thyssenkrupp Materials (UK) Ltd

Aluminium Alloy 6005A - T6 Extrusion

Material Data Sheet

Specifications

- Commercial: 6005A
- EN: 6005A

Aluminium alloy 6005A is a medium strength, heat treatable alloy with excellent corrosion resistance. Alloy 6005 has properties between those of alloys 6061 and 6082and can sometimesbe used interchangeably with these alloys, but 6005 has better extrusion characteristics and a better mill surface finish. It is difficult to produce thin-wall or complicated extrusions in 6005, but it is still more extrudable than 6082. 6005A tube has very good bending properties.

Application

6005 and 6005A typically find application in intricate extrusions like: tubing for furniture, railway and bus profile structures, pylons, platforms and pipelines, portable ladders and sections where greater strength is needed than given by 6060 and 6063.

Supplied Forms

- Extrusions
- Tube

Alloy Designations

Aluminium alloy 6005A also corresponds to the following standard designations and specifications but may not be a direct equivalent:

- A96005
- AlSiMg
- AlSiMg(A)

Temper Types

The most common temper for 6005 aluminium is: T6 - Solution heat treated and artificially aged.

Fabrication

- Workability - Cold: Fair
- Machinability: Fair

Weldability

The weldability of 6005A is excellent. 4043 welding wire is recommended unless joining to one of the 7XXX series. In this case 5356 wire is the suggested alternative.

- Weldability - Gas: Excellent
- Weldability - Arc: Excellent
- Weldability - Resistance: Excellent
- Brazability: Excellent

Chemical Composition

BS EN 573-3: 2009 Alloy 6005

Element	% Present
Silicon (Si)	0.50 - 0.90
Magnesium (Mg)	0.40 - 0.70
Manganese + Chromium (Mn+Cr)	0.12 - 0.50
Manganese (Mn)	0.0 - 0.50
Iron (Fe)	0.0 - 0.35
Copper (Cu)	0.0 - 0.30
Chromium (Cr)	0.0 - 0.30
Zinx (Zn)	0.0 - 0.20
Others (Total)	0.0 - 0.15
Titanium (Ti)	0.0 - 0.10
Other (Each)	0.0 - 0.05
Aluminium (Al)	Balance

Generic Physical Properties

Property	Value
Density	2.70 Kg/m^3
Melting Point	605 °C
Thermal Expansion	24 x 10^{-6} /K
Modulus of Elasticity	70 GPa
Thermal Conductivity	188 W/m.K
Electrical Resistivity	0.034 x 10^{-6} Ω .m

Mechanical Properties

BS EN 573-3: 2009 Alloy 6005
Rod & bar up to 25mm Dia. & A/F

Property	Value
Proof Stress	225 Min MPa
Tensile Strength	270 Min MPa
Elongation A50 mm	8%
Shear Strength	205 MPa
Hardness Brinell	90 HB
Elongation A	10 Min %

BS EN 755-2:2008
Rod & bar 25mm to 50mm Dia. & A/F

Property	Value
Proof Stress	225 Min MPa
Tensile Strength	270 Min MPa
Hardness Brinell	90 HB
Elongation A	8 Min %

BS EN 755-2:2008
Rod & bar 50mm to 100mm Dia. & A/F

Property	Value
Proof Stress	215 Min MPa
Tensile Strength	260 Min MPa
Hardness Brinell	85 HB
Elongation A	8 Min %

BS EN 755-2:2008
Tube Up To 5mm Wall Thickness

Property	Value
Proof Stress	225 Min MPa
Tensile Strength	270 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	90 HB
Elongation A	8 Min %

BS EN 755-2:2008
Tube 5mm to 10mm Wall Thickness

Property	Value
Proof Stress	215 Min MPa
Tensile Strength	260 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	85 HB
Elongation A	8 Min %

BS EN 755-2:2008
Open Profile Up To 5mm Wall Thickness

Property	Value
Proof Stress	225 Min MPa
Tensile Strength	270 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	90 HB
Elongation A	8 Min %

BS EN 755-2:2008
Open Profile 5mm to 10mm Wall Thickness

Property	Value
Proof Stress	215 Min MPa
Tensile Strength	260 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	85 HB
Elongation A	8 Min %

BS EN 755-2:2008
Open Profile 10mm to 25mm Wall Thickness

Property	Value
Proof Stress	200 Min MPa
Tensile Strength	250 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	85 HB
Elongation A	8 Min %

BS EN 755-2:2008
Hollow Profile Up To 5mm Wall Thickness

Property	Value
Proof Stress	215 Min MPa
Tensile Strength	255 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	85 HB
Elongation A	8 Min %

BS EN 755-2:2008
Hollow Profile Up To 5mm to 15mm Wall Thickness

Property	Value
Proof Stress	200 Min MPa
Tensile Strength	250 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	85 HB
Elongation A	8 Min %

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Important Note