



# Instrument Tubing

Catalog 1006C-B

February 2014

aerospace  
climate control  
electromechanical  
filtration  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



ENGINEERING YOUR SUCCESS.



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# Introduction

When you want to reduce the risk of leakage in your hydraulic and instrumentation system, consider Parker seamless stainless steel tubing. Every step of the tube production is controlled to ensure consistent quality. Parker tubing are characterized by the ovality, concentricity and hardness limits required for superior performance in hydraulic and instrumentation system applications, Plus Parker tubing offers the high surface smoothness and close dimensional tolerances needed to ensure there are no leakages when connected with Parker fittings.

## Features

- A complete package of tube fittings and tubing via a single order
- Weld-ability
- Plugged ends
- Superior OD Finish and Close tolerances
- Strictly controlled ovality, concentricity and hardness
- High cleanliness of Tubing Inside
- 100% Eddy Current and Hydrostatic tested
- Parker branded for quality assure

## Benefits

- The installer only needs to develop one source for products
- Reduce your vendors
- Controlled and consistent quality of steel grades provide easy welding
- Protection of tube ends and ID from environments contamination
- Ensure a high integrity system with Parker tubing and fittings
- Superior performance in a wide variety of system applications, temperatures and pressures
- Suitable for clean environment application
- Easy to identify brand and tubing specifications along the full length of the tubing

# Technical Specification

## Chemical Composition

Elements	Cr	Ni	Mo	Mn	Si	C	S	P
ASTM A269	16-18%	10-15%	2.0-3.0%	2.0 max	0.75 max	0.035 max	0.03 max	0.04 max
High Mo > 2.5%	16-18%	10-15%	2.5-3.0%	2.0 max	0.75 max	0.03 max	0.03 max	0.04 max

### Material Standards:

Grade: 316L  
UNS: S31603  
ASTM: A213/A269  
ASME: SA213



### Term Definition:

CR: Cold Rolled  
CD: Cold Drawn  
Nominal Length: 6 meters/EA

### Finish Hardness:

≤90HRB



## Option Material Tubing

Any other special such as 321, 321H, 304, 304L, 317, 904L, 6Mo, 825 and 625 etc. material tubing, please contact Parker Instrumentation Sales Department.



# Dimension

## ASTM A269 Tubing

Tube O.D. inch	Nominal Wall Thickness inch	ASTM A269 Tubing Ordering Number		Weight kg/m
		Cold Rolled Tubing	Cold Drawn Tubing	
1/8"	0.028"	TUBE 1/8X.028-316L-CR	TUBE 1/8X.028-316L-CD	0.04
1/4"	0.028"	TUBE 1/4X.028-316L-CR	TUBE 1/4X.028-316L-CD	0.10
	0.035"	TUBE 1/4X.035-316L-CR	TUBE 1/4X.035-316L-CD	0.12
	0.049"	TUBE 1/4X.049-316L-CR	TUBE 1/4X.049-316L-CD	0.16
	0.065"	TUBE 1/4X.065-316L-CR	TUBE 1/4X.065-316L-CD	0.19
3/8"	0.035"	TUBE 3/8X.035-316L-CR	TUBE 3/8X.035-316L-CD	0.19
	0.049"	TUBE 3/8X.049-316L-CR	TUBE 3/8X.049-316L-CD	0.26
	0.065"	TUBE 3/8X.065-316L-CR	TUBE 3/8X.065-316L-CD	0.32
	0.083"	TUBE 3/8X.083-316L-CR	TUBE 3/8X.083-316L-CD	0.39
	0.095"	TUBE 3/8X.095-316L-CR	TUBE 3/8X.095-316L-CD	0.43
1/2"	0.035"	TUBE 1/2X.035-316L-CR	TUBE 1/2X.035-316L-CD	0.26
	0.049"	TUBE 1/2X.049-316L-CR	TUBE 1/2X.049-316L-CD	0.36
	0.065"	TUBE 1/2X.065-316L-CR	TUBE 1/2X.065-316L-CD	0.46
	0.083"	TUBE 1/2X.083-316L-CR	TUBE 1/2X.083-316L-CD	0.56
3/4"	0.049"	TUBE 3/4X.049-316L-CR	TUBE 3/4X.049-316L-CD	0.55
	0.065"	TUBE 3/4X.065-316L-CR	TUBE 3/4X.065-316L-CD	0.72
	0.083"	TUBE 3/4X.083-316L-CR	TUBE 3/4X.083-316L-CD	0.89
	0.095"	TUBE 3/4X.095-316L-CR	TUBE 3/4X.095-316L-CD	1.00
	0.105"	TUBE 3/4X.105-316L-CR	TUBE 3/4X.105-316L-CD	1.09
1"	0.109"	TUBE 3/4X.109-316L-CR	TUBE 3/4X.109-316L-CD	1.13
	0.065"	TUBE 1X.065-316L-CR	TUBE 1X.065-316L-CD	0.98
	0.083"	TUBE 1X.083-316L-CR	TUBE 1X.083-316L-CD	1.23
1-1/4"	0.095"	TUBE 1X.095-316L-CR	TUBE 1X.095-316L-CD	1.39
	0.12"	TUBE 1-1/4X.12-316L-CR	TUBE 1-1/4X.12-316L-CD	2.19
1-1/2"	0.134"	TUBE 1-1/4X.134-316L-CR	TUBE 1-1/4X.134-316L-CD	2.41
	0.12"	TUBE 1-1/2X.12-316L-CR	TUBE 1-1/2X.12-316L-CD	2.67
	0.134"	TUBE 1-1/2X.134-316L-CR	TUBE 1-1/2X.134-316L-CD	2.95

