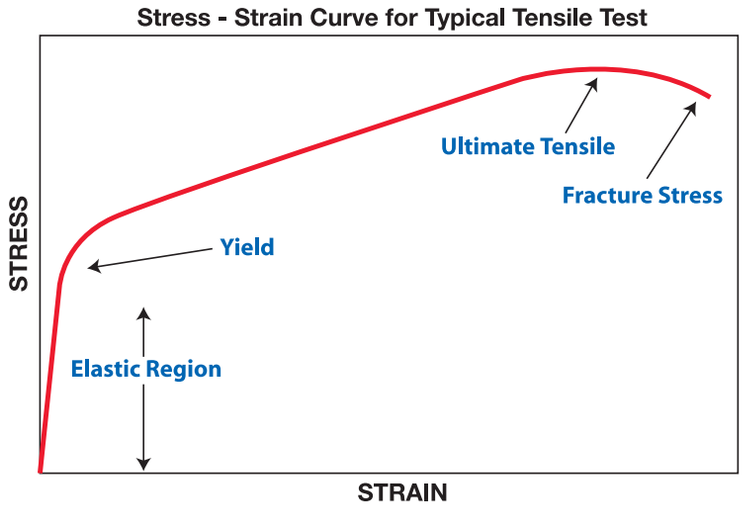


Definitions

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Breaking Strength/Tensile Strength - The strength of a material when subjected to a stretching (tensile) force usually measured by placing a standard test piece in the jaws of a tensile machine, gradually separating the jaws, and measuring the force necessary to break the test piece. (This strength is expressed as pounds per square inch or PSI.)
Clamping Force - (Also, Retained Force) The amount of force applied to an object by an installed clamp or tie. The clamping force maintains the assembly integrity and hardware placement.
Cold Flow Properties of Flexible Hose Materials - The continued deformation or movement of hose wall material as a result of clamp tension.
Corrosion Resistance - The ability of a material to withstand degradation in specific environments.
Decorative Coating - A coating for matching pre-existing hardware or decorative traffic poles. These coatings are often an applied and baked, powder polyester finish.
Elongation - The amount of stretch that occurs prior to the band/clamp material breaking. This is typically expressed as a percentage of original length and is a measure of the ductility of the metal.
Loop Tensile Strength - The max amount of force, applied radially, an installed clamp/tie will withstand prior to failure.
Nylon 11 - Non-toxic polymer cable tie coating resistant to stress cracking, abrasion, impact, salt spray and typical airborne pollutants. When subjected to fire, this coating is halogen-free and produces low amounts of smoke.
Powder Polyester - A coating available in colors applied to products and baked on for a durable finish. Polyester coatings are resistant to fading, stress cracking, abrasion, impact, salt spray and typical airborne pollutants.
PPA - (Performance Polymer Alloy) Non-toxic polymer coating for rolled band resistant to stress cracking, abrasion, impact, salt spray and typical airborne pollutants. When subject to fire, this coating is halogen free and produces low amounts of smoke.
Production Tool - Power tools to install band clamps and tie products consistently.
Ultimate Strength - The maximum tensile or clamping force that a band clamp or tie will withstand prior to breaking.
Yield Strength - The point at which the material begins to stretch as a result of stress being applied. Loading beyond this point will result in deformation.

Abbreviations

cm- Centimeter
GCS - Galvanized Carbon Steel
ID - Inside Diameter
Kg - Kilogram
Lb - Pound
M - Meter
mm- Millimeter
NPSC - National Pipe Straight Coupling
NPSM - American Standard Straight Pipe Thread for Mechanical Joints
NPT - National Pipe Thread
OD - Outside Diameter
SS - Stainless Steel
UIC - Uniform Industrial Code

