THERMAL INSULATION
TROCELLEN SLEEVES
**CLOSED CELL CROSS-LINKED POLYOLEFIN FOAM**

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

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

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

- Thicknesses available: 6, 8, 12, 16, 20, 30, 40, 50 mm.

---

### TECHNICAL DATA SHEET

<table>
<thead>
<tr>
<th>Type of material</th>
<th>Norm</th>
<th>Unit</th>
<th>Trocelle AL/CL1</th>
<th>Trocellen AL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction to fire</td>
<td>UNI 8457 / UNI 9174</td>
<td>Class 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal conductivity at 0 °C (λ)</td>
<td>EN 12667</td>
<td>W/mK kcal/mh°C</td>
<td>0.0344</td>
<td>0.0344</td>
</tr>
<tr>
<td>Thermal conductivity at 40 °C (λ)</td>
<td>EN 12667</td>
<td>W/mK kcal/mh°C</td>
<td>0.0372</td>
<td>0.0372</td>
</tr>
<tr>
<td>Water vapour diffusion coefficient</td>
<td>EN 12086 EN ISO 12572</td>
<td>μ</td>
<td>&gt; 12.000</td>
<td>&gt; 12.000</td>
</tr>
<tr>
<td>Density</td>
<td>EN ISO 845</td>
<td>kg/m³</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Thickness</td>
<td>EN ISO 1923</td>
<td>mm</td>
<td>from 6 to 50</td>
<td>from 6 to 50</td>
</tr>
<tr>
<td>Colour</td>
<td>Base Specifications</td>
<td>Light grey</td>
<td>Anthracite grey</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>EN ISO 3386/1</td>
<td>g/cm²</td>
<td>190</td>
<td>245</td>
</tr>
<tr>
<td>Water vapour permeability</td>
<td>EN ISO 12572</td>
<td>ng/Pa s m</td>
<td>0.12</td>
<td>0.12</td>
</tr>
<tr>
<td>Water assimilation after 28 days</td>
<td>ISO 2896</td>
<td>Vol.%</td>
<td>&lt; 3</td>
<td>&lt; 3</td>
</tr>
<tr>
<td>Dimensional stability (&lt; 5%)</td>
<td>ISO 2796</td>
<td>°C</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Max utilization temperature</td>
<td>ISO 2796</td>
<td>°C</td>
<td>-80 ÷ +100</td>
<td>-80 ÷ +100</td>
</tr>
<tr>
<td>Utilization temperature with mechanical stress</td>
<td>ISO 2796</td>
<td>°C</td>
<td>-40 ÷ +100</td>
<td>-40 ÷ +100</td>
</tr>
</tbody>
</table>
**THERMAL INSULATION FOR HEATING SYSTEMS**

### AVAILABLE THICKNESSES

<table>
<thead>
<tr>
<th>External diameter of pipe (inches)</th>
<th>Trocellen sleeve AL - AL/CL1</th>
<th>Trocellen sleeve ISOCOMPACT and AS AL/CL1, CL1 ALU</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- 6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>- 8</td>
<td>6 8</td>
<td>6</td>
</tr>
<tr>
<td>- 10</td>
<td>6 8</td>
<td>6</td>
</tr>
<tr>
<td>- 12</td>
<td>6 8</td>
<td>6</td>
</tr>
<tr>
<td>- 14</td>
<td>6 8</td>
<td>6</td>
</tr>
<tr>
<td>- 16</td>
<td>6 8</td>
<td>6</td>
</tr>
<tr>
<td>3/8</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>1/2</td>
<td>21.3 6 8</td>
<td>12 16 20 30 40 50</td>
</tr>
<tr>
<td>3/4</td>
<td>26.9 6 8</td>
<td>12 16 20 30 40 50</td>
</tr>
<tr>
<td>1</td>
<td>33.7 6 8</td>
<td>12 16 20 30 40 50</td>
</tr>
<tr>
<td>1 1/4</td>
<td>42.4 6 8</td>
<td>16 20 30 40 50</td>
</tr>
<tr>
<td>1 1/2</td>
<td>48.3 6 8</td>
<td>16 20 30 40 50</td>
</tr>
<tr>
<td>2</td>
<td>60.3 8</td>
<td>16 20 30 40 50</td>
</tr>
<tr>
<td>2 1/2</td>
<td>76.1 8</td>
<td>12 20 30 40 50</td>
</tr>
<tr>
<td>3</td>
<td>88.9 8</td>
<td>12 20 30 40 50</td>
</tr>
<tr>
<td>3 1/2</td>
<td>101.6 12</td>
<td>20 30 40 50</td>
</tr>
<tr>
<td>4</td>
<td>114.3 12</td>
<td>20 30 40 50</td>
</tr>
<tr>
<td>5</td>
<td>140 12</td>
<td>20 30 40 50</td>
</tr>
<tr>
<td>6</td>
<td>168</td>
<td>20 30 40 50</td>
</tr>
</tbody>
</table>

**Thickness advised**

- Green: underlay for heated floors and dividing walls
- External perimeter walls, skylights
- Boiler rooms, cellars, garages, external piping, ventilation shafts

Thicknesses are advised in accordance with Italian legislation currently in force: Law 09/01/91 n° 10 Pres. Dec. 26/08/93 n° 412 See extract in the section entitled “Laws and Decrees”
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.

