



Data and facts for application

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EN AW-4032
The wear-resistant alloy

EN AW-4032 - THE WEAR-RESISTANT ALLOY

The alloy EN AW-4032 is one of the heat treatable alloys. Accordingly, heat treatment such as solution annealing and subsequent artificial aging is necessary. Only then can the alloy develop its full potential. 4032 is the alloy with the highest attainable strength of the 4000-group and is frequently used as a piston alloy. Due to the very low ductility caused by the high silicon content, this alloy is difficult to extrude. Leichtmetall is also able to cast special non-standardised variants of this alloy with more than 20 % silicon. Please contact us.

Chemical composition*

Si 11,0 13,5	Fe 1,0	Cu 0,50 1,3	Mg 0,8 1,3	Cr 0,10
Zn 0,25	Ni 0,50 1,3	others, each 0,05	others, total 0,15	

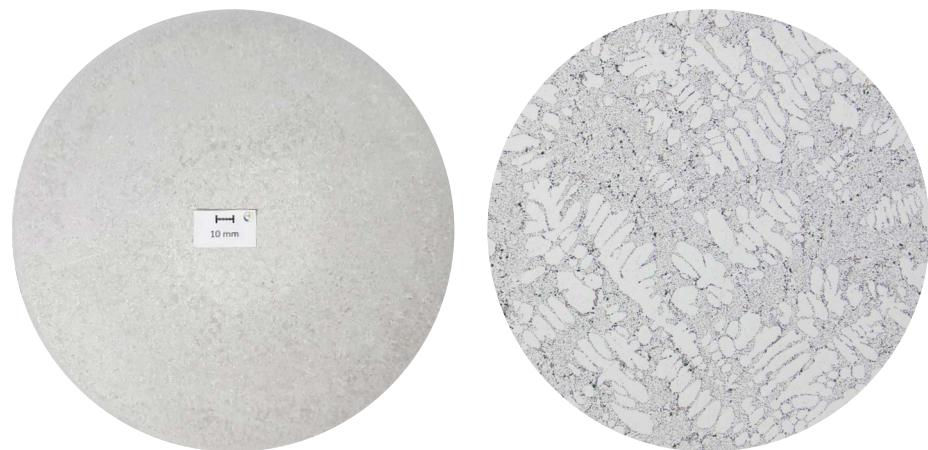
*according to EN-573-3 or Teal-Sheets (AA)

Index	
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 278 mm.



Macrosection, d278 mm: Segregation 2,1 mm Microsection, d278 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. The homogenized 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 homogenized state (O3). The advantage: a consistent structure as well as good properties for further processing with reshaping processes (forging and extruding). We have summarized typical attainable empirical values from our experience - in relation to the heat treatments and resulting technological properties.

Physical properties

Density	2,68 g/cm ³
Solidification range	530 - 570 °C
Electr. conductivity	20 - 23 MS/m
Thermal conductivity	138 - 155 Q/(mK)
Modulus of elasticity	79.000 MPa
Specific heat	864 J/(kgK)
Shear modulus	26.000 MPa

Heat treatment

Solution annealing	6h by 510 °C
Artificial aging	10h by 171 °C

Mechanical Parameters

Condition	R _{p0,2} (MPa)	R _m (MPa)	A (%)
T6	288	360	-

(all values for extruded round rods D. up to 100 mm)

Technological properties*

Weldability	
WIG	+
MIG	+
Resistance welding	nA
Surface Treatment	
Anodization protective	+
Anodization decorative	--
Coating	nA
Cold reshapeability	
Bending	--
Deep-drawing / Pressing / Upsetting	--
Impact Extrusion	--
Corrosion resistance	
Atmospheric conditions	-
Seawater	--
Brazeability	
Hard soldering	nA
Abrasion soldering	nA
Soft soldering with flux	nA
Hot reshapeability	
Extrusion molding	-
Drop forging / Open die forging	+
Machineability	+
Use in contact with food	No

* ++ = 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 chemical compositions are possible and similarly very pure alloys can be produced with limited amounts of Natrium, Calcium or Beryllium. We are looking forward to receiving 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.