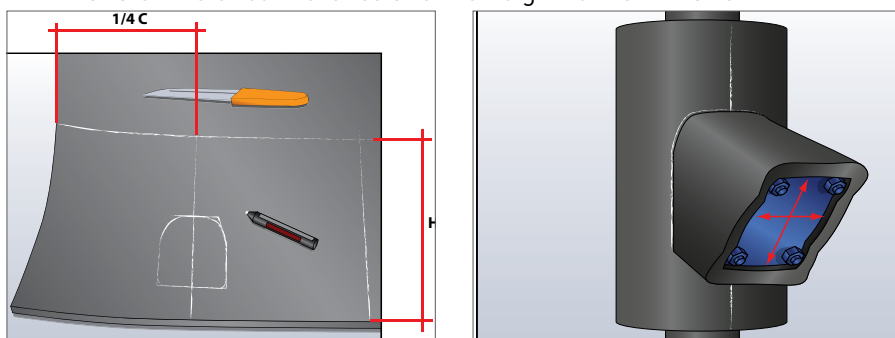
Note: The strainer section may extend into the insulation of the strainer valve body and an additional length may be necessary so that the insulation of the strainer section juts out of the insulation of the strainer valve body.

- Cut the piece out of the sheet material and attach the insulation to the strainer section using Armaflex® adhesive.**

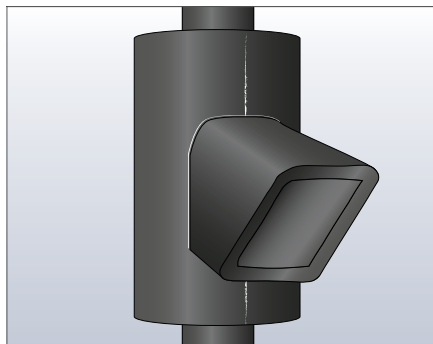
Attention: Do not glue to the edge of the removable strainer lid!



7. Using a pair of calipers determine the diameters of the:
 - insulated incoming pipes
 - flanges of the strainer valve
8. Transfer these measurements to a piece of Armaflex® sheet. Mark two concentric circles with dividers. Repeat on a second piece of sheet. Cut out two Armaflex® rings and install on both flanges.
9. Measure the distance between the outer faces of the two Armaflex® rings and the circumference of the disc by using a strip of Armaflex® with the thickness to be used for the insulation.
10. Transfer the circumference and the height to the Armaflex®.



11. Mark a centre line and cut an outline for the strainer section. Cut the sheet and apply adhesive to the longitudinal seam. Attach the insulation to the strainer valve body using Armaflex® adhesive.
12. Measure the height and the width of the strainer section including 2x insulation thickness, transfer to Armaflex® sheet and cut out the disc for the end cover.
13. Determine the circumference of the disc. Always measure with a strip of Armaflex® material that has the same thickness as the insulation to be installed. Measure the shortest and the longest distances from the end of the strainer to the insulated strainer valve body.
14. Transfer these measurements to Armaflex® sheet as shown and connect the end-points with a divider.



To the video



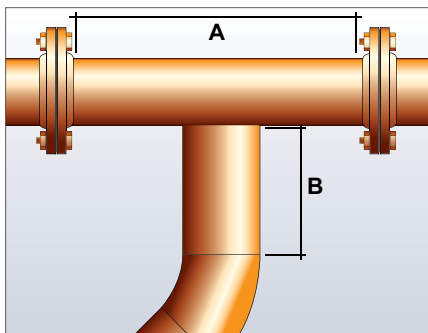
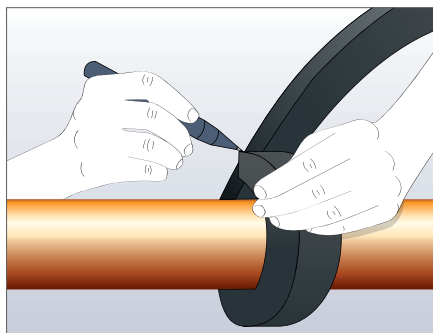
Cut the plotted shape and apply adhesive to all seams. Allow the adhesive to tack dry and roll the panel up around the end disc, do not stretch during application. Check alignment throughout.

15. Install strainer insulation and glue precisely to the strainer valve body.

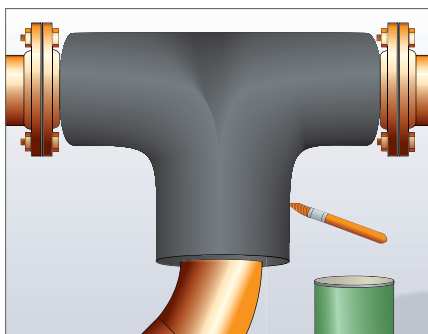
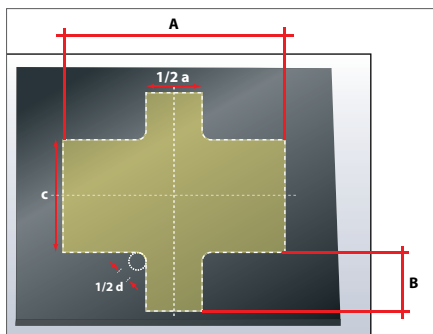
Note: Although the strainer must be cleaned periodically, a removable cap is not recommended on cold applications.

One-part T-piece with Armaflex® sheet

1. Determine the pipe circumference using a strip of Armaflex® in the thickness which is also to be used for the insulation later.



2. Measure the length A of the main pipe and the length B of the branch pipe.
3. Draw horizontal and vertical reference lines on the Armaflex® sheet material. Transfer the measurements determined as shown in the drawing.
4. To round off the corners, draw an arc with a radius equal to a quarter of the pipe diameter on all four corners and cut out the ... along the curves drawn.
5. Apply adhesive to all seams, allow to tack dry and then close around the T- piece.

