# WEBCO Welded Titanium and Corrosion Resistant Alloy Tubing

DATASHEET

| ALLOY | UNS | Chemical Composition Limits, % | | | | OTHER | TENSILE STRENGTH MIN, ksi (MPa) | YIELD STRENGTH OFFSET 0.2% MIN, ksi (MPa) | ELONGATION IN 2" OR 50 mm MIN % | ROCKWELL HARDNESS NO., MAX |
|---|---|---|---|---|---|---|---|---|---|---|
| | | C, Max | Cr | Ni | Mo | | | | | |
| **Austenitic** | | | | | | | | | | |
| 304 | S30400 | 0.080 | 18-20 | 8-11 | – | – | 75 (515) | 30 (205) | 35 | B90 |
| 304L | S30403 | 0.030 | 18-20 | 8-12 | – | – | 70 (485) | 25 (170) | 35 | B90 |
| 304LN | S30453 | 0.030 | 18-20 | 8-11 | – | N (0.10-0.16) | 75 (515) | 30 (205) | 35 | B90 |
| 316 | S31600 | 0.080 | 16-18 | 10-14 | 2-3 | – | 75 (515) | 30 (205) | 35 | B90 |
| 316L | S31603 | 0.030 | 16-18 | 10-14 | 2-3 | – | 70 (485) | 25 (170) | 35 | B90 |
| 316LN | S31653 | 0.030 | 16-18 | 10-13 | 2-3 | N (0.10-0.16) | 75 (515) | 30 (205) | 35 | B90 |
| 317L | S31703 | 0.030 | 18-20 | 11-15 | 3-4 | – | 75 (515) | 30 (205) | 35 | B90 |
| 686 | N06686 | 0.010 | 19-23 | Bal. | 15-17 | Ti (.02-.25), Fe (5), W (3.0-4.4) | 100 (690) | 45 (310) | 45 | N/A |
| C276 | N10276 | 0.010 | 14.5-16.5 | Bal. | 15-17 | Fe (4.0-7.0), W (3.0-4.5) | 100 (690) | 41 (283) | 40 | N/A |
| 625 | N06625 | 0.100 | 20-23 | 58.0 min | 8-10 | Fe (5.0 max), Cb+Ta=3.15-4.15 | 120 (827) | 60 (414) | 30 | – |
| 825 | N08825 | 0.050 | 19.5-23.5 | 38-46 | 2.5-3.5 | Fe (22 min), Cu (1.5-3.0) | 85 (586) | 35 (240) | 30 | – |
| AL-6XN® | N08367 | 0.030 | 20-22 | 23.5-25.5 | 6-7 | N (0.18-0.25) | 100 (690) | 45 (310) | 30 | B100 |
| **Ferritic** | | | | | | | | | | |
| 439 | S43035 | 0.070 | 17-19 | 0.50 max | – | TI 0.20+4(C+N) min 1.10 max; 0.04 N max | 60 (415) | 30 (205) | 20 | B90 |
| AL29-4C® | S44735 | 0.030 | 28-30 | 1.00 max | 3.6-4.2 | (TI+Cb)=0.20-1.00w/6 (C+N) min; 0.45 N max | 75 (515) | 60 (415) | 18 | B100 |
| **Duplex** | | | | | | | | | | |
| 2003 | S32003 | 0.030 | 19.5-22.5 | 3.0-4.0 | 1.50-2.00 | N (0.14-0.20) | 100 (690) | 70 (485) | 25 | C30 |
| 2205 | S32205 | 0.030 | 22-23 | 4.5-6.5 | 3.0-3.5 | N (0.14-0.20) | 95 (655) | 70 (485) | 25 | C30 |
| **Reactive Metals** | | | | | | | | | | |
| Ti Grade 2 | R50400 | Unalloyed Titanium | | | | $O_2$ (0.25 max) | 50 (345) | 40 (275) | 20 | |
| Ti Grade 7 | R52250 | Palladium Alloyed Titanium | | | | Pa (0.12-0.25) | 50 (345) | 40 (275) | 20 | |
| Ti Grade 12 | R53400 | Ni, Mo Alloyed Titanium | | | | Ni (0.6-0.9), Mo (0.2-0.4) | 70 (483) | 50 (345) | 18 | |
| Ti Grade 16 | R52402 | Palladium Alloyed Titanium | | | | Pa (0.04-0.08) | 50 (345) | 40 (275) | 20 | |

## Contact Information for Welded Titanium and Corrosion Resistant Alloy Tubing


WEBCO sales, distribution and manufacturing facilities are located in Sand Springs, Tulsa, Kellyville, Mannford and Catoosa, OK; Oil City and Reno, PA; and Orange, TX, USA. Please contact one of the representatives below or call 918-245-2211 or fax 918-245-0306 with general inquiries.

| | | | | |
|---|---|---|---|---|
| Bill Bieber | Sales | 918-241-9974 (office) | 865-388-5001 (cell) | wbieber@webcotube.com |
| Mike Jamison | Sales | 918-241-9973 (office) | 918-630-0982 (cell) | mjamison@webcotube.com |
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WEBCO is a certified **ISO 9001** organization.

