TROCELLEN

INSULATION

TROCELLEN SLEEVES

Piping Application

Thermal Insulation

Sleeves

TROCELLEN is an insulating material produced with chemically cross-linked closed cell polyolefin foam (a group which includes PE, PP, copolymers EVA etc.).

Available sleeves:

TROCELLEN N
Chemically cross-linked foam without fire retardant additives.

TROCELLEN P
Chemically cross-linked foam, laminated with scratch resistant embossed polyethylene film.

TROCELLEN AL
Chemically cross-linked foam, laminated with scratch-resistant embossed metallic film.

TROCELLEN AL/CL1
Chemically cross-linked foam with fire retardant additives, certified Class 1, laminated with scratch-resistant embossed metallic film.

TROCELLEN CLASS AL (CE marked)
TROCELLEN CLASS means **CE marked** and **Euroclass** product portfolio, according to EN 14313.
Chemically cross-linked closed cell foam sleeves, colour light green, laminated with scratch-resistant embossed metallic film.

Other type available: **TROCELLEN CLASS P** sleeves, laminated with scratch-resistant embossed PE film.

Thicknesses: 6, 8, 12, 20 mm


AL/CL1


AL CE marked

TECHNICAL DATA

TECHNICAL CHARACTERISTICS	NORM	UNIT	TROCELLEN N	TROCELLEN AL	TROCELLEN AL/ CL1	TROCELLEN CLASS AL
Reaction to fire	UNI 8457 / UNI 9174 EN 13501-1		NA	NA	Classe 1	Euroclass D_L-s2, d0
Thermal conductivity coefficient at 0 °C (λ-value)	EN 12667	W/mK kcal/mh°C	0,0345 0,0297	0,0345 0,0297	0,0345 0,0297	0,0360 0,0310
Thermal conductivity coefficient at 40 °C (λ-value)	EN 12667	W/mK kcal/mh°C	0,0400 0,0344	0,0400 0,0344	0,0400 0,0344	0,0450 0,0387
Water vapour diffusion factor (μ-value)	EN 12086 EN ISO 12572		≥ 2000	≥ 15000	≥ 12000	≥ 15000
Density	EN ISO 845	kg/m³	30	30	30	28
Thickness	EN ISO 1923	mm	6 - 8 - 12 - 20 (see base specifications)	6 - 8 - 12 - 20 (see base specifications)	6 - 8 - 12 - 20 (see base specifications)	6 - 8 - 12 - 20 (see base specifications)
Colour	Spec. BASE	-	anthracite grey	anthracite grey	light grey	light grey
Lenght		m	2	2	2	2
Compression stress at 10%	EN ISO 3386/1	kPa	24	24	18,6	13
Water absorption after 28 days	ISO 2896	Vol%	<3	<3	<3	<3
Dimensional stability (< 5%)	ISO 2796	°C	100	100	100	90
Maximum operative temperature range		°C	-80÷ +100	-80÷ +100	-80÷ +100	-80÷ +90
Maximum operative temperature range with mechanical stress		°C	-40÷ +100	-40÷ +100	-40÷ +100	-40÷ +90

THERMAL INSULATION FOR HEATING SYSTEMS

AVAILABLE THICKNESSES					
EXTERNAL PIPE DIAMETER (inches)	(mm)	TROCELLEN SLEEVES N - AL - AL/CL1 - CLASS AL			
-	6	6			
-	8	6	8		
-	10	6	8		
-	12	6	8		
-	14	6	8		
-	16	6	8		
3/8	17,2	6	8		
1/2	21,3	6	8	12	20
3/4	26,9	6	8	12	20
1	33,7	6	8	12	20
1 1/4	42,4	6	8	12	20
1 1/2	48,3	6	8	12	20
2	60,3		8	12	20
2 1/2	76,1		8	12	20
3	88,9		8	12	20
3 1/2	101,6			12	20
4	114,3			12	20
5	140				20
6	168				20

Thicknesses are suggested in accordance with Italian current legislation:
Law 09/01/91 n° 10 Pres. Dec. 26/08/93 n° 412

underlay for heated floors and dividing walls
external perimeter walls, skylights
boiler rooms, cellars, garages, external piping, ventilation shafts

