

AEROFOAM[®]

Installation Handbook

Applicable for
Aerofoam[®] XLPE
Aerofoam[®] XF
Aerofoam[®] XLPE N Clad



Cross-linked Closed Cell
Polyolefin Thermal Insulation

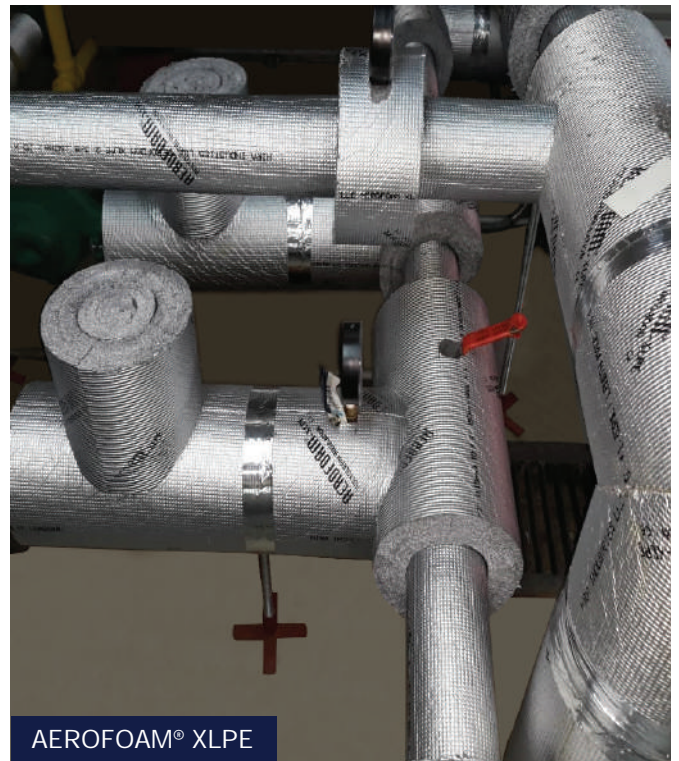
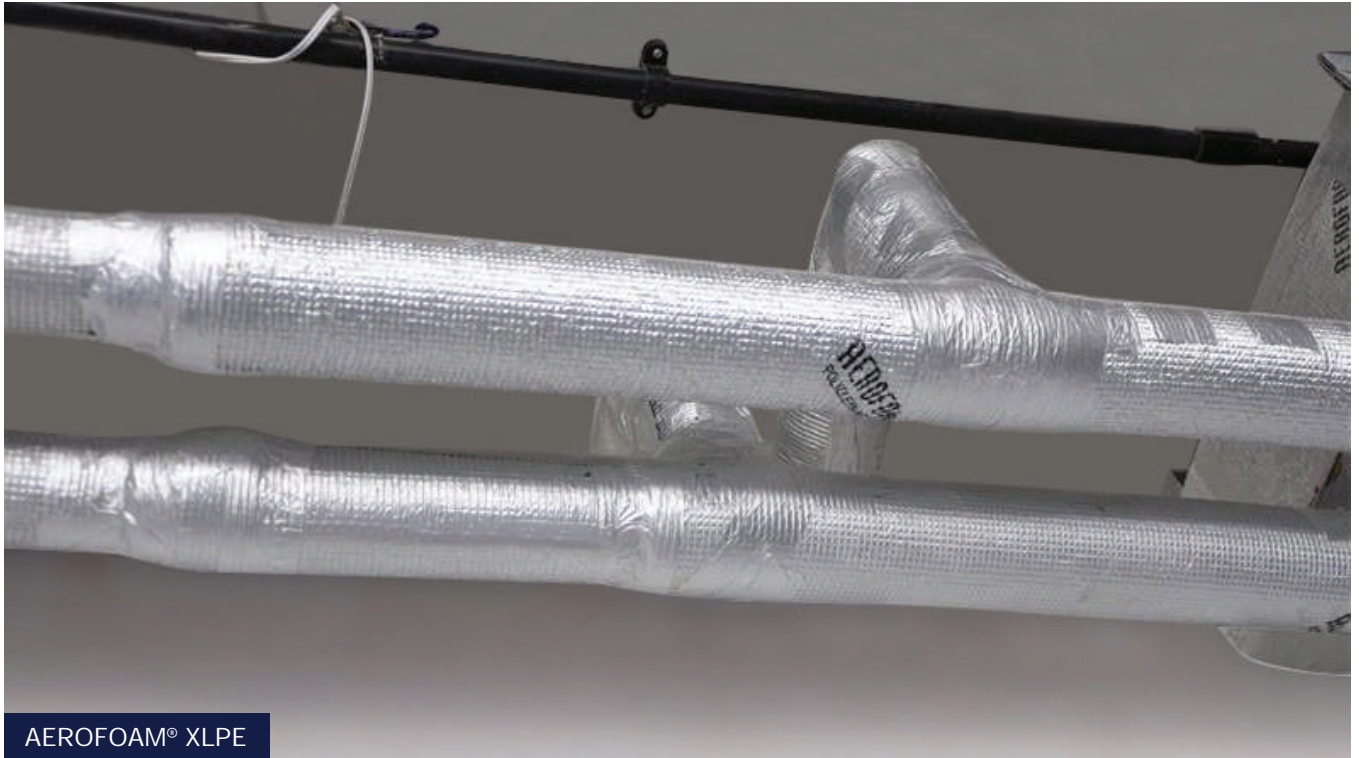
Thermal Insulation for
Outdoor & Indoor Solutions



AEROFOAM®

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AEROFOAM® XLPE



FLEXICELL® XLPE

(BLUE FOIL FACER)



AEROFOAM® XLPE



AEROFOAM® XF



AEROFOAM® XLPE



AEROFOAM® XLPE

1. General Information

All the information below, where Aerofoam® is referenced can be applied to Aerofoam® XLPE, Aerofoam® XF and Aerofoam® XLPE N Clad.

- Aerofoam® XLPE, Aerofoam® XF and Aerofoam® XLPE N Clad contain Tubes, Sheets, Rolls, Dedicated Tapes, Dedicated Adhesive and Aerofittings.

1.1. Working with Aerofoam®

- Use clean Aerofoam® material with no dust, dirt, oil, grease or water. Always work with non-damaged and originally packed materials.
- Make sure that adhesive or self adhesive version of the product will not be used on the surfaces that have been treated with coatings containing asphalt, bitumen, etc. On the pre-coated or pre-painted surfaces, ensure that the adhesive will stick to the paint (physical test is required before installation).
- Use good quality tools, in particular a sharp knife, clean brush and recommended Aerofoam® adhesive or any other adhesive approved by Manufacturer of thermal insulation.
- Use correctly dimensioned material. Always check diameters and thicknesses before installation.
- Never pull glued joints when sealing them, always push them together.
- Never insulate systems that are in operation. System can be run only after 36 hours from completing application of insulation.
- Ensure that all outdoor and exposed applications are being insulated with specially dedicated thermal insulation Aerofoam® thermal insulation products with weather resistant coatings / cladding.
- In case of outdoor installations, it is necessary to protect Aerofoam® XLPE / XF with UV and weather resistant layer (e.g. metal cladding, canvas cloth and mastic). The protective cladding/jacketing shall be applied maximum within 7 days from completing the insulation installation processes as per Aerofoam® Installation Handbook.
- Do not use Aerofoam® thermal insulation products without additional mechanical protection in areas where physical damages can occur (transport passages, corridors, operating machines areas).

- Do not leave any sharp edges of insulation foils/coverings/cladding without trimming or protection.
- If the installer uses recommended accessories and the craftsmanship is of high quality, the location of the linear s seam (top, bottom, sides) of the pipe section is neutral. However, Aerofoam® recommends to locate the seam on the bottom of the pipe section, if possible.

1.1.2. Storage & Handling



Deliver to the job site in its original, unopened packaging with all labels intact.



Carefully unload the material to avoid damages. Dropping, throwing or dragging the material on the ground can result in damages of outer layers and edges.



Keep the material in its original packaging until cutting/installation takes place to ensure all surfaces remain clean and free from dust/moisture.



Inspect for visual defects before the installation. No labor claim will be honored on material installed with visual defects. Any discrepancies must be reported immediately before beginning installation.



Do not expose to any source of flame or intense heat.



Can be stored for 24 months (12 months with pressure sensitive adhesive) from the manufacturing date in a clean, dry, dust-free room at normal humidity and ambient temperature.



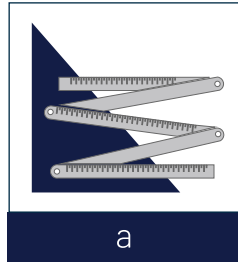
Store horizontally on the ground to avoid damaging the edges.



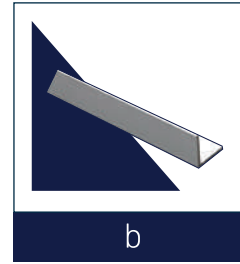
Store indoor in a clean, dry and smooth surface, away from direct sunlight at 0-35 °C.

1.2. Tools for Installing Aerofoam®

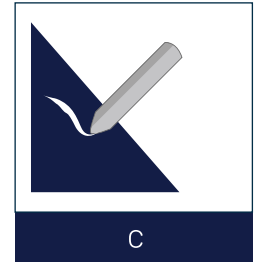
- (a) Folding ruler
- (b) Cutting rail
- (c) Marker pen
- (d) Marking Dividers
- (e) Calipers
- (f) Sharp knives (short, medium, long)
- (g) Sharpening stone
- (h) Ruler
- (i) Template
- (j) Scissors
- (k) Brushes
- (l) Smooth spatula (plastic or steel)
- (m) Sharpened pipe ends for precise holes
- (n) Rollers for surface gluing
- (o) Gluemaster



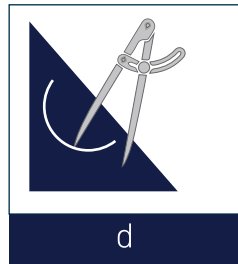
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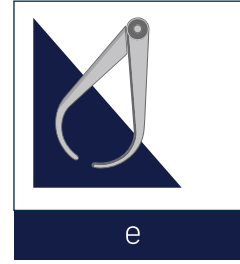
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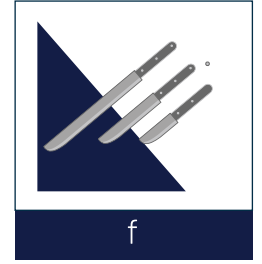
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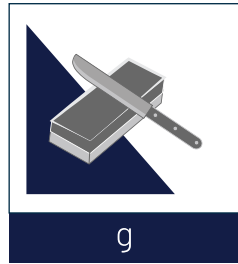
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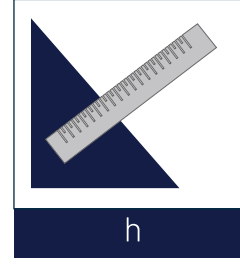
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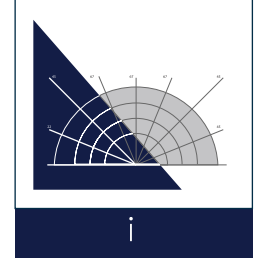
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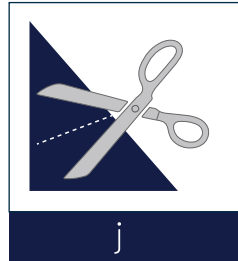
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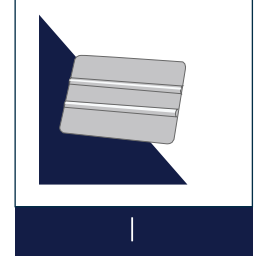
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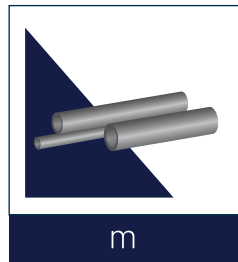
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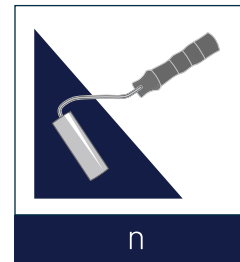
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1.3. Correct Use of Aerofoam® Accessories

Aerofoam® accessories are recommended to be used during installation process as an integrated system for Aerofoam® thermal insulation.

1.3.1. Aerofoam® Adhesive - General Information

Aerofoam® Adhesive has been specially developed to bond Aerofoam® all kinds of joints and seals.

Stir Aerofoam® XLPE Glue for sometime or shake the can before application. Always keep can closed to avoid thickening. It is recommended to fill the adhesive from larger cans into smaller ones. Adhesive should be stirred again just before use. This needs to be repeated regularly.

Please use only recommended thinner dedicated for specific type of Glue (xylene based) .

When applying Aerofoam® Thermal Insulation to metallic or other surfaces, it is recommended to apply adhesive on the insulation material first and then to the corresponding surfaces.

To apply Aerofoam® XLPE Glue on the tube joints and sheets edges, use the brush or gluemaster. For larger surfaces, plastic or metal spatula or paint roller would be a faster option to apply the glue.

Seams must always be processed with compression and never with tension. It is recommended to keep some additional allowance (approximately 5% per running meter) to allow product for thermal expansion and contraction.

The best temperature range for Aerofoam® XLPE Glue application is between +5 °C to +35 °C.

Fully cured joints can be exposed maximum up to 85 °C. The bond is resistant to weathering and aging.

Cans of Aerofoam® XLPE Glue should be stored in a safe place without direct exposure to weather and sunlight. It shall not be stored below 0 °C and above 35 °C. The shelf life is approximately 1 year (Please check expire date on can).

Low VOC Glue is available upon request. Please contact Aerofoam® Technical Department for more information.

Check that the adhesive will adhere to the surfaces. In case of rusted surfaces, it is recommended to remove loose rust particles and paint with the primer or anticorrosion paint. Aerofoam® XLPE Glue may not adhere to bitumen, asphalt or red lead. For application on ABS plastic pipes, please check if there is no objection from manufacturer of pipes.

For cleaning tools, surfaces and remaining stains use the thinner, preferable xylene based. However, others will work as well.

Note: For safety reasons, it is recommended to use required Personal Protection Equipment while working with Aerofoam® XLPE Glue to avoid skin and eye irritation. Moreover, it is mandatory to work only in well-ventilated areas with continuous air circulation. Do not smoke, weld or open fire while working with Aerofoam® XLPE Glue.

