



Common Name: 302HQ, 304CU, 304HQ

302HQ is a specific wire grade finding wide utilization for the manufacture of stainless steel fasteners. The consideration of 3% copper in the composition decreases the cold work hardening rate substantially similar to Grade 304. This grade is the standard material for the manufacture of self-tapping screws and light machine screws and is additionally utilized for some bolts, set screws, rivets and specialized fasteners. Stainless Steel 302HQ has now completely replaced Grades 384 and 305. Alternative designations for Grade 302HQ involve "XM-7", "304Cu" and "304HQ". The stable austenitic structure makes 302HQ non-magnetic, even after significant cold work, and also results in excellent toughness, even down to cryogenic temperatures.

Applications

- All severe cold heading applications
- Self-tapping screws
- Roofing bolts
- Machine screws
- Bolts
- Set screws
- Blind rivets

Characteristics

- Non-magnetic
- Excellent toughness even down to cryogenic temperatures

Corrosion Resistance

Stainless Steel 302HQ is excellent equal to or surpassing that of Grade 304 in a wide variety of corrosive media. Subject to pitting and crevice corrosion in warm chloride environments and to stress corrosion cracking above around 60°C. Considered resistant to consumable water with up to the around 200mg/L chlorides at surrounding temperatures, decreasing to about 150mg/L at 60°C.

Heat Resistance

Good oxidation resistance in discontinuous service to 870°C and in continuous service to 925°C. Continuous utilization of Grade 302HQ in 425-860°C range is typically protected (free of carbide precipitation) as the grade has very low carbon content.

Machining

302HQ is once in a while machined due to its form and likely products. The grade always has very low sulphur content as this aids formability, however unfortunately this also reduces machinability. Machining is surely possible. An enhanced machinability version of Grade 302HQ is manufactured with the help of elevated machinability. This version has slightly higher sulphur content as well as calcium treated. This enhanced machinability grade (referred to as Ugima 4567) has been available just too extraordinary request.

Welding

Use Grade 308L rods or electrodes for excellent weldability by all the standard fusion techniques, both with and without filler metals. Due to its applications this grade is not repeatedly welded. Special cases are resistance butt welding to combine wires together during wire manufacture and when the grade is utilized to make stud welding fasteners. 302HQ is not particularly recorded in AS 1554.6.

Cold Working

302HQ has the minimum work hardening rate of any of the normal austenitic stainless steels. This results in a tensile strength developed approximately 8MPa/%Ra (8MPa increase in tensile strength for each 1% reduction of area of cold work - this data from wire drawing). Even after considerable cold work this grade remains basically non-responsive to a magnet.

Chemical Properties

C	Mn	P	S	Si	Cr	Ni	Cu	Fe
0.03 max	2.0 max	0.045 max	0.03 max	1.0 max	18.0 - 20.0	8.0 - 10.5	3.0 - 4.0	Remainder

Mechanical Properties

Tensile Strength (ksi)	0.2% Yield Strength (ksi)	Elongation% in 2 inches
75	30	60

Physical Properties

Properties	Units	Temperature in °C
Density	8.0 g/cm ³	Room
Specific Heat	0.12 Kcal/kg.C	22°
Melting Range	1400-1445 °C	-
Modulus of Elasticity	200 KN/mm ²	20°
Electrical Resistivity	720 μΩ.cm	Room
Coefficient of Expansion	17.3 μm/m °C	20-100°
Thermal Conductivity	16.3 W/m-°K	20°

ASTM Specifications

Wire
A 493

Availability

MANUFACTURING
Fasteners
Custom Machining
Custom Fabrication
Stamped Parts

RAW MATERIALS
Wires
-
-
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