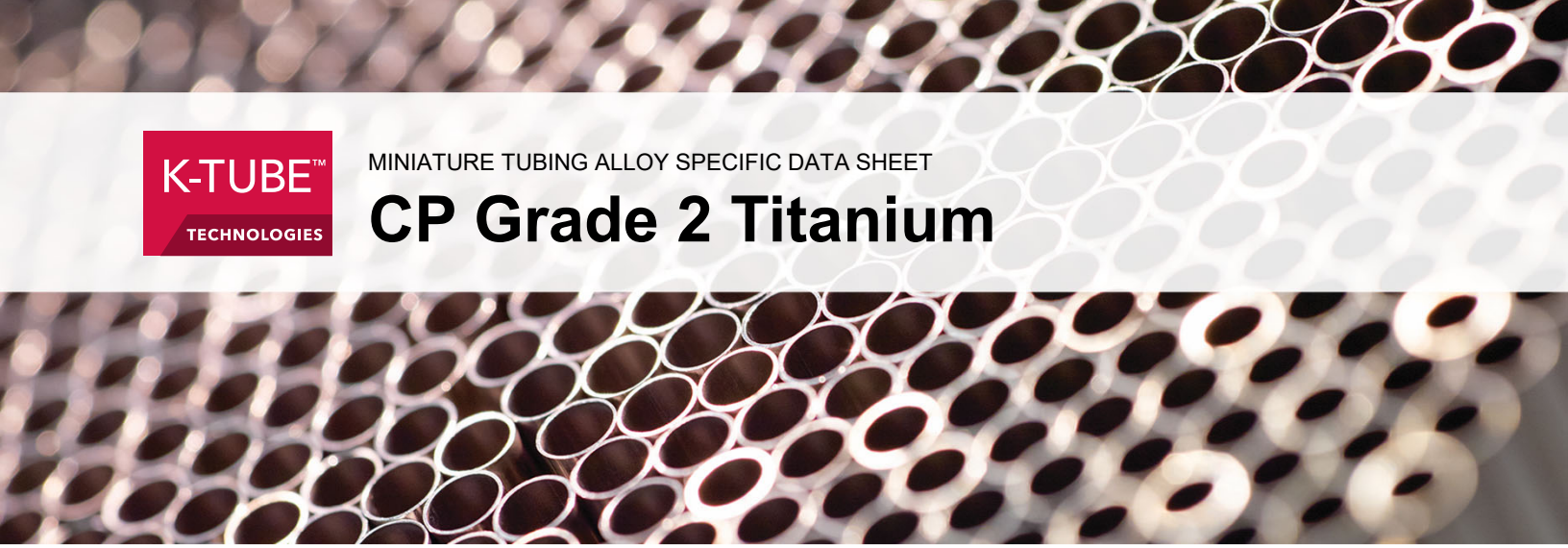


K-TUBE™ TECHNOLOGIES

MINIATURE TUBING ALLOY SPECIFIC DATA SHEET

CP Grade 2 Titanium

General Description

Commercially Pure (CP) Grade 2 Titanium is an industry workhorse. Commercially Pure or CP titanium in unalloyed. Grade 2 has higher levels of iron and oxygen than other CP grades, which offers excellent formability and moderate strength with superior corrosion resistance. Due to this grade's range of physical properties, it has become one of the most commercially available titanium grades. The grade is used with many diverse applications for chemical and marine, aerospace and medical applications.

Applications

- Screws / prostheses / plates
- Medical needles
- Medical syringes
- Sensor probes
- Catheters
- Heat exchangers

Reference Standards

- AMS 4902
- UNS R50400

Characteristics

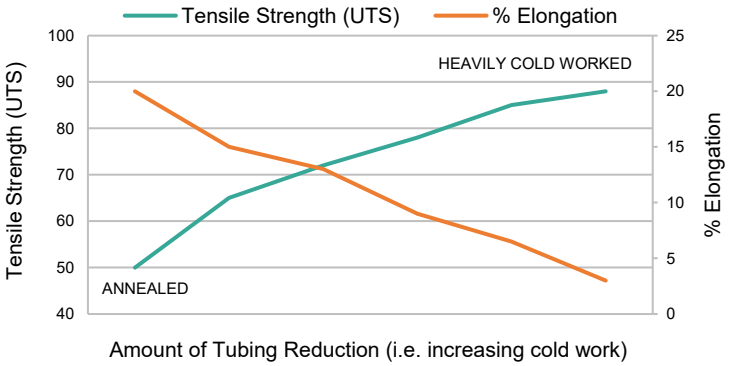
- Cold working will achieve higher tensile strengths
- Non-ferromagnetic—perfect for MRI operating theatres or implants within the body.
- Best strength to weight ratio of any corrosion resistant material
- Most economical and readily available CP titanium grade
- Can be used for parts requiring strength up to 400°F and oxidation resistance to 600°F.

