



# Sheet Insulation - Pipe & Circular ducts

THERMAFLEX INSTALLATION MANUAL

**DISCLAIMER:**

The information in this document is based on our current state of technical knowledge. Due to the variety of possible influences during installation and combination of products, the insulator is responsible for any necessary verification of certain information. For the current technical product specifications, we refer to the relevant products and the related datasheets. Any copy, duplication or reprint requires a written agreement by Thermaflex International Holding bv.

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# 01. General

This installation manual will guide you in professional pipe and circular duct insulation for outer diameters over 114mm (4") with Thermaflex® polyolefin sheet insulation as well as the most common used fittings. For the insulation of specific fittings not covered in this installation manual, please contact your Thermaflex partner and our insulation specialists will be happy to assist you.

Whether your insulation challenge is retrofit, new construction or prefabrication, we offer complete toolsets and installation training programs to ensure maximum peace of mind for owner, installer and end-user.



## 02. Pipes & circular ducts

### Measurement & cutting

#### 1. Measure

- Determine the circumference (C) of the pipe using a strip of the insulation material of the same thickness to be used for the insulation.

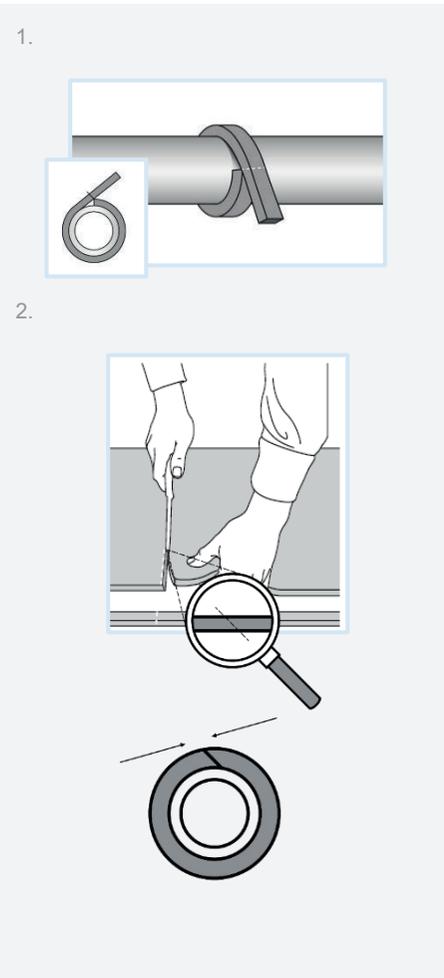
#### 2. Outline guides & cut (Circumferential joint)

- Plot the circumference on the sheet insulation and cut accordingly.
- For circumferential joining, cut the sheet material in a beveled manner to maximize the joining surface.

C Pipe circumference  
L Length

#### TIP!

Before start marking, make sure the curve of the sheet material follows the curve of the pipe / circular duct for easy application.

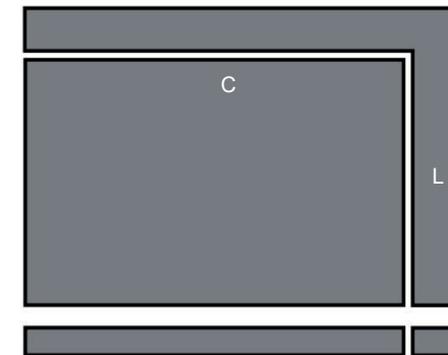
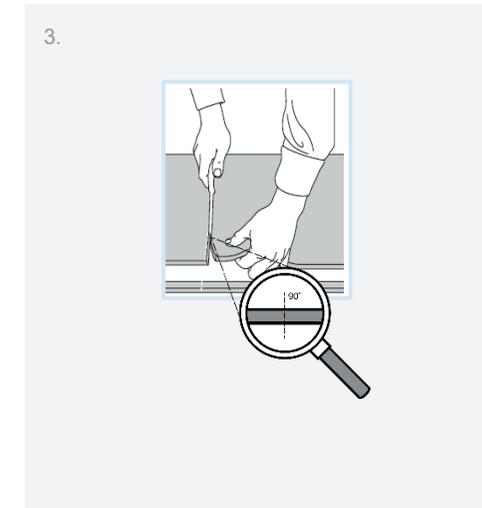
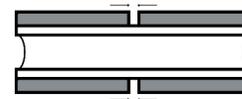


#### 3. Cut (Butt joint)

- Cut the sheet insulation to length (L) for butt joining if necessary.
- For longitudinal joining cut with a 90° angle by using a knife.

#### Important!

Don't forget to allow an excess length of 5mm for wet sealing.



Insulation strip (C)

#### Required tools:



## Surface preparation

### 1. Clean surfaces

- Surface of the pipe / duct and the insulation material must be free of contamination such as dust or grease and free of moisture prior the application of ThermaGlue.

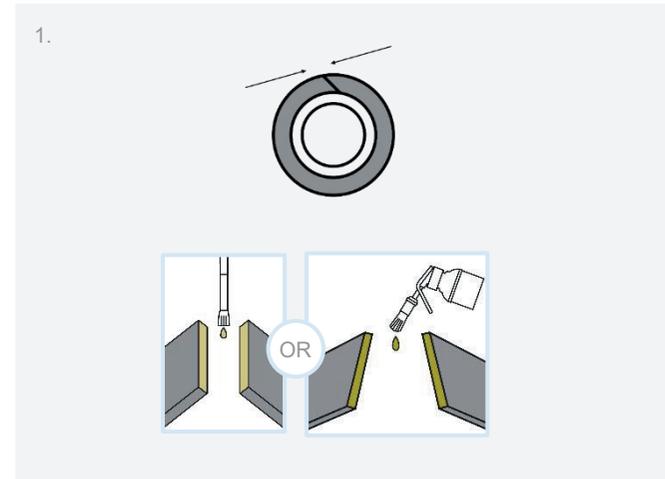
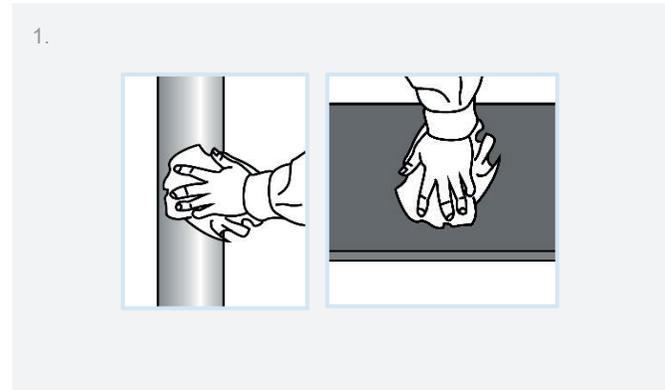
#### **Important!**

Clean the surfaces with polyolefin cleaner (PB, PE, PP) and make sure that the surface to be insulated is resistant against the cleaner.

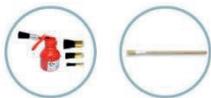
## Apply glue

### 1. Join insulation

- Coat both surfaces for circumferential joining with glue and let sealant dry before application (tack-dry consistency).



#### Required tools:



## 2. Apply glue (join to object)

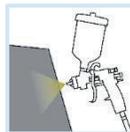
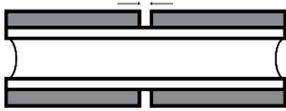
- Due to the excellent stability of the Thermaflex® polyolefin insulation materials, the risk of sacking is limited so it is not necessary to glue the entire sheet onto the pipe / duct with diameters up to 800mm.
- Coat or Spray at a strip of >10cm thickness at the ends, one strip in the middle and at seam level with Thermaflex adhesive (figure 2.1).
- Make sure to leave ~ 3-5 cm free for wet sealing.
- For pipes / ducts with diameters > 800mm, full surface bonding is necessary (figure 2.2).
- Apply glue on both the Thermaflex® sheet insulation and the pipe / duct surface. Ensure Thermaflex adhesive is tack dry before joining.

### Important!

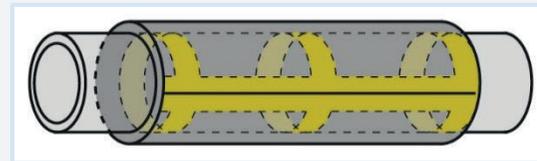
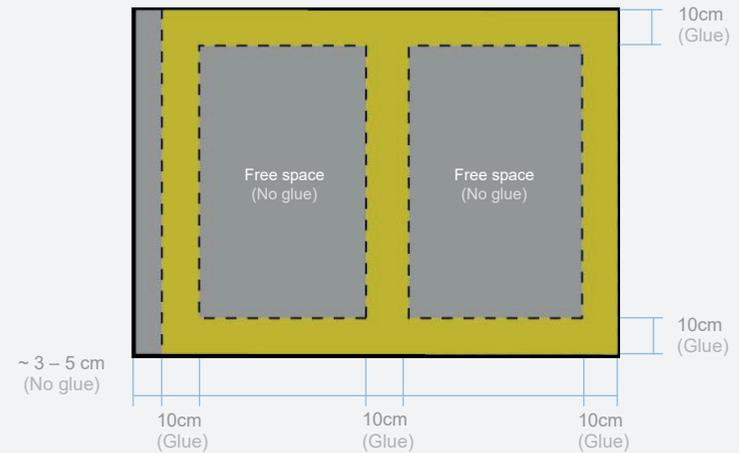
< 800 mm Ø - 3x 10cm + seam  
> 800 mm Ø - full surface bonding recommended

### TIP!

When applying glue on large surfaces, we recommend using a spatula or spray gun. Please contact your nearest Thermaflex partner for tailor-made spray gun equipment for Thermaflex adhesive.



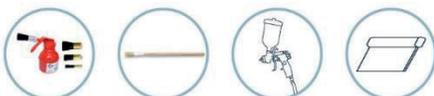
2.1



2.2



### Required tools:



# Apply insulation

## 1. Circumferential joining

- Wrap sheet insulation around the pipe (1,2,3).
- First join the edges (4,5) and then the middle part (6) to prevent misalignment of the ends.
- Join the remaining parts applying light pressure.

### Important!

When securing sheet insulation material, care should be taken to avoid high tension on the sealed seam caused by the bending of the sheet. See 3. Multi-Layer-Insulation.

## 2. Butt joining

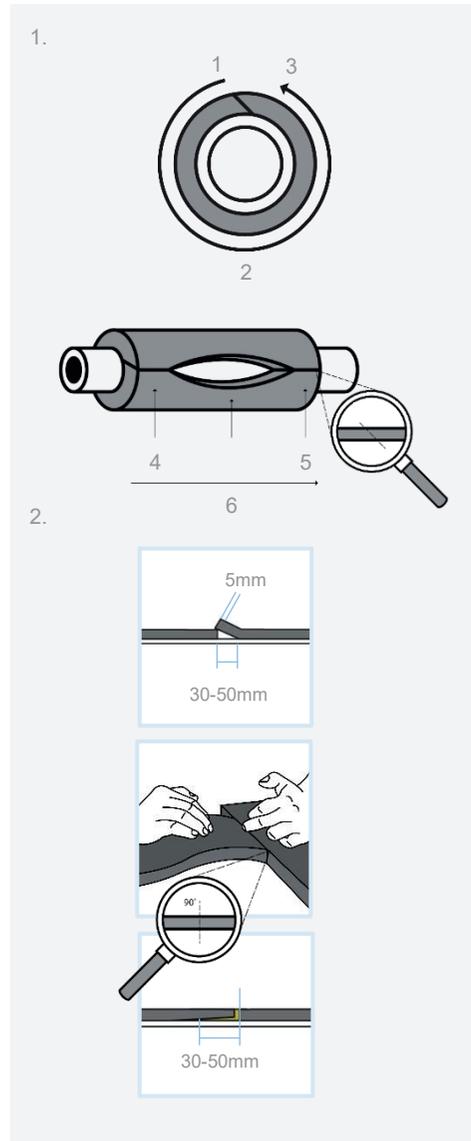
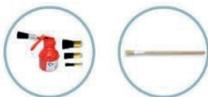
- Apply the insulation sheet material in longitudinal direction with an excess length of +5mm.
- Use the wet sealing technique for the butt joint.

### Important!

Make sure that the seam is in visible area for correct installation work and quality inspection!

