



# Sheet Insulation - Rectangular ducts

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.

Responsible publisher: Thermaflex International Holding bv

# Table of Contents

|                          |    |
|--------------------------|----|
| 1. General               | 4  |
| 2. Rectangular ducts     | 5  |
| 2.1. Gluing              | 10 |
| 2.2. Self-Adhesive Sheet | 12 |
| 3. Duct flange           | 14 |
| 4. Tools                 | 16 |

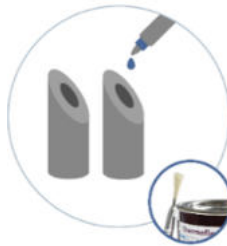


# 1. General

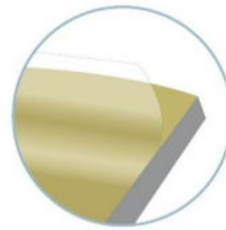
This installation manual will guide you in professional rectangular air duct insulation and the most common elements of square ducting systems with Thermaflex® polyolefin sheet insulation, also available in Self Adhesive that can save valuable installation labor costs. For the insulation of specific elements 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.

Glue



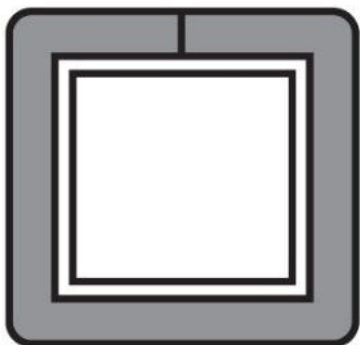
Self adhesive sheet insulation



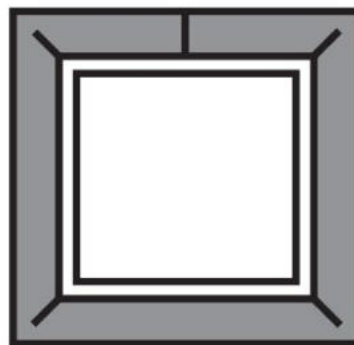
## 2. Rectangular ducts

All methods shown in this manual can be followed either by Gluing (ThermaGlue) or Thermaflex® Self-adhesive sheet material.

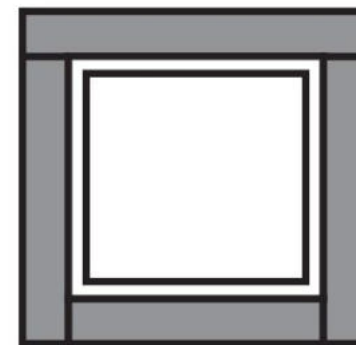
Method 1




Method 2



Method 3



|                    |                                 |                  |  |
|--------------------|---------------------------------|------------------|--|
| <b>Thickness</b>   | Up to 13mm thickness only       | All thicknesses  | All thicknesses  |
| <b>Application</b> | Not for condensation prevention | All applications | All thicknesses  |
|                    |                                 |                  | <p>This method is ideal for bigger thicknesses and multilayer application. Due to the closed cell structure of Thermaflex® insulation material, the visible cells on the edges has no influence on the insulation performance. If you prefer not to see open cells you can choose the alternative option as shown below.</p>  |

## Surface preparation

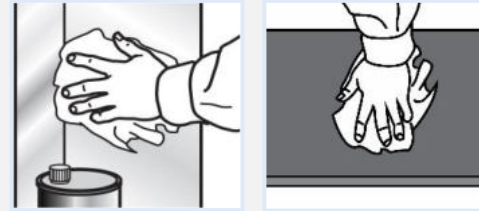
### 1. Clean surfaces

- Rectangular duct and insulation surface must be free of contamination such as dust or grease, and free of moisture prior to 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.

1.



## Measurement & cutting

### 1. Measure

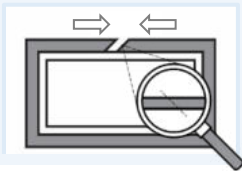
- Determine the circumference (C) of the rectangular duct using a strip of insulation material of the same thickness to be used for the insulation.
- Measure the required length (L) up to the next duct flange or other network component.