To dispose used cans and tools, please strictly follow local environmental regulations.

1.3.2. Aerofoam® Tapes - General Information

It is recommended to use Aerofoam® Tapes for effective finish of your installation.

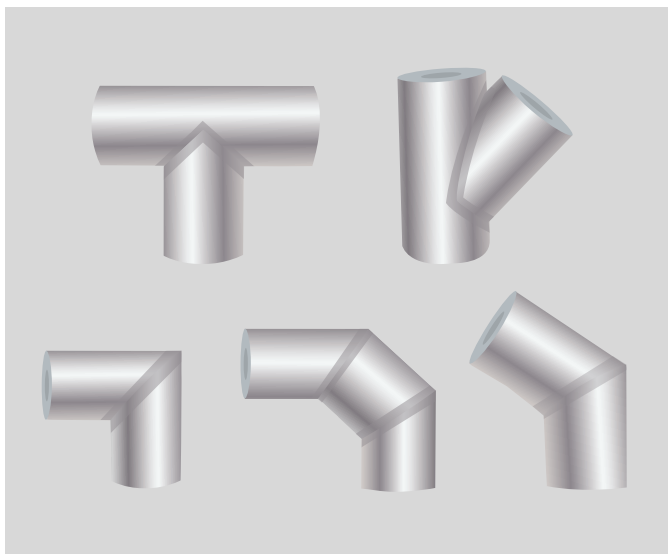
Name of the Tape	Name of the System
Aerofoam® Foam Tape	Universal
Aerofoam® Alupet Tape	Aerofoam® XLPE
Aerofoam® N Clad Tape	Aerofoam® XLPE N Clad
Aerofoam® Aluminum Foil Tape	Aerofoam® XLPE
Aerofoam® Reinforced Aluminum Tape	Aerofoam® XF

Aerofoam® Tapes should be used to seal the joints and to maintain the esthetic look of the installation. Tapes can be cut with normal scissors and applied. Put pressure on the tape with hand or spatula.

1.3.3. Aerofoam® AeroFittings - General Information (optional)

Aerofoam® product range offers factory made fittings, AeroFittings for faster and more accurate applications of thermal insulation pipes. It also helps to keep the continuity of insulation on all kinds of fittings. Types of AeroFittings include elbows, Tees and Y joints.

The fittings can be customized depending on the type and radius of the elbow, for example 2-segments, 3-segments, 4-segments and 5-segments.



AeroFittings are a recommended accessory.

1.4 Safety Equipment

Aerofoam® materials do not contain loose fibers/particles or any other harmful components or skin irritating chemicals. However, it is recommended to use gloves and goggles while working with glue and self-adhesive products. Before starting application of insulation, strictly follow health and safety rules referring to local regulations. Moreover, for further safety related information refer to the Aerofoam® Material Safety Datasheet.

2. Ductwork Insulation

Before you proceed with installation, follow chapter 1. General information, for details regarding preparation for installation and necessary accessories.

2.1 Insulating Air Ducts with Aerofoam®

2.1.1 4- Piece Procedure

It is highly recommended to use Aerofoam® without self-adhesive for application of high thicknesses of thermal insulation (over 30 mm).

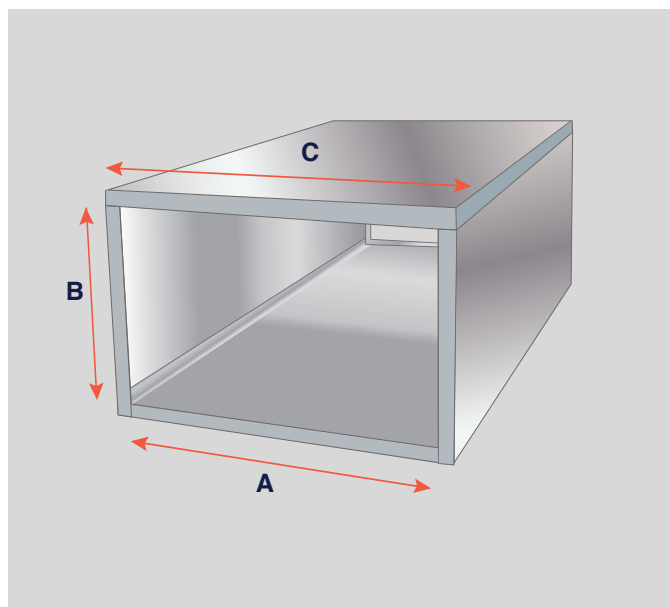
All ductwork should be free of dust, moisture, grease and oil. To clean the duct, first wipe with a clean cloth to remove dust particles. Then, remove grease and oil by applying a methylated spirit or acetone (special glue cleaner) and allow them to evaporate. Work within a reasonably clean area to avoid dust.

a) Measure the sizes of the surface and cut the Aerofoam® roll accordingly.

A = duct width

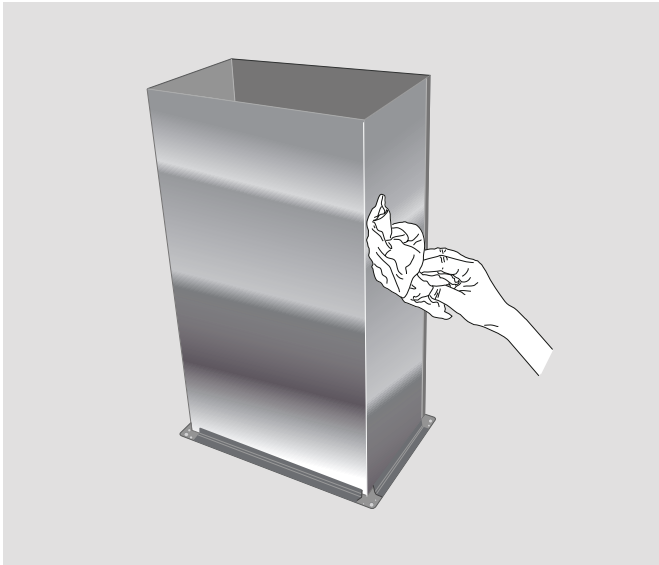
B = duct height + 1 x insulation thickness

C = duct width + 2 x insulation thickness

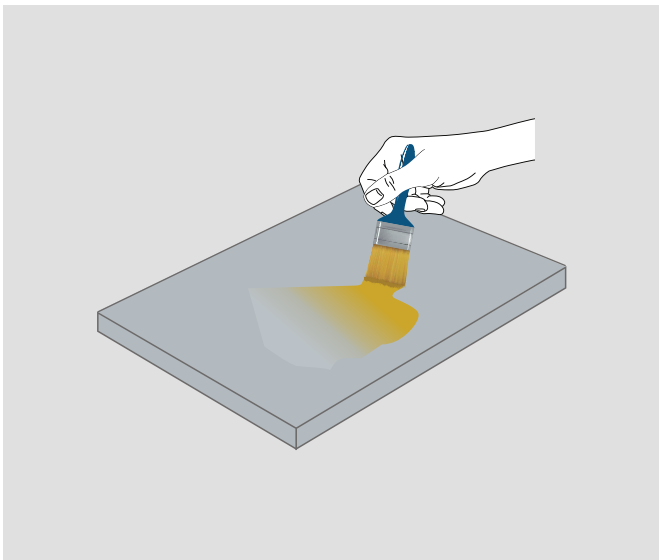
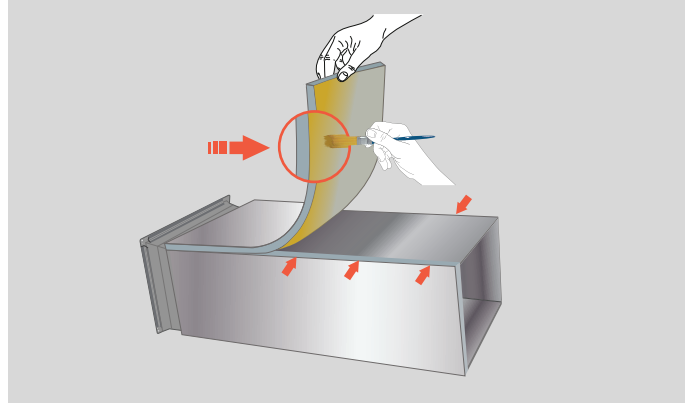


(b) Spread a coating of adhesive onto the Aerofoam® roll/sheet and then onto the metal surface.

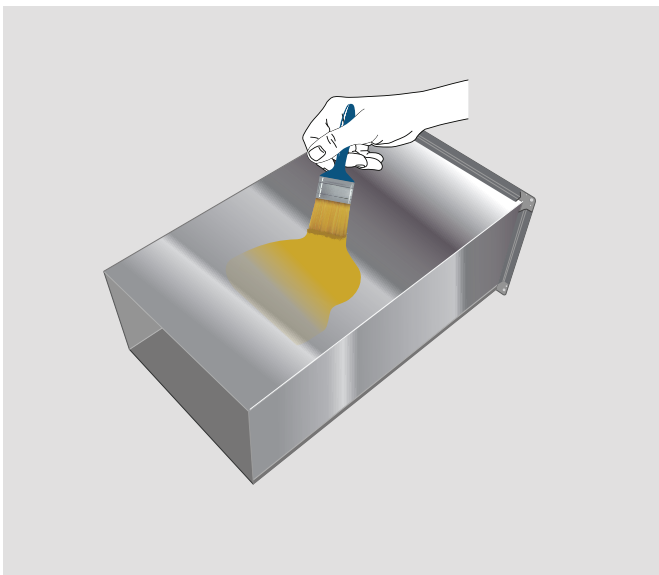
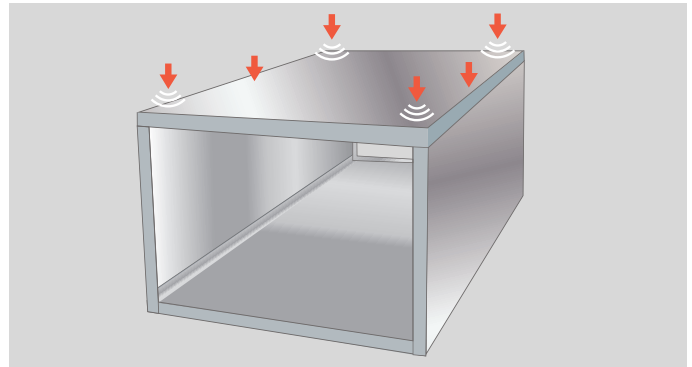
It is recommended to use Aerofoam® XLPE Glue or other type of glue approved by Aerofoam®.



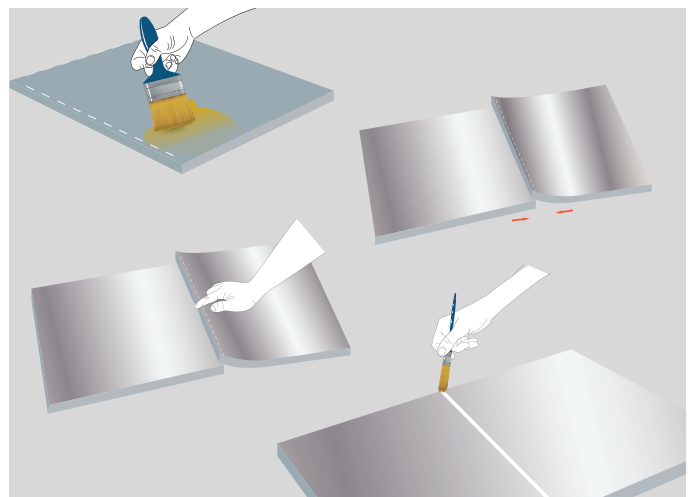
(c) When the adhesive is tack-dry (fingernail test), place Aerofoam® roll in position and press firmly to achieve a strong bond. Continue applying Aerofoam® XLPE Glue to both surfaces including the edges of the Aerofoam® foam sheet and allow to tack-dry before pressing firmly into position.



(d) During the installation process, pay attention to the edges of insulation, keeping in mind that installation should be done with no gaps in the joints and air bubbles between the insulation and metal surface. Insulate according to the drawing below.



(e) For larger sections of ducts, if the joint of insulation is in the center, cut the rolls/sheets in excess of 3 mm for joint compression. Do not apply glue to this area on either the Aerofoam® sheet or the duct surface.

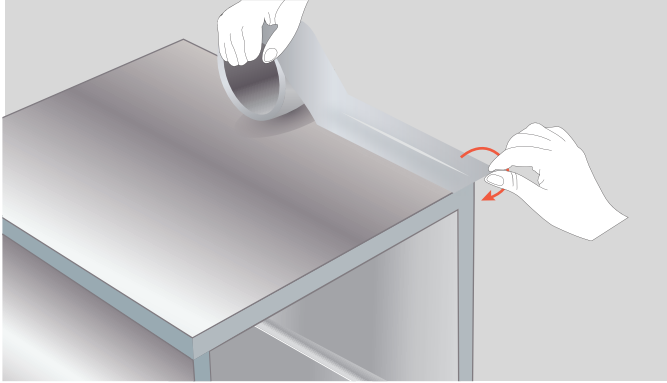


(f) It is recommended to apply Aerofoam® Tapes all over the edges. Use the recommended type of tape for each system as per below:

Aerofoam® XLPE - Aerofoam® Alupet Tape

Aerofoam® XLPE N Clad - Aerofoam® N Clad Tape

Aerofoam® XF - Aerofoam® Reinforced Aluminum Tape



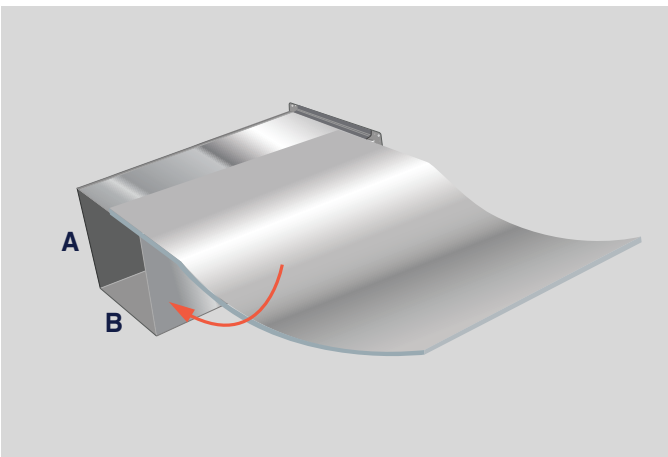
It is recommended to use below widths of tapes according to thickness of insulation:

Width of Tapes	Thickness of Insulation
2" (48-50 mm)	Up to 20 mm
3" (upto 75 mm)	From 20 mm to 40 mm
4" (upto 100 mm)	>40 mm

2.1.2. Wrap Around Option

This procedure is possible only for Aerofoam® thickness upto 20 mm.

