

# STAINLESS STEEL POWDERS

## Innovative and Advanced Metallurgical Technology

### YOUR SINGLE SOURCE FOR METAL POWDERS

Since 1970, we have produced a wide variety of pre-alloyed metal powders used in P/M and M.I.M. applications. All AMETEK P/M powders are produced by high-pressure water atomization under carefully controlled conditions using the most advanced technology and modern equipment available to the industry.

### QUALITY GUARANTEED

Each production lot of powder is quality controlled and certified for chemical and physical properties by experienced and highly qualified technicians using MPIF standard test procedures. Every blended lot is compared to a set of certified standards to ensure consistent properties from one lot to another. The latest statistical process control technology is a cornerstone of our quality assurance program.

### TESTS PROVE INCREASED “CORROSION RESISTANCE” VIA ULTRA STAINLESS P/M TECHNOLOGY

In recent years, as the need for P/M stainless steels with improved corrosion resistance has become more evident, AMETEK has invested heavily in research and development in this area. These efforts have resulted in AMETEK’s patented Ultra Stainless Steels,<sup>™</sup> which are produced by alloying conventional austenitic compositions with a small amount of tin, then blending them with a small amount of copper-nickel-tin alloy. This combination of metals results in a marked improvement in corrosion resistance, while other properties are comparable to their conventional counterparts.

### STAINLESS STEEL ALLOYS AVAILABLE FROM AMETEK

- P303L
- P304L
- P316L
- P410L
- P420L
- P430L
- P431L
- P434L
- 70/30 FeCr
- 17-4PH<sup>®\*</sup>
- 50/50 NiFe

\* Registered trademark of Armco Material Corp.  
Custom and proprietary atomized powders also available.

### TYPICAL 300 SERIES CHEMICAL COMPOSITION

ELEMENT %	303L	ULTRA 303L	304L	ULTRA 304L	316L	ULTRA 316L
Chromium	18	18	19	19	17	17
Nickel	11	11	11	11	13	13
Molybdenum	-	-	-	-	2.5	2.5
Manganese	0.2	0.2	0.2	0.2	0.2	0.2
Silicon	0.8	0.8	0.8	0.8	0.8	0.8
Sulfur	0.2	0.2	0.01	0.01	0.01	0.01
Phosphorus	0.01	0.01	0.01	0.01	0.01	0.01
Carbon	0.02	0.02	0.02	0.02	0.02	0.02
Copper	-	0.8	-	0.8	-	0.8
Tin	-	2	-	2	-	2
Iron	Balance	Balance	Balance	Balance	Balance	Balance

*The data herein are subject to revision without notice. Since AMETEK products, and the information given and recommendations made herein, may be used under conditions beyond our control, AMETEK makes no guarantee, either express or implied, concerning the sustainability of our products, or the applicability and accuracy of the information, or recommendations, in any specific situation. User is solely responsible for determining the suitability of AMETEK products of any specific purpose.*

# 17-4 PH

## The Workhorse of Precipitation Hardening Stainless Steels

Developed by Armco, Inc. (now AK Steel), 17-4 PH, a wrought compressed stainless steel powder, combines high strength and high hardness with excellent corrosion resistance, fracture toughness and heat treatment properties ideal for manufacturing aircraft fittings, braces, chemical processing components, coupling, fasteners, gas turbines, gears, hydraulic actuators, jet engines, nuclear reactor parts, pump shafts, rocket and missile components, valve stems and wear rings.

When machined, 17-4 PH produces long, gummy chips. While soft and ductile in annealed condition, it is capable of high hardness properties with a single precipitation or aging treatment.

The physical properties of 17-4 PH stainless steel make it weldable by common fusion and resistance techniques. Among members of the precipitation hardening class of stainless steels, 17-4 PH has the best weldability.

For more information, contact AMETEK Specialty Metals, at 724-225-8400 or E-mail [EF.Sales@ametek.com](mailto:EF.Sales@ametek.com).

# 17-4 PH

## Physical Properties

	CONDITION A (MAGNETIC)	CONDITION H 900 (MAGNETIC)	CONDITION H 1075 (MAGNETIC)	CONDITION H 1150 (MAGNETIC)
Density, lbs/in <sup>2</sup> (g/cm <sup>3</sup> )	0.28 (7.78)	0.282 (7.80)	0.283 (7.81)	0.284 (7.82)
Electrical Resistivity, microhm-cm	98	77	–	–
Specific Heat BTU/lb/°F (32-212°F) kJ/kg•K (0-100°C)	0.11 (0.46)	0.11 (0.46)		
Thermal Conductivity BTU/hr/ft <sup>2</sup> /in/°F (W/m•K) 300°F (149°C) 500°F (260°C) 900°F (482°C)		124 (17.9) 135 (19.5) 157 (22.6)		
Mean Coefficient of Thermal Expansion in/in/°F (m/m•K) –100 - 70°F (-73 - 21°C) 70 - 200°F (21 - 93°C) 70 - 600°F (21 - 316°C) 70 - 800°F (21 - 427°C)	– 6.0 x 10 <sup>4</sup> (10.8) 6.2 x 10 <sup>4</sup> (11.2) 6.3 x 10 <sup>4</sup> (11.3)	6.8 x 10 <sup>4</sup> (10.4) 6.0 x 10 <sup>4</sup> (10.8) 6.3 x 10 <sup>4</sup> (11.3) 6.5 x 10 <sup>4</sup> (11.7)	– 6.3 x 10 <sup>4</sup> (11.3) 6.6 x 10 <sup>4</sup> (11.9) 6.8 x 10 <sup>4</sup> (12.2)	6.1 x 10 <sup>4</sup> (11.0) 6.6 x 10 <sup>4</sup> (11.9) 7.1 x 10 <sup>4</sup> (12.8) 7.2 x 10 <sup>4</sup> (13.0)



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