

2001

STAINLESS STEEL AND EXOTIC ALLOY PRODUCTS

*Most orders shipped
within 24 HOURS!
ex-USA
Transit ~10days
Import > Australia
Min ORDER AUD100*



STOCK TUBING



CUSTOM TUBING



CUT & DEBURRED TUBING



FITTINGS & VALVES



NEEDLES & SYRINGES



SPECIALTY TOOLS



MICRO-MACHINED PARTS



CUSTOM COMPONENTS



CUSTOM ASSEMBLIES



CUSTOM TUBING



MICRO-MACHINED PARTS



FITTINGS & VALVES

Tubing

Abrasive Bead Blasting
Abrasive Slurry
Cut-Off & Deburr, Laser
Deburring, Electrochemical
Drawing
EDM, Ram
EDM, Wire
Electropolishing
Etching, Chemical
Grinding, Centerless
Grinding, Centerless CNC
Honing
Hydrogen Furnace
Knurling, Laser
Machining, General
Passivating
Perforating
Pipe
Polishing, Belt
Sawing, Abrasive
Sawing, Cold (Milling)
Sawing, Electrochemical
Sawing, High Speed Carbide
Straightening
Tubing, Beverage
Tubing, Cable Crimp
Tubing, Capillary
Tubing, Carbide
Tubing, Catheter
Tubing, Chromatographic
Tubing, Custom
Tubing, Cut & Deburred
Tubing, Fractional
Tubing, Hypodermic
Tubing, Layered
Tubing, Manufactured Types
Tubing, Medical
Tubing, Metric
Tubing, Multi-lumen
Tubing, Round
Tubing, Shaped
Tubing, Specifications
Tubing, Stent
Tubing, Surplus
Tubing, Telescoping
Tubing, Tolerances
Tumbling, Vibratory & Barrel
Turning, CNC
Vacuum Stress Relieving

Custom Products

Assemblies, Aircraft & Aerospace
Assemblies, Bellows
Assemblies, Carbide
Assemblies, Exotic Alloys
Assemblies, Medical & Dental
Assemblies, Stainless Steel
Assemblies, Titanium
Assemblies, Tubing
Bellows, Metal
Belts, Metal
Blades, Surgical
Blades, Tubular
Bone Screws
Catheters & Stents
Fasteners
Fittings, Miniature
Fittings, Tubular
Machined Springs
Manifolds, Miniature
Medical Devices
Needles
Perforated Tubing
Shaft Couplings
Stamping & Punching
Tubing Components
Tubing Components
Valves, Miniature
Wire Forms

Contract Services

Brazing & Soldering

Hydrogen Furnace
Induction
Micro-Torch
Vacuum Furnace

Cut-Off & Deburring

Abrasive Bead Blasting
Cut-Off & Deburr, Laser
Deburring, Abrasive Slurry
Deburring, Electrochemical
EDM, Ram
EDM, Wire
Electropolishing
Sawing, Abrasive
Sawing, Cold (Milling)
Sawing, Electrochemical
Sawing, High Speed Carbide
Tumbling, Vibratory & Barrel
Turning, CNC

Drawing & Straightening

Drawing
Bright Annealing
Straightening

Engineering & Quality

Design Review
Inspection
Project Management
Quality Control
Registrations, ISO & FDA
SPC
Testing, Metallurgy
Testing, Pressure
Testing, Tensile
Tooling

Finishing

Abrasive Bead Blasting
Cleaning, Catheter
Cleaning, Filtered Ultrasonic
Electropolishing
Etching, Chemical
Laser Engraving
Packaging
Passivating
Pyrolyzation
Tumbling, Vibratory & Barrel

Grinding & Polishing

Electropolishing
Grinding, Centerless
Grinding, Centerless CNC
Grinding, CNC
Honing
Needles
Polishing, Belt
Surgical Blades

Heat Treating

Hydrogen Furnace
Induction Heating
Vacuum Oven

Specialty Tools

Benders

Blades, Cut-Off Saw
Brushes, Deburring
Brushes, Hand, Stainless Steel
Brushes, Stem, Abrasive
Brushes, Stem, Miniature
Brushes, Stem, Stainless Steel
Brushes, Wheel, Abrasive
Brushes, Wheel, Stainless Steel
Flexhone® Flexible Hones
Lubricants
Saws, Cut-Off

Machining, CNC

EDM, CNC Ram
EDM, CNC Wire
Grinding, CNC
Laser, CNC
Milling, CNC
Prototyping, CNC
Turning, CNC

Machining, Electrochemical

Deburring, Electrochemical
EDM, Ram
EDM, Wire
Electropolishing
Grinding, Electrochemical
Sawing, Electrochemical