CONDENSATION INSULATION FOR AIR CONDITIONING AND REFRIGERATED PIPING

The thickness of the insulation (with reference to the Mollier diagram) is calculated on the basis of the temperature of the fluid in the piping, the ambient temperature and of the relative humidity of the air.

$$t2 = \frac{0{,}2 \cdot \lambda \cdot (ti - te)}{(d + 2s) \cdot L \cdot \frac{(d + 2s)}{d}} + te$$

t2 = surf. temperature of insulation
ti = temperature of fluid
te = ambient temperature
d = pipe diameter
s = thickness of insulation
L = Neperian log. (2.3 Log)
λ = thermal conductivity coefficient in kcal/hm °C

INSULATION THICKNESS (mm)																				
TEMPERATURE OF PIPE (°C)	ROOM TEMPERATURE AND RELATIVE HUMIDITY																			
	15 °C				20 °C				25 °C				30 °C				35 °C			
	50%	60%	70%	80%	50%	60%	70%	80%	50%	60%	70%	80%	50%	60%	70%	80%	50%	60%	70%	80%
+15							6	8		6	8	12	6	8	12	20	6	8	12	20
+10			6	8		6	8	12	6	8	12	20	6	8	12	20	8	12	20	20
+5		6	8	20	6	6	8	20	6	8	12	20	8	12	20	30	8	12	20	30
0	6	8	12	20	6	8	12	20	8	12	20	30	8	12	20	30	8	12	20	30
-5	8	12	20	30	8	12	20	30	8	12	20	30	12	20	20	30	12	20	20	40
-10	8	12	20	30	8	12	20	30	12	20	20	30	12	20	30	40	12	20	30	40
-20	12	20	30	40	12	20	30	40	12	20	30	40	20	20	30	40	20	20	30	50
-30	20	20	30	50	16	20	30	50	20	20	30	50	20	20	30	50	20	30	40	50

In order to perform a more accurate verification of the insulating thickness necessary to prevent condensation, provided that you have the required technical skills and the complete application details at your disposal, we suggest using a dedicated calculation software, such as Trocellen **Thermal Insulation** calculation software, which is available on our website.

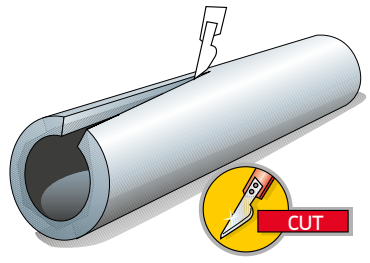
FITTING TROCELLEN SLEEVES

On piping being laid: the sleeves are fitted to the pipes leaving free sections which require welding or joints which need to be tested for water/air tightness.

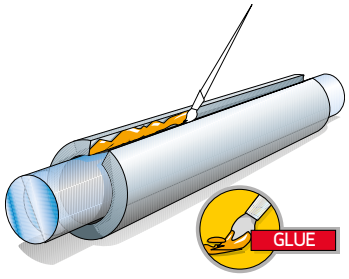
On **existing piping:** this requires the sleeves to be cut lengthways and the two surfaces to be glued both spread with a thin layer of MATIBLOCK.
Wait a few minutes to allow the solvents to evaporate (both surfaces must be dry to the touch) then press the surfaces together until perfectly joined.
With a temperature of 20 - 30 °C, the evaporation time is about 15 minutes.

N.B. To cut time lost while the solvents dry, it is advisable to cut and spread glue on several metres of sleeving at a time.

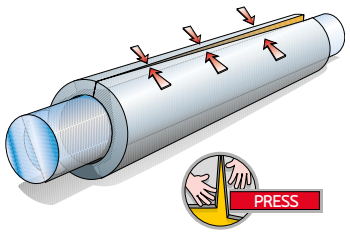
Cutting the sleeves, it is important to use a well sharpened knife or retractable blade cutter. A new blade makes the cut easy and clean. If cutting the sleeve proves difficult, sharpen the knife or replace the blade.



