

application manual

Arma-Chek® R

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WORKING WITH ARMA-CHEK R

- The installer should have a general knowledge of the installation techniques relating to Armaflex tube and sheet products.
- Use high quality tools. A sharp knife, good brushes and fresh Armaflex adhesive, Arma-Chek Mastic and Armaflex Cleaner / Local solvent are required.
- Use clean material. No dust, dirt, oil or water should be present on the surface. Clean using Armaflex cleaner where necessary.
- Use correctly dimensioned material!
- Never pull glued joints when sealing. When using pre-covered Arma-Chek R tubes always push joints together and fit under compression.
- Never insulate installations and systems that are in operation! Only start insulated plants after 36 hours, after this time the adhesive is fully cured.
- All bonded contacting surfaces require Armaflex adhesive applied.
- Take care to avoid air/ solvent pockets being trapped on the underside of the covering when applying to large flat surface area. Do not bond down contacting surfaces when they are wet. Allow open time, apply when touch dry.
- Always clean the seam and joint details using Armaflex Cleaner before applying Arma-Chek mastic.
- Clean away unwanted Armaflex adhesive from the Arma-Chek R surface using Armaflex Cleaner.
- Do not use Arma-Chek mastic as the only fixing solution for butt and longitudinal joints and seams.
- Do not apply Arma-Chek covering on seams and joints which are glued using Armaflex adhesive until the adhesive has been given time to fully cure (typically 36 hours).
- Fabricate Arma-Chek fittings on a workbench as you would use when working with metal jacketing.
- Avoid installing in very humid or wet conditions. Tent and weather protect where possible.
- Avoid installing Arma-Chek covering under tension.
- When using Arma-Chek R covering on Armaflex substrate ensure all seams/joints are fully sealed using the correct Armaflex Adhesive before commencing installation. No gaps shall be present within the insulation systems.
- Always use the correct Armaflex Adhesive as specified. Do not assume all adhesives perform identically! If in doubt, consult the Armacell technical department
- On external installations always ensure a “watershed” is present on all seams and joints.

- On external /internal installations always provide the Arma-Chek mastic seal to all exposed seams and joints after the application of the specified Armaflex adhesive.
- For internal installations where the installation may be “washed down” install the Arma-Chek R covering as for an external application, including the provision for the application of Arma-Chek mastic.
- Minimize joints where possible and “stagger”.
- On external installations apply Arma-Chek covering within 3 days of installing Armaflex insulation.

HEALTH & SAFETY

- When using adhesive and mastic sealants, the manufacturer's recommendations should be strictly followed. Details available from your local Armacell Technical Services Department.
- Arma-Chek coverings are easily cut with a sharp craft knife. Such knives should be handled with due care.

TOOLS FOR INSTALLING ARMA-CHEK R

* A three knife set plus sharpening stone are available together as a tool kit

CORRECT USE OF ARMAFLEX ADHESIVE

Armaflex Adhesive 520

Armaflex Adhesive 520 has been specially developed to bond all Armaflex except HT/Armaflex. Arma-Chek R and ArmaSound RD may also be bonded using Armaflex Adhesive 520. It joins the surfaces reliably and safely at medium temperatures of up to +105°C. The bond is resistant to weathering and aging.

Armaflex Adhesive HT625

Armaflex Adhesive HT625 has been specially developed to bond HT/Armaflex. Arma-Chek R and ArmaSound RD may also be bonded using Armaflex Adhesive HT625. When using HT/Armaflex **only** Armaflex Adhesive HT625 should be used. It joins the surfaces reliably and safely at medium temperatures of up to +150°C. The bond is resistant to weathering and aging.

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.

Damage due to frost can be reversed by storing in warm conditions, or for immediate use by placing the can into a bucket of hot water. Shelf life approx. 1 year.

1. Where installation surfaces are soiled with dust, dirt, oil or water all of these contaminants must be removed and, where applicable, 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. Plants must not be in operation during the installation process!
4. 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 the materials can be glued only with difficulty.
Check whether this has happened by applying absorbent paper. When working in areas with a high atmospheric humidity and high temperatures see "Hot Climates" advice on www.armacell.com/uk or Armaflex Application Manual.
5. Stir adhesive well after opening. If left to stand, heavier components in the adhesive may settle in the bottom of the can. These must be mixed thoroughly before use in order to effectively activate the adhesive.

APPLYING ARMAFLEX ADHESIVE

1. Plants must not be in operation during the installation process!
2. Use brushes with short, stiff bristles. Alternatively the Armaflex adhesive glue master can be used when working with the adhesive. A short pile fabric paint roller/large paintbrush may be preferred on large circular and flat surface areas.
3. Where all over adhesive coverage is required apply adhesive in a thin, uniform layer to both the Armaflex surface and the inner face of the Arma-Chek R. Always ensure there is all over adhesive coverage to both surfaces with no signs of "dry spots".
4. Allow the adhesive to "tack-dry" on overlapping details. This "tack" time is dependent on a number of factors including the humidity of the air. All overlapping contacting surfaces shall be fully covered with Armaflex Adhesive.
5. If surfaces are left too long to dry they will not bond when pressure is applied. When this happens you can re-activate by applying a further film of Armaflex Adhesive.
6. Do not use adhesive under 0°C (for further information see Armaflex application manual page 3).
7. Use Armaflex cleaner to clean your tools, contaminated metal surfaces and surfaces which have had talc applied.

"FINGERNAIL TEST"

Test for "tack-dryness" by using 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 covering can be positioned and fixed using hand pressure.

CORRECT USE OF ARMA-CHEK MASTICS

Arma-Chek mastic is an adhesive and a sealing product designed to give additional and long life protection to all Arma-Chek R glued seams and joints in external environments.

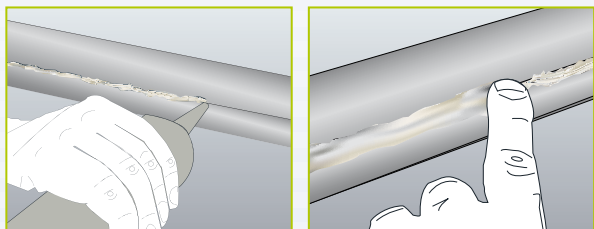
Arma-Chek mastic can also be used to vapour seal connecting metal parts attached to piping equipment, within the service temperature limits of the product.

- Always use the appropriate Arma-Chek mastic for the colour of covering: Arma-Chek Grey mastic for use with Arma-Chek R Grey and Arma-Chek Black mastic for use with Arma-Chek R Black.
- Check all seams and joints are securely fixed with the correct type of Armaflex adhesive before applying Arma-Chek mastic.

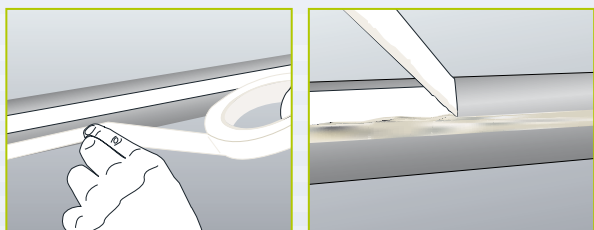
- In all situations the area around the seam and jointing details shall **always** be cleaned using Armaflex Cleaner or a locally approved solvent cleaner, **before** applying the Arma-Chek Mastic to Arma-Chek R covering. Cleaning of the area, removes the manufacturing “swaff” that is naturally present on the surface of the product allowing for greater adhesion.

APPLYING ARMA-CHEK MASTICS

1. Ensure all under-laying fixing seams/joints are fully bonded and secured using Armaflex adhesive and check that all seams and joints are clean, dry and free from contamination before applying the mastic.
2. For all seams and joints allowance should be made for a minimum 10 mm wide and 3 mm thick mastic “beading” to be applied.
3. Smooth the mastic with the use of a mastic spoon. The finish of the mastic can be enhanced by “masking” off 5 mm either side of the seams and joints, prior to the application of the mastic. Proceed to remove the “masking tape” while the mastic is in its wet state.
4. In general, the application of the mastic should not be carried out when the ambient temperature is below +5 °C or the relative humidity is higher than 80%.
5. The Arma-Chek mastic should not be used on a stand alone basis to fix and bond the coverings (see paragraph 1 of this section).



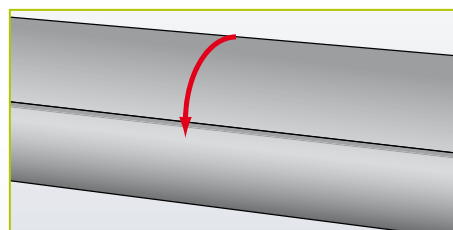
To get a smoother and more even finish to the mastic joint masking tape can be used



APPLYING ARMA-CHEK R OUTDOORS (Water-Shed - Roof Tile Effect)

All seams and joint details should be arranged so as to eliminate any direct paths which may allow water ingress into the insulation system. On straight-line applications, the main fixing seams shall be staggered with the overlap facing downward offset the joint as shown.