C Duct circumference

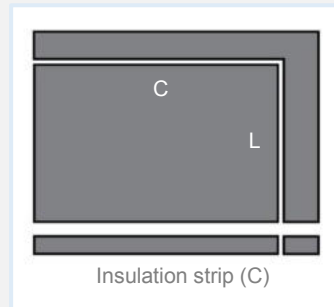
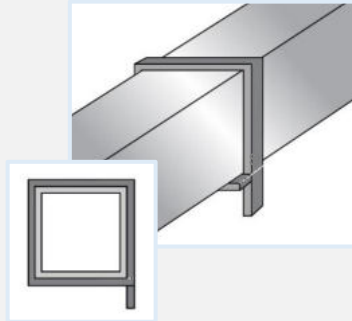
L Length

#### TIP!

For circumferential joining, cut the sheet material in a beveled manner to maximize the joining surface.



1.



### 2. Outline guides & cut

- Plot the circumference on the sheet insulation and cut accordingly.
- Cut the sheet insulation to length (L) for butt joining towards the next network: a duct flange, readily insulated element, etc.

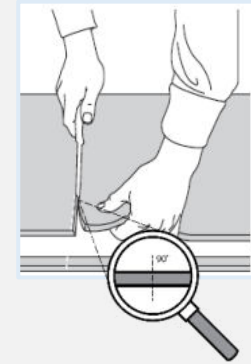
#### Important!

Remember: allow an excess length of +5mm for wet sealing for the butt joints and compression joining to the e.g. duct flange.

## Method 1



2.



### Required tools:



#### Important!

This method is not suitable for condensation prevention and can only be used for up to 13mm insulation thickness.

## Measurement & cutting

### 1. Measure

- Determine the circumference (C) of the rectangular duct using a strip of insulation material of the same thickness to be used for the insulation and add excess length for compression joining.
- Mark the edges on the insulation strip to obtain the side length.
- Measure the required length (L) until the next duct flange or other network element.

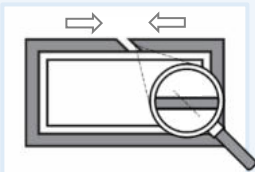
### 2. Outline guides & cut

- Plot the circumference on the sheet insulation and cut accordingly.
- Cut the sheet insulation to length (L) for butt joining towards the next network element.

|         |                    |
|---------|--------------------|
| C       | Duct circumference |
| L       | Length             |
| a,b,c,d | Side length        |

#### TIP!

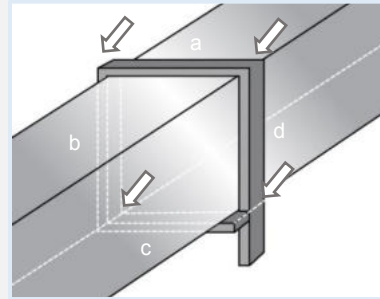
For circumferential joining, cut the sheet material in a beveled manner to maximize the joining surface.



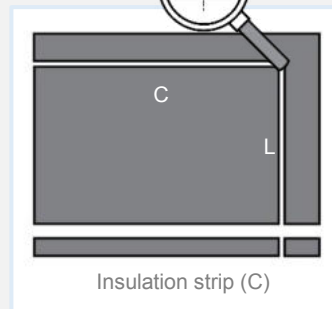
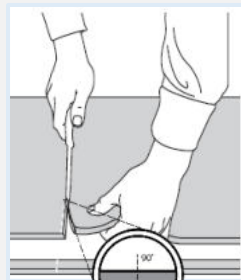
#### Required tools:



1.



2.



### 3. Mark lines and make v-groove

- Mark lines according to figure 3.
- Use a miter cutter or angle grinder with suitable cutter to make a v-groove of 2/3 of the sheet insulation thickness.