Machining, General

Prototype
Production

Machining, Laser

Cut-Off & Deburr, Laser
Cutting, Laser
Drilling, Laser
Knurling, Laser
Machining, Laser

Perforating, Metals

Cutting, Laser
Etching, Photo
Perforating, Tubing
Punching
Ram EDM
Stamping

Stamping & Punching

Cutting, Laser
Foil & Sheet, Perforated
Products, Foil & Sheet

Surface Abrading

Abrasive Bead Blasting
Etching, Chemical
Knurling, Laser

Tube Forming

Closures
End Forming
Flaring, Tube
Roll Forming
Swaging
Tube Bending
Tube Forming

Welding

Welding, Laser
Welding, MIG
Welding, Plasma
Welding, Resistance (Spot)
Welding, TIG

Fluid Handling

Dispensing Bottles
Dispensing Needles
Dispensing Tips
Fittings, Medical
Fittings, Miniature
Fittings, Tubular
Fittings, Tubular
Inspection Gages, Luer
Manifolds, Miniature
Pumps
Syringes, Glass
Syringes, Plastic
Valves, Miniature

General Information

Five Reasons to Buy From US !

It's All About Speed – Advantage from OUR USA OEM

Speed 1. Greatest Selection

Save time by sourcing through our inventory of over 5 million feet of standard and special size tubing including many configurations of fittings and valves and unique small tools.

Speed 2. Immediate Quoting

Fast quoting over the phone or online. Quick turnaround time on quotes for customs.

Speed 3. Knowledgeable Staff/Great Service and Support

Our Account Representatives and Sales Engineers are tubing experts with years of hands-on experience. They'll be happy to assist you with your needs. Our Customer Service Representatives are always available to help you with any questions or concerns regarding your order.

Speed 4. Four Easy Ways to Pay

1. If you don't already have an account, your Sales Representative can usually qualify you within minutes to set up a N30 account.
2. Credit cards are accepted; MasterCard, VISA, Discover, American Express.
3. C.O.D.
4. Letter of Credit for our international accounts.

Speed 5. Fast Delivery

With our US OEM large inventory and manufacturing facility, We can deliver A most items promptly to help meet your needs. Imports into Australia within 10-14days from Date of PO & Payment!



Stainless Steel Tubing

5



Stainless Steel TubeKITS

13



Custom Small Diameter Tubing

17



100% Burr-Free Cutting

19



Precision Manufacturing Services

21



Stainless Steel Tube & Hose Fittings

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Miniature Fittings

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Miniature Valves

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Dispensing Products

49



Specialty Small Tools

53

Terms and Conditions

1) Payment Terms: Net with PurchaseOrder. A finance charge of 1 1/2% per month (18% annum) will be charged on ANY past due accounts. Statements will not be mailed unless an account is past due when a finance charge will apply.

2) Freight: All shipments are FOB Melbourne.

3) Industry Standard

4) Returned Goods Policy: Returned merchandise is accepted up to 30 days only after purchase and is subject to a 25% restocking charge, plus freight costs. Returns cannot be accepted without a Return Materials Authorization number which can be obtained from your sales representative. MicroGroup reserves the right to require proof of purchase prior to authorization for returns by requesting invoice copies.

5) Specials/Customs: No customs or specials will commence work without confirming order and associated documentation. Orders for specials for customs may be subject to a non-refundable deposit or payment in advance. Orders for special items are not subject to cancellation unless we are reimbursed for costs incurred. No specials may be returned.

6) Minimum Order: A minimum order of \$100.00 net per order is required,

7) Credit Terms: All new accounts must supply financial and credit references if an open account is desired. Other options include check in advance, C.O.D. or credit card orders.

8) Certifications of Material: Certifications are not automatically provided and orders will be shipped without certifications unless otherwise requested by the customer at the time of the order.

All orders are contingent upon availability to secure raw materials and services. No changes will be made without written confirmation and associated documentation and are subject to rescheduling. Prices and terms are subject to change without notice. An Equal Opportunity Employer.

Online Pricing & Ordering

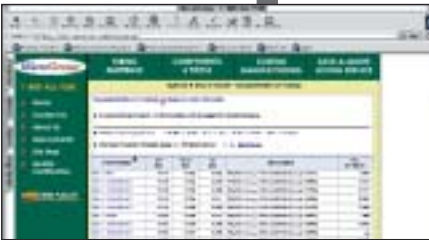
Stock Tubing



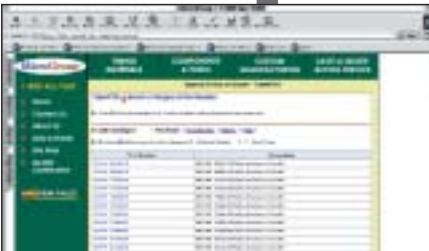
Prototype Tubing



Surplus Tubing



Custom Tubing



Cut Tubing



Custom

Products



Contract

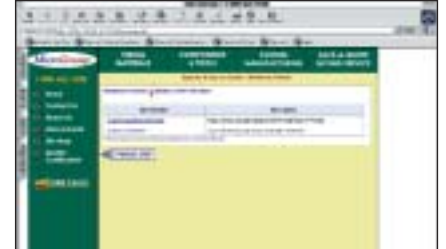
Services



Fittings



Valves



Syringes



Needles



Specialty Tools



Online Prices
Online Ordering
Online Fitting

Stainless Steel Tubing - In Stock

Fast Turnaround!