Note: Particular attention is required on fittings such as elbows and tee's.



TEMPERATURE LIMITATIONS OF ARMA-CHEK R

Arma-Chek R should not be placed in direct contact with surfaces exceeding 125°C.

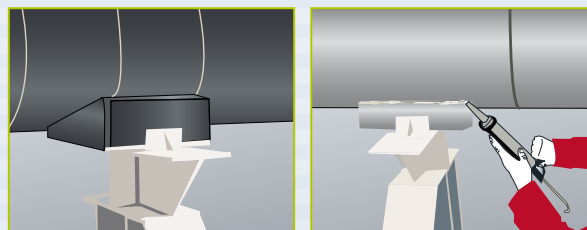
Arma-Chek R may be used to clad insulation on pipes of any temperature provided the insulation surface temperature is below 125°C.

USE OF ARMA-CHEK R ON DIFFERENT ARMAFLEX MATERIALS

Arma-Chek R is fully compatible for use with Class O Armaflex, NH/Armaflex and HT/Armaflex and may be bonded directly to ArmaSound RD or ArmaSound Barrier as part of an ArmaSound Industrial System.

HOW TO HANDLE PIPE SUPPORTS, PRESSURE GAUGES AND METAL PROTRUSIONS

All metallic parts directly attached to the main piping surface, including pipe loading supports and pressure gauge connections, should be fully insulated and clad using Arma-Chek R. It is important that all connections are fully vapour sealed using both Armaflex Adhesive and the relevant Arma-Chek mastic.



ARMA-CHEK R PRE-COVERED TUBES

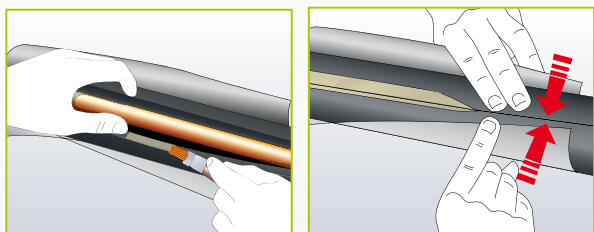
Arma-Chek R pre-covered tubes (slit) are available in black and grey and are supplied in 1 metre lengths. The covering finishes approximately 10 mm before one end of the tube in order to guarantee that the insulation material is installed “under tension” around butt joints. The other butt end has a 50mm overlap of covering material.

The Arma-Chek R pre-covered tube range is available for pipes with an outer diameter of up to 89 mm.

Note: Due to the semi-flexible nature of the products sleeving around bends is not possible!

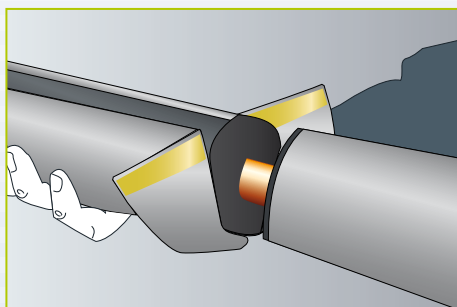
INSULATING STRAIGHT PIPES (OD < 89 MM) WITH ARMA-CHEK R PRE-COVERED TUBES

1. Clean the pipe surface with Armaflex cleaner removing any dust or other contamination.

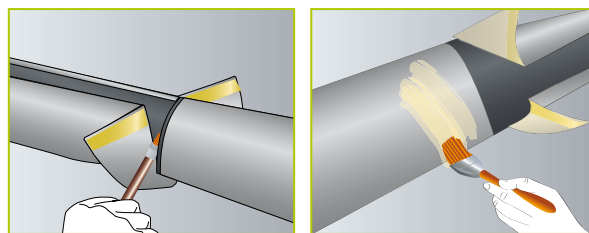


2. Snap the tube onto the pipe.
3. Apply the correct type of Armaflex adhesive to each side of the Armaflex seam detail. Allow to “touch dry” and with firm pressure close the adhesive seam.

Note: Always check the seam is fully bonded before proceeding further.



4. Apply a second tube of pre-covered Arma-Chek R following procedures 1-3 and ensuring the uncoated 10 mm end of one tube faces the 50 mm overlap end of the second tube.
5. Roll back the 50 mm Arma-Chek R covering at the tube end revealing the Armaflex butt joint as shown.

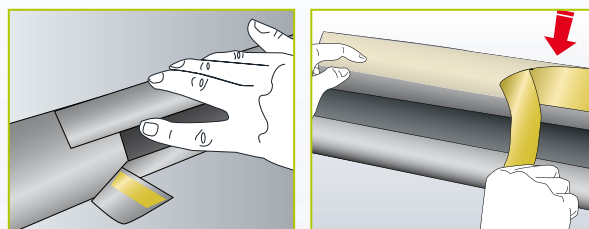


6. Apply Armaflex Adhesive to the facing Armaflex butt joints and create a “wet seal” to the pipe as described in the Armaflex Application Manual.

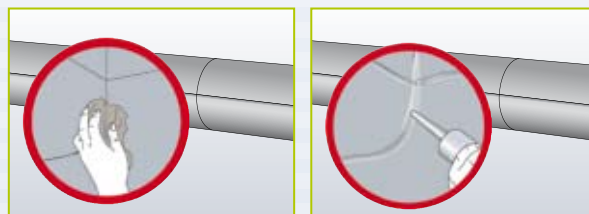
Note: Remember to seal the two butt joints under compression.

7. Peel back the self-adhesive fixing strip of the Arma-Chek R coating which will be covered by the overlap for approximately 50 - 100 mm. Fix the Arma-Chek R covering using this self-adhesive strip.

Note: Do not release the whole length of the fixing strip at this point.



8. Apply Armaflex Adhesive to the outer surface of the Arma-Chek R covering which will be covered by the overlap (approximately 50 mm). Peel back the self-adhesive fixing tape on the Arma-Chek R which will form the overlap for approx. 50 mm. Apply Armaflex Adhesive to the Arma-Chek R which will form the overlap for approximately 50 mm. Roll back the Arma-Chek R covering and apply pressure to complete the overlap.
9. Release the self-adhesive strips along the complete longitudinal length to seal the Arma-Chek R along its entire length.



10. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
11. Seal all seam and jointing details of the covering with a “bead” of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic “beading” applied.

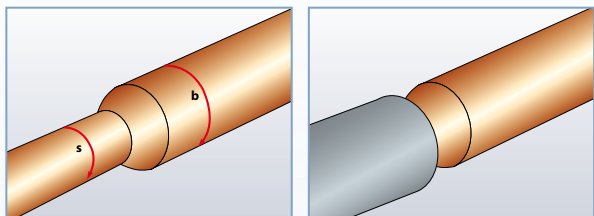
FITTING FABRICATIONS – ELBOWS, TEES AND OTHER FITTINGS.

It is generally more efficient when insulating elbows, tees and other fittings to use plain, uncovered, Armaflex tubes with the Arma-Chek R covering fabricated and installed in a distinct second stage.

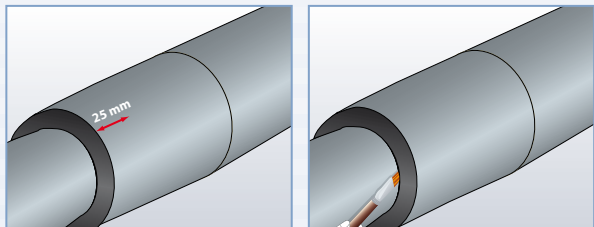
For details on how to fabricate covers for different fitting types please refer to section “Using Arma-Chek R covering” of this manual.

A full range of pre-fabricated fittings for bends, end caps and T-piece's is available with prices on request. Special application instructions are available on www.armacell.com or from our technical service team.

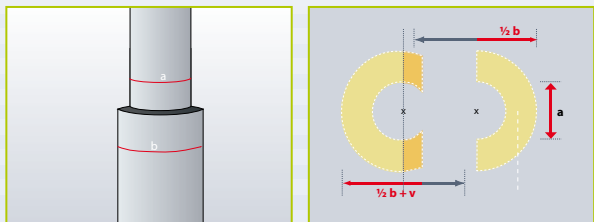
INSULATION OF PIPE REDUCER USING ARMA-CHEK R PRE-COVERED TUBES



1. Select two different sized Arma-Chek R pre-covered tubes: one to fit the smaller bore pipe and one to fit the larger bore pipe.
2. Push the Arma-Chek R tube designed to fit the smaller bore pipe to the point where the pipe begins to increase in diameter and seal as described on page 7 of this manual.