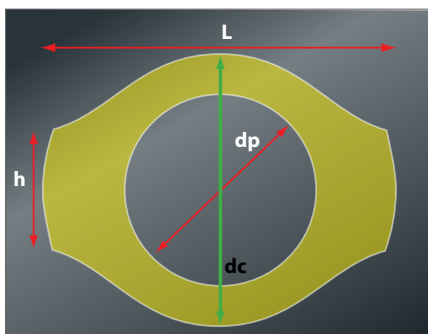
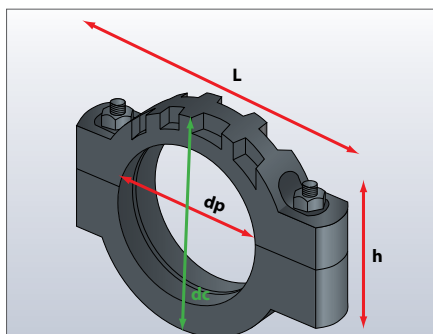


To the video



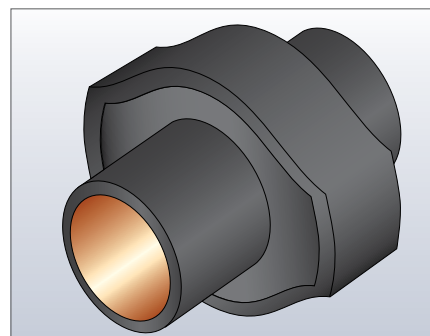
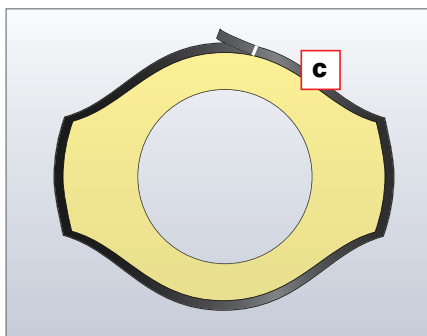
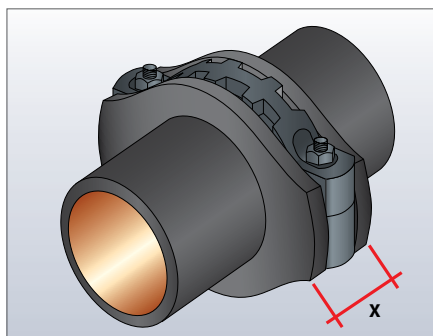
Insulating victaulic couplings with Armaflex® sheet

1. Insulate pipes up to the coupling.



2. Determine
 dc = diameter of coupling + 2 x insulation thickness
 h = height of screws + 2 x insulation thickness
 L = length of coupling

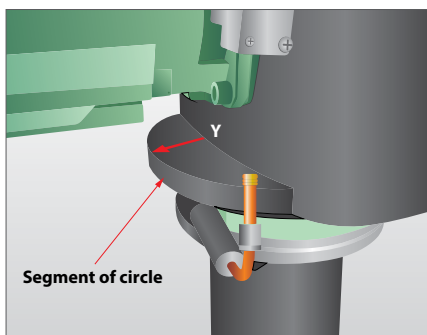
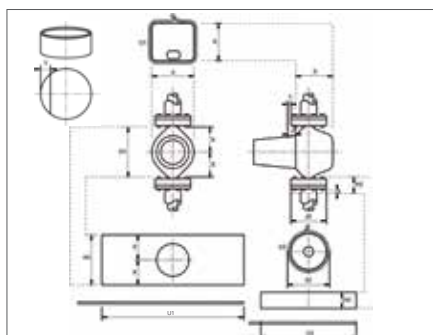
3. Using $\frac{1}{2}$ of dc (diameter coupling + 2 x insulation thickness) as a radius, transfer a circular arc to the Armaflex® sheet and mark a horizontal centre line.
4. From the centre of the line, mark the width of the coupling.
5. At both ends, mark the height of the screws plus 2x insulation thickness at a 90° angle to the centre line.
6. Connect the four end-points and the circular arc with a tangent so that a oval-like disc is formed.
7. Determine the diameter of the insulated pipe and mark it on the Armaflex® sheet.
8. Cut out this disc and use as a template to create a second identical disc.



9. Glue both discs directly next to the coupling as shown.
10. Determine the circumference of the disc and measure the distance over the outer faces of the two discs. Transfer these measurements to a sheet of Armaflex®.
Important: Always measure with a strip of Armaflex® material that has the same thickness as the insulation to be installed. Do not stretch the strip.
11. Cut this section and glue over the Armaflex® discs around the coupling.

Insulating pumps with Armaflex® sheet

Various types of pumps are available. The following section offers general advice and procedures which can be applied and modified as required to insulate most pump configurations.

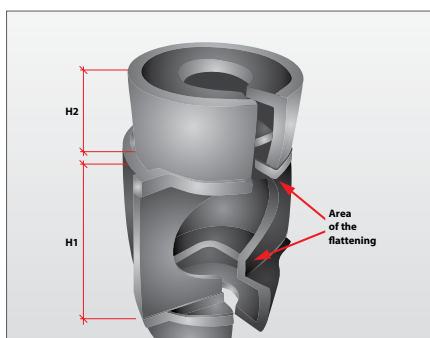


1. Insulate the incoming pipes up to the flange.
2. Cut to size two Armaflex® discs including the cutouts according to the dimension of the pump body (a x b).
3. Determine the circumference of the disc (U1).

Important: Always measure with a strip of Armaflex® material that has the same thickness as the insulation to be installed. Do not stretch the strip.

4. Cut out the section for the insulation of the pump body from an Armaflex® sheet (U1 x H1).

5. Create the cutout for the motor pump. To provide a close-fitting cutout in the penetration area of the pump motor, it should be 5 mm smaller than measured.
 6. Glue both discs to the section for the pump body. Place the insulation cover over the pump body and apply adhesive. Allow to tack dry then press the surfaces firmly together.
- Note:** In the area of the pump motor, apply self-adhesive Armaflex® tape to the pump to ensure the insulation is attached securely.
7. For the flattening fabricate two circular sections. Cut out discs with the dimension of flange diameter + 2 x insulation thickness. Mark the Y-dimension, cut the two circular sections and glue at the top and bottom of the pump cap.
 8. Fabricate the flange boxes: determine the diameter of the flanges d1, circumference U2, the height H2 and the cutouts for the insulated piping connections.
 9. Fit the flange boxes around the flange and wet seal all seams and joints.



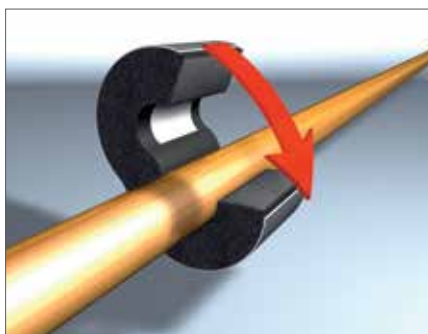
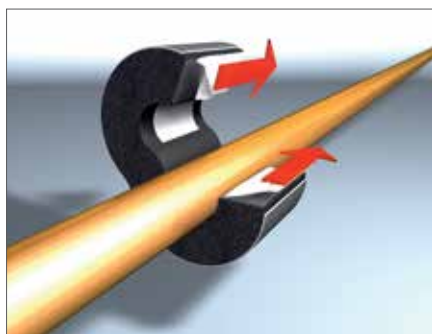
The picture shows a pump box with a straight front cover and a semi-circular shell.