*Most orders shipped
within 24 HOURS!
ex-USA
Transit ~10days
Import > Australia
Min ORDER AUD100*

◀ HYPODERMIC

◀ FRACTIONAL

◀ METRIC

◀ MEDICAL

◀ PIPE

◀ ODD-LOT



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About Tubing



The ITEM CODE was initially developed to enable our employees and computer systems to accurately specify and control the ALL-TUBE inventory. It has been so successful that we will use it as an outline. Please use the "Item Code" where possible.

Material:

Specifying "Material" is mandatory and can contain any number of digits (text and/or numeric) between one (1) and four (4).

Dash (-):

Dash (-) is mandatory at this position.

Category:

Specifying "Category" is mandatory and must contain one (1) text digit.

Tolerance Level:

"Tolerance Level" is optional, but can have only one (1) numeric digit.

Dash (-):

Dash (-) is mandatory at this position.

Nominal OD:

Specifying "OD" (outside diameter) is mandatory and must contain between one (1) and five (5) numeric digits and decimals if required.

By sign (x):

Inclusion of a "by sign" (x) is mandatory at this position.

Nominal Wall:

Specifying "Wall" is mandatory and must contain between one (1) and four (4) numeric digits and decimals, if required.

Dash (-):

Inclusion of a dash (-) is mandatory at this position.

Manufactured Type:

"Manufactured Type" is mandatory and can have two (2) text digits.

Dash (-):

Dash (-) is mandatory at this position.

Specification Type:

"Specification Type" is optional, but can have only one (1) numeric digit.

Dash (-):

Dash (-) is mandatory at this position.

Temper:

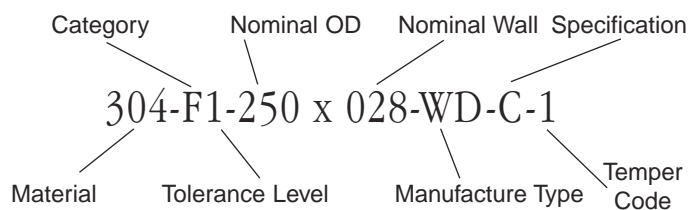
"Temper" is optional, but if used, must contain only one (1) numeric digit.

Note:

A complete explanation of these specifications and considerations not included in the ALL-TUBE Standard Item Code, are listed in our full-line catalog and at www.alltube.com.

Item Code Example

The following example is a guideline to assist you in the ordering process. Your MicroGroup representative can help you further with this process if necessary.



Tubing can be Provided in the Following Configurations

Random Lengths:

2' to 20' unless otherwise specified.

Straight Lengths:

20' straight lengths generally available, 40' maximum.

Coils:

Coils of 5,000 feet or more can be produced in welded and seamless.

Cut-Off:

Commercial practice on Cut-Off tubing does NOT include deburring.

Cut and Deburred:

Commercial practice includes burr-free ends.

* 24 hour delivery is contingent upon materials availability.

T304

Stock Hypodermic Tubing

T316

Description: Often referred to as "seamless" because of its smooth appearance, hypo tubing is manufactured, welded and drawn to tight O.D. and I.D. tolerances. Stocked in grades 304 & 316 stainless steel in the full hard condition.

Application: Ideal for medical and industrial components that require strength, uniformity, and corrosion resistance. Not manufactured for pressure service. Wide selection, economical and quick delivery.