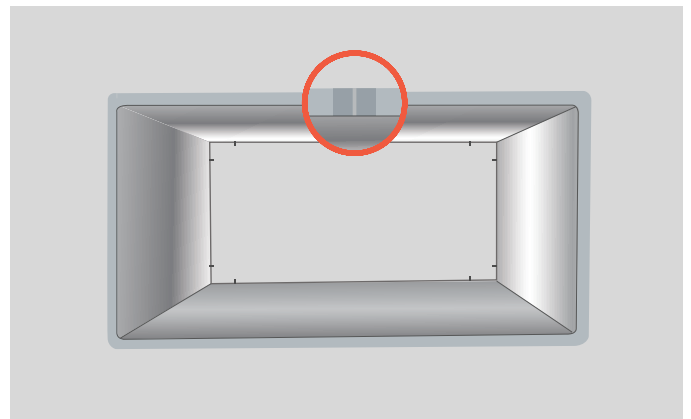
(a) Cut Aerofoam® insulation to the required length. Always allow 5 mm excess for final adjustment. Lay the duct on the floor. It is advisable to use soft sheet, board or any other suitable covering to the floor to avoid damage of insulation. The required length of the insulation is: $L = 2A + 2B + 4x(\text{Thickness}) + 5 \text{ mm}$.



(b) To apply the glue, follow points b and c from section 2.1.1.

(c) Once one side is fixed, turn the duct to expose bare-side. Repeat until completely covered. Avoid pulling of the insulation on the edges to ensure the insulation thickness on the corners will be maintained the same.

(d) Ensure the insulation length reaches the same level as the starting edge. Make sure that the connection between start and end of insulation layer meets in the middle (on the top of the duct). Cover the joint with suitable tape (follow point 2.1.1. (f) for details).



2.2. Insulating Air Ducts with Aerofoam® XLPE Self-Adhesive

In this section, the installation procedures for ducts and vessels/tanks will be presented. Please always consider that the adhesive applied on the Aerofoam® rolls is a pressure sensitive adhesive (PSA), so that uniform pressure should be applied on the surface of the material for strong adhesion. In order to avoid having surfaces where the roll will not adhere to the duct due to the fact that not enough pressure was applied, it is recommended to use a roller or spatula to apply pressure on the material for a strong bond.

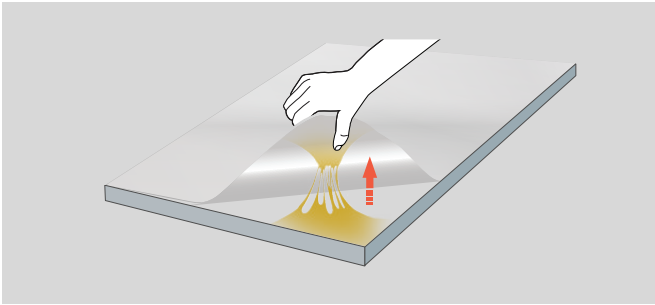
2.2.1. Wrap around procedure with self adhesive layer

This procedure is recommended only for Aerofoam® thickness upto 20 mm.

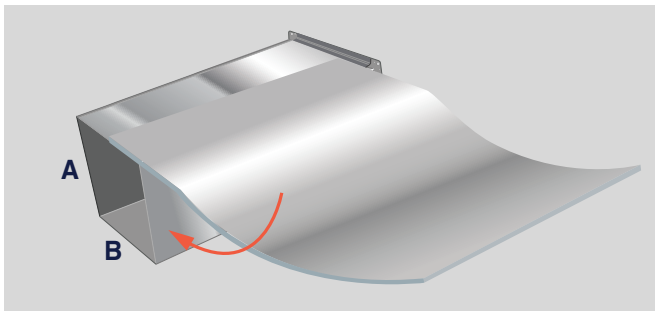
(a) Cut Aerofoam® insulation to the required length. Always allow 5 mm excess for final adjustment. Lay the duct on the flat stable surface. It is recommended to use soft sheet, board or any other suitable material to cover the work space to avoid damage to insulation. The required length of the insulation is:

$$L = 2A + 2B + 4x(\text{Thickness}) + 5 \text{ mm}.$$

The width of insulation should be slightly bigger than the length of the duct to achieve small compression on the flanges area.



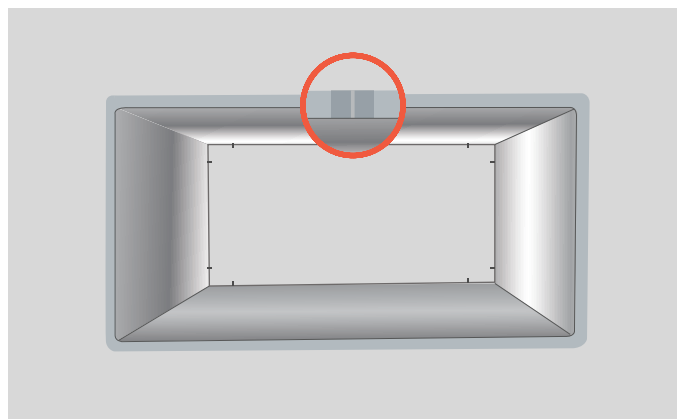
(b) Peel off a small section of around 100 mm of the protective liner. Start pasting from the top middle section of the duct. Press firmly for strong adhesion (PSA). There should be no air bubbles.



(c) Align the insulation edge with the edge of the duct and gently lower the sheet exposing only required adhesive. Pat the insulation firmly as it lays on the duct from the fixed edge moving to the other edge ensuring that the air is expelled and there are no air bubbles in between.

(d) Once one side is fixed, turn the duct to expose bare-side. Repeat until completely covered. Avoid pulling of the insulation on the edges to ensure the insulation thickness on the corners will be maintained the same.

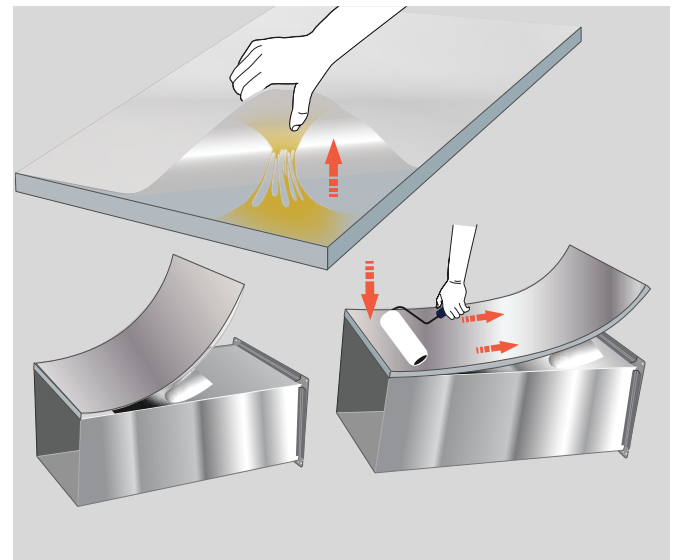
(e) Ensure the insulation length reaches the same level as the starting edge. Make sure that the connection between start and end of insulation layer meets in the middle (on the top of the duct). Cover the joint with suitable tape (follow point 2.1.1. (f) for details).



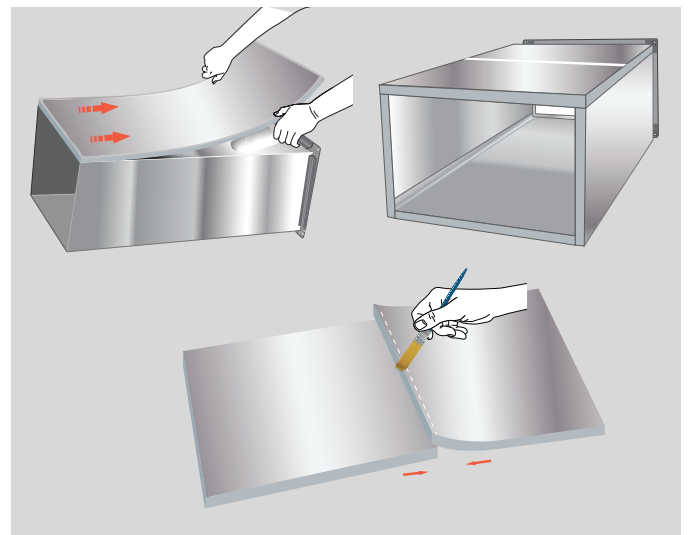
2.2.2. 4-Piece Procedure with self adhesive layer

The duct should be wiped with clean cloth to remove any dust particles, grease and oil by applying a methylated spirit or acetone (special glue cleaner) and allow them evaporating. Work within a reasonably clean area to avoid dust. This cleaning process should be followed for insulation jobs.

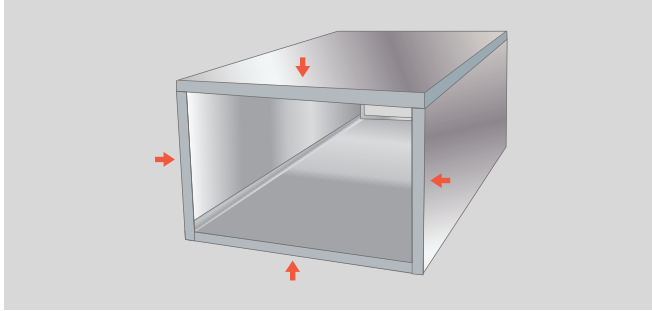
(a) Peel off a small section of around 100 mm of the protective liner. Start pasting from the flange edge of the duct. Press firmly for strong adhesion (PSA). There should be no air bubbles.



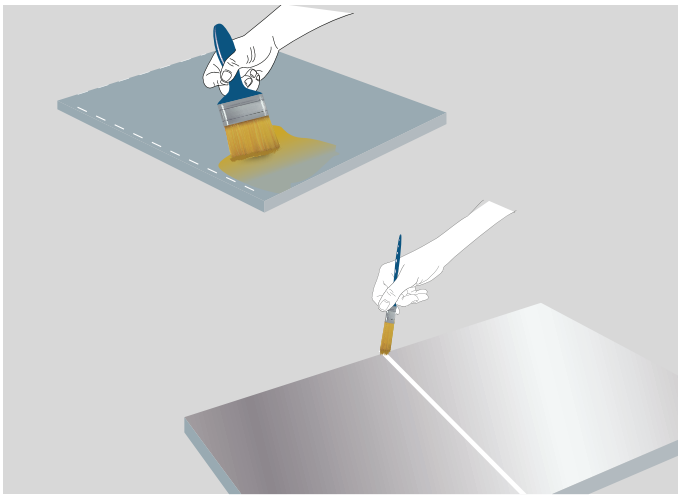
(b) Align the insulation edge with the edge of the duct and gently lower the sheet exposing only required adhesive. Pat the insulation firmly as it lays on the duct from the fixed edge moving to the other edge ensuring that the air is expelled. At butt joints, allow 5 mm overlap for compression. Then, apply glue to the compressed butt joint. Wait until adhesive is tack-dry (fingernail test) and joint the butt-joints together.



(c) During the installation process, pay special attention to the edges of insulation, keeping in mind that installation should be done with no gaps. Insulate according to the drawing below.



(d) For larger sections of ducts, in case if the joint of insulation is in the middle, consider cutting the rolls/sheets with extra length of 3 mm for compression. Apply the glue over the butt-joints and cover with dedicated tape.

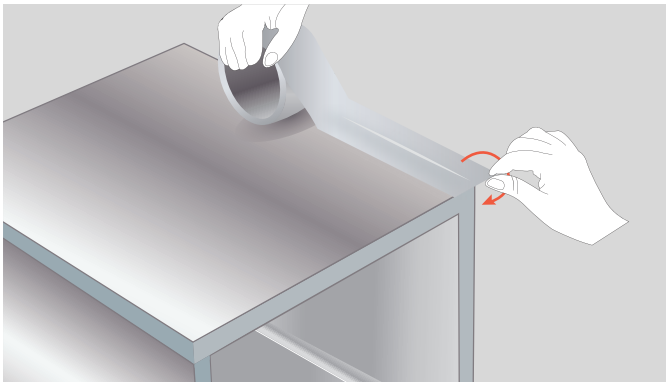


(e) It is recommended to apply Aerofoam® Tapes over all the edges. Use the recommended tape for each material type as per below:

Aerofoam® XLPE - Aerofoam® Alupet Tape

Aerofoam® XLPE N Clad - Aerofoam® N Clad Tape

Aerofoam® XF - Aerofoam® Aluminum Tape



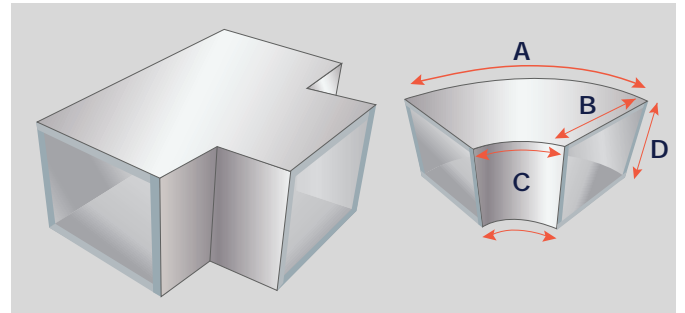
It is recommended to use below widths of tapes according to thickness of insulation to cover visible edges:

Width of Tapes	Thickness of Insulation
2" (50 mm)	Upto 20 mm
3" (75 mm)	From 20 mm to 40 mm
4" (100 mm)	>40 mm

2.3. Insulating Duct Elbow

The duct should be wiped with clean cloth to remove any dust particles, grease and oil by applying a methylated spirit or acetone (special glue cleaner) and allow them to evaporate. Work within a reasonably clean area to avoid dust. This cleaning process should be followed for insulation jobs.