Required tools:

8



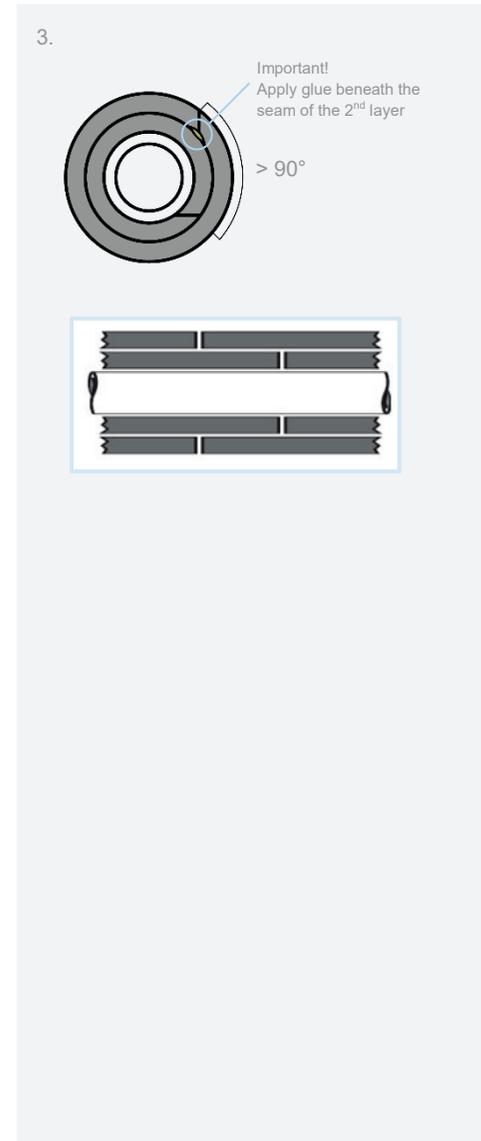
## 3. Multi-Layer-Insulation

Ensure that the two layers are at least 90° apart from each other and the longitudinal seams don't overlap as shown in figure 3. After applying the first layer, the second layer should be applied in the same manner.

### Important!

The Multi-layer technique is also needed if higher insulation thicknesses.

Apply glue beneath the seam of the 2<sup>nd</sup> layer.



## 2.1 ThermaSmart® Marine 2.0 Black

ThermaSmart® Marine 2.0 Black is a polyolefin insulation system covered with black aluminum foil



The final application of ThermaSmart® Marine 2.0 Black Sheet is the same as for other Thermaflex sheet insulation, but in this case the following rules should be applied:

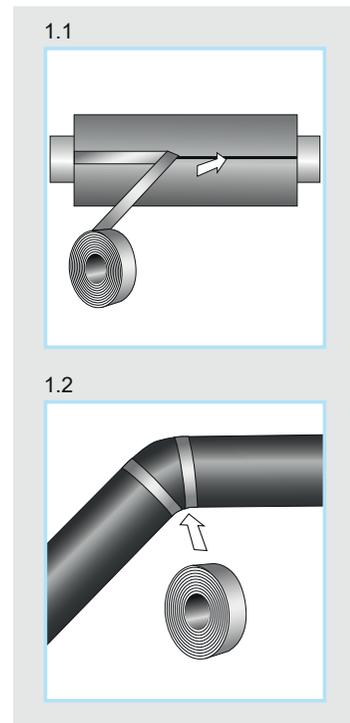
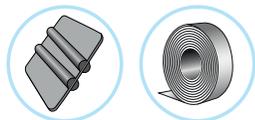
### 1. Seam protection

- On the installed insulation, all seams (after gluing previously with a ThermaGlue 474) should be provided with ThermaSmart® Marine 2.0 Black Tape

#### Important!

All seams should be covered with an overlap at least 25 mm wide

#### Required tools:



### 2. Applying tape

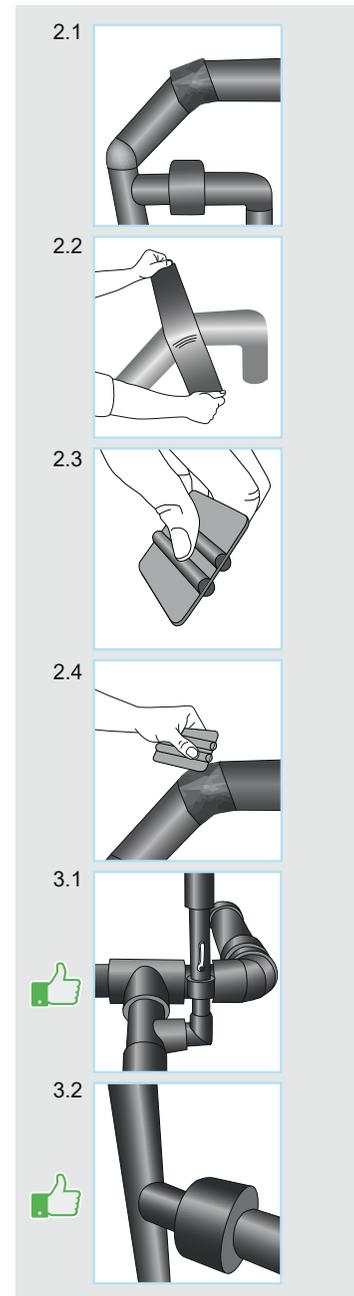
- For accurate protection of the insulation, after applying the ThermaSmart® Marine 2.0 Black Tape to the seam, smooth the surface thoroughly so that the tape adheres tightly to the insulation surface

### 3. Finishing assembly

- After installation, make sure that the entire ThermaSmart® Marine 2.0 Black system has been coated with black aluminum foil

#### Important!

In the case of places without black aluminum foil they should be supplemented with ThermaSmart® Marine 2.0 Black Tape



## Application thickness 50 mm

**Because of the limited flexibility, ThermaSmart® PRO LS version is produced in a maximum thickness of 30 mm.**

- Applications may require larger thickness which can and should be done in 2 layers:

1<sup>st</sup> layer ThermaSmart® PRO LS version  
2<sup>nd</sup> layer ThermaSmart® Marine 2.0 Black

- Combinations of all wall thicknesses from the range can be used for this with the remark that the total wall thickness does not exceed the maximum allowed 50 mm.
- After installing the 2<sup>nd</sup> layer of ThermaSmart® Marine 2.0 Black, all seams longitudinally as well as front side connections must be covered with self-adhesive ThermaSmart® Marine 2.0 Black Tape with a minimum width of 50 mm

**2<sup>nd</sup> layer ThermaSmart Marine 2.0 Black**

**1<sup>st</sup> layer ThermaSmart PRO LS version**

# 03. Fittings

## 3.1. Segment bend 90°

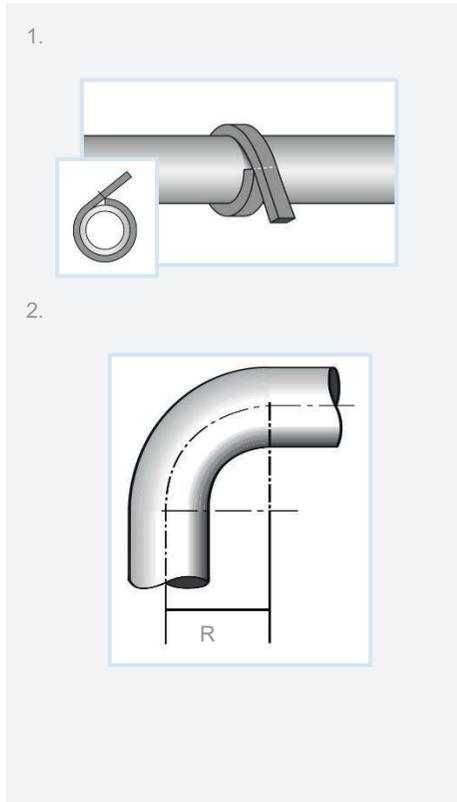
### Measurement

#### 1. Circumference

- Measure the circumference (C) of the pipe using a strip of insulation material of the same thickness to be used for the insulation.

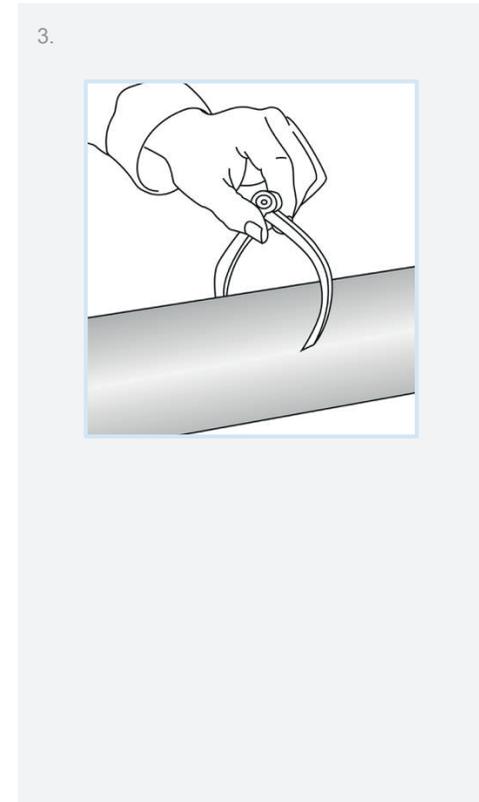
#### 2. Curve radius

- Measure the curve radius (R) using a folding ruler, metal ruler or Talmeter.



#### 3. Pipe diameter

- Measure the outer diameter of the pipe ( $\varnothing_{\text{pipe}}$ ) with the outside calipers or using the Talmeter.



Requ





## Draw cutting lines

### 1. Outline

Create an outline of the insulation bend on a piece of cardboard to obtain the length of the cutting lines on the sheet insulation.

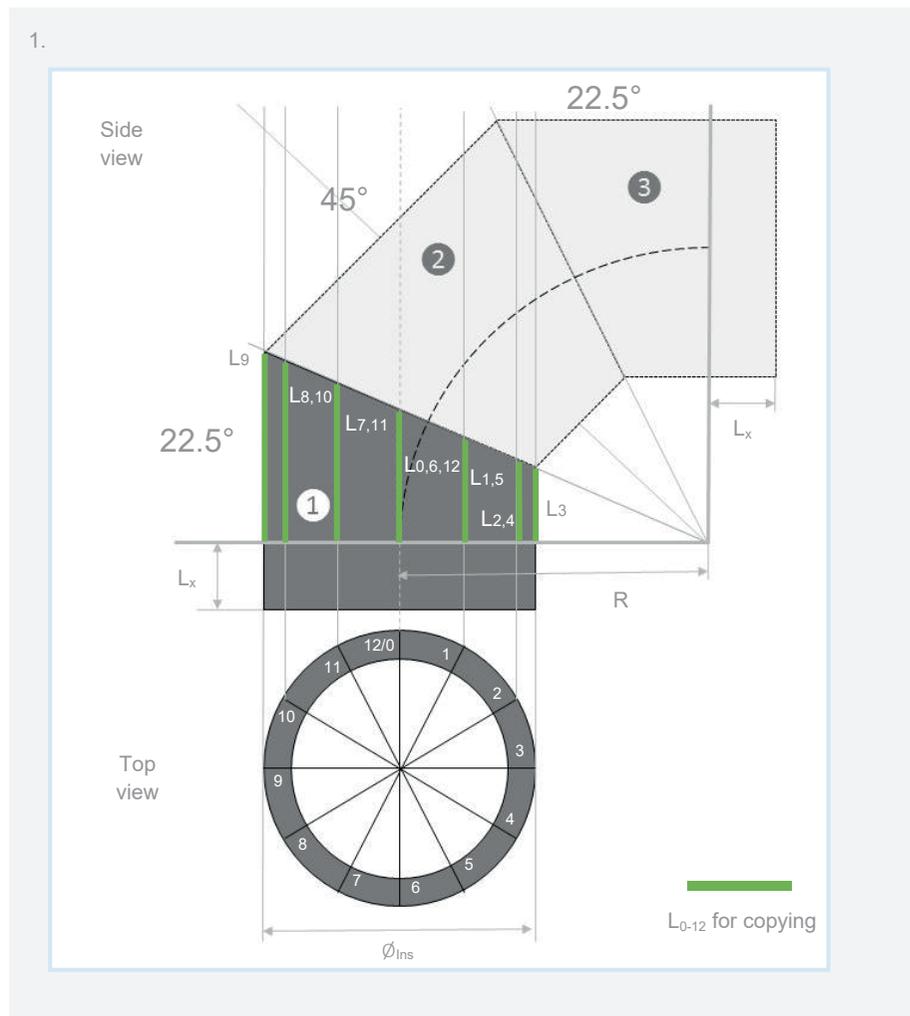
1. Start with a top view of the pipe cross-section area including the insulation thickness.
2. Draw the side view of the fitting
  - Choose number of segments (see table)
  - Draw the guides for the segments and draw segment 1
  - Copy the points 0 - 12 from the topview by drawing vertical guides.

$\varnothing_{\text{pipe}}$	Outer diameter pipe
$\varnothing_{\text{ins}}$	Outer diameter (pipe + 2x Insulation thickness)
R	Curve radius
C	Pipe circumference
$L_x$	Excess length required
$L_{0-12}$	Height of the insulation for copying to insulation with compass

Number of segments	End parts angle [°]	Middle part angle [°]
2 + 1	2x 22.5°	1x 45°
2 + 2	2x 15°	2x 30°
2 + 3	2x 11.25°	3x 22.5°
2 + 4	2x 9°	4x 18°

### Important!

Lengths  $L_9$  should not be over 140 mm.  
If this length is over 140 mm, add another bend segment.



### Calculation tool

We offer a calculation program that provides you with all the measurements you need just by entering the measurements of the bend. Please contact your local Thermaflex partner to access it.





