

17-7 PH STAINLESS STEEL

UNS S17700



AK Steel 17-7 PH® is a precipitation-hardening stainless steel that provides high strength and hardness, excellent fatigue properties, good corrosion resistance, good formability, and minimum distortion upon heat treatment.

The alloy provides valuable property combinations particularly well suited for aerospace applications. This special alloy also provides benefits for other applications requiring high strength and good corrosion resistance, as well as excellent properties for flat springs at temperatures up to 600°F (316°C).

COMPOSITION

| | % |
|------------|---------------|
| Carbon | 0.09 max. |
| Manganese | 1.00 max. |
| Phosphorus | 0.040 max. |
| Sulfur | 0.030 max. |
| Silicon | 1.00 max. |
| Chromium | 16.00 - 18.00 |
| Nickel | 6.50 - 7.75 |
| Aluminum | 0.75 - 1.50 |

AVAILABLE FORMS

AK Steel produces 17-7 PH Stainless Steel sheet and strip in thicknesses from 0.015" to 0.135" (0.381 to 3.429 mm). For material requirements heavier than 0.135" (3.429 mm), inquire. Material is supplied in Condition A, ready for fabrication by the user. Sheet and strip material 0.050" (1.27 mm) and thinner are also produced in the hard-rolled Condition C for applications requiring maximum strength.

MECHANICAL PROPERTIES

Typical Room Temperature Mechanical Properties

| Property | A | TH 1050 | Condition RH 950 | C | CH 900 |
|----------------------------------|--------------|---------------|------------------|---------------|---------------|
| UTS, ksi (MPa) | 130 (896) | 200 (1379) | 235 (1620) | 220 (1517) | 265 (1827) |
| 0.2% YS, ksi (MPa) | 40 (276) | 185 (1276) | 220 (1517) | 190 (1310) | 260 (1793) |
| Elongation, % in 2" (50.8 mm) | 35 | 9 | 6 | 5 | 2 |
| Hardness, Rockwell | B85 | C43 | C48 | C43 | C49 |

STANDARD HEAT TREATMENTS

This material requires three essential steps in heat treating:

- 1) Austenite conditioning.
- 2) Cooling to transform the austenite to martensite.
- 3) Precipitation hardening to Condition TH 1050 or RH 950.

To obtain the highest mechanical properties from the alloy, Condition A material is transformed to martensite at the mill by cold reduction to Condition C. Hardening to Condition CH 900 is accomplished with a single, low-temperature heat treatment.