Tube O.D. mm	Nominal Wall Thickness mm	ASTM A269 Tubing Ordering Number		Weight kg/m
		Cold Rolled Tubing	Cold Drawn Tubing	
3	0.71	TUBE 3MMX0.71-316L-CR	TUBE 3MMX0.71-316L-CD	0.04
4	1.00	TUBE 4MMX1.0-316L-CR	TUBE 4MMX1.0-316L-CD	0.08
6	0.75	TUBE 6MMX0.75-316L-CR	TUBE 6MMX0.75-316L-CD	0.10
	1.00	TUBE 6MMX1.0-316L-CR	TUBE 6MMX1.0-316L-CD	0.13
8	1.50	TUBE 6MMX1.5-316L-CR	TUBE 6MMX1.5-316L-CD	0.17
	1.00	TUBE 8MMX1.0-316L-CR	TUBE 8MMX1.0-316L-CD	0.18
10	1.50	TUBE 8MMX1.5-316L-CR	TUBE 8MMX1.5-316L-CD	0.24
	1.00	TUBE 10MMX1.0-316L-CR	TUBE 10MMX1.0-316L-CD	0.23
	1.50	TUBE 10MMX1.5-316L-CR	TUBE 10MMX1.5-316L-CD	0.32
12	2.00	TUBE 10MMX2.0-316L-CR	TUBE 10MMX2.0-316L-CD	0.40
	3.00	TUBE 10MMX3.0-316L-CR	TUBE 10MMX3.0-316L-CD	0.53
	1.00	TUBE 12MMX1.0-316L-CR	TUBE 12MMX1.0-316L-CD	0.28
	1.50	TUBE 12MMX1.5-316L-CR	TUBE 12MMX1.5-316L-CD	0.39
14	2.00	TUBE 12MMX2.0-316L-CR	TUBE 12MMX2.0-316L-CD	0.50
	2.50	TUBE 12MMX2.5-316L-CR	TUBE 12MMX2.5-316L-CD	0.59
	2.00	TUBE 14MMX2.0-316L-CR	TUBE 14MMX2.0-316L-CD	0.60
	2.50	TUBE 14MMX2.5-316L-CR	TUBE 14MMX2.5-316L-CD	0.72
15	3.00	TUBE 14MMX3.0-316L-CR	TUBE 14MMX3.0-316L-CD	0.83
	3.50	TUBE 14MMX3.5-316L-CR	TUBE 14MMX3.5-316L-CD	0.92
	4.00	TUBE 14MMX4.0-316L-CR	TUBE 14MMX4.0-316L-CD	1.00
	1.00	TUBE 15MMX1.0-316L-CR	TUBE 15MMX1.0-316L-CD	0.35
16	1.50	TUBE 15MMX1.5-316L-CR	TUBE 15MMX1.5-316L-CD	0.51
	1.80	TUBE 15MMX1.8-316L-CR	TUBE 15MMX1.8-316L-CD	0.59
18	1.50	TUBE 16MMX1.5-316L-CR	TUBE 16MMX1.5-316L-CD	0.54
	2.00	TUBE 16MMX2.0-316L-CR	TUBE 16MMX2.0-316L-CD	0.70
	2.50	TUBE 16MMX2.5-316L-CR	TUBE 16MMX2.5-316L-CD	0.84
20	1.50	TUBE 18MMX1.5-316L-CR	TUBE 18MMX1.5-316L-CD	0.62
	2.00	TUBE 18MMX2.0-316L-CR	TUBE 18MMX2.0-316L-CD	0.80
	2.20	TUBE 18MMX2.2-316L-CR	TUBE 18MMX2.2-316L-CD	0.87
	2.50	TUBE 18MMX2.5-316L-CR	TUBE 18MMX2.5-316L-CD	0.97
20	3.00	TUBE 18MMX3.0-316L-CR	TUBE 18MMX3.0-316L-CD	1.13
	2.00	TUBE 20MMX2.0-316L-CR	TUBE 20MMX2.0-316L-CD	0.90
	2.50	TUBE 20MMX2.5-316L-CR	TUBE 20MMX2.5-316L-CD	1.09
	3.00	TUBE 20MMX3.0-316L-CR	TUBE 20MMX3.0-316L-CD	1.28



