SALZGITTER FLACHSTAHL
A member of the Salzgitter Group

22MnB5

Colled-rolled quenched and tempered steel, boronalloyed

Material no.	–
SZFG material data sheet 11-112	

General information

The steel grade 22MnB5 in its cold rolled state is not standardized

This steel grade belongs to the product category of quenched and tempered steels, and features outstanding forming properties in the soft delivery state (in particular in terms of the deep drawing properties of cold strip), and high strength after heat treatment (hardening).

The materials strength is propagated by adding a small fraction of boron to the carbon, manganese and chromium composition. Therefore this steel grade is also called „boron steel“, in colloquial terms.

Chemical composition

(in percent by weight)

	min.	max.
C	0.22%	0.25%
Mn	1.20%	1.40%
Si	0.20%	0.30%
P		0.020%
S		0.005%
Al	0.020%	0.050%
Ti	0.020%	0.050%
Cr	0.11%	0.20%
B	0.002%	0,0035%
Mo		0.10%
Cu		0.10%
Ni		0.10%

Mechanical properties [1)]

Yield strength $R_{p\,0,2}$
310 – 400 MPa

Tensile strength R_m
480 – 580 MPa

Total elongation A_{80}
≥20 %

1) Mechanical values derived from tensile tests transversal to rolling direction (delivery state, untreated).

This steel type may reach a tensile strength of up to 1,650 Mpa when hardened after a hot forming process.

The characteristic values available after hardening of the hot formed steel are process- and component-specific, and produced at the responsibility of the user.

Available Dimensions

Thickness in mm	Width in mm
1.00 – 1.24	900 – 1,000
1.25 – 2.59	900 – 1,600
2.60 – 3.00	900 – 1,250

Thicknesses ranging from 0.80 mm to 0.99 mm can be delivered on request as sample deliveries.

Form of delivery:

This steel sheet type is delivered with a thickness of ≥ 1.00 mm ≤ 3.00 mm, with surface finish category A in accordance with DIN EN 10130.

Delivery is based on conditions to DIN EN 10021, in combination with relevant valid dimensioning standards (DIN EN 10131) or special terms of delivery. The test unit comprises 20 tons, or 20 tons of each new batch, of products of the same steel grade and nominal thickness.

Strip material is tested in coil form. The maximum strip width is 1,500 mm.

Microstructure

(delivery state, untreated):
The 22MnB5 steel in cold formed state usually has a ferritic-pearlitic microstructure with carbide precipitations, and a typical grain size of > 10 ASTM.

Usage and processing information

Cold formed boron-alloyed tempered steels were developed especially for automotive engineering.

The steel features excellent forming capabilities in the cold-rolled delivery state, and is thus also suitable for the production of components with complex structure.

The steel will not reach its ultimate strength until the hot formed part has been treated in the subsequent controlled cooling process (form hardening, steels suitable for press hardening).

SALZGITTER FLACHSTAHL
A member of the Salzgitter Group

Salzgitter Flachstahl GmbH · Eisenhüttenstraße 99 · 38239 Salzgitter
Phone +49 (0) 5341 21-2890 · Telefax +49 (0) 5341 21-8536
E-Mail flachstahl@salzgitter-ag.de · http://www.salzgitter-flachstahl.de

22MnB5

Colled-rolled quenched and tempered steel, boronalloyed

Two methods are deployed to harden the hot formed steel (press hardening):

- Cold forming of the blank, and (separate) hardening in the next step.
- In the hot forming process, the microstructure is heated to a temperature above 950°C in a protective furnace atmosphere, transformed to the austenitic state, and then formed. The formed part remains in the die until it has cooled down to a temperature between 100°C and 200°C, thus producing a martensitic microstructure for a high strength component.

This steel was developed specifically with the focus set on satisfying requirements of automotive industry in terms of weight reduction and high-performance crash properties.

The combination of forming and hardening capabilities makes 22MnB5 steel an ideal solution for the passenger cabin or motor.

Examples of automotive applications (selection):

- A-pillar reinforcement
- B-pillar reinforcement
- Side impact protection
- Sills
- Frame components
- Bumpers, bumper mounts
- Door pillar reinforcements
- Rear and front end cross members
- Roof frames

Companies processing such steel products must verify compliance of their calculation, construction and processing methods with material requirements. The forming technology deployed must be fit for the purpose, compliant with state-of-the-art, and should be adapted as required.

Manufacturers can process the steel described in this document as usual by common welding techniques, in accordance with general technical rules. Allowances should be made in the design of joints for adequate stress absorption capability (forces) within the construction. Customers should make allowances for such factors.

The steel product is available with surface protection (scale-resistant coil coating), not weldable for the time being.

SALZGITTER FLACHSTAHL
A member of the Salzgitter Group

Salzgitter Flachstahl GmbH · Eisenhüttenstraße 99 · 38239 Salzgitter
Phone +49 (0) 5341 21-2890 · Telefax +49 (0) 5341 21-8536
E-Mail flachstahl@salzgitter-ag.de · http://www.salzgitter-flachstahl.de