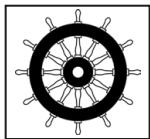
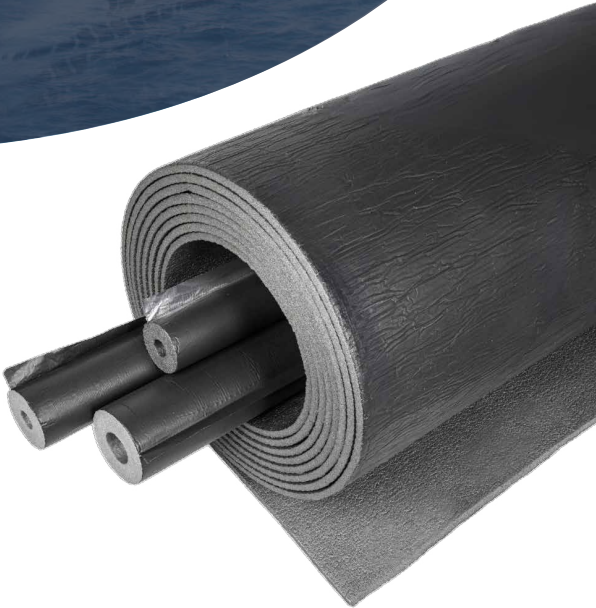




INSTALLATION MANUAL

ThermaSmart®
Marine 2.0 Black



2690/2025



THERMAFLEX®

Marine Installation Manual - EN | 2025

00.021.863 - v.1.2 - 28.01.2025

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. Product images are for illustration purposes only. Actual products may vary in appearance. Refer to product specifications or contact us for accurate details.

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I. ThermaSmart® Marine 2.0 Black Tube

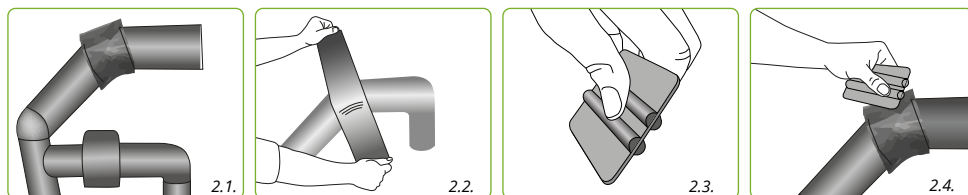
ThermaSmart® Marine 2.0 Black is a polyolefin elastomer insulation system covered with black aluminum foil.

The application of ThermaSmart® Marine 2.0 Black Tube is the same as other Thermaflex tube insulation (see page 6,7,8), but in this case the following rules should be applied:

1. Seam protection

- For ThermaSmart® Marine 2.0 Black installed insulation, all seams should be covered with ThermaSmart® Marine 2.0 Black aluminum tape, therefore glueing the seams is not needed.
- For ThermaSmart® PRO LS used in multi-layer application all seams should be previously glued with ThermaGlue (see ThermaSmart® Pro LS on pages 6-7).

2. Applying tape



3. Finishing assembly

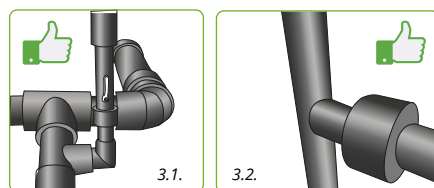
After installation, make sure that the entire ThermaSmart® Marine 2.0 Black system has been coated with black aluminum foil.

Required tools



ThermaSmart® Marine 2.0 Black tube

ThermaSmart® PRO LS tube



Important!

In the case of places without black aluminum foil they should be covered with ThermaSmart® Marine Black aluminum tape.



Knives & cutters



Utility knife



Small paring knife, 8 cm



Marker



Meter



Folding ruler



Squeegee



Tape

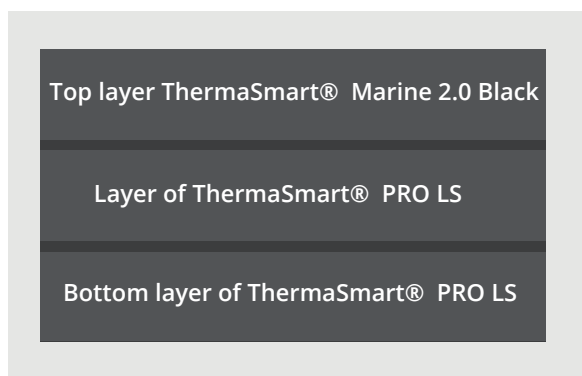


Cutting board

Application thickness above 30 mm and up to 150 mm

ThermaSmart® Marine 2.0 Black and ThermaSmart® PRO LS tube versions are produced in a maximum thickness of 30 mm. For applications requiring greater thickness, a multi-layer system can and should be used, as follows:

- Bottom layers ThermaSmart® PRO LS version
 - **ThermaGlue must be used to seal all seams**
- Final top layer ThermaSmart® Marine 2.0 Black
 - **No ThermaGlue is needed.**
 - Seams can be sealed by only using ThermaSmart® Marine 2.0 Black aluminum tape



Important!

Make sure to allow an excess length of +2% for compression joining to compensate for thermal expansion!

Note

The three layers shown in the picture are just an example. More or fewer layers can be used, provided the total thickness does not exceed 150 mm.

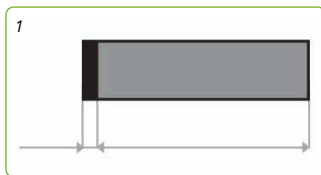
- Combinations of all wall thicknesses from the range can be used for this with the remark that the total wall thickness does not exceed the maximum allowed 150 mm.
- After installing the top layer of ThermaSmart® Marine 2.0 Black, all seams longitudinally as well as front side connections must be covered with self-adhesive ThermaSmart® Marine 2.0 Black aluminum tape with a minimum width of 50 mm.
- Glueless application is only for the Marine tube insulation with the Black Alu foil. The ThermaSmart® LS tube used as a first layer in a multi-layer system should always be installed using ThermaGlue to seal the seams (see manual tube Insulation).
- If ThermaSmart® Marine 2.0 Black is used in only one layer (up to 30 mm) no Glue is needed. All seams can be sealed with only using Marine 2.0 Black aluminum tape.
- Make sure that all seams are closed before using the ThermaSmart® Marine 2.0 Black aluminum tape to seal and cover the seams.