Installing Armafix® FRV pipe supports

Where Armaflex® is installed, the use of Armafix® FRV pipe supports is the preferred solution to prevent ice and condensation on cold installations. However, when Armafix® FRV pipe supports are not selected, it is imperative to follow these instructions:

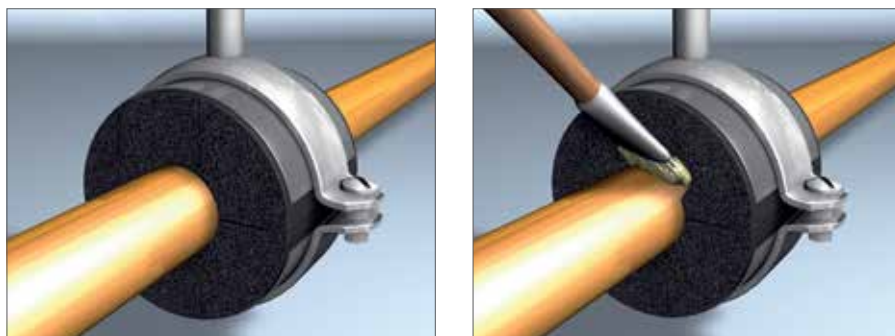
- Ensure that the Armaflex® is fitted tight to the support with no air gaps and vapour-sealed with Armaflex® adhesive.
- Install Armaflex® self-adhesive tape to the butt joint where the insulation and the support meet. Ensure the surface of the butt joint is free from dust before installing the Armaflex® tape.

Armafix® FRV pipe supports are sections of Armaflex® FRV with load bearing PUR inserts.



1. Install Armafix® FRV pipe support to the pipe, remove the white protective paper strip on both side. Close the seam applying firm pressure.

Note: Select the correctly dimensioned Armafix® FRV pipe support (min. insulation thickness of tube).



2. Install the brackets.

Important: Use only the PUR segments to bear the load.

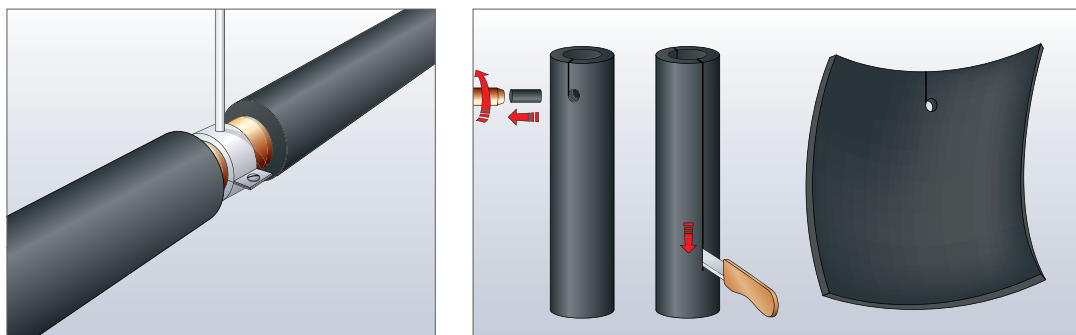
3. Install the Armaflex® FRV insulation on either side of the Armafix® FRV pipe support. Wet seal the butt joints of Armafix® FRV pipe support using Armaflex® adhesive.

Note: Ensure that the pipe insulation is installed under slight compression.

Insulating “over” pipe supports (encapsulating)

The insulation of standard brackets can be carried out using the following procedure:

Note: When installing on cold lines, it is essential to raise concerns about the suitability of such systems before beginning work.

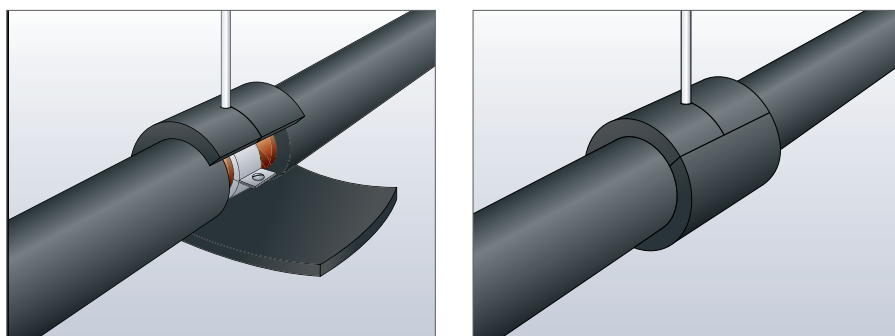


1. Install Armaflex® as close to the fixing bracket as possible. Seal the ends of the tube to the pipe with Armaflex® adhesive.

Note: On cold lines, insulate the fixing bracket with a suitable Armaflex® tube or with Armaflex® self-adhesive tape.

2. With a large off-cut of Armaflex® tube, punch out a small hole to allow for the oil thread support of the bracket and slit with a small sharp knife along the flat face of the tube.

Note: For large pipe diameter the use of Armaflex® sheet is recommended.



3. Place the Armaflex® cover over the support area, mark and cut the true circumference of the cover. Fix and vapour seal all seams and joints in and around the attached insulation using Armaflex® adhesive.

To the video



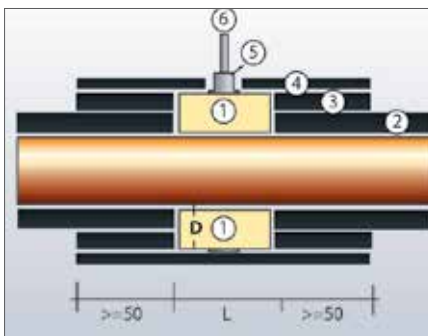
Insulation of other pipe supports

Armafix® pipe supports is a better solution for the prevention of condensation in cold applications, as it complements the Armaflex® insulation system against water vapour ingress.

In instances where cold clamps made of PUR/PIR are required for pipe hanging, it is important to ensure a vapour-tight bond between the cold clamps and the insulation material. This is because the interface represent a thermal bridge where condensation may occur. Hence, adhesion at these points require special attention.

1. Clean the surface of the clamp using Armaflex® cleaner.
2. Apply Armaflex® adhesive on the surfaces which are to be glued. Allow this first layer of Armaflex® adhesive to dry.
3. Apply a second thin coat of adhesive evenly on both the surface of the clamp and the Armaflex® adhesive joints. After the adhesive has cured, the joints should be pressed together briefly, but firmly.
4. When gluing both butt joints under pressure, wet seal around the joint, when the clamps have been glued in advance (please see above)
5. If necessary double the Armaflex® thickness to the diameter of the PUR-support.
6. To secure the butt joints, apply an overlapping strip of Armaflex® using all-over adhesive coverage.