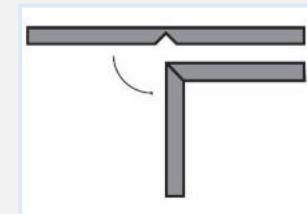
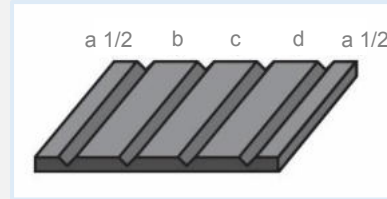
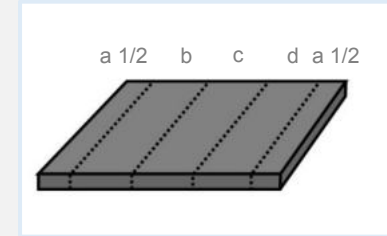
#### Important!

Remember: allow an excess length of +5mm for wet sealing for the butt joints and compression joining to the e.g. duct flange.

## Method 2



3.





## Measurement & cutting

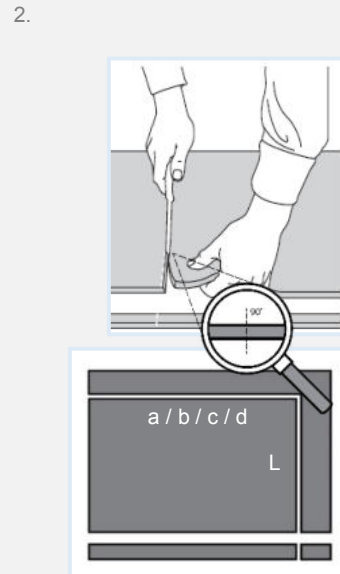
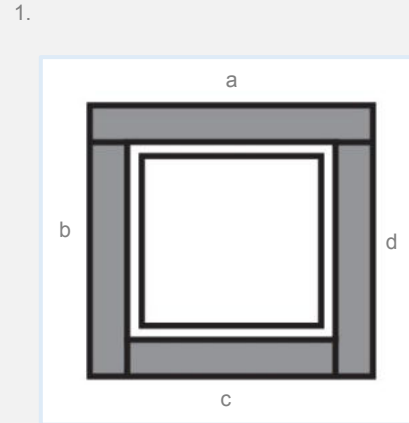
### 1. Measure

- Measure the required length (L) up to the next duct flange or other network element.
- Determine the required side lengths as shown in figure 1., described below:

- a width of duct + 5mm + 2x insulation thickness
- c width of duct + 5mm
- b,d height of duct + 5mm + insulation thickness
- L Length

### 2. Outline guides & cut

- Plot the determined side length on the sheet insulation and cut accordingly.
- Cut the sheet insulation to length (L) for butt joining towards the next network element.



### Alternative solution – closed corners

For optical reasons, the edges are cut at an 45° angle with a miter cutter or with a knife so that the top layer fits the corners and no cell structure is visible.

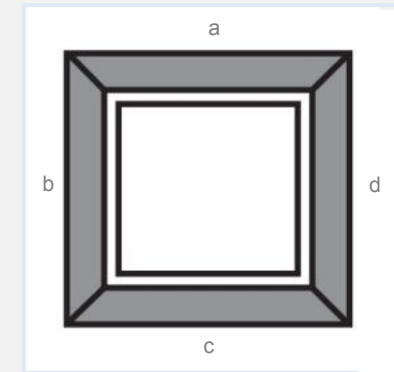
#### Important!

Allow an excess length of +5mm for compression joining and thermal expansion for all side lengths.

#### Important!

Method 2: Apply glue to the edges of V-cut as well!

