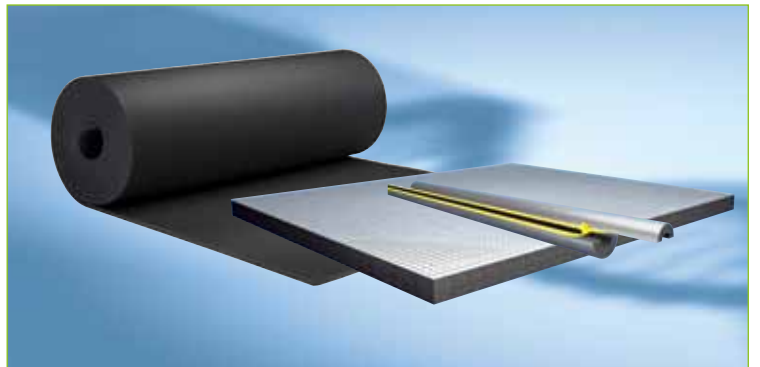
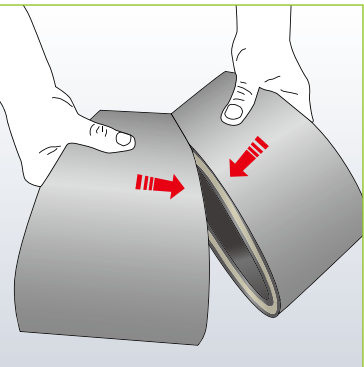
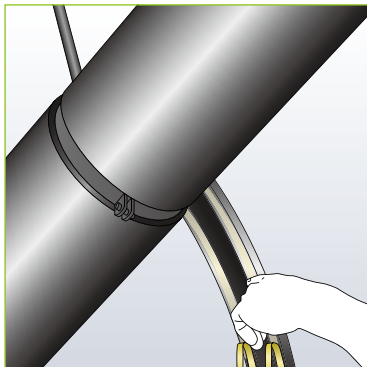
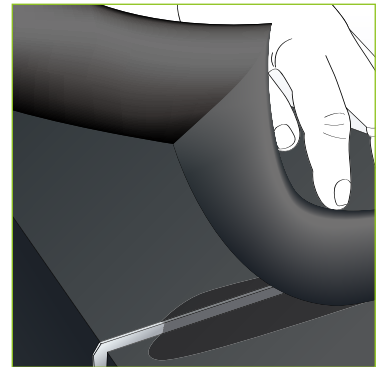
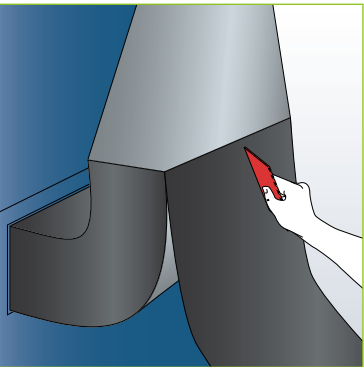


Armaflex®

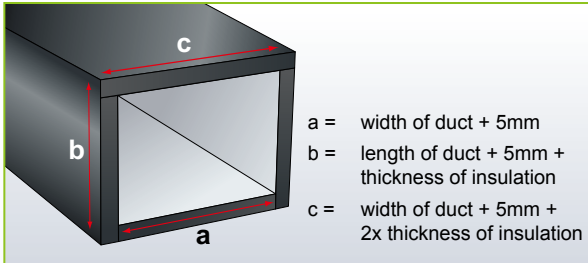


application manual >> DUCTWORK

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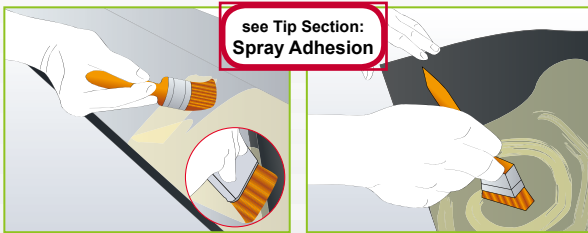
MEASURE SURFACE DIMENSIONS FOR INSULATING RECTANGULAR DUCTS

Measure surface dimensions and cut Armaflex sheet to size. **Note:** Add 5mm so that material is fitted under compression.

