Wieland vision
Wieland is the worldwide supplier of outstanding solutions and superior services. We focus on semi-finished products in copper and copper alloys, complemented by other materials and products.

Within an entrepreneurial performance culture, we have high expectations of our workforce and actively encourage their advancement.

Wieland is market leader in its core business. We achieve a fair return and increase the economic value of our company.
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The Wieland Group with headquarters in Ulm, Germany, is one of the world’s leading manufacturers of semi-finished and special products in copper and copper alloys: strip, sheet, tube, rod, wire and sections as well as slide bearings, finned tubes and heat exchangers.

Wieland’s roots go back almost 200 years: In 1820, Philipp Jakob Wieland started with the manufacture of bells and brass castings in Ulm.

Today, the Wieland Group comprises manufacturing companies, slitting centres and trading subsidiaries in many European countries as well as in the USA, in South Africa, Singapore, India and China.

Wieland supplies customers in numerous markets with over 100 different copper materials which are primarily used in the electrical and electronic industries. Other important customer sectors include domestic installations, air conditioning and refrigeration and the automotive industry.
1820  After a series of extended study tours through Germany and neighbouring countries, Philipp Jakob Wieland returned to his hometown Ulm with a thorough grounding in his trade. At the age of 27, he took over the fine art and bell foundry in the Rosengasse from his uncle Thomas Frauenlob, which had been established some 250 years earlier. This was announced to the townspeople of Ulm in the local newspaper “Ulmisches Intelligenzblatt” on 19 October 1820, offering his services to produce brass castings of all kinds.

1828  Production of rolled brass material starts in the centre of Ulm.

1865  Opening of the Vöhringen plant, 17 km south of Ulm; sheet, wire and first seamless tubes are manufactured with an initial workforce of 38 people.

1891  Transfer of slab foundry from Ulm to Vöhringen

1901  In Vöhringen, the first extrusion press for sections and tubes is put into operation.
1924 Electrical induction furnaces replace coal-fired furnaces at the Vöhringen foundry; brass is hot rolled.

1931 Acquisition of Messingwerk Schwarzwald AG

1946 Reconstruction of the Ulm plant largely destroyed by bombs; dismantling of important production units in Vöhringen

1961 Production start of new tube mill in Vöhringen

1972 Production start of new hot-rolling mill in Vöhringen

1982 Move from city centre Ulm to new plant and administration unit Ulm/Donautal

1987 Acquisition of Langenberg Kupfer- und Messingwerke, including participation in Schwermetall Halbzeugwerk, Stolberg; official opening of rolling mill in Wheeling (USA)

1988 B. Mason & Sons Ltd., Birmingham (GB), becomes a member of the Wieland Group.

1993 New production line for rods, sections and wires in the southern part of the Vöhringen plant

1999 Majority participation in Austria Buntmetall AG, Enzesfeld, with companies in Amstetten and Enzesfeld (A)

2002 Start-up of a new hot-rolling mill at the Vöhringen plant

2003 Joint venture with Kobe Steel Japan in the USA, today Wieland Copper Products, Pine Hall

2007 Opening of rolling mill in Singapore

2008 Participation in Wolverine Tube Shanghai, China, today Wieland Thermal Solutions; new extrusion press at the Vöhringen plant

2011 A new continuous billet casting plant in the Vöhringen foundry

2013 Acquisition of the finned-tube mill Wolverine Tubagem, (P), today Wieland Thermal Solutions
Base material copper
Copper – aes cyprium, “ore from Cyprus”, is the name the Romans once gave to the reddish bright metal. During the course of history, man has rediscovered the advantages of copper and its alloys time and again: good formability, strength, resistance, good thermal and electrical conductivity. Copper has consequently developed into one of the most important industrial metals in modern times.

The main component of Wieland’s production is copper. In its foundries, the company produces numerous conventional and innovative alloys. The essential chemical elements are zinc, tin and nickel. Wieland uses new metal, for example copper cathodes, along with high-quality recycling materials which originate from its own production or from customers.

