

Material data sheet

Alumide®

1 General

A typical application for Alumide® is the manufacture of stiff parts of metallic appearance for applications in automotive manufacture (e.g. wind tunnel tests or parts that are not safety-relevant), for tool inserts for injecting and moulding small production runs, for illustrative models (metallic appearance), for education and jig manufacture, among other aspects.

Surfaces of parts made of Alumide® can be finished by grinding, polishing or coating. An additional advantage is that low tool-wear machining is possible, e.g., milling, drilling or turning.

Alumide® is suitable for processing on the following systems:

- EOSINT P 730, P 700
- EOSINT P 390, P 385, P 380i, P 380, with or without powder conveying system
EOSINT P 360 with upgrade S&P, P 350/2 + upgrade 99 + upgrade S&P
- FORMIGA P 100

2 Technical data

General material properties

Average grain size	ISO 13320-1	60	µm
	Laser diffraction	2.36	mil
Bulk density	EN ISO 60	0.67	g/cm ³
Density of laser-sintered part	EOS-method	1.36	g/cm ³
		85	lb/ft ³

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Mechanical properties

Tensile modulus	EN ISO 527	3800	MPa
	ASTM D638	551	ksi
Tensile strength	EN ISO 527	48	MPa
	ASTM D638	6962	psi
Elongation at break	EN ISO 527	4	%
	ASTM D638	4	%
Flexural modulus	EN ISO 178	3600	MPa
	ASTM D790	522	ksi
Flexural strength	EN ISO 178	72	MPa
	ASTM D790	10443	psi
Charpy - Impact strength	EN ISO 179	29	kJ/m ²
Charpy - Notched impact strength	EN ISO 179	4.6	kJ/m ²
Shore D - hardness	ISO 868	76	-
	ASTM D2240	76	-

Thermal properties

Melting point	EN ISO 11357-1	172 – 180	°C
Heat deflection temperatur	ASTM D648 (0.45 MPa)	351	°F
Vicat softening temperature B/50	EN ISO 306	169	°C
	ASTM D1525	336	°F
Heat conductivity (170 °C)	Hot wire method	0.5 – 0.8	W/(mK)

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Electrical properties

Surface resistance [10 V]	IEC 93	3×10^{12}	Ω
	ASTM D257-93	3×10^{12}	Ω
Specific surface resistance	IEC 93	5×10^{14}	Ω
	ASTM D257-93	5×10^{14}	Ω
Volume resistance [10 V]	IEC 93	6×10^{12}	Ω
	ASTM D257-93	6×10^{12}	Ω
Specific volume resistance	IEC 93	3×10^{14}	Ωcm
	ASTM D257-93	3×10^{14}	Ωcm
Dielectric breakdown strength	EN 60243-1	0.1	kV/mm
Dielectric constant (1 kHz)	DIN 53483	13 ± 1.5 (100 Hz)	-
		10 ± 0.5 (1 MHz)	-
Dielectric loss factor (1 kHz)	DIN 53483	0.018 ± 0.002	-

Due to the aluminium particle content, it was not possible to produce a breakdown on the test specimens in the conventional meaning (e.g. ceramic). Breakdown was due to the formation of leakage paths at voltages $< 200 \text{ V}$.

The resistance measurements were made on laser-sintered test specimens on which the surface had only been treated by blasting with glass beads and was thus relatively rough. Different values can thus be expected with ground or polished surfaces.

The electrical properties are heavily dependent on temperature and moisture content. The values listed characterise the sample part with the following conditioning: storage at $23 \text{ }^\circ\text{C}$ and 50 % relative humidity up to saturation. The information given above relates to the characterisation of the electrical behaviour of the material (test bodies) and not to that of a finished part.

The mechanical properties depend on the x-, y-, z-position of the test parts and on the exposure parameters used.

The data are based on our latest knowledge and are subject to changes without notice. They do not guarantee properties for a particular part and in a particular application.

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