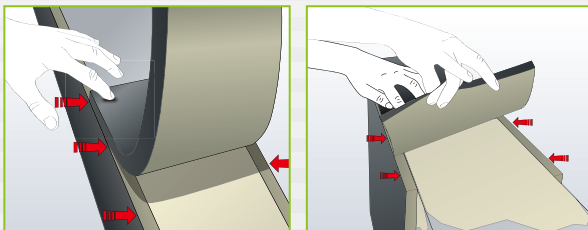


INSULATING RECTANGULAR DUCTS WITH ARMAFLEX SHEET

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

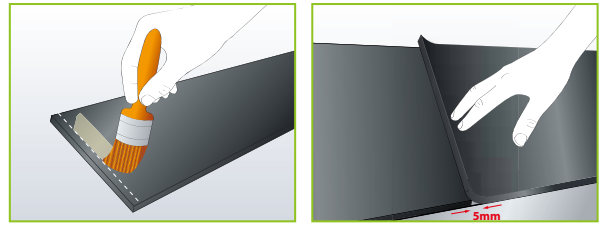
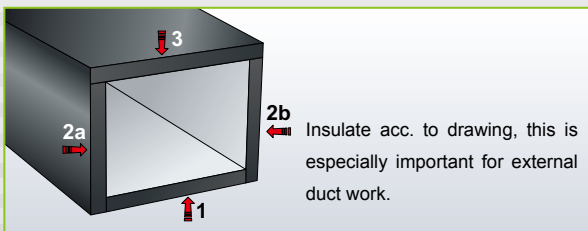


Spread a thin film of adhesive onto the metal surface and then onto the Armaflex sheet.

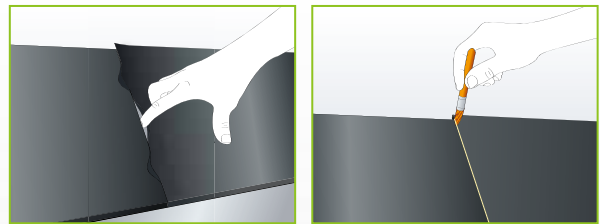


When the adhesive is tack dry (fingernail test) place Armaflex sheet in position and press firmly to achieve a good bond. Continue applying Armaflex adhesive to both surfaces, including the Armaflex edge, and allow to tack dry before pressing firmly into position.

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



The cut sheets should be positioned so that there is a 5-10mm overlap (for compression). Do not apply adhesive to this area.

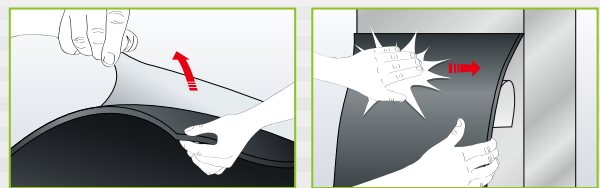


When pressed together the material is under compression and is not stretched. Apply an additional wet seal along the butt joints.

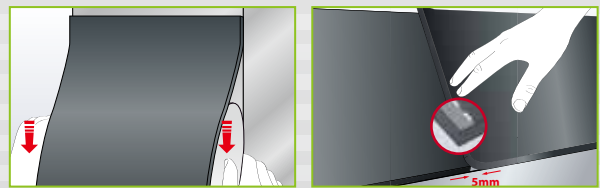
Note: Armaflex sheet of 16mm thickness or less can be wrapped around the duct without the need for cutting into 4-pieces. However, care must be taken to ensure the upper surface is sloped toward the edges, with at least a 2° angle. Sloping of the top will prevent ponding of water, particularly on exterior applications, and forms a watershed. This is best achieved if the material is wrapped around the lower edges, but the upper side is fitted with a separate sheet.

INSULATING WITH SELF-ADHESIVE SHEET

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



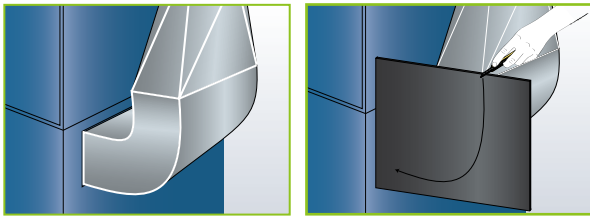
Peel back release paper & line up sheet. Press firmly to activate adhesive.



