



Data and facts for application

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EN AW-5083
The naturally hard and universal alloy

EN AW-5083 – NATURALLY HARD AND UNIVERSAL

The EN AW-5083 ranks among the non-curable (naturally hard) alloys. Correspondingly, they can either be used directly or reshaped after homogenisation. A heat treatment for increasing strength is not possible.

Due to its very good corrosion resistance, this alloy is primarily used in shipbuilding and in the chemical industry.

Chemical composition*

Si 0,40	Fe 0,40	Cu 0,10	Mn 0,40 1,0	Mg 4,0 4,9
Cr 0,05 0,25	Zn 0,25	Ti 0,15	others, each 0,05	others, total 0,15

*according to EN-573-3 or Teal-Sheets (AA)

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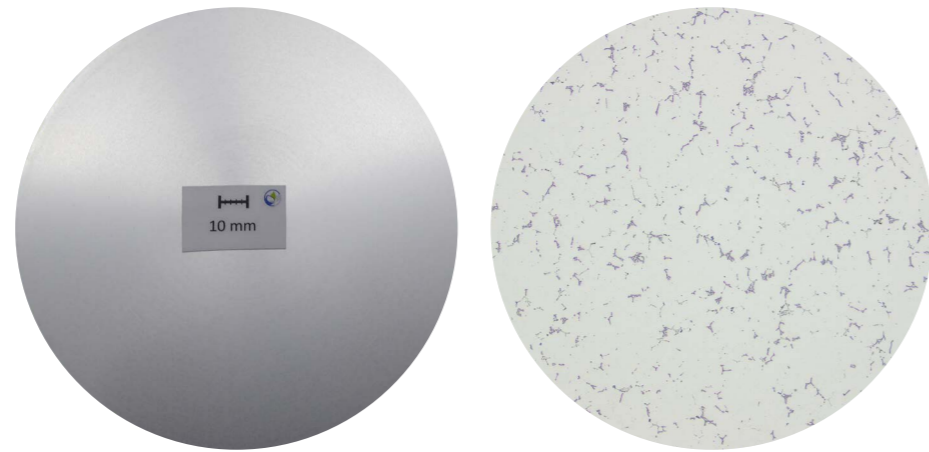
Mn 0,4 1,0

Min-Value Max-Value

All values in mass %

Structure of the billets

Depending on the process, a segregation zone occurs immediately in the marginalised layer of continuously cast billets. Prior to further processing these should be removed – this is already the case for the turned billets from Leichtmetall. Additionally these billets are also subjected to a final quality test by means of an automatic ultrasonic test underwater. In the case of casting lengths, the depth of the segregation zone is shown by way of example at 178 mm.



Macrosection, d178 mm: Segregation zone 2,1 mm Microsection, d178 mm (25 times magnification)

Casting length dimensions

Ø 160 mm	Ø 177 mm	Ø 201 mm	Ø 215 mm	Ø 227 mm	Ø 253 mm	Ø 280 mm
Ø 314 mm	Ø 350 mm	Ø 372 mm	Ø 425 mm	Ø 435 mm	Ø 478 mm	Ø 518 mm
Ø 607 mm	Ø 682 mm	Ø 756 mm	Ø 935 mm	Ø 1135 mm		

Turned billets

We can produce all diameters between 140 - 1080 mm.

Mechanical properties

There is no standard for cast round rods (cast billets / bolts) that defines mechanical properties. A Brinell hardness in the homogenised state of approx. 70 HBW can be named as a guideline for cast material. The homogenised state (=„O3“ according to EN515) is comparable in strength with the annealed state (=„O“) for extruded products. The final strength is essentially adjusted by the reshaping process and/or the heat treatments by our customers.

Profit from our extensive materials experience

We ship billets in the homogenised state (O3). The advantage: a consistent structure as well as good properties for further processing with reshaping processes (forging and extruding). We have summarised typical attainable empirical values from our experience – in relation to the heat treatments and resulting technological properties.

Physical properties

Density	2,6 g/cm ³
Solidification range	574-638 °C
Electr. conductivity	16-19 MS/m
Thermal conductivity	110-140 W/(mK)
Modulus of elasticity	71.000 MPa
Specific heat	900 J/(kgK)
Shear modulus	26.800 MPa

Heat treatment

Soft annealing, Recrystallization annealing	
Annealing temperature	380-420 °C
Heat-up time	1-2 h
Cooling conditions	30-50 °C/h

Mechanical parameters

Condition	R _{p0,2} (MPa)	R _m (MPa)	A (%)
O	110	270	10
H111	110	270	10
H112	125	270	10

(all stated values for extruded round rods D. < 200 mm)

Technological properties*

Weldability	
Gas	o
WIG	+
MIG	+
Resistance welding	+
Surface treatment	
Anodisation protection	+
Anodisation decorative	o
Coating	o
Cold reshapeability	
Bending	+
Pressing	o
Deep-drawing	+ (Condition O)
Forging	+ (Condition O)
Upsetting	o
Corrosion resistance	
Atmospheric conditions	++
Seawater	++
Brazeability	
Hard soldering with / without flux	-
Abrasion soldering	o
Soft soldering with flux	-
Hot reshapeability	
Extrusion molding	-
Drop forging / Open die forging	o
Machineability	
Annealed	o
Work hardened	+
Work Use in contact with food	Yes

* ++ = very good --- = not possible

Customer-Specific solutions ...

Upon request we can adapt the analysis presets according to your individual processing needs and quality requirements. Various compositions are possible and similarly very pure alloys can be produced with limited amounts of Sodium, Calcium or Beryllium. We are looking forward to receive your request!

... no problem for Leichtmetall

High strength alloys are our Speciality. Our know-how as a foundry stretches back over 90 years. Today, demanding customers from many branches of industry – for example from Aviation, Automobile, general Machinery and Energy Management use the Premium Alloys made in Hannover, Germany. Particularly close to our hearts, is our commitment to optimised production – saving energy and protecting the environment. To that end, for example, we use secondary aluminium from the circular economy to ensure environmental and climate protection.