



INCOLOY® alloy DS, initially created for woven wire furnace conveyor belts, is now broadly utilized for a scope of heat treatment applications where its strength and corrosion resistance at high temperatures enables its utilization in light section. Alloys for use in high-temperature processes must have the capacity to withstand presentation to hot burning gasses and working airs for an extensive time frame without the loss of powerful area that can be created by corrosion. INCOLOY alloy DS, in the same manner as other heat-resisting alloys, adds to a firmly disciple oxide film that secures its surface against corrosion processes. It is likewise resistant to 'green rot' which can occur in nickel-chromium alloy when environments differ in the middle of decreasing and oxidizing, and at times where the reducing climate is of a carburizing nature. Hence, the corrosion resistance and strength of INCOLOY Alloy DS represent its utilization in a wide scope of high temperature process equipment ranging from furnace retorts and heat treatment jigs to segments utilized as a part of domestic appliances.

Characteristics

Incoloy DS is a heat resistant iron-nickel-chromium alloy particularly resistant to carburization and/or substituting oxidation-carburization hot situations.

Applications

Incoloy DS is mainly utilized in industrial heat-treating furnaces.

INCOLOY® alloy DS

Machining

INCOLOY alloy DS is best machined in the annealed condition, with hot-rolled, as-rolled and hot-produced material demonstrating the following best results. It is best machined on heavy duty equipment utilizing tools widely and sufficiently overwhelming to withstand the loads and dissipate heat quickly.

Forming

This alloy has good ductility and might be promptly formed by every standard technique. Since the alloy is more powerful than consistent steel it requires all the more effective equipment to perform forming. Heavy-duty lubricants should be utilized during cold forming. It is important to altogether clean the part of all traces of lubricant to shaping as embrittlement of the alloy might occur at high temperatures if lubricant is left on.

Welding

Incoloy DS™ is welded utilizing gas-tungsten arc welding, shielded metal-arc welding, gas metal-arc welding and submerged-arc welding strategies.

Heat Treatment

The alloy is not responsive to strengthening by heat treatment.

Forging

The alloy might be forged at temperatures within the scope of 2000 F.

Hot Working

This alloy might be hot worked in a temperature within the scope of 1900 F or lower.

Cold Working

Cold forming might be done utilizing standard tooling albeit plain carbon tool steels are not recommended for shaping as they tend to produce galling. Soft die materials (bronze, zinc alloy, and so forth.) minimize galling and deliver great completions, yet the die life is to some degree short. For long production runs the alloy tool steels (D-2, D-3) and high speed steels (T-1, M-2, M-10) give great results particularly if hard chromium plated to decrease galling. Tooling should be, for example, to take into consideration liberal clearances and radii. Heavy duty lubricants should be utilized to minimize galling in all forming operations. Twisting of sheet or plate through 180 degrees is for the most part constrained to a twist sweep of 1 T for material up to 1/8" thick and 2 T for material thicker than 1/8".

Annealing

The alloy should be annealed inside the scope of 1000-1150°C, the temperature and holding time depending upon the thickness of the material and the proposed application. Cooling rate does not influence hardness. Furnace fuel should best be without sulfur. Town's gas, natural gas, distillate fuel oils and power are suitable. For most heat treatments and heating process, the environment should be changed in accordance with keeping up slight oxidizing conditions. Bright annealing can be completed in dry hydrogen or cracked ammonia.

Hardening

Hardens are because of cold working only.

Chemical Properties

C	Si	S	Ti	Cr	Mn	Fe	Cu	Ni + Co
0.10	1.9 - 2.6	0.03	0.20	17.0 - 19.0	0.8 - 1.5	Balance	0.50	34.5 - 41.0

INCOLOY® alloy DS

Mechanical Properties

Tensile Strength (ksi)	0.2% Yield Strength (ksi)	Elongation% in 2 inches
99.64	52.64	37.1

Physical Properties

Properties	Units	Temperature in °C
Density	7.86 g/cm ³	Room
Specific Heat	0.107 Kcal/kg. C	20°
Melting Range	1330 - 1400 °C	-
Modulus of Elasticity	197 KN/mm ²	21°
Electrical Resistivity	108 μΩ.cm	Room
Coefficient of Expansion	15.0 μm/m °C	20 - 100°
Thermal Conductivity	12.0 W/m -°K	20°

ASTM Specifications

Pipe / Tube (SMLS)	Pipe Welded	Tube Welded	Sheet / Plate	Bar	Forging	Fitting
-	-	-	-	-	-	-

Availability

MANUFACTURING
Fasteners
Custom Machining
Custom Fabrication
Piping / Spools
Stamped Parts
B/W Fittings
S/W Fittings
Flanges
Compression Fittings

RAW MATERIALS
Pipes
Tubes
Bars
wires
Sheets
Plates
-

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