## 2. Copy lengths

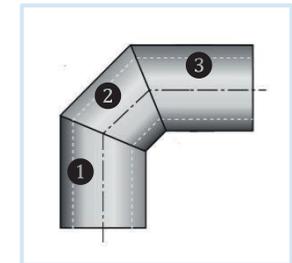
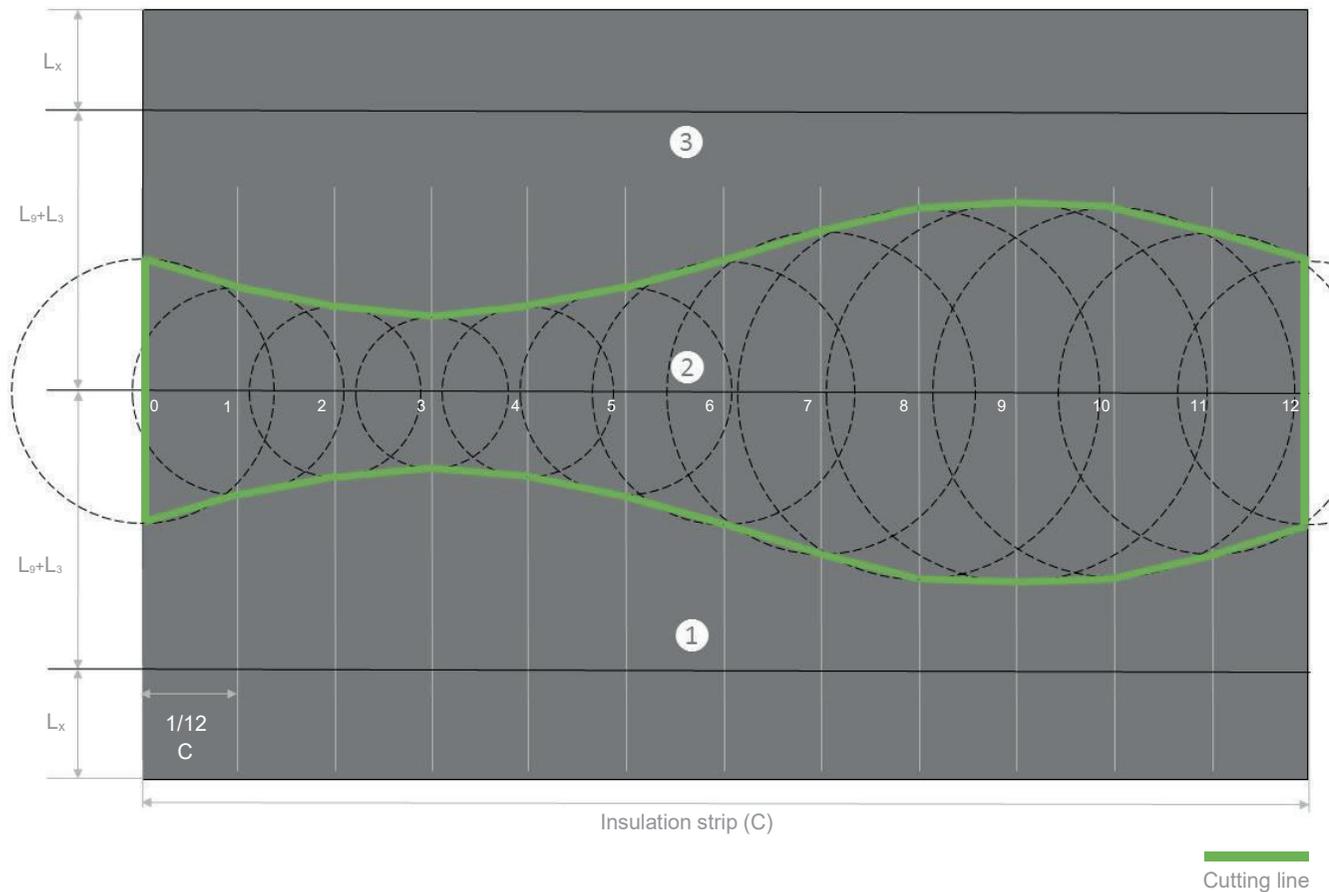
1. Cut a piece of sheet insulation at the width of the circumference (C) or mark it on a bigger piece of sheet insulation.
2. Divide the sheet width (C) into 12 parts and draw vertical guides.
3. Copy the lengths from the template:
  - Draw a horizontal guide for the excess length ( $L_x$ )
  - Draw the horizontal guide(s) ( $L_9 + L_3$ ) for the copy the heights from the side view.
  - Copy the heights using a compass ( $r = L_{0-10}$   $L_{12}$ ) at the points 0 – 12.
  - Connect the intersecting point and you get the cutting lines.

### Important!

Hold the compass at an angle when marking the insulation surface to avoid ripping.

### TIP!

When fitting more than one elbow with same measure, we advise you to make a template to save time!



### Required tools:



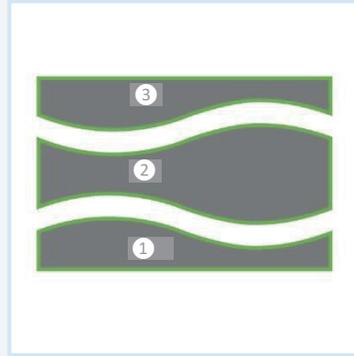


## Assemble & join segments

### 1. Cut out

- Cut out the segments from the sheet insulation material on the cutting lines.

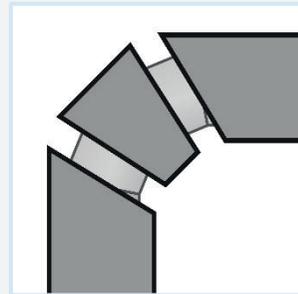
1.



### 2. Fit

- Apply glue to the joining surface of the freshly cut sheet and allow to tack dry.
- Place sheet on the bend and glue each of the segments together.
- Due to the bending of the segments, the joining surfaces may retract inwards and outwards. Make sure to cut them straight so they fit together (especially for bigger thicknesses).

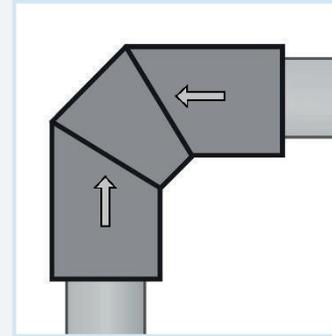
2.



### 3. Join

- Apply glue on the joining surfaces, let it dry and join the segments on the bend.

3.



Required tools:





## Example: 90° Segment bend – 2 + 3 middle parts

Depending on the pipe diameter and the curve radius, sometimes more than 3 bend segments are necessary. To determine the number of bend segments,

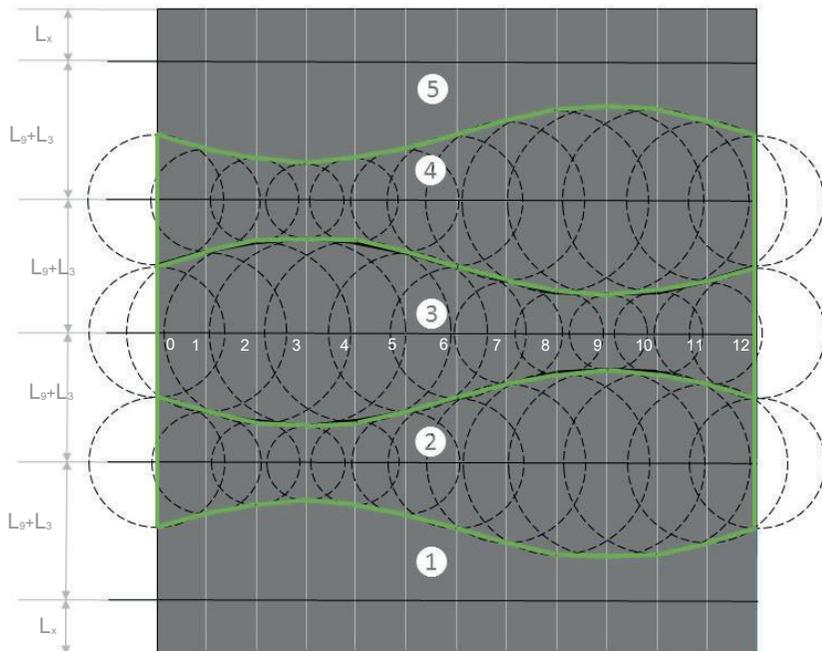
consult the table below. Make sure to respect a maximum of 140mm for the length  $L_9$ . 1. Create template

The template for a bend with 5 segments is given below.

Number of segments	End parts angle [°]	Middle part angle [°]
2 + 1	2x 22.5°	1x 45°
2 + 2	2x 15°	2x 30°
2 + 3	2x 11.25°	3x 22.5°
2 + 4	2x 9°	4x 18°

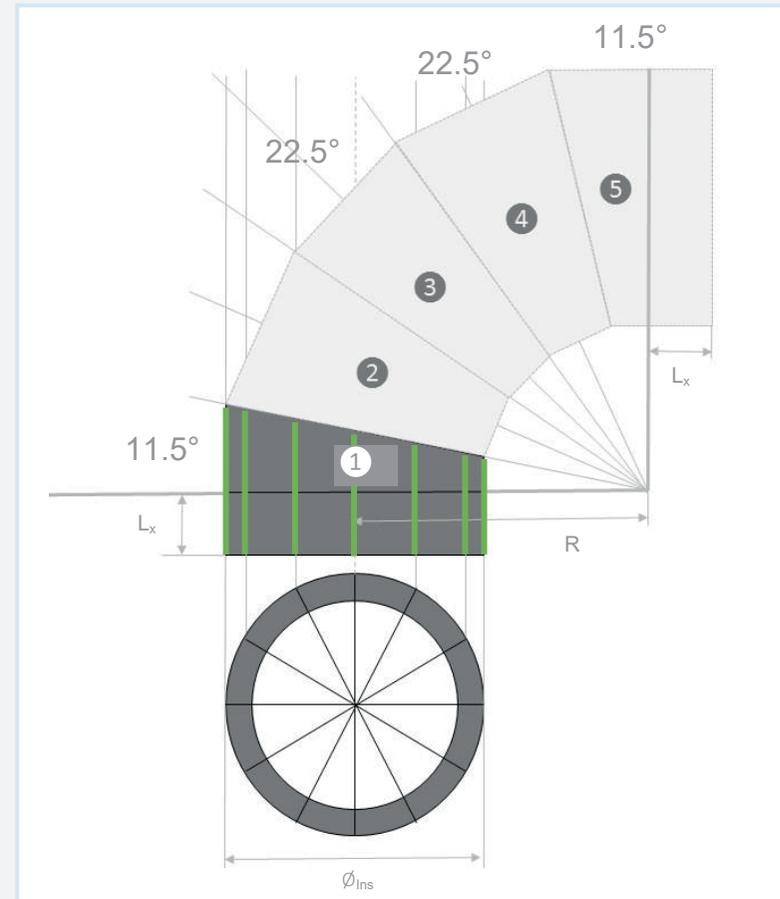
### 2. Draw cutting lines

The cutting lines to cut out the 5 segments are given below.



Cutting line

1.





### 3.2. Bend 45°

## Measure & Draw cutting lines

### 1. Measure

- Decide on the side length (L) of the bend.
- Determine the circumference of the pipe using a strip of insulation material of the same thickness to be used for the insulation.

$\varnothing_{\text{pipe}}$  Outer diameter pipe

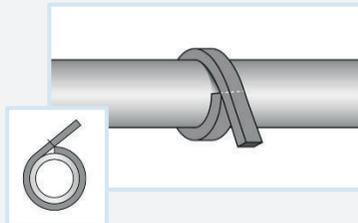
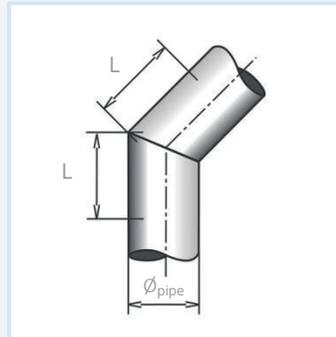
C Pipe circumference

L Side length of the insulation bend

### Important!

The side length, L must be more than the pipe radius ( $\varnothing_{\text{pipe}} / 2$ )!

