Spiral-welded aluminium pipes.
The spiral-welding of aluminium pipes is a special fabrication process to obtain leakage-free pipes in a wide range of diameters and wall thicknesses according to pressure vessel requirements.

This process has been set-up based on own Linde development in 1976 and has thus been improved continuously. Linde is today one of the leading producer of spiral-welded aluminium pipes with an annual capacity of approx. 90 kilometers.
Dimensions.

- Range of diameters: from 273 up to 1,200 mm
- Range of wall thicknesses: from 4 up to 10 mm
- Standard lengths: from 3 up to 19 m

Pipes on stock

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>Wall thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>273</td>
<td>4</td>
</tr>
<tr>
<td>324</td>
<td>4</td>
</tr>
<tr>
<td>406</td>
<td>4</td>
</tr>
<tr>
<td>406</td>
<td>8</td>
</tr>
<tr>
<td>508</td>
<td>10</td>
</tr>
<tr>
<td>610</td>
<td>5</td>
</tr>
<tr>
<td>711</td>
<td>6</td>
</tr>
<tr>
<td>813</td>
<td>6</td>
</tr>
<tr>
<td>914</td>
<td>6</td>
</tr>
<tr>
<td>914</td>
<td>8</td>
</tr>
<tr>
<td>1016</td>
<td>8</td>
</tr>
<tr>
<td>1118</td>
<td>8</td>
</tr>
<tr>
<td>1220</td>
<td>10</td>
</tr>
</tbody>
</table>

Packing:
- Wooden saddles keep bundled pipes in position for land transport
- Pipes up to 11.6 m can be packed into 40 ft. containers
- Pipes up to 19 m can be packed into steel racks

Fabrication.

Welding is performed using a plasma arc welding process which guarantees a joint efficiency of \( V = 1.0 \).

The surface is clean and free of oil and grease, suitable for oxygen use.

Material.

The range of materials includes:
- EN AW 5754-O (AIMg3)
- EN AW 5083-O (AIMg4,5)
  (other weldable alloys upon request)

Material tests are in accordance with code requirements and customer specifications on each individual batch.

Pipes will come with material certificates in line with the respective pressure vessel code.

Benefits.

The outstanding quality and the wide range of applications for Linde’s aluminium spiral-welded pipes offers a lot of benefits for the user:

- Standard sizes in EN-AW 5083 can be delivered with short delivery times and in small quantities
- Standard pipes are 100 % ultrasonic tested
  - If required, additional testing is possible:
    - Hydrostatic pressure test acc. to pressure vessel requirements
    - Radiography
    - Third party approval
- Individual production of any required dimension from 273 mm up to 1,200 mm in diameter and up to 10 mm in wall thickness (inch-sizes are also available)
- Max. fabrication length of ~ 19 m
- Separate cutting lengths during the production
- Time saving fabrication with automatic ultrasonic testing and marking assures a continuously high quality
- Tolerances of ± 1 mm for OD < 400 mm and +2/-1 mm for OD > 400 mm are Linde standard requirements
- Pipes allow for an installation in leakage free systems with high operation pressure
Applications.

Linde spiral-welded aluminium pipes can be used for a wide range of applications in the industry.

The main applications are for example:
- Gas-insulated high voltage switch gears and transmission lines
- Cryogenic process plants (for example gas treatment plants and air separation units)

Technical data.

Tolerances

<table>
<thead>
<tr>
<th>Outside diameter, calculated from circumference</th>
<th>DN &lt; 400: +/− 1 mm</th>
<th>DN &gt; 400: + 2 mm /− 1 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out of roundness</td>
<td>max. 1 % of outside diameter</td>
<td></td>
</tr>
<tr>
<td>Ordered length</td>
<td>± 1.5 mm /± 1.5 mm</td>
<td></td>
</tr>
<tr>
<td>Diameter 273 mm up to 360 mm</td>
<td>4 – 6 mm wall thickness</td>
<td></td>
</tr>
<tr>
<td>Diameter 360 mm up to 1200 mm</td>
<td>4 – 10 mm wall thickness</td>
<td></td>
</tr>
<tr>
<td>Wall thickness</td>
<td>&lt; 7 mm: +/− 0.3 mm</td>
<td></td>
</tr>
<tr>
<td>Height of welding bead inside / wall thickness</td>
<td>&lt; 7 mm: max. 0.8 mm</td>
<td></td>
</tr>
<tr>
<td>Outside</td>
<td>2 mm</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>up to 18.3 meters</td>
<td></td>
</tr>
<tr>
<td>EN AW 5754-0</td>
<td>equivalent to SB 209 5754-0</td>
<td></td>
</tr>
<tr>
<td>EN AW 5083-0</td>
<td>equivalent to SB 209 5083-0</td>
<td></td>
</tr>
<tr>
<td>Other weldable alloys on request. Kindly ask us.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Non destructive examination

Ultrasonic testing of spiral weld, 100 %
Visual examination, dimensional checks, 100 %
Certificate according to EN 10204/3.1 B
Linde’s Engineering Division, a leading player in the international plant engineering business, covers every step in the design, project management and construction of turnkey industrial plants. Drawing on our extensive, proven process know-how, we set the standards for innovation, flexibility and reliability with ground-breaking concepts and a dedication to engineering excellence.

The success of our customers and partners around the globe is of primary importance. With a clear focus on efficiency, sustainability and growth, we develop customised solutions for projects of all sizes and degrees of complexity. We have already delivered more than 4,000 plants worldwide and always aim to find the best technical and economic solution for our customers.

Core competencies in plant engineering:
- Air separation plants
- LNG and natural gas processing plants
- Petrochemical plants
- Hydrogen and synthesis gas plants
- Chemical plants
- Adsorption plants
- Cryogenic plants
- Biotechnology plants
- Carbon capture and utilisation plants
- Furnaces, fired heaters, incinerators

Core competencies in component manufacturing:
- Packaged units and coldboxes
- Coil-wound heat exchangers
- Plate-fin heat exchangers
- Cryogenic columns
- Cryogenic tanks
- Air-heated vaporisers
- Water bath vaporisers
- Spiral-welded aluminium pipes