

THE LINDE GROUP

Linde

Manufacturing

Introduction.

The Engineering Division, with its technological focus on promising market segments such as processing plants for hydrogen, oxygen, olefin and natural gas, is successful throughout the world.

We have extensive process engineering know-how combined with broad experience in the planning, project development and construction of turnkey industrial plants. The wide spectrum of Linde's technologies is characterized by the scope of the temperatures applied, ranging from -271°C in a refrigeration plant for superfluid helium to $1,200^{\circ}\text{C}$ in the process for olefin production.

Production facilities.

The production facilities in Pullach near Munich have an overall area of 50,100 m² of which 13,000 m² are shop floor space.

The main fabrication for plant components in Schalchen, located approx. 90 km east of Munich, Germany, comprises an overall area of 200,700 m².

There are 22 production shops with 63,000 m² covered shop floor space for the fabrication of cryogenic equipment.

For very large units satellite workshops are available at the coast (e.g. Bremen/Germany and Antwerp/Belgium).



Schalchen plant, approx. 90 km east of Munich, Germany

Cold box assembly for Hammerfest, Norway at the satellite workshop port of Antwerp, Belgium Δ



Aluminium plate-fin heat exchangers

These units are key components in many process plants. Each aluminium plate-fin heat exchanger is specially designed for the required thermal and hydraulic performance thus providing a tailor made and very economic process equipment.

Plate-fin heat exchanger
in the production hall



Cold boxes

An economic alternative to separate installation on site is the assembly of various cryogenic plant components into a steel containment (cold box). Interconnecting piping, vessels, valves and instrumentation are included in this packaged unit to form, after filling with insulation material (perlite), a ready-to-operate unit.

Mounted cold box



Coil-wound heat exchangers

Coil-wound heat exchangers are compact and reliable with a broad temperature and pressure range and suitable for single phase as well as two phase streams. Multiple streams can be accommodated in one exchanger. They are known for their robustness in particular during start-up and shut-down or plant trip conditions.

Tube bundle fabrication



Storage tanks for cryogenic gases

Industrial gases such as oxygen, nitrogen and argon are delivered to customers in liquid form at cryogenic temperatures and are then stored by the customers in tanks before future use. The vacuum-insulated double wall tanks consist of two concentric vessels, an austenitic steel inner tank and an outer jacket in carbon steel with an anti-corrosion primer and a special environmentally friendly top coat.

Various sizes of storage tanks



Air-heated vaporizers

Linde air-heated vaporizers are heat exchangers for evaporating and superheating of cryogenic fluids, such as oxygen, nitrogen, argon, hydrogen and carbon dioxide. A new generation of all aluminium vaporizers ensures maximum air circulation due to optimized fin and vaporizer geometrics.

Air-heated vaporizers



Water-bath vaporizers

These kind of vaporizers are used to vaporize liquefied gases such as oxygen, nitrogen, argon, ethylene, propylene and natural gas. The Linde water-bath vaporizer consists of a water vessel in which a coiled tube bundle is submerged. The water is heated by direct steam injection or hot water circulation.

Fabrication of water-bath vaporizer

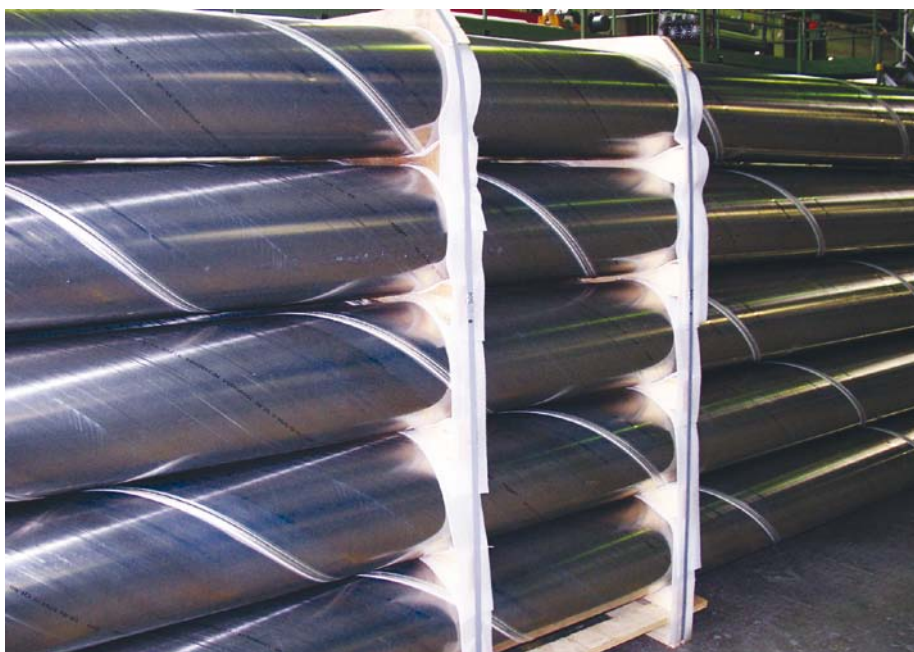


Spiral-welded aluminium pipes

These pipes can be used for different applications such as:

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

The spiral-welding of aluminium pipes is a special fabrication process to obtain leakage free pipes in a wide range of diameters and wall thickness which accord with pressure vessel requirements.



Gas-insulated high voltage switch gear

Spiral-welded aluminium pipes Δ



Designing Processes – Constructing Plants.

Linde's Engineering Division continuously develops extensive process engineering know-how in the planning, project management and construction of turnkey industrial plants.

The range of products comprises:

- Petrochemical plants
- LNG and natural gas processing plants
- Synthesis gas plants
- Hydrogen plants
- Gas processing plants
- Adsorption plants
- Air separation plants
- Cryogenic plants
- Biotechnological plants
- Furnaces for petrochemical plants and refineries

More than 3,800 plants worldwide document the leading position of the Engineering Division in international plant construction.

Production facilities.

We at the Linde Schalchen Plant are located 90 km east of Munich, Germany and cover a total site area of approx. 200,000 m². Our 750 engineers and skilled workers design and manufacture components and complete modules for the application in process plants.

Backed up by more than 100 years of production know-how, highly developed plant modules are manufactured. Our innovative technologies and our competitiveness open the door to participation in prestigious plant projects world-wide.

We provide complete services on field installation and operation. A specialized service crew is available for immediate and professional repair services.

For further informations please contact:

Linde AG

Engineering Division, Schalchen Plant
Carl-von-Linde-Str. 15, D-83342 Tacherting, Germany
Phone +49.8621.85-6434
Fax +49.8621.85-6622
E-Mail: plantcomponents@linde-le.com
Website: www.linde-plantcomponents.com

Product range.

- Aluminium plate-fin heat exchangers as single units or as manifolded assemblies
- Coldboxes with aluminium plate-fin heat exchangers, columns and vessels
- Coil-wound heat exchangers and isothermal reactors for chemical and petrochemical plants
- Columns and pressure vessels in aluminium for cryogenic plants
- Spiral-welded pipes in aluminium
- Storage tanks for liquefied gases
- Steam-heated waterbath vaporizers as well as air-heated vaporisers for liquefied gases