1 Cut the insulating sleeve lengthways



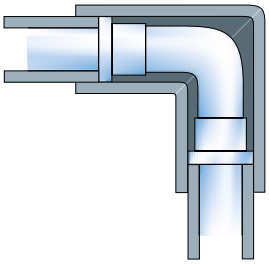
2 Spread MATIBLOCK glue evenly on the two cut edges

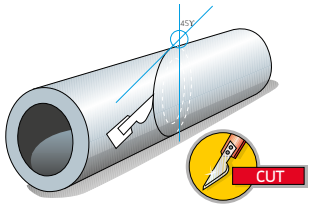


3 Wait for the glue to dry, then join the two edges, pressing them together to ensure perfect bonding

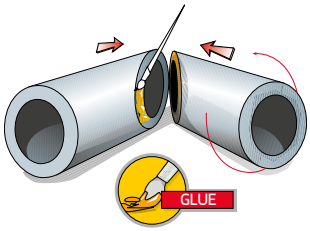
INSULATING RIGHT ANGLED JOINTS

When joining onto another straight pipe with smaller diameter, slide the insulating sleeve inside a **TROCELLEN** elbow joint of appropriate size.

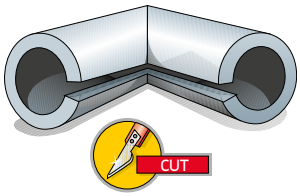




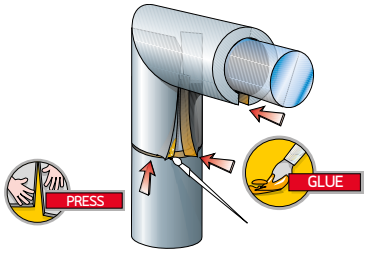
1 Cut the **TROCELLEN** sleeve crossways at 45° (preferably using a guide)



2 Rotate one of the sections and glue the diagonal ends together to form a right angle



3 Make a cut lengthways along the inside of the section

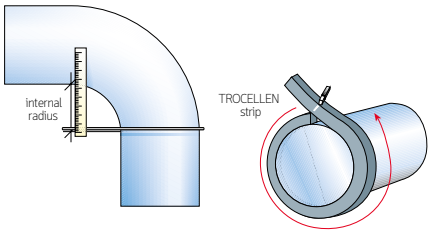


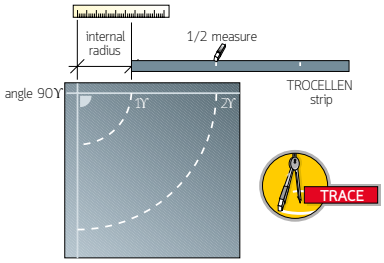
4 Sheath the elbow joint with the sleeve and glue the cut edges together, press to bond and continue cladding with straight sections of **TROCELLEN** sleeve of the same diameter

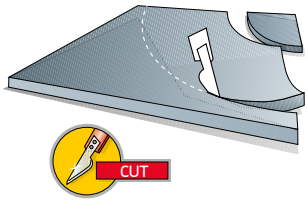
INSULATING CURVED SECTIONS

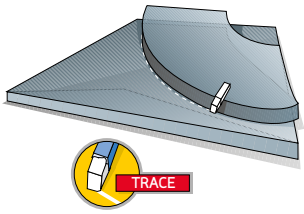
To insulate curved sections, first trace the geometric shape of the curve onto a sheet of **TROCELLEN**.

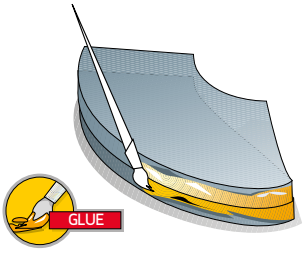
1 Using a rod and a metal rule placed at right angles, calculate the internal radius of the curve and, using a strip of **TROCELLEN** of known thickness, measure the circumference of the pipe (the strip must be placed without pulling round the pipe to be insulated), marking half the circumference. Using a pair of compasses, mark two arcs on a sheet of **TROCELLEN**, the smaller given by them measurements of the internal radius, and the larger given by the measurement of half the circumference of the **TROCELLEN** strip





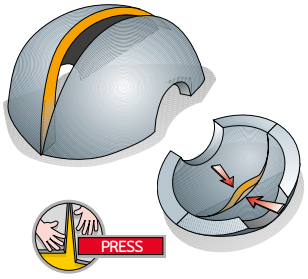




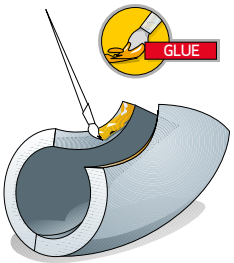


2 Cut along the marked lines to make the first shape that will serve as a "die" for the second section, and other successive sections