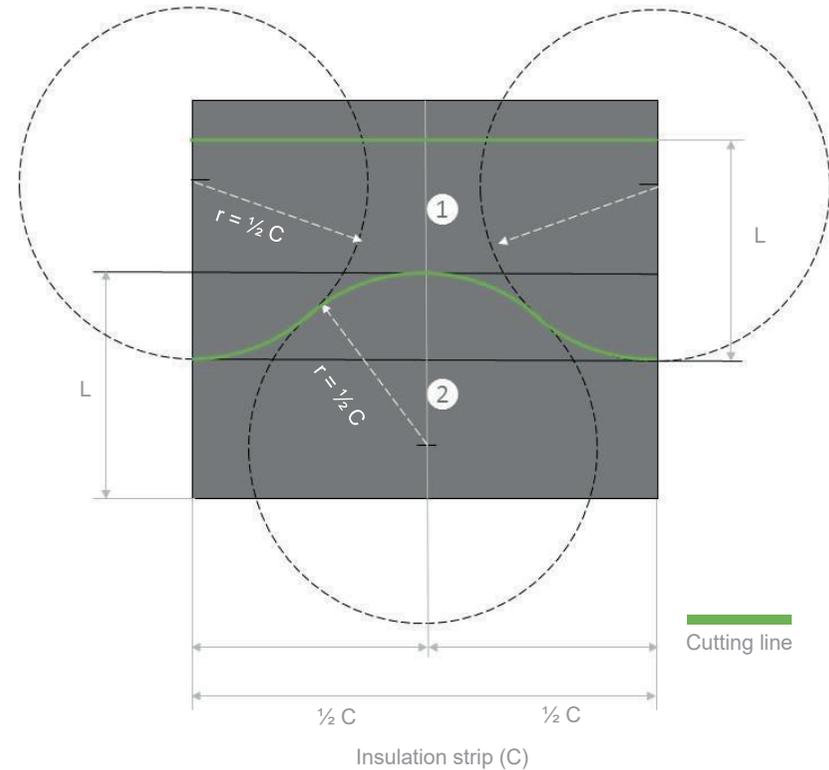
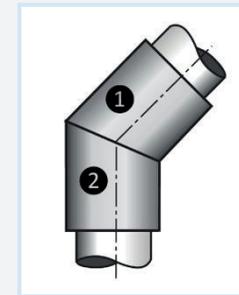
1.



### 2. Draw guides on sheet insulation

- Cut piece of sheet insulation at the width of the circumference (C) or mark on a bigger piece of sheet.
- Halve the sheet and draw a vertical guide.
- Draw a horizontal line at the height L.
- Mark the center of the circle (2) at  $\frac{1}{2} C$  and draw the circle using a compass.
- Next, use a compass to draw the other two circles with the same radius.

2.



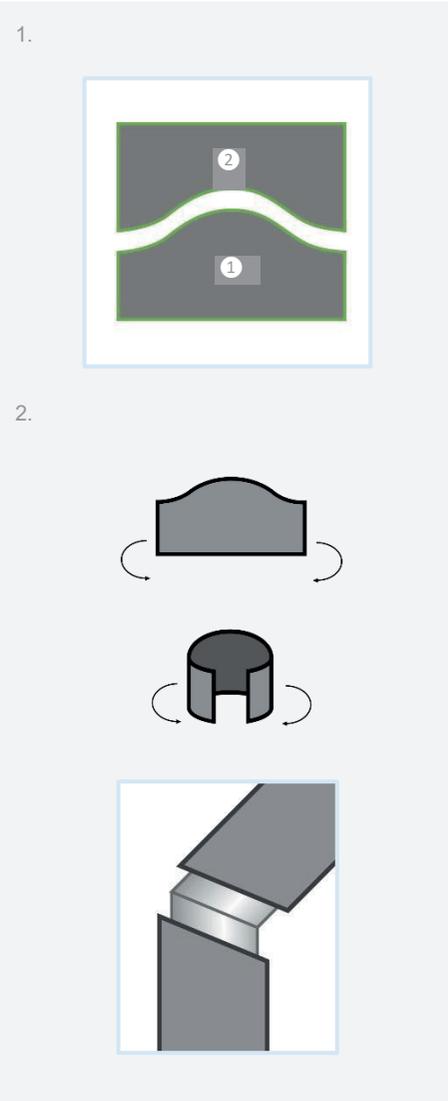
### Required tools:



# Assemble & join segments

## 1. Cut out

- Cut out the segments from the sheet insulation material at the cutting lines.

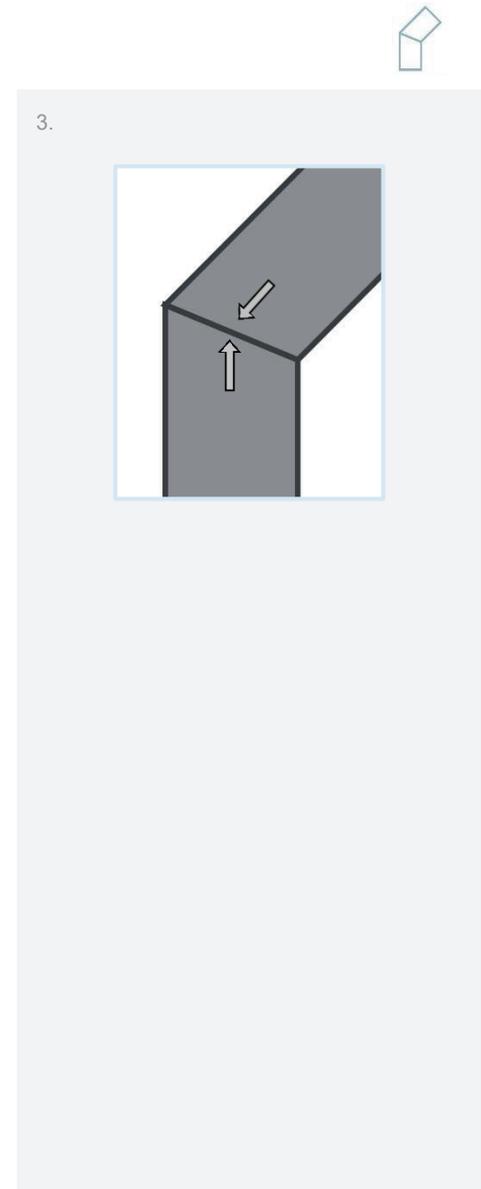


## 2. Fit

- Apply glue to the joining surface of the freshly cut sheet and allow to tack dry.
- Place sheet on the bend and glue each of the segments together.
- Due to the bending of the segments, the joining surfaces may retract inwards and outwards. Make sure to cut them straight so they fit together (especially for bigger wall thicknesses).

## 3. Join

- Apply glue on the joining surfaces, let it dry and join the segments on the bend.



Required tools:



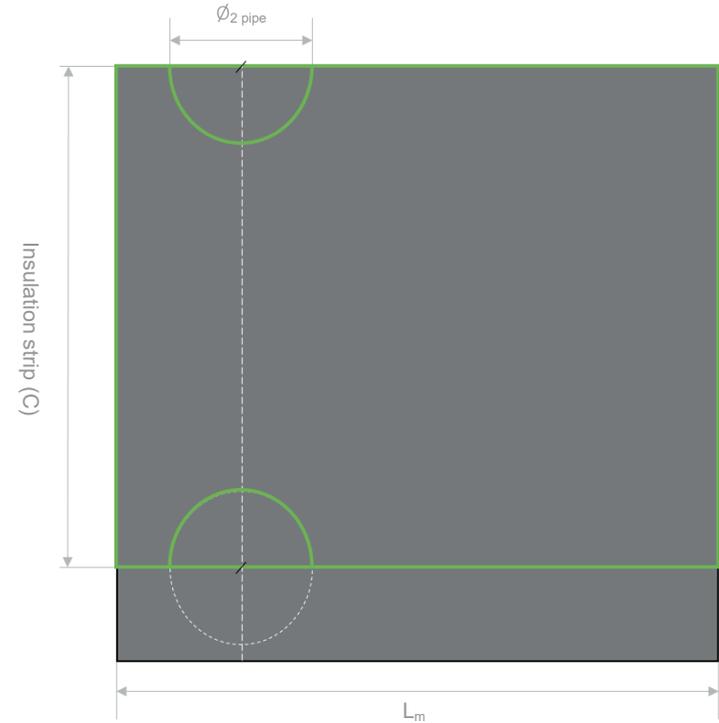
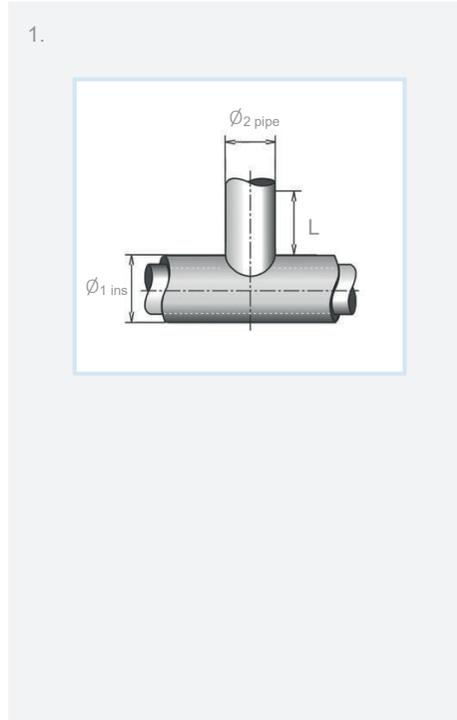


### 3.3. T-piece 90° Insulate main line

#### 1. Insulate

- Measure the branching pipe diameter ( $\varnothing_2$  pipe).
- Insulate the main line and cut out a hole for the branching pipe.
- For smaller branching pipe diameters use the hollow punches.
- Ensure compartmentation by applying glue around the hole towards the pipe / duct.

$\varnothing_2$  pipe Outer diameter branching pipe  
 $L_m$  Required length for the main line



Cutting line

#### Required tools:



# Measure & draw cutting lines

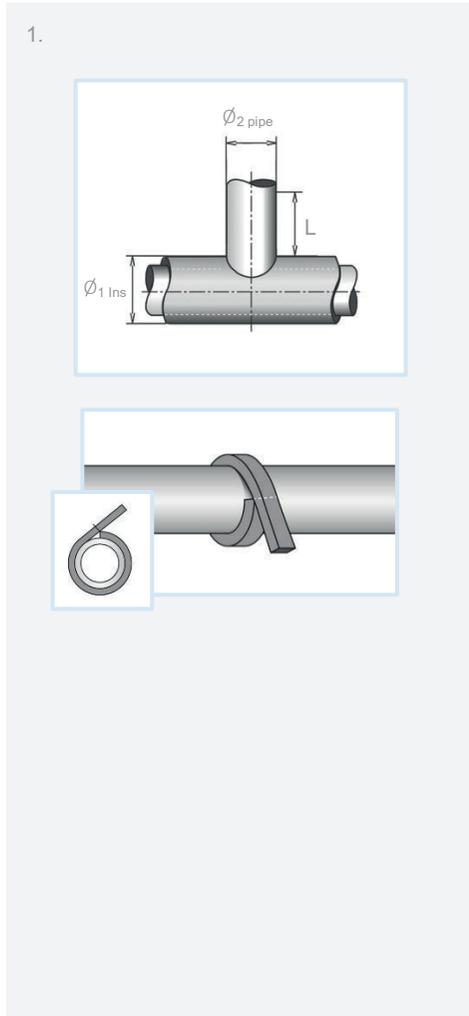
## 1. Measure

- Decide on the length needed for the insulation of the branching pipe (L).
- Measure the outer diameter of the main pipe including insulation ( $\varnothing_{1 \text{ Ins}}$ ) using the outside caliper or talmeter.
- Measure the circumference (C) of the branching pipe by using a strip of insulation material.

$\varnothing_{1 \text{ Ins}}$  Outer diameter pipe (main pipe + insulation)

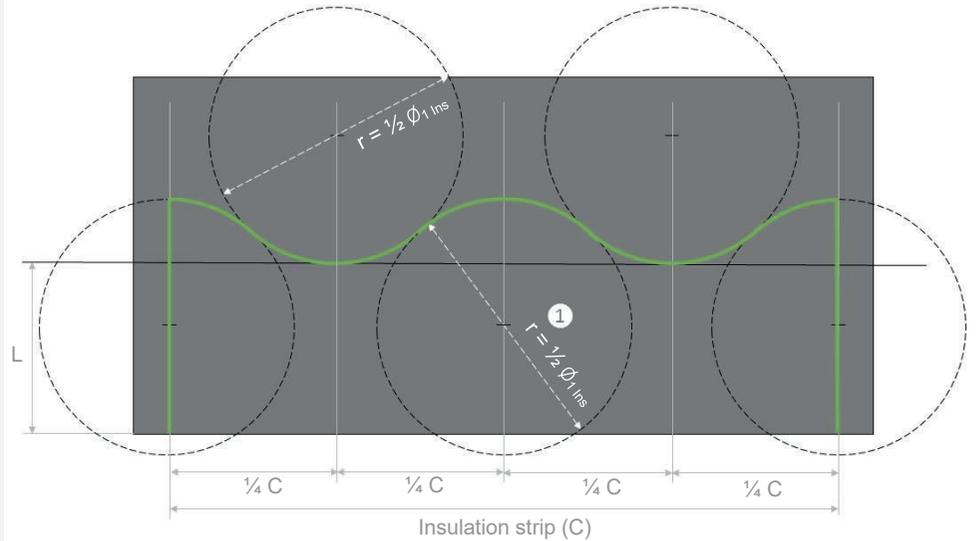
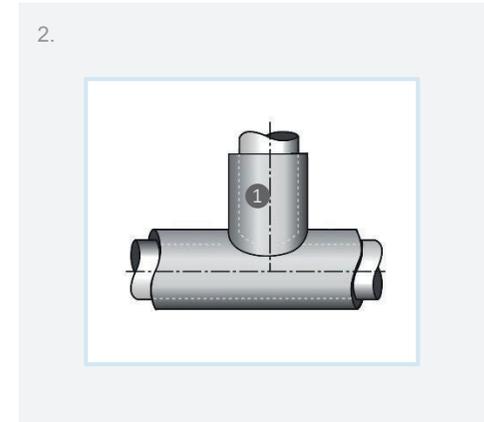
C Pipe circumference of branching pipe

L Length of insulation of branching pipe



## 2. Draw guides on sheet insulation

- Take a piece of insulation sheet that's at least the width of the circumference, (C) and mark the width, Divide by four and draw the vertical guides.
- Draw a horizontal guideline at the height of L, mark the centers of the two upper circles and draw the circles using a compass.
- Mark the centers of the three lower circles using the compass and draw them.