Tube O.D. mm	Nominal Wall Thickness mm	ASTM A269 Tubing Ordering Number		Weight kg/m
		Cold Rolled Tubing	Cold Drawn Tubing	
22	2.00	TUBE 22MMX2.0-316L-CR	TUBE 22MMX2.0-316L-CD	1.00
	2.80	TUBE 22MMX2.8-316L-CR	TUBE 22MMX2.8-316L-CD	1.34
	3.50	TUBE 22MMX3.5-316L-CR	TUBE 22MMX3.5-316L-CD	1.62
	4.00	TUBE 22MMX4.0-316L-CR	TUBE 22MMX4.0-316L-CD	1.80
25	2.00	TUBE 25MMX2.0-316L-CR	TUBE 25MMX2.0-316L-CD	1.15
	2.50	TUBE 25MMX2.5-316L-CR	TUBE 25MMX2.5-316L-CD	1.41
	3.00	TUBE 25MMX3.0-316L-CR	TUBE 25MMX3.0-316L-CD	1.65
28	2.00	TUBE 28MMX2.0-316L-CR	TUBE 28MMX2.0-316L-CD	1.30
	2.50	TUBE 28MMX2.5-316L-CR	TUBE 28MMX2.5-316L-CD	1.59
	3.50	TUBE 28MMX3.5-316L-CR	TUBE 28MMX3.5-316L-CD	2.14
	4.00	TUBE 28MMX4.0-316L-CR	TUBE 28MMX4.0-316L-CD	2.40

### High Molybdenum Tubing

Tube O.D. inch	Nominal Wall Thickness inch	High Molybdenum Tubing Ordering Number		Weight kg/m
		Cold Rolled Tubing	Cold Drawn Tubing	
1/8"	0.028"	TUBE1/8x.028-SSCRMO2.5	TUBE1/8x.028-SSCDMO2.5	0.04
3/16"	0.028"	TUBE3/16x.028-SSCRMO2.5	TUBE3/16x.028-SSCDMO2.5	0.07
1/4"	0.035"	TUBE1/4x.035-SSCRMO2.5	TUBE1/4x.035-SSCDMO2.5	0.12
	0.049"	TUBE1/4x.049-SSCRMO2.5	TUBE1/4x.049-SSCDMO2.5	0.16
	0.065"	TUBE1/4x.065-SSCRMO2.5	TUBE1/4x.065-SSCDMO2.5	0.19
3/8"	0.035"	TUBE3/8x.035-SSCRMO2.5	TUBE3/8x.035-SSCDMO2.5	0.19
	0.049"	TUBE3/8x.049-SSCRMO2.5	TUBE3/8x.049-SSCDMO2.5	0.26
	0.065"	TUBE3/8x.065-SSCRMO2.5	TUBE3/8x.065-SSCDMO2.5	0.32
1/2"	0.035"	TUBE1/2x.035-SSCRMO2.5	TUBE1/2x.035-SSCDMO2.5	0.26
	0.049"	TUBE1/2x.049-SSCRMO2.5	TUBE1/2x.049-SSCDMO2.5	0.36
	0.065"	TUBE1/2x.065-SSCRMO2.5	TUBE1/2x.065-SSCDMO2.5	0.46
	0.083"	TUBE1/2x.083-SSCRMO2.5	TUBE1/2x.083-SSCDMO2.5	0.56
3/4"	0.049"	TUBE3/4x.049-SSCRMO2.5	TUBE3/4x.049-SSCDMO2.5	0.55
	0.065"	TUBE3/4x.065-SSCRMO2.5	TUBE3/4x.065-SSCDMO2.5	0.72
	0.083"	TUBE3/4x.083-SSCRMO2.5	TUBE3/4x.083-SSCDMO2.5	0.89
	0.095"	TUBE3/4x.095-SSCRMO2.5	TUBE3/4x.095-SSCDMO2.5	1.00
	0.105"	TUBE3/4x.105-SSCRMO2.5	TUBE3/4x.105-SSCDMO2.5	1.09
1"	0.049"	TUBE1x.049-SSCRMO2.5	TUBE1x.049-SSCDMO2.5	0.75
	0.065"	TUBE1x.065-SSCRMO2.5	TUBE1x.065-SSCDMO2.5	0.98
	0.083"	TUBE1x.083-SSCRMO2.5	TUBE1x.083-SSCDMO2.5	1.23
	0.105"	TUBE1x.105-SSCRMO2.5	TUBE1x.105-SSCDMO2.5	1.52
	0.125"	TUBE1x.125-SSCRMO2.5	TUBE1x.125-SSCDMO2.5	1.76
1-1/4"	0.065"	TUBE1-1/4x.065-SSCRMO2.5	TUBE1-1/4x.065-SSCDMO2.5	1.24
	0.083"	TUBE1-1/4x.083-SSCRMO2.5	TUBE1-1/4x.083-SSCDMO2.5	1.56
1-1/2"	0.083"	TUBE1-1/2x.083-SSCRMO2.5	TUBE1-1/2x.083-SSCDMO2.5	1.90
	0.095"	TUBE1-1/2x.095-SSCRMO2.5	TUBE1-1/2x.095-SSCDMO2.5	2.15
	0.109"	TUBE1-1/2x.109-SSCRMO2.5	TUBE1-1/2x.109-SSCDMO2.5	2.45

