

SOONV[®] alloy R41 (UNS N07041) is a precipitation-hardenable nickel-chromium alloy containing significant amounts of cobalt and molybdenum, along with lesser amounts of aluminum and titanium. Alloy R41 exhibits extremely high room and elevated temperature mechanical properties. Excellent corrosion resistance and fabricability have led to wide usage in critical aircraft engine components such as nozzle partitions, turbine blades and wheels, combustion chamber liners and structural hardware.

Table 1 - Limiting Chemical Composition, %

| | |
|-----------------|-------------|
| Chromium..... | 18.0-20.0 |
| Cobalt..... | 10.0-12.0 |
| Molybdenum..... | 9.0-10.5 |
| Aluminum..... | 1.40-1.80 |
| Titanium..... | 3.0-3.3 |
| Iron..... | 5.0 max. |
| Boron..... | 0.003-0.010 |
| Carbon..... | 0.12 max. |
| Nickel..... | Balance* |

*Reference to the 'balance' of a composition does not guarantee this is exclusively of the element mentioned but that it predominates and others are present only in minimal quantities.

Typical Mechanical Properties

Table 3 - 1000-Hour Rupture Strength of Precipitation-Hardened S N alloy R41

| Temperature | | Rupture Strength | |
|-------------|-----|------------------|-----|
| °F | °C | ksi | MPa |
| 1200 | 649 | 102 | 705 |
| 1300 | 704 | 80 | 550 |
| 1400 | 760 | 50 | 345 |
| 1500 | 816 | 29 | 200 |
| 1600 | 871 | 17 | 117 |
| 1700 | 927 | 11 | 76 |

Physical Constants

Table 2 - Physical Constants

| | |
|--|-----------|
| Density, lb/in ³ | 0.298 |
| g/cm ³ | 8.25 |
| Melting Range, °F..... | 2250-2535 |
| °C..... | 1232-1391 |
| Specific Heat, Btu/lb•°F..... | 0.104 |
| J/kg•°K..... | 435 |
| Coefficient of Expansion, 70-200°F, 10 ⁻⁶ in/in•°F..... | 6.63 |
| 21-93°C, μm/m•°C..... | 11.9 |
| Thermal Conductivity, Btu•in/ft ² •h•°F..... | 62 |
| W/m•°C..... | 9.0 |

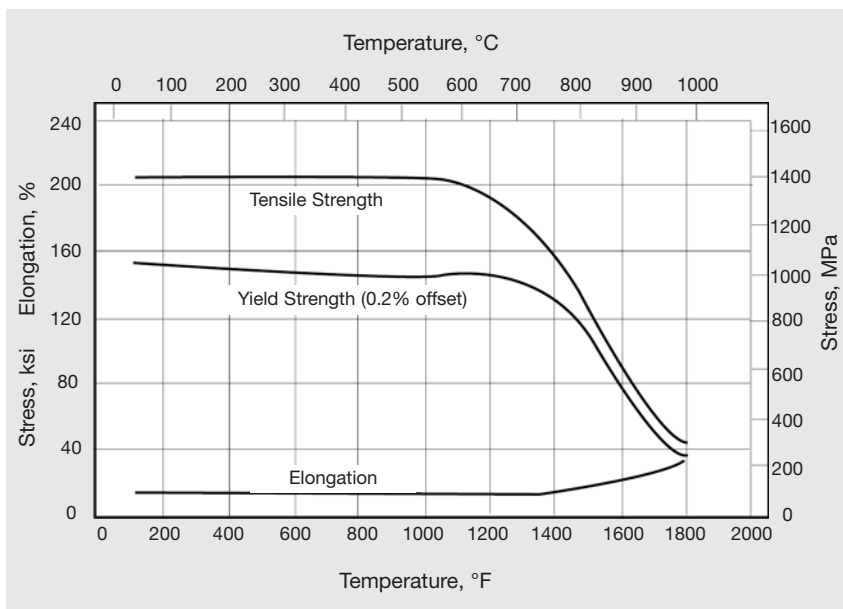


Figure 1. Typical mechanical properties of precipitation-hardened S N alloy R41

Available Products and Specifications

Soonv alloy R41 is designated UNS N07041 and is available as forging billet, bar, sheet and plate.

Major specifications:

- AMS 5545
- AMS 5712
- AMS 5713