Cutting line

## Required tools:



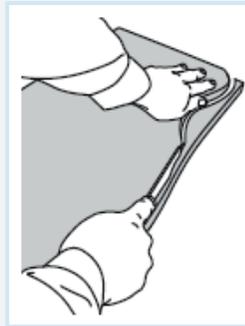


## Cut out segment & join

### 1. Cut

- Cut out the segments from the sheet insulation material on the cutting lines.

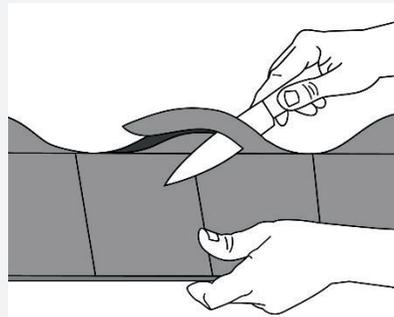
1.



### 2. Fit

- Adapt the joining surface to the main line insulation making a 90° cut at the short length and increase the angle towards the top as shown in figure 2.
- Apply the segment onto the T-piece and towards the main pipe insulation and check the fit.
- Readjust if needed to get a perfect fit.

2.



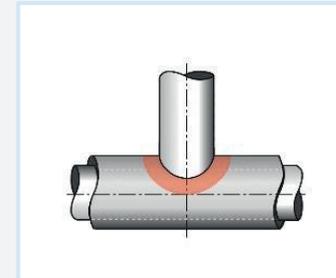
### Important!

Joining surfaces must make a perfect fit for vapor tight joining.

### 3. Prepare surface

- Clean the joining surface of the main pipe using a cleaner.
- Mark the joining surface of the main line using the freshly cut segment.
- Scrape the joining surface of the main line using a knife for better jointing.

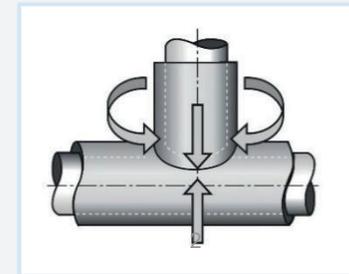
3.



### 4. Join

- Clean, apply glue, let it dry.
- First join the segment together and then direct towards the main pipe insulation.

4.



### Required tools:



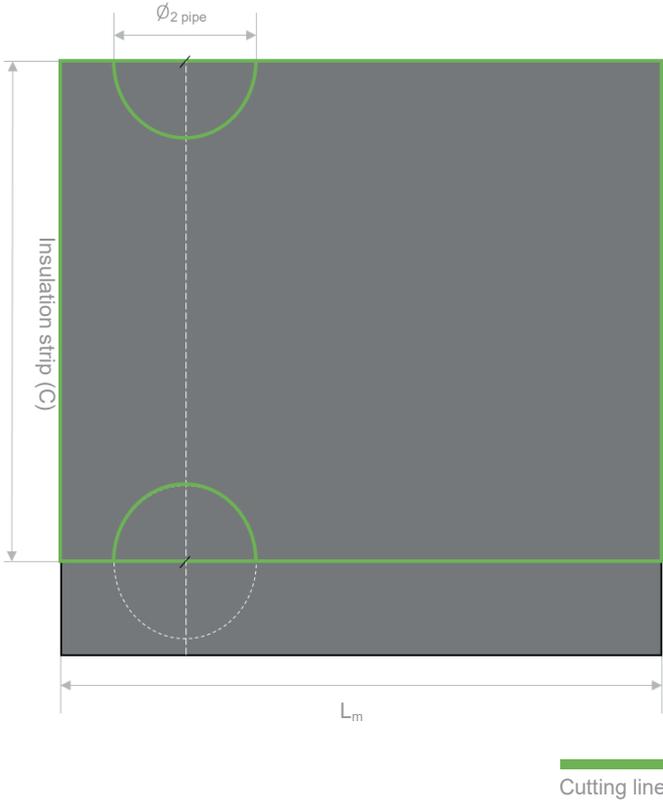
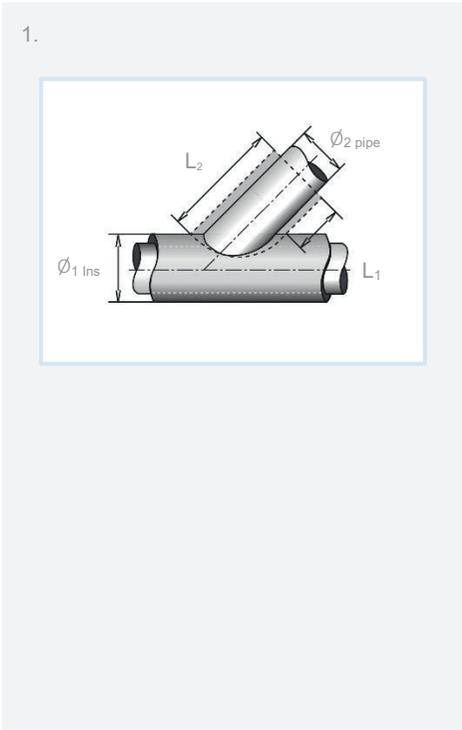


### 3.4. Angle T-piece Insulate main line

#### 1. Insulate

- Measure the branching pipe diameter ( $\varnothing_{2 \text{ pipe}}$ ).
- Insulate the main line and cut out a hole for the branching pipe.
- For smaller branching pipe diameters use the hollow punches.
- Shape the hole with a knife to fit the angled branching pipe.

$\varnothing_{2 \text{ pipe}}$  Outer diameter branching pipe  
 $L_m$  Required sheet length for insulating the main line



#### Required tools:





## Measurement & draw cutting lines

### 1. Measure

- Determine the length needed for the insulation of the branching pipe and determine the two lengths  $L_1$  and  $L_2$  by wrapping a strip of insulation around the branching pipe and measure the required lengths  $L_1$  and  $L_2$ .
- Measure outer diameter of the main pipe with insulation ( $\varnothing_{1 \text{ ins}}$ ) using the outside calipers or talmeter.
- Measure the circumference ( $C$ ) of the branching pipe using a strip of insulation material.

$\varnothing_{1 \text{ ins}}$  Outer diameter pipe (main pipe + insulation)

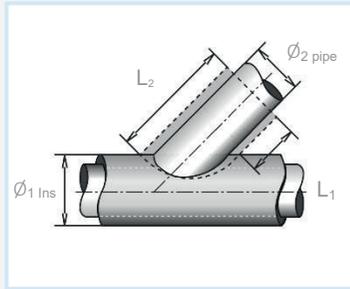
$\varnothing_{2 \text{ pipe}}$  Outer diameter pipe (branching pipe)

$C$  Pipe circumference of branching pipe

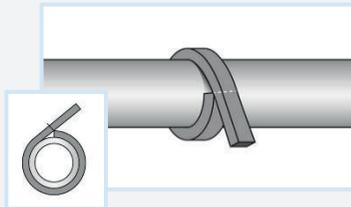
$L_1$  Length of insulation of branching pipe (shortest distance)

$L_2$  Length of insulation of branching pipe (longest distance)

1.

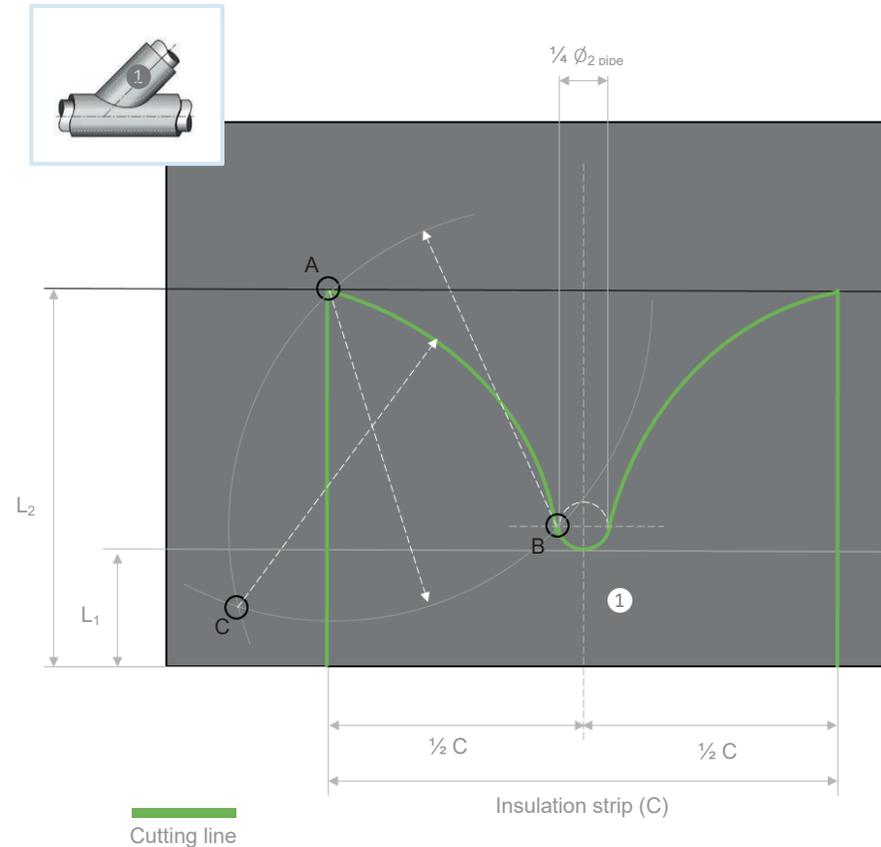


2.



### 3. Draw guides

- Take a piece of insulation sheet with at least the width of the circumference ( $C$ ).
- Draw the vertical lines for the width of the circumference at  $\frac{1}{2} C$ .
- Draw horizontal guides at height of  $L_1$  and  $L_2$ .
- Draw the small circle ( $\frac{1}{4} \varnothing_{2 \text{ pipe}}$ ) using the compass.
- Use point (A) as the circle center for the compass and the distance (AB) as the radius.
- Draw the circle and then do the same using point (B) as the circle center. Now, use the point of intersection (C) as the circle center and the distance (AC) as radius, connect (A) and (B) using a compass to get the cutting line.



### Required tools:





## Cut out segment & join

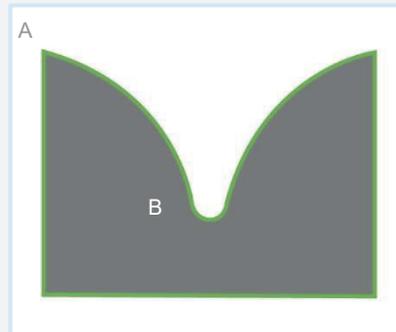
### 1. Cut & adapt to fit

- Cut out the segments from the sheet insulation material at the cutting lines.
- Direct the joining surface of the segment towards the main line insulation by cutting at a beveled angle so it fits the mainline from (A) to (B).
- Apply the segment onto the T-piece and towards the main pipe insulation and check the fit.
- Readjust if needed to get a perfect fit.

#### Important!

Joining surfaces must fit perfectly together for vapor tight joining.

1.



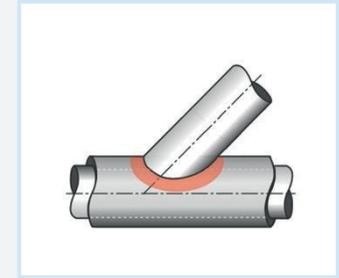
### 2. Prepare surface

- Clean the joining surface of the main pipe with a cleaner.
- Mark the joining surface of the main line using the freshly cut segment.
- Scrape the joining surface of the main line using a knife for better jointing.

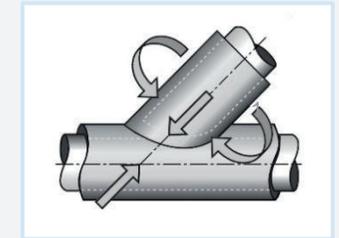
### 3. Join

- Clean, apply glue and let it dry.
- First join the segment together
- Then direct towards the main line insulation.

2.



3.