Gage Size	OD Nom	Wall Nom	ID Nom	GGN 196	OD Max/Min	ID Max/Min	T304 Item #	T316 Item #
6RW	.2030	.015	.173	-	.2040/.2020	.1760/.1700	304H-6RW	316H-6RW
6TW	.2030	.010	.183	-	.2040/.2020	.1850/.1810	304H-6TW	316H-6TW
6X	.2030	.007	.189	-	.2040/.2020	.1910/.1870	304H-6X	
6.5	.1880	.010	.168	-	.1890/.1870	.1710/.1650	304H-6.5	
7RW	.1800	.015	.150	-	.1810/.1790	.1530/.1470	304H-7RW	316H-7RW
7TW	.1800	.010	.160	-	.1810/.1790	.1620/.1580	304H-7TW	
7X	.1800	.007	.166	-	.1810/.1790	.1680/.1640	304H-7X	
7XX	.1800	.004	.173	-	.1810/.1790	.1740/.1720	304H-7XX	
7.5	.1720	.011	.150	-	.1730/.1710	.1530/.1470	304H-7.5	
8RW	.1650	.015	.135	-	.1660/.1640	.1380/.1320	304H-8RW	316H-8RW
8TW	.1650	.010	.145	-	.1660/.1640	.1470/.1430	304H-8TW	
8XX	.1650	.007	.150	-	.1660/.1640	.1530/.1475	304H-8XX	
8.5	.1560	.010	.136	-	.1570/.1550	.1390/.1330	304H-8.5	
9RW	.1480	.015	.118	-	.1490/.1470	.1210/.1150	304H-9RW	316H-9RW
9TW	.1480	.010	.128	-	.1490/.1470	.1300/.1260	304H-9TW	316H-9TW
9XX	.1480	.006	.135	-	.1490/.1470	.1370/.1330	304H-9XX	
9.5	.1410	.011	.119	-	.1420/.1400	.1210/.1170	304H-9.5	
10RW	.1340	.014	.106	-	.1350/.1330	.1080/.1040	304H-10RW	316H-10RW
10TW	.1340	.010	.114	-	.1350/.1330	.1160/.1120	304H-10TW	316H-10TW
10X	.1340	.008	.118	-	.1350/.1330	.1200/.1165	304H-10X	
10.5	.1260	.010	.106	-	.1270/.1250	.1080/.1040	304H-10.5	
11RW	.1200	.013	.094	-	.1210/.1190	.0960/.0920	304H-11RW	316H-11RW
11TW	.1200	.010	.100	-	.1210/.1190	.1020/.0980	304H-11TW	316H-11TW
11X	.1200	.007	.106	-	.1210/.1190	.1080/.1040	304H-11X	
11XX	.1200	.004	.112	-	.1210/.1190	.1140/.1100	304H-11XX	
11.5	.1150	.010	.095	-	.1160/.1140	.0960/.0930	304H-11.5	
12H	.1090	.016	.077	-	.1100/.1080	.0790/.0750	304H-12H	
12RW	.1090	.012	.085	-	.1100/.1080	.0870/.0830	304H-12RW	316H-12RW
12TW	.1090	.009	.091	-	.1100/.1080	.0930/.0890	304H-12TW	316H-12TW
12X	.1090	.006	.097	-	.1100/.1080	.0990/.0950	304H-12X	
12XX	.1090	.005	.100	-	.1100/.1080	.1010/.0990	304H-12XX	
12.5	.1000	.009	.082	-	.1010/.0990	.0840/.0800	304H-12.5	
13RW	.0950	.012	.071	Y	.0960/.0940	.0730/.0690	304H-13RW	316H-13RW
13TW	.0950	.009	.077	-	.0960/.0940	.0790/.0750	304H-13TW	316H-13TW
13X	.0950	.005	.085	-	.0960/.0940	.0860/.0840	304H-13X	
13XX	.0950	.003	.090	-	.0960/.0940	.0910/.0890	304H-13XX	
13.5	.0890	.009	.071	-	.0900/.0880	.0730/.0690	304H-13.5	
14XH	.0830	.022	.039	-	.0840/.0820	.0410/.0370	304H-14XH	
14H	.0830	.017	.049	-	.0840/.0820	.0510/.0470	304H-14H	
14RW	.0830	.010	.063	Y	.0840/.0820	.0650/.0610	304H-14RW	316H-14RW
14M	.0830	.008	.068	-	.0840/.0820	.0690/.0660	304H-14M	
14TW	.0830	.006	.072	-	.0840/.0820	.0730/.0700	304H-14TW	316H-14TW
14XX	.0830	.003	.077	-	.0840/.0820	.0780/.0760	304H-14XX	
14.5	.0780	.008	.063	-	.0790/.0770	.0640/.0620	304H-14.5	
15RW	.0720	.009	.054	Y	.0725/.0715	.0555/.0525	304H-15RW	316H-15RW
15TW	.0720	.006	.060	-	.0725/.0715	.0615/.0585	304H-15TW	316H-15TW
15X	.0720	.005	.063	-	.0725/.0715	.0640/.0620	304H-15X	
15H	.0720	.011	.050	-	.0725/.0715	.0520/.0480	304H-15H	
15.5	.0680	.007	.054	-	.0685/.0675	.0555/.0525	304H-15.5	
16RW	.0650	.009	.047	Y	.0655/.0645	.0485/.0455	304H-16RW	316H-16RW
16TW	.0650	.006	.053	-	.0655/.0645	.0545/.0515	304H-16TW	316H-16TW
16X	.0650	.004	.057	-	.0655/.0645	.0580/.0550	304H-16X	
16XX	.0650	.003	.060	-	.0655/.0645	.0610/.0585	304H-16XX	
16H	.0650	.016	.033	-	.0655/.0645	.0350/.0310	304H-16H	316H-16H
16.5	.0620	.005	.052	-	.0625/.0615	.0535/.0505	304H-16.5	316H-16.5
17RW	.0590	.009	.041	Y	.0595/.0585	.0425/.0395	304H-17RW	316H-17RW
17TW	.0590	.007	.046	-	.0595/.0585	.0475/.0445	304H-17TW	316H-17TW

