

# QUICK GUIDE

## CARBON AND ALLOY TUBING

TYPE	GRADE	SPECIFICATION AND FINISH	DESCRIPTION	TYPICAL APPLICATIONS	TYPICAL MECHANICAL PROPERTIES			FABRICATION CHARACTERISTICS		
					Tensile (PSI)	Yield (PSI)	Elongation	Weldability	Machinability	
<b>STRUCTURAL</b>	.26 MAX CARBON	ASTM A500 GR B	Cold formed, electric resistance welded tubing which can be produced in round, square or rectangular shapes. Grades A and C available on inquiry basis.	Structural columns, beams, supports, heavy equipment frames, light and sign posts, telescoping devices.	58,000	42,000	23%	Good	N/A	
<b>PIPE</b>	.30 MAX CARBON	A53 WELDED or SEAMLESS	Hollows produced to ID dimension with schedules denoting wall thickness. Generally used for conveying liquid and gases. Used predominantly in long lengths coupled together. Available in pipe sizes and mechanical tube sizes.	Rolls, machined parts, and pipe lines for conveyance of liquids or gases.	60,000	35,000	20%	Good	Good	
	.30 MAX CARBON	A106 SEAMLESS Gr B or Gr C			GR B	60,000	35,000	30%	Good	Good
					GR C	70,000	40,000	30%	Good	Good
<b>HYDRAULIC FLUID LINE</b>	.18 MAX CARBON	J524 (CDS)	J524 & J525 bends and flares easily, pressure tested, ends are capped to prevent ID contamination. All material is dead soft annealed and drawn OD & ID.	Fittings, couplings, fluid lines.	45,000	25,000	35%	Good	Good	
	.18 MAX CARBON	J525 (DOM)			45,000	25,000	35%	Good	Good	
	.18 MAX CARBON	J356 (ERW)			45,000	25,000	35%	Good	Good	
<b>ALLOY</b>	4130	ASTM A513 TYPE 5 (DOM)	Lower alloy with an excellent combination of strength, hardness and toughness in both welded and seamless.	Shafts, special tools and machined parts.	90,000	80,000	10%	Good	Good	
		ASTM A519 (CDS)			90,000	80,000	10%	Good	Good	
	4140 4142	ASTM A519 (HFS)	Medium carbon alloy tube. Excellent where higher physical properties are needed, generally by heat treatment.	All forms of machined parts, rolls, shafts.	80,000	60,000	25%	Good	Good	
		ASTM A519 (HFS) L80	Through heat treated steel, higher physicals than standard 4140 alloy, main choice when toughness is a consideration.	Oil and gas applications, machined parts, rings, gears.	95,000 MIN	80,000 MIN	20%	Good	Good	
	P110				L80 & P110 refers to minimum yield. L80 is 22 max RC and P110 is 30 to 36 RC.	125,000 MIN	110,000 MIN	13%	Good	Good
	8620	ASTM A534	Bearing quality steel used when a hard outer case is needed but a soft core is also required. Excellent for carburizing.	Bearing races, gears, bushings.	78,000	56,000	31%	Good	Good	
	52100	ASTM A295 ASTM A485	A moderately deep hardened alloy having high resistance to wear, medium toughness and low resistance to softening at high temperatures. Excellent stability in hardened condition, low cost substitute for some tool steels.	Bearings, rolls, bushings, spacers, cutting tools.	100,000	81,000	25%	Good	Good	

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SEAMLESS MECHANICAL	C1026	ASTM A519 COLD DRAWN (CDS)	General purpose seamless tubing, CDS allows selection of chemistry and rough tube size. Cold drawing produces higher physical properties without heat treating. Offers widest range of sizes and chemistries in mechanical tubing. Better tolerances and reduced machining allowances over HFS. Typically ordered as either OD and wall or OD and ID.	Machined parts, rollers, shafts, sleeves and cylinders.	75,000	65,000	5%	Good to Excellent	Good
		ASTM A519 HOT FINISHED (HFS)	HFS is available in larger diameters and heavier walls than cold drawn seamless. Hot finished is subject to surface imperfections and wider tolerances over CDS. Ordered to OD and wall only. May offer cost savings over parts presently using plate burn-outs, bar, or castings, due to less machining.	Rollers, heavily machined parts and sleeves.	55,000	35,000	25%	Good to Excellent	Good
WELDED MECHANICAL	C1010	ASTM A513 TYPE 1 AS WELDED HOT ROLLED	Good forming quality tubing. A513 Type 1 can be purchased with ID weld flash-in, flash controlled, or flash removed. Available in surface finishes of hot rolled or hot rolled pickled and oiled.	Automotive and truck components, frames, racks, railings, roller sleeves and industrial machinery.	45,000	32,000	15% min.	Good	Good
		ASTM A513 TYPE 2 AS WELDED COLD ROLLED	Excellent forming quality tubing. A513 Type 2 can be purchased with ID weld flash-in, flash controlled, or flash removed. It is produced from cold rolled steel in commercial quality or plating quality and is slightly more expensive than hot rolled as-welded.	Good for use in light structural applications, frames and furniture. Suitable for painting or plating, where surface finish is important.	45,000	32,000	15% min.	Good	Good
	C1026	ASTM A513 TYPE 5 DRAWN OVER MANDREL (DOM)	DOM is cold drawn through a die and over a mandrel resulting in improved surface finish, excellent concentricity and dimensional accuracy. Lower cost alternative to CDS with equal or superior physical properties.	Can be used for machined parts, rollers, shafts, sleeves and is most readily adaptable in cylinder applications.	80,000	70,000	10%	Good to Excellent	Good
	C1020	ASTM A512 COLD DRAWN BUTTWELD	Excellent surface finish and machinability. Produced to closer tolerances than ERW, A513 Type 1 & 2. A512 is considered an acceptable low cost substitute for DOM and cold drawn seamless in non-pressure applications.	Can be used for structural applications, bushings, spacers, sleeves, or for many upsetting, flaring, and bending applications.	65,000	55,000	10%	Good	Good
FLUID POWER	C1026 ST52.3	ASTM A519 (CDS)	CDS and DOM mechanical tube for fluid power applications. CDS items are stocked in finished walls .750" and heavier. DOM items are stocked in finished walls up to and including .625". Available in suitable to hone, suitable to skive and pre-honed. All honing is done in Castle Metals' owned facilities.	Hydraulic Cylinders	75,000	65,000	5%	Good to Excellent	Good
		ASTM A513 TYPE 5 (DOM)			85,000	75,000	15%	Good to Excellent	Good