### Required tools:





### 3.5. Reducer concentric Measure & draw cutting lines

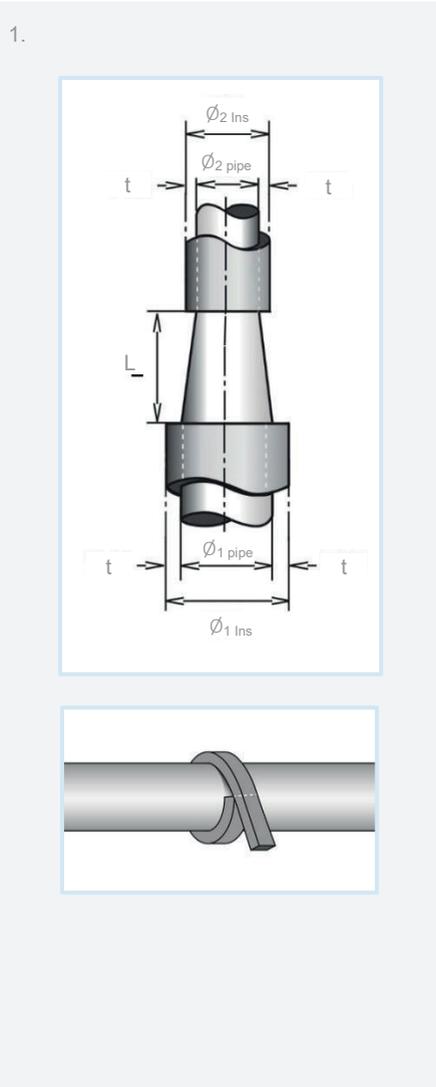
#### Insulate main line

- First, insulate the main line up to the pipe reducer.

#### 1. Measure

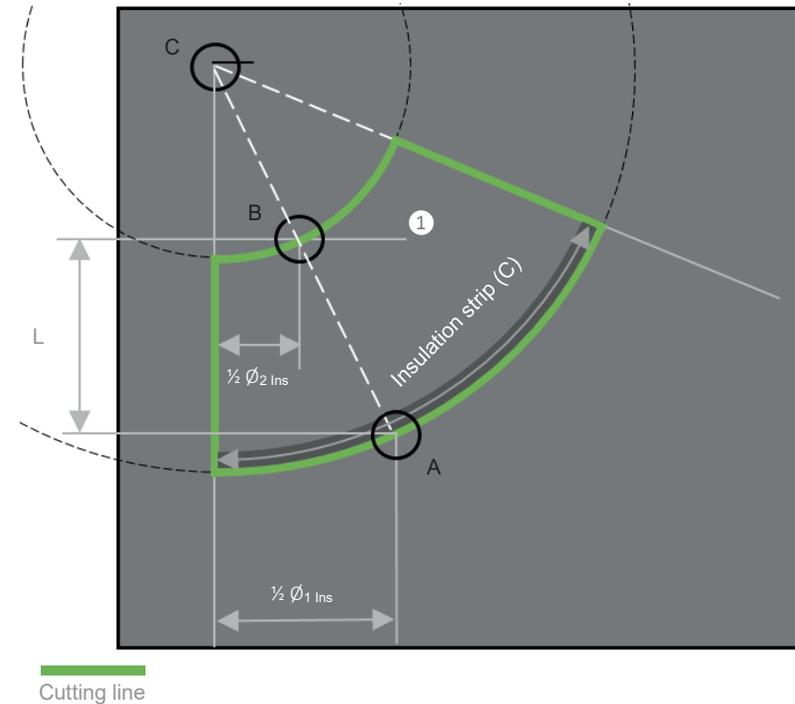
- Measure the length needed for the reducer (L).
- Determine the diameter ( $\varnothing_{1\text{ Ins}}$  and  $\varnothing_{2\text{ Ins}}$ ) using the outside caliper.
- Determine the circumference (C) of the larger carrier pipe ( $\varnothing_{1\text{ pipe}}$ ) including insulation by using a strip of insulation material of the same thickness (t).

- $\varnothing_{1\text{ pipe}}$  Outer diameter larger pipe
- $\varnothing_{2\text{ pipe}}$  Outer diameter smaller pipe
- $\varnothing_{1\text{ Ins}}$  Outer diameter larger pipe + insulation
- $\varnothing_{2\text{ Ins}}$  Outer diameter small pipe + insulation
- t Wall thickness sheet insulation
- C Pipe circumference of larger pipe
- L Length reducer



#### 2. Draw guides

- Take a piece of sheet insulation. Use the vertical edge or draw a rectangular vertical guide.
- Transfer the length (L) with two horizontal guides and two vertical guides at a distance of  $\frac{1}{2} \varnothing_{1\text{ Ins}}$  and  $\frac{1}{2} \varnothing_{2\text{ Ins}}$  from the left edge or vertical guide and get the intersection points (A) and (B).
- Draw a guide by connecting the points (A) and (B) to get the circle center (C) for drawing the curved cutting lines.
- Use the compass to draw two circles with (C) as the circle center with the radius (AC) and (BC).
- Now transfer the circumference (C) to the outer circle by using the sheet insulation strip and draw the final guide in order to get the straight cutting lines.



#### Required tools:



## Assemble segment



### 1. Cut out segment and join

- Cut out the reducer piece from the sheet insulation material at the marked cutting lines.
- Adapt the joining surfaces toward the pipe insulation on both sides if required, using a knife.
- Apply glue to the two joining surfaces of the reducer piece and ensure it is tack dry.
- Join the segment together on the pipe reducer.

#### TIP!

Apply glue only to the two surfaces to join the segment! First join the ends of the seam, then the middle part to prevent misalignment of the ends. Then join the remaining parts by firmly pressing the joining surfaces together.

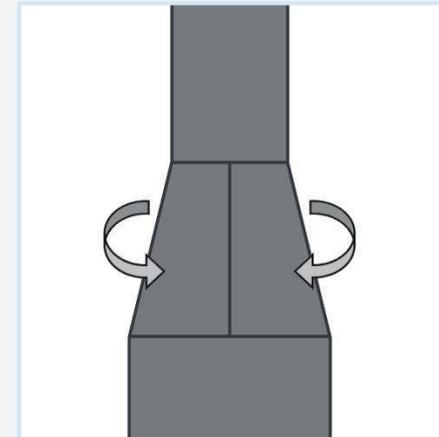
### 2. Join reducer piece with main pipe insulation

- Use the wet sealing technique for both butt joints and direct towards the main line insulation.

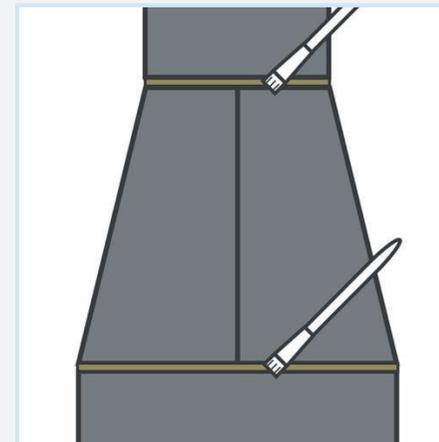
#### Required tools:



1.



2.



### 3.6. Reducer eccentric Measure



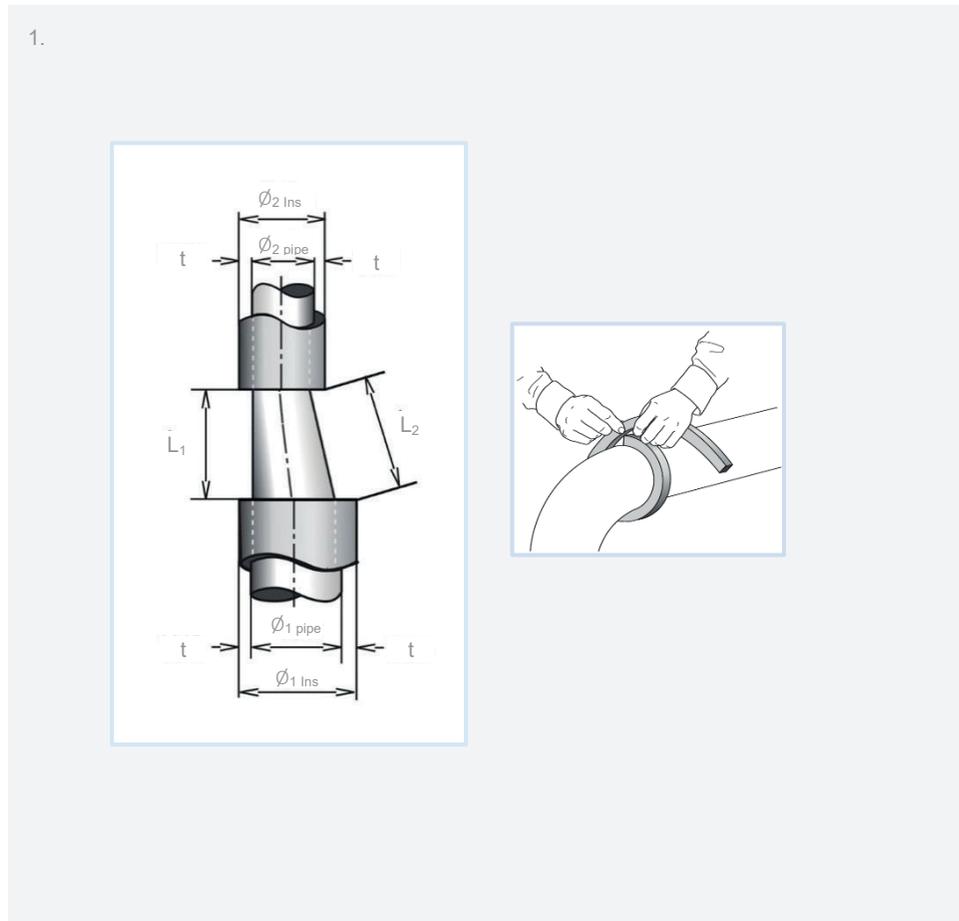
#### Insulate main line

- First, insulate the main line up to the pipe reducer.

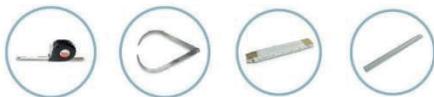
#### 1. Measure

- Measure the two lengths of the reducer ( $L_1$  and  $L_2$ ).
- Determine the diameter ( $\varnothing_{1 \text{ pipe}}$  and  $\varnothing_{2 \text{ pipe}}$ ).
- Determine the circumference (C) by placing a strip insulation sheet material of the same thickness (t) around the pipe ( $\varnothing_{1 \text{ pipe}}$ ).

$\varnothing_{1 \text{ pipe}}$	Outer diameter larger pipe
$\varnothing_{2 \text{ pipe}}$	Outer diameter smaller pipe
$\varnothing_{1 \text{ Ins}}$	Outer diameter larger pipe + insulation
$\varnothing_{2 \text{ Ins}}$	Outer diameter small pipe + insulation
t	Wall thickness Thermaflex® insulation
C	Pipe circumference of larger pipe
$L_1$	Length reducer (shorter distance)
$L_2$	Length reducer (longer distance)



#### Required tools:

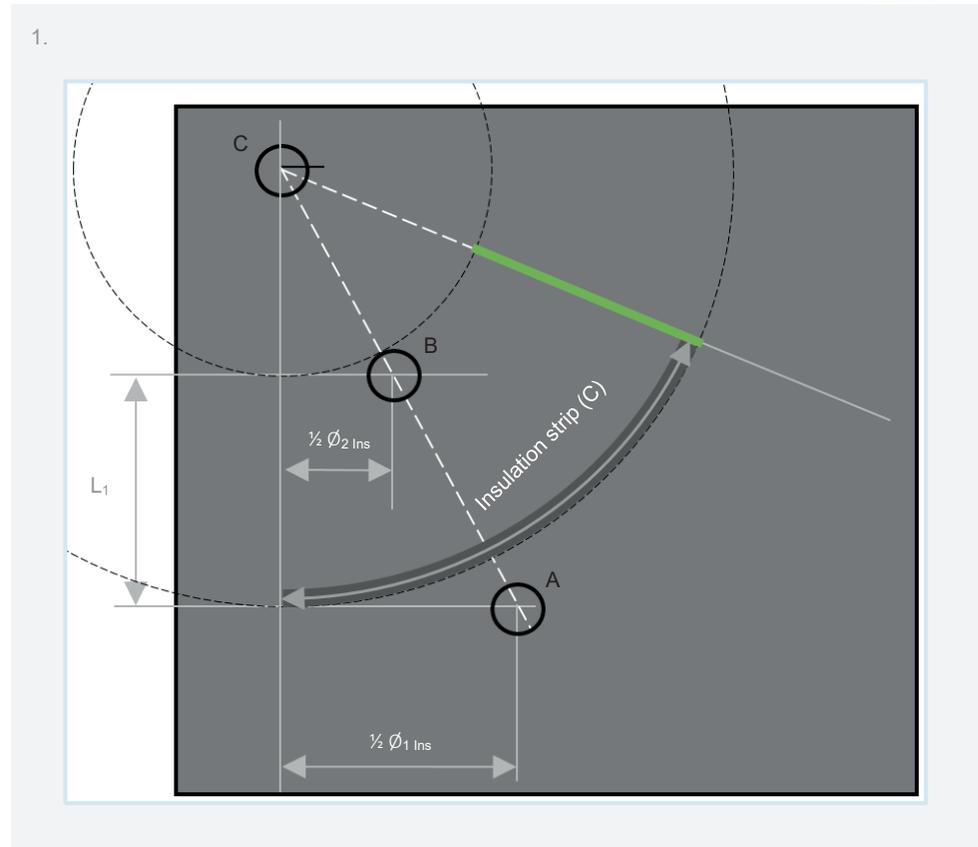




## Draw cutting lines

### 1. Draw guides on sheet insulation (1)

- Take a piece of sheet insulation and draw a rectangular vertical guide.
- Transfer the length ( $L_1$ ) with two horizontal guides.
- Then mark the distances  $\frac{1}{2} \varnothing_{1 \text{ Ins}}$  and  $\frac{1}{2} \varnothing_{2 \text{ Ins}}$  on these horizontal guides as shown in figure 1. to get the intersection points (A) and (B).
- Draw a guide by connecting the points (A) and (B) to determine the circle center (C).
- Draw two circles with (C) as the center with the radius (AC) and (BC).
- Now transfer the circumference (C) to the outer circle using the sheet insulation strip and get the first cutting line.