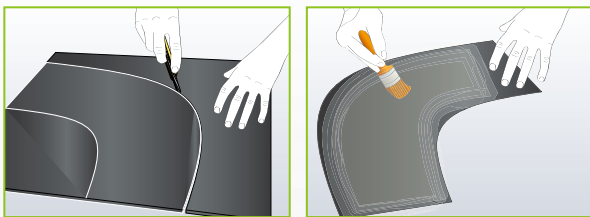
Align material and continue to correctly line up, pressing firmly whilst slowly removing release paper. At butt joints allow 5mm overlap for compression.

Note: Keep the release paper on the 5-10mm butt joint overlap. The rest of the release paper shall be removed.

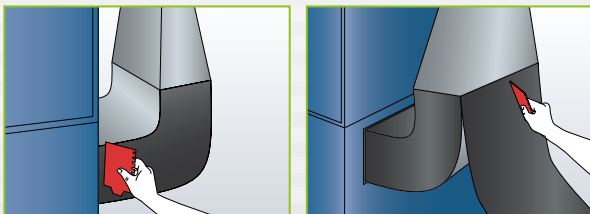
INSULATING IRREGULAR FLAT SHAPES WITH ARMAFLEX SHEET



1. Trace all seams using standard drawing chalk.
2. Create a template by pressing a piece of Armaflex onto the chalked duct seams.

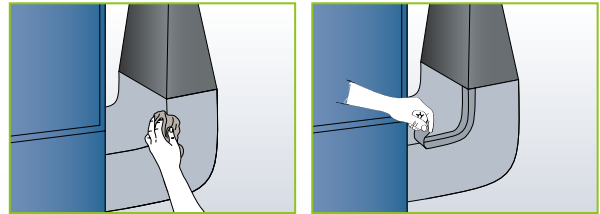


3. Cut the shape of the resulting pattern out of the Armaflex sheet.
Note: Add a minimum 5 mm to each measurement to allow for installation under compression.
4. Apply all over Adhesive coverage both the duct surface and the contacting Armaflex surface. Allow the adhesive to tack dry. (see tip "spray tacking").



5. Position and fix the Armaflex sheet. Add pressure using a plastic card to provide optimal adhesion with a smooth finish. Avoid air/solvent bubbles.
6. Measure and cut Armaflex sheet for the straight backs to size, adhere and smooth out with a plastic card to finish. Avoid air/solvent bubbles.

IF USING ARMAFLEX DUCT SHEETS (aluminium foil finished)

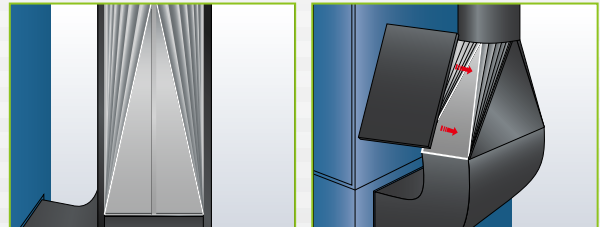


7. Before sealing all seams with self-adhesive aluminium foil tape, the seams and joints require a pre-clean with Armaflex cleaner.
8. Close all seams self-adhesive aluminium foil tape.

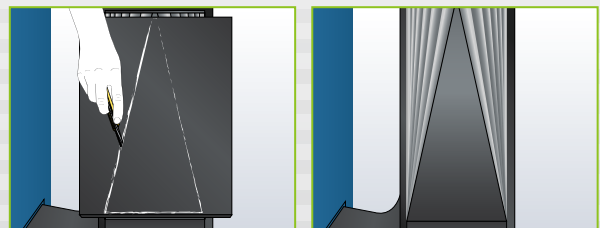
INSULATING SQUARE TO ROUND SECTIONS WITH ARMAFLEX SHEET

When covering square to round duct sections, it may be easier to create a template directly onto the Armaflex sheet as opposed to first transferring onto a piece of cardboard.