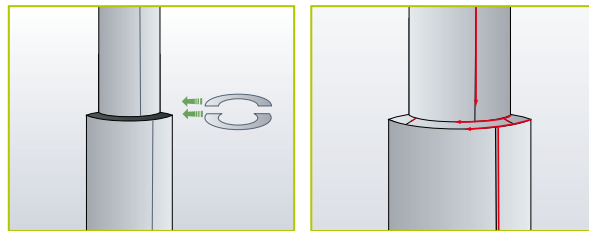
3. Sleeve the larger Arma-Chek R tube over the larger pipe. The tube should overlap the tube on the smaller pipe by 25 mm. Seal as described on page 7 of this manual.
4. Seal the butt joint with Armaflex Adhesive



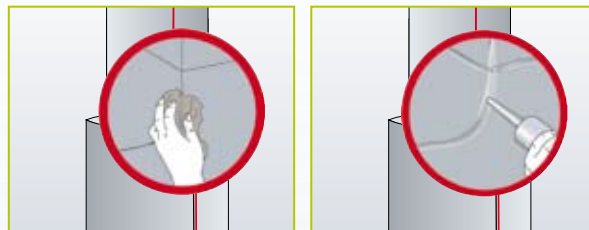
5. Measure the following diameters to produce a cover for the remaining Armaflex:
a - small bore insulated pipe outer diameter
b - large bore insulated pipe outer diameter

6. Using Arma-Chek covering create a template by marking out 2 circles with the same center and the measurements above. One of the half circles requires an additional 50 mm overlap (v)

7. Cut the pattern from Arma-Chek R covering.



8. Apply Armaflex Adhesive to one side of the Arma-Chek R pattern and to the exposed Armaflex surface on the end of the larger Arma-Chek R tube. Allow the adhesive to tack dry before applying.



9. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
10. Seal all seam and jointing details of the covering with a “bead” of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic “beading” applied.

WORKING WITH ARMA-CHEK R COVERING

- Armaflex should have been installed according to the recommendations of the Armaflex Application guide. Ensure the Armaflex insulation surface is clean, dry and free from all oils, greases and other contaminants, with all seams and joints secured using Armaflex adhesive.
- Armaflex adhesive is required on the Armaflex surface and on the facing underside of the overlapping Arma-Chek R covering.
- It is required to fully adhere both the Armaflex surface and the facing Arma-Chek surfaces (all over adhesive coverage) for cylindrical bodies with pipe outer diameter > 500 mm. For applying all over adhesive coverage a short pile fabric paint roller may be preferred over standard brushes.
- Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

Note: An additional minimum overlap allowance shall be added to all circumference-fixing seams. For piping equipment with sizes above 150mm, the circumference overlap is increased. For other sizes see overlap allowance table below. All "butt" jointing and feathering details - require a minimum of 50mm.

outer-Ø insulated pipe (mm)	min. required overlap (mm)
10 - 150	50
150 - 200	75
200 - 400	100
400 - 500	125
500 and above	150
Flat surface	50

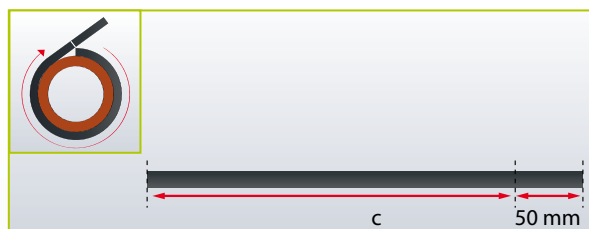
- For outdoor installations:
 - Check the adhesive seams and joints on the covering for any defects and rectify
 - Allow for a "watershed" where applicable
- Allow 36 hours curing time before turning on the equipment.

COVERING OF CYLINDRICAL BODIES

(pipes, vessels, ductwork, ...)

Determine the circumference the insulated pipe and add an additional minimum 50 mm to this length to function as an overlap. (for more details on the minimum overlap required please see the section "working with Arma-Chek R covering")

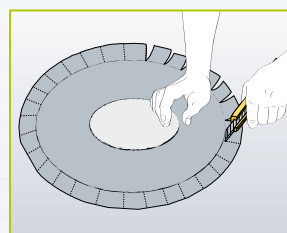
Transfer this measurement onto a sheet of Arma-Chek R and cut the covering sheet as required.



THE "FEATHERING" TECHNIQUE

In order to achieve a smooth fit on some surfaces – particularly when the Arma-Chek covering is terminating on a convex or concave surface - it may be necessary to "feather" the Arma-Chek R covering along the edge.

"Feathering" is achieved by cutting the scheduled overlap at regular intervals into feathers or tassels as shown below:

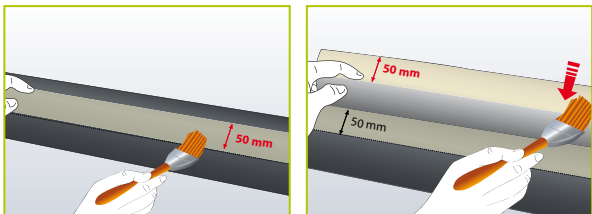


These tassels will then accurately and smoothly fit onto a convex or concave surface without creasing the Arma-Chek covering.

Decreasing the width of each "feather" will ensure a more accurate fit but will increase the labour time.

Note: The feathering process is applicable when fabricating and installing most Arma-Chek R fittings - including bends, tees, off-set tees and cap ends.

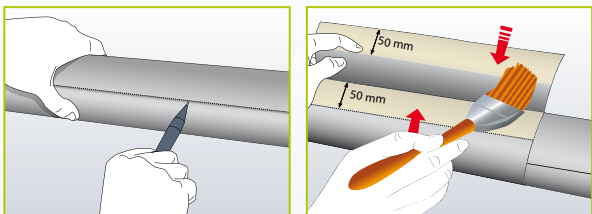
HORIZONTAL PIPEWORK WITH AN OUTER-Ø < 500 MM (measurement of outer-Ø incl. insulation)



1. Apply a minimum 50 mm glue line with the correct type of Armaflex adhesive to the surface of the Armaflex and the underside of the Arma-Chek R covering. Correctly position the covering along this line and, when satisfied, apply firm pressure.

Smooth the covering around the circumference for a clean finish.

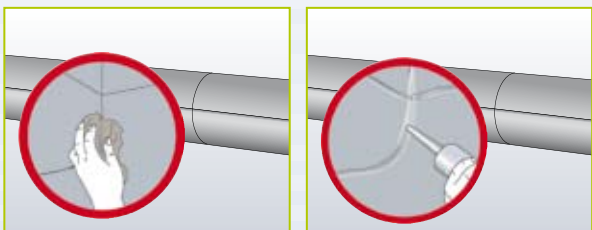
Note: Always ensure the Arma-Chek R covering overlaps by a minimum of 50 mm.



2. When the covering has been smoothed in position, mark the overlap position on the under face area using a pen. Apply adhesive on the underside of the overlapping Arma-Chek R and also onto the surface to be covered by the overlap.

Allow to touch dry (use the "fingernail test") before fixing down the overlap.

3. Seal the overlapping butt joints of the covering using Armaflex adhesive.
4. Check seams and joints on the covering for any defects and rectify as required. Remove unwanted adhesive using Armaflex cleaner.



5. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
6. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

PIPEWORK WITH AN OUTER Ø > 500 MM AND ALL VERTICAL LINES.

(measurement of outer-Ø incl. insulation)

All over adhesive coverage is required for pipework > 500 mm, and all sizes of pipework in a vertical position. In all other respects the application procedure remains as for insulated pipework less than 500 mm in diameter.

Note: Check the Armaflex adhesive specification table when installing Arma-Chek coverings. Use only the appropriate Armaflex adhesive for the substrate.

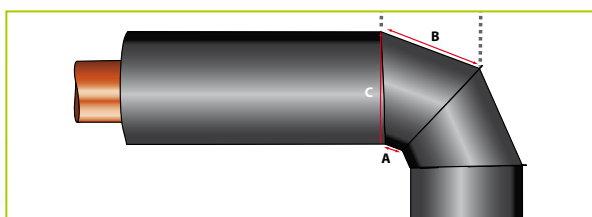
Care should be taken to avoid solvent/air bubbles when installing Arma-Chek R coverings to large surface area. The Arma-Chek R covering shall be smoothed to eliminate bubbles by using a smooth spatula or a paint roller.

