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13-8 PH STAINLESS STEEL – AMS 5629 – UNS S13800 DATA SHEET

GENERAL CHARACTERISTICS:

13-8 PH is a martensitic precipitation-hardening stainless steel. This alloy is double melted in a Vacuum Induction Furnace followed by Consumable Electrode Vacuum Melt (VIM-VAR); or in some cases, 2nd melt is by Electroslag Remelting (ESR) as specified by the consumer. It exhibits excellent strength, high hardness, superior toughness, and good corrosion resistance. Good transverse toughness properties are achieved by tight chemical composition control, low carbon content, and vacuum melting. 13-8 PH steel provides a wide range of properties through a single precipitation hardening heat treatment. It is weldable; inert gas shielding with Helium is preferred. Corrosion resistance is similar to 304 Stainless, with greatest resistance in the fully hardened conditions.

Service Steel Aerospace is the largest U.S. stocking distributor of 13-8 PH stainless steel. It is available predominantly in Bars, Wire, Forgings, Rings and Extrusions per AMS 5629. It is also available in Sheet and Plate.

13-8 PH stainless steel is typically used in the following applications:

- Aerospace components
- Injection molding equipment
- Waterjet cutting equipment
- Petrochemical industries
- Nuclear industries



Common Specifications:

- AMS 5629 Bars, Forgings, Wire, Extrusions
 - Rounds 12" max diameter
 - Hexagons 12" max across flat sides
 - 12" max least distance parallel sides
 - Stock of any size for forgings, flash welded rings, or extrusion
- AMS 5629/H1000 (produced & precipitation hardened to H1000 condition)
- AMS 5864 (Plate)
- ASTM A564 (Type XM-13 Bars, Wires, Shapes)
- ASTM A693 (Sheet, Plate, Strip)
- ASTM A705 (Forgings)



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Common Trade Names:

- PH13-8Mo
- XM-13
- UNS S13800
- DMS 2100 Grade
- HMS 6-1105 REV A AMD 3
- ST0160LB0013 REV E
- ASTM F899-12B
- RMS-150 REV N for sizes 3.625" Max

Common OEM Approvals:

- Pratt Whitney LCS
- Honeywell
- GE S-400, S-1000
- Bombardier approval to AMS 5629 including aging to H1000
- Gulfstream

Stocked Sizes:

- Rounds: 44 sizes 0.500" through 9.0" diameter
- Flats & Blocks: 52 sizes 0.25" through 8"
 - Custom thicknesses & widths available saw-cut or forged
- Ingots & Billets: 3 sizes 14" through 29" for conversions

Note: Stocked primarily in annealed condition (solution treatment)
SSA routinely provides heat treated materials to all Hxxx conditions

Chemical Composition:

Symbol	Element	Min %	Max %
C	Carbon		0.05%
Mn	Manganese		0.10%
Si	Silicon		0.10%
P	Phosphorus		0.010%
S	Sulfur		0.008%
Cr	Chromium	12.25%	13.25%
Ni	Nickel	7.50%	8.50%
Mo	Molybdenum	2.00%	2.50%
N	Nitrogen		0.010%
Al	Aluminum	0.90%	1.35%
Fe	Iron		Balance

Physical Properties:

- Density: 0.2836 #/in³
- Melting Range 2560° - 2680°F

Heat Treatment:

Condition	Temperature
H950	950 °F ± 10 °F (510 °C ± 6 °C)
H1000	1000 °F ± 10 °F (538 °C ± 6 °C)
H1025	1025 °F ± 10 °F (552 °C ± 6 °C)
H1050	1050 °F ± 10 °F (566 °C ± 6 °C)
H1100	1100 °F ± 10 °F (593 °C ± 6 °C)
H1150	1150 °F ± 10 °F (621 °C ± 6 °C)



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Mechanical Properties:

Condition	Tensile	Yield 0.2% offset	Elongation (%in 2")	Reduction of Area	Brinell Hardness	Rockwell Hardness
Ann	175 ksi max				363 max	
H950	220 ksi	205 ksi	10%	45%		C45 min
H1000	205 ksi	190 ksi	10%	50%		C45 min
H1025	185 ksi	175 ksi	11%	50%		
H1050	175 ksi	165 ksi	12%	50%		C40 min
H1100	150 ksi	135 ksi	14%	50%		C34 min
H1150	135 ksi	90 ksi	14%	50%		C30 min