Follow the order of installation as per below:



To measure the length of required insulation, cut off the piece/stripe of the material with the same thickness.

Using the stripe measure the length of external (A) and internal (C) radial surface marking both lengths on the stripe.

To measure the width (B) and height (D) of the duct, use measuring tape.

Transfer all the measurements into insulation sheet as shown on the drawing.

Cut the pieces accordingly with use of sharp knife. Glue the material into the previously prepared duct surface in the following order.

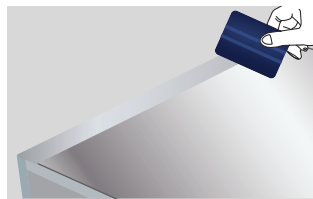
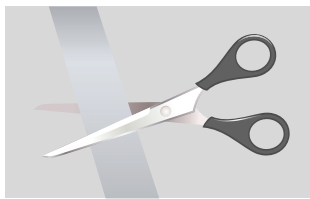
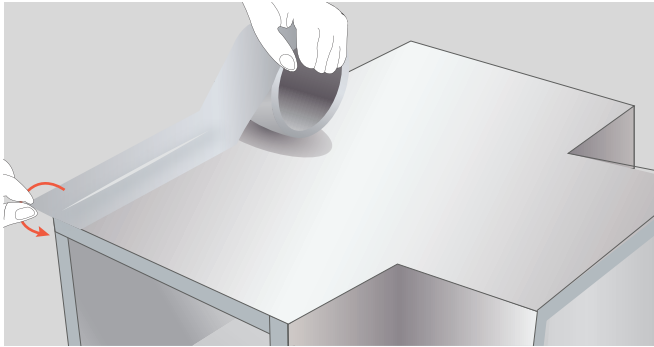
- 1: CD, AD
- 2: ABx2

Incase if you use non self-adhesive version of material, refer to section 2.1.1 (b) for glue application).

After application of inner and outer insulation, flip the elbow on the insulation sheet and mark the outer line of the edge.

Put special attention on the edges to be sealed well and use dedicated tape type for finishing. Refer to section 1.3.2 for details regarding suitable tapes.

Follow the drawing to cut the tape and shape it on the edges accordingly.



Note: In case of application of Aerofoam® XLPE N Clad, use additional silicone to cover the edge of the elbow which could not be covered with the tape.

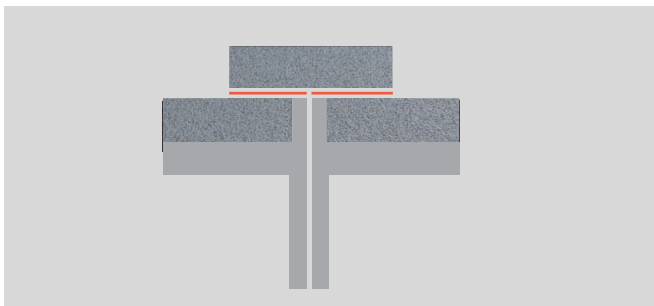
2.4. Insulating Duct Flanges with Aerofoam® Polyolefin Foam (XLPE, XF, XLPE N Clad)

Duct flanges shall be insulated with Aerofoam® Thermal Insulation Foam while using one out of 3 recommended options below:

2.4.1. With Aerofoam® Rolls/Sheets

In case if the thickness of insulation is the same as the height of the flange, it is recommended to use single strip method as described below:

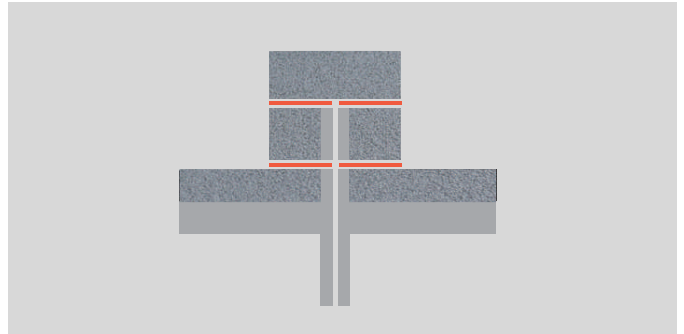
Single strip method - Four single strips applied to the insulation



(a) When the insulation thickness is matching the height of the flange, cover the top of the flange with the strip of the same insulation thickness, making sure that there are no gaps in between.

(b) Both variants of material can be used with or without self-adhesive. All joints shall be covered with dedicated tape.

Three-sided box method

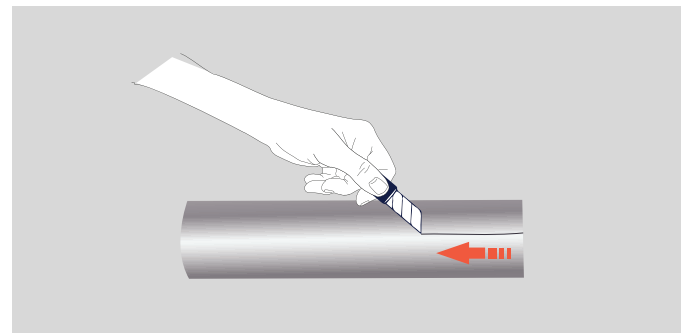


(a) When the insulation thickness is lower than the height of the flange, compensate the difference with stripes of the insulation on both sides. Then cover the top of the flange with the insulation of same thickness. All edges have to be covered with dedicated type of tape.

(b) Both variants of material can be used - with or without self-adhesive. All joints shall be covered with dedicated tape.

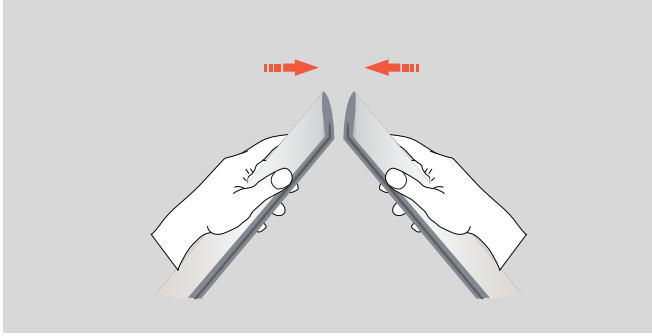
2.4.2. With Aerofoam® Tubes

(a) Using Aerofoam® tube with equal thickness as the attached main duct insulation thickness, split the tube with a sharp knife into two equal halves. If the tube is slit, please start with the next step. The tube ID size shall be selected based on the difference between insulation thickness and flange height. ID should be at least twice the size of the above mentioned difference.



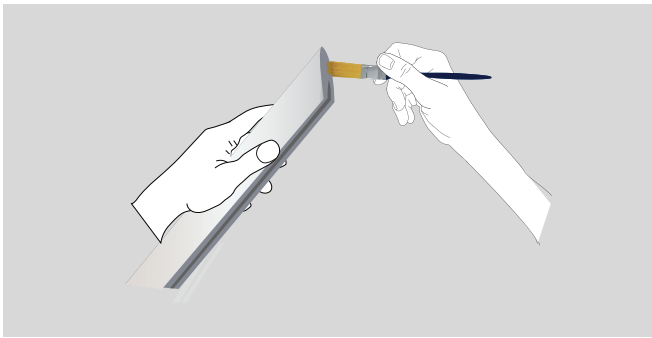
(b) Measure the four insulated sides of the duct flanges.

(c) Using a mitre box or the Aerofoam® template, cut the Aerofoam® tube as shown with a 45 degree angle. From the measurement, determine the length of the fitting and cut an opposite 45 degree angle as shown in the picture.

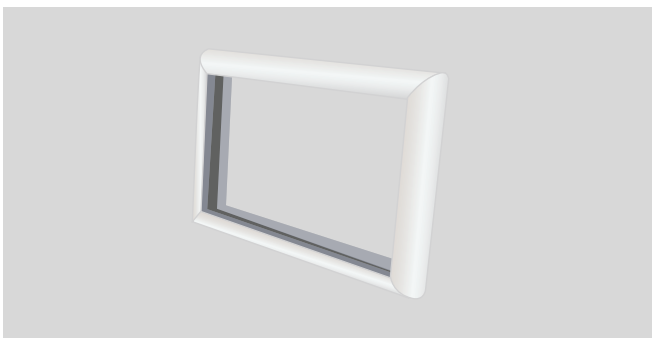


(d) Continue to cut the other 3 sides of the tube for picture frame fitting.

(e) Using Aerofoam® XLPE Glue, apply a thin even film with a brush to the three sets of 45-degree angles and over the linear joints.

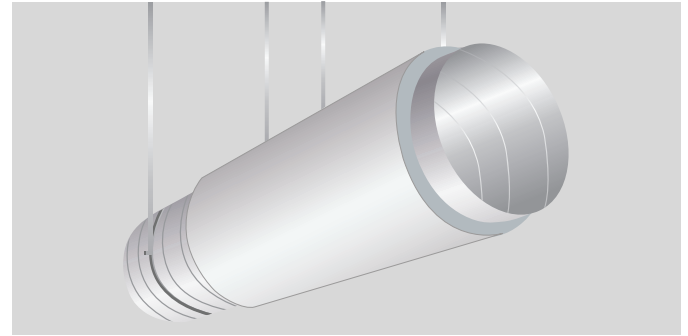


(f) Allow the adhesive to touch dry and fix the angles together by applying firm and even pressure for a good bond.



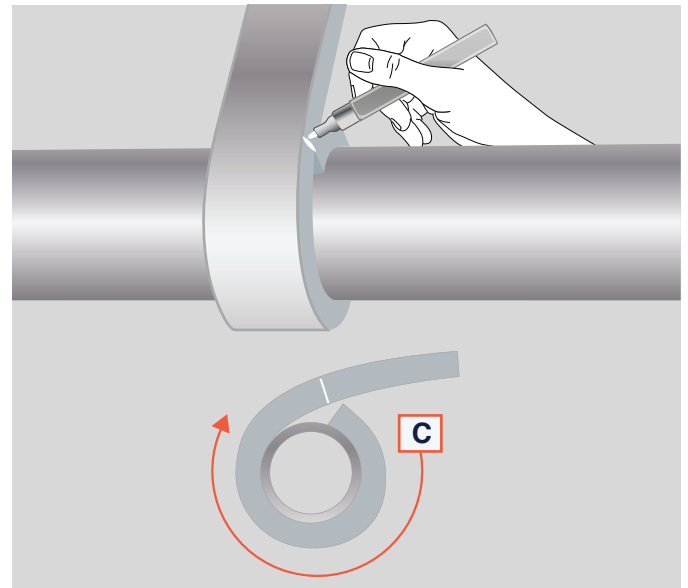
(g) Place the Aerofoam® tubes around the duct flange and apply the adhesive to the final angle cuts and bond to complete the fixing of the frame.

(h) To finish, apply the dedicated tape over all joints.



Apply the glue on the prepared surface of insulation (follow the glue application procedure).

Place the prepared insulation sheet over previously cleaned duct surface (refer to the duct preparation procedure).



Once all above-mentioned processes are completed apply dedicated tape over each joint.

2.5.2. Circular Duct – Elbow

Following the below drawing, measure the three points of width (B, C, D) and length/circumference (A) of the segments.

Apply the measurement onto the thermal insulation sheet and cut the required pieces precisely.

Number of segments depends on pipe diameters, thickness of insulation and radius of the elbow.

We recommend to use pre-made fittings "Aerofittings".

Please contact Aerofoam Technical Department for further information.

2.5. Insulating Circular Ducts with Aerofoam® XLPE

2.5.1. Circular Duct - Straight Section

Measure the external circumference of the duct with the strip of the thermal insulation material. Mark the circumference and transfer the dimension into the insulation surface to cut the matching piece.

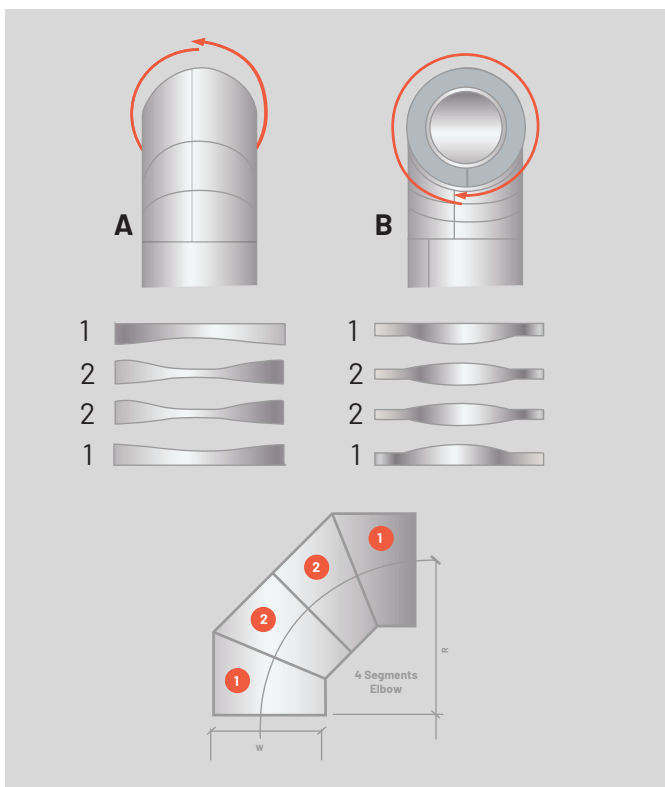
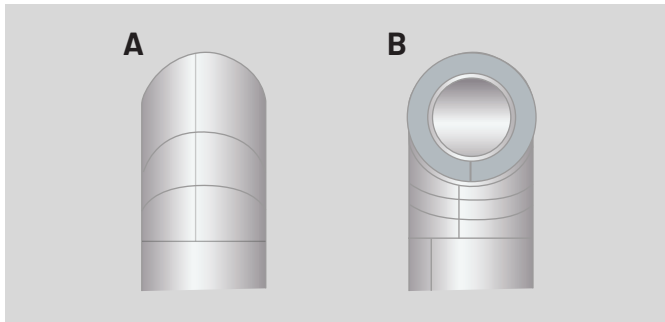
(A) Circumference of the elbow including thermal insulation thickness

(B) Inner width of the segment

(C) Outer width of the segment

(D) Intermedia width of the segment

Once all above-mentioned processes are complete, apply dedicated glue over each piece, cover the duct accordingly and seal the joints with recommended tape.