FITTINGS MADE OF COVERING MATERIAL

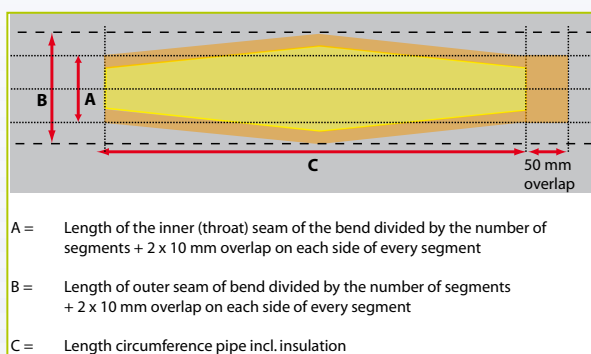
Arma-Chek R fittings can all be fabricated using traditional metal cladding working methods and techniques. Those experienced with metal working practices may choose to work following said practices.

The methods detailed below provide straightforward, step-by-step, instructions to fabricate appropriate fitting templates and are recommended for installers of all levels of experience.

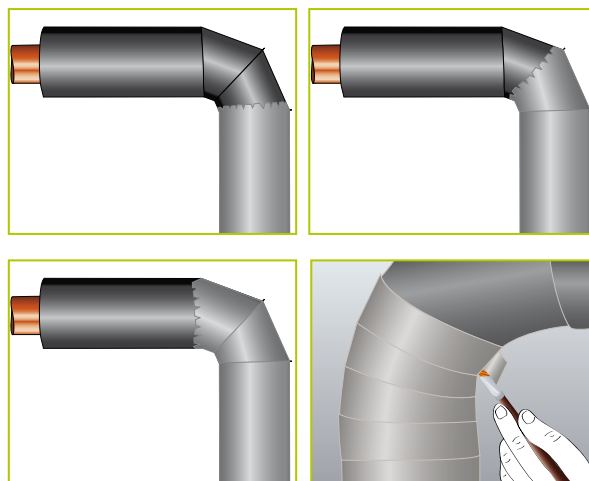
COVERING FOR SEGMENTED BENDS (for small bore piping)



1. Measure the width of the throat (A) and back (B) of a segment of the assembled segment bend and determine the circumference (C).

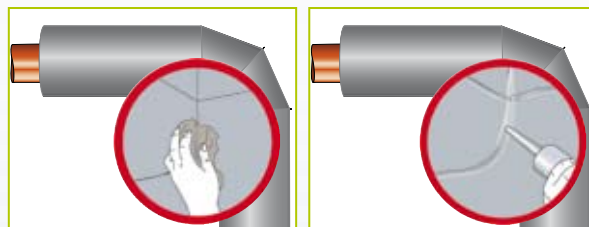


2. Transfer the circumference measurement C to the Arma-Chek covering material and draw a perpendicular bisecting line of length B (plus an additional 10 - 20 mm) at the mid point. Now extend the circumferential line by an additional 50 mm on one side.
3. At each end of the circumferential line draw a perpendicular line of length A (plus an additional 10 - 20 mm).
4. Extend the circumferential line by an additional 50 mm on one side creating a rectangle of width A (plus an additional 10 - 20 mm) as shown.
5. Connect the lines to create a fishtail outline as shown.
Remark: Where many identical fishtails are required it is recommended to transfer this shape onto a durable template in order to allow for easy replication.
6. Optimise the shape of the curve at the widest point of the cut-out segments by rounding slightly with a pair of scissors or craft knife.

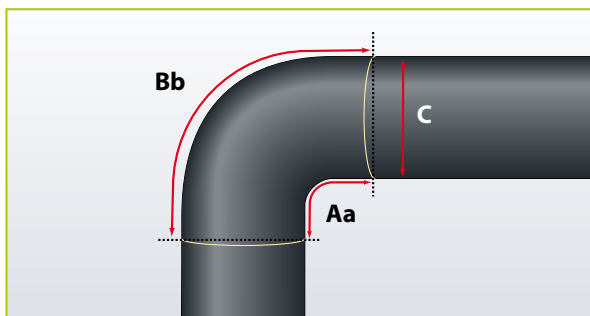


7. Install the segments using Armaflex Adhesive as standard.

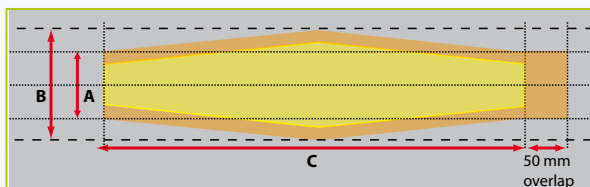
Note: To ensure that the overlap sits tidily, the material can be feathered. On external installations, arrange the segments to provide a "watershed".



8. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
9. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

COVERING FOR TWO-PIECE BEND MADE OF ARMAFLEX

1. Measure the inner (throat) (A) and the outer (back) (B) lengths of the bend and determine the number of segments required. The number of segments should be chosen to achieve an exact fit on the outer side (back) of the bend (recommendation: min. segment width in the throat area > 20 mm.)
2. Determine the circumference of the insulated pipe and transfer this to the covering material.

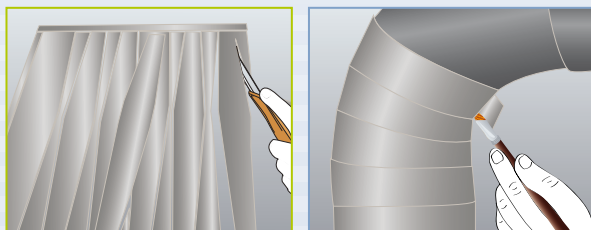


- A = Length of the inner (throat) seam of the bend divided by the number of segments + 2 x 10 mm overlap on each side of every segment
- B = Length of outer seam of bend divided by the number of segments + 2 x 10 mm overlap on each side of every segment
- C = Length circumference pipe incl. insulation

3. Draw a perpendicular bisecting line of length B divided by the number of segments at the mid point. Now extend the circumferential line by an additional 50 mm on one side. At each end of the circumferential line draw a perpendicular line of length A divided by the number of segments.

Note: The Arma-Chek Fishtail calculator may be used to help determine the required dimensions for each fishtail.

4. Connect the lines to create a fishtail outline as shown.
5. Extend the circumferential line by a minimum additional 50 mm on one side creating a rectangle of width A (plus an additional 10 – 20 mm) as shown.

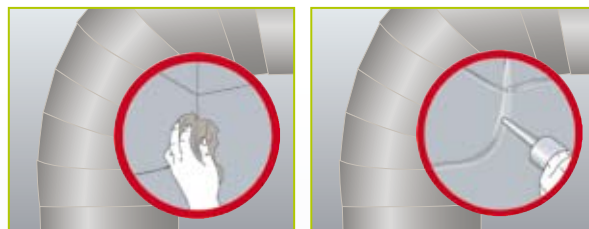


6. Cut out the finished segment. This can be used as a

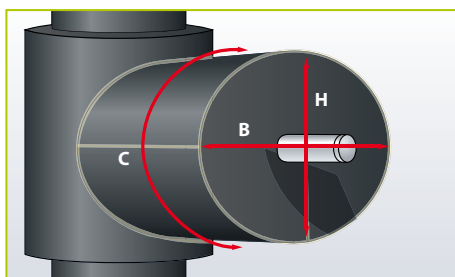
template to fabricate further segments.

7. Fabricate initial pieces for the beginning of the bend with a half segment. These form “starter” and “finishing” items.
8. Install the segments using Armaflex Adhesive as standard.

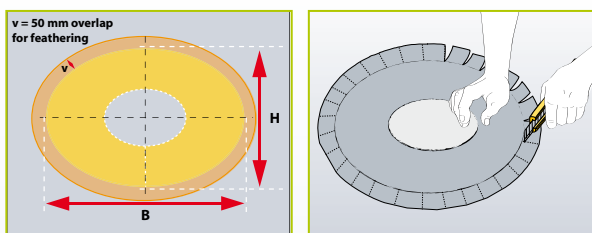
Note: To ensure that the overlap sits tidily, the material can be feathered. On external installations, arrange the segments to provide a “watershed”



9. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
10. Seal all seams and jointing details of the covering with a “bead” of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic “beading” applied.

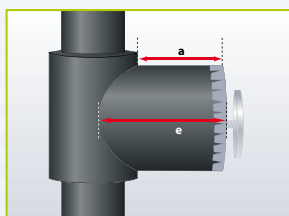
COVERING OF NECK-T / PIPE-T / SPINDLE NECK OF VALVE

1. Determine the total outer circumference of the T-branch (including insulation).

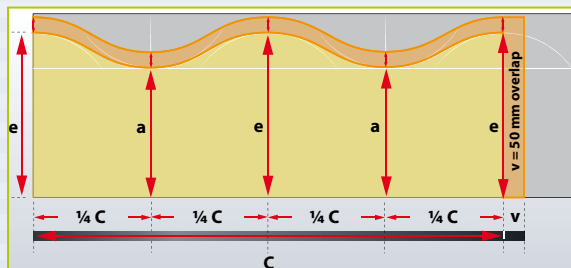


2. Transfer the height (H) and the width (B) of the valve neck spindle (end cap) to a sheet of Arma-Chek R as shown in the above drawings. Add a 50 mm overlap around the circumference and "feather" this as shown. The added allowance for the feathering shall be a minimum of 25mm.