In the metal store, all incoming metal is registered, controlled and baled. After intermediate storage and weighing out in accordance with the various alloy mixtures, the required materials are sent to the foundry. There they are melted in induction furnaces. To monitor the chemical composition, a sample of the molten metal is taken from each individual heat for spectrometric analysis. Once approved, the molten metal is ready for casting.
Diagram of continuous and semi-continuous casting
Wieland operates to the Wieland-Junghans continuous cast procedure which was developed in-house in 1933: the molten metal flows from the casting furnace via an automatic flow regulator into water-cooled molds. It is then cast either semi-continuously or continuously and cooled.

The foundry is the starting point of Wieland’s production. Billets are further processed into rod, tube, wire and sections. Slabs are the pre-material for strip and sheet.
Wieland produces strip in all major economic regions of the world: in Germany in the rolling mills in Vöhringen, Velbert-Langenberg and Villingen-Schwenningen as well as at Schwermetall in Stolberg. Further manufacturing companies are B. Mason & Sons in Great Britain, Wieland Metals in the USA and Wieland Metals Singapore.

The base material for the production of strip and sheet is semi-continuous cast slabs. They are heated in a gas-fired furnace to the optimum temperature for hot rolling. Depending on the alloy, the temperature ranges from 600 to 1,000 °C. The reversing hot rolling process reduces the thickness to 10–18 mm. As an alternative to hot rolling, strip in this dimensional range is manufactured at B. Mason & Sons through horizontal casting. The casting skin and the oxides from hot rolling are then removed by milling.

In subsequent steps, rolling alternates with annealing until the final thickness is achieved. As final operation, the strip is slit to the required width. If requested, several coils can be welded together for a longer coil length. A global network of slitting centres enables fast and flexible supply to the customers.

*Heated slab prior to hot rolling*
Electrical applications often require hot-dip tinned surfaces. Wieland has tinning lines in three locations in Germany: Vöhringen, Villingen-Schwenningen and Velbert-Langenberg.

One of Wieland’s special products is contour-milled strip produced in Langenberg and Singapore.

Many copper alloys are also available as sheet. These are cut from strip or rolled individually.

Copper and copper-alloy strip is mainly used for current-carrying parts in the following sectors:

- **Automotive industry**
- **Electrical industry**
- **Semiconductor industry**
- **Information technology**
Production diagram of strip and sheet
Automotive connectors

Even when the material is not used as a conductor, the processing industries value good surface quality and the fact that copper alloys are easy to galvanize: rolled products are also used for high-value consumer goods such as decorative metal goods, cutlery and musical instruments.
The Wieland Group manufactures copper tubes in Vöhringen, at Buntmetall Amstetten in Austria and at Wieland Copper Products in Pine Hall, USA. Finned tubes in copper and other metals are manufactured in Ulm, in Portugal at Wieland Thermal Solutions, at Wieland Copper Products in Wheeling, USA, at Wieland South Africa and at Wieland Thermal Solutions, Shanghai in China.

At the Vöhringen plant, the production of tubes begins with continuous cast billets. They are first heated to the hot forming temperature of 950 °C, then extruded to become the shells for further processing. They subsequently undergo a number of cold-forming drawing operations on either spinner blocks or drawing benches. Copper requires no intermediate annealing operations. When the tube has been drawn to or close to the required size, heat treatment may be necessary depending on the requested temper. Finally, the tubes are straightened and supplied cut to length, coiled or level wound as per customer order.

At other locations, modified production steps are alternatively used prior to drawing: In Amstetten, extruded tubes are pilger-rolled and in Pine Hall cast tubes are rolled.
Branded copper tubes have been successfully used for many years in domestic plumbing including drinking water, gas, radiator and underfloor heating applications.

As a specialty Wieland manufactures tubes with inside and outside structures enabling customers to increase the efficiency of heat exchangers manufactured from these tubes.