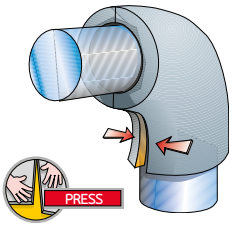
3 Lay one section flat on top of the other and spread **MATIBLOCK** glue on the longest edge of both



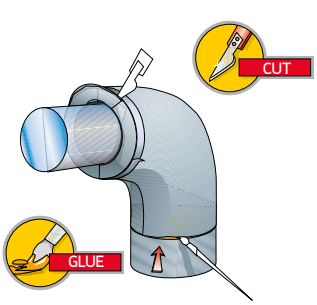
4 When the glue has dried, join the two flat sections, starting by gluing the outside edges and ensuring that the join is perfect on the other side, too



5 Apply glue to the inside edges and allow to dry

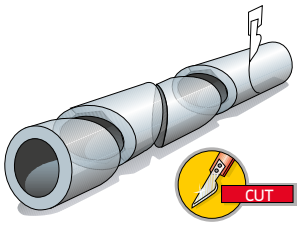


6 Fit the insulating material to the curved section of piping, pressing the internal cut edges together firmly

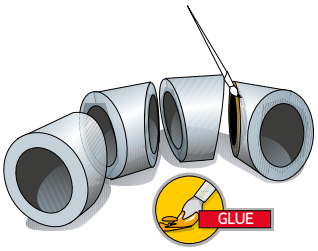


7 Using metal tape as a guide, cut the exposed ends to be at a right angle to the pipe to fit with connecting sleeves

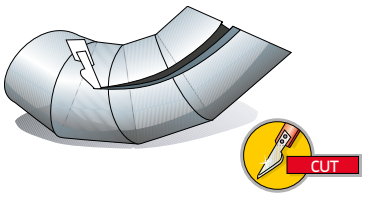
OTHER WAYS TO FIT CURVED SECTIONS



1 Cut a **TROCELLEN** sleeve into three or four segments with the same angles and rotate each segment cut through 180°



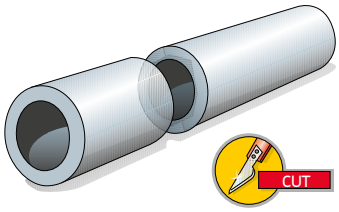
2 Fit the segments together and glue them to form the curved section required



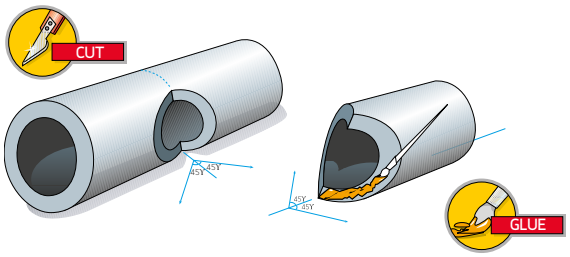
3 Make a cut lengthways down the section to fit onto the pipe and glue

INSULATING "T" JOINTS

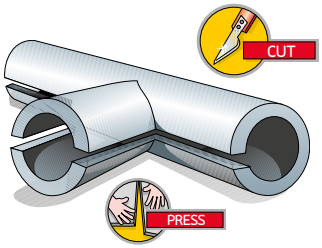
A. 45° CUT



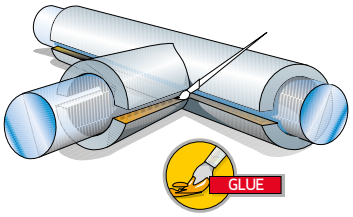
1 Divide **TROCELLEN** sleeve into two sections, one being 1/3 of the total length and the other 2/3 of the total length. cut



2 Midway along the longest section, make two 45°cuts converging towards the centre of the sleeve. Then make two 45° cuts at one end of the shorter section and apply glue to the cut edges