The general approach is as in the following procedure:



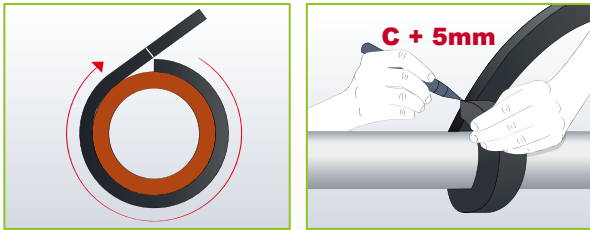
1. Apply chalk directly onto the ductwork section.
2. Press an Armaflex sheet of the required insulation thickness firmly onto the chalked edges to transfer an accurate impression on the Armaflex sheet.
Before cutting the resulting shape add an additional 5 mm (minimum) to all sides of the shape to allow for installation under compression.



3. Apply the shaped Armaflex sheet to the ductwork surface as described in the section "Insulating irregular flat shapes".

INSULATING STRAIGHT PARTS OF CIRCULAR DUCTS WITH ARMAFLEX SHEET

For circular ducts larger than OD > 500mm please refer to the Armaflex application manual (page 14) section "Armaflex adhesive and its use on pipework > 88.9 mm O.D." Follow always the procedure recommended for vertical pipes.

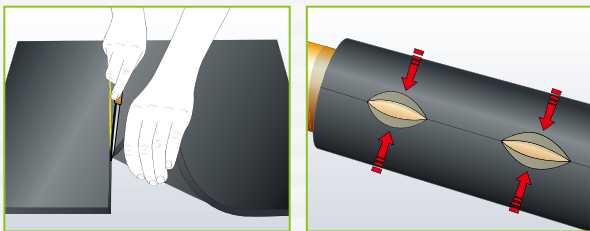


1. Determine the circumference of the pipe.

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

Warning: Do not stretch the strip.

Note: Add a minimum 5mm to each measurement to allow for installation under compression.

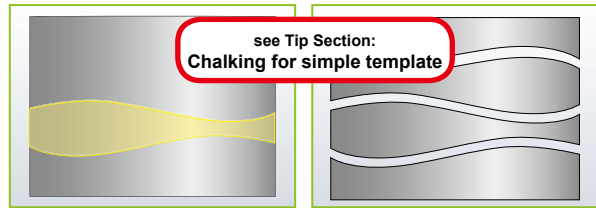


2. Cut Armaflex sheet to the required size - apply Armaflex adhesive to the cut surfaces in a thin layer, allow to touch dry.
3. Press together at the ends and then in the middle. Close the entire seam starting from the middle.

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

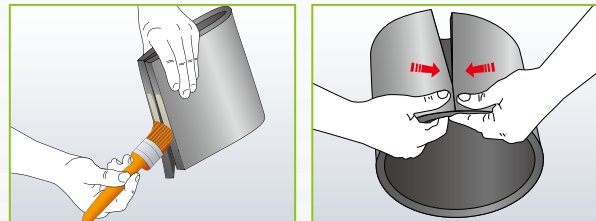
Check the open time of adhesive to ensure it is still fit for use.

INSULATING SEGMENTED BEND OF CIRCULAR DUCTS WITH ARMAFLEX SHEET

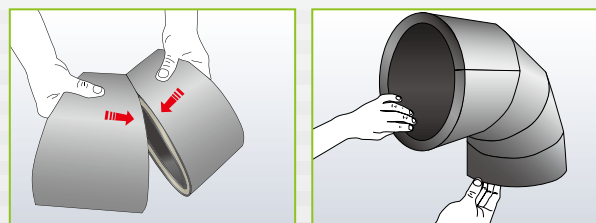


1. Place the segment/fishtail template onto the surface of the laminated Armaflex surface. Mark out the required number of segments for the bend.
2. Cut the segments using a small sharp knife.

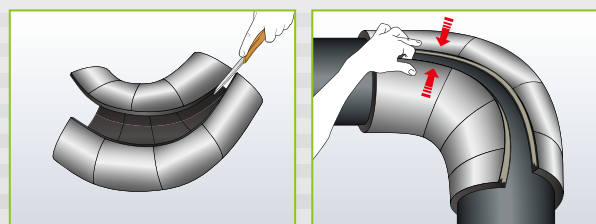
Note: The example shown is for a 2+2 fabrication - two centre pieces, one starting and one finishing piece.



3. Using Armaflex adhesive apply a thin, even layer of adhesive to both edges of the segment. Multiple segments can be glued at one time, as shown.
4. Allow the adhesive to tack dry (fingernail test), fit then press the glued seams together firmly. Note: For easy fixing, press together each end first, then press the centre section area last.



