

AMS 5659 | 15-5PH STAINLESS STEEL

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.

Specific Gravity											
7.8 g/cm3											
Typical Applications						Related Specifications					
Shafts						AMS 5659					
Gears						UNS S15500					
Aircraft Structural parts						W.Nr 1.4545					
Fittings											
Fasteners											
Valve parts											
Chemical Composition (Wt %)											
	C	Si	Mn	P	S	Cr	Mo	Ni	Cb	Cu	Fe

Min	–	–	–	–	–	14.00	–	3.50	5 x %	2.50	Bal
Max	0.07	1.00	1.00	0.030	0.015	15.50	0.50	5.50	0.45	4.50	–

Typical Mechanical Properties

	0.2% Proof Stress	Tensile Strength	Elongation		Reduction of area		Hardness	
	MPA	MPA	%		%		HB	
	Min	Min	Min		Min		Min	Max
			L	T	L	T		
H900	1172	1310	10	6	35	20	388	
H925	1069	1172	10	7	38	25	375	
H1025	1000	1069	12	8	45	32	331	
H1075	862	1000	13	9	45	33	311	
H1100	793	965	14	10	45	34	302	
H1150	724	931	16	11	50	35	277	

* This data has been supplied in good faith and is indicative only. It has been provided for general information purposes only and is not to be relied upon in place of the full specification. Mechanical properties can vary considerably with different supply conditions such as heat treatment or temper and product dimensions.

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