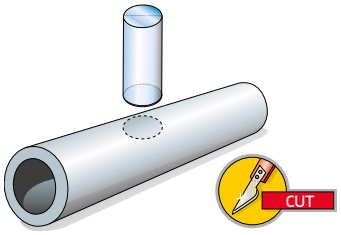


3 Fit the two sections together to make a "T" shaped branch. Cut the sleeve lengthways to allow for fitting

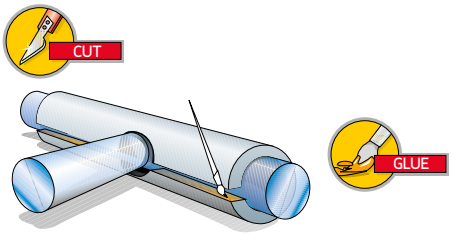


4 Apply glue to the cut edges and join together

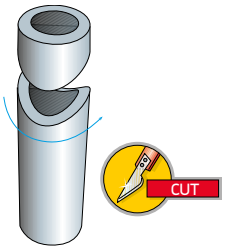
B. HOLE PUNCH



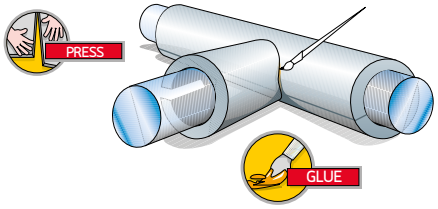
1 Make a hole in the **TROCELLEN** insulating sleeve using a tube with sharpened rim



2 Cut the sleeve lengthways and fit it to the pipe. Spread the cut edges with MATIBLOCK glue and press together



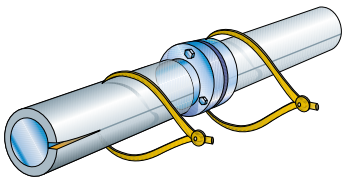
3 A rounded cut at the end of another **TROCELLEN** sleeve makes the correct shape to fit the sleeve with the hole



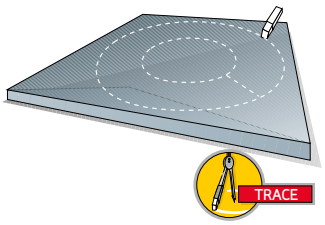
4 Spread glue on the parts to be joined together and press them together firmly to create the "T" joint

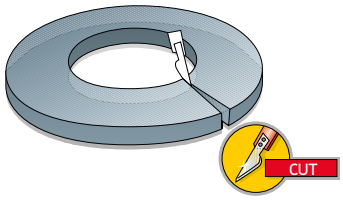
INSULATING A FLANGE

Insulating a flange with flat sheets is not a complicated operation, but care is required when cutting the two **TROCELLEN** rings.

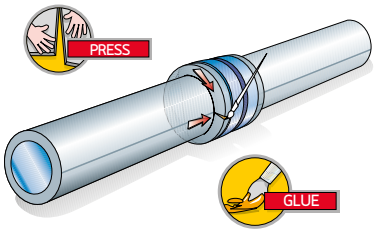


1 Insulate the sections of piping on either side of the flanges. Measure the diameter of the flanges and that of the sections of insulated piping

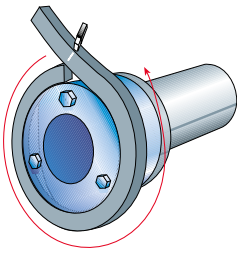


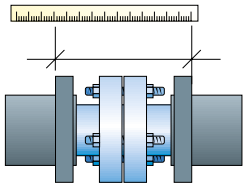


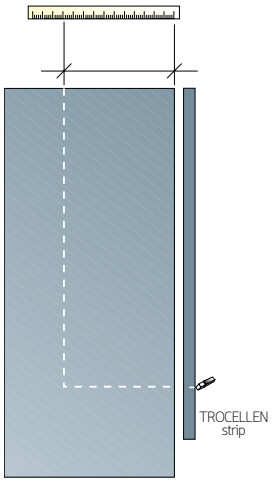
2 Using a pair of compasses, trace two concentric circles on a sheet of **TROCELLEN**; one corresponding to the diameter of the flange, and one corresponding to the diameter of the pipe. Cut out the ring obtained and make a cut to allow for fitting to the pipe



