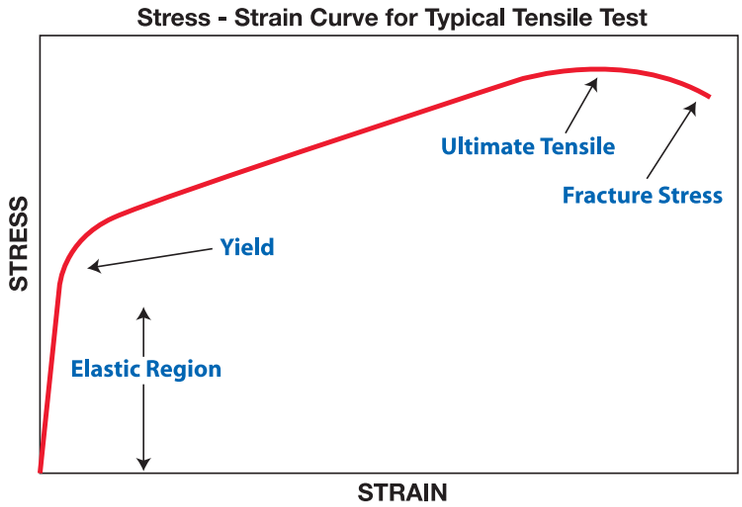



## Definitions

For additional Technical information visit: www.uespromura.com.au

**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 - 95$R_B$ | 90 - 95$R_B$ | 20 - 30$R_C$ | 75 - 95$R_B$ | 70 - 90$R_B$ | 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 |

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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.<br>Mn 2.00 Max.<br>Si .75 Max.<br>Cr 18.00 - 20.00<br>Ni 11.00 - 15.00<br>P 0.045 Max.<br>S 0.03 Max.<br>Mo 3.00-4.00 | C 0.08 Max.<br>Mn 1.00 Max.<br>Si 1.00 Max.<br>Cr 10.50 - 11.75<br>Ni 0.050<br>P 0.045 Max.<br>S 0.03 Max. | C 0.12 Max.<br>Mn 1.00 Max.<br>Si 1.00 Max.<br>Cr 16.00 -18.00<br>P 0.04 Max.<br>S 0.03 Max. | C .3 Max.<br>Mn 2.0 Max.<br>Si 0.50 Max.<br>Ni 63.00 -70.00<br>Cu 28-34<br>Fe 2.5 Max<br>S 0.024 Max. | C 0.10 Max.<br>Mn .5 Max.<br>Cr 20.0-23.0<br>Ni Balance<br>Mo 8.0 - 10.0<br>Ti 0.4 Max.<br>Fe 2.5 Max.<br>Al 0.4 Max. | C .030 Max.<br>N 2.0 Max.<br>P .040 Max.<br>S .030 Max.<br>Si 1.0 Max.<br>Ni 23.5 - 25.5<br>Cr 20.0 - 22.0<br>Mo 6.0 -7.0<br>Cu .75 Max.<br>N .18 -.25 | C 0.08 Max.<br>N 0.03 Max.<br>H 0.015 Max.<br>O 0.18 Max.<br>Fe 0.2 Max.<br>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 - 85$R_B$ | 88$R_B$ Max | 75 - 90$R_B$ | 60 - 80$R_B$ | 88 - 94$R_B$ | 80 - 95$R_B$ | 64 - 70$R_B$ | 80 - 95$R_B$ |
| 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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