SCHEMATIC CROSS-SECTION OF A CONNECTION OF ARMAFLEX® TUBES WITH A CLAMP MADE OF PU RIGID FOAM



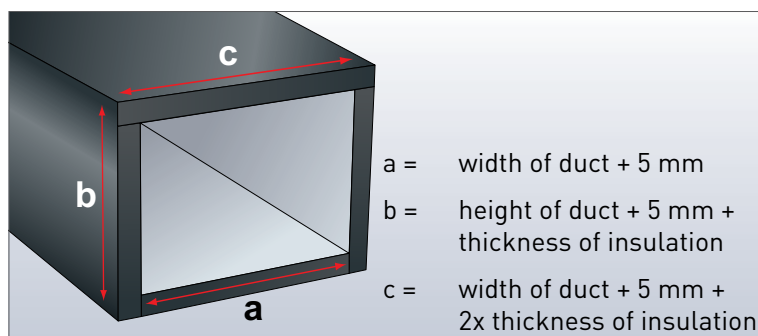
1. Clamp made of PU rigid foam
2. Armaflex® tube
3. Armaflex® double layer
4. Armaflex® overlap (thickness ≥ 9 mm)
5. Connecting thread
6. Threaded bar

Ducts

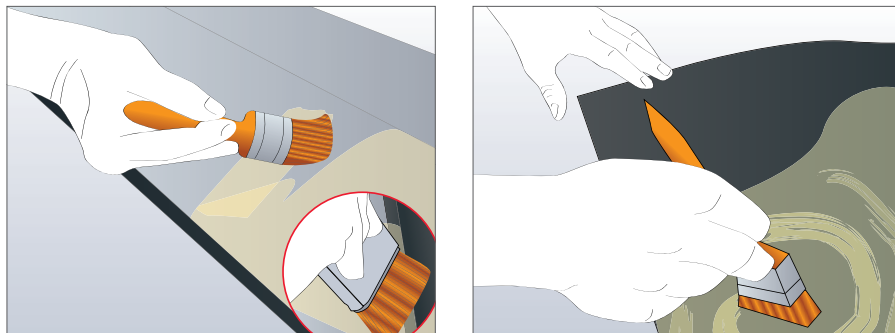
Insulating rectangular ducts with Armaflex® sheet

1. Measure surface dimensions and cut Armaflex® sheet to size.

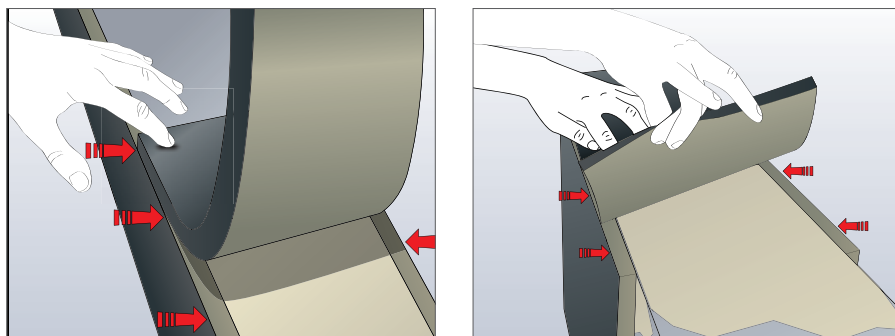
Note: Add 5 mm so that the material is fitted under compression.



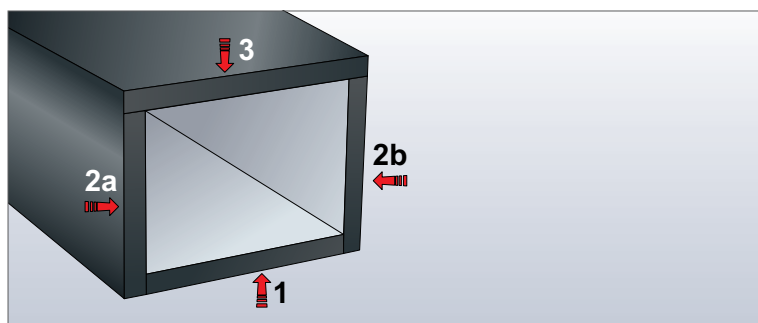
2. Clean all surfaces using Armaflex® cleaner to remove grease, oil, dirt etc. and cut sheets to size.



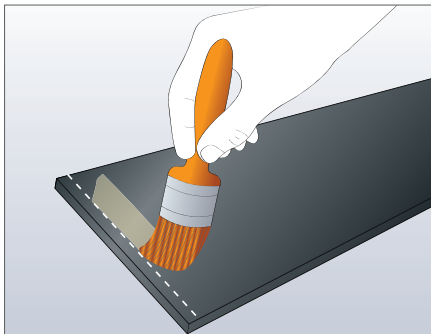
3. Spread a thin film of adhesive onto the metal surface and then onto the Armaflex® sheet.



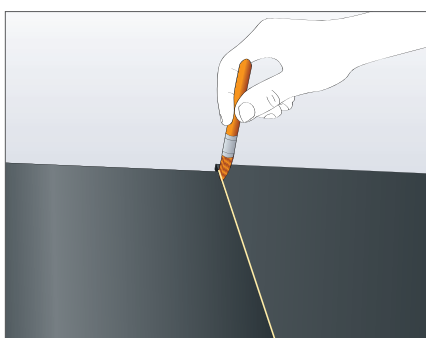
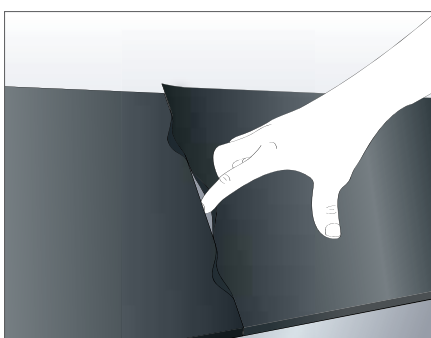
4. When the adhesive is tack dry (fingernail test) place Armaflex® sheet in position and press firmly to achieve a good bond. Continue, applying Armaflex® adhesive to both surfaces including the Armaflex® edge, and allow to tack dry before pressing firmly into position.



Note: Remember to roll the sheet down into position along the insulated edges.



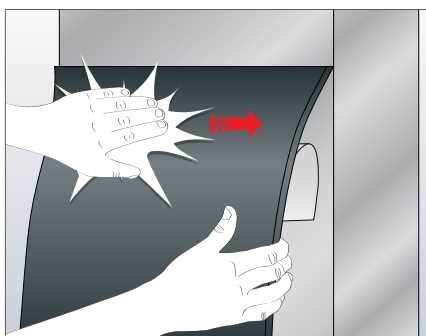
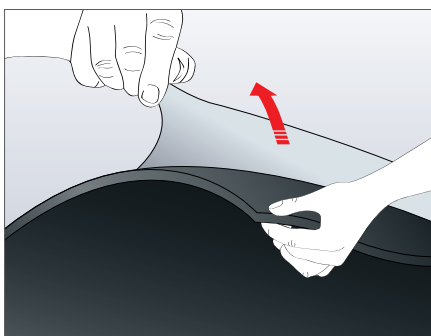
5. The cut sheets should be positioned so that there is a 5 -10 mm overlap (for compression). Do not apply adhesive to this area on either the Armaflex® sheet or the duct surface. Where two sheets join, leave a 30 mm strip of both the sheet and the duct surface free of adhesive.