Number of segments depends on the radius of the elbow and may increase with the radius.

2.6. Hangers/Supporting Channels

If the duct is fixed on a hanger, please read below:

The hangers are suitable for the installation of Aerofoam®. If the duct is insulated before it is installed, the hanger base must be lined with foam of the same thickness of Aerofoam® to protect against compression. Depending on the size/load of the duct, thickness of the XLPE foam on the channels should not be less than 12 mm.

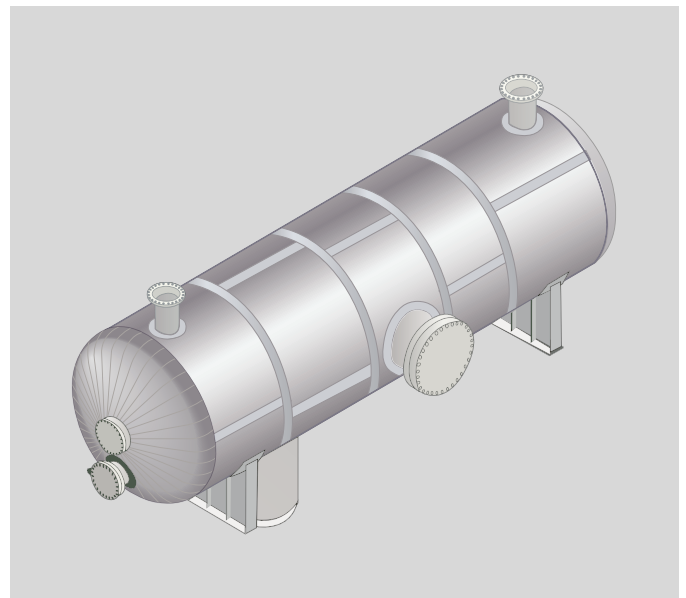
3. Insulating Vessels & Tanks

Before you proceed with installation, follow chapter 1. General information, for details regarding preparation for installation and necessary accessories.

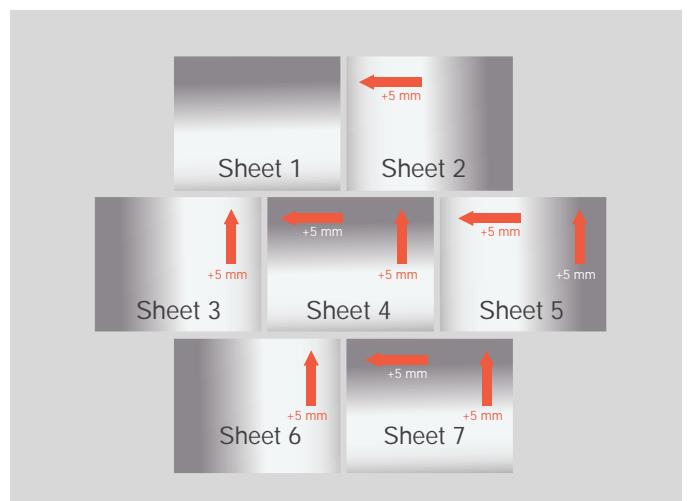
3.1. Insulating Vessels & Tanks with Aerofoam®

To cover the required surface of the sides of vessel/tank, it is necessary to cut the sections of Aerofoam® while considering openings for supply and return along with control accessories. Apply cut sections over the required areas and seal it with Aerofoam® XLPE Glue and cover the joints with dedicated tape.

It is recommended to seal all openings for control accessories supply and return with silicone. In case of outdoor application, silicone must be UV resistant.



In case of large size of vessels/tanks, it is recommended to use below application order to minimize tension between segments:

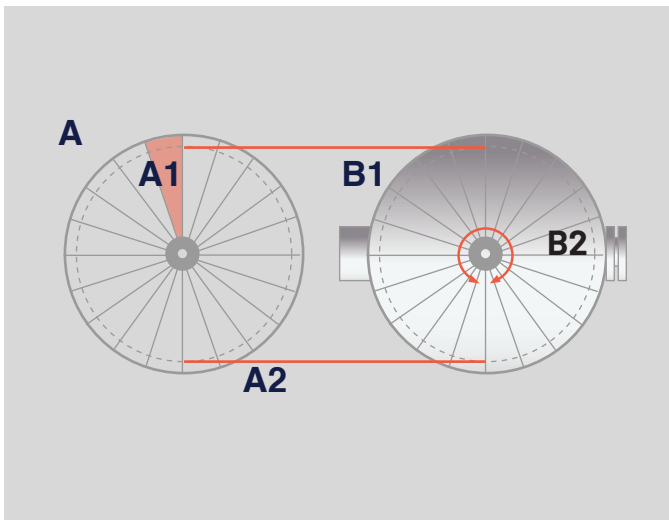


Following the drawing below, cut out segments of Aerofoam® sheet which will be enough to complete the covering of the top of the tank. Use dedicated adhesive between segments and the surface of the tank and cover the joints with dedicated tape.

The radius of the insulation on the top of the tank should cover the edge of insulation applied on the sides.

Follow the same process to cover the bottom, considering possible differences in the measurements.

The edges of the insulation on the sides must cover the insulation edge installed on the bottom.



4. Pipework Insulation

Before you proceed with installation, follow chapter 1. General information, for details regarding preparation for installation and necessary accessories.

4.1. Insulating Pipes using Aerofoam® Tubes

All pipeline should be free of rust, dust, grease and oil. To clean the pipe, first wipe with a clean cloth to remove any particles. Then, remove grease and oil by applying a methylated spirit or acetone (special glue cleaner) and allow them evaporating. Work within a reasonably clean area to avoid dusty areas and to achieve the highest bonding power of adhesive.

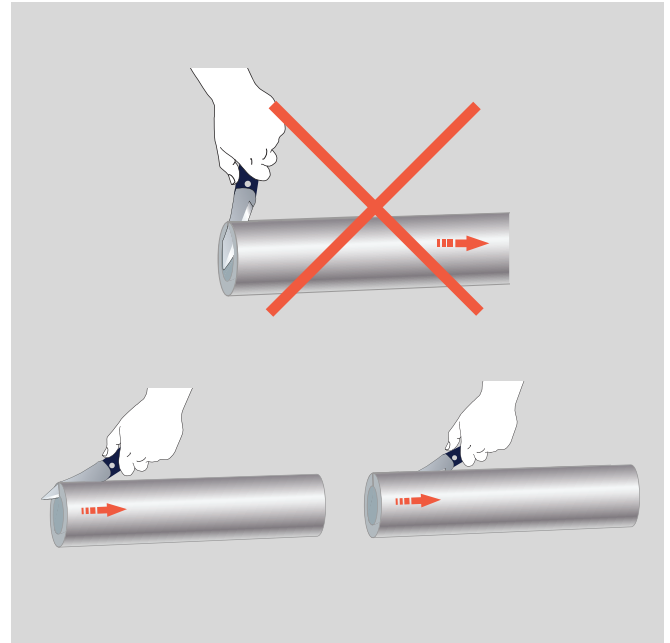
It is recommended to start the insulation work in the below order:

- (1) Elbows, Tee joints, Valves, Flanges, Filters
- (2) Straight pipe sections

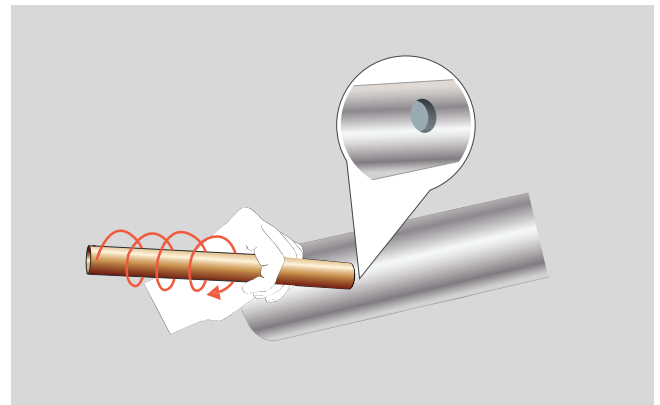
4.1.1. Cutting Aerofoam® Tubes

To cut the Aerofoam® Tubes, it is necessary to use appropriate accessories and tools. Refer to the section 1.2 and 1.3.

In case of non-slitted tubes, use sharp knife. Keep knife at a low angle when slitting tube to avoid damaging the inner skin of the tube.



To make holes, use sharpened off-cuts of pipes:

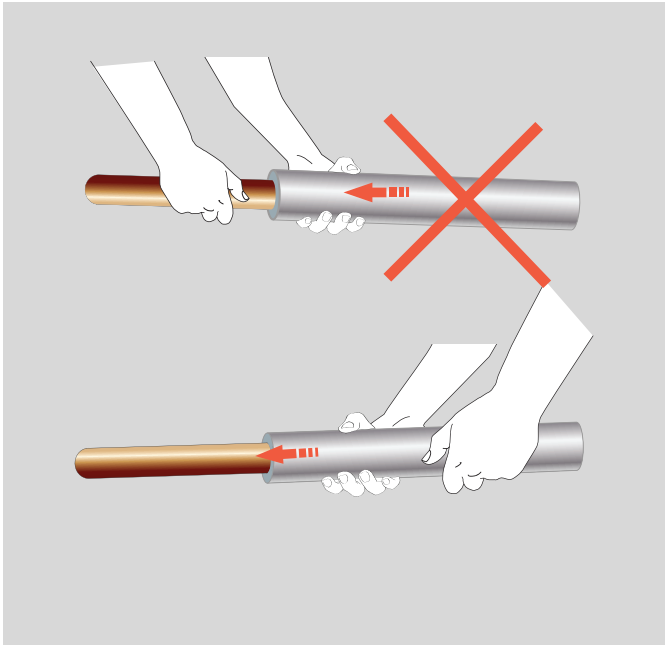


4.1.2. Insulating Pipes by Sleeving-On

Aerofoam® Tubes can be slid on the straight pipe sections without slitting and gluing.

In case if sleeving-on causes friction, it is possible to use mild lubricant to ease the work. In such case, make sure that the excess of lubricant is removed from joints to be glued.

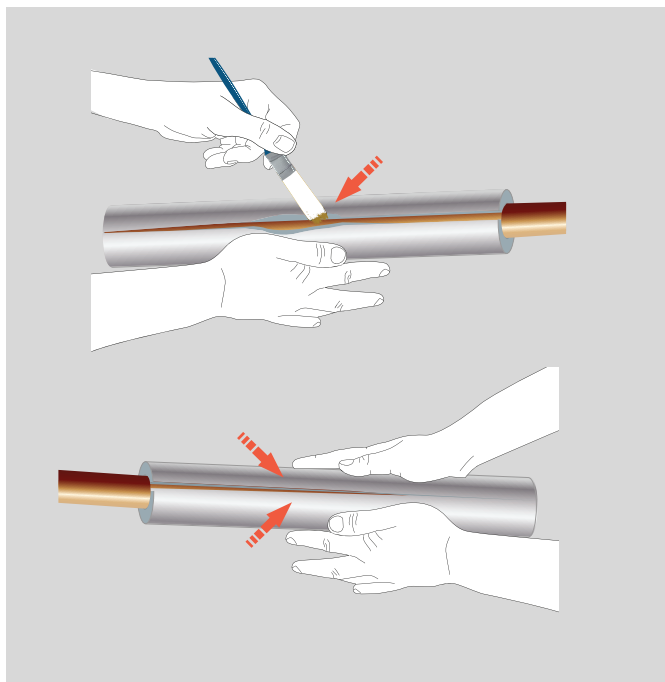
Always push the Aerofoam® tube over the pipe as shown below:



4.1.3. Insulating Pipes by Snap-On

In case if the tube is un-slitted, use sharp knife to slit the tube along the entire length.

Place the slit tube onto the clean pipe and apply Aerofoam® system/approved adhesive on both of the cut edges with a thin even layer of adhesive using a brush.

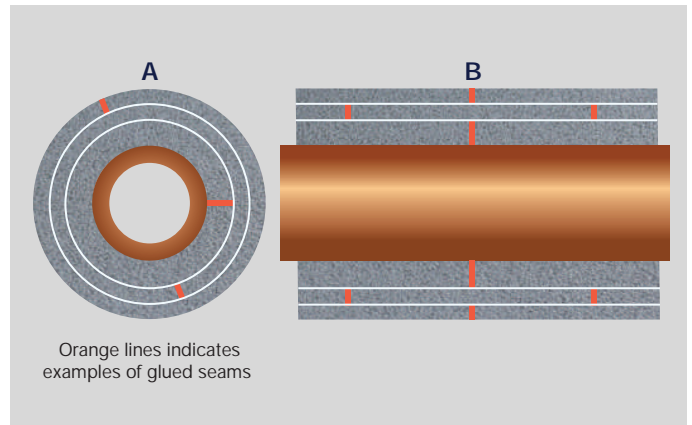


4.1.4. Multilayer Insulation of Pipes

Multilayer insulation gives you a chance to obtain desired thickness and to relieve mechanical tension of the thermal insulation. Selection of thickness of each layer should consider mechanical properties of the insulation. First layer of installed tube should not exceed thickness of 50 mm for all available diameters. Following layers should not exceed thickness of 25 mm. It is recommended to use several layers with lower thicknesses instead of lower number of layers with higher thicknesses.

Joints of each insulation layer should not be placed one above the other (follow the drawing A below).

The butt-to-butt joints need to be covered by following layer (follow the drawing B below).



There is no need to cover entire surface with adhesive, if following layers are glued in the beginning and end of each section and well sealed without air gaps.

All joints shall be sealed with dedicated Aerofoam® Tape.

Multilayer insulation can be a combination of tubes or tubes and sheets (depending on the diameter and selected thicknesses of insulation as mentioned above).

