

## **BRODER METALS GROUP 15-5PH - AMS 5659**

### **COMMON NAMES:**

15-5PH

UNS S15500

### **FORM & USE:**

ASMS659 is a corrosion resistant steel. We hold this grade in round bar form in both the solution treated condition (Condition A) and in the H1025 precipitation treated (aged) condition. The material is typically used for parts requiring corrosion resistance and high strength up to 300°C. The material exhibits good ductility and strength in the transverse direction in large section sizes.

### **SIZES STOCKED:**

Condition A – 9.5 mm dia – 152.4 mm dia

H1025 condition – 12.7 mm dia – 152.4 mm dia

### **TYPES:**

There are two classifications of AMS5659:

Type 1 – where the steel has been multiple melted using vacuum.

consumable electrode remelting (e.g. VAR)

in the final melt cycle.

Type 2 – where the steel has been multiple melted using electroslag remelting (e.g. ESR) in the final melt cycle.

Note: AMS allows either type to be supplied unless a specific type is ordered.

### **GENERAL:**

Material is premium aircraft-quality conforming to AMS2300.



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### CHEMISTRY:

C	Mn	Si	P	S	Cr	Ni	Nb (Cb)	Cu	Mo
<0.07	<1.00	<1.00	<0.030	<0.015	14.00 - 15.00	3.50 - 5.00	* - 0.45	2.50 - 4.50	<0.50

\*the minimum amount of Niobium (Columbium) permitted is 5 x the value of Carbon in the material.

### MELT PRACTICE:

Material is multiple melted using vacuum consumable electrode remelting for Type 1 material or using electroslag remelting for Type 2 material.

### FINISH:

Material is supplied smooth turned, centreless ground and polished, or peeled and polished according to the finished diameter.

Bars are not cut from plate.

### HEAT TREATMENT:

Solution heat Treatment: in accordance with AMS-H-6875 by heating to 1024-1052°C, holding at heat for a time commensurate with the section thickness, and cooling to below 32°C. Pyrometry of the furnaces is in accordance with AMS2750 or equivalent.

Precipitation Treatment: H1025: 546-568°C, for 4-4.5 hours, then cooled in air.

Macro structure: examined in accordance with ASTM A604. The macrostructure should show no pipe or cracks. Porosity, segregation, inclusions, or other imperfections are to be no worse than the following severities as per ASTM A604:

Class	Condition	Severity
1	Freckles	A
2	White Spots	A
3	Radial Segregation	A
4	Ring Pattern	B



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Micro structure: does not contain more than 2% free ferrite, as determined according to AMS2315

Tensile Properties:

	Minimum Tensile Strength Ksi	Minimum Yield strength at 0.2% Offset Ksi	Minimum Elongation in 2" or 4d %	Minimum Reduction of Area %	Hardness
Solution Heat Treated	-	-	-	-	<363 HB, determined at 1/4T
As Condition H1025:					
Longitudinal direction	155	145	12	45	-
Transverse direction (63.5 mm – 305 mm diameter)	155	145	8	32	-

A “-“ indicates no requirement for the property.

Full material traceability, with anti-counterfeit measures, is maintained at all times, and full certification is provided, including producer’s name and country where the material was melted.



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