## Method 3



### Required tools:



## 2.1. Gluing Apply glue



### 1. Apply glue (join to object)

- Due to the excellent stability of Thermaflex® insulation material, we recommend full surface joining to the bottom surface only to reduce the risk of sacking and save glue.
- Coat or spray ends at a strip of >10cm thickness with Thermaflex adhesive as shown in figure 1.1 and figure 1.2.
- Make sure to leave an excess ~ 30-50 mm for wet sealing towards network elements or already installed sheet insulation.
- Apply glue on both the Thermaflex® sheet insulation and the pipe / duct surface. Ensure Thermaflex adhesive is tack-dry before joining.

### 2. Join insulation

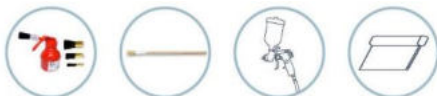
- Coat both surfaces for circumferential joining with glue and let sealant dry before application (tack-dry consistency).

#### TIP!

When applying glue to 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.

#### Required tools:

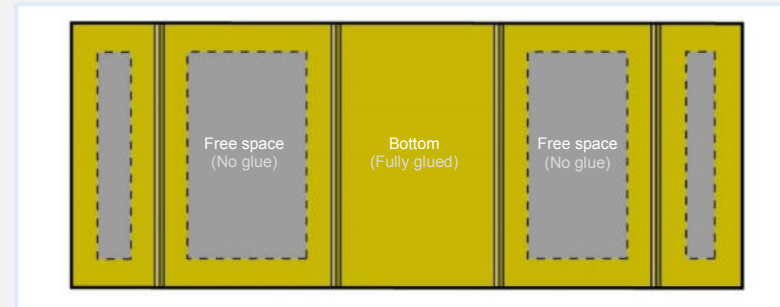
10



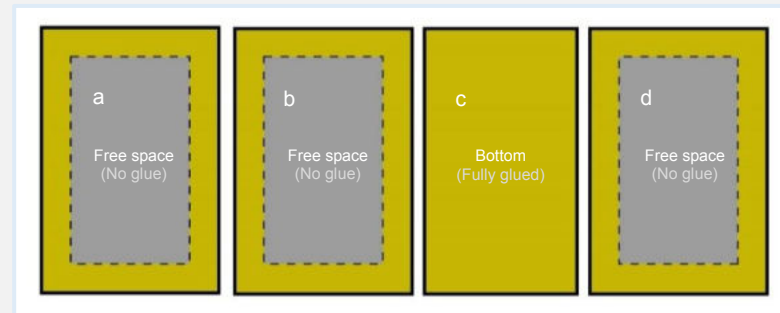
## Method 1,2 & 3



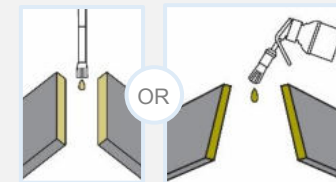
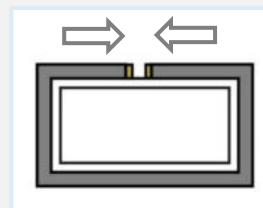
### 1.1 (Method 1 & 2)



### 1.2 (Method 3)



### 2.



## Apply insulation

### 1. Circumferential joining

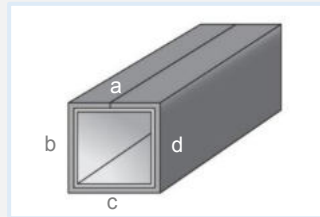
#### 1.1 Method 1 & 2

- Wrap sheet insulation around the rectangular air duct.
- First join the edges and then the middle part to prevent misalignment of the ends for each side length.
- Join the remaining parts applying light pressure.

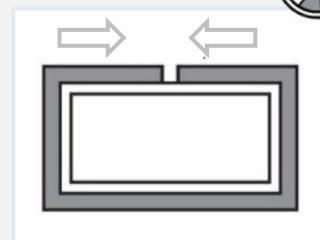
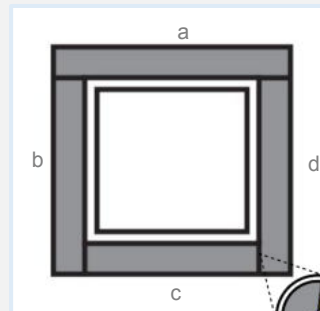
#### 1.2 Method 3

- Start with applying sheet c, then sides b and d.
- Apply insulation top cover a.