II. ThermaSmart® PRO LS Tube

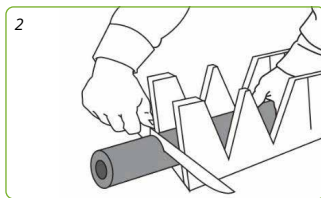
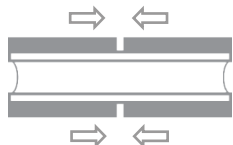
Measurement & Cutting

1. Measure length

- Measure the length needed for the tube insulation.
- Add 2% extra length to compensate for thermal expansion.
- Cut the insulation tube at a 90° angle.



2. Cut to length (butt joint)

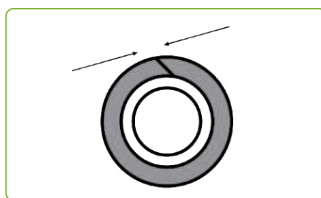


TIP!

Use a metri box for a perfect 90° cut!

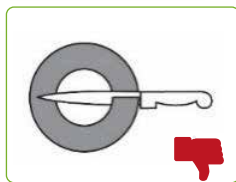
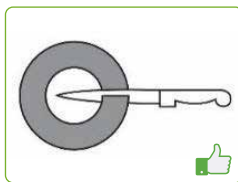
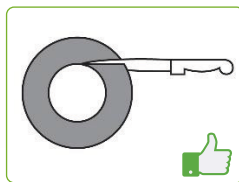
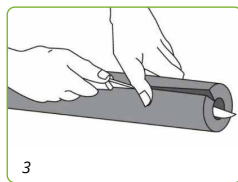
3. Longitudinal cut (circumferential joining)

- Cut open tubular insulation along the longitudinal direction using a knife.
- Maximize the joining surface as shown in Figure 3. For optimum, save and vapor-tight joining.



Important!

Reduce the ovality of the tube insulation by pressing on it. Always cut tubes on the flat side to minimize tension on the seam.

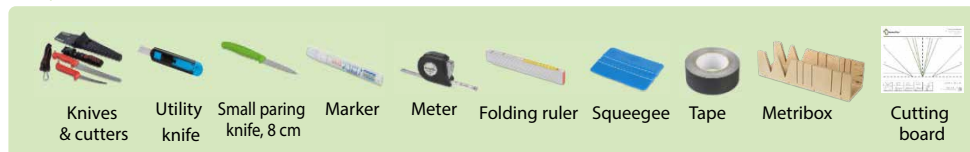


Important!

Make sure to use the right product with the right inner diameter.

- ID too small → tension in the seam.
- ID too big → hollow space.

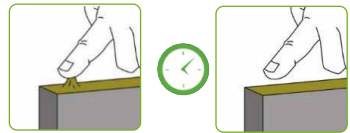
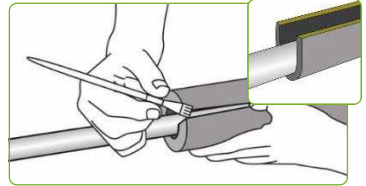
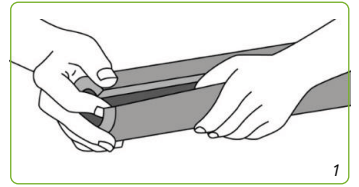
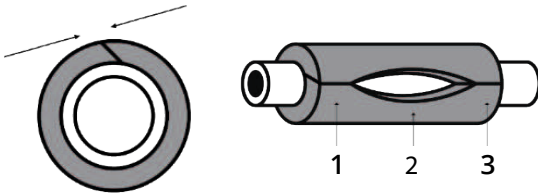
Required tools



Apply glue & join

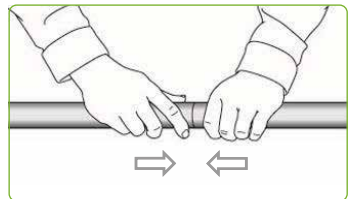
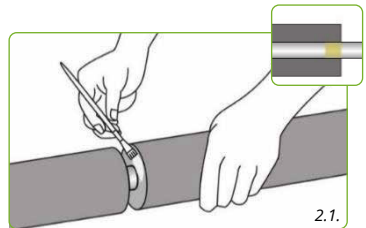
1. Circumferential joining

- After making the longitudinal cut, open insulation using your finger.
- Wrap around the pipe.
- Cover both joining surfaces with ThermoGlue.
- Let glue dry and do the fingernail test.
- Press seam together:
- First join edges (1,3) to prevent misalignment
- Then join middle part (2) .
- Join the remaining parts applying light pressure.



2.1. Butt joint (option 1.)

- Ensure compartmentation on the already installed tube end.
- Apply glue to both the surface of the installed tube end and the new insulation tube.
- Wait until glue is tack-dry.
- Join the two insulation tubes by applying light pressure to the already installed tube.



Important!

Make sure to allow an excess length of +2% for compression joining to compensate for thermal expansion!

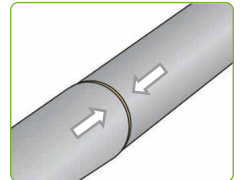
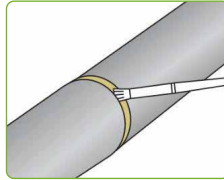
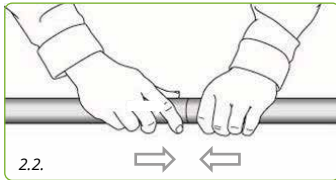
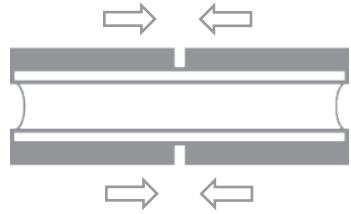
Required tools



ThermoSmart® PRO LS tube

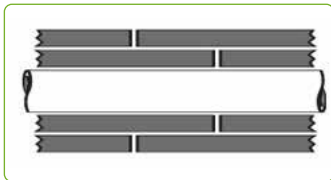
2.2. Butt joint - wet sealing (option 2.)

