

Special Metals UDIMET® alloy 520 Superalloy

Categories: [Metal](#); [Nonferrous Metal](#); [Nickel Alloy](#); [Superalloy](#)

Material Notes: UDIMET® alloy 520 is a precipitation-hardenable nickel base superalloy with an exceptional combination of high-temperature mechanical properties, corrosion resistance and forgeability characteristics.





Developed for use in the 1400-1700°F (760-927°C) temperature range, the alloy has excellent structural stability and unusually good fabricability. The primary application for alloy 520 is blading for aircraft and land-based gas turbines.

Information Provided by Special Metals Corporation

Key Words: PDS 15125A1

Vendors: [Click here to view all available suppliers for this material.](#)

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Physical Properties	Metric	English	Comments
Density	8.21 g/cc	0.297 lb/in ³	
Mechanical Properties	Metric	English	Comments
Tensile Strength at Break 	350 MPa @Temperature 950 °C	50800 psi @Temperature 1740 °F	
	1150 MPa @Temperature 700 °C	167000 psi @Temperature 1290 °F	
	1250 MPa @Temperature 400 °C	181000 psi @Temperature 752 °F	
	1300 MPa @Temperature 50.0 °C	189000 psi @Temperature 122 °F	
Tensile Strength, Yield 	500 MPa @Strain 0.200 %, Temperature 850 °C	72500 psi @Strain 0.200 %, Temperature 1560 °F	
	700 MPa @Strain 0.200 %, Temperature 700 °C	102000 psi @Strain 0.200 %, Temperature 1290 °F	
	850 MPa @Strain 0.200 %, Temperature 50.0 °C	123000 psi @Strain 0.200 %, Temperature 122 °F	
	850 MPa @Strain 0.200 %, Temperature 400 °C	123000 psi @Strain 0.200 %, Temperature 752 °F	
Elongation at Break 	100 % @Temperature 50.0 °C	100 % @Temperature 122 °F	
	100 % @Temperature 400 °C	100 % @Temperature 752 °F	
	100 % @Temperature 700 °C	100 % @Temperature 1290 °F	
Rupture Strength 	150 MPa @Temperature 871 °C, Time 3.60e+6 sec	21800 psi @Temperature 1600 °F, Time 1000 hour	
	230 MPa @Temperature 816 °C, Time 3.60e+6 sec	33400 psi @Temperature 1500 °F, Time 1000 hour	
	345 MPa @Temperature 760 °C, Time 3.60e+6 sec	50000 psi @Temperature 1400 °F, Time 1000 hour	
	475 MPa @Temperature 704 °C, Time 3.60e+6 sec	68900 psi @Temperature 1300 °F, Time 1000 hour	
	585 MPa @Temperature 649 °C, Time 3.60e+6 sec	84800 psi @Temperature 1200 °F, Time 1000 hour	
Thermal Properties	Metric	English	Comments
Melting Point	1260 - 1405 °C	2300 - 2561 °F	
Solidus	1260 °C	2300 °F	
Liquidus	1405 °C	2561 °F	
Component Elements Properties	Metric	English	Comments
Aluminum, Al	1.8 - 2.3 %	1.8 - 2.3 %	
Boron, B	0.0040 - 0.010 %	0.0040 - 0.010 %	
Carbon, C	0.020 - 0.060 %	0.020 - 0.060 %	
Chromium, Cr	18 - 20 %	18 - 20 %	

Cobalt, Co	11 - 14 %	11 - 14 %	
Molybdenum, Mo	5.5 - 7.0 %	5.5 - 7.0 %	
Nickel, Ni	52.18 - 59.976 %	52.18 - 59.976 %	Balance
Titanium, Ti	2.9 - 3.25 %	2.9 - 3.25 %	
Tungsten, W	0.80 - 1.2 %	0.80 - 1.2 %	

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistent format. Users requiring more precise data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the original value or one of its raw conversions in your calculations to minimize rounding error. We also ask that you refer to MatWeb's [terms of use](#) regarding this information. [Click here](#) to view all the property values for this datasheet as they were originally entered into MatWeb.