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302 Stainless Steel

DESCRIPTION
Type 302 Stainless Steel is an austenitic chromium-nickel stainless steel, non-hardenable by thermal treatments. It may be cold worked to high tensile strengths with slightly lower ductility than Type 301. Its corrosion resistance is superior to that of Type 301. Type 302 is essentially nonmagnetic in the annealed condition and becomes slightly magnetic when cold worked.

PRODUCT FORMS
Sheet, Strip

SPECIFICATIONS
ASTM A240, A666

TYPICAL APPLICATIONS
Automotive and architectural trim, springs, kitchen and restaurant equipment and utensils, dairy and food processing equipment

PROCESSING
Hardening Type 302 can be hardened only by cold working. Annealing Heat in the range of 1850-2050°F and cool rapidly. Light gauges (under 16 gauge) may be air cooled. Heavier sections require water quenching from annealing temperature. Stress Relieving The recommended temperature range for stress relieving is 400-750°F.

FORMING
Type 302 can be formed into most shapes. It work hardens rapidly, so it may be necessary to anneal between forming steps.

WELDING
Type 302 is weldable by electric arc, gas fusion or electrical resistance processes. In heavy sections, the material may develop poor resistance to chemical attack due to to carbide precipitation in the heat affected region of the weld. Restoration of normal corrosion resistance can be obtained by heating to 1750-2000°F and cooling rapidly. If subsequent annealing is impractical, then Type 304L or one of the stabilized grades should be used. Type 308 filler metal is used for welding Type 302.

CORROSION
Type 302 stainless steel in the annealed condition is highly resistant to corrosive conditions in urban and rural environments. It is resistant to most organic acids.

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CHEMICAL COMPOSITION: (ASTM A240, A666)

Element	**Type 302**
Carbon	0.15 max.
Manganese	2.00 max.
Sulfur	0.030 max.
Phosphorus	0.045 max.
Silicon	0.75 max.
Chromium	17.00 - 19.00
Nickel	8.00 - 10.00
Nitrogen	0.10 max.

MECHANICAL PROPERTIES: (ASTM A240, A666)

Type	**Yield Strength 0.2% offset** (KSI)	**Tensile Strength** (KSI)	**% Elongation** (2” Gauge Length)
302 Ann	30 min.	75 min.	40.0 min.
302 1/4 Hard	75 min.	125 min.	12.0 min,
302 1/2 Hard	110 min.	150 min.	10.0 min.
302 3/4 Hard	135 min.	175 min.	6.0 min.
302 Full Hard	145 min.	185 min.	4.0 min.

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PHYSICAL PROPERTIES: (ANNEALED)

Density (lb./in^2) @ RT		0.29
Modulus of Elasticity in Tension (psi x 10^6)		28.0
Specific Heat (BTU/o F/lb.)	32 to 212 oF	0.12
Thermal Conductivity (BTU/hr/ft^2/ft)	212 oF	9.4
	932 oF	12.4
Mean Coefficient of Thermal Expansion (in. x 10^-6 per o F)	32 to 212 oF	9.6
	32 to 600 oF	9.9
	32 to 1,000 oF	10.2
	32 to 1,200 oF	10.4
Electrical Resistivity (micro ohms - cm)	at 70 oF	72
Melting Point Range (oF)		2550/2590
Oxidation Resistance - Continuous Service (oF)		1650
Oxidation Resistance - Intermittent Service (oF)		1500