- Both insulation tubes already installed.
- Pull the two insulation ends apart.
- Use the wet sealing technique by applying adhesive evenly between both joining surfaces.
- Use light pressure to join the two insulation tubes together while glue is still wet for a vapor tight bond.



3. Multi-layer-insulation

Ensure that the two layers are at least 90° apart from each other and the longitudinal seams do not overlap. 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 are required.

Required tools



ThermaSmart® PRO LS tube

III. Prefab it yourself

Preparation

1. Joining techniques:

We offer two main joining techniques to seal off your system! These includes our long-time performance proven ThermoGlue as well as our heat plate tool for tubular prefabrications to simply and swiftly prefab-it-yourself, on site or in your workshop.

2. Heat up the heating element

Heat surface to the temperature of 180°C.

Important!

Ambient temperature 5°C - 35°C

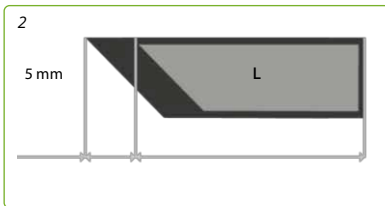


3. Length allowance

For melting provide an additional length of + 5mm to the original length of each fitting.

Important!

Respect the country specific health and safety regulations for working with high temperature electrical equipment.



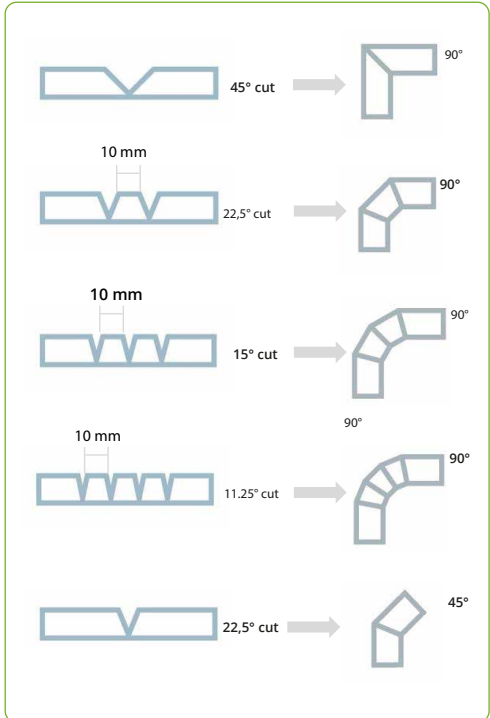
Required tools



4. Cut fitting segments

Cut fitting segments with the help of the ThermoFlex cutting mat or mitre box according to the figures beneath.

Bends 90° and 45°

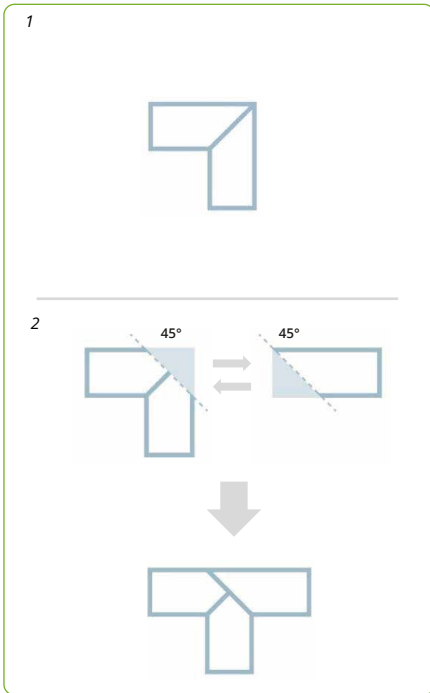


Pre-fabricating a 90° or a 45° bend involves a simple process.

Step one: Cut the segment parts

Step two: Weld.

T-piece 90°



Pre-fabricating a 90° T-piece involves a two-step process.

Step one: Produce a 90° bend.

Step two: Find an additional piece of tube insulation of the same size; then, cut both pieces to fit together like shown in figure 2 and weld.

Joining

1. Melt fitting component interface

Press both components onto the heating element and proceed with the following steps.

Equalize surface:

- Press for 1 second (to equalize the surface)
- Remove from the heating element
- Press for 1 second (to equalize the surface)
- Remove from the heating element

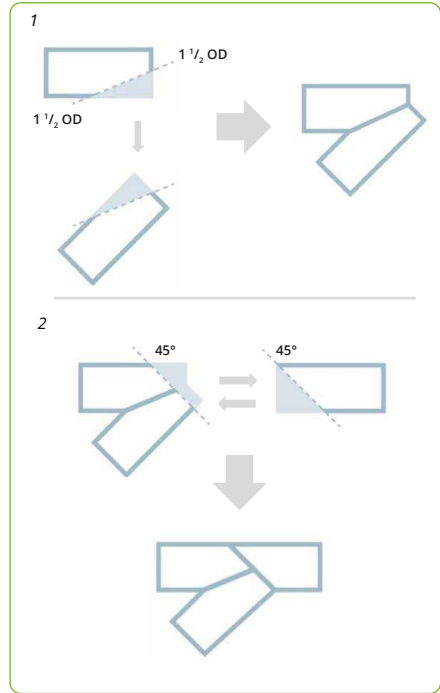
Heat up surface:

- Press for 1 second (heat up time)

Important!

Lightly press fitting components onto the heating element.

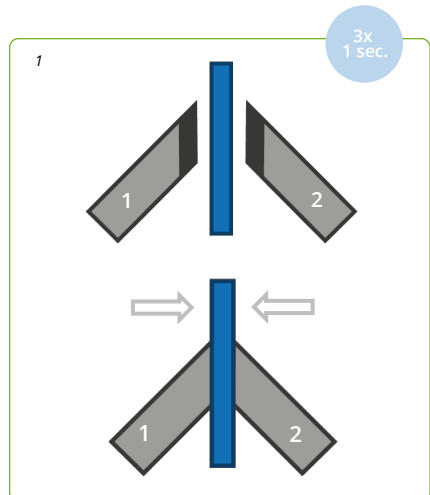
T-piece 45°



Pre-fabricating a 45° T-piece involves a two-step process.

Step one: Produce a 135° bend as shown in figure 1.

Step two: Cut the bend and the tube insulation to fit together as shown in figure 2 and weld.