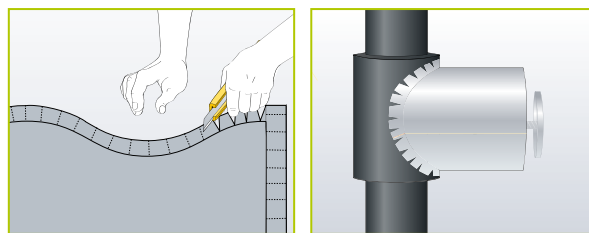
Apply Armaflex adhesive to the underside of the Arma-Chek R covering and the outer surface of the Armaflex on the valve neck spindle (end cap) cover. Allow the adhesive to tack dry before applying the covering with firm even pressure.



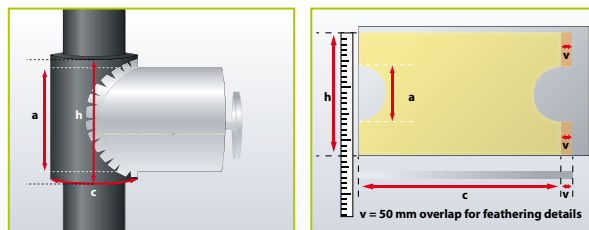
3. Measure the minimum height (a) and maximum height (e) of the insulated T-branch. Transfer this height to the marked out covering.
4. Transfer measurements as illustrated below:
(for more information see Armaflex Application Manual)



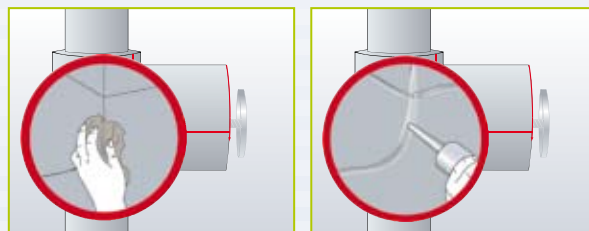
a = minimum length (height)
e = maximum length (height)
C = circumference



5. After cutting the end overlap to create a "feathering" effect apply Armaflex adhesive to one side of the Arma-Chek R pattern and also to the Armaflex installed on the Valve. Allow to tack dry before applying as shown.

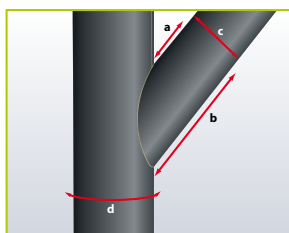


6. Measure
h = height of insulated valve body
a = diameter of insulated T-Neck
c = circumference of insulated valve body
7. Transfer these measurements to a sheet of Arma-Chek R as shown in the drawing above leaving a 50 mm overlap on one side.
Cut the pattern using a pair of scissors or a craft knife
8. Apply Armaflex adhesive to one side of the Arma-Chek R pattern and also to the Armaflex installed on the main body pipe. Allow to tack dry before applying as shown.

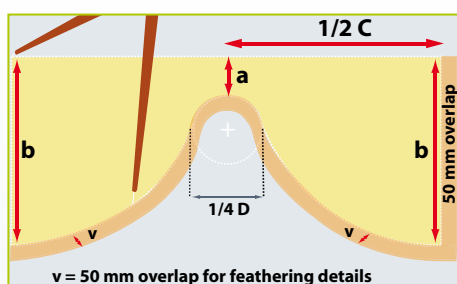


9. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
10. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.
11. For valve body caps ends - see cap ends and termination points.

OFFSET ANGLES



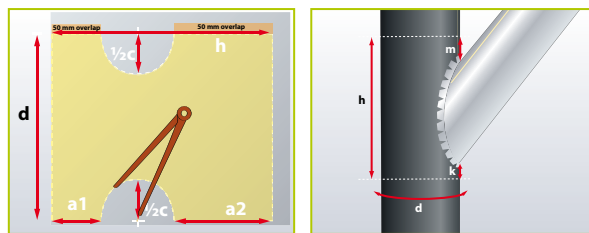
1. Determine the circumference (c) of the Armaflex insulated offset angle, the min. (a) and maximum (b) heights, and the total outer diameter of the insulated pipe (d) to which the offset angle connects.



2. Clad the insulated pipe run up to the termination point using Arma-Chek R covering as standard.
3. Mark the minimum height (a) of the offset angle from the mid point of the circumferential line at right angles. Mark the maximum height (b) from either end of the circumferential line at right angles.
4. Draw a circle with a diameter equal to a quarter of the total diameter of the main insulated pipe ($1/4 d$).
5. Extend the circumferential line by 50 mm on one side to provide an overlap.
6. Draw the jacket line by marking two arcs (radius = half circumference) between a tangent of the circle standing on the mid point line and the points at distance (a) from either end of the circumferential line. Continue the arc into the 50 mm overlap.
7. In order to achieve a pleasing finish feathering can be carried out as described elsewhere in this guide. When feathering remember to allow at least 10 mm parallel to the jacket line.

Cut out the pattern using a pair of scissors or a craft knife.

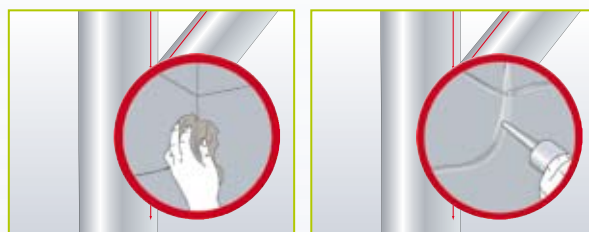
8. Apply Armaflex adhesive to one side of the Arma-Chek R pattern and also to the Armaflex installed on the offset pipe. Allow to tack dry before applying.



9. Measure the circumference of the main body pipe and the points at which the offset pipe joins the main body. Transfer these measurements to a sheet of Arma-Chek R as shown in the drawing above leaving a 50 mm overlap on one side.

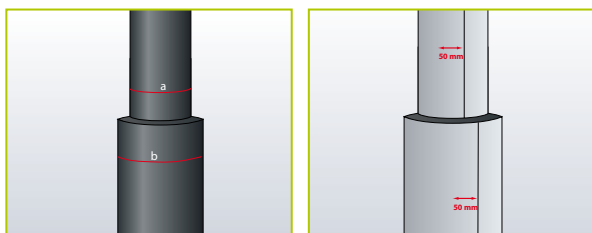
Cut the pattern using a pair of scissors or a craft knife

10. Apply Armaflex adhesive to one side of the Arma-Chek R pattern and also to the Armaflex installed on the main body pipe. Allow to tack dry before applying.

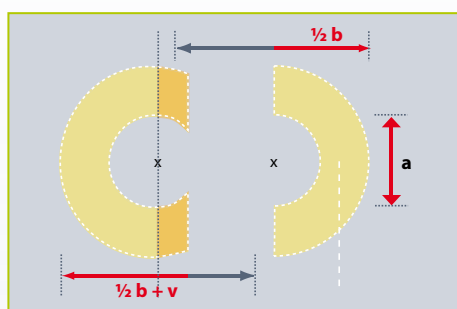


11. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
12. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

COVERING END CAPS AND TERMINATION POINTS (standard temperatures < 125°C)



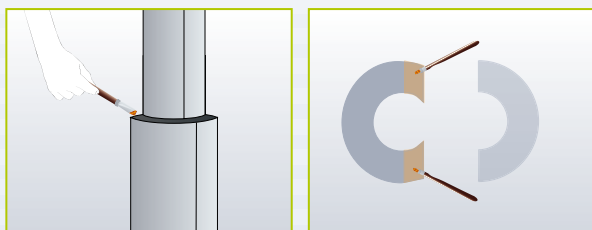
1. Measure the following diameters of the end cap:
a - small (insulated) pipe diameter and
b - the large bore insulated body.
2. Clad the insulated pipe run up to the termination point using Arma-Chek R covering as standard.



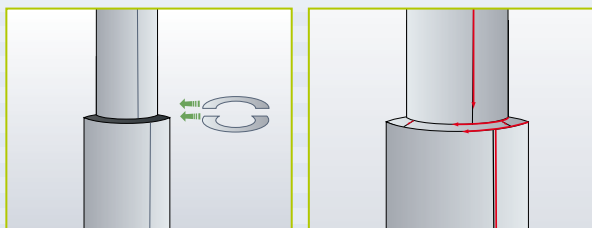
3. Using Arma-Chek covering create a template by marking out 2 sets of semi-circles with the same centre and the measurements as shown. One set of semi-circles shall extend to include an additional 50 mm overlap (v).