Gage Size	OD Nom	Wall Nom	ID Nom	GGN 196	OD Max/Min	ID Max/Min	T304 Item #	T316 Item #
17X	.0590	.004	.052	-	.0595/.0585	.0530/.0510	304H-17X	
17XX	.0590	.002	.054	-	.0595/.0585	.0550/.0535	304H-17XX	
17S	.0580	.008	.042	-	.0585/.0575	.0435/.0405	304H-17S	316H-17S
17SX	.0580	.004	.050	-	.0585/.0575	.0510/.0490	304H-17SX	
17H	.0590	.010	.039	-	.0595/.0585	.0410/.0370	304H-17H	
17.5	.0560	.005	.046	-	.0565/.0555	.0475/.0445	304H-17.5	
18RW	.0500	.009	.033	Y	.0505/.0495	.0345/.0315	304H-18RW	316H-18RW
18S	.0500	.006	.038	-	.0505/.0495	.0395/.0365	304H-18S	316H-18S
18TW	.0500	.004	.042	-	.0505/.0495	.0430/.0410	304H-18TW	316H-18TW
18XX	.0500	.003	.045	-	.0505/.0495	.0460/.0440	304H-18XX	
18H	.0500	.010	.030	-	.0505/.0495	.0320/.0280	304H-18H	
18.5	.0460	.006	.034	-	.0465/.0455	.0355/.0325	304H-18.5	
19RW	.0425	.008	.028	Y	.0430/.0420	.0290/.0260	304H-19RW	316H-19RW
19TW	.0425	.005	.033	-	.0430/.0420	.0335/.0315	304H-19TW	316H-19TW
19X	.0425	.004	.035	-	.0430/.0420	.0360/.0340	304H-19X	
19XX	.0425	.003	.038	-	.0430/.0420	.0385/.0365	304H-19XX	
19H	.0425	.010	.023	-	.0430/.0420	.0240/.0210	304H-19H	
19.5	.0390	.006	.027	-	.0395/.0385	.0285/.0255	304H-19.5	
20RW	.0355	.006	.024	Y	.0360/.0355	.0245/.0230	304H-20RW	316H-20RW
20TW	.0355	.005	.026	-	.0360/.0355	.0265/.0250	304H-20TW	316H-20TW
20X	.0355	.004	.028	-	.0360/.0355	.0285/.0270	304H-20X	
20XX	.0355	.003	.031	-	.0360/.0355	.0315/.0295	304H-20XX	
20.5	.0340	.004	.027	-	.0345/.0340	.0275/.0255	304H-20.5	
21H	.0320	.008	.017	-	.0325/.0320	.0180/.0150	304H-21H	
21RW	.0320	.006	.020	Y	.0325/.0320	.0210/.0195	304H-21RW	316H-21RW
21TW	.0320	.005	.023	-	.0325/.0320	.0240/.0220	304H-21TW	316H-21TW
21XX	.0320	.002	.029	-	.0325/.0320	.0295/.0280	304H-21XX	
21.5	.0300	.003	.024	-	.0305/.0300	.0245/.0230	304H-21.5	
22RW	.0280	.006	.016	Y	.0285/.0280	.0170/.0155	304H-22RW	316H-22RW
22TW	.0280	.004	.020	-	.0285/.0280	.0205/.0190	304H-22TW	316H-22TW
22XX	.0280	.002	.024	-	.0285/.0280	.0240/.0230	304H-22XX	
22X	.0280	.003	.022	-	.0285/.0280	.0225/.0210	304H-22X	
22XH	.0280	.011	.007	-	.0285/.0280	.0090/.0050	304H-22XH	
22.5	.0260	.003	.020	-	.0265/.0260	.0210/.0195	304H-22.5	
23RW	.0250	.006	.013	Y	.0255/.0250	.0140/.0125	304H-23RW	316H-23RW
23TW	.0250	.004	.017	-	.0255/.0250	.0180/.0165	304H-23TW	316H-23TW
23XX	.0250	.002	.020	-	.0255/.0250	.0210/.0195	304H-23XX	
23.5	.0230	.003	.017	-	.0235/.0230	.0180/.0165	304H-23.5	
24RW	.0220	.005	.012	Y	.0225/.0220	.0130/.0115	304H-24RW	316H-24RW
24TW	.0220	.004	.014	-	.0225/.0220	.0150/.0135	304H-24TW	316H-24TW
24XX	.0220	.003	.016	-	.0225/.0220	.0170/.0155	304H-24XX	
24.5	.0210	.002	.016	-	.0215/.0210	.0170/.0155	304H-24.5	
25RW	.0200	.005	.010	Y	.0205/.0200	.0110/.0095	304H-25RW	316H-25RW
25TW	.0200	.004	.012	-	.0205/.0200	.0130/.0115	304H-25TW	316H-25TW
25XX	.0200	.002	.016	-	.0205/.0200	.0170/.0155	304H-25XX	
25.5	.0190	.002	.014	-	.0195/.0190	.0150/.0135	304H-25.5	
26RW	.0180	.004	.010Y	.0185/.0180	.0110/.0095	304H-26RW	316H-26RW	
27RW	.0160	.004	.008Y	.0165/.0160	.0090/.0075	304H-27RW	316H-27RW	
28RW	.0140	.003	.007Y	.0145/.0140	.0080/.0065	304H-28RW	316H-28RW	
29RW	.0130	.003	.007	.0135/.0130	.0080/.0065	304H-29RW	316H-29RW	
30XH	.0120	.004	.003	-	.0125/.0115	.0040/.0020	304H-30XH	
30H	.0120	.004	.004	-	.0125/.0120	.0050/.0035	304H-30H	
30RW	.0120	.003	.006	-	.0125/.0120	.0070/.0055	304H-30RW	316H-30RW
31RW	.0100	.002	.005	-	.0105/.0100	.0060/.0045	304H-31RW	
32RW	.0090	.002	.004	-	.0095/.0090	.0050/.0035	304H-32RW	
33RW	.0080	.002	.004	-	.0085/.0080	.0050/.0035	304H-33RW	
34RW	.0060	.002	.002	-	.0065/.0060	.0030/.0015	304H-34RW	