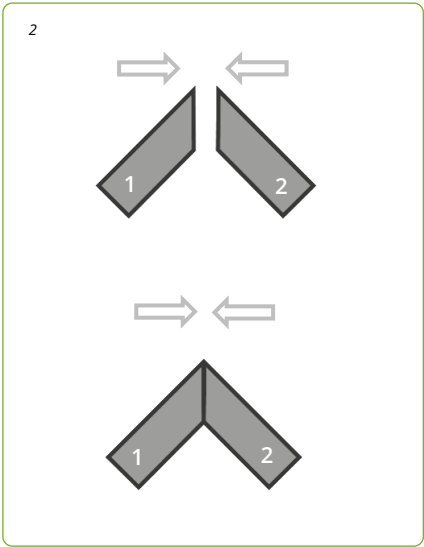


2. Joining

Join the two fitting components within 2 seconds (dwell time) after removing from the heating element and secure fittings by holding firmly with pressure for 3 seconds (welding time). After the welding process the two components are bound and homogenously joined.

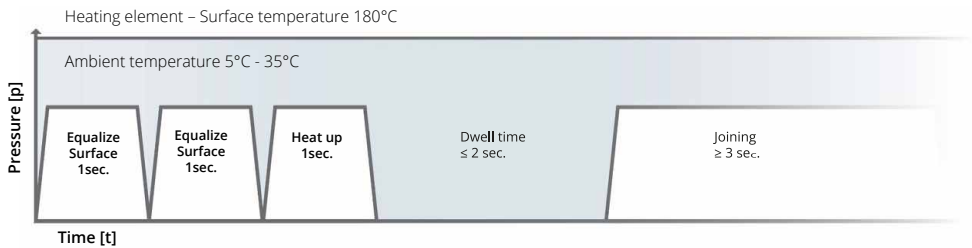
Important!

After the welding process, carefully clean the surface of the heating element with a thick and dry paper cloth.



Welding process

Polyfusion welding of tubular polyolefin insulation



IV. ThermaSmart® Marine 2.0 Black Sheet

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

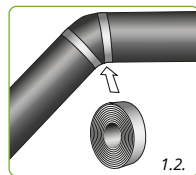
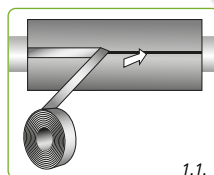
Glue still required for all ThermaSmart® Marine 2.0 Black sheet

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



1. Seam protection

- All seams should be previously glued with ThermaGlue, and then covered with ThermaSmart® Marine 2.0 Black aluminum tape

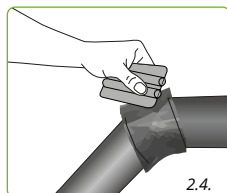
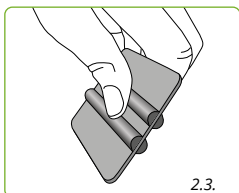
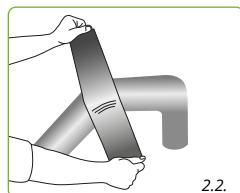
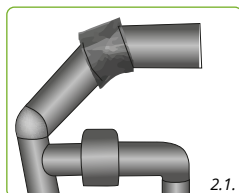


Important!

All seams should be covered with an overlap at least 50 mm wide!

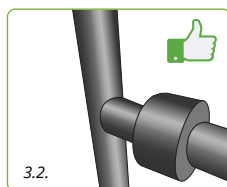
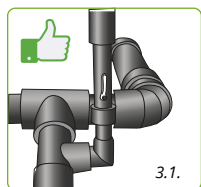
2. Applying tape

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

Required tools



ThermaSmart® Marine 2.0 Black sheet



ThermaSmart® PRO LS sheet



Knives & cutters



Utility knife



Small paring knife, 8 cm



Marker



Meter



Folding ruler



Squeegee



Tape

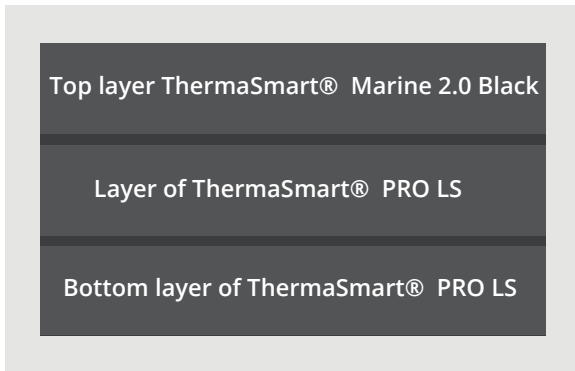


Cutting board

Application thickness above 25 mm and up to 150 mm

ThermaSmart® Marine 2.0 Black and ThermaSmart® PRO LS tube versions are produced in a maximum thickness of 25mm. For applications requiring greater thickness, a multi-layer system can and should be used, as follows:

- Bottom layers ThermaSmart® PRO LS version
 - **ThermaGlue must be used to seal all seams**
- Final top layer ThermaSmart® Marine 2.0 Black
 - **ThermaGlue must be used to seal all seams**



Important!

Make sure to allow an excess length of +2% for compression joining to compensate for thermal expansion!

Note

The three layers shown in the picture are just an example. More or fewer layers can be used, provided the total thickness does not exceed 150 mm.

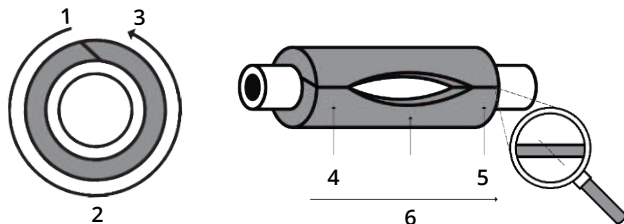
- Combinations of all wall thicknesses from the range can be used for this with the remark that the total wall thickness does not exceed the maximum allowed 150 mm.
- After installing the top layer of ThermaSmart® Marine 2.0 Black, all seams longitudinally as well as front side connections must be covered with self-adhesive ThermaSmart® Marine 2.0 Black aluminium tape with a minimum width of 50 mm
- Glueless application is only for the Marine tube insulation with the Black Alu foil. The ThermaSmart® LS tube used as a first layer in a multi-layer system should always be installed using ThermaGlue to seal the seams (see manual tube Insulation)
- Make sure that all seams are closed before using the ThermaSmart® Marine 2.0 Black aluminium tape to seal and cover the seams

V. ThermaSmart® PRO LS Sheet

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



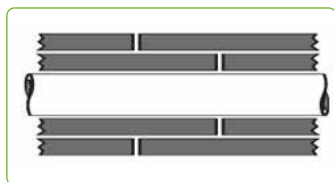
2. Butt joining

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



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 are required.