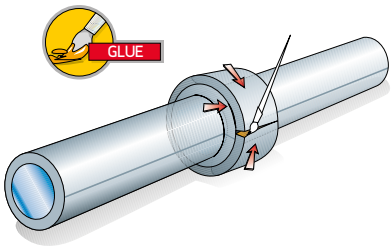
3 After applying **MATIBLOCK** where necessary to the insulation and to the flanges, glue the rings of insulation to the side of the flanges







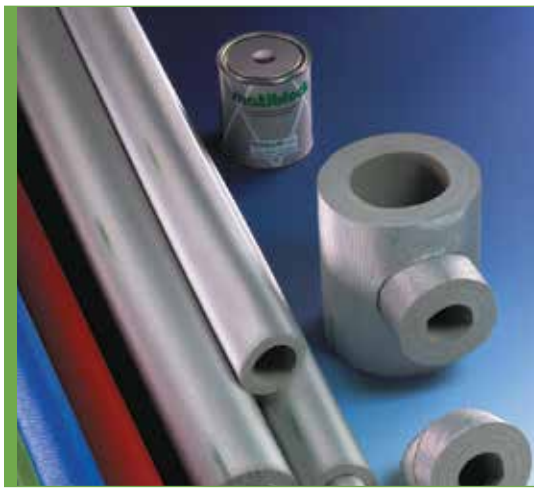
4 Using a strip of **TROCELLEN** of the same thickness, measure the circumference of the two rings of insulation fitted and the distance between them, including the width of the rings themselves. Using these measurements, trace and cut out the rectangular section to cover the top of the flanges



5 The strip which is obtained can then be fitted round the flange, after glue has been carefully applied to the points of contact with the two rings previously fitted

SPECIFICATION ITEMS

TROCELLEN SLEEVES N



Chemically cross-linked closed cell foam sleeves, density 30 kg/m^3, colour anthracite grey.

- Thermal conductivity coefficient at 10 °C (λ-value)= 0,0359 W/mK (0,031 kcal/mh°C)
- Water vapour diffusion factor (μ-value) ≥ 2000
- Classified F1, toxicity and opacity of fumes in case of fire, according to NF F 16-101
- CFC free.

TROCELLEN SLEEVES AL

Chemically cross-linked closed cell foam sleeves, density 30 kg/m^3, colour anthracite grey, laminated with scratch-resistant embossed metallic film.

- Thermal conductivity coefficient at 10 °C (λ-value)= 0,0359 W/mK (0,031 kcal/mh°C)
- Water vapour diffusion factor (μ-value) ≥ 15000
- Classified F1, toxicity and opacity of fumes in case of fire, according to NF F 16-101
- CFC free.

TROCELLEN SLEEVES AL/CL1

AL/CL1

Chemically cross-linked closed cell foam sleeves, density 30 kg/m^3, colour light grey, laminated with scratch-resistant embossed metallic film, Class 1.

- Thermal conductivity coefficient at 10 °C (λ-value)= 0,0359 W/mK (0,031 kcal/mh°C)
- Water vapour diffusion factor (μ-value) ≥ 12000
- Classified F2, toxicity and opacity of fumes in case of fire, according to NF F 16-101
- CFC free.

TROCELLEN CLASS AL SLEEVES (CE marked)

Chemically cross-linked closed cell foam sleeves, CE marked, density 28 kg/m^3, colour light green, laminated with scratch-resistant embossed metallic film.

- Euroclass D_L-s2, d0
- Classified F1, toxicity and opacity of fumes in case of fire, according to NF F 16-101
- Thermal conductivity coefficient at 10 °C (λ)= 0,0378 W/mK (0,0325 kcal/mh°C)
- Water vapour diffusion factor (μ-value) ≥ 15000.

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TROCELLEN*

Trocellen is the first choice European polyolefin foam-solution provider. Through continuous innovations and successful partnerships we dedicate ourselves to one goal: protecting and providing comfort for people.

After more than 40 years, with 600 employees at seven sites and many cooperating companies, various partner universities, institutes and designers we offer solutions for our business partners in various industries such as construction and insulation, automotive, leisure and professional sport, adhesive tapes, footwear and packaging.

*Trocellen is the member of Furukawa Group.

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35° 40′ N	139° 49′ O	Japan FURUKAWA