

Outokumpu 253MA® High Temperature Austenitic Stainless Steel

Category : Metal , Ferrous Metal , Austenitic , Stainless Steel

Material Notes:

Variant of 1.4828 with increased nitrogen content and has been microalloyed with rare earth metals (REM). The most suitable temperature range is 850-1100°C, because structural changes when used between 600-850°C can lead to reduced impact toughness at room temperature. Applications: Heat and creep resistance. For use over 550°C for equipment and components within: Iron, steel, and non-ferrous industries. Engineering industry. Energy conservation plants. Cement industry. Available in hot rolled plate (Quarto), hot rolled strip/sheet (CPP), cold rolled strip/sheet, cold rolled narrow strip, bar, and rod forms.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Outokumpu-253MA-High-Temperature-Austenitic-Stainless-Steel.php

Physical Properties	Metric	English	Comments
Density	7.80 g/cc	0.282 lb/in ³	RT

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	700 MPa	102000 psi	Outokumpu Typical, Hot Rolled Plate (Quarto); EN 10002-1
	360 MPa	52200 psi	EN min.
	@Temperature 700 °C	@Temperature 1290 °F	
	445 MPa	64500 psi	EN min.; EN 10002-5
	@Temperature 600 °C	@Temperature 1110 °F	
	495 MPa	71800 psi	EN min.; EN 10002-5
	@Temperature 500 °C	@Temperature 932 °F	
	530 MPa	76900 psi	EN min.; EN 10002-5
	@Temperature 400 °C	@Temperature 752 °F	
	535 MPa	77600 psi	EN min.; EN 10002-5
	@Temperature 300 °C	@Temperature 572 °F	
	545 MPa	79000 psi	EN min.; EN 10002-5
	@Temperature 200 °C	@Temperature 392 °F	
	585 MPa	84800 psi	EN min.; EN 10002-5
	@Temperature 100 °C	@Temperature 212 °F	
	630 MPa	91400 psi	EN min.; EN 10002-5
	@Temperature 50.0 °C	@Temperature 122 °F	
	370 MPa	53700 psi	

Tensile Strength, Yield Mechanical Properties	Metric @ Strain 0.200 %	English @ Strain 0.200 %	Comments Outokumpu Typical, Hot Rolled Plate (Quarto); EN 10002-1
	410 MPa @ Strain 1.00 %	59500 psi @ Strain 1.00 %	Outokumpu Typical, Hot Rolled Plate (Quarto); EN 10002-1
	130 MPa @ Strain 0.200 %, Temperature 700 °C	18900 psi @ Strain 0.200 %, Temperature 1290 °F	EN min.
	140 MPa @ Strain 0.200 %, Temperature 600 °C	20300 psi @ Strain 0.200 %, Temperature 1110 °F	EN min.; EN 10002-5
	150 MPa @ Strain 0.200 %, Temperature 500 °C	21800 psi @ Strain 0.200 %, Temperature 932 °F	EN min.; EN 10002-5
	155 MPa @ Strain 1.00 %, Temperature 700 °C	22500 psi @ Strain 1.00 %, Temperature 1290 °F	EN min.
	160 MPa @ Strain 0.200 %, Temperature 400 °C	23200 psi @ Strain 0.200 %, Temperature 752 °F	EN min.; EN 10002-5
	170 MPa @ Strain 1.00 %, Temperature 600 °C	24700 psi @ Strain 1.00 %, Temperature 1110 °F	EN min.; EN 10002-5
	170 MPa @ Strain 0.200 %, Temperature 300 °C	24700 psi @ Strain 0.200 %, Temperature 572 °F	EN min.; EN 10002-5
	180 MPa @ Strain 1.00 %, Temperature 500 °C	26100 psi @ Strain 1.00 %, Temperature 932 °F	EN min.; EN 10002-5
	185 MPa @ Strain 0.200 %, Temperature 200 °C	26800 psi @ Strain 0.200 %, Temperature 392 °F	EN min.; EN 10002-5
	190 MPa @ Strain 1.00 %, Temperature 400 °C	27600 psi @ Strain 1.00 %, Temperature 752 °F	EN min.; EN 10002-5
	200 MPa @ Strain 1.00 %, Temperature 300 °C	29000 psi @ Strain 1.00 %, Temperature 572 °F	EN min.; EN 10002-5
	215 MPa	31200 psi	