Formula for calculating the surface temperature

\[ t_2 = \frac{0.2 \cdot \lambda \cdot (t_i - t_e)}{(d + 2s) \cdot L \cdot (d + 2s)} + t_e \]

- \( t_2 \) = surface temperature of insulation
- \( t_i \) = temperature of fluid
- \( t_e \) = ambient temperature
- \( d \) = pipe diameter
- \( s \) = thickness of insulation
- \( L \) = Neperian log. (2.3 Log.)
- \( \lambda \) = thermal condution coeff in kcal/hm °C

### SPESSORE ISOLANTE (mm)

<table>
<thead>
<tr>
<th>Temperature of piping (°C)</th>
<th>15 °C</th>
<th>20 °C</th>
<th>25 °C</th>
<th>30 °C</th>
<th>35 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% 60% 70% 80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ 15</td>
<td>6</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>+ 10</td>
<td>6</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>+ 5</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>0</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>- 5</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>- 10</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>- 20</td>
<td>12</td>
<td>16</td>
<td>30</td>
<td>40</td>
<td>-</td>
</tr>
<tr>
<td>- 30</td>
<td>16</td>
<td>20</td>
<td>30</td>
<td>50</td>
<td>-</td>
</tr>
</tbody>
</table>

### 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.

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.

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.
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

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.

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 the measurement 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 180º.

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.

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.

SUMMARY

TROCELLEN AL/CL1 SLEEVES
Class 1 cross linked polyolefine (polyethylene) foam laminated with protective layer of embossed metallic film.
Thermal conductivity at 40º 0.0372 W/mk (0.032 kcal/mh °C)
Water vapour diffusion coefficient (µ) > 12,000.
Does not contain CFCs.

TROCELLEN AL SLEEVES
Cross linked polyolefine (polyethylene) foam laminated with protective layer of embossed metallic film.
Thermal conductivity at 40º 0.0372 W/mk (0.032 kcal/mh °C)
Water vapour diffusion coefficient (µ) > 12,000.
Does not contain CFCs.

TROCELLEN AL/CL1, AL ROLLS
Cladding for piping with surface diameter over 168 mm, drums and tanks.

TROCELLEN SHEETS
sheets: 2.00 x 1.48, 30 mm thick.
INTERNATIONAL LOCATIONS

Headquarters
TROCELLEN GmbH
Mülheimer Straße 26
53840 Troisdorf
Germany
Ph. +49 2241 85 04
Fax +49 2241 85 37 53

TROCELLEN Italia S.p.A.
Via della Chimica, 21-23
20867 Caponago (MB)
Italy
Ph. +39 02 95 96
Fax +39 035 50 21 74

TROCELLEN Ibérica S.A.
C/Avila, s/n
28804 Alcalá de Henares
Spain
Ph. +34 91 885 55 00
Fax +34 91 885 55 01

TROCELLEN S.E.A. Sdn Bhd
Lot 2213, Kg. Batu 9 Kebun Baru,
Jalan Kasawari,
42500 Telok Panglima Garang
Selangor Darul Ehsan,
Malaysia
Ph. +603 3122 1213
Fax +603 3122 1211

TROCELLEN GmbH, UK Office
Central Chambers, 77 Westborough
Scarborough, North Yorkshire
YO11 1 TP
United Kingdom
Ph. +44 1723 376 111
Fax +44 1723 376 444

TROCELLEN Rus
141402 Moskovskaya - oblast
Himki - 2, post box 186
Russian Federation
Ph. +7 495 739 44 38
Fax +7 495 739 44 21

Polifoam Plastic Processing Co.
Ltd. Hungary
Tábáls u. 32
1097 Budapest
Hungary
Ph. +36 1 347 98 00
Fax +36 1 280 67 08

TROCELLEN Italia S.p.A.
Sales office
Via Dante, 3
20867 Caponago (MB)
Italy
Ph. +39 02 959 621
Fax +39 02 959 62 235

TROCELLEN GmbH
Mülheimer Straße 26
53840 Troisdorf
Germany
Ph. +49 2241 85 04
Fax +49 2241 85 37 53

World-leading supplier of long lasting insulation foams