All dimensions are measured in inches.

The HYPO tables on this page have been revised to address the inconsistency of past "standards" which vary by vendor. MicroGroup has attempted to meet as many of these old varied standards as possible in these new tables. Please verify your older prints. Although every effort has been made to ensure accuracy, no guarantee is granted or implied. Unlike other tubing and pipe sizes - Hypodermic tubing is specified by a Gage number which determines OD and ID of the tube - Not the WALL thickness.



Need Custom Tubing Fast?

Call a MicroGroup technical representative at 1-800-255-8823 and tell us what you need and when you need it. Our response will be fast and accurate.

T304

T316

T321

Stock Fractional Tubing

C276, Ti

Description: "Fractional" tubing starts at 1/32" O.D. and continues in increments of 1/32" (i.e. 1/16", 3/32", 1/8", 5/32", 3/16" etc.) or 1/16" (i.e. 3/8", 7/16", 1/2", 9/16" etc.). Available in seamless or welded and drawn, fractional tubing is often used in commercial applications that require corrosion resistance and good strength. Also available in other stainless and nickel alloy grades (i.e. 321, 200, 600 etc.). Normally available in commercial specifications (i.e. ASTM-A269); Occasionally available in aircraft specs. (i.e. Mil-T-8504, AMS-5570). Primarily stocked in annealed temper.

Application: Used in many different industries ranging from medical to aircraft, fractional tubing covers small (1/32") to large (up through 3") applications. Welded and drawn can often be substituted for seamless because it usually has the same, if not better, appearance, tolerances, concentricity and specifications.

