Long Products Stainless Steel NAS 155	
ASTM Designation	EN Designation
303	1.4305
S30300	

DESCRIPTION

This grade is austenitic stainless steel and is similar to AISI 302 but with high sulfur to facilitate machining.
Minimum required sulfur per ASTM is 0.15%.
NAS 155 typically contains 0.34% sulfur for improved machinability.
This grade is fairly corrosion/oxidation resistant but not better than 302/304.

CHEMICAL COMPOSITION

C	Si	Mn	P	S	Cr	Ni	Mo
≤ 0.15	≤ 1.00	≤ 2.00	≤ 0.02	0.30 - 0.34	17.00-19.00	8.40 - 10.00	0.25 - 0.50

NOMINAL MECHANICAL PROPERTIES IN ANNELED CONDITION

UTS	90 ksi min [620 MPa]
0.2% YS	45 ksi min [310 MPa]
% Elongation	50
Hardness	180 Brinell

PHYSICAL PROPERTIES

Density (kg/m3)	7.9
Modulus of Elasticity (x10^6 psi)	193
Coefficient of Thermal Expansion, 0-100˚C (um/mK)	17.2
Thermal conductivity at 100˚C (W/mK)	16.2
Specific Heat Capacity (J/kgK)	500
Melting Range (˚C)	1400 - 1450
Relative Permeability	1.02

ANNEALING

Parts can be annealed at 1900°F – 2000°F held for minimum 60 minutes per inch of thickness and water quenched. Prolonged exposure between 800°F – 1500°F must be avoided to prevent embrittlement and loss of corrosion properties.
This grade does not harden with heat treatment.

MACHINABILITY

The chemistry of this grade is specially designed for high machinability. This can be machined at high speeds with conventional tools without the use of chip curlers/breakers.

WELDING

Welding of 303 is generally not recommended. Fusion welding using 308, 310 or 312 electrodes is possible to a very limited extent. Type 312 weld metal contains a large amount of delta ferrite, which tends to overcome the tendency of hot cracking. Anneal after welding for maximum corrosion resistance.

CORROSION RESISTANCE

This grade has fair corrosion resistance in mildly corrosive atmosphere. It is much inferior to 304 SS. For maximum corrosion resistance, material should be used in annealed condition and parts should be passivated.

COLD WORKABILITY

Cold working of this grade is possible to a limited extent, except under all compressive stresses, such as wire drawing. It still is not as good as 302/304 stainless steel. Heavy forming/reductions will require frequent intermediate annealing.

HOT WORKABILITY

This grade has limited forgeability. Heat uniformly to 2100°F - 2300°F and should not go below 1800°F. This grade is susceptible to Hot Shortness. Parts should be water quenched after hot working for good corrosion resistance.