

SEAMLESS MECHANICAL ALLOY TUBING

ASTM A 519

Cold Drawn Seamless Mechanical Alloy Tubing is produced by the Carbon & Alloy Tube Group of Plymouth Tube Co. in alloy grades 4130 and 4140 at two of our facilities: Streator, IL and Cold Draw at Winamac, IN.

Seamless Mechanical Alloy Tubing Size Range:

OD: 0.090" – 5.563" (2.286 mm – 141.3 mm) **Wall:** 0.020" – 0.750" (0.508 mm – 19.05 mm)

Other physical properties may be obtained upon request.

Typical Tensile Properties, Hardness, and Thermal Condition¹

Grade Designation	Condition	Ultimate Strength		Yield Strength		Elongation in 2 in. or 50% mm, %	Rockwell Hardness
		ksi	MPa	ksi	MPa		
4130	UN ²	120	828	110	759	5	C25
	SR	105	724	85	586	10	B95
	A	75	517	55	379	30	B81
	N	90	621	60	414	20	B89
4140	UN ²	125	863	115	794	5	C26
	SR	120	855	100	689	10	B100
	A	80	552	60	414	25	B85
	N	120	855	90	621	20	B100

¹From Plymouth Tube Streator Mill Testing & Research.

(UN=Unannealed; SR=Stress Relieved; A=Annealed; N=Normalized)

Chemical Requirements for Alloy Steels¹

Grade Designation	Chemical Composition Limits, %							
	Carbon	Manganese	Phosphorus max	Sulfur max	Silicon	Nickel	Chromium	Molybdenum
4130	0.28-0.33	0.40-0.60	0.040	0.040	0.15-0.35	---	0.80-1.10	0.15-0.25
4140	0.38-0.43	0.75-1.00	0.040	0.040	0.15-0.35	---	0.80-1.10	0.15-0.25

Outside and Inside Diameter Tolerances for Round Cold-Worked Tubing¹

OD Size Range	Wall Thickness as % of OD	Thermal Treatment after Final Cold Work Producing Size							
		None, or not exceeding 1100F Nominal Temp				Heated > 1100F Nominal Temp w/o Accelerated Cooling			
		OD, in.		ID, in.		OD, in.		ID, in.	
		Over	Under	Over	Under	Over	Under	Over	Under
Up to 0.4999	all	0.004	0.000	---	---	0.005	0.002	---	---
0.500-1.699	all	0.005	0.000	0.000	0.005	0.007	0.002	0.002	0.007
1.700-2.099	all	0.006	0.000	0.000	0.006	0.006	0.005	0.005	0.006
2.100-2.499	all	0.007	0.000	0.000	0.007	0.008	0.005	0.005	0.008
2.500-2.899	all	0.008	0.000	0.000	0.008	0.009	0.005	0.005	0.009
2.900-3.299	all	0.009	0.000	0.000	0.009	0.011	0.005	0.005	0.001
3.300-3.699	all	0.010	0.000	0.000	0.010	0.013	0.005	0.005	0.013
3.700-4.099	all	0.011	0.000	0.000	0.011	0.013	0.007	0.010	0.010
4.100-4.499	all	0.012	0.000	0.000	0.012	0.014	0.007	0.011	0.011
4.500-4.899	all	0.013	0.000	0.000	0.013	0.016	0.007	0.012	0.012
4.900-5.299	all	0.014	0.000	0.000	0.014	0.018	0.007	0.013	0.013
5.300-5.549	all	0.015	0.000	0.000	0.015	0.020	0.007	0.014	0.014

Wall Thickness Tolerances for Cold Worked Tubing¹

Wall Thickness Range as % of Outside Diameter	Wall Thickness Tolerance Over and Under Nominal, %	
	Up to 1.499 in., ID	1.500 in. and Over
25 and Under	10.0	7.5
Over 25	12.5	10.0



¹Extracted, with permission, from the Annual Book of ASTM Standards © American Society for Testing and Materials, 100 Bar Harbor Drive, West Conshohocken, PA 19428-2959

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