1.1 (Method 1 & 2)

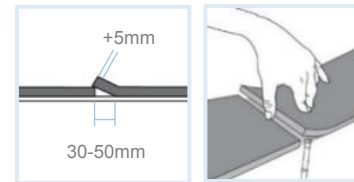


1.2 (Method 3)



### 2. Butt joining

- Apply sheet with an excess length of +5mm onto the object for compression joining.
- When joining the sheet material onto the object, don't apply glue on the last 30 - 50mm to allow wet sealing.



### 3. Multi-Layer-Insulation

Ensure that the two layers are away from each other or even at another side of the rectangular duct so that 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.

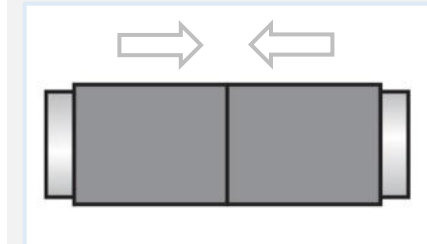
#### Important!

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

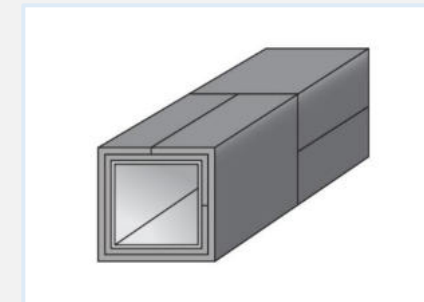
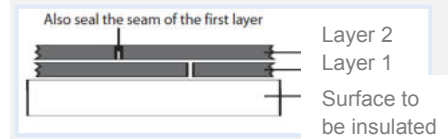
Apply glue under the seam of the 2<sup>nd</sup> layer.



2.



3.



Required tools:



## 2.2. Self-adhesive sheet



### Apply insulation

This chapter shows the installation of self-adhesive sheet using Method 3 as example.

#### 1. Measure, Cut

- Determine the duct measures.
- Allow an additional 1% overlength due to the shrinkage after removing foil.
- Allow an additional +5mm for butt joints.
- Cut sheet insulation to fit.

#### Important!

Allow additional 1% overlength!

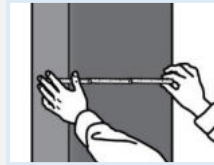
#### 2. Peel back foil

- Slightly peel back the foil for the part to insulate.

#### Important!

Do not remove the foil completely.

1.



2.



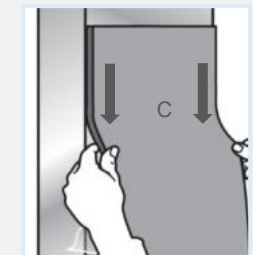
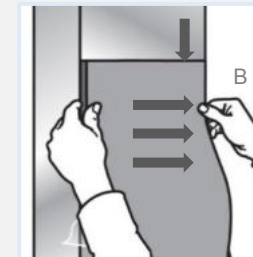
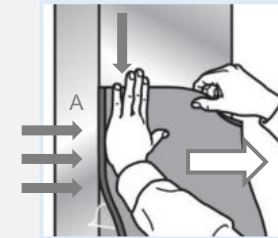
## Method 1,2 & 3



#### 3. Apply sheet

- Line up sheet at points A and B.
- Press firmly onto the active adhesive.
- Align material and continue to ensure it is lined out correctly.
- Press down firmly whilst slowly removing the foil.

3.



