

HOWAT GROUP

UNS S21800 (Nitronic® 60)

Grade: Austenitic stainless steel (UNS S21800 / Nitronic® 60)

Type: Corrosion resistant stainless steel, with outstanding wear and galling resistance

Nominal Composition	
Element	Weight /
Carbon	0.10 max
Silicon	3.5 - 4.5
Manganese	7.0 / 9.0
Phosphorus	0.04 max
Sulphur	0.010 max
Molybdenum	0.75 max
Chromium	16.0 - 18.0
Nickel	8.0 - 9.0
Nitrogen	0.08 - 0.18
Copper	0.75 max
Cobalt	0.20 max

Notes

This grade cannot be hardened by heat treatment
Nitronic® is a trade name

Mechanical Properties: annealed condition

Property	Values
Ultimate Tensile Strength	104 min Ksi (717 N/mm ²)
0.2 / Yield Strength	57 min Ksi (393 N/mm ²)
Elongation	62 / min
Reduction of Area	
CVN impacts @ -196°C	217 Joules
Hardness	241 HBW max

HOWAT GROUP

Notes:

The grade is readily weldable using conventional processes. High strength material can be attained by proprietary processing. Corrosion tests are not normally carried out on high strength material.

Overview

This fully austenitic, all purpose, stainless steel was originally designed as a temperature alloy and subsequently has good high temperature properties for temperatures around 1800°F. The oxidation resistance of this grade is similar to Type 309SS and far superior to Type 304SS. However it is best known for its outstanding wear and galling resistance.

The additions of silicon and manganese have given this alloy a matrix to inhibit wear, galling and fretting even in the annealed condition. Higher strengths are attainable through cold working the material and is still fully austenitic after severe cold working. This working does not enhance the anti-galling properties as is normal for carbon steels and some stainless steels. The benefit to the cold or hot work put into the material is added strength and hardness and the wear resistance does not decrease noticeably.

Chromium and nickel additions give it comparable corrosion to 304 and 316 type stainless steels while having approximately twice the yield strength. The high mechanical strength in annealed parts permits use of reduced cross sections for weight and cost reductions through the use of thinner sections.

Applications

Valve stems, seats and trim, fastening systems, screening, pins, bushings, roller bearings, pump shafts, rings, and also wear plates, rails, guides and bridge pins..

This alloy provides a significant lower cost way to fight wear and galling compared to nickel and cobalt based alloys and if galling problems occur at less than 1500°F then you should think about switching to this alloy.