Note: on larger bore pipework it may be necessary to use 1/4 or 1/8 circles in place of semi-circles. A 50 mm overlap should be incorporated into each section.

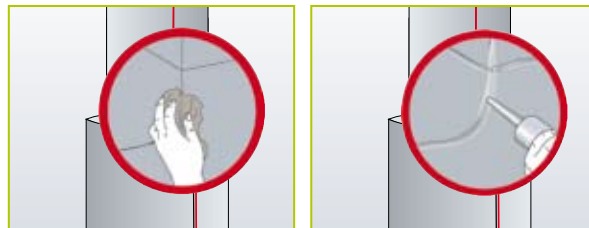
4. Cut the two parts of the collar from Arma-Chek R covering.



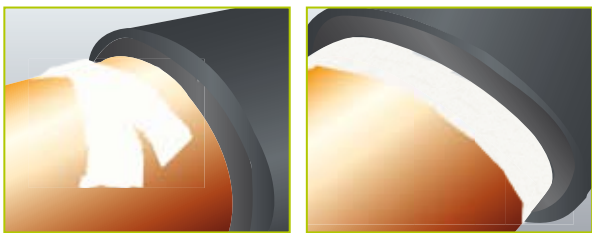
5. Apply Armaflex Adhesive to one side of the Arma-Chek R pattern and to the exposed Armaflex surface at the end of the larger insulated pipe. Allow the adhesive to tack dry before applying.



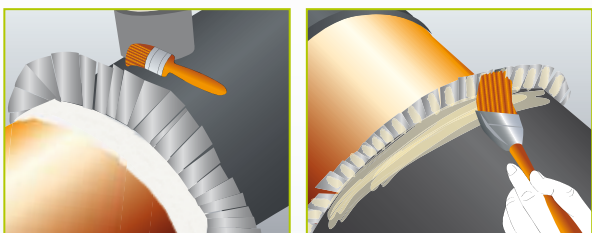
6. Apply both semi-circles to the Armaflex surface



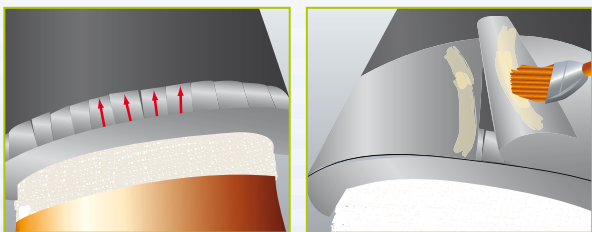
7. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
8. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

COVERING END CAPS AND TERMINATION POINTS (high temperatures > 125°C)

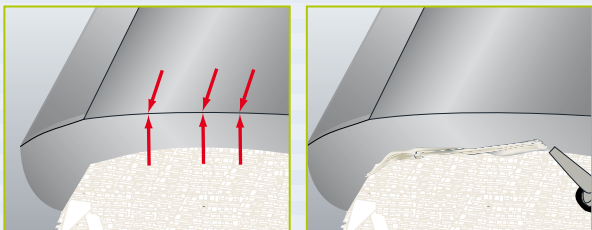
1. Ensure that all seams & joints are sealed with Armaflex Adhesive HT625
2. Install an appropriate high temperature bandage tight to the pipework with a min. of 50mm overlap. Secure with insulation wire.



3. Cut a collar from Arma-Chek R covering as for standard temperature pipework, allowing an additional 50 mm on the outer diameter to form a feathered overlap.
4. Cut the outer 50 mm into feathers as described in the section "The feathering technique".

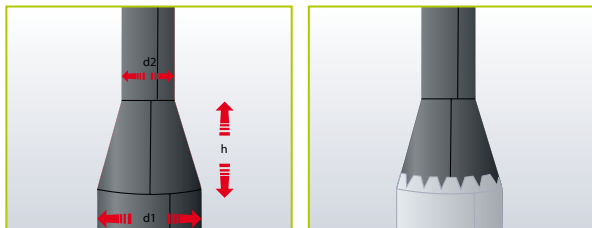


5. Apply Armaflex Adhesive to one side of the Arma-Chek R pattern and to the exposed Armaflex surface at the end of the larger insulated pipe. Allow the adhesive to tack dry before applying.
6. Clad the insulated pipe run using Arma-Chek R covering as standard. Ensure all feathered "tassels" of the end cap are over covered by the cladding on the linear pipework run.

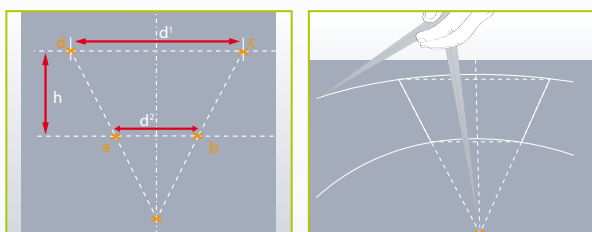


8. Using Armaflex Adhesive apply a "wet seal" around the circumferential seam.

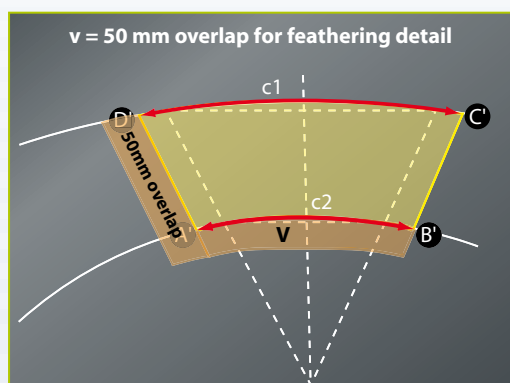
9. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a water-shed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

COVERING OF CONCENTRIC REDUCER

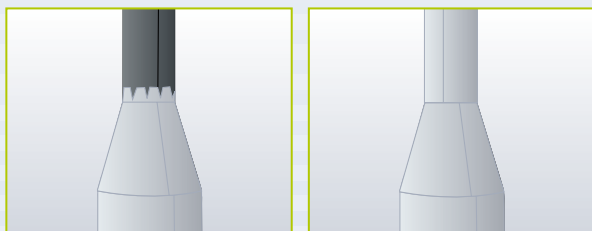
1. Measure the following:
 h = height of reducer
 $d1$ = diameter of larger pipe
 $d2$ = diameter of smaller pipe
2. Clad the larger insulated pipe using Arma-Chek R covering as standard. Allow for feathered "tassels" onto the insulated reducer as shown.



3. Using Arma-Chek covering create a template by marking out a reducer pattern. See the Armaflex application manual for more details.



4. Modify the template by adding an additional 50 mm overlap onto one side of the seam and an additional 50 mm along the length of the shorter arc. This overlap shall be cut into feathered tassels as described elsewhere.



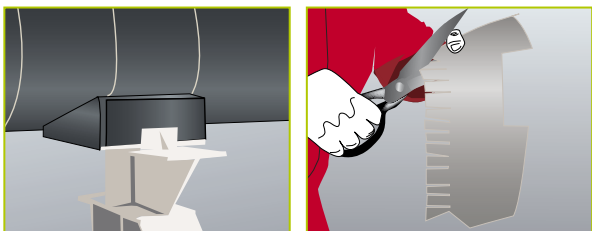
5. Cut the pattern and apply Armaflex Adhesive to both the underside of the Arma-Chek pattern and to the insulated reducer surface. Allow the adhesive to tack dry and apply to the surface.

6. Clad the smaller insulated pipe run using Arma-Chek R covering as standard. Ensure all feathered "tassels" of the reducer are over covered by the cladding on the linear pipework run.



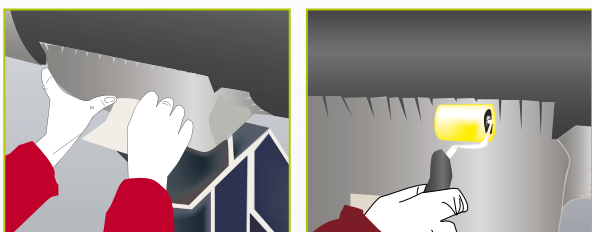
7. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
8. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

COVERING OF ANCHOR SHOES AND OTHER METAL PROTRUSIONS

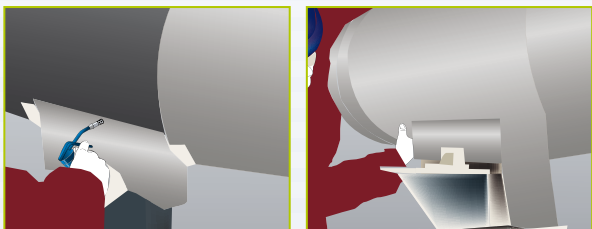


1. Measure the shape of the protrusion and , using Arma-Chek R covering, cut a pattern to match the requirements

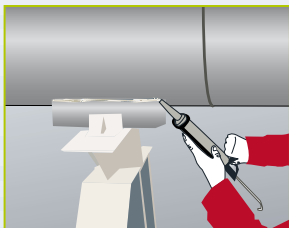
Note: Add a minimum 50 mm overlap on all sides. When overlapping onto curved surfaces this overlap may need to be cut into feathered tassels as described elsewhere.



