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15-5 PH STAINLESS STEEL – AMS 5659 DATA SHEET

GENERAL CHARACTERISTICS:

15-5 PH stainless steel is a martensitic precipitation-hardening stainless steel with approximately 15% Chromium and 5% Nickel. It has high strength, high hardness, and excellent corrosion resistance. Strength can be further increased by a single low temperature heat treatment. Compared to 17-4 PH, it offers better transverse toughness and ductility; better mechanical properties in larger cross-sections, and better forgeability. It is readily weldable. It can be machined in any of the several Thermal Conditions available to this grade.

Service Steel Aerospace has 15-5 PH Steel available in several forms including stainless steel round bar, flat bar, and square bar as well as stainless steel plate, sheet, block, and billet. See below for product size ranges stocked.

15-5 PH stainless steel is typically used in the following applications:

- Aerospace structural components
- Valves
- Gears and Shafts
- Oil and Gas components
- Nuclear reactor components

Common Specifications: AMS 5659, AMS 5862, BMS 7-240, ASTM-A-564

- AMS 5659 (Bar & Forgings)
- AMS 5862 (Plate)
- ASTM A564 (Grade XM-12)
- ASTM A705 (Grade XM-12)
- ASME SA564
- Boeing BMS 7-240
- Boeing BMS 7-351
- SPP Canada Aircraft SPPCA-EN-SOW-0036 (Capability)
- Liebherr LAT 1-9037
- AMS-STD-2154 (Ultrasonic Inspection)

For the AMS Specifications, there are two types:

- Type 1: VAR (Vacuum Arc Remelt)
- Type 2: ESR (Electroslag Remelt)





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Common Trade Names:

- PH15-5
- XM-12
- UNS S15500
- 15Cr-5Ni
- DIN X4CrNiCuNb164
- X5CrNiCu15-5
- DIN 1.4540
- DIN 1.4545

15-5 Stocked Sizes at Service Steel Aerospace:

- 15-5 ESR Plate: 20 sizes 0.188" through 4" thick
- 15-5 ESR Rounds: 22 sizes 0.625" through 8.5" diameter
- 15-5 VAR Block: 52 sizes 0.25" through 9.5" thick
- 15-5 VAR Flat Bar: 86 sizes 0.25" x 1" through 5.75" x 8.125"
- 15-5 VAR Ingots: kept in stock for conversion to special bar sizes
- 15-5 VAR Plate: 14 sizes 0.500" through 4" thick
- 15-5 VAR Rounds: 65 sizes 0.188" through 9.5" diameter
- 15-5 VAR Sheet: 6 sizes 0.032" through 0.125" gauge
- 15-5 VAR Squares: 4 sizes 1" through 2.75"

Composition:

Carbon	0.07 max
Manganese	1.00 max
Phosphorus	0.040 max
Sulfur	0.030 max
Silicon	1.00 max
Chromium	14.00 - 15.50
Nickel	3.50 - 5.50
Copper	2.50 - 4.50
Columbium plus Tantalum	0.15 - 0.45

Physical Properties:

- Density: 0.2836 #/in³

Heat Treatment:

- H900
- H925
- H1025
- H1075
- 1100
- H1150
- Double H1150
- H1150M (Modified)

Mechanical Properties:

Condition	Tensile	Yield 0.2% offset	Elongation (%in 2")	Reduction of Area	Brinell Hardness	Rockwell Hardness
Ann					363 Bhn	C33
H900	190,000 psi	170,000 psi	6%	15%	388 Bhn	C40
H1025	155,000 psi	145,000 psi	8%	27%	331 Bhn	C35
H1075	145,000 psi	125,000 psi	9%	28%	311 Bhn	C32
H1150	135,000 psi	105,000 psi	11%	30%	277 Bhn	C28
H1150-M	115,000 psi	75,000 psi	14%	35%	255 Bhn	C25