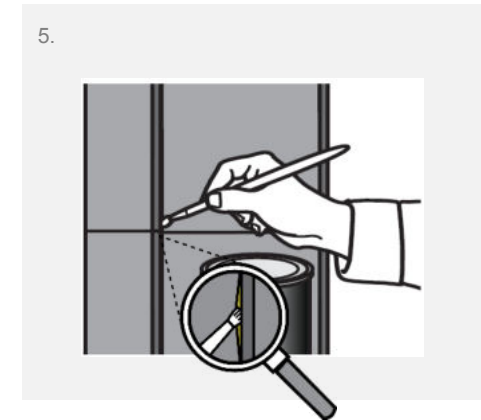
#### 4. Butt joints

- For butt joints leave 5mm overlap for compression joining / wet sealing technique.



#### 5. Seal off corners

- Apply the wet sealing technique to the compressed butt joint for a vapor tight seam.



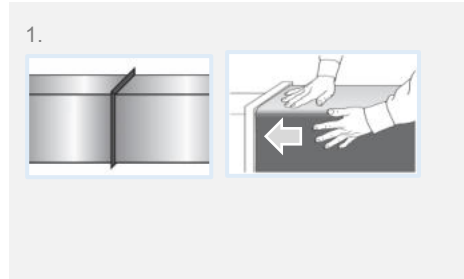
#### Required tools:



# 3. Duct flange

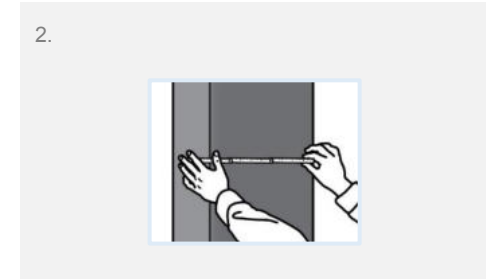
## 1. Insulate Air ducts

- Apply insulation on the rectangular air duct first. Insulate up to the flange connection applying light pressure (+5mm).



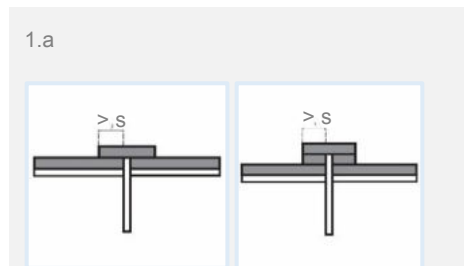
## 2. Measure

- Determine the measures of the insulated duct and the duct flange to be insulated.



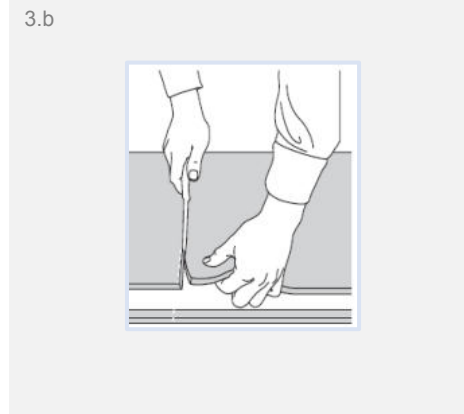
## 1.a Method 1 – box

- If the height of the flange is less than, or equal to the insulation thickness, only one in insulation strip is required.
- If the flange is higher, a box must be built around the duct flange.



## 1.b Cut, clean and glue

- Take a piece of Thermaflex® insulation sheet with the same thickness and cut out the required strips.
- Scrape the joining surface to improve bonding, by using a knife for example.
- Clean the joining surfaces with a polyolefin cleaner.
- Coat the joining surfaces with Thermaflex adhesive and let dry (tack-dry consistency) prior to application.