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# WEBCO Welded Titanium and Corrosion Resistant Alloy Tubing

DATASHEET

## Range of Tubing Sizes*

| OUTSIDE DIAMETER | | WALL THICKNESS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inch | (mm) | Gauge Inch (mm) | 25 0.020 0.51 | 24 0.022 .056 | 23 0.025 .064 | 22 0.028 .071 | 20 0.035 0.89 | 18 0.049 1.24 | 16 0.065 1.65 | 15 0.072 1.83 | 14 0.083 2.11 | 13 0.095 2.41 | 12 0.109 2.77 | 11 0.120 3.05 |
| 0.375 | 9.53 | | • | • | • | • | | | | | | | | |
| 0.500 | 12.70 | | • | • | • | • | • | • | • | | | | | |
| 0.625 | 15.88 | | • | • | • | • | • | • | • | • | • | • | | |
| 0.750 | 19.05 | | • | • | • | • | • | • | • | • | • | • | | |
| 0.875 | 22.23 | | • | • | • | • | • | • | • | • | • | • | | |
| 1.000 | 25.40 | | • | • | • | • | • | • | • | • | • | • | | |
| 1.125 | 28.58 | | | • | • | • | • | • | • | • | • | • | | |
| 1.250 | 31.75 | | | | • | • | • | • | • | • | • | • | | |
| 1.500 | 38.10 | | | | | • | • | • | • | • | • | • | | |
| 1.750 | 44.45 | | | | | • | • | • | • | • | • | • | | |
| 2.000 | 50.80 | | | | | • | • | • | • | • | • | • | • | • |

*Other sizes available upon request (metric and specials)

## Common Tubing Specifications

| SPECIFICATION | ALLOYS INCLUDED* |
|---|---|
| ASTM A249/SA249 | 304, 304H, 304L, 304N, 304LN, 316, 316L, 316N, 316LN, 317L, AL-6XN® |
| A268/SA268 | 439 (XM-8), E-BRITE® (XM-27), AL29-4C® |
| ASTM A269 | 304, 304L, 304LN, 316, 316L, 316LN, 317, AL-6XN® |
| A789/SA789 | 2003, 2101, 2205 |
| A688/SA688 | 304, 304L, 304N, 304LN, 316, 316L, 316N, 316LN, AL-6XN® |
| A803/SA803 | 439 (XM-8), E-BRITE® (XM-27), AL29-4C® |
| B338/SB338 | Titanium grades 2 and 7 tubing for condensers and heat exchangers |
| B626/SB626 | Welded USN N06686 |
| A-1016/SA-1016 | General requirements for ferritic alloy steel, austenitic alloy steel and stainless steel tubes |
| B704/SB704 | Welded UNS N06625 and UNS N08825 alloy tubes |

*Alloys other than referenced in these specifications may also be available

## Specialty Tubing Alloys

| ALLOY | | APPLICATIONS |
|---|---|---|
| Ferritic | AL29-4C® | Resistance to stress corrosion cracking and pitting crevice corrosion in severe chloride service, including seawater and geothermal brines. Surface condensers, heat exchangers, evaporators, etc. |
| | 439 | Designed to resist corrosion in a variety of oxidizing environments from fresh water to boiling acids. Primarily used for heat exchangers. |
| Austenitic | AL-6XN® | Nitrogen modified high molybdenum alloy with excellent resistance to pitting/crevice corrosion in chloride environments such as seawater and brine. High strength and available in many product forms for heat transfer and chemical process uses. |
| Duplex | 2003 | High strength and resistance to stress corrosion cracking. General corrosion resistance similar to 316 with superior pitting/crevice corrosion resistance. |
| | 2205 | High strength and resistance to stress corrosion cracking. General corrosion resistance similar to 316 with superior pitting/crevice corrosion resistance. |
| Reactive Metals | Titanium Grades 2, 7, 12, 16 | Resistance to general and local corrosion in wide range of oxidizing and neutral environments. Excellent resistance to chlorides and other halides. Immune to chloride stress corrosion cracking. Very good heat transfer properties. |

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