3003 O Aluminum Circle

Mechanical

Property	Temperature	Value	Comment
Bending Fatigue Strength	23.0 °C	50 MPa	
Elastic modulus	23.0 °C	69 - 69.5 GPa	
Elongation	-195.0 °C	46 %	Elongation in 50 mm
	-80.0 °C	42 %	Elongation in 50 mm
	0.0 °C	41 %	Elongation in 50 mm
	23.0 °C	27 %	Elongation in 50 mm
	24.0 °C	40 %	Elongation in 50 mm
	100.0 °C	43 %	Elongation in 50 mm
	150.0 °C	47 %	Elongation in 50 mm
	205.0 °C	60 %	Elongation in 50 mm
	260.0 °C	65 %	Elongation in 50 mm
	315.0 °C	70 %	Elongation in 50 mm
	370.0 °C	70 %	Elongation in 50 mm
Elongation A100	23.0 °C	21 - 37 %	
Elongation A50	23.0 °C	14 - 30 %	
Fatigue strength	23.0 °C	48 MPa	for $5x10^8$ cycles
Hardness, Brinell	23.0 °C	28 [-]	500 kg load, 10 mm ball
Plane-Strain Fracture Toughnes	23.0 °C	22 - 35 MPa·√m	Typical for Wrought 3000 Series Aluminium
Poisson's ratio	23.0 °C	0.33 [-]	Typical for Wrought 3000 Series Aluminium

Shear modulus	23.0 °C	25 GPa	
Shear strength	23.0 °C	76 MPa	
Tensile strength	-195.0 °C	228 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	-80.0 °C	138 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	0.0 °C	117 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	23.0 °C	95 - 135 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	24.0 °C	110 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	100.0 °C	90 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	150.0 °C	75 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	205.0 °C	59 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture

	260.0 °C	40 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	315.0 °C	28 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	370.0 °C	19 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
Yield strength	23.0 °C	40 MPa	
Yield strength Rp0.2	-200.0 °C	60 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	-100.0 °C	52 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	-30.0 °C	45 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	23.0 °C	35 - 40 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	25.0 °C	41 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture

	100.0 °C	38 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	200.0 °C	30 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	300.0 °C	17 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture
	400.0 °C	12 MPa	up to 10000 h at temperature, at 35 MPa/min to yield strength and then at strain rate of 5%/min to fracture

Thermal

Property	Temperature	Value
Coefficient of thermal expansion	20.0 °C	2.32E-5 1/K
	23.0 °C	2.3E-5 - 2.31E-5 1/K
	100.0 °C	2.32E-5 1/K
Melting point		640 - 655 °C
Specific heat capacity	23.0 °C	890 J/(kg·K)
Thermal conductivity	23.0 °C	159 - 193 W/(m·K)

Electrical

Property	Temperature	Value	Comment
Electrical conductivity	23.0 °C	2.40E+7 - 2.90E+7 S/m	Typical/derived value
Electrical resistivity	23.0 °C	3.4E-8 - 4.17E-8 Ω·m	Typical value
Specific Electrical conductivity		50 % IACS	Typical value

Chemical properties

Property	Value	Comment
Aluminium	96.8 - 99 %	Balance
Cobalt	0.05 - 0.2 %	
Copper	0.05 - 0.2 %	
Hydrogen	0.7 %	
Iron	0 - 0.7 %	Si + Fe
Magnesium	1 - 1.5 %	
Manganese	1 - 1.5 %	
Other	0 - 0.15 %	each 0.05, total 0.15, Rest Al,Total
Silicon	0 - 0.6 %	Si + Fe
Zinc	0 - 0.1 %	
Zirconium	0 - 0.1 %	

Technological properties

Property	
Application areas	

	roofing and sidings, acoustic ceilings, corrugated sheets, storage tanks, pipes, metal work, heat exchangers, air condition evaporators, motor vehicle radiators, freezer linings, cooking utensils, bakery moulds, office equipment, tubes & pipes, containers, closures, cladding alloymetal workcorrugated sheets,
Brazing	general: possible with commercial processes and methods
Corrosion properties	Stress corrosion cracking: no damage during operation and laboratory tests, general: very good, without protection in industrial or seawater atmosphere
General machinability	General: not suitable (O, H12), poor (H14, H16, H25)
Soldering general	Very Good
Welding	Gas: Very Good; Arc: Very Good; Resistance: Good
Workability	general (condition): good (O, H12), acceptable (H14, H25), poor(H16, H18)