Typical Chemistry

Element	Minimum	Maximum
Iron		0.30%
Carbon		0.08%
Oxygen		0.25%
Nitrogen		0.030%
Hydrogen		0.015%
Other Elements, Each		0.10%
Other Elements, Total		0.40%
Titanium	Balance	

Possible Mechanical Properties

Attribute	Annealed	Typical As Drawn
Tensile Strength	50 ksi	85 ksi
Elongation	20%	5%



General Properties

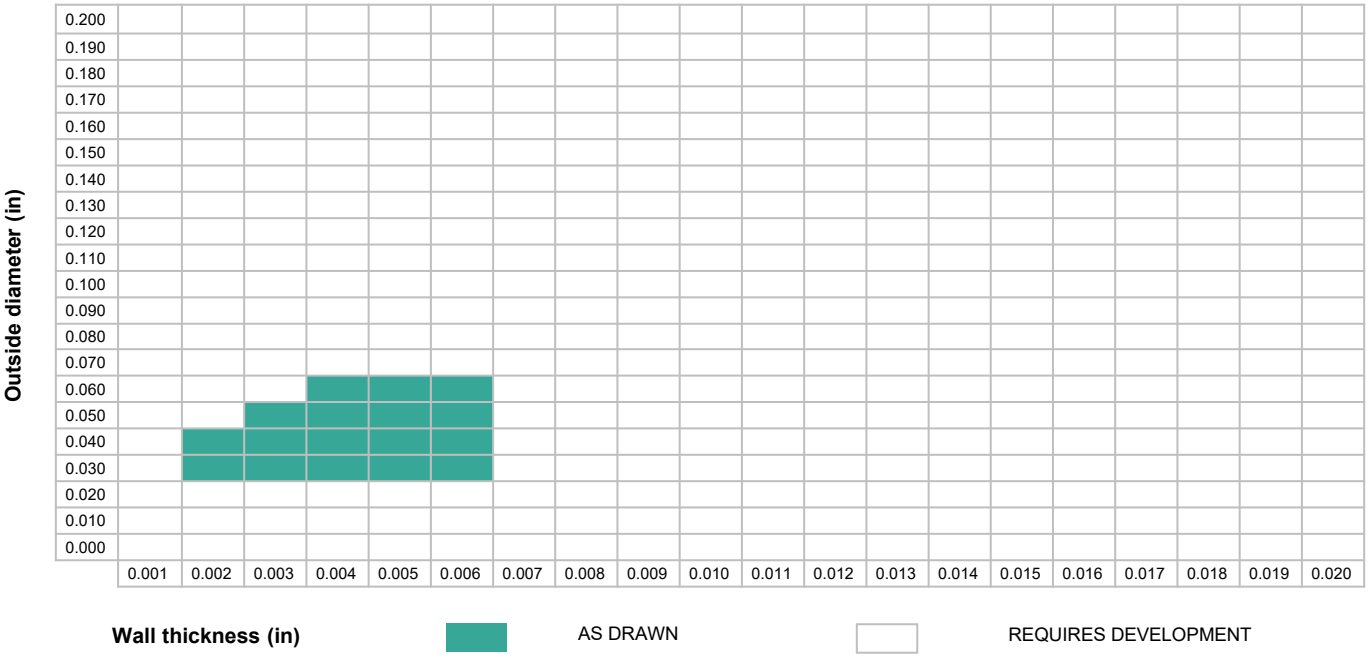
Attribute	English
Density	.163 lb/in^3
Elastic modulus	15,200 ksi
Thermal conductivity (@70F)	114 BTU-in/hr-ft^2 - F
Mean CTE (70-212F)	4.78x10-6 in/in/F

Tubing-specific Requirements

- **Lengths:** Tubing is normally furnished in mill lengths of 5 ft, but it can be supplied in up to 10 ft lengths with a shear cut end.
- **Roundness:** Difference in minimum and maximum OD measurements must be equal or less than half the OD tolerance.
- **Surface Finish:** OD and ID surface finish (Rq or RMS) limits may be specified. ID and OD surface finish values are only reported for dimensions >0.020".
- **Typical OD Surface:** < 35 µin Rq.
- **ID Surface finish:** Depends on the reduction (drawing) method. Free sunk tubing has a typical ID surface finish from 20 - 80 µin Rq.
- **Straightness:** No deflection greater than 5% of the outside diameter for tubing with OD > 0.020" or 0.001" maximum deflection for tubing with OD <0.020". Any special straightness requirements shall be agreed upon between the purchaser and supplier. Tubing should not "wobble" as defined per ASTM F2819

Available Dimensions

K-Tube has the capability to make tubing with the wall thickness and outside diameter combinations in the table below. Tubing with an OD/Wall ratio lower than 20:1 can be drawn to the final dimensions. Tubing with an OD/Wall ratio between 20:1 and 40:1 must be centerless ground to the final dimensions. K-Tube's capabilities are constantly improving, please inquire if your dimensions are outside of the listed dimensions.



Contact Information

Our professional staff is available to assist you with custom projects and provide you with the direction you need to complete your project to specification and on time. We look forward to working with you.

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