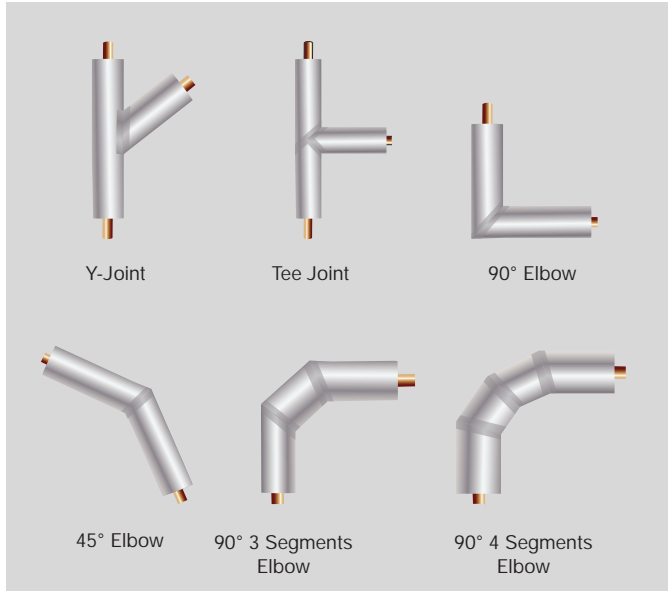
In case of the insulation with tubes only, the inside diameter of the second tube should be selected according to the maximum outer diameter of the first layer. The thickness selection should be done carefully to avoid any air gaps between the layers.

In case of insulation with tubes and sheets, it is recommended to use the tube as a first layer of insulation, following the second layer with sheets for ease of installation, strictly following the maximum thicknesses of each layer as mentioned above. It is not recommended to use sheets with self-adhesive layer.

4.2. Using Factory Made AeroFittings

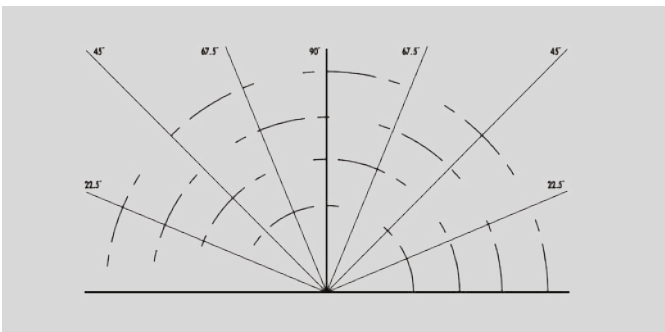
It is recommended to use AeroFittings for best quality and ease of installation.

Aerofoam® system/approve adhesive and dedicated Tape must be applied on all joints just like pipe sections.



4.3. Using the Aerofoam® Template

The fabrication of bends and tees using Aerofoam® Tubes requires the tubes to be cut in different angles. In order to make this process easier and quicker, Aerofoam® Template should be used.



Printed copy of the Aerofoam® Template should be placed face up on a table. Line a tube of Aerofoam® across the template parallel along the horizontal base line. Select the required angle cut from the template and cut along this line.

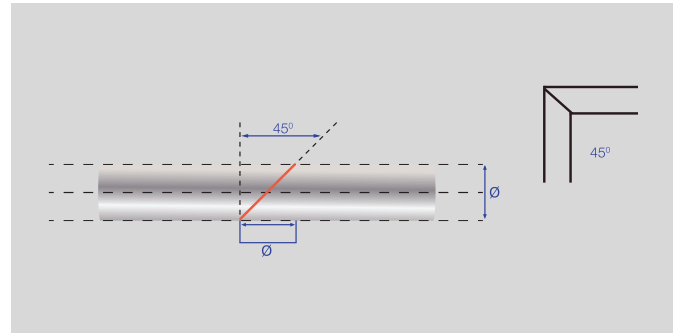
4.4. Detailed Drawings for Fabrication of Fittings

We recommend to use pre-made fittings "Aerofittings". Please contact Aerofoam® Technical Support for further information.

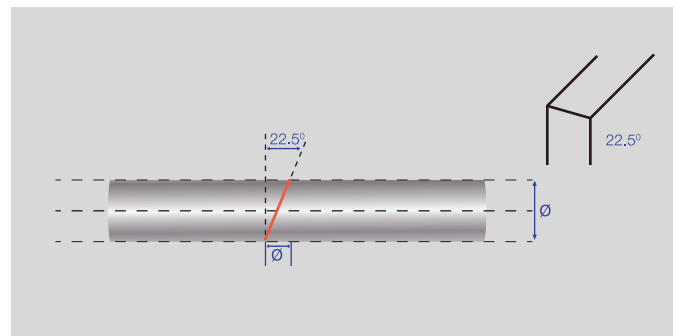
To prepare the insulation material for pipe fitting, it is recommended to follow below drawings. The orange

lines indicate areas where the cut shall be made. Use Aerofoam® template for correct placement and measurement of cuts.

(i) Bend with 90° angle



(ii) Bend with 45° angle



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

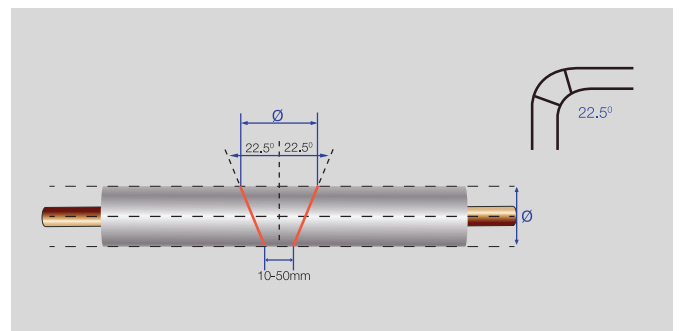
a. To obtain the 22.5°, use Aerofoam® template or cut the tube in an angle to achieve one-third of the outer diameter of the insulation.

b. Apply Aerofoam® Adhesive on both surfaces of the 45° cut.

c. Join both ends firmly.

d. Apply dedicated Aerofoam® Tape on each joint.

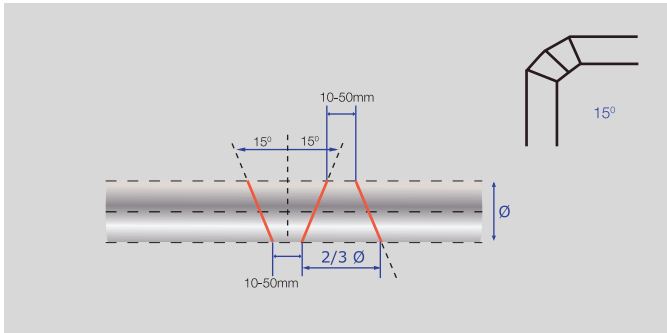
(iii) Segmented bend with 1 middle part



a. To obtain the 22.5°, use Aerofoam® template or cut the tube in an angle with spacing of 10-15 mm for the middle piece.

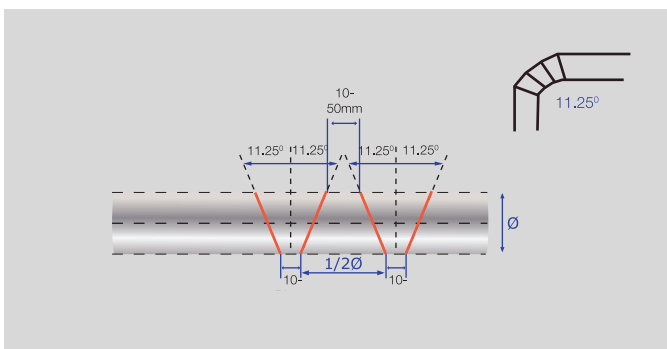
- b. Apply Aerofoam® Adhesive on both surfaces of the angle ends.
- c. Join both ends firmly.
- d. Apply dedicated Aerofoam® Tape on each joint.

(iv) Segmented bend with 2 middle part



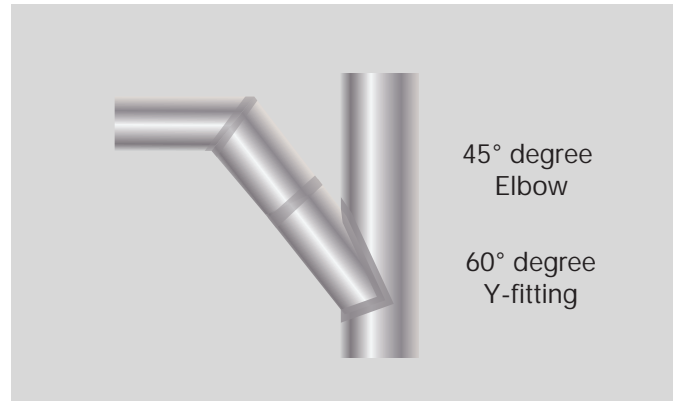
- a. To obtain the 15°, use meter box or cut the tube in an angle with spacing of 10-15 mm for the middle piece.
- b. Apply Aerofoam® Adhesive on both surfaces of the angle ends.
- c. Join both ends firmly.
- d. Apply dedicated Aerofoam® Tape on each joint.

(v) Segmented bend with 3 middle parts



- a. To obtain the 11.25°, use meter box or cut the tube in pieces.
- b. Apply Aerofoam® Adhesive on both surfaces of the angle ends.
- c. Join both ends firmly.
- d. Apply dedicated Aerofoam® Tape on each joint.

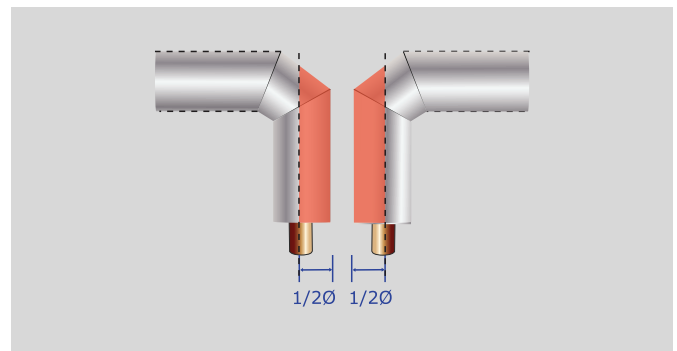
(vi) Y-Tube



Further fabrication of the 45° bend (2 times) and the 90° bend (once)

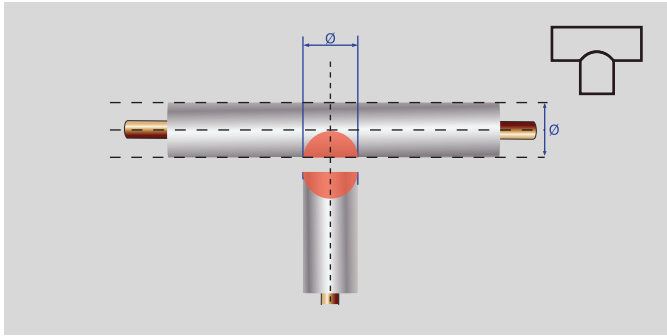
- a. Follow the steps described at "Bend with 45° angle" to create 2 elbows of 45°.
- b. Follow the steps described at "Bend with 90° angle" to create one elbow of 90° from the 2 elbows of 45°.
- c. Cut the 90° elbow as indicated in the drawing, after measuring it.
- d. Apply Aerofoam® Adhesive on the surfaces of the cut areas and on the tube end. Join both ends firmly.
- e. Apply dedicated Aerofoam® Tape on each joint.

(vii) Swept T-piece



- a. Follow the steps described at "Segmented bend with 1 middle part" to create 2 elbows of 90°.
- b. Cut both elbows as indicated in the drawing, after measuring them.
- c. Apply Aerofoam® Adhesive on both surfaces of cut areas. Join both ends firmly.
- d. Apply dedicated Aerofoam® Tape on each joint.

(viii) Angle T-piece



a. Cut two 45° angles at the end of the tube section for the branching pipe as shown using Aerofoam® Template.

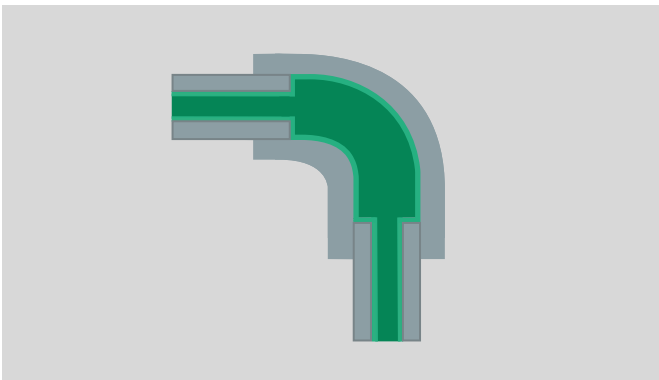
b. Cut a 90° wedge into the tube section covering the primary pipe. This should correspond to the outer diameter of the branching tube.

c. Join the pre-cut parts with adhesive to form a "T".

d. Slit the formed piece sideways with a sharp knife, apply Aerofoam® Adhesive to seams and fit when tack-dry.

e. Use maximum 1 cm width of tape to covered the joint or alternatively silver color silicon.

(ix) Insulating coupling pipe joints

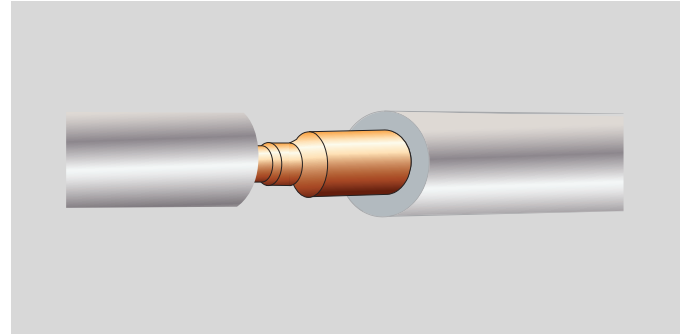


a. Insulate the pipe with tube section up to the plastic/steel pipe fitting and secure to the pipe using Aerofoam® Adhesive.