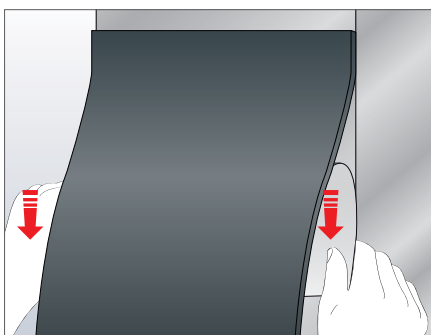
6. When pressed together, the material is under compression and not stretched.
7. Apply an additional wet seal along the butt joints.

Insulating rectangular ducts with Armaflex® self-adhesive sheet

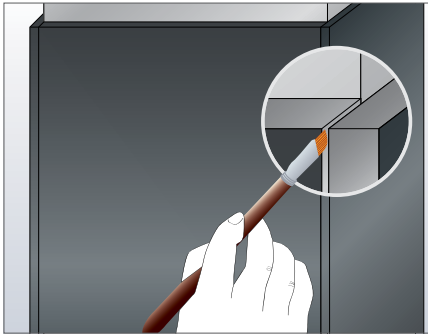
1. Clean all surfaces using Armaflex® cleaner to remove grease, oil, dirt etc. and cut sheets to size.



2. Peel back release paper 10 to 20 cm & line up sheet. Press firmly to activate adhesive.



3. Align material and continue to line up correctly, pressing firmly whilst slowly removing release paper. At butt joints allow 5 mm overlap for compression
4. To allow the sheets to be overlapped, first re-stick an approximately 30-mm strip of the backing foil to the edge of the sheet.



- 5 . Wet seal the compressed butt joint.

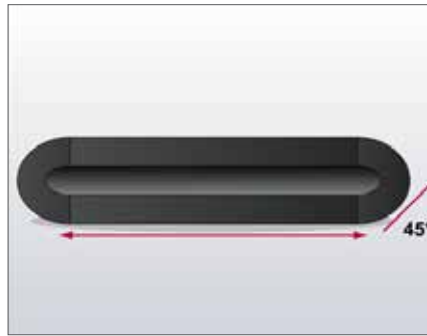
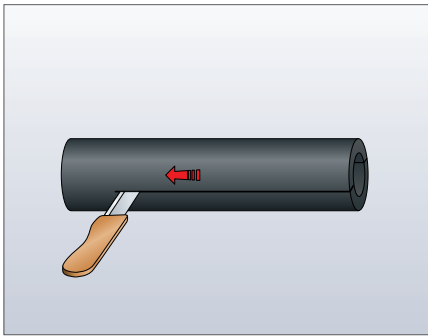
To the video (also showing
the insulation of duct
flanges)



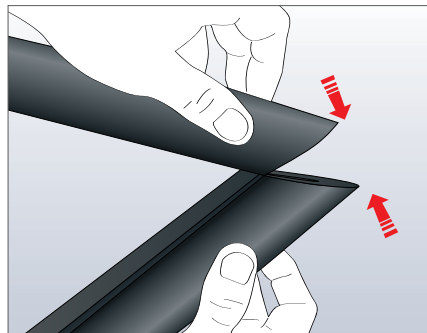
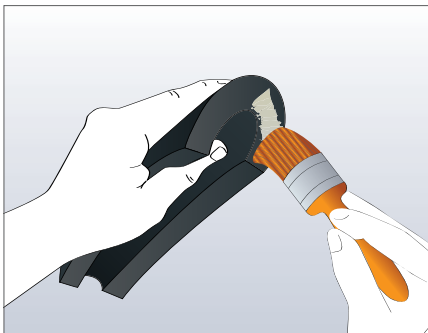
Insulating duct brackets with Armaflex®

INSULATING DUCT BRACKETS USING ARMAFLEX® TUBES

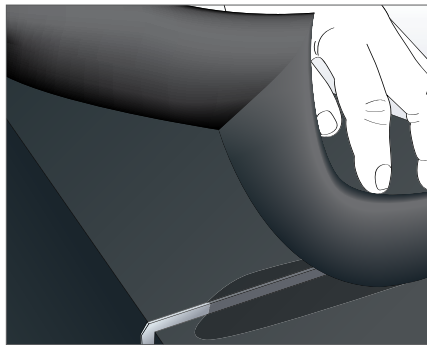
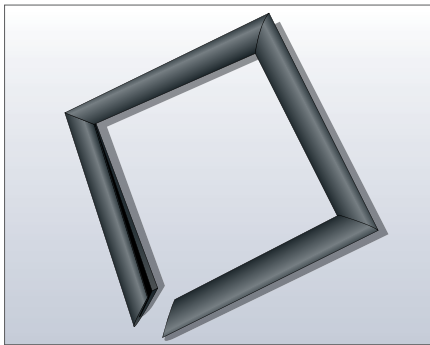
For a cost-effective solution with a high-end finish, Armaflex® tube can be used to cover duct brackets.



1. Use unslit Armaflex® tube in a thickness equal to the duct insulation. Split the tube into two equal halves using a sharp knife.
2. Measure the four insulated sides of the duct body.
3. Using a mitre box, or the Armaflex® template, cut the Armaflex® as shown with a 45° angle. From the throat measurement, determine the length of the fitting and cut an opposite 45° angle as shown.
4. Continue to cut the other 3 sides of the tube picture frame fitting.



5. Using Armaflex® adhesive, apply a thin even film with a brush to the three sets of 45° angles.
6. Allow the adhesive to tack dry and press the angles together, applying firm even pressure for a good bond.



7. Place the picture frame of Armaflex® tube material around the ducting, apply the adhesive to the final angle cuts and bond to complete.
8. To finish, wet seal around the picture frame fitting cover.

INSULATING DUCT BRACKETS USING ARMAFLEX® SHEET



Single strip method - Four single strips applied to the insulation.



Three-sided box method - Built up side strips with over-covering body strips.



Continuous single strip method - Complete single continuous strip.

In all these cases the fabricated Armaflex® insulation bracket covers have the same thickness as the attached ductwork connections. For a continuous vapour-tight system, all insulation covers should be securely fixed and wet sealed with Armaflex® adhesive.

Insulating circular ducts with Armaflex® sheet

For circular ducts proceed as described in the sections “Insulating large pipes with Armaflex® sheets” and “Use of adhesive on pipes with outer diameter > 600 mm”.

