AMS 5659 | 15-5ph Stainless Steel

Typical Applications

Shafts

Gears

Aircraft Structural parts

Fittings

Fasteners

Valve parts

15-5 PH is a precipitation-hardening stainless steel alloy that offers excellent corrosion resistance, high strength, and good toughness. This alloy conforms to AMS 5659 and AMS 5862 and is commonly used in aerospace and power generation applications where the combination of high strength and corrosion resistance is essential. (see table below)

Specifically, in aerospace, 15-5 PH (UNS S15500) is frequently used in engine parts, structural components, and landing gear. In power generation, it is used in components such as gas turbine engine parts, valves, and shafts.

One of the benefits of 15-5 PH is that it is relatively easy to work with and can be readily machined, welded, and formed. However, to optimize the mechanical properties of this alloy, heat treatment may be necessary.

The heat treatment process for 15-5 PH typically involves two steps: solution annealing and precipitation hardening. Solution annealing is performed at a temperature range of 1010-1150°C for 1-4 hours to dissolve the alloy's precipitates and homogenize the microstructure. Precipitation hardening is then performed at a lower temperature of around 480°C for 4-16 hours to promote the precipitation of the strengthening phase. This process results in significant improvements in the alloy's strength, hardness, and toughness, making it suitable for use in demanding applications where high mechanical performance is required.

It can be produced either through consumable electrode melting (ESR) or Vacuum Arc Remelting (VAR). 15 5PH stainless steel offers very good transverse properties and is corrosion resistant.

Technical specification

Related Specifications

AMS 5659

UNS S15500

W.Nr 1.4545

AMS 5862

Specific Gravity

7.8 g/cm3

Chemical Composition (WT %)

	Min	Max
C	-	0.07
Si	-	1.00

Mn	-	1.00
P	-	0.030
S	-	0.015
Cr	14.00	15.50
Mo	-	0.50
Ni	3.50	550
Cb	5 x %	0.45
Cu	2.50	4.50
Fe	Bal	-

Typical Mechanical Properties in the Annealed Condition

				-	H900	H925	H1025	H1075	H1100	H1150
0.2% Proof Stress	MPA	Min	-	1172	1069	1000	862	793	724
Tensile Strength	MPA	Min	-	1310	1172	1069	1000	965	931
Elongation	%	Min	L	10	10	12	13	14	16
Elongation	%	Max	T	6	7	8	9	10	11

Reduction of area	%	Min	L	35	38	45	45	45	50
Reduction of area	%	Max	T	20	25	32	33	34	35
Hardness	HB	Min	-	388	375	331	311	302	277

Need more information? ***Get in touch***

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