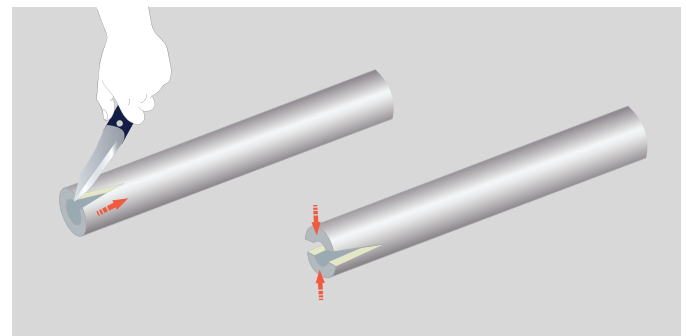
b. The fitting cover is made from insulation tube with internal diameter equal to outer diameter of incoming tube including thickness of thermal insulation. Minimum of 25 mm overlap shall be provided on each side. To create the fitting, you can also follow the process described in the point 4.4 (i).

(x) Pipe Reducer

Pipe Reducer that has to be insulated is shown below:

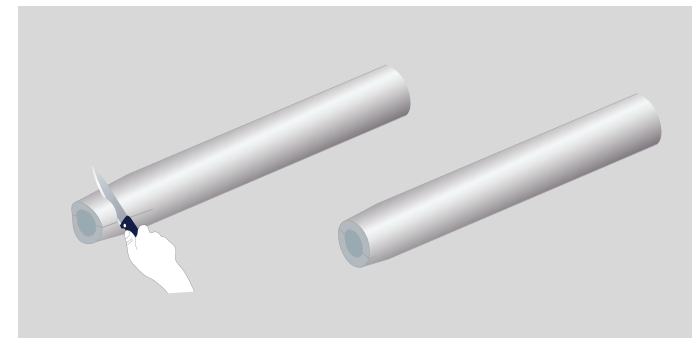


(a) Cut out segments from a tube of the larger diameter and glue seams with Aerofoam® Adhesive.



(b) Cut it to the size of the reducer. Slit fitting on the flat side. For bigger reduction of the tube, the cutting shall be done every 90°.

(c) Close the slitted cut and add adhesive on all open sides.



(d) Install and glue seam and butt joints.

(e) Apply dedicated type of Aerofoam® Tape on the joints.

Note: Depending on the diameter and thickness of insulation the number of cuts can be made to obtain right shape of reducer.

5. Insulating Large Pipes with Aerofoam® XLPE/XF/XLPE N Clad Rolls

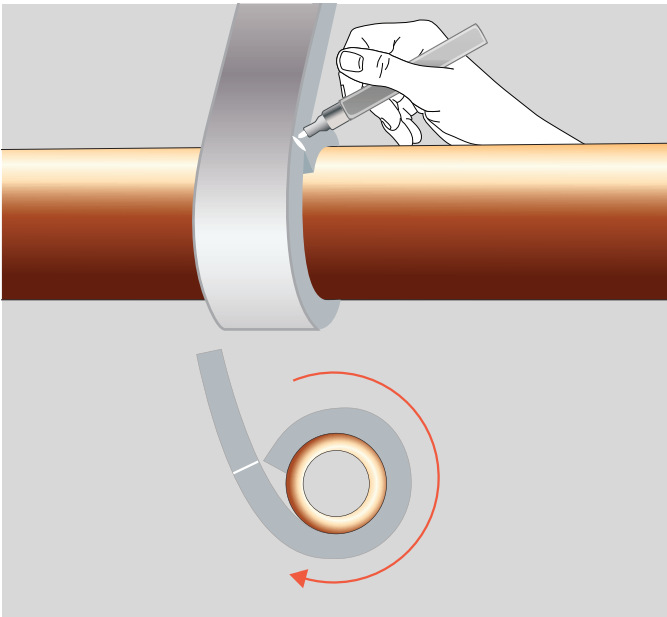
Recommended maximum thicknesses of Aerofoam® XLPE/XF/ XLPE N Clad Rolls/Sheets for insulation of large pipes:

Thermal Insulation thickness	Pipe Outer Diameter								
	323 mm	355 mm	406 mm	457 mm	508 mm	559 mm	610 mm	660 mm	>711 mm
12 mm	X	X	X	X	X	X	X	X	X
15 mm		X	X	X	X	X	X	X	X
20 mm					X	X	X	X	X
25 mm							X	X	X

It is not recommended to use Aerofoam® XLPE/XF/XLPE N Clad Rolls/Sheets with higher thicknesses to insulate pipes. If the higher thickness is necessary to be used, it is highly recommended to use Aerofoam® XLPE/XF/XLPE N Clad tubes only or multilayer combination of tubes and sheets.

5.1.1. Insulating Large Diameters of Pipes

(a) Determine the circumference of the pipe by using Aerofoam® XLPE/XF/XLPE N Clad stripe with the same thickness as the selected insulation.



(b) Cut Aerofoam® XLPE/XF/XLPE N clad sheet to the required size. Apply Aerofoam® Adhesive over the whole surface (side without aluminum foil facer only). Conditionally, if beginning and end of the section are properly glued and sealed, it is also acceptable (when no gaps between pipe and insulation are present).

(c) Press together at the ends and in the middle. Make sure that the entire seam is closed without any gap. Apply dedicated type of Aerofoam® Tape over all joints.

5.1.2. Step by Step Guides for the Fabrication of valve casing

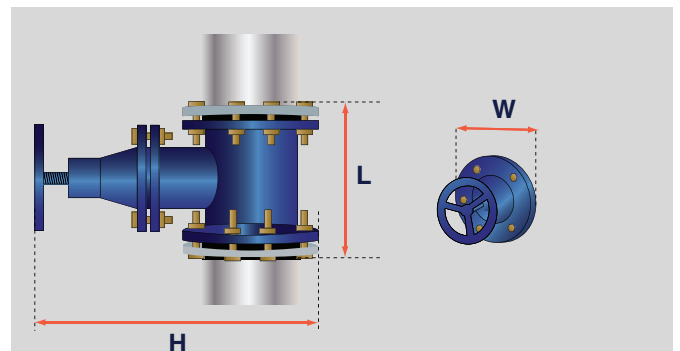
(a) Valve insulation with D-Box

Take following measurements:

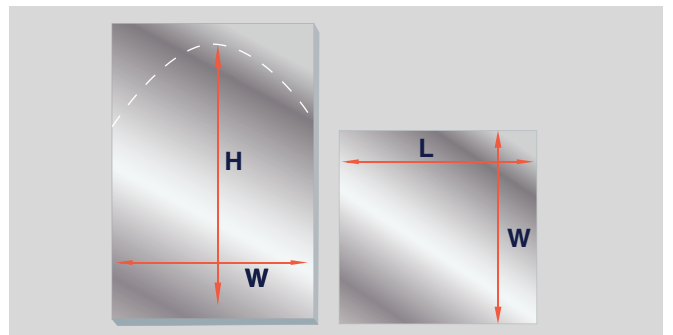
L - length of valve + 2 x thickness of insulation

H - height of valve + 2 x thickness of insulation

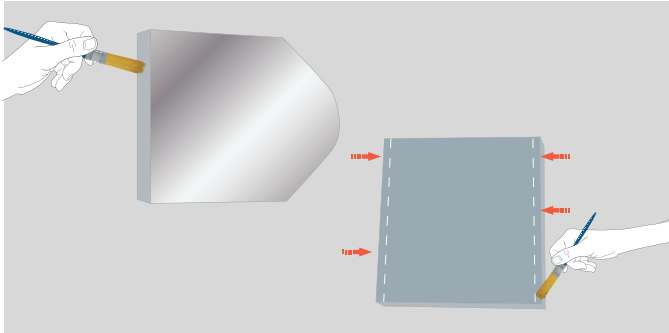
W - Ø (diameter) + 10 mm



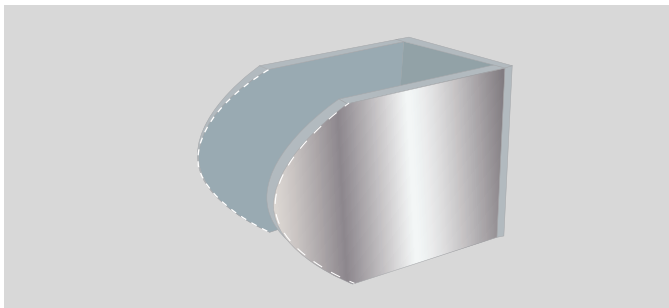
Mark out and fabricate 2 pieces for end panels and 1 piece for top panel using the measurements made in the previous step. Cut out the indicated pieces using a sharp knife.



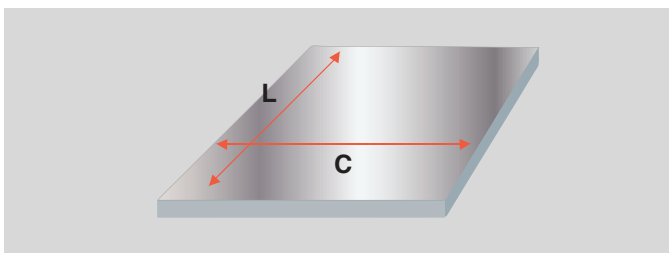
Apply Aerofoam® Adhesive along the edges as indicated in the picture.



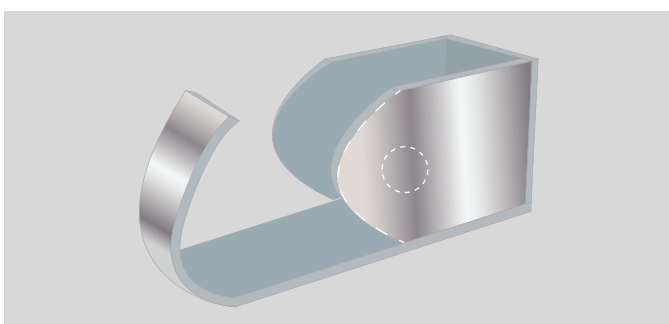
Glue the top edges of the end panels and the top panel edge. Fix the end panels to the top panel making sure that edges are in-line.



Use a strip of Aerofoam® XLPE/XF/XLPE N Clad to determine the circumference around one-end panel (including the top panel). Mark measurement (L) and circumference (C) and cut the panel to size. Apply Aerofoam® Adhesive to the panel-end and the panel edges as shown.



Gently roll the panel edges around the end-panels until the cover panel resembles a box. Ensure that the edges are in-line.



Continue to fix all edges in the same way. Cut holes for the insulated piping connections on each of the end panels and a final cut-out for the valve spindle connection at the top. Split the box into two halves and fit around the valve. Apply Aerofoam® Adhesive to the fixing seams, allow to touch dry and fix the seams together. Apply dedicated type of Aerofoam® Tape over all joints and seams.

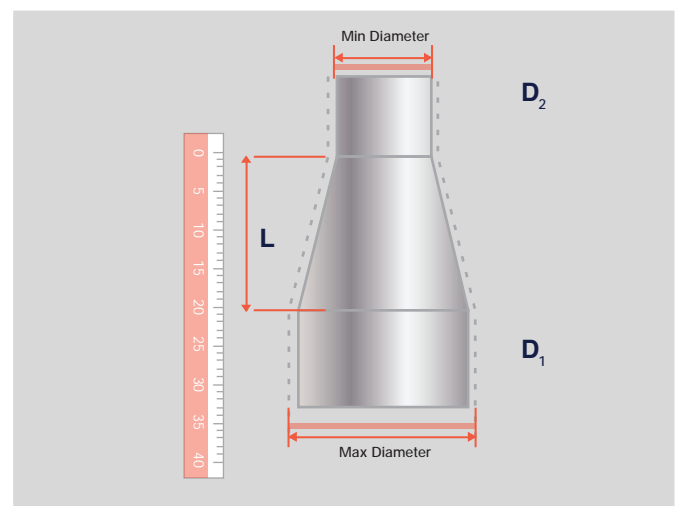
(b) Concentric reducers

Determine the following measurements:

L – length of the reducer

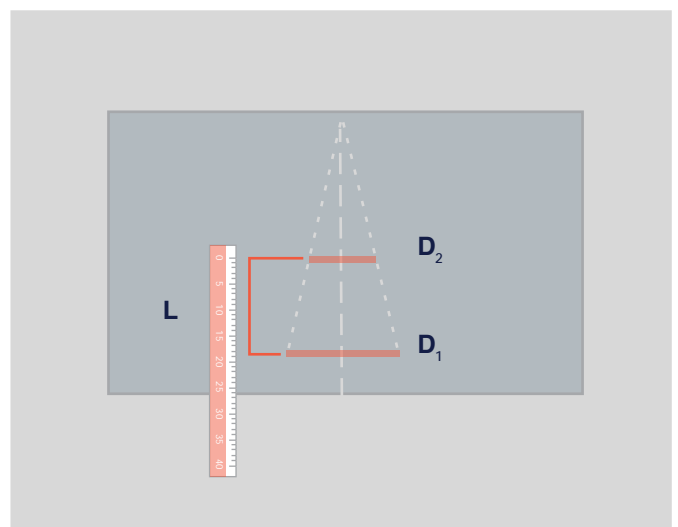
D_1 – diameter of larger pipe + 2 x insulation thickness

D_2 – diameter of smaller pipe + 2 x insulation thickness



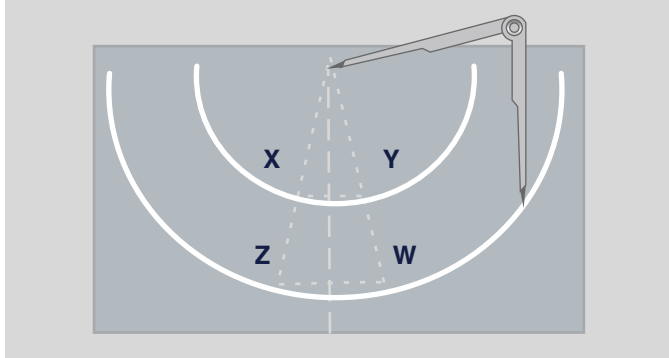
Mark out the Aerofoam® Sheet with a center line.

D_1 and D_2 are marked off at each end, as shown in the drawing below (yellow lines). The distance between lines D_1 and D_2 is length L.