5. When all applicable fabrications have been fixed together, apply a thin even film of adhesive around all circumferential edges of the segments.
6. Position and line-up the centre seams, apply firm pressure around the glued seams to bond the segments together. Note: Ensure all fixing seam surfaces have adhesive applied. Allow adhesive to "touch dry" before bonding together.

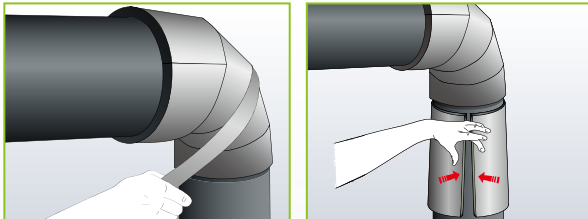


7. When all segments are glued together use a small sharp knife and cut along the centre line of the fabrication.

8. Place the pre-fabricated fitting cover over the ducting bend. Apply a thin coat of Armaflex adhesive to the main fixing seams.

Allow to tack dry. Fix the glued seam together, starting from both ends and working to the centre.

Note: As an alternative, segments can be applied separately and then fixed, positioned, sealed and taped to finish, directly on the installed ducting on location.



9. **If using Armaflex Duct (aluminium foil finished):** To finish, apply matching self-adhesive tape on all seams and joining details.

Note: Before applying the tape, ensure the insulation surface is clean and dry.

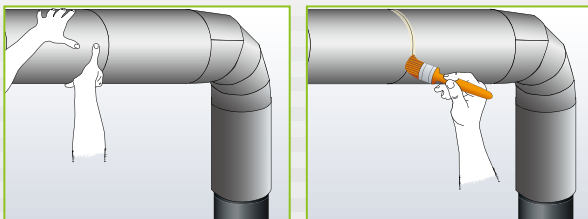
Tip: Using a plastic card when applying, can enhance the bonding strength of the tape.

10. On completion of the bend fabrication, continue to install the straight-line fabrications. The main fixing seams should be secured using Armaflex Adhesive.

The sheets should always be positioned so that there is a 5-10mm overlap (for compression). Do not apply adhesive to this area.

Apply an additional wet seal along all butt joints.

Note: Allow additional circumferential excess in the sheet fabrications when using Armaflex Duct (pre-covered sheet).



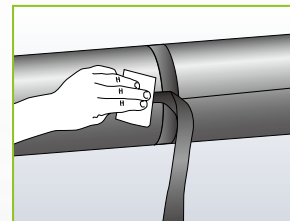
12. The fixing of the straight-line fabrication is the same as for standard Armaflex sheet.

Note: For vertical ductwork all-over adhesive coverage to the ductwork surface is required at all times. For horizontal ductwork above 500 mm in diameter, 1/4 adhesive coverage to ductwork surface is required.

Tip: Where required, “turn away” the main fixing seam from view.

13. Push straight line fabrications up-to the “butt” joints of the bend, and where applicable provide an additional vapour seal (wet seal) using Armaflex adhesive. Ensure there are no gaps between the jointing details before applying tape or adhesive.

Tip: On vertical applications, to avoid the insulation “slipping”, fix the Armaflex sheet to the surface of the ducting by applying 50mm of Adhesive on both the innerface of the insulation and metal surface using a brush. Allow 1 - 4 minutes before pressing the sheet to the ducting surface for a secure bond.



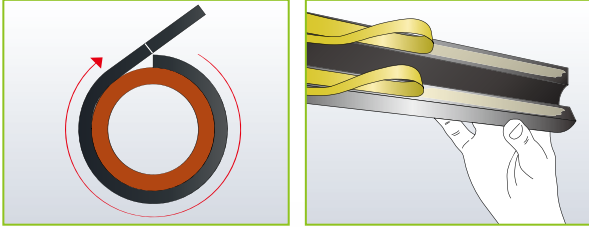
14. **If using Armaflex Duct (aluminium foil finished):** To finish, cover over all seams and joints using smatching self-adhesive tape.

Tip: using a plastic card when applying can enhance the bonding strength of the tape.

Note: Additional vapour sealing of “butt” joints with Armaflex adhesive is only required where the inside air temperature of the ducting is below +15° C.