Finned or plain tube heat exchangers are made according to customer’s geometric requirements.
Production diagram of copper tubes

- Heating
- Extruding the tube
- Cooling
- Drawing
- Final draw
- Straightening
- Inspection
- Cutting to length
- Tubes in straight length
- Straightening
- Inspection
- Coiling
- Layer wound tubes
Copper is very corrosion resistant and long lasting. It can be connected easily by soldering and is an excellent heat conductor. Copper tubes are mainly used for:

- **Air conditioning and refrigeration**
- **Domestic plumbing**
- **Heating engineering**
- **Plant engineering and construction**

*Inner-grooved tubes for heat exchangers*

*Water chiller unit for large-scale air conditioning systems*

*Drinking water installations with copper tubes*
Rod, wire, tube and sections
The Wieland Group manufactures rod, wire, tube and sections in copper and copper alloys in Ulm and Vöhringen as well as at Buntmetall Amstetten in Austria.

The base material is continuous cast or spray-formed billets. The first stage in the process is heating to the temperature best suited for working that particular material. The temperature range is between 600 and 1,000 °C. On hydraulic extrusion presses cross sections are produced which are as close as possible to the desired final dimension. Alternatively, such cross sections are produced by rolling a cast copper wire.

One drawing process is sufficient to reach the final dimension with an alloy that is easily hot formed. Materials where hot working is more difficult require several rolling and drawing operations until the desired dimension is reached. Depending on the degree of work hardening it may be necessary to recrystallize the alloy by annealing.

Once the final dimension has been reached, the section or rod is cut to the required length. The product is then straightened. Alternatively, Wieland can supply customer-specific dimensions as wire. If required, Wieland also manufactures ready-to-mount components.
Spray-formed copper alloys are distinguished by a particularly advantageous combination of high strength as well as good forming and machining capability. These alloys are ideal for the manufacture of different components such as superconductors, slide bearings, forming tools and components for drill strings.

Precision continuous cast billets are used for rods, tubes or sections made from copper cast alloys, ready for machining by the customer. As these products are particularly corrosion resistant and have good sliding properties, they are widely used for fittings and in the engineering and automotive industries.

Large diameter tubes made from copper materials are seamless tubes with an outer diameter of up to 300 mm. They are suitable for the electronic, telecommunications, heat transfer and mechanical engineering sectors.
Production diagram of brass rods

- Heating
- Extruding
- Pickling/washing
- Drawing
- Inspection
- Cutting to length
- Straightening
- Rods chamfered and pointed
Rod, wire, tube and sections are processed by the customers to a variety of components and used in different industries:

- **Construction industry**
- **Electrical industry**
- **Automotive and engineering industries**
- **Precision engineering**
Slide bearings and components
in copper alloys

Slide bearings and components are manufactured in Ulm. Similar products such as cages for roller bearings are made at the Enzesfeld-Caro plant of Buntmetall Amstetten in Austria.

Wieland processes the pre-material – tube, rod and strip – using the following technologies: turning, precision turning, milling, grinding, drilling, broaching, stamping, wrapping and bending. Lot sizes for series production range from a few hundred to several thousand pieces. If requested, Wieland produces samples and prototypes with the necessary documentation prior to series production.

Production of machined bushings
Wieland slide bearings can be found in a wide range of applications, for example as piston and connecting-rod bushings or rocker arm pins in technically sophisticated internal-combustion engines. Furthermore, they are used for modern axle, brake and transmission systems as well as in differentials and hydraulic pumps and have also proven their worth in elements with oscillating movements such as booms or grippers in construction and agricultural machinery.

**Piston bushings**

**Connecting-rod bushings**
In addition, the Slide Bearings and Components Division manufactures electrical components for hybrid powertrains of passenger cars and trucks. The components are circuit carriers in stators.

Forming and laser welding are done by a fully automated process. The design may vary according to the customer’s requirement.
Production diagram of wrapped
and machined bushings

- Drawing of tubes (cold)
- Turning
- Slitting
- Drilling etc.
- Grinding
- Stamping
- Coining
- Wrapping
- Calibrating
- Milling
Research and development
Ongoing research and development is the foundation on which high-quality, future-oriented products are created within the Wieland Group.

A stringent, comprehensive control system ensures constant and consistent product quality. Another way in which Wieland satisfies ever-rising quality demands is by developing and building high-precision measuring and testing equipment. In the field of standardization, Wieland contributes significantly to the definition of product and test standards. Moreover, Wieland-Werke AG has a DIN EN ISO/IEC 17025 (2005) accredited testing and certification laboratory.