### Required tools:







# Assemble segment

## 1. Cut out segment and join

- Cut out the reducer piece from the sheet insulation material at the marked cutting line.
- Adapt the joining surfaces toward the pipe insulation on both sides if required, using a knife.
- Apply glue to the two joining surfaces of the reducer piece and ensure it's tack dry.
- Join the segment together on the pipe reducer.

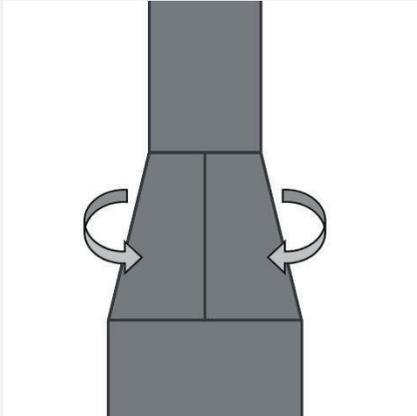
**TIP!**

First join the ends of the seam, then the middle part to prevent misalignment of the ends. Then join the remaining parts by firmly pressing the joining surfaces together.

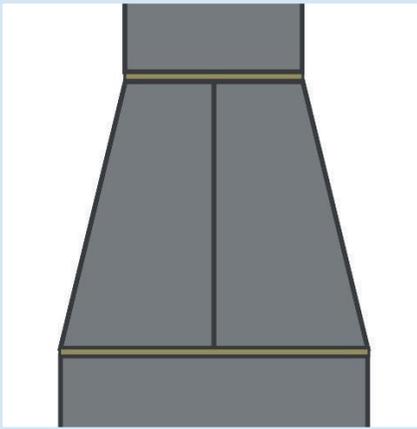
## 2. Join reducer piece with main pipe insulation

Use the wet sealing technique for both butt joints and direct towards the main line insulation.

1.



2.



Required tools:



## Flange connection

### Flange - Side elements

#### Insulate main line

- First, insulate the main line / duct up to the backing ring.

#### Important!

Use compression joining for the butt joint toward the backing ring.

#### 1. Measure

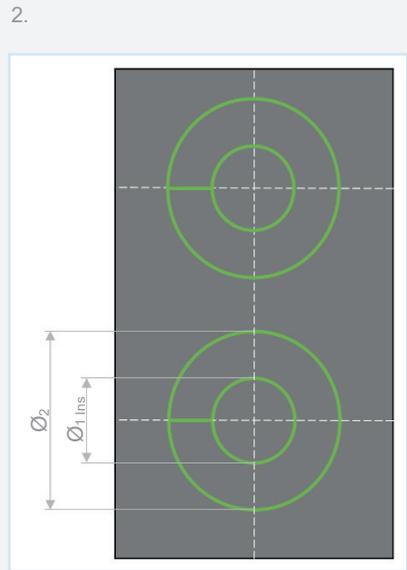
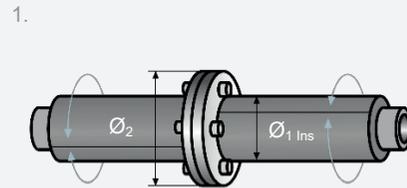
- Determine the diameters with the outside caliper.

$\varnothing_{1\text{ ins}}$  Outer diameter pipe (main pipe + insulation)

$\varnothing_2$  Outer diameter backing ring

#### 2. Draw cutting lines

- Draw vertical and horizontal guides (center lines for the circles).
- Use the compass to mark circles on the sheet insulation.



Cutting line

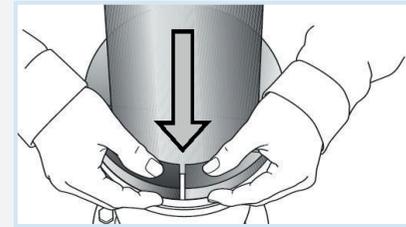
#### 3. Cut & join

- Cut out the two segments.
- With a knife, make a small cut in the segments to allow for connection.
- Apply glue on both sides, let dry and re-join the two side elements on the pipe / duct.
- Use the wet sealing technique to join the insulation side elements towards the pipe / duct insulation.

#### Important!

Clean the joining insulation surface of the pipe / duct insulation with a proper cleaner and open the cells with a knife or emery cloth for better jointing.

3.



#### Required tools:





## Flange - Insulation cover

### 1. Measure

- Determine the circumference with a strip of sheet insulation.
- Measure the width (L) to be insulated.

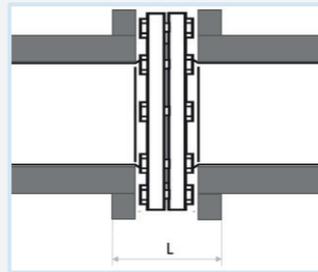
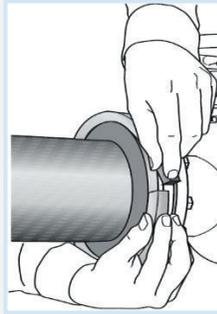
C Circumference

L Width to be insulated

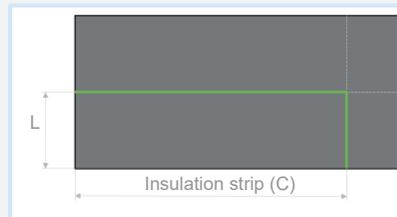
### 2. Draw cutting lines

- Draw horizontal and vertical cutting lines.

1.



2.



Cutting line

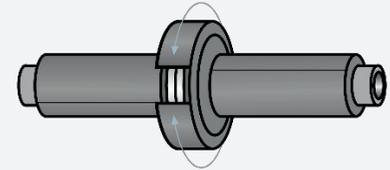
### 3. Cut & join

- Cut out the rectangular piece of sheet insulation on the cutting lines.
- Apply glue to the ends of the insulation cover itself as well as to the joining surfaces of the side elements.
- Allow time to dry and apply on the flange connection by firmly pressing the sides together, from one end to the other.

#### Important!

Clean the joining insulation surface of the insulation cover with a proper cleaner and open the cells with a knife or emery cloth for better joining.

3.



### Required tools:





### 3.7. Valve - Side elements

#### Insulate main line

- First, insulate the main line / duct up to the backing ring.

#### Important!

Use compression jointing for the butt joint towards the backing ring.

#### 1. Measure

- Determine the diameter using the outside caliper.

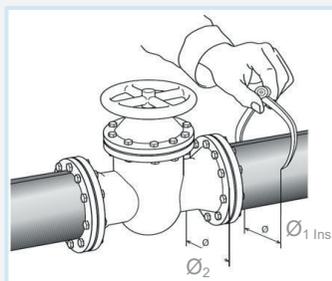
$\varnothing_{1\text{ Ins}}$  Outer diameter pipe (main pipe + insulation)

$\varnothing_2$  Outer diameter backing ring

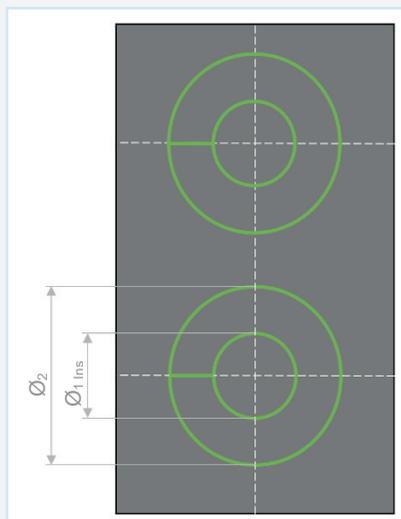
#### 2. Draw cutting lines

- Draw vertical and horizontal guides (center lines for the circles).
- Use the compass to mark circles on the sheet insulation.

1.



2.



Cutting line

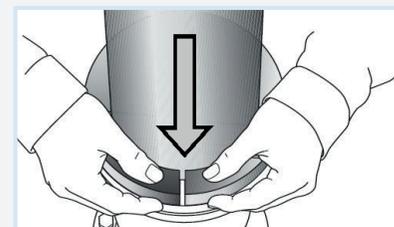
#### 3. Cut & join

- Cut out the two segments.
- Using a knife, make a small cut in the segments to allow connection.
- Apply glue on both sides, let dry and re-join the two side elements on the pipe / duct.
- Use the wet sealing technique to join the side elements towards the pipe insulation.

#### Important!

Clean the joining insulation surface of the pipe / duct insulation with a proper cleaner and open the cells with a knife or emery cloth for better jointing.

3.



#### Required tools:





## Valve - Body cover

### 1. Measure

- Determine the circumference ( $C_1$ ) with a strip of sheet insulation.
- Measure the width ( $L_1$ ) to be insulated.
- Measure the outer diameter of the valve body,  $OD_3$ .

$\varnothing_3$  Outer diameter Valve body

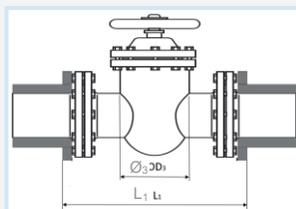
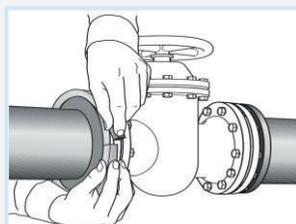
$C_1$  Circumference

$L_1$  Width to be insulated

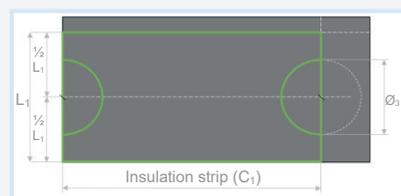
### 2. Draw cutting lines

- Draw horizontal and vertical cutting lines.
- From the vertical lines, draw two half circles for the outlet of the fitting body with a compass.

1.



2.



Cutting line

### 3. Cut & join

- Cut out segment on the cutting lines.
- Apply glue to the two connecting surfaces of the body cover itself and the joining surfaces towards the side elements.
- Allow to dry before joining.

#### Important!

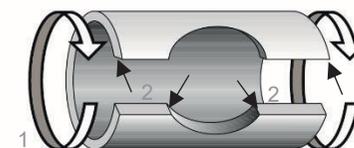
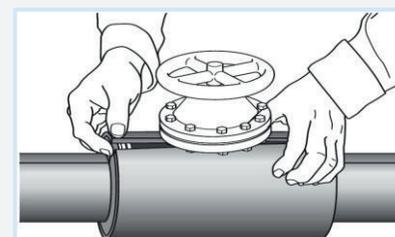
Clean the joining insulation surface of the body cover towards the side elements with a proper cleaner and open the cells with a knife or emery cloth for better joining.

- Wrap the body cover towards the side elements around the valve.
- Join both sides of the body cover together.
- To prevent misalignment, join the edges first.
- Apply light pressure to join the remaining parts.

#### TIP!

Due the stability of Thermaflex® polyolefin insulation reinforcement is not necessary.

3.



### Required tools:





## Valve - Top cover

### 1. Measure

- Determine the two diameters using the outside calipers.

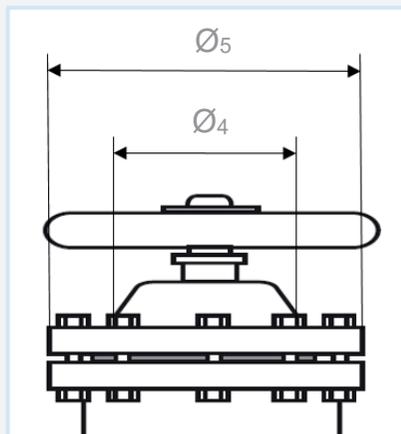
$\varnothing_4$  Outer diameter Valve handle / wheel outlet

$\varnothing_5$  Outer diameter Valve bonnet

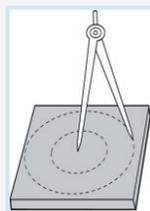
### 2. Draw cutting lines

- Draw diameters  $\varnothing_4$  and  $\varnothing_5$  on a piece of sheet insulation.