2. Apply Armaflex Adhesive to both the underside of the Arma-Chek pattern and to the insulated surface. Allow the adhesive to tack dry and apply to the surface.
3. Smooth any air bubbles or pockets by using a smooth spatula or a paint fabric roller



4. Using Arma-Chek R covering cut a pattern to cover the main insulated body avoiding the shoe or protrusion.
5. Clad the main body of the insulated pipe run using Arma-Chek R covering as standard. Ensure all feathered "tassels" of the shoe or protrusion are over covered by the cladding on the main body of the pipework run.



6. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.

7. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a water-shed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

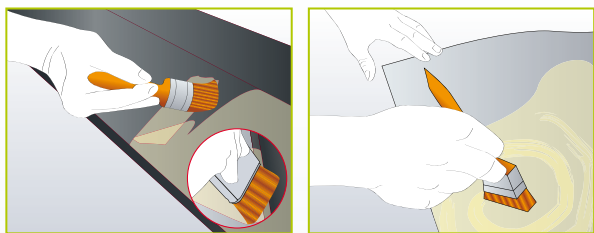
COVERING OF INSULATED RECTANGULAR SHAPES

(ductwork, tanks and flat surfaces)

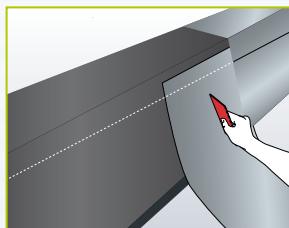
To reduce labour time it is recommend to install the Arma-Chek coverings to the ductwork in a single complete "wrap-around":

1. Measure the circumference of the ductwork and cut the Arma-Chek coverings to the correct dimension, allow for a 50 mm overlap of the fixing seam.

Note: for larger duct surfaces a "step-by-step" application of the coverings in 2 or 4 separate sections may be the preferred option where there is only one installer on the application.

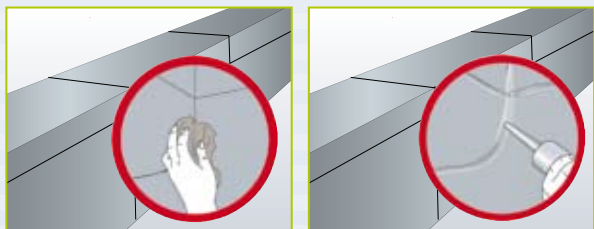


2. Apply the Armaflex adhesive directly to both the Armaflex and the Arma-Chek R surfaces in a thin and even manner using a large paint brush/ fabric paint roller. Allow the adhesive to "touch dry".



3. Position the coverings and fix to the Armaflex sheet. Ensure the covering is "in-line" and in the desired position.

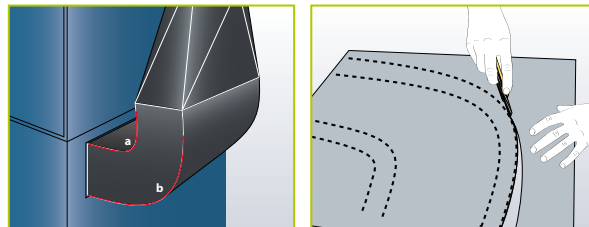
Apply firm even pressure and smooth the covering around the surface of the insulation avoiding any air/ solvent pockets or crease's and crinkles. Use a plastic card to enhance the edges at the corners of the duct. Pinch and smooth along the covering, as its being applied.



4. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
6. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic.

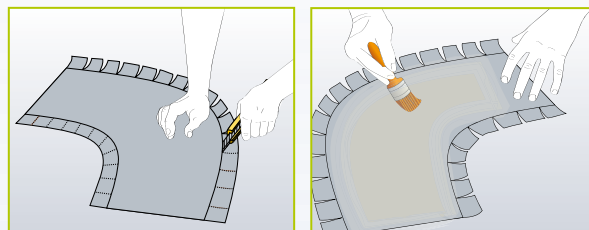
Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

DUCTWORK BENDS AND IRREGULAR SHAPES

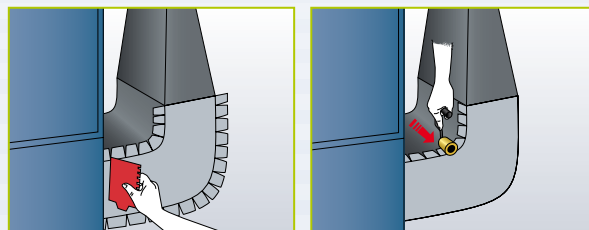


1. Measure the length of the inner and outer ductwork bend. Cut the Arma-Chek R covering to the correct dimensions, allowing an additional 50 mm overlap along each edge for "feathering".

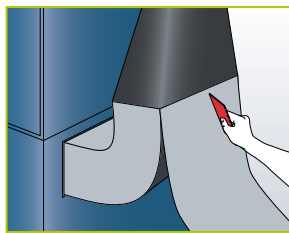
Note: Contour lines of duct and other irregular shapes can also be plotted by applying chalk to the duct and placing a piece of the covering directly onto the outline to create an accurate imprint (see section "Hints").



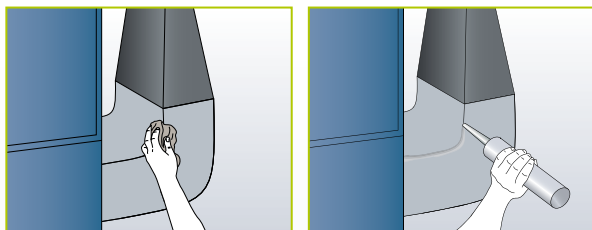
2. Cut the overlap into "tassels" using the feathering method.
3. Apply Armaflex adhesive to one side of the Arma-Chek R pattern and also to the Armaflex installed on the duct. Allow to tack dry before applying.



4. Apply the cut pieces following the procedures described (see chapter "rectangular shapes" on this page).
5. Smooth the covering using a spatula to remove any air gaps. Use a roller to smooth the feathered "tassels" around the edge as shown.



6. Apply an adequate piece of covering on the lateral face of the insulated ductwork bend. Cut this covering alongside the edges of the duct channel.

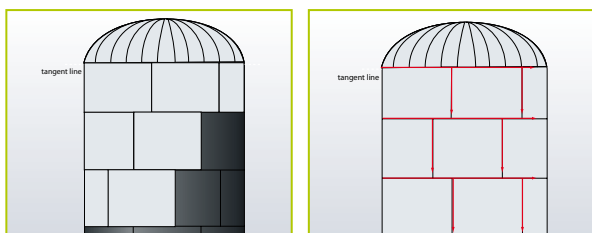


7. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
8. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

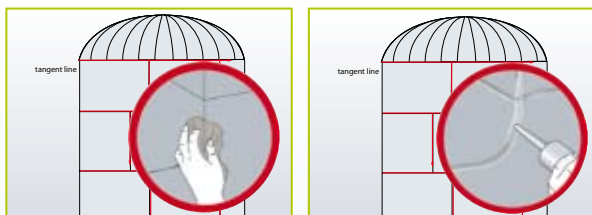
CIRCULAR DUCTWORK

Apply the Arma-Chek R covering on circular ductwork as for large bore pipework installations. (Refer to the section on large bore pipework installations on page 10 of this manual.)

COVERING OF VESSEL BODY



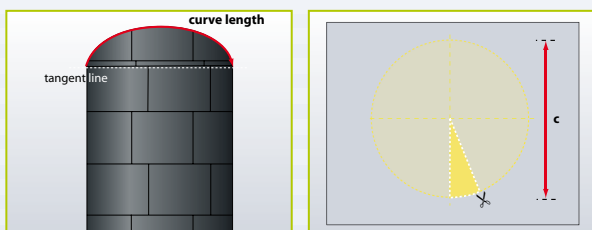
1. Apply covering material to the Armaflex insulated vessel (jacket), beginning from the butt jointing to the dome end cover. Where applicable, install the jacketing panels using the "roof tile" method.



