

INCONEL alloy C-276 (UNS N10276/W.Nr. 2.4819) is known for its corrosion resistance in a wide range of aggressive media. The high molybdenum content imparts resistance to localized corrosion such as pitting. The low carbon minimizes carbide precipitation during welding to maintain resistance to intergranular attack in heat-affected zones of welded joints. It is used in chemical processing, pollution control, pulp and paper production, industrial and municipal waste treatment and the recovery of “sour” natural gas. Applications in air pollution control include stack liners, ducts, dampers, scrubbers, stack-gas re-heaters, fans and fan housings. In chemical processing, the alloy is used for components including heat exchangers, reaction vessels, evaporators and transfer piping.

Physical Properties

Table 2 - Physical Properties

Temp	Thermal Conductivity	Coeff. of Expansion ^a	Electrical Resistivity	Young's Modulus
°F	Btu•in./ft ² •h•°F	10 ⁻⁶ in/in•°F	ohm•cmil/ft	10 ³ ksi
-270	50	-	-	-
-100	60	-	0	-
0	65	-	-	-
77	-	-	739.2	29.8
100	71	-	-	-
200	77	6.8	743.8	29.5
400	90	7.0	749.3	28.6
600	104	7.2	757.7	27.8
800	117	7.4	760.3	26.7
1000	132	7.5	772.5	25.7
1200	145	7.7	781.5	24.8
1400	159	8.1	773.9	23.5
1600	173	8.5	768.3	22.0
1800	185	-	766.2	20.6
2000	195	-	757.7	19.1
°C	W/m•°C	µm/m•°C	µΩ•cm	GPa
-168	7.2	-	-	-
-73	8.7	-	-	-
20	9.8	-	-	-
25	-	-	122.9	205
100	11.2	12.2	123.7	203
200	12.8	12.4	124.5	198
300	14.7	12.9	125.7	192
400	16.4	13.2	126.0	186
500	18.2	13.5	127.7	180
600	20.0	13.6	129.9	178
700	21.9	14.1	129.7	167
800	23.7	14.8	128.2	159
900	25.4	-	127.4	150
1000	27.0	-	127.1	141
1100	28.3	-	-	-

^aMean coefficient of linear expansion between 77°F (25°C) and temperature shown.

Table 1 - Limiting Chemical Composition, %

Nickel	Balance
Molybdenum	15.0-17.0
Chromium.....	14.5-16.5
Iron	4.0-7.0
Tungsten.....	3.0-4.5
Cobalt	2.5 max.
Manganese	1.0 max.
Carbon	0.01 max.
Vanadium	0.35 max.
Phosphorus	0.04 max.
Sulfur	0.03 max.
Silicon	0.08 max.

Table 4 - Elevated Temperature Dynamic Modulus Properties

Temperature	Young's Modulus	Shear Modulus	Poisson's Ratio
°F	10 ³ ksi	10 ³ ksi	
70	31.30	11.81	0.33
100	31.18	11.75	0.33
200	30.77	11.57	0.33
300	30.35	11.40	0.33
400	29.92	11.23	0.33
500	29.42	11.05	0.33

Table 3 - Physical Constants

Density, lb/in ³	0.321
g/cm ³	8.89
Melting Range, °F	2415-2500
°C	1325-1370
Thermal Conductivity, Btu•in./ft ² •h•°F	67.9
W/m•°C	9.8
Specific Heat, Btu•lb•°F	0.102
J/kg•°C	427
Young's Modulus, 10 ³ ksi	29.8
GPa	205
Shear Modulus, 10 ³ ksi	11.4
GPa.....	79
Permeability at 200 oersted (15.9 kA/m).....	1.0002
Poisson's Ratio	0.307

INCONEL[®] alloy C-276