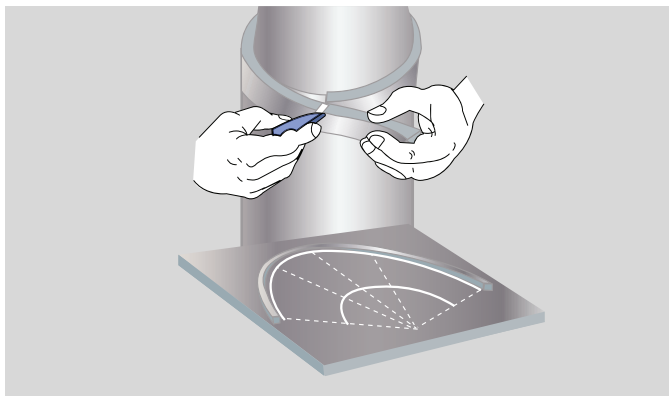
Strike two arches from the highest point, connecting marked ends as shown on the drawing.

From the highest point, strike two arches through X-Y and W-Z. Determine the circumference C (of the large pipe) and c (of the small pipe).



Always take the measurement with the strip of Aerofoam® XLPE / XF / XLPE N Clad with the same thickness to be used for insulation purposes.

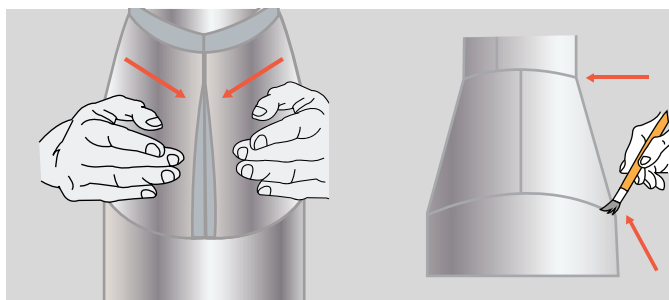
Transfer two circumferences (smaller and bigger) by using two strips to measure the circumference of the reducers and mark final dimensions on the insulation sheet.



Cut out the reducer piece with a sharp knife.

Apply thin coat of Aerofoam® Adhesive to the whole insulation surface (side without aluminum foil facer). Allow to tack dry. Press together firmly at one end, then at the other end and seal the joint. Complete the process by insulating the pipes on both sides of the reducer. Apply dedicated Aerofoam® Tape on all the joints and seams.

Note: Cut the edge and adjust the angle before gluing to the next section using a sharp knife and metal band.



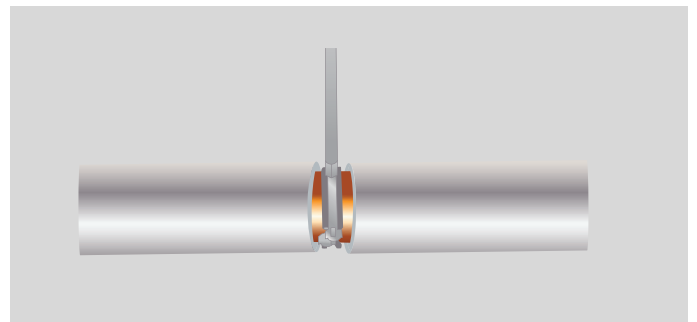
6. Insulating Pipe Supports

I. Insulating "over" the Pipe Brackets

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

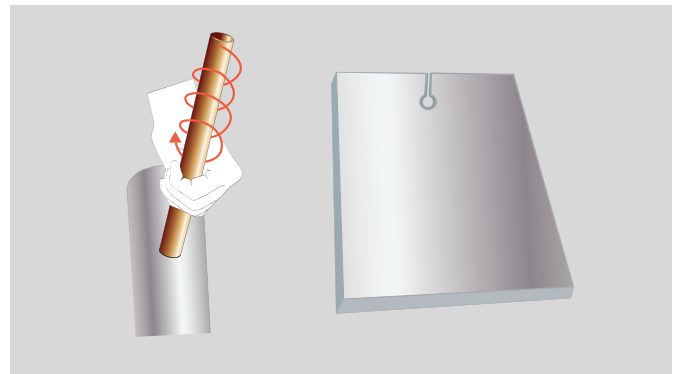
(a) Install Aerofoam® XLPE tube as close to the fixing bracket as possible. Seal the end of the tube to the pipe with Aerofoam® Adhesive and dedicated Aerofoam® Tape.

In case of cold lines, insulate the fixing bracket with a relevant Aerofoam® XLPE / XF / XLPE N Clad tube.

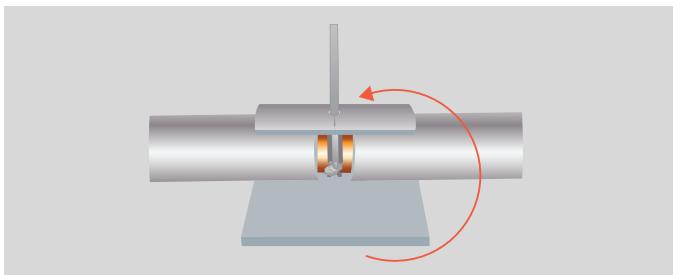


(b) With a large off-cut of Aerofoam® Tube, cut out the small hole (equal to rod diameter) to allow for the threaded rod support of the bracket and slit with a small sharp knife along the flat face of the tube.

Make sure that same insulation thickness as in point (a) is being used.



(c) Place the Aerofoam® cover over the support area, mark and cut the true circumference of the cover. Fix and seal all seams and joints in and around the attached insulation using Aerofoam® Adhesive.



Note: Distance between insulation and clamp should be reduced to minimum to avoid air gaps.

II. Insulation of Pipe Supports insert

The chosen pipe hanging systems are often made of PUR/PIR/wood/rubber core. It is important to maintain a vapor tight bonding between thermal inserts in the supporting clamps and the Aerofoam® insulation. Follow below steps to avoid thermal bridges:

(a) Apply Aerofoam® Adhesive on the clean surface. Allow to touch dry.

(b) Apply second layer of Aerofoam® Adhesive on both surfaces of the clamps and joints.

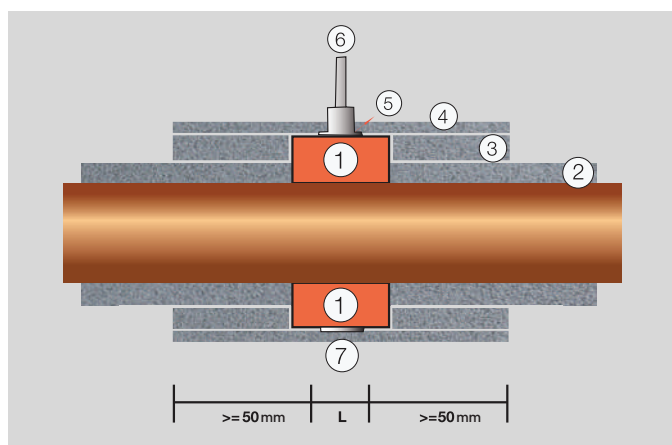
(c) Once the adhesive is cured, press all joints together.

(d) If necessary, double the Aerofoam® thickness to the diameter of the PUR/PIR/wood/rubber core support. To secure the butt joints, apply and overlap a strip of Aerofoam® using adhesive all over it.

(e) All surfaces of the clamp as well as in-between the insulation layers must be covered with adhesive.

Cross section of a connection of Aerofoam® tubes with a clamp made of PUR/PIR/wood/rubber core:

1. Clamp with thermal insert
2. Aerofoam® tube
3. Aerofoam® tube/sheet (optional if insulation thickness is smaller than the insert)
4. Aerofoam® insulation top cover
5. Mounting nut
6. Threaded rod
7. Metal clamp



6.1. Aerofoam® with Additional Metal Cladding

It is necessary to protect Aerofoam® from mechanical damage and UV radiation (in outdoor application) with an additional layer of metal cladding. If such cladding is used, it must be considered that the

metal cladding may influence the insulation thickness requirement. In particular, the altered surface emissivity will impact on the surfaces coefficient of heat transfer to be used in calculations. It is considered as the best practice to install the metal cladding directly onto the Aerofoam®, leaving no air gap. Since fixing screws will be directly inserted into Aerofoam®, thermal bridges will be created and the insulation wall thickness may have 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 Aerofoam® as a distance holder. In addition, a 10 mm drilling with differences of 300 mm at a maximum on the underside of the cladding should be carried out.

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

6.2. Installation of Aerofoam® Insulation in the Soil

Pressure of soil backfilled on top of the Aerofoam® XLPE will cause compression of the material impacting on the insulation wall thickness. It is recommended that Aerofoam® XLPE be shielded from compression by sleeving the insulated pipe into a rigid soil or wastewater drainage pipe.

Prevent compression of flexible cellular material due to contact with the outer protective pipe by selecting drainpipe whose bore is sufficiently larger than the outer diameter of the insulated pipe assembly which is to be inserted.

Ensure the outer protective pipe is fully supported. For example, by having full intimate contact with the surrounding soil to prevent breaks occurring in the drainpipe joints and connections are particularly vulnerable to these kinds of events.

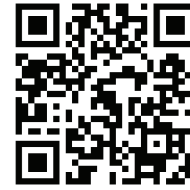
6.3. Installation of Aerofoam® Insulation on Plastic

Aerofoam® insulation materials and Aerofoam® Adhesive are compatible with most plastic pipe materials which are used for industrial and building service equipment.

On pipes made of PVC-C, PE-Xa, PEX-AL-PEX and PE-HD plastics, Aerofoam® XLPE can simply be installed in the same way as on metal pipes. However, when bonding Aerofoam® XLPE 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, it is recommended to perform a roughening of the plastic where the partition bonding is to be carried out.

When Aerofoam® is glued to ABS pipes, solvent from the Aerofoam® Adhesive may be trapped. During the aging process of the ABS plastic, this can lead to hair cracks in the pipes. Therefore, do not apply self-adhesive rubber foam tape on direct partition bonds where the partition is to be created and then carried out.

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.



[Aerofoam® Youtube Channel](#)

Compatibility of Aerofoam® and Adhesive with Plastic Pipes

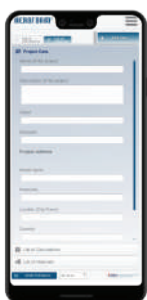
Plastic Pipe	Compatibility	Comments
PVC-C	YES	-
PE-C	YES	-
PE-HD	YES	-
PEX-AL-PEX	YES	-
PP	YES	To improve bonding, e.g. where partition bonds are to be carried out, first roughen the plastic.
ABS	YES	In the case of partition bonding, first apply self-adhesive rubber foam tape where the partition is to be created, then carry out partition bonding.



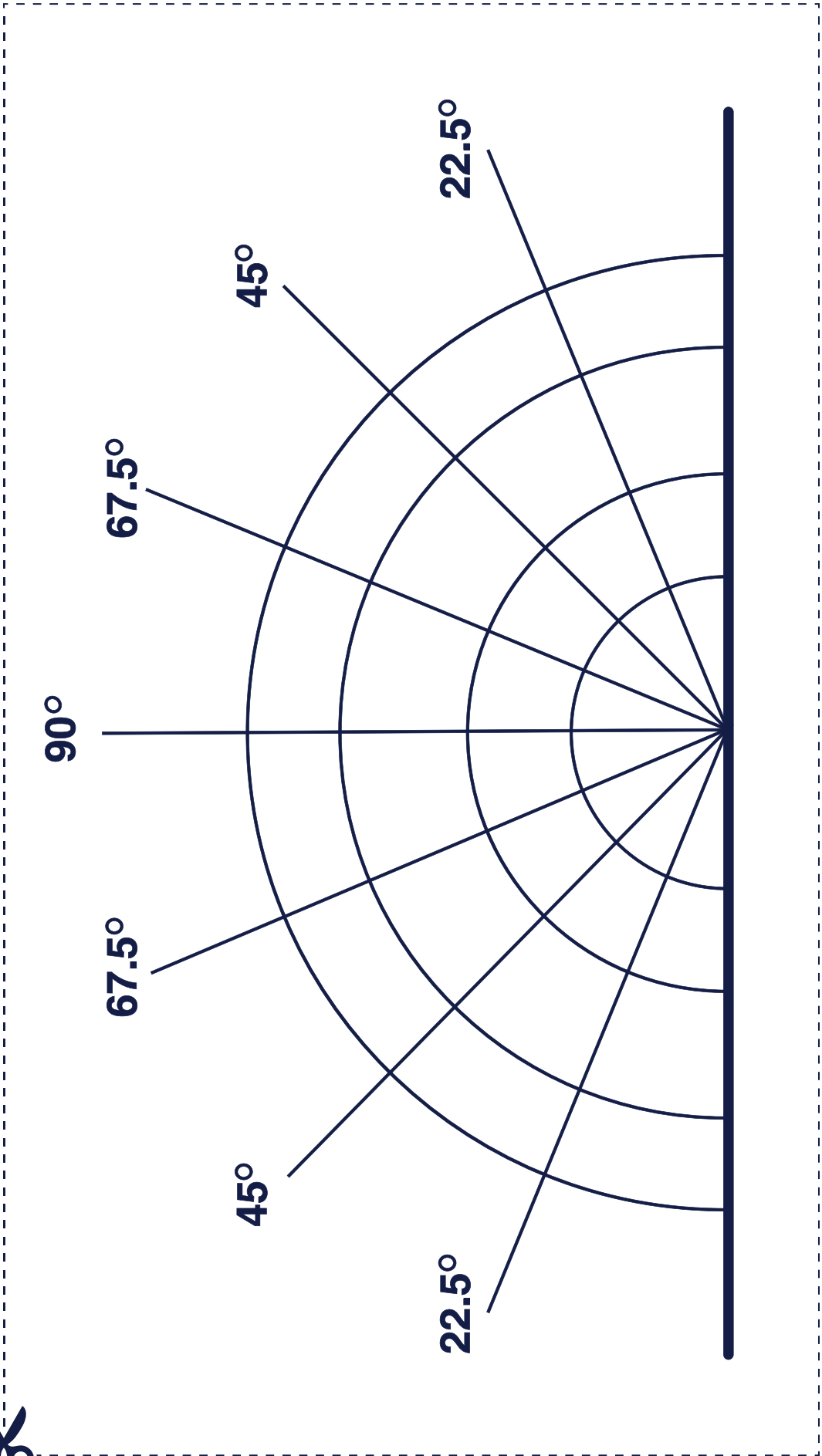
[Aerofoam® Website](#)

AEROCALC

Calculation software is a tool for consultants, architects and engineers, available on PC, Mac, iPhone and Android application.



[AeroCalc Software](#)



Notes

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AEROFOAM[®]

Global Footprint



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