

Outokumpu 153MA™ High Temperature Austenitic Stainless Steel

Category : Metal , Ferrous Metal , Austenitic , Stainless Steel

Material Notes:

Variant of 1.4301 with increased silicon and nitrogen contents and microalloyed with rare earth metals (REM). This raises the max service temperature in dry air to 1000°C. 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), 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-153MA-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	660 MPa	95700 psi	Outokumpu Typical, Hot Rolled Plate (Quarto); EN 10002-1
	300 MPa	43500 psi	EN min.
	@Temperature 700 °C	@Temperature 1290 °F	
	385 MPa	55800 psi	EN min.; EN 10002-5
	@Temperature 600 °C	@Temperature 1110 °F	
	435 MPa	63100 psi	EN min.; EN 10002-5
	@Temperature 500 °C	@Temperature 932 °F	
	470 MPa	68200 psi	EN min.; EN 10002-5
	@Temperature 400 °C	@Temperature 752 °F	
	475 MPa	68900 psi	EN min.; EN 10002-5
@Temperature 300 °C	@Temperature 572 °F		
485 MPa	70300 psi	EN min.; EN 10002-5	
@Temperature 200 °C	@Temperature 392 °F		
525 MPa	76100 psi	EN min.; EN 10002-5	
@Temperature 100 °C	@Temperature 212 °F		
570 MPa	82700 psi	EN min.; EN 10002-5	
@Temperature 50.0 °C	@Temperature 122 °F		
Tensile Strength, Yield	340 MPa	49300 psi	Outokumpu Typical, Hot Rolled Plate (Quarto); EN 10002-1
	@Strain 0.200 %	@Strain 0.200 %	

Mechanical Properties	Metric MPa	English psi	Comments
	@Strain 1.00 %	@Strain 1.00 %	Otokampa Typical; Hot Rolled Plate (Quarto); EN 10002-1
	110 MPa	16000 psi	EN min.
	@Strain 0.200 %, Temperature 700 °C	@Strain 0.200 %, Temperature 1290 °F	
	120 MPa	17400 psi	EN min.; EN 10002-5
	@Strain 0.200 %, Temperature 600 °C	@Strain 0.200 %, Temperature 1110 °F	
	130 MPa	18900 psi	EN min.; EN 10002-5
	@Strain 0.200 %, Temperature 500 °C	@Strain 0.200 %, Temperature 932 °F	
	135 MPa	19600 psi	EN min.
	@Strain 1.00 %, Temperature 700 °C	@Strain 1.00 %, Temperature 1290 °F	
	140 MPa	20300 psi	EN min.; EN 10002-5
	@Strain 0.200 %, Temperature 400 °C	@Strain 0.200 %, Temperature 752 °F	
	150 MPa	21800 psi	EN min.; EN 10002-5
	@Strain 1.00 %, Temperature 600 °C	@Strain 1.00 %, Temperature 1110 °F	
	150 MPa	21800 psi	EN min.; EN 10002-5
	@Strain 0.200 %, Temperature 300 °C	@Strain 0.200 %, Temperature 572 °F	
	160 MPa	23200 psi	EN min.; EN 10002-5
	@Strain 1.00 %, Temperature 500 °C	@Strain 1.00 %, Temperature 932 °F	
	165 MPa	23900 psi	EN min.; EN 10002-5
	@Strain 0.200 %, Temperature 200 °C	@Strain 0.200 %, Temperature 392 °F	
	170 MPa	24700 psi	EN min.; EN 10002-5
	@Strain 1.00 %, Temperature 400 °C	@Strain 1.00 %, Temperature 752 °F	
	180 MPa	26100 psi	EN min.; EN 10002-5
	@Strain 1.00 %, Temperature 300 °C	@Strain 1.00 %, Temperature 572 °F	
	195 MPa	28300 psi	EN min.; EN 10002-5
	@Strain 1.00 %,	@Strain 1.00 %,	

Mechanical Properties	Temperature 200 °C Metric	Temperature 392 °F English	Comments
	200 MPa	29000 psi	
	@Strain 0.200 %, Temperature 100 °C	@Strain 0.200 %, Temperature 212 °F	EN min.; EN 10002-5
	235 MPa	34100 psi	
	@Strain 1.00 %, Temperature 100 °C	@Strain 1.00 %, Temperature 212 °F	EN min.; EN 10002-5
	245 MPa	35500 psi	
	@Strain 0.200 %, Temperature 50.0 °C	@Strain 0.200 %, Temperature 122 °F	EN min.; EN 10002-5
	280 MPa	40600 psi	
	@Strain 1.00 %, Temperature 50.0 °C	@Strain 1.00 %, Temperature 122 °F	EN min.; EN 10002-5
Elongation at Break	55 %	55 %	Outokumpu Typical, Hot Rolled Plate (Quarto); EN 10002-1
Rupture Strength	4.00 MPa	580 psi	
	@Temperature 1000 °C, Time 3.60e+7 sec	@Temperature 1830 °F, Time 10000 hour	
	10.0 MPa	1450 psi	
	@Temperature 900 °C, Time 3.60e+7 sec	@Temperature 1650 °F, Time 10000 hour	
	16.0 MPa	2320 psi	
	@Temperature 850 °C, Time 3.60e+7 sec	@Temperature 1560 °F, Time 10000 hour	
	25.0 MPa	3630 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	
	@Temperature 650 °C, Time 3.60e+7 sec	@Temperature 1200 °F, Time 10000 hour	
	157 MPa	22800 psi	
	@Temperature 600 °C,	@Temperature 1110 °F,	

Mechanical Properties	Time 3.60e+7 sec Metric	Time 10000 hour English	Comments
	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 $\mu\text{m}/\text{m}\cdot\text{°C}$	10.1 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 500 °C	@Temperature 932 °F	
	19.5 $\mu\text{m}/\text{m}\cdot\text{°C}$	10.8 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@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-ft ² -°F	RT
	21.2 W/m-K	147 BTU-in/hr-ft ² -°F	
	@Temperature 500 °C	@Temperature 932 °F	
	29.0 W/m-K	201 BTU-in/hr-ft ² -°F	
	@Temperature 1000 °C	@Temperature 1830 °F	
Maximum Service Temperature, Air	1000 °C	1830 °F	Dry Air

Component Elements Properties	Metric	English	Comments
Carbon, C	0.050 %	0.050 %	
Cerium, Ce	1.3 %	1.3 %	
Chromium, Cr	18.5 %	18.5 %	
Iron, Fe	69.2 %	69.2 %	
Nickel, Ni	9.5 %	9.5 %	

Nitrogen, N Component Elements Properties	0.15 % Metric	0.15 % English	Comments
Silicon, Si	1.3 %	1.3 %	

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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