Vessels and tanks

Insulating vessels and tanks with Armaflex® sheet

DRAW UP A CUTTING SCHEDULE

Work out the most efficient way of covering the surfaces using Armaflex® sheet (2 x 0.5 metre) or continuous roll (1m width and length 3 - 15 m depending on the thickness).

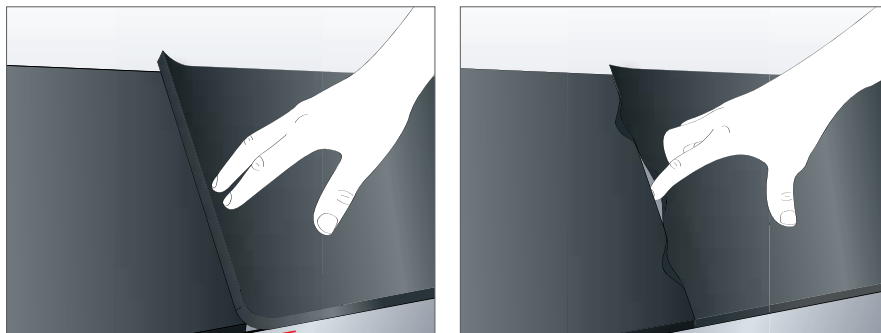
Armaflex® sheet layout for large vessels and tanks

Note: Ensure that sheet joints are staggered.



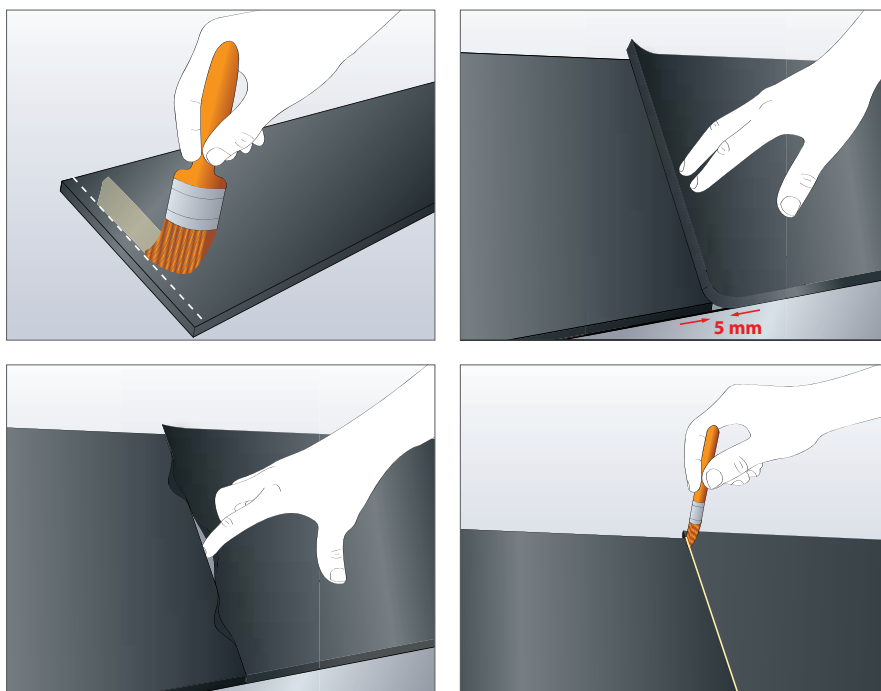
COMPRESSION JOINTS

Provide an allowance of an additional 5 mm on all dimensions when cutting from Armaflex® sheet or roll. Always make compression joints. On curved surfaces, measure the circumference with a strip of Armaflex® material that has the same thickness as the insulation to be installed, including any surface finish. Do not stretch the strip.



ADHESION

1. Apply Armaflex® adhesive first to the insulation before applying adhesive to the metal surface.
2. All seams are joined wet. Leave about 30 mm without an adhesive coating on the Armaflex® surface. Attach the connecting sheet with adhesive and with 5 mm overlap. Then press in the overlapping butt joint to give additional compression.
3. Wet seal joints on flat surfaces:



MULTI-LAYER APPLICATION

Where multi-layer insulation is installed use Armaflex® cleaner after 36 hours (see “Multi-layer insulation of pipework” on page 13) to remove any talc, chalk, dirt, grease and moisture from the surfaces to be joined. Stagger all seams and butt joints on the second layer relative to the first layer.

COMPLEX SHAPES

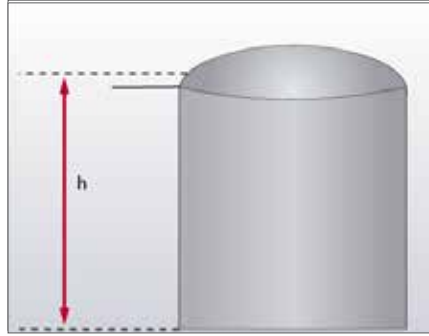
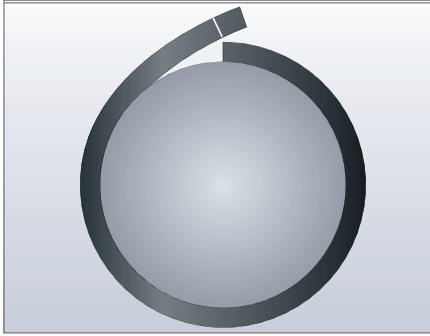
Where complex shapes are to be insulated, the shape of the body is outlined with chalk and these chalk markings can be transferred directly to the Armaflex® sheet by pressing the flexible material against the metal surface. Cut along the chalked line with a sharp knife to obtain a good fit for the Armaflex®.

OUTDOOR INSTALLATIONS

All Armaflex® materials (except HT/Armaflex®) used outdoors will require additional protection against UV radiation. We recommend the use of Armafinish paint or one of the Arma-Chek® Systems (see "Outdoor use of Armaflex®" on page 07).

HT/Armaflex® insulation does not require painting when used outdoors.