Mechanical Properties	Metric	English	Comments
	@Strain 1.00 %, Temperature 200 °C	@Strain 1.00 %, Temperature 392 °F	EN min.; EN 10002-5
	230 MPa	33400 psi	EN min.; EN 10002-5
	@Strain 0.200 %, Temperature 100 °C	@Strain 0.200 %, Temperature 212 °F	
	265 MPa	38400 psi	EN min.; EN 10002-5
	@Strain 1.00 %, Temperature 100 °C	@Strain 1.00 %, Temperature 212 °F	
	280 MPa	40600 psi	EN min.; EN 10002-5
	@Strain 0.200 %, Temperature 50.0 °C	@Strain 0.200 %, Temperature 122 °F	
	315 MPa	45700 psi	EN min.; EN 10002-5
	@Strain 1.00 %, Temperature 50.0 °C	@Strain 1.00 %, Temperature 122 °F	
Elongation at Break	50 %	50 %	Outokumpu Typical, Hot Rolled Plate (Quarto); EN 10002-1
Rupture Strength	4.00 MPa	580 psi	
	@Temperature 1100 °C, Time 3.60e+7 sec	@Temperature 2010 °F, Time 10000 hour	
	7.00 MPa	1020 psi	
	@Temperature 1000 °C, Time 3.60e+7 sec	@Temperature 1830 °F, Time 10000 hour	
	13.0 MPa	1890 psi	
	@Temperature 900 °C, Time 3.60e+7 sec	@Temperature 1650 °F, Time 10000 hour	
	18.0 MPa	2610 psi	
	@Temperature 850 °C, Time 3.60e+7 sec	@Temperature 1560 °F, Time 10000 hour	
	27.0 MPa	3920 psi	
	@Temperature 800 °C, Time 3.60e+7 sec	@Temperature 1470 °F, Time 10000 hour	
	41.0 MPa	5950 psi	
	@Temperature 750 °C, Time 3.60e+7 sec	@Temperature 1380 °F, Time 10000 hour	
	63.0 MPa	9140 psi	
	@Temperature 700 °C, Time 3.60e+7 sec	@Temperature 1290 °F, Time 10000 hour	
	98.0 MPa	14200 psi	

Mechanical Properties	Metric	English	Comments
	@ Temperature 650 °C, Time 3.60e+7 sec	@ Temperature 1200 °F, Time 10000 hour	
	157 MPa	22800 psi	
	@Temperature 600 °C, Time 3.60e+7 sec	@Temperature 1110 °F, Time 10000 hour	
	250 MPa	36300 psi	
	@Temperature 550 °C, Time 3.60e+7 sec	@Temperature 1020 °F, Time 10000 hour	
Modulus of Elasticity	200 GPa	29000 ksi	RT
	120 GPa	17400 ksi	
	@Temperature 1000 °C	@Temperature 1830 °F	
	163 GPa	23600 ksi	
	@Temperature 500 °C	@Temperature 932 °F	

Thermal Properties	Metric	English	Comments
CTE, linear	18.2 µm/m-°C	10.1 µin/in-°F	
	@Temperature 500 °C	@Temperature 932 °F	
	19.5 µm/m-°C	10.8 µin/in-°F	
	@Temperature 1000 °C	@Temperature 1830 °F	
Specific Heat Capacity	0.500 J/g-°C	0.120 BTU/lb-°F	RT
	0.580 J/g-°C	0.139 BTU/lb-°F	
	@Temperature 500 °C	@Temperature 932 °F	
Thermal Conductivity	15.0 W/m-K	104 BTU-in/hr-ft²-°F	RT
	21.2 W/m-K	147 BTU-in/hr-ft²-°F	
	@Temperature 500 °C	@Temperature 932 °F	
	29.0 W/m-K	201 BTU-in/hr-ft²-°F	
	@Temperature 1000 °C	@Temperature 1830 °F	
Maximum Service Temperature, Air	1100 °C	2010 °F	Dry Air

Component Elements Properties	Metric	English	Comments
Carbon, C	0.090 %	0.090 %	
Cerium, Ce	1.6 %	1.6 %	

Chromium, Cr Component Elements Properties	21 % Metric	21 % English	Comments
Iron, Fe	64.54 %	64.54 %	
Nickel, Ni	11 %	11 %	
Nitrogen, N	0.17 %	0.17 %	
Silicon, Si	1.6 %	1.6 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000840 ohm-cm	0.0000840 ohm-cm	RT

Processing Properties	Metric	English	Comments
Annealing Temperature	900 °C	1650 °F	Stress Relief Annealing (min. 0.5 h)
	1020 - 1120 °C	1870 - 2050 °F	Solution Annealing

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