JACQUES ALLEMANN
NOTZ group advanced metal solutions

Aluminium 1050

		EN standard	AFNOR	UNS	DIN
Description	**Al99.5**	AW-1050A	1050A	A91050	3.0255

Chemical composition

Al	Fe	Zn	Cu	Mg	Mn	Si	Ti
± 99.5	± 0.40	± 0.07	± 0.05	± 0.05	± 0.05	± 0.25	± 0.05

Chemical analysis according to European EN standard in percentages by mass. / *Other

Main technical properties and features

Aluminium 1050 belongs to the series of high-purity alloys containing at least 99.5% aluminium, which gives it particularly sought-after physical and chemical properties. Thanks to its almost pure composition, this alloy is one of the most versatile, economical and high-performance metal materials used in industry.

Known as one of the most widely used grades in the 1xxx series, aluminium 1050 is distinguished by its very high electrical conductivity (≈60—62% IACS) and high thermal conductivity (~222 W/m·K), as well as excellent corrosion resistance. This strength comes from the natural formation of an ultra-thin and stable layer of aluminium oxide – Al_2O_3 – which provides lasting protection against moisture, seawater and mildly harsh environments. Aluminium 1050 is also appreciated for its very high ductility and exceptional formability, making it particularly suitable for cold rolling and wire drawing. Its low density – about three times lower than that of steel – makes it a material of choice when lightness is an essential criterion. On the other hand, its limited mechanical strength makes it suitable for applications where structural strength is not crucial.

It also offers a naturally reflective surface, easy weldability (TIG, MIG/MAG processes) and food compatibility, which is why it is used extensively in the electrical, chemical and food industries. Its low content of alloying elements promotes formability and conductivity, but is nevertheless accompanied by moderate machinability.

Dimensions

Products	Ø [mm]	Accuracies (µm)	Dimensions (mm)	Length (mm)
Wire	0.020 - 4.000	+/- 2 µm		
Bars	0.100 - 4.000			1000 - 4500
Axes	0.020 - 4.000			10.000 - 1000
Flat wires			0.010 min x 10,000 max	
Profiles			Any type Max. cross-section 20 mm^2	
Other forms Other tolerances	On request			

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Technical data

Typical applications:

- Light electric conductors and cables
- Electrotechnical winding and components
- Thermal elements, coils, small tubes, springs
- Sheets for heat exchangers
- Thin sheets and technical films for food applications
- Agro-food bonding wires
- Wire braiding, mesh

Mechanical properties

Electrical conductivity	20 °C	62	%IACS
Resistivity	20 °C	2.8	$\times 10^{-8}\Omega \cdot m$
Thermal conductivity at 20°C	25 °C	222	W/m·K
Coefficient of thermal expansion		2.35	$\times 10^{-5}$/°C
Young's modulus		70	GPa
Melting point		650 - 655	°C
Density		2.71	g/cm³

Heat treatments

Aluminium 1050 is not heat treatable, it cannot be hardened by quenching and tempering. Its mechanical properties therefore vary only by work-hardening, i.e. by cold working.

	State	Rp0.2 (MPa)	Rm (MPa)	Y_{80} (%)	Hardness (HBW)
Annealing	Y	20	60 - -95	20 - 30	20
1/2 hard	H14	70	100 - 135	3 - 6	30
4/4 hard	H18	125	145	1 - 3	43

To restore ductility, annealing around 200-300 °C is recommended

Note

All information provided in this data sheet is based on the best knowledge and state of the art, but without warranty. The use of materials should always be discussed with our sales specialists or our materials laboratory on a product and application-specific basis.

Jacques Allemann, branch of Notz Metal Inc.
Bernstrasse 24
CH 2555 Brügg
Tel. +41 32 485 15 66

www.jacques-allemann.com
info@jacques-allemann.ch