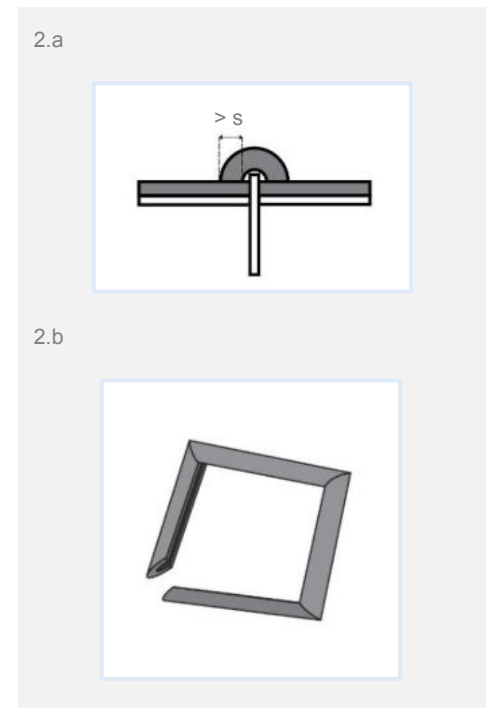


## 2.a Method 2 – tube insulation

- For this method, cut tube insulation in half for insulating the duct flange.

## 2.b Cut, clean and glue

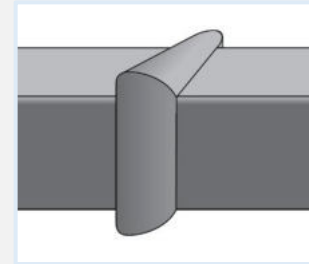
- Cut the tube insulation to length at a 45° angle using a miter box or cutting mat.
- Cut tubular insulation of the same insulation thickness (at least 20mm) into two equal halves.
- Scrape the joining surface to improve bonding, by using a knife for example.
- Clean the joining surfaces with a polyolefin cleaner.
- Glue together to fit over the insulated duct body and flange, while leaving one side open.



### 3.c Apply insulation

- Apply the insulation frame over the duct flange on the duct body.
- Join the frame together.
- Apply the wet sealing technique to join the frame onto the insulated duct body.

3.c

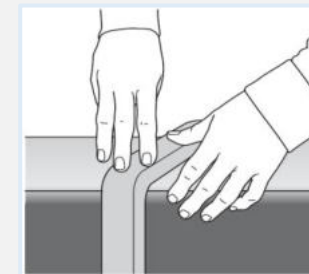


### Close seams

#### 1. Apply ThermaTape

- We recommend, to close the seams for optical reasons after inspection.

1.



## 4. Tools

The following tools have been tailor-made for the installation of Thermaflex® polyolefin 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

### Talmeter (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.

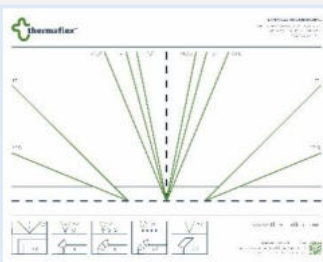
Our nickel-plated steel compass is accurate and fast adjusting, and marks circles up to 107cm. Points can be easily re-sharpened or replaced.



### 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

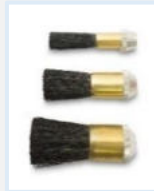
#### Solidity is key.

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.

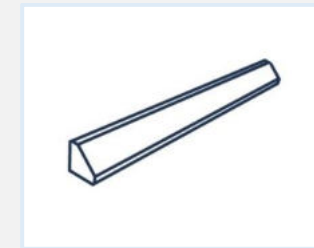


## Measurement & marking

### Cutting aid

**For perfect beveled cutting.**

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



## Measurement & marking

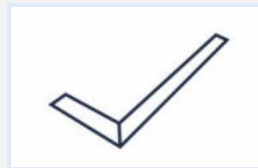
### Steel framing square

**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

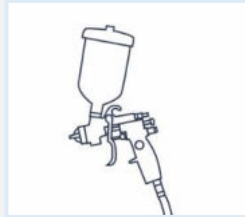
### Spray glue gun

**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.



# Take a note

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---



**WWW.THERMAFLEX.COM**

Thermaflex International Holding b.v.

Veerweg 1, 5145 NS Waalwijk

The Netherlands



Installation video's.



Installation manuals.