INSULATING DUCT BRACKETS WITH ARMAFLEX DUCT HALF-ROUND SECTIONS

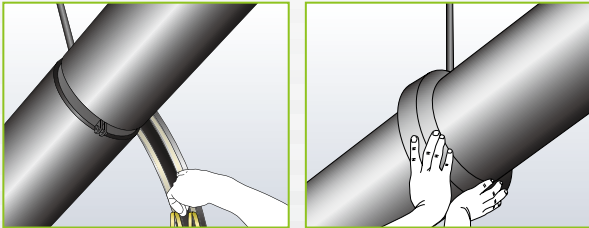
“WRAP-AROUND” METHOD



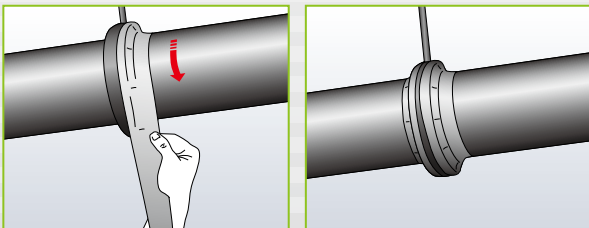
1. Determine the actual circumference of the insulated ducting, using the Armaflex Duct bracket material. For large diameter ducts, it may be necessary to join multiple bracket strips together using Armaflex adhesive.

Note: The covers can be used to insulate over hanging bracket connections and flanges.

2. The insulation surface shall be clean and dry before applying the self-adhesive bracket/flange covers.
3. Remove from both edges the self-adhesive release strip.



4. Place and fix down the cover in the required starting position.
5. Without stretching, continue to work the cover around items to be over-covered, applying firm pressure to the self-adhesive area of the cover.



6. Continue to fully insulate over/around the required items. Where applicable, cut out for the “oil thread” that holds the hanger in place.

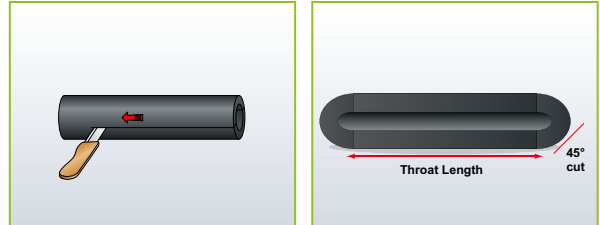
Tip: Check to see that the cover has completely bonded to the insulation surface. Apply firm even pressure.

7. To fully complete the vapour seal, apply self-adhesive aluminium foil tape to all attached seams and joints. **Tip:** using a plastic card when applying can enhance the bonding strength of the tape.

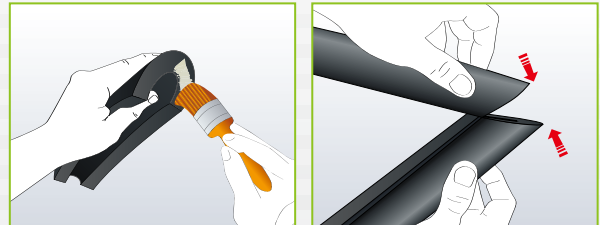
INSULATING DUCT BRACKETS WITH ARMAFLEX TUBES

“PICTURE FRAME” METHOD

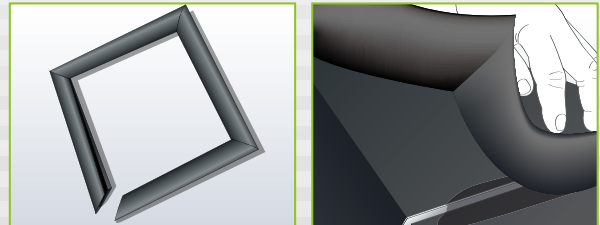
For a cost effective solution with a high-end finish, Armaflex tube can be used to over-cover raised ductwork-connecting brackets.



1. Using unslit Armaflex tube with equal thickness as the attached main duct branch; split with a sharp knife the tube into two equal halves.
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 degree 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 touch dry, fix the angles together, applying firm even pressure for a good bond.



