

**GABO STAHL**



## **Grades**

**Quality steel**  
**Heat-treated steel**  
**Case hardening steel**  
**Free-cutting steel**  
**Stainless steel**  
**Tool steel**  
**Nitriding steel**

## **Types**

**Billets**  
**Bars**  
**Ingots**  
**Sheets**  
**Tubes**  
**Draft parts**

## **Production and services**

**Peeling and straightening**  
**Sawing and prefabrication**  
**Single bar inductive heat treatment**  
**Heat treatment**  
**Crack testing**  
**Material testing**



## Excerpt of our product range

### Our customer oriented range covers:

Carbon steel, hardened steel, heat-treated steel, steel for induction hardening, boron steel, spring steel, ball-bearing steel, steel for improved machinability, micro-alloyed steel, stainless steel, tool steel, special steel

100Cr6	20MnB5	34CrAlNi7	C15 / 22 / 22.8 / 35 / 45 / 60
10CrMo9-10	20MoCr4	34CrMo4	Cf53 / C55
13CrMo4-4	21CrMoV5-7	34CrNiMo6	S355J2
15NiCr13	23MnNiCrMo5-2	35S20	TSTE355
15CrNi6	23MnNiMoCr5-4	37MnSi5	STE420 / 460 / 500 / 690
15Mo3	25CrMo4	41Cr4	ZF1
16/20MnCr5	27/30/38MnVS6	42CrMo4	ZF1A
16MnCr5+B	27-33MnCrB5	45S20	ZF6
17CrNi6	30CrNiMo8	50CrMo4	ZF7
17CrNi6-6	30Mn5	51CrV4	ZF7B
18CrNi8	31CrMoV9	58CrV4	ZF50
18CrNiMo7-6	34Cr4	62SiMnCr4	Tool steels
20CrMo5	34CrAlMo5		Stainless steels

## Production and services

### Peeling and straightening

One strength of our company is the machining of steel bars on centerless peeling machines. The process involves a cutter rotating around the well-leveled bar to remove shavings from a large surface area.

The method of peeling, which is subject to continuous, rigorous quality controls, enables tight tolerances to be maintained.

- Material strength: 500 - 1200 MPa
- Diameter: Ø 20 - 100 mm
- Tolerance range h9: Ø 20 - 100 mm
- Bar length: 2,9 - 8 m
- In-line sawing and beveling machine for Ø 20 - 80 mm, possible chamfer angle 30° - 45° - 60°
- Fully automatic Dr. Förster eddy current crack testing machine for surface crack testing according to EN 10277-1 - up to surface quality class 4

### Sawing and prefabrication

High modern sawing equipment completes the range of services of GABO STAHL. The access to a variety of stocks ensures a wide range of products and a fast processing.

- sawing up to Ø 1100 mm
- short processing time and careful handling using the latest technologies
- short term procurement of laser-plasma cutters, tubes, profiles, mountings and accessories, sheets and fittings
- High-speed circular sawing up to Ø 150 mm

Non-ferrous metals and stainless steel of almost any size are also available:

Flat steel, round steel, bright steel, square steel, square tubes, T-section steel, U-section steel, angle steel, round tubes, plates, construction steel, flame-cut-plates, continuous casting, etc.

### Single bar inductive heat treatment

Within diameter range Ø 18mm - Ø 105 mm GABO STAHL is running a single bar inductive heat treatment line. In this method a uniform and homogeneous heating is achieved.

In contrast to heating in a chamber furnace, there is less difference in tensile strength between the beginning and end of the bar as well as less difference between the core and the surface.

Structures and properties can be adjusted in a controlled way (bar by bar) that ensures homogeneity over the entire bar respectively the entire batch.
















The continuous rotation precisely increases the qualitative level of the properties and therefore highest strength classes can be achieved (e.g. 8.8 / 10.9 / 12.9).

Through single bar inductive heat treatment, highest customer requirements are fulfilled, especially for safety-relevant components, even in small batches.





## Size range:

 <b>Square billets hot rolled</b> 30 - 300 mm	 <b>Square (Stainless)</b> 20 - 500 mm	 <b>Sheets (Stainless)</b> 1D/2B/2R
 <b>Round bar peeled and polished</b> 16 - 102 mm	 <b>Hexagonal (Stainless)</b> 8 - 60 mm	 <b>Sheets cut from coil (Stainless)</b>
 <b>Round bar cold drawn</b> 5 - 80 mm	 <b>Flat steel (Stainless)</b> upon request	 <b>Welded tubes (Stainless)</b> upon request
 <b>Round bar hot rolled</b> 16 - 350 mm	 <b>Blocks (Stainless)</b> upon request	 <b>Seamless tubes (Stainless)</b> upon request
 <b>Round bar forged</b> 230 - 1000 mm	 <b>Angle steel (Stainless)</b> upon request	 <b>Hollow steel (Stainless)</b> upon request

Further grades and dimensions on request.

DIN EN ISO 50001    DIN EN ISO 9001

### Heat treatment

The steel refinement is an important main pillar of the company. At our production site OWZ, five chamber furnaces, each with a loading capacity of 15 tons, are available for processing in an open furnace atmosphere. The maximum component's dimension is 8 x 2 x 0.8 metres.

In addition, the heat treatment can also be offered in a continuous furnace with inert gas. The charging weight is 850 kg. The steel grid blasting completed the technical possibilities in the processing center.

- Stress relief annealing
- Soft annealing
- Normalized annealing
- Coarse-grain annealing
- Diffusion annealing
- Recrystallisation annealing
- Isothermal annealing
- Annealing for cold-shearability
- Cementite spheroidizing
- Quenched and tempering (oil or water quenched)
- Steel grid blasting

### Crack testing

Crack tests are very important to ensure the raising quality standards. With their procedure, GABO Werkstofftechnik is responding to the customer expectations:

- Magnetic particle inspection (MT): crack testing by magnetic particle inspection for detecting surface defects on, respectively near the surface of ferromagnetic materials
- Penetration Testing (PT): method for verification of surface defects
- Ultrasonic Testing (UT): acoustic method for detection of internal material defects via ultrasonic sound
- Eddy Current Testing (ET): electronic method for non-destructive testing of electro conductive materials (crack testing, coat thickness measuring, antimix control)
- Visual Testing (VT): in addition to further testing methods and sorting
- Demagnetization: by AC/DC for any shapes of components
- Additional Services: dimensional inspection and any kind of reworking of all kinds (e.g. grinding, milling, etc.)

### Material testing

Through modern equipment and the methods of research and development the importance of quality management and certification increase. GABO Werkstofftechnik offers a wide range of destructive material testing:

- Physical-mechanical-technological testing
  - tensile test: specimen type B (A, C, E, H) temperature range up to +800°C
  - notched impact tests: ISO-U, ISO-V, DVM samples temperature range: room temperature till -80°C (-196°C)
  - hardness tests: Brinell, Vickers and Rockwell
  - bending tests
- Chemical composition
  - spectral analysis (OES)
  - x-ray fluorescence analysis (RFA)
  - antimixing tests
- Metallography
  - macroscopic tests: inspection of rougher defects as cavities, cracks, pinholes, segregations
  - microscopic tests: structures, weld seam inspection, damage evaluation
- Special testing
  - jominy test (hardenability)
  - intercrystalline corrosion test
  - blue fracture test
  - heat treatment in bench-scale unit



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