Required tools



Glue pump

Brush



ThermaSmart® PRO LS sheet



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.

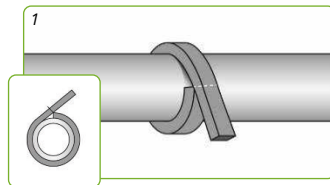
Important!

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

VI. Measurement & cutting

1. Measure

Determine the circumference (C) of the pipe by using a strip of the insulation material that matches the thickness of the insulation to be applied.

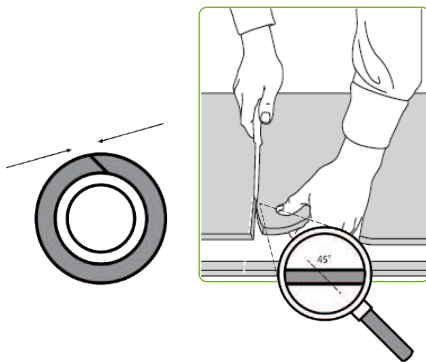


2. Outline guides & cut (circumferential joint)

- 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

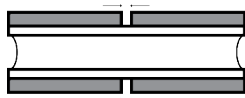
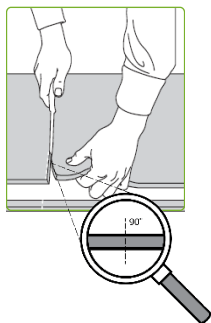
TIP!

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



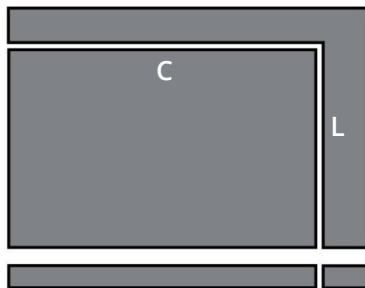
3. Cut (but joint)

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



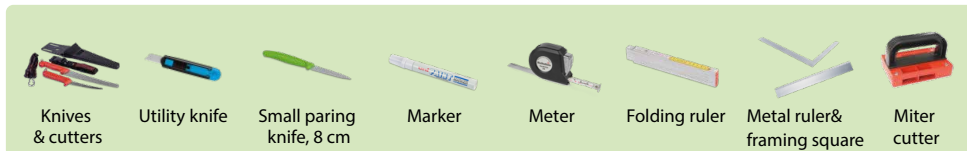
Important!

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



Insulation strip (C)
C Pipe circumference
L Length

Required tools



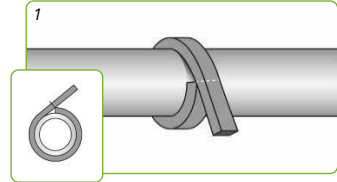
VII. Fittings

Segment bend 90°

Measurement

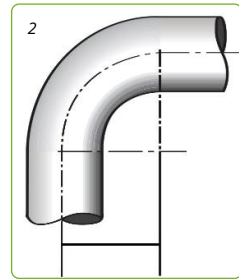
1. Measure

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



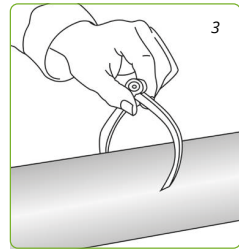
2. Curve radius

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

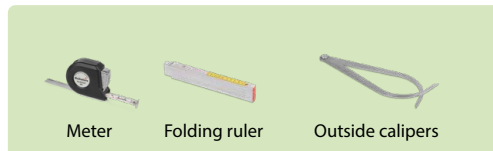


3. Pipe diameter

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



Required tools

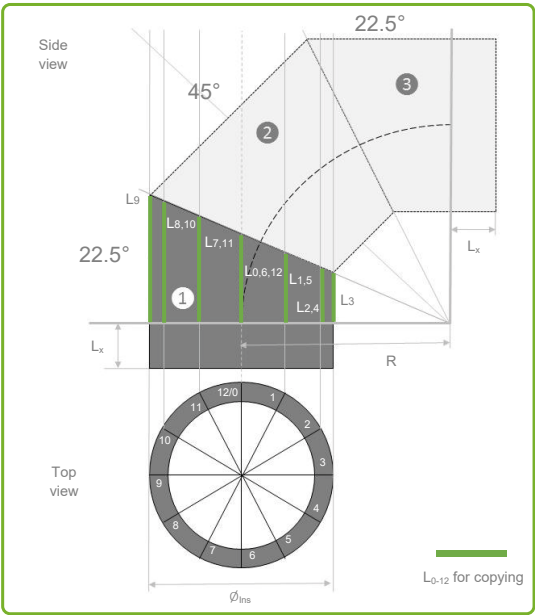


Draw cutting lines

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 the number of segments (see table)
 - Draw the guides for the segments and draw segment
 - Copy the points 0-12 from the top view by drawing vertical guides.



Important!

Lengths L9 should not be over 140 mm. If this length is over 140 mm, add another bend segment.

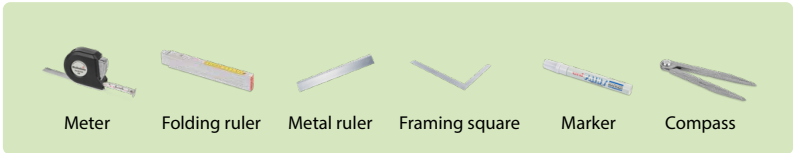
- $\varnothing_{\text{pipe}}$ Outer diameter pipe
- \varnothing_{ins} Outer diameter (pipe + 2x Insulation thickness)
- R Curve radius
- C Pipe circumference
- Lx Excess length required
- L0-12 Height of the insulation for copying to insulation with compass.

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.