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

INSULATING DUCT BRACKETS BY USING ARMAFLEX SHEETS



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



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



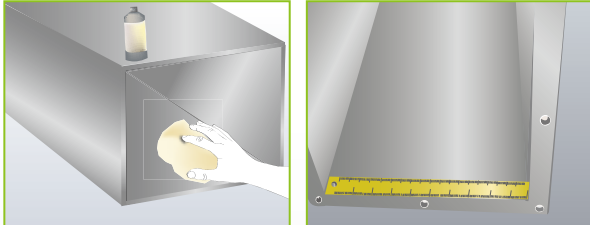
Continuous single strip method - Complete single continuous strip.

In all situations, the fabricated Armaflex insulation bracket covers have the same thickness as the attached ductwork connections. For a continuous vapour sealed system, all insulation covers shall be securely fixed and wet sealed with Armaflex adhesive.

Note: On foil covered Armaflex Duct, all exposed black edges, seams and joints should be covered using matching self-adhesive foil tape.

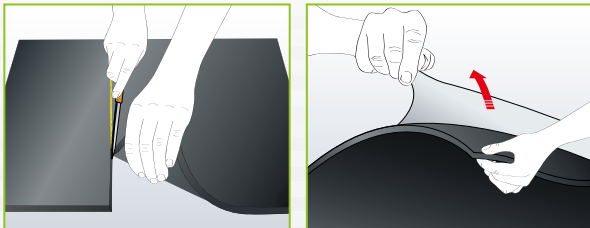
LINING OF DUCTWORK

Armaflex can be used to internally line ductwork for acoustic purposes. All general rules and recommendations for working with Armaflex remain valid.

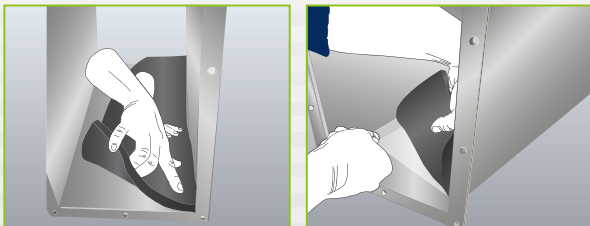


The temperature of the air and of the insulation should be between 4°C and 38°C at the time of installation.

1. Clean all surfaces using Armaflex cleaner to remove grease, oil, dirt etc. before commencing installation.
2. Measure the internal duct dimensions and add an additional 5 mm to each dimension, cut Armaflex sheet to size.



3. Cut Armaflex sheet to size.
4. Peel back enough release liner to start.



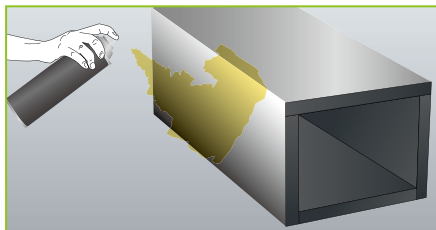
5. Square off sheet along an edge or corner. Press the sheet to the surface taking care not to trap any air.
6. Reach behind the Armaflex sheet and peel liner back while pressing the sheet to the surface.
Apply firm and even pressure to adhere the Armaflex sheet to the ductwork surface.



At all butt joints allow an additional 5 mm of material to enable installation under compression. This will prevent the possible opening of seams in high air velocities.

SPRAY ADHESION

Using Spray Adhesive when using Armaflex sheet on ductwork



Some full contact spray adhesives can be used in conjunction with Armaflex Duct sheets on ductwork operating at above ambient temperatures. As with standard Armaflex Adhesive, both the insulation surface and the ductwork surface should be covered using all over adhesive coverage. Spray adhesive should be applied as according to the manufacturers recommendations.

Armacell does not recommend any specific brand of spray adhesive for use. If in any doubt regarding the suitability of using a given spray adhesive for a given Armaflex Duct application, please contact our technical support team.

Important: Where a specification states insulation must achieve a 0 ODP rating, the spray adhesive should also conform to this requirement.

Note: Before applying any spray adhesive, please confirm with the spray adhesive manufacturer that the adhesive is suitable for use throughout the expected operating temperature range of the ductwork.