OD Nom	Wall Nom	ID Nom	Est Wt #/Ft	Item #	Type 304	Type 316	Other
1/32"	.006	.019	.002	F1-032x006-	WD SL	WD SL	200
.032	.010	.011	.002	F1-032x010-	WD SL	WD SL	200,321,600
.79mm							
1/16"	.006	.051	.004	F1-062x006-	WD SL	WD SL	200,321,600
.0625	.010	.042	.006	F1-062x010-	WD SL	WD SL	200,276,321,400,600
	.016	.030	.008	F1-062x016-	WD SL	WD SL	200,321,600,Ti2
	.020	.022	.009	F1-062x020-	WD SL	WD SL	200,321,600
	.023	.017	.010	F1-062x023-	SL	SL	
	.026	.011	.010	F1-062x026-	SL	SL	
	.028	.007	.011	F1-062x028-	SL	SL	200,Ti2
3/32"	.006	.082	.006	F1-093x006-	WD SL	WD SL	200
.0938	.010	.074	.009	F1-093x010-	WD SL	WD SL	200,321,600
2.38mm	.016	.062	.014	F1-093x016-	WD SL	WD SL	200,321,600,Ti2
	.020	.054	.016	F1-093x020-	WD SL	WD SL	200,321,600
	.028	.038	.020	F1-093x028-	WD SL	SL	321
	.035	.024	.023	F1-093x035-	WD SL	SL	
1/8"	.006	.113	.008	F1-125x006-	WD SL	SL	200
.1250	.010	.105	.013	F1-125x010-	WD SL	WD SL	200,276,321,600
3.17mm	.012	.101	.015	F1-125x012-	SL	SL	
	.016	.093	.019	F1-125x016-	WD SL	WD SL	200,321,400,600,Ti2
	.020	.085	.023	F1-125x020-	WD SL	WD SL	200,276,321,400,600
	.025	.075	.027	F1-125x025-	SL	SL	
	.028	.069	.030	F1-125x028-	WD SL	WD SL	200,321,400,600
	.032	.061	.033	F1-125x032-	WD SL	SL	
	.035	.055	.034	F1-125x035-	WD SL	WD SL	200,276,321,400,600
	.042	.041	.038	F1-125x042-	SL	SL	
	.049	.027	.041	F1-125x049-	SL	SL	321
5/32"	.006	.144	.010	F1-156x006-	WD SL	SL	
.1563	.010	.136	.016	F1-156x010-	WD SL	SL	600
3.97mm	.016	.124	.025	F1-156x016-	WD SL	WD SL	321
	.020	.116	.030	F1-156x020-	WD SL	WD SL	321
	.028	.100	.039	F1-156x028-	WD SL	WD SL	321
	.035	.086	.046	F1-156x035-	WD SL	WD SL	600
	.049	.058	.057	F1-156x049-	SL	SL	
3/16"	.006	.175	.012	F1-188x006-	WD SL	SL	
.1875	.010	.167	.019	F1-188x010-	WD SL	WD SL	200,321,600
4.76mm	.016	.156	.030	F1-188x016-	WD SL	WD SL	200,321,600
	.020	.148	.037	F1-188x020-	WD SL	WD SL	200,321,400,600
	.028	.131	.049	F1-188x028-	WD SL	WD SL	200,321,600
	.035	.118	.058	F1-188x035-	WD SL	WD SL	200,321,400,600
	.049	.089	.074	F1-188x049-	WD SL	WD SL	321
	.065	.057	.087	F1-188x065-	SL	SL	
7/32"	.006	.207	.014	F1-218x006-	SL	SL	
.2188	.010	.199	.023	F1-218x010-	SL	SL	321
5.55mm	.016	.187	.035	F1-218x016-	SL	SL	
	.020	.179	.043	F1-218x020-	SL	SL	
	.028	.163	.058	F1-218x028-	SL	SL	
	.035	.149	.070	F1-218x035-	SL	SL	321
	.049	.121		F1-218x049-	SL		
1/4"	.006	.238	.016	F1-250x006-	WD SL	SL	
.2500	.010	.230	.026	F1-250x010-	WD SL	WD SL	200,600
6.35mm	.012	.226	.031	F1-250x012-	SL	SL	
	.016	.218	.041	F1-250x016-	WD SL	WD SL	321,200,600
	.020	.210	.050	F1-250x020-	WD SL	WD SL	321,200,400,600

