ALLOY 17-4 PH

AMS 5604 / UNS S17400

17-4 PH steel (AMS 5604) is a grade of martensitic, precipitation-hardening stainless steel with the additions of chromium, nickel, and copper. 17-4 PH stainless steel has a valuable combination of high strength, good corrosion resistance, and toughness in both base metals and welds. This material provides excellent corrosion resistance (comparable to grade 304) for many medical, chemical, paper, and food processing industries, and it withstands corrosive attacks better than most hardenable stainless steels. These properties give designers the ability to add reliability to their products while simplifying fabrication and often reducing their costs. High strength is maintained to approximately 600°F (316°C). 17-4 PH has good resistance to stress corrosion cracking at higher aging temperatures.

Products & Sizes			
Coil	**Sheet**	**Plate**	**Bar**
0.032" - 0.1425"	0.032" - 0.1425"	0.1875" - 2.500"	0.250" - 5.000"

17-4 PH Chemical Composition

	Element	Min	Max
C	Carbon	-	0.07
Mn	Manganese	-	1.00
P	Phosphorus	-	0.04
S	Sulfur	-	0.03
Si	Silicon	-	1.00
Cr	Chromium	15.00	17.50
Ni	Nickel	3.00	5.00
Cu	Copper	3.00	5.00
Nb/ Ta	Columbium + Tantalum	0.15	0.45

Industry Standards

- W.NR. 1.4542
- PWA-LCS
- S1000 / S-SPEC-1
- GE Aviation S-SPEC-35 AeDMS S-400
- RR SABRe Edition 2
- DFARS Compliant

Industry Applications

- Surgical instrumentation
- Fasteners
- Base plates
- Chemical processing equipment
- Oil and petroleum refining equipment
- Nuclear components and waste casks
- Food grade processing equipment
- Paper / pulp processing
- Aircraft and Aerospace materials

Physical Properties

Property	Value
Density	0.2820 lb/in^3
Melting Range	2560-2625°F (1404-1440°C)
Electrical Resistivity (Annealed Condition)	98 microhm-cm

Mean Coefficient of Thermal Expansion (Annealed Condition)			
Temperature Range		Coefficients	
°C	°F	µm/m·°C	in/in/°F·106
21-93	70-200	10.8	6.0
21-204	70-400	10.8	6.0
21-316	70-600	11.2	6.2
21-427	70-800	11.2	6.3

Thermal Conductivity (H 900 Condition)			
Temperature Range		W/m·K	Btu/(hr/ft²/in/°F)
°C	°F		
149	300	17.90	124
260	500	19.50	135
460	860	22.50	156
482	900	22.60	157

Specific Heat (Annealed Condition)			
Temperature Range		J/gg·K	Btu/lb/°F
°C	°F		
0-100	32-212	460	0.11

Mechanical Properties

Mechanical Properties and Yield Strength 17-4 PH - Cold Flattened (Annealed)	
Property	Value
Ultimate Tensile Strength, ksi (MPa)	160 (1103)
.02% Yield Strength, ksi (MPa)	145 (1000)
Elongation, % in 2" (50mm)	5.0
Hardness Rockwell C	35