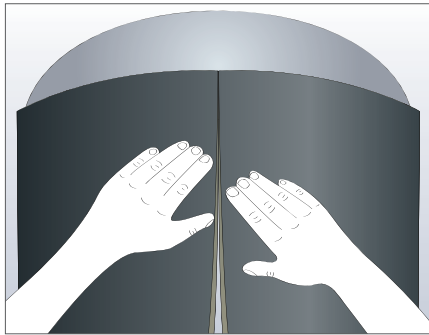
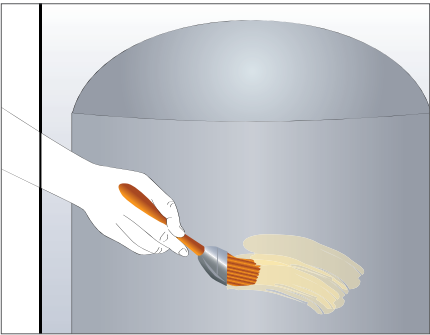
Insulating small ($\varnothing < 1.5$ m) tanks and vessels using Armaflex® sheet



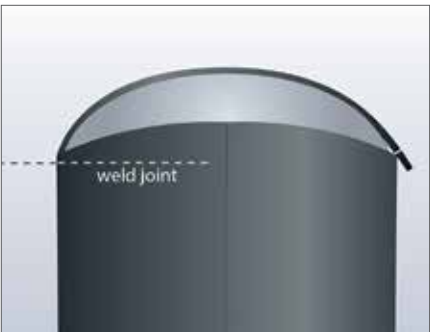
1. Determine the circumference of the tank.

Important: Always measure with a strip of Armaflex® material that has the same thickness as the insulation to be installed.

Warning: Do not stretch the strip.

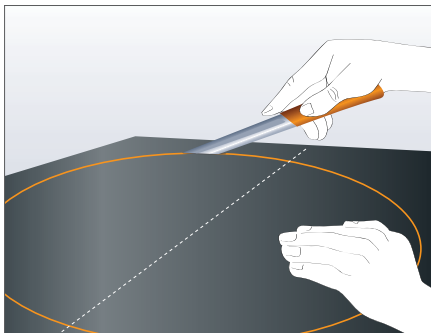


2. Transfer the circumference to the Armaflex® sheet and cut to the required size. Spread a thin film of adhesive onto the Armaflex® sheet and then onto the metal surface. When the adhesive is tack dry (fingernail test) place Armaflex® sheet in position and press firmly to achieve a good bond. Depending on the size of the tank, allow the Armaflex® sheet to overlap the weld joint in the region of the dome of the vessel head by approximately 10 to 20 cm.

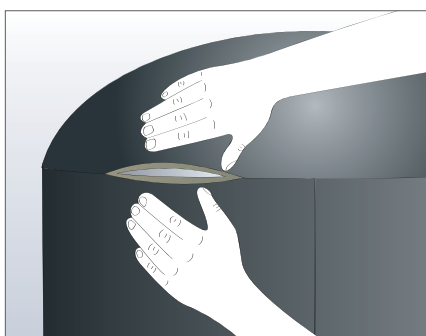
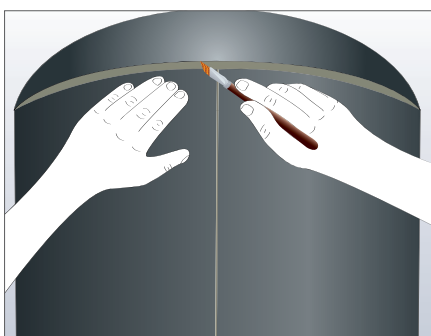


3. Determine the curve length of domed surface.
Important: Always measure with a strip of Armaflex® material that has the same thickness as the insulation to be installed.

Warning: Do not stretch the strip.



4. Using the curve length as the diameter, mark a complete disc on a piece of Armaflex® sheet. If this disc is too large to fit on a single sheet of Armaflex® first glue multiple sheets together.
5. Cut around the disc.
6. Spread a thin film of adhesive onto the back of the Armaflex® sheet and then onto the metal surface.



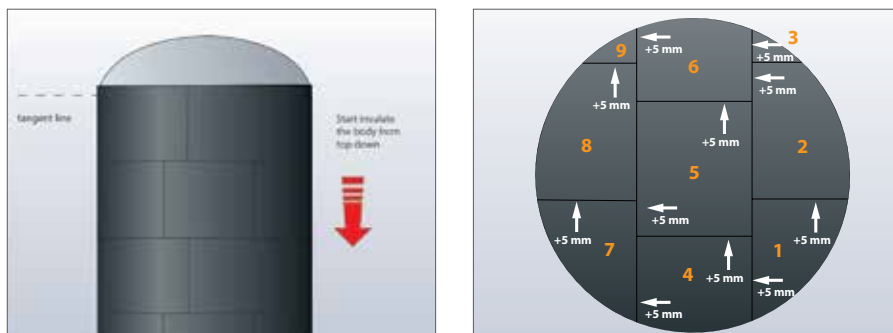
To the video

7. When the adhesive is tack dry (fingernail test) place Armaflex® sheet in position onto the top of the tank and press firmly down from the centre, avoiding any slipping of the material, to achieve a good bond.
8. Apply an additional wet seal along the edges at the top of the tank.
9. After the adhesive has been given time to tack dry, press the edges of the seam firmly together.

Key basic application procedures for large vessels $\varnothing > 1.5$ m

Install the Armaflex® sheet panels from the domed end section of the vessel as shown. Use all-over adhesive coverage to both surfaces.

Continue to install the panels of Armaflex® around this domed end section. Ensure the Armaflex® sheet is fitted under compression. After the first ring of panels are installed, continue to apply other panels of Armaflex® sheet around the body of the vessel as shown.



When the entire surface area of the vessel body is completed, insulate the dome ends as shown.

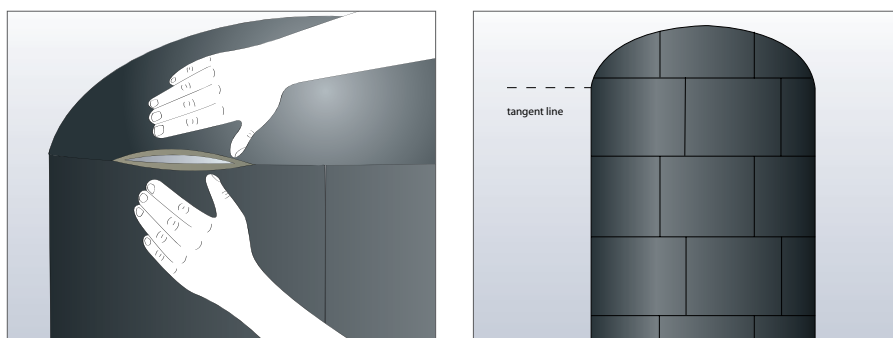
To determine the exact shape of the edge sheets, mark the edges of the Armaflex® used to insulate the vessel body with white chalk.

For the edges of the domed end section, cut sheets roughly to size with an overlap of approx. 50 mm. Place sheets over the chalked edges and apply firm pressure and remove. The underside of the Armaflex® sheet will show the impression of the required profile.

Cut the marked outline with a shape knife and install directly to the appropriate section with all-over adhesive coverage.

Note: Do not apply adhesive to the circular profile edges of the domed end. This is done last by wet sealing the jointing details as described below.

Continue to install the required insulation panels as required to complete the domed section.