Tube O.D. mm	Nominal Wall Thickness mm	High Molybdenum Tubing Ordering Number		Weight kg/m
		Cold Rolled Tubing	Cold Drawn Tubing	
3	0.71	TUBE3MMX0.71-SSCRMO2.5	TUBE3MMX0.71-SSCDMO2.5	0.04
6	1.00	TUBE6MMX1.0-SSCRMO2.5	TUBE6MMX1.0-SSCDMO2.5	0.13
	1.50	TUBE6MMX1.5-SSCRMO2.5	TUBE6MMX1.5-SSCDMO2.5	0.17
8	1.00	TUBE8MMX1.0-SSCRMO2.5	TUBE8MMX1.0-SSCDMO2.5	0.18
	1.50	TUBE8MMX1.5-SSCRMO2.5	TUBE8MMX1.5-SSCDMO2.5	0.24
10	1.00	TUBE10MMX1.0-SSCRMO2.5	TUBE10MMX1.0-SSCDMO2.5	0.23
	1.50	TUBE10MMX1.5-SSCRMO2.5	TUBE10MMX1.5-SSCDMO2.5	0.32
12	1.00	TUBE12MMX1.0-SSCRMO2.5	TUBE12MMX1.0-SSCDMO2.5	0.28
	1.50	TUBE12MMX1.5-SSCRMO2.5	TUBE12MMX1.5-SSCDMO2.5	0.39
	2.00	TUBE12MMX2.0-SSCRMO2.5	TUBE12MMX2.0-SSCDMO2.5	0.50
	2.50	TUBE12MMX2.5-SSCRMO2.5	TUBE12MMX2.5-SSCDMO2.5	0.59
14	2.00	TUBE14MMX2.0-SSCRMO2.5	TUBE14MMX2.0-SSCDMO2.5	0.60
	2.50	TUBE14MMX2.5-SSCRMO2.5	TUBE14MMX2.5-SSCDMO2.5	0.72
16	1.50	TUBE16MMX1.5-SSCRMO2.5	TUBE16MMX1.5-SSCDMO2.5	0.54
	2.00	TUBE16MMX2.0-SSCRMO2.5	TUBE16MMX2.0-SSCDMO2.5	0.70
18	1.50	TUBE18MMX1.5-SSCRMO2.5	TUBE18MMX1.5-SSCDMO2.5	0.62
	2.00	TUBE18MMX2.0-SSCRMO2.5	TUBE18MMX2.0-SSCDMO2.5	0.80
20	2.00	TUBE20MMX2.0-SSCRMO2.5	TUBE20MMX2.0-SSCDMO2.5	0.90
22	2.00	TUBE22MMX2.0-SSCRMO2.5	TUBE22MMX2.0-SSCDMO2.5	1.00
25	2.00	TUBE25MMX2.0-SSCRMO2.5	TUBE25MMX2.0-SSCDMO2.5	1.15
	2.50	TUBE25MMX2.5-SSCRMO2.5	TUBE25MMX2.5-SSCDMO2.5	1.41

Remarks: For big size (1 1/2" - 2") or thick wall tubing, pls consult with Parker upon your request

## Dimensional Tolerances

Tolerances according to ASTM A213/A269/A632

Product	Size	Tolerances OD mm	Tolerances Length mm	Tolerance Wall Thickness %
CR Tubing	1/8"-1 1/2"	±0.08 mm	0-3.00mm	±10
	3 mm - 28 mm	±0.08 mm	0-3.00mm	±10
CD Tubing	1/8"-1 1/2"	±0.10 mm	0-3.00mm	±10
	3 mm – 28 mm	±0.10 mm	0-3.00mm	±10

## Cleaning and Packaging

Product	Size
CR Tubing	20 uin (0.5 um) Ra Max
CD Tubing	Standard Finish ( Reference ASTM A269 )

All of Tubing ends are protected with polyethylene caps.