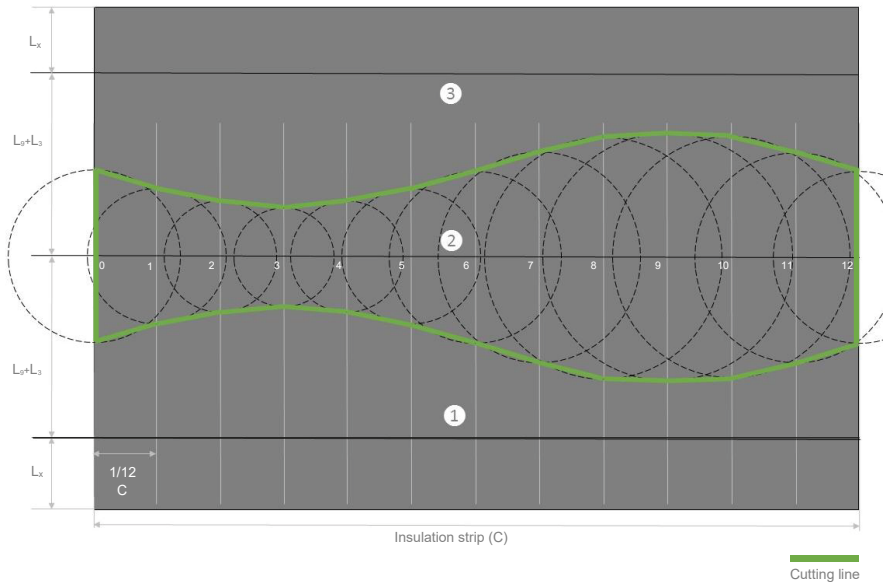
Numbers of segments	End parts angle [°]	Middle parts angle [°]
2+1	2x22.5°	1x45°
2+2	2x15°	2x30°
2+3	2x11.25°	3x22.5°
2+4	2x9°	4x18°

Required tools



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 (Lx)
 - Draw the horizontal guide(s) (L9 + L3) for the copy of the heights from the side view.
 - Copy the heights using a compass (r = L0 to L12) at the points 0 – 12.
 - Connect the intersecting point and you get the cutting lines.

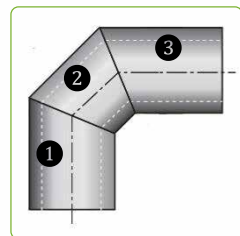


Important!

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

TIP

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



Required tools



Meter

Folding ruler



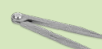
Metal ruler



Framing square



Marker

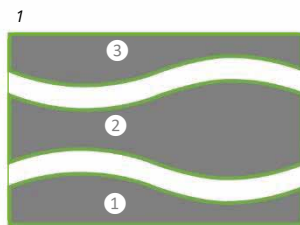


Compass

Assemble & join segments

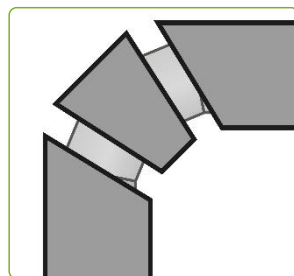
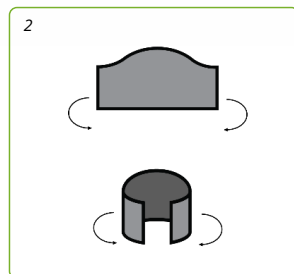
1. Cut out

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



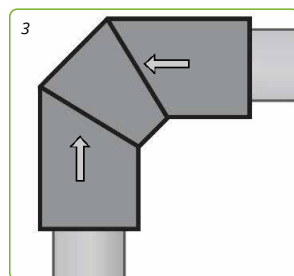
2. Fit

- 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 thicknesses).



3. Join

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



Required tools



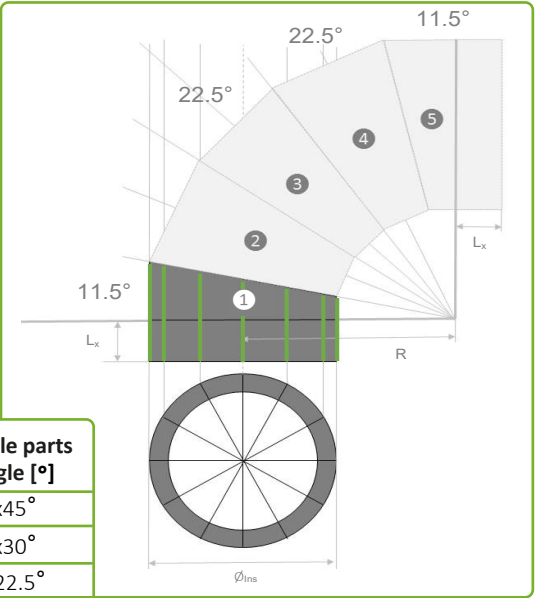
Example: 90° Segment bend
– 2 + 3 middle parts

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 140 mm for the length L9.

1. Create template

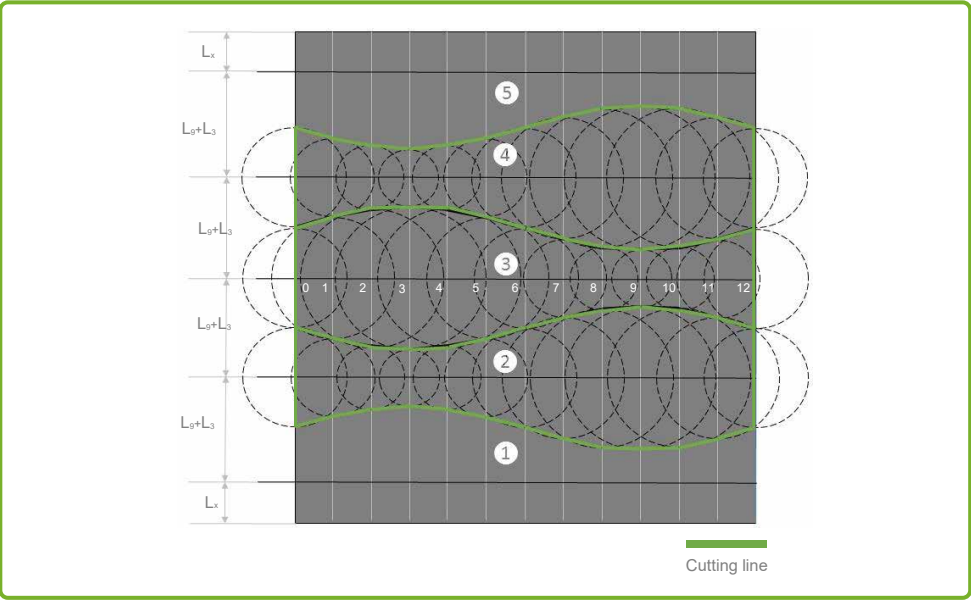
The template for a bend with 5 segments is given below.

