



LEICHTMETALL

DATA AND FACTS FOR APPLICATION

# EN AW-2017A

The high-strength alloy – ideal for turning

# EN AW-2017A – THE HIGH STRENGTH ALLOY

EN AW-2017A – high-strength and easily workable. Our alloy EN AW-2017A ranks among the high-strength, hardenable alloys. Correspondingly, a heat treatment such as solution annealing and subsequent natural aging are necessary so that this alloy can develop its full potential. This can increase the strength by several multitudes.

This alloy is used, due to its high strength with simultaneously good workability, in the aerospace industry and in defence technology and aviation.

## Chemical Composition\*

<b>Si</b> 0,20 0,8	<b>Fe</b> 0,7	<b>Cu</b> 3,5 4,5	<b>Mn</b> 0,40 1,0	<b>Mg</b> 0,40 1,0	<b>Cr</b> 0,10
<b>Zn</b> 0,25	<b>Ti + Zr</b> 0,25		others, each 0,05	others, total 0,15	

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

## Index

<b>Mn</b>	
0,4	1,0
Min-Value	Max-Value

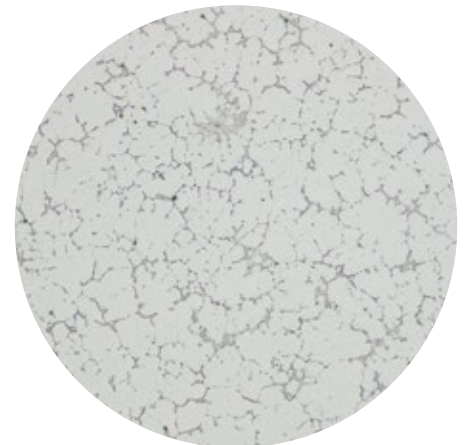
All values in mass %

## Structure of the billets

Depending on the process, a segregation zone occurs immediately in the marginalized 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 2,9 mm



Microsection, d178 mm (25 times magnification)

## Casting Length Dimensions

Ø 160 mm	Ø 178 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 518 mm	Ø 607 mm
Ø 682 mm	Ø 750 mm**	Ø 930 mm*	Ø 1150 mm**			

\* Q4 2022

\*\* Q2 2023

## Turned billets

We can produce all diameters between 140 – 650 mm. From Q2 2023 onwards, we are able to produce diameters up to 1.100 mm.

## Mechanical Properties

There is no standard for cast round rods (cast billets / bolts) that defines mechanical properties. A Brinell hardness in the homogenized state of approx. 85 HBW can be named as a guideline for cast material. The homogenized state (=„03“ according to EN515) is comparable in strength with the annealed state (=„0“) 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	2,8 g/cm <sup>3</sup>
Solidification range	512-650 °C
Electr. conductivity	18-28 MS/m
Thermal conductivity	130-200 W/(mK)
Modulus of elasticity	72.500 MPa
Specific heat	860 J/(kgK)
Shear modulus	27.200 MPa

### Heat Treatment

#### Soft annealing, Recrystallization annealing

Annealing temperature	380-420 °C
Heat-up time	2-3 h
Cooling conditions	> 250 °C: ≤ 30 °C/h ≤ 250 °C: in open air

#### Hardening

Solution annealing	495-505 °C
Quenching	Water
Natural aging	5-8 days

### Mechanical Parameters

Condition	R <sub>p0,2</sub> (MPa)	R <sub>m</sub> (MPa)	A (%)
O	135	250	12
T4	240	370	8
T4510	240	370	8

(all stated values for extruded round rods D. between 150 - 200 mm)

### Technological Properties\*

#### Weldability

Gas / WIG / MIG	--
Resistance welding	++

#### Surface treatment

Anodization protection	+
Anodization decorative	--
Coating	o

#### Cold reshapeability

Bending	+ (Condition O)
Pressing / Deep-drawing / Upsetting	o (Condition O)
Impact Extrusion	o (Condition O)

#### Corrosion resistance

Atmospheric conditions	o
Seawater	-

#### Brazeability

Hard soldering with / without flux	--
Abrasion soldering	o
Soft soldering with flux	--

#### Hot reshapeability

Extrusion molding	o
Drop forging / Open die forging	o

#### Machineability

Annealed	o
Work-hardened	o
Hardened	+
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 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 optimized 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.



**Do you have questions?**

Please call us at +49 511 89878 475