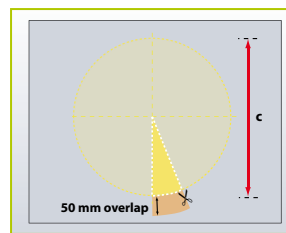
2. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
3. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

COVERING OF VESSEL DOME ENDS

When covering an Armaflex-insulated vessel dome end with Arma-Chek R covering material it is necessary to cut out segments. Use enough segments to ensure that the material can be applied without wrinkles.

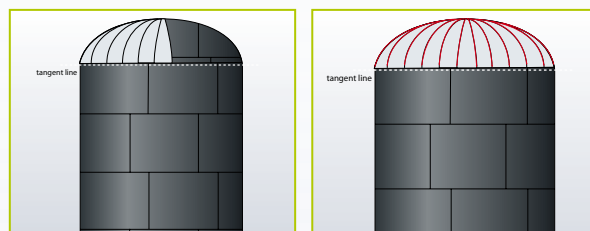


1. Determine the curve length (a) of the insulated vessel dome end using a tape measure.
2. Calculate or measure the circumference $C = \text{arc length} \times \pi$ and divide the circumference by the number of segments to be used.
3. Draw the segment shape on a piece of cardboard to create template.
The dome end segments must be fabricated allowing a minimum 50 mm overlap (see drawing). The overlap should be "feathered" if required or applicable.

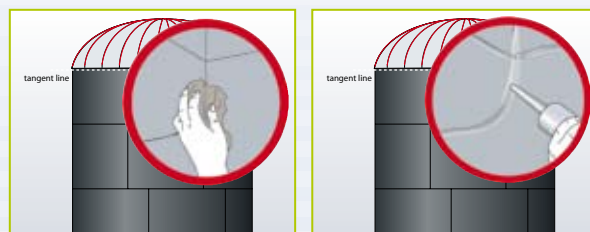
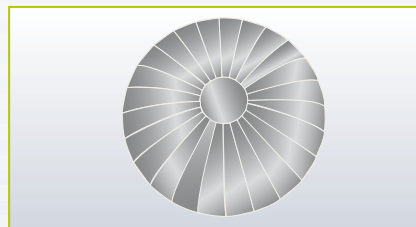


4. Use this template to draw and cut out the other segments.
5. Apply all over adhesive coverage using Armaflex adhesive to both side of the Arma-Chek R pattern and also to the Armaflex installed on the vessel. Allow to tack dry before applying.

Note: for external installations first insulate the vessel body as described **before** the dome ends. Position the overlap **over** the body panels to create a watershed.



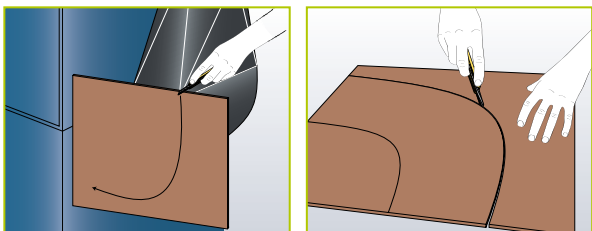
6. Butt-up all vessel dome segments until the whole dome end is covered with Arma-Chek R.



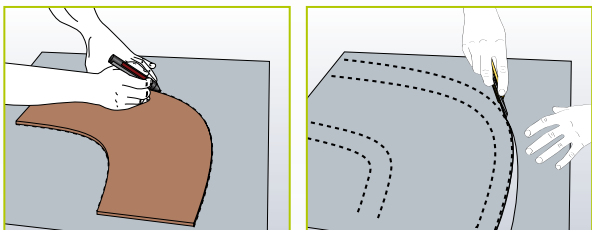
5. Clean all seam and joints with Armaflex Cleaner or a locally approved solvent cleaner before applying mastic.
6. Seal all seam and jointing details of the covering with a "bead" of the appropriate Arma-Chek mastic. Ensure all joints are staggered to provide a watershed. All seams and joints shall have an allowance of a minimum of 10 mm wide and 3 mm thick mastic "beading" applied.

USEFUL HINTS

Templates for irregular shapes



1. Place a piece of card next to the insulated duct feature and trace the shape.
2. Using a craft knife cut this shape from the card.



3. Using this as a template draw the shape directly onto the Arma-Chek covering.
4. Add the required 50 mm overlap for “feathering” and cut the resulting shape.

REFERENCES

In addition to this manual Armacell provides the following documents, freely available from www.armacell.com/uk (or as part of our ArmaPlus CD). These documents contain further detailed advice for specific applications.

MECHANICAL PROTECTION AND OUTDOOR APPLICATIONS WITH ARMAFLEX

Explanation of the issues arising when installing Armaflex outdoors and evaluation of solutions to protect Armaflex from mechanical damage.

New INSULATING COLD LINES WITH LINE TEMPERATURES BETWEEN -50°C TO -196°C (-58°F to -320°F)

Installation advice on issues arising when insulating low temperature lines below -40°C.

ARMAFLEX UNDERGROUND

Explanation of the theory underlying insulating underground pipes, including advice on insulating underground pipes using Armaflex and also including a calculation tool to calculate the impact of insulation on the time until pipe freezing occurs.

TRACE HEATING

Explanation of the theory underlying insulating trace heated pipes, including advice on selecting correctly dimensioned insulation tube.

ARMAFLEX ON RECTANGULAR & CIRCULAR DUCTWORK

Additional detailed installation advice when installing Armaflex onto rectangular or circular ductwork.

ARMAFLEX IN CONCRETE

Installation advice when burying pipes insulated in Armaflex directly in concrete.

GLUING ARMAFLEX ONTO CELLULAR GLASS

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

OTHER APPLICATION GUIDES

- New** Application Guides for Arma-Chek S+, Arma-Chek T, Arma-Chek D
 - » Armaflex Application manual
 - » Special Application Advice for NH/Armaflex
 - » Special Application Advice for HT/Armaflex
 - » Application Hints for Armaflex Underground
 - » Application hints for Armaflex TuffCoat
 - » Application of Armaflex DuoSolar VA
- New** Armaflex application guide for plastic pipes
- New** Armaflex Protect R-90 application guide
- New** Application guide for Armaflex on ductwork
 - » Application guide for ArmaSound Industrial Systems
 - » Armaflex & Arma-Chek application video

CALCULATION TOOLS

- » **Armafinish FR paint - Coverage Calculator**
- New** **Arma-Chek T - Coverage Calculator**
- » **keytec. ISO 15665**
Determine the right ArmaSound Industrial Systems
- » **keytec. Armaflex Underground**
Calculate the impact of insulation on the time until pipe freezing occurs.
- New** **keytec. Arma-Chek R fishtail calculator**
Calculate the exact shape and measurements for fishtails used to cover bends insulated with Armaflex
- New** **keytec. Unit converter metric / imperial**
Calculate the most common units from metric to imperial measurements
- » **ArmWin AS**
Armwin AS 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.

ARMA-CHEK COVERING SYSTEMS



Arma-Chek S+

The insulation system resistant to mechanical impact with a bright silver finish.



Arma-Chek D

The lightweight and easy to apply insulation system resistant to mechanical impact.



Arma-Chek R

The insulation system with extra system security that minimises the risk of under insulation corrosion (UIC)



Arma-Chek T

The easy to apply and highly reliable solution for irregular shapes and hard to access areas.



Select the right Arma-Chek Covering System for your application ...

Equipment Type	General Construction		Process Industries		Shipbuilding
	Office & Commercial buildings	Plant buildings / Warehouses	Heavy Industry & Offshore (incl. Petrochemical / LNG)	Pharma & Food industries	
HVAC - Plant rooms	D S	D	D R T	S D	T
HVAC - Service Shafts	D S	D	D R	D S	T
HVAC - Suspended Sub-Flooring	D S		D R	D S	T
AC ductwork, indoors (exposed to view)	S D	S D	D R	S D	
AC ductwork, outdoors	D R S	D R S	R D	R D S	
Pipe work, indoors		D S	R D	S R	
Pipe work, outdoors	D S	D S	R T	D R T	T R
Process Pipework			R T	S R T	R T
Process pipe work, Dual Temp (intermittent)		R	R	R	
Vessels & Tanks, indoors	S D	D R S	R D	S R	T R
Vessels & Tanks, outdoors	D S	R D S	R T	R T	T R
Engine rooms					T

Where a letter appears in a full shaded circle in the table above this implies that the corresponding Arma-Chek system is particularly suited to this application. A letter in a non-shaded circle also implies a high level of suitability for the corresponding Arma-Chek system, although this is not the standard Armacell recommendation for this application.

Arma-Chek products may also be used in areas not indicated above and as such the table represents indicative advice only.



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