Numbers of segments	End parts angle [°]	Middle parts angle [°]
2+1	2x22.5°	1x45°
2+2	2x15°	2x30°
2+3	2x11.25°	3x22.5°
2+4	2x9°	4x18°



2. Draw cutting lines

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

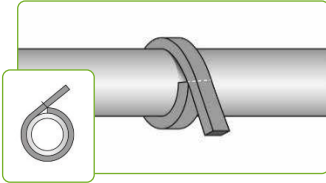


Bend 45°

Measure & Draw cutting lines

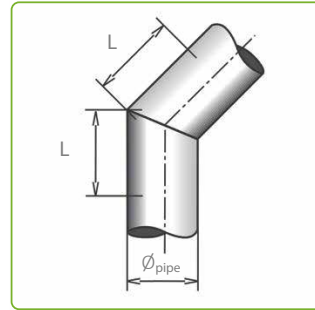
1. Measure

- Decide on the side length (L) of the bend.
- Determine the circumference of the pipe by using a strip of insulation material that matches the thickness of the insulation to be applied.



Important!

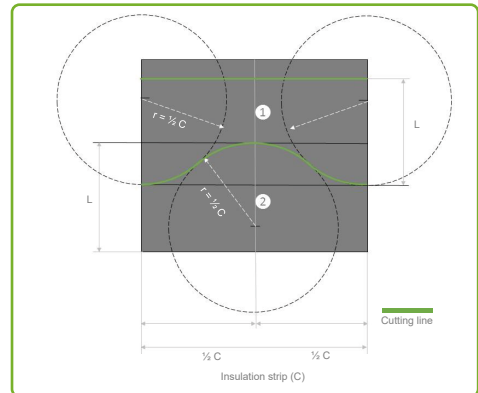
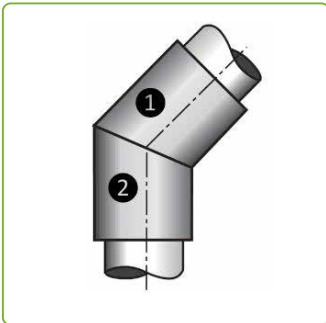
The side length (L) must be more than the pipe radius ($\varnothing_{\text{pipe}} / 2$)!



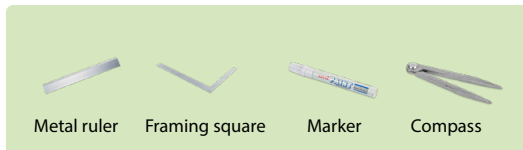
$\varnothing_{\text{pipe}}$ Outer diameter pipe
C Pipe circumference
L Side length of the insulation bend

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.



Required tools

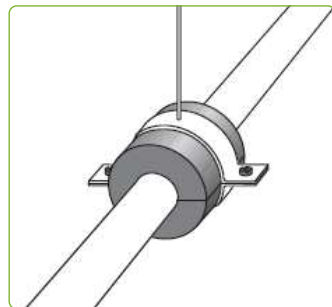


VIII. Pipe Fixation

The choice of the pipe fixation system and the insulation thickness greatly affects the spacial design during the pipework installation. Bracket spacing depends on pipe system!

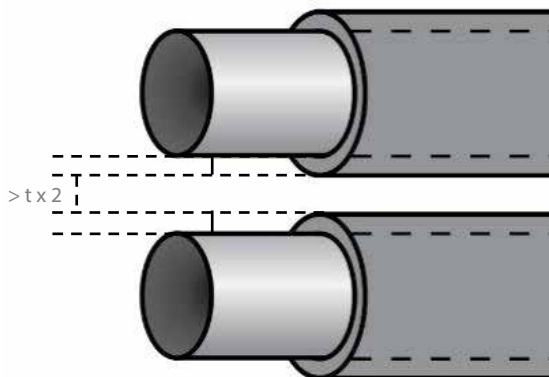
1. ThermaMount Marine pipe supports

Pre-insulated pipe supports are installed together with the pipes. So designers or project planners must ensure selecting the right pipe support in the design process. That's the only way to guarantee the right components are available on site for the pipework installation.



2. Ensure space between Insulated pipes

When it comes to chilled water lines or refrigeration systems, space should be allowed between the insulated system components to ensure free convection. We recommend to use at least twice the insulation wall thickness as an additional safety measure against condensation.



Important!

For chilled water lines and refrigeration systems we recommend ThermaMount Marine pipe support only to guarantee a vapor-tight insulated system without thermal bridges.

t = wall thickness of ThermaSmart® Marine
2.0
Black insulation material

IX. ThermaMount Marine

ThermaMount Marine pipe support

For a vapor-tight system

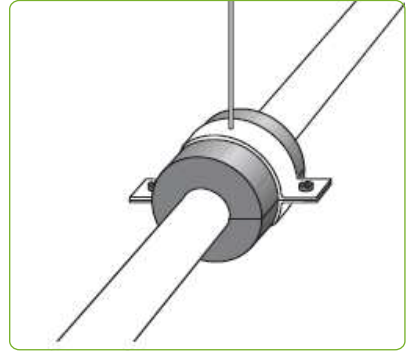
For chilled water applications, pre-insulated pipe supports are recommended to create a fully watertight and vapor-tight system. When opting for alternative pipe hangers, it is difficult to ensure that the clamp will be vapor-tight when used in combination with Thermaflex insulation.

Our pre-insulated hangers prevent:

- Condensation gaps
- Thickness compression of insulation
- Undesirable influence on the system performance of chilled water applications.
- Hereby ensuring an optimal, and hassle-free system performance.

