HASTELLOY® S alloy

Principal Features

HASTELLOY® S alloy (UNS N06635) is a nickel-base, high-temperature alloy with a unique combination of properties. It has excellent thermal stability, low thermal expansion and excellent oxidation resistance to 200°F (1093°C). In addition, the alloy has good high-temperature and thermal fatigue strength. S alloy retains its strength and ductility after aging at temperatures of 800 to 1600°F (427 to 871°C).

S alloy was developed for applications involving severely cyclical heating conditions where components must be capable of retaining their strength, ductility, and metallurgical integrity after long-time exposure. It is used extensively as seal rings in gas turbine engines where its low thermal expansion coefficients is also important.

All wrought forms of S alloy are supplied in the solution heat treated condition unless otherwise specified. The standard heat-treatment is 1950°F (1066°C) followed by cooling in air or hydrogen. Since the alloy is very stable, cooling rates from slow-fumace cooling to rapid ice-brine quenching have virtually no effect on the mechanical properties.

HASTELLOY® S alloy can be readily forged and, because of its excellent ductility, can be cold worked. It can be welded by both manual and automatic welding methods including gas tungsten arc (GTAW), and gas metal arc (GMAW). Forging should be performed from 2100°F (1145°C) to 1600°F (871°C) up to the final 20 percent cross-section reduction. The final 20 percent reduction should be done from about 1900°F (1038°C) to 1500°F (816°C).