CR Tubing is packed in single polyethylene, heat-sealed bags.

CD Tubing is also packed in single polyethylene, heat-sealed bags.

## Instrument Tubing Selection Guide

Maximum Allowable Working Pressure Rating Table In Psi Unit

316L STAINLESS STEEL (Seamless)																
Tube O.D. Size	Wall Thickness															
	0.010	0.012	0.014	0.016	0.020	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120	0.134	0.156	0.188
1/16"	5600	6900	8200	9500	12100	16800										
1/8"						8600	10900									
3/16"						5500	7000	10300								
1/4"						4000	5100	7500	10300							
5/16"							4100	5900	8100							
3/8"							3300	4800	6600							
1/2"							2600	3700	5100	6700						
5/8"								3000	4000	5200	6100					
3/4"								2400	3300	4300	5000	5800				
7/8"								2100	2800	3600	4200	4900				
1"									2400	3200	3700	4200	4700			
1-1/4"										2500	2900	3300	3700	4100	4900	
1-1/2"											2400	2700	3000	3400	4000	4500
2"												2000	2200	2500	2900	3200

Remark: Ratings in gray not suitable for gas service.

## How To Order

### 1、ASTM A269 Tubing

TUBE     1/8X.028   -316L   -CR  
↑            ↑            ↑            ↑  
Tubing    OD x WT    Material   Cold Rolled

### 2、High Molybdenum Tubing

TUBE   25MMX2.5   -SS   CD            MO2.5  
↑            ↑            ↑            ↑            ↑  
Tubing    OD x WT    Material   Cold Drawn   High Molybdenum



### **WARNING**

FAILURE, IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

### **Offer of Sale**

The items described in this document are available for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. Any sale contract entered into by Parker will be governed by the provisions stated in Parker's standard terms and conditions of sale (copy available upon request).





# Putting it all together

Parker has the fittings, tools, and training to help reduce the risk of system leaks.

## The Fittings

Four flareless fitting innovations allow users to make tubing connections faster, smarter, cleaner, and safer; with improvements ranging from lower bill of material costs and faster assembly to fewer potential leak paths, lower emissions, and longer life.



- **A-LOK®**: A twin-ferrule compression fitting that dominates low-pressure applications up to 6,000 psi (414 Bar), aided by the unique anti-corrosion performance of its Suparcase®-treated ferrule.



- **CPI™**: Delivers a single-ferrule version (Suparcase®-treated) of the industry standard twin-ferrule fitting, reducing potential leak paths.



- **MPI™**: Brings the Suparcase®-treated ferrule compression assembly principle to medium pressures, providing a time- and cost-saving alternative to cone and thread fittings for applications up to 15,000 psi (1034 bar).

- **Phastite®**: A ferrule-less, push-fit connector that can be used in applications up to 20,000 psi (1380 bar). Its innovative design concept combines quick installation with a simple assembly process.

**See our Tube Fittings Cat4230/4233 for more information.**



## The Tubing Tools

Parker offers a comprehensive selection of hand-operated tools for fabricating small bore tubing tools. Available for a broad spectrum of instrumentation tubing sizes, the tools include seven heavy-duty tube benders, a cutter, a deburrer tool, a sawing vise with an integral hacksaw guide, and inspection gauges. The tools are key to reliable, leak-free assembly, easily providing accurate, tight radius bends of up to

180 degrees on soft copper, aluminum, brass, steel, and stainless steel tubing.

**See our Tube Fabricating Equipment Cat 4290 for more information.**



## The Training

Parker's Tube Fabrication Training Seminar can teach anybody the right way to measure, cut, and bend tubing. The class is designed to demonstrate the proper method of installing tube fittings in various system applications. Attendees will learn the right way to measure, cut, and bend tubing, as well as the correct tube fitting make-up and remake procedures. Plus all attendees will receive a free training guide.

**See our Tube Fitting installation manual Bul 4200-B4 for more information.**

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**Parker Hannifin Instrumentation**



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