CHALKING FOR SIMPLE TEMPLATES

Make a template for a segmented duct bend with Armaflex sheet

1. Determine the true circumference of the bend by using a strip of Armaflex around the centre of the bend.

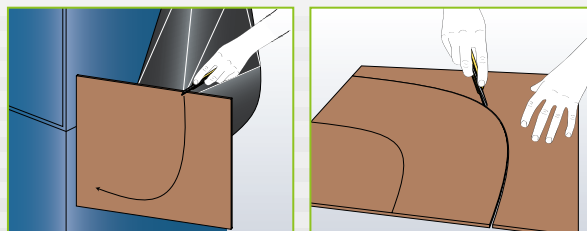
Important: Always measure using a strip of pre-covered Armaflex sheet - 50mm wide - of the thickness to be used for the insulation. Do not stretch the strip.

Note: If the segmented bend has raised seams, the Armaflex strip should be placed on top and around this area.

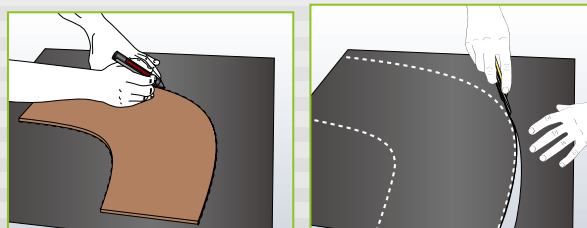
2. Mark the circumference and add 10mm to the determining true length. This will be referred to as the "true circumference" length.
3. To produce a quick pattern for the segments below mark, using white chalk, one of the centre segments contained within the ducting bend.
4. Using a long strip of pre-covered Armaflex sheet press an imprint of the chalked surface onto the Armaflex. This can be used as the basis of the master template.
5. Cut out a "trial" segment and, where required, make slight adjustments to the marking out. Place the trial segment around the duct bend before completing the master copy. Add additional length to the master as required.

Tip: Avoid making the fitting cover too tight.

Make a template 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 Armaflex sheet.
4. Cut the resulting shape

REFERENCES

In addition to this manual, Armacell provides the following documents, freely available from www.armacell.com. 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

- » Armaflex Application manual
- New** Application Guides for Arma-Chek S Plus, Arma-Chek T, Arma-Chek D and Arma-Chek R
- » Special Application Advice for NH/Armaflex
- » Special Application Advice for HT/Armaflex
- » Application Hints for Armaflex Underground
- » Application Hints for Armaflex TuffCoat
- New** Armaflex Application Guide for Plastic pipes
- » Armaflex Protect R-90 Application Guide
- » 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.

The Armaflex Assurance System

The Armaflex Assurance System - your peace-of-mind assurance that Armaflex is made to the strictest quality, technical performance and environmentally friendly standards.

Prevents Moisture Permeation

Multi-layered closed wall cells provide a built-in vapour barrier which can't be compromised by surface punctures or rips - this ensures the vapour barrier stays working for the lifetime of the insulation system.

Provides Long Term Thermal Performance

Non-wicking - No transmission of water vapour is possible through the insulation due to the closed cell nature of Armaflex. Moisture will not migrate through professionally installed Armaflex.

Long Term Durability

No fragile water vapour barrier - The built-in vapour barrier can't be "damaged" during installation or over the lifetime of the insulation.

Avoids Thermal Bridging

Armaflex is a seamless insulation system - these same technical properties provide a secure system.

Long Term Energy Efficiency

By minimising the ingress of water vapour into the insulation the multi-layered cells in Armaflex prevent the thermal conductivity from rising. Increased thermal conductivity can in the long term lead to increased energy costs and surface condensation.

Inhibits Growth of Mould

- Minimises moisture permeation, the first requirement for mould growth
- Minimises the second requirement: No cellulosic vapour jacket, and the smooth surface doesn't trap dust

Formaldehyde Free

Ensures that Armaflex is a low-emitting product. It is also low VOC.

Support Requirements of Health & IAQ (Indoor-Air-Quality)

- Dust free and fibre free
- Will not emit any particles or fibres - even when cut into shapes and fittings
- No outgassing - CFC & HCFC free manufacturing process

Supervised Quality Standards

ISO Registration ensures that all Armacell manufacturing facilities consistently meet customer requirements by managing all processes with ongoing quality assessments.



Armacell Asia Limited · Suite 9-10 · L25 Office Tower Langham Place
8 Argyle Street · Mongkok · Kowloon · Hong Kong
Phone +852 2574 8420 · Fax +852 2574 8394
www.armacell.com

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