To finish, wet seal the domed panels to the main insulated body sections as shown in the section relating to vessels with diameters smaller than 1.5 m.

Additional application advice

The following sections contain further detailed information for specific applications.

Armaflex® with additional metal cladding

Sometimes an additional metal cladding is needed to protect Armaflex® against mechanical damage and, in outdoor applications, UV radiation.

If such cladding is used, it is necessary to bear in mind that the metal cladding may influence the insulation thickness required. In particular the altered surface emissivity will have an impact on the surface coefficient of heat transfer to be used in calculations.

It is considered best practice to install the metal cladding directly onto the Armaflex® leaving no air gap. Since fixing screws will be directly inserted into the material, thermal bridges will be created and the insulation wall thickness may need to be increased to compensate for this.

Alternatively, the cladding can also be installed with an air gap (minimum 15 mm) by using strips of Armaflex® as spacers. In addition, holes with a diameter of 10 mm should be drilled in the underside of the cladding at least every 300 mm.

Note: It is important to ensure that condensation does not occur within this air layer or on the surface of the aluminium cladding. Always pay careful attention to the changing surface coefficient of heat transfer as this can seriously impact upon the insulation thickness requirement.

Armaflex® installed in the soil

Pressure of soil backfilled on top of insulation material will cause compression of the material, which will have an impact on the insulation wall thickness.

It is recommended that insulation material is protected against compression by sleeving the insulated pipe into a rigid soil or waste water drainage pipe.

1. Prevent compression of flexible cellular material due to contact with the outer protective pipe by selecting a drainpipe which is sufficiently larger than the outer diameter of the insulated pipe assembly to be inserted.
2. Ensure the outer protective pipe is fully supported, e. g. by having full contact with the surrounding soil, to prevent the drainpipe breaking. Joints and connections are particularly vulnerable.

Installation of Armaflex® insulation on plastic pipes

Armaflex® insulation materials and Armaflex® 520 and HT625 Adhesives are compatible with most plastic pipe materials used for industrial and building service equipment. On pipes made of PVC-C, PE-Xa and PE-HD plastics, Armaflex® can simply be installed in the same way as on metal pipes.

However, when bonding Armaflex® to polypropylene (PP) pipes, it is necessary to bear in mind that the adhesion of the material is not optimal. Therefore, to improve the bond, Armacell recommends first roughening the plastic where the partition bonding is to be carried out.

When Armaflex® is glued to ABS pipes, solvent from the Armaflex® adhesive may be trapped. During the aging process of the ABS plastic, this can lead to hair cracks in the pipes. Direct partition bonds should therefore not be used on ABS pipes. It is possible to first apply self-adhesive Armaflex® Tape where the partition is to be created and then carry out partition bonding. In contrast, this is not necessary when the longitudinal seams are glued. Here it can be assumed that if the work is carried out correctly, the solvent present in the applied adhesive will have evaporated before the insulation is glued together.

Compatibility of Armaflex® and Armaflex® adhesive with plastic pipes

Plastic pipe	Compatibility	Remarks
PVC-C	yes	-
PE-Xa	yes	-
PE-HD	yes	-
PP	yes	To improve bonding - e.g. where partition bonds are to be carried out - first roughen the plastic
ABS	yes	In the case of partition bonding, first apply self-adhesive Armaflex® Tape where the partition is to be created, then carry out partition bonding. Note: For Durapipe ABS pipes at medium temperatures greater than 30 °C the use of HT/Armaflex® or NH/Armaflex® should be considered.

References

In addition to this manual, Armacell provides the following documents, free of charge. Please ask our Customer Service Center.

INSULATION OF STAINLESS STEEL WITH ARMAFLEX®

CORROSION PROTECTION IN THERMAL AND REFRIGERATION INSULATION ON TECHNICAL OPERATING SYSTEMS

ARMAFLEX® COLD WORK APPLICATION GUIDANCE

Insulating cold lines with temperatures between -50 °C to -196 °C.

GLUING ARMAFLEX® ONTO CELLULAR GLASS

Installation advice when installing Armaflex directly onto a cellular glass surface.

OTHER APPLICATION GUIDES

- Application Guide for Arma-Chek® products
- Special Application Advice for HT/Armaflex®
- Application guide for ArmaSound® Industrial Systems
- Application videos

Calculation tools

ARMWIN

Armwin is the technical calculation program to determine insulation thicknesses required to prevent surface condensation and limit energy losses.

It also allows users to calculate U-values, heat flows and temperature changes for pipes, ducts and tanks.

keytec. ISO 15665

Determine the right ArmaSound® Industrial Systems

Armaflex® products

ARMAFLEX® FRV

Armaflex® FRV is a reliable flexible insulation material with a long term performance in condensation control. This is due to its unique combination of extremely low thermal conductivity and a high water vapour diffusion resistance. Designed to deliver high levels of fire performance, Armaflex® FRV pipe insulation is tested and certified to the fire performance standards required by Australia's National Construction Code and the New Zealand Building Code for use in commercial buildings and multi-residential construction.

It is additionally tested to the US National Fire Protection Association (NFPA) standard 274. This standard is a full-scale fire test that simulates one of the most severe conditions in a building: a fire involving multiple insulated pipes in a confined vertical space. NFPA 274 is a pipe chase test, simulating services contained in a vertical riser shaft.

ARMAFLEX® FRV PAIRCOIL

Armaflex® FRV is not only available as pre-formed pipe sections and flat sheets, it is also available as paircoils. Made with AS/NZS 15714 compliant annealed copper, and high-performance closed-cell rubber insulation, Armaflex® FRV paircoil is trusted for effective and reliable condensation control for split-system air-conditioning.

HT/ARMAFLEX®

Naturally UV-resistant, closed-cell, EPDM rubber-based Armaflex® insulation material capable of operating at line temperatures up to 150 °C.

NH/ARMAFLEX®

Halogen-free, closed-cell, nitrile rubber-based Armaflex® insulation material with a low smoke toxicity rating. Achieves a number of maritime fire performance certificates.

ARMAFLEX® SOLAR

Parallel stainless-steel or copper pipes pre-insulated with naturally UV-resistant, closed-cell, EPDM rubber-based Armaflex® insulation. Insulation comes with a tough black covering pre-applied. Designed to withstand the temperatures associated with solar hot-water systems.

ARMAFIX® FRV PIPE SUPPORT

Armaflex® FRV sections with load-bearing PUR inserts to prevent excessive material compression. Intelligent lock for better installation and easy to install with self-adhesive tape.

ARMAFLEX® ACCESSORIES

Armaflex® 520 is used for adhering nitrile rubber-based Armaflex® materials and Armaflex® HT 625 for adhering EPDM-based Armaflex® materials.

Armafinish 99 paint for visual impact and to prevent damage from UV exposure when Armaflex® is used outside.

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