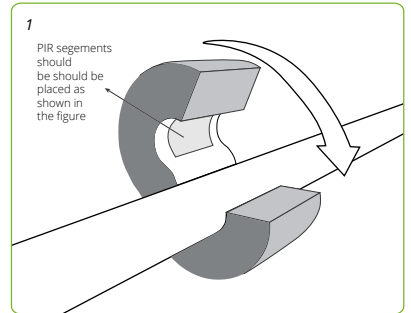
TIP!

- Use a nylon locking nut / anti-vibratory fastener.
- Apply non-skid pads to the clamps to minimize movement.
- Keep in mind pre-insulated supports should be installed together with the pipes.



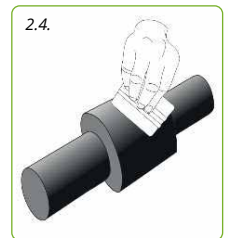
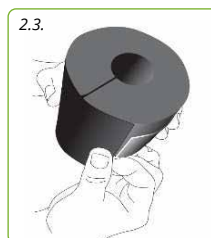
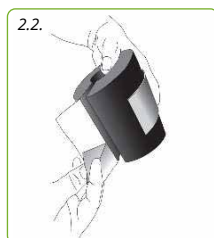
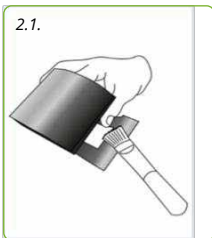
1. Place insulation pipe support

Wrap the ThermaMount Marine around the pipe. Locate the PIR segments to bear the load.



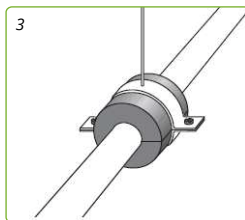
2. Seal ThermaMount Marine

Close the seam by joining them firmly to press. Seal the seam with the self adhesive Marine 2.0 Black aluminum tape and smooth the surface thoroughly



3. Place pipe support clamp

Place the clamp around the ThermoMount Marine pipe support.



Important!

Pipe hangers are not suitable for anchoring! (sliding brackets).

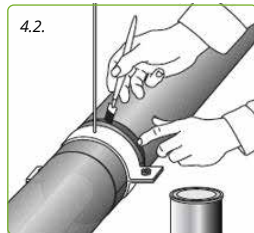
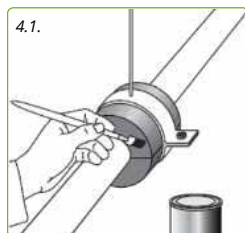
Select ThermoMount Marine pipe supports with the correct dimensions!

4. Coat with glue

Important!

Only applicable for ThermoSmart® LS Tubes in 1st layer.

Coat all joining surfaces of the pipe support and insulation tube with ThermoGlue.

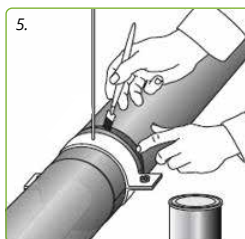


5. Let glue sit and join

Important!

Only applicable for ThermoSmart® LS Tubes in 1st layer.

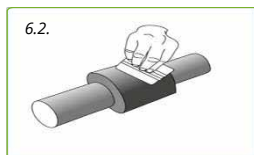
Let glue sit until tack dry (fingernail test) and firmly press the insulation against the pipe hanger insulation.



6. Seal butt joint

Apply ThermoSmart® Marine 2.0 Black aluminum tape to the butt joint where the ThermoFlex insulation and support come together.

Make sure the surface of the butt seam is free of dust before applying the aluminium tape.



7. Applying tape

For accurate protection of the insulation, after applying the ThermoSmart® Marine 2.0 Black aluminium tape to the seam, smooth the surface thoroughly so that the tape adheres strongly to the insulation surface.



ThermoMount Marine

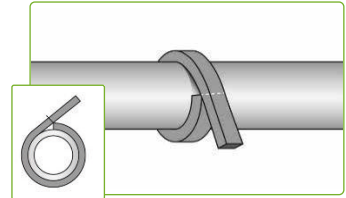
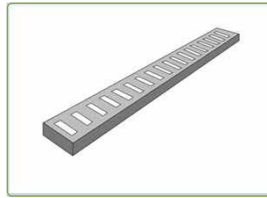
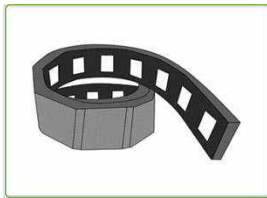
X. ThermaMount Marine Flex

Flexible pipe support used for pipe diameters above diameter 114 mm



1. Measurement

Measure circumference for ThermaMount Marine flex. When dealing with pipes or circular ducts with a diameter of more than 114 mm, use ThermaMount Marine flex. When applying ThermaMount Marine flex, avoid tension at all costs. To guarantee measuring the required excess length, we recommend using a strip of insulation of the same thickness to determine the circumference including excess length.

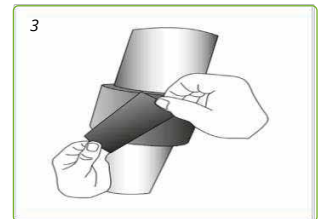
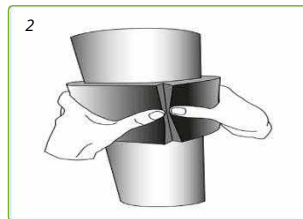
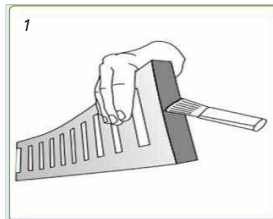


Important!

Do not stretch the strip!

2. Join insulation

- Coat both surfaces for circumferential joining with glue and let the sealant dry before application (tack -dry consistency). (1)
- Wrap the insulation around the pipe (2)
- Join the edges by applying light pressure (2)
- Apply ThermaSmart® Marine 2.0 Black aluminum tape to the butt joint (3)



Note

Never shorten the inserts when cutting the ThermaMount Marine Flex to size. If necessary use several strips to reach the correct diameter.

3. Applying tape

For accurate protection of the insulation, after applying the ThermaSmart® Marine 2.0 Black aluminum tape to the seam, smooth the surface thoroughly so that the tape adheres strongly to the insulation surface.



ThermaMount Marine Flex

Required tools



Meter



Folding ruler



Outside caliper



Glue pump



Brush



Squeegee



Tape



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