1.



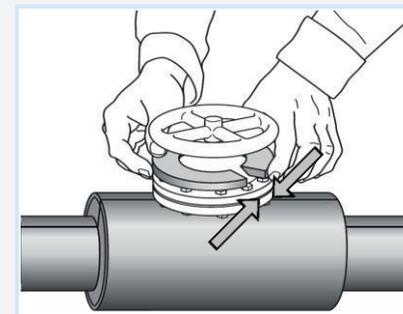
2.



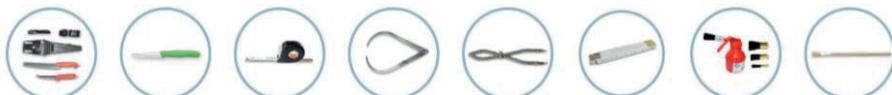
### 3. Cut & Apply top cover

- Cut out the top cover and cut open on one side.
- Apply glue and ensure it's tack-dry before reconnecting the two ends of the top cover.

3.



### Required tools:



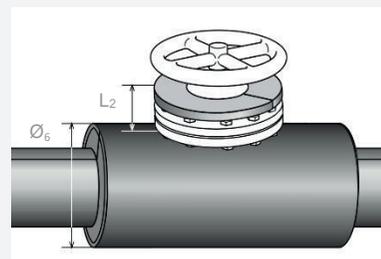
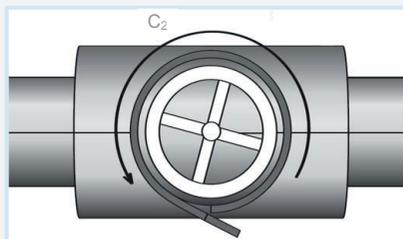


## Valve – Bonnet cover

### 1. Measure

- Determine the circumference ( $C_2$ ) using a strip of sheet insulation material.
- Measure the lowest point of the Valve bonnet ( $L_2$ ) including the insulation thickness of the top cover.
- Measure the outside diameter of the body cover insulation ( $\varnothing_6$ ) using the outside calipers.

1.

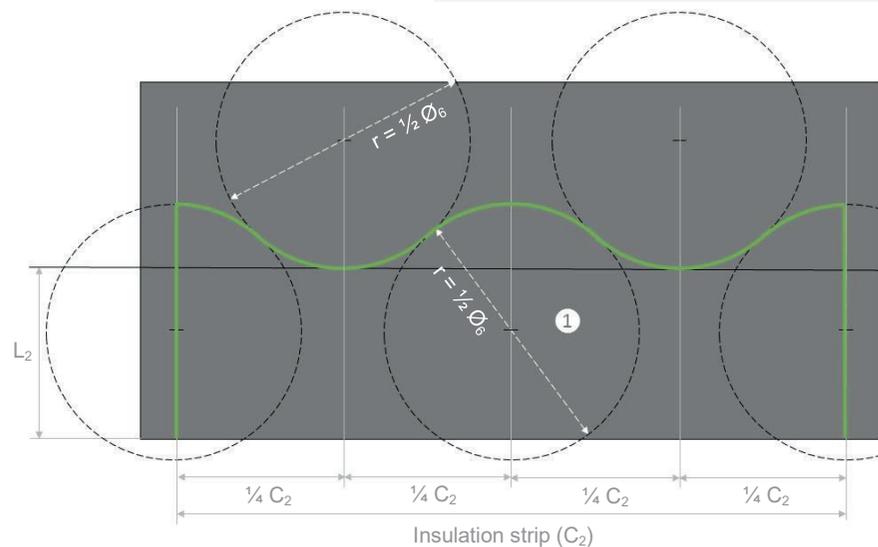
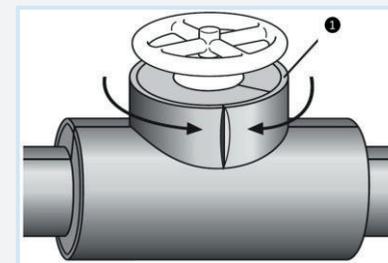


$\varnothing_6$  Outer diameter body cover insulation  
 $C_2$  Circumference  
 $L_2$  Smallest distance including insulation thickness

### 2. Draw cutting lines

- Take a piece of insulation sheet material and mark the width of the circumference ( $C_2$ ). Divide by four and draw the vertical guides.
- Draw a horizontal guide at  $L_2$ .
- Mark the centers of the two upper circles and draw the circles using a compass.
- Mark the centers of the three lower circles and draw them.

2.



 Cutting line

Required tools:

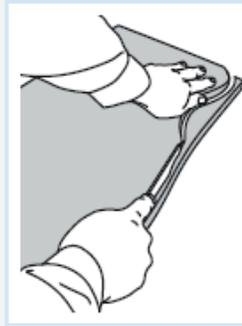


## Valve – Bonnet cover

### 3. Cut

- Cut out the segment from the sheet insulation material on the cutting lines.

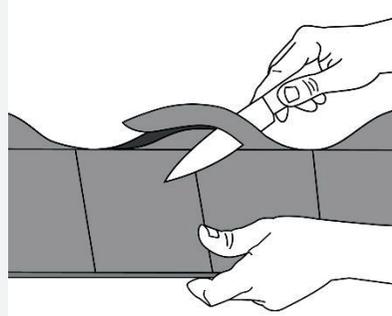
3.



### 4. Fit

- Adapt the joining surface to the body cover insulation making a 90° cut at the short length and increase the inwards-beveled angle toward the top as shown in figure 4.
- Apply the segment onto the Valve bonnet and towards the body cover insulation and check the fit.
- Readjust if needed for a perfect fit.

4.



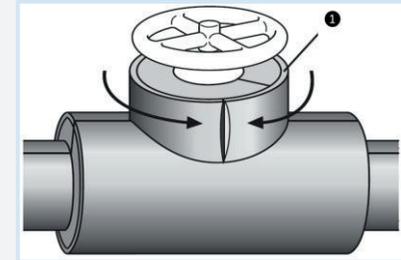
### 5. Join

- Apply glue and make sure its tack-dry before joining the surfaces of the body cover itself as well as the surfaces towards the top cover.
- Fix the bonnet cover onto the top cover.
- Use wet sealing technique to fix onto the body cover.

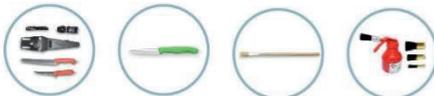
#### Important!

Clean the joining surfaces with a proper cleaner and open the cells with a knife or emery cloth for better joining.

5.



#### Required tools:



## 04. Tools

The following tools have been tailor-made for the installation of Thermaflex® sheet insulation, and ensure sustainable functionality and convenience for insulators around the world working with our material. We therefore highly recommend to work with our toolbox, available for purchase from your local dealer. Make sure our tools comply with your national laws and safety standards for building sites.

### Knives & cutters

#### Specialized 25cm, and 12.5cm insulation knife set

##### For serious insulation functionality.

The double insulation knife set has been developed for fast, efficient and comfortable cutting and shaping of Thermaflex® insulation. The 2 knives are accompanied by a locking safety holster, belt and lanyard to ensure maximum safety, and convenient transportation.



#### Small paring knife, 8cm

##### For the finer craft.

The 8cm straight-edge paring knife is for the finer cuts and shapes. Its pointed head makes it ideal for carving, cutting, and shaping for detail and accuracy.



#### Utility knife

##### The all-rounder.

Our universal utility knife is a safe companion when you're on the move. Its long, stable 40mm blade retracts automatically upon release, ensuring maximum safety. Are you a left hander? Simply open the handle, and turn the blade around – no tools needed. Comes with belt holster for easy transportation.



#### Miter cutter

##### Angle for perfection.

The miter cutter is suited for insulation applications with 90° angles, such as ventilation channels. With its 45° angled blades, it can perfect V-grooves in your insulation sheet in one smooth pull. The miter cutter is also suited for 45° beveled cuts of sheet insulation for better joining. The maximum insulation thickness possible is 13mm. An additional blade set is included.



#### Hollow punch set (5pcs)

##### For the perfect circle.

Our universal stainless steel hollow punches are ideal for quickly, and efficiently carving out pipe ends. The 5-piece set covers the standard, most commonly applied diameters: 21mm, 27mm, 33mm, 38mm, and 60mm.



#### Whetstone

##### Keep it sharp.

A sharpening stone is included to keep your knives razor-sharp, and ensure the best and smoothest possible cuts.



## Measurement & marking

### Talimeter (3m)

#### Measure it. Mark it. Craft it.

The ideal marking measure for insulation craftsmen. This white, impact-resistant steel tape measure has both millimeters and diameters, combining marking and measurement edges so you can quickly and simply measure and mark both internal and external lengths. Superior for marking large diameters.

### Outside calipers

#### Who goes around, knows around.

Need to figure out your exact pipe diameter? Our outside calipers are the perfect way to do so. Just clip them round, and measure the span.

### Compass

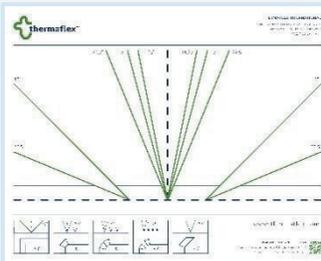
#### Mark like a pro.

Our nickel-plated steel compass is accurate and fast adjusting, and marks circles up to 107cm. Points can be easily re-sharpened or replaced.

### Cutting mat

#### Cut to fit.

Use our Thermaflex-designed cutting mat for optimal angular precision, covering all the cutting angles you need. Perfectly suitable for all your elbows, bends, T and Y pieces, you name it. The cutting mat is made for both right and left handed craftsmen.



### Folding ruler

#### Unfolding precision.

Our folding ruler measures length and angular degrees all in one handy, compact tool.

### Metal ruler (50cm)

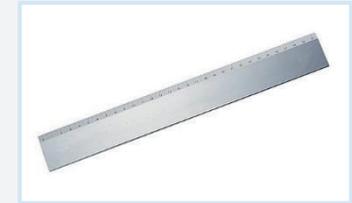
#### Solid precision.

Our metal ruler measures cm and inch.

### Marker

#### Swift and sure.

Draw out exactly where you need to cut, shape, or carve with our black insulation marker.



## Adhesive Tools

### Glue master

#### Solidity is key.

The 0,25l glue master allows for a quick, and efficient application of our specially developed Thermaflex adhesive. Our selection of 3 detachable brushes including a 11mm, 17mm and 23mm brush, makes it applicable for medium and larger surface areas.

### Spare brushes

#### For superb application.

Glue master replacement parts. Our selection of 3 detachable brushes including a 11mm, 17mm and 23mm brush, makes it applicable for medium and larger surface areas.



### Brush

#### For the delicate work.

To perfect the small and narrow gluing work, our professional glue brush is your best bet.

#### TIP!

We recommend a flat brush with sturdy and short bristles.



# Optional Tools

The following tools are relatively standard, but also recommended. As they tend to be already widely included in standard insulation toolkits, we do not include them in our toolbox, and can be easily acquired locally.

## Knives & cutters

### Long Knife (30cm)

**For professional insulation works.**

A 30cm long and thin blade allows for perfect beveled cuts and easy working in combination with the Thermaflex Miter Box.

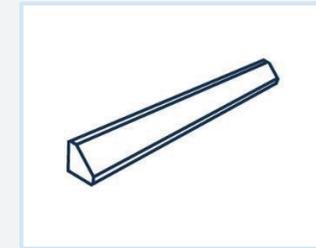


## Measurement & marking

### Cutting aid

**For perfect beveled cutting.**

Use a cutting aid with 130cm length for long perfect 45° beveled cutting of sheet insulation.



## Measurement & marking

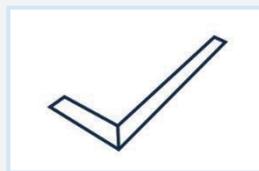
### Steel framing square

**Angular precision.**

Use a steel framing square for perfect 90° precision marking on sheet insulation.

#### **TIP!**

Use the Thermaflex cutting mat instead!



## Adhesive Tools - large surfaces

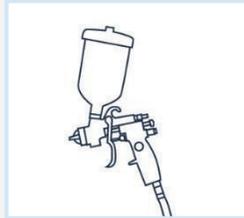
### Spray glue gun

**Rapid application.**

A spray gun offers rapid application of Thermaflex adhesive for large surfaces.

**TIP!**

Contact your Thermaflex partner to get information on the required specifications!



### Glue roller

**Fast application.**

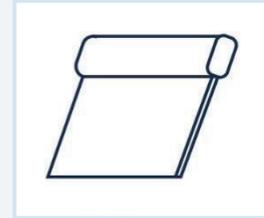
A glue roller ensures rapid application of Thermaflex glue to bigger surfaces.



### Spatula

**Fast application.**

A smooth spatula ensures rapid application of Thermaflex glue. Suitable for bigger surfaces.





[WWW.THERMAFLEX.COM](http://WWW.THERMAFLEX.COM)

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Installation video's.



Installation manuals.