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Metals Data

AISI TYPE NUMBER OR NAME		200/300	201	201 1/4 Hard	301	304	316
SPECIFICATION	UNS Designation	-	S20100	S20100	S30100	S30400	S31600
	ASTM	-	A-666	A-666	A-666	A-666	A-666
Principal Alloying Elements, %		-	C 0.15 Max.	C 0.03 Max.	C 0.15 Max.	C 0.08 Max.	C 0.08 Max.
		-	Mn 5.50 - 7.50	Mn 5.50 - 7.50	Mn 2.00 Max.	Mn 2.00 Max.	Mn 2.00 Max.
		-	Si .75 Max.	Si 1.00 Max.	Si 1.00 Max.	Si 1.00 Max.	Si .75 Max.
		-	Cr 16.00 -18.00	Cr 16.00 -18.00	Cr 16.00 -18.00	Cr 18.00 -20.00	Cr 16.00 -18.00
		-	Ni 3.50 - 5.50	Ni 3.50 - 5.50	Ni 6.00 - 8.00	Ni 8.00 - 10.50	Ni 10.00 -14.00
		-	N 0.25 Max	N 0.25 Max			Mo 2.00 - 3.00
PHYSICAL PROPERTIES							
Density, Lb/Cu. In.		0.28	0.28	0.28	0.29	0.29	0.29
Mod. of Elasticity in Tension x 10^6 PSI		28.0	28.6	28.6	28.0	29.0	28.0
Structure		Austenitic	Austenitic	Austenitic	Austenitic	Austenitic	Austenitic
Mean Coefficient of Thermal Expansion per °F. x 10^{-6}	32 - 212°F	9.0	8.7	9.0	9.4	9.4	8.9
	32 - 600°F	9.70	9.70	10.00	9.50	9.6	9.00
	32 - 1000°F	10.20	10.20	10.50	10.10	10.20	9.70
	32 - 1200°F	10.40	10.50	-	10.40	10.40	10.30
Melting Range		2550 - 2650°F	2550 - 2650°F	2550 - 2650°F	2550 - 2590°F	2550 - 2590°F	2540 - 2630°F
ELECTRICAL PROPERTIES		Non-Magnetic	Non-Magnetic	Non-Magnetic	Non-Magnetic	Non-Magnetic	Non-Magnetic
Magnetic Permeability, Annealed		μ = 1.02	μ = 1.02	μ = 1.02	μ = 1.02	μ = 1.008	μ = 1.008
Elec. Resistivity, Microhm-cm, 70°F		70.00	69.00	69.00	72.00	70.00	74.00
MECHANICAL PROPERTIES							
Rockwell Hardness		70 - 95R_B	90 - 95R_B	20 - 30R_C	75 - 95R_B	70 - 90R_B	70 - 85$_B$
Ultimate Tensile Strength,		75,000	100,000	120,000	100,000	75,000	80,000
BAND-IT Min. Spec. (PSI), Typical (PSI)		80,000	115,000	135,000	105,000	80,000	90,000
Yield Strength,		30,000	45,000	85,000	45,000	30,000	35,000
BAND-IT Min. Spec. (PSI) Typical (PSI)		45,000	60,000	90,000	55,000	45,000	50,000
% of Elongation in 2 inches		30	40	40	40	30	35
BAND-IT Min. Spec., Typical (%)		45	55	45	50	45	45
Tensile Strength at Elevated Temps., Short Time Tests, (PSI)	1300°F	36,000	37,500	37,500	35,500	36,000	48,000
	1500°F	22,000	23,000	23,000	22,500	22,000	28,000
	1700°F	11,000	11,000	11,000	11,000	13,500	18,000
CORROSION RESISTANCE							
Mild Atmospheric and Fresh Water		Good	Good	Good	Good	Very Good	Excellent
Industrial Atmosphere		Good	Good	Good	Good	Very Good	Very Good
Marine Atmosphere		Fair	Fair	Fair	Fair	Good	Very Good
Salt Water		No	No	No	No	No	Good
Mild Chemical		Fair	Fair	Fair	Fair	Good	Good
Oxidizing Chemical		Fair	Fair	Fair	Fair	Good	Good
Reducing Chemical		No	No	No	No	No	Good
USE	General	Municipal, Strapping, Construction	Municipal, Construction, Automotive	Construction, Automotive, Municipal	Construction, Automotive	Chemical, Food, Dairy, Hospitals, Electrical Power Transmission	Marine, Chemical, Food, Petroleum, Paper, Textile, Medical
	BAND-IT®	VALU-STRAP™, Valuclips, Brackets, BAND-IT® Tie, Band Clamps	Center Punch Clamps, Jr.® Smooth ID Clamps, Band, Buckle, BAND-FAST™, Tie Strips, Band-Lok® Tie 1/4" Ultra-Lok® Ties	Ultra-Lok® Band and Clamps	Scru-Seal Housing & Base, Worm Gear, Clamps, Buckles	304 Strap, Tie-Dex® Band, Tie-Lok® Ties, Ball-Lok Ties, Self-Lok Ties,	Multi-Lok, Tie-Lok®, Ball-Lok, Self-Lok® Ties, Junior® SID Clamps, Nipples, Tri-Lokts®, 316 Band/Buckle, All Purpose Band, Easy Read

All values in table are reference only.