The objective of the development work, over and above high quality, is to provide customers with innovative products which allow cost-effective manufacture hand in hand with the efficient use of resources. Another aspect of Wieland’s R&D activities is the development of materials which conform to current environment and health requirements.

Close cooperation with customers often leads to individual solutions, but cooperative development work is also firmly established with other companies, institutes and research establishments. The number of patents applied for each year points to the competence and success of Wieland’s R&D work, which is certified to DIN EN ISO 9001.

Specimens prior to spectrometric analysis
Employees play an important role in the success of the company. Wieland, therefore, supports and promotes their skills, abilities and dedication in many different ways.

The company trains for both technical and commercial careers. High School graduates can study parallel courses, specializing in diverse subjects including mechanical and production engineering.

Wieland offers every employee the chance to develop their professional qualifications on the basis of a training and human resources development program. This program not only covers specialist knowledge but also promotes abilities regarding teamwork, leadership and project management.

Wieland encourages its workforce to keep fit and healthy. For this purpose, there are programs, for example in-house back training and special health seminars for shift workers and long-serving employees as well as dietary advice. To balance work and family life the company offers their employees a number of additional services such as child care and an ironing service. As a special service different take-away meals are available from the works canteens.
The company has a long-standing tradition of looking after its employees and its attitude towards staff is the forerunner for the German industry.

Philipp Jakob Wieland was one of the first employers in Germany to introduce a voluntary company health scheme in 1834 on which today’s company health schemes are based.

In the year 1873, Mathilde Wieland established a Pension and Support Fund. The continuation of this fund is the Wieland support scheme which was established in 1922. It still provides company pensions and supports staff in need.

In cooperation with the Worker’s Council the company has developed and realized new concepts. Examples are the Work-Time Account introduced in 1993, one of the first working-life models in Germany, the profit-related remuneration scheme implemented in 1994/95 and the flexible working system introduced in 2003.
Copper and its alloys are 100 percent recyclable without any loss of quality and as often as required. Copper recycling, therefore, helps to save valuable resources: it consumes about 80 percent less energy than required for extracting the metal from copper ore. For the manufacture of semi-finished products, Wieland mainly uses recycling material from its own production or from customers.

Copper is also environmentally friendly in various applications. After silver, it is the metal with the highest thermal and electrical conductivity. Copper materials, therefore, help to use energy efficiently: for example as copper tube and sheet in solar heat absorbers or as material for electrical connectors in computers and automobiles. Through the development of special alloys such as lead-free materials for drinking water fittings, Wieland ensures that products comply with health and environmental standards.

As a manufacturer with energy-intensive production, Wieland has an obligation to protect the environment. Therefore, the company strives to use energy as sparingly and efficiently as possible and protects resources, water, air and soil. All production plants worldwide have an efficient environmen-
tal management system in place. The European plants are certified to the international environmental standard DIN EN ISO 14001. The energy management of the German plants is additionally certified to DIN EN ISO 50001 and the biggest plant in Vöhringen is also certified to the European Eco-Management and Audit Scheme (EMAS).
Wieland worldwide

North America
USA

South America
Brazil
Colombia

Production plants

Germany: Wieland-Werke AG with plants in Ulm, Vöhringen, Langenberg, Villingen; Eucaro Buntmetall, Bremen; Schwermetall, Stolberg;
Sites of the Wieland Group and its trading agencies

Europe
Austria, Belarus, Belgium, Croatia, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Italy, Poland, Portugal, Romania, Russia, Spain, Sweden, Switzerland, Turkey

Asia
China
India
Japan
Korea
Singapore

Africa
South Africa

Australia

Austria: Buntmetall Amstetten with plants in Amstetten and Enzesfeld; China: Wieland Thermal Solutions, Shanghai; Great Britain: B. Mason & Sons, Birmingham; Portugal: Wieland Thermal Solutions, Esposende; Singapore: Wieland Metals Singapore; South Africa: Wieland South Africa, Edenvale; USA: Wieland Metals, Wheeling, IL; Wieland Copper Products, Pine Hall, NC