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Metals Data

AISI TYPE NUMBER OR NAME	317L 1/4 Hard	409	430	Monel® 400	Inconel® 625	AL6XN®	Titanium GR1	GCS
SPECIFICATION UNS Designation	S31703	S40900	S43000	N04400	N06625	N08367	R50250	-
ASTM	A-240	A-240	A-240	B127	B443	B688	B265	-
Principal Alloying Elements, %	C 0.030 Max. Mn 2.00 Max. Si .75 Max. Cr 18.00 - 20.00 Ni 11.00 - 15.00 P 0.045 Max. S 0.03 Max. Mo 3.00-4.00	C 0.08 Max. Mn 1.00 Max. Si 1.00 Max. Cr 10.50 - 11.75 Ni 0.050 P 0.045 Max. S 0.03 Max.	C 0.12 Max. Mn 1.00 Max. Si 1.00 Max. Cr 16.00 -18.00 P 0.04 Max. S 0.03 Max.	C .3 Max. Mn 2.0 Max. Si 0.50 Max. Ni 63.00 -70.00 Cu 28-34 Fe 2.5 Max S 0.024 Max.	C 0.10 Max. Mn .5 Max. Cr 20.0-23.0 Ni Balance Mo 8.0 - 10.0 Ti 0.4 Max. Fe 2.5 Max. Al 0.4 Max.	C .030 Max. N 2.0 Max. P .040 Max. S .030 Max. Si 1.0 Max. Ni 23.5 - 25.5 Cr 20.0 - 22.0 Mo 6.0 -7.0 Cu .75 Max. N .18 -.25	C 0.08 Max. N 0.03 Max. H 0.015 Max. O 0.18 Max. Fe 0.2 Max. Ti Balance	
PHYSICAL PROPERTIES								
Density, Lb/Cu. In.	0.29	0.28	0.278	0.319	0.305	0.291	0.163	0.283
Mod. of Elasticity in Tension x 10 ^{6}PSI	29.0	30.2	29.0	26.0	30.0	28.3	15.0	30.0
Structure	Austenitic	Ferritic	Ferritic	-	-	Austenitic	Alpha	Ferritic
Mean Coefficient of Thermal Expansion per °F. x 10^{-6} 32 - 212°F	8.9	5.8	5.8	7.7	7.4	8.5	4.6	6.3
32 - 600°F	9.00	6.12	6.10	8.80	-	8.8	5.30	7.30
32 - 1000°F	9.70	6.60	6.30	9.10	-	9.1	5.50	7.90
32 - 1200°F	10.30	6.86	6.60	9.30	-	9.5	5.70	8.20
Melting Range	2500 - 2550°F	2500 - 2550°F	2500 - 2550°F	2500 - 2550°F	2500 - 2550°F	2500 - 2550°F	2500 - 2550°F	-
ELECTRICAL PROPERTIES	Non-Magnetic	-	Magnetic	-	Non-Magnetic	-	Non-Magnetic	Magnetic
Magnetic Permeability, Annealed	μ = 1.008	-	μ = 600-1100	-	μ = 1.006	μ = 1.0028	μ = 1.00005	1500-2000
Elec. Resistivity, Microhm-cm, 70°F	74.00	60.00	60.00	5.10	12.90	89.0	4.20	17.20
MECHANICAL PROPERTIES								
Rockwell Hardness	70 - 85R_B	88R_B Max	75 - 90R_B	60 - 80R_B	88 - 94R_B	80 - 95R_B	64 - 70R_B	80 - 95R_B
Ultimate, Tensile Strength	115,000	55,000	55,000	70,000	120,000	95,000	-	84,000
BAND-IT Min. Spec. (PSI), Typical (PSI)	120,000	68,000	75,000	75,000	130,000	110,000	46,000	90,000
Yield Strength,	75,000	25,000	40,000	32,000	60,000	45,000	25,000	80,000
BAND-IT® Min. Spec. (PSI), Typical (PSI)	80,000	35,000	55,000	40,000	75,000	55,000	31,000	85,000
% of Elongation in 2 inches,	10	20	20	30	30	30	24	5
BAND-IT® Min. Spec., Typical (%)	15	33	25	40	40	45	30	8
Tensile Strength at Elevated Temps., Short Time Tests, (PSI) 1300°F	48,000	5,000	15,000	-	-	-	-	-
1500°F	28,000	1,500	8,000	-	-	-	-	-
1700°F	18,000	-	5,000	-	-	-	-	-
CORROSION RESISTANCE								
Mild Atmospheric and Fresh Water	Excellent	Good	Good	Good	Good	Good	Good	Good/Fair
Industrial Atmosphere	Very Good	Good	Good	Good	Good	Good	Good	Fair
Marine Atmosphere	Very Good	Poor	Poor	Excellent	Excellent	Excellent	Good	Poor
Salt Water	Good	No	No	Excellent	Excellent	Excellent	Good	No
Mild Chemical	Very Good	Fair	Fair	Good	Good	Good	Good	No
Oxidizing Chemical	Good	Fair	Fair	Good	Good	Good	*	No
Reducing Chemical	Good	Good	No	Good	Good	Good		No
USE General	Pulp/Paper, Chemical, Marine	Auto Agriculture	Interior Architecture, Automotive Trim	Electronics, Marine, Chemical, Petroleum	Chemical, Nuclear, Aerospace, Marine	Chemical, Nuclear, Aerospace, Marine	Corrosive Service Good for Machinery Weldable	Indoor, Mild Atmosphere
BAND-IT®	317L Band for Paper Mills, Special Applications	Special	Automotive, Universal Clamp	Band/Buckle	Band/Buckle, Preformed Clamps	Special	Band/Buckle	Band/Buckle Preformed Clamps

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