OD Nom	Wall Nom	ID Nom	Est Wt #/Ft	Item #	Type 304	Type 316	Other
1/4"	.028	.194	.068	F1-250x028-	WD SL	WD SL	200,321,400,600
cont.	.032	.186	.076	F1-250x032-	SL	SL	
	.035	.180	.082	F1-250x035-	WD SL	WD SL	200,276,321,400,600,Ti2
	.042	.166	.095	F1-250x042-	SL	SL	
	.049	.152	.108	F1-250x049-	WD SL	WD SL	200,321,400,600
	.058	.134	.122	F1-250x058-	SL	SL	321,Ti2
	.065	.120	.131	F1-250x065-	WD SL	WD SL	200,276,321,400,600
	.083	.084	.151	F1-250x083-	WD SL	WD SL	321,400
	.095	.060	.161	F1-250x095-	SL	SL	321
9/32"	.006	.269	.018	F1-281x006-	SL	SL	
.2813	.010	.261	.030	F1-281x010-	SL	SL	
7.14mm	.016	.249	.046	F1-281x016-	SL	SL	
	.020	.241	.057	F1-281x020-	SL	SL	
	.028	.225	.077	F1-281x028-	SL	SL	
	.035	.211	.094	F1-281x035-	SL	SL	
5/16"	.006	.301	.020	F1-312x006-	SL	SL	
.3125	.010	.293	.033	F1-312x010-	WD SL	SL	321
7.93mm	.016	.280	.052	F1-312x016-	WD SL	SL	321
	.020	.272	.064	F1-312x020-	WD SL	WD SL	321,600
	.028	.257	.087	F1-312x028-	WD SL	WD SL	321,600
	.035	.243	.106	F1-312x035-	WD SL	WD SL	276,321,400,600,Ti2
	.049	.215	.141	F1-312x049-	WD SL	WD SL	321,600,Ti2
	.065	.183	.176	F1-312x065-	WD SL	WD SL	200,321,400,600,Ti2
	.083	.147	.208	F1-312x083-	SL	SL	321
	.095	.122	.226	F1-312x095-	SL	SL	
11/32"	.010	.324	.037	F1-344x010-	SL	SL	
.3438	.016	.312	.057	F1-344x016-	SL	SL	
8.73mm	.020	.304	.071	F1-344x020-	SL	SL	
	.028	.288	.097	F1-344x028-	SL	SL	
	.035	.274	.118	F1-344x035-	SL	SL	
3/8"	.006	.363	.024	F1-375x006-	SL	SL	
.3750	.010	.355	.040	F1-375x010-	WD SL	WD SL	200,321,600
9.52mm	.016	.343	.063	F1-375x016-	WD SL	WD SL	200,321,600
	.020	.335	.078	F1-375x020-	WD SL	WD SL	200,321,400,600
	.028	.319	.106	F1-375x028-	WD SL	WD SL	200,321,400,600
	.035	.305	.130	F1-375x035-	WD SL	WD SL	200,276,321,400,600,Ti2
	.049	.277	.174	F1-375x049-	WD SL	WD SL	200,321,400,600,Ti2
	.065	.245	.220	F1-375x065-	WD SL	WD SL	200,276,321,400,600,Ti2
	.083	.209	.265	F1-375x083-	WD SL	WD SL	321,400,600
	.095	.185	.291	F1-375x095-	WD SL	WD SL	321
	.120	.135	.334	F1-375x120-	SL	SL	321
7/16"	.010	.418	.047	F1-438x010-	SL	SL	
.4375	.016	.405	.074	F1-438x016-	WD SL	SL	
11.10mm	.020	.397	.091	F1-438x020-	WD SL	SL	321
	.028	.382	.125	F1-438x028-	WD SL	SL	321
	.035	.368	.154	F1-438x035-	WD SL	SL	321,600
	.049	.340	.208	F1-438x049-	WD SL	SL	321
	.065	.308	.264	F1-438x065-	WD SL	SL	321
	.083	.272	.321	F1-438x083-	WD SL	SL	
	.095	.248	.355	F1-438x095-	SL	SL	
	.120	.197	.416	F1-438x120-	SL	SL	
1/2"	.006	.488	.032	F1-500x006-	SL	SL	
.5000	.010	.480	.054	F1-500x010-	WD SL	SL	321
12.69mm	.016	.468	.085	F1-500x016-	WD SL	WD SL	321,600
	.020	.460	.105	F1-500x020-	WD SL	WD SL	200,321,600
	.028	.444	.144	F1-500x028-	WD SL	WD SL	200,321,400,600,Ti2
	.035	.430	.178	F1-500x035-	WD SL	WD SL	200,276,321,400,600,Ti2
	.049	.402	.241	F1-500x049-	WD SL	WD SL	200,276,321,400,600,Ti2
	.065	.370	.309	F1-500x065-	WD SL	WD SL	200,276,321,400,600,Ti2
	.083	.334	.378	F1-500x083-	WD SL	WD SL	321,400,600
	.095	.310	.420	F1-500x095-	WD SL	WD SL	321,400
	.120	.260	.498	F1-500x120-	WD SL	WD SL	321,400,600
	.156	.188	.586	F1-500x156-	SL	SL	
	.188	.124	.641	F1-500x188-	SL	SL	

All dimensions are measured in inches except where designated mm (millimeters) *Hastelloy® is a registered trademark of Haynes International, Inc. Please contact our sales office regarding availability. Some items may not be available for immediate delivery.

T304

T316

T321

Stock Fractional Tubing

C276, Ti

OD Nom	Wall Nom	ID Nom	Est Wt #/Ft	Item #	Type 304	Type 316	Other
9/16"	.010	.543	.060	F1-562x010-	SL	SL	
.5625	.016	.530	.096	F1-562x016-	SL	SL	321
14.28mm	.020	.523	.119	F1-562x020-	SL	SL	
	.028	.507	.163	F1-562x028-	WD SL	SL	321
	.035	.492	.202	F1-562x035-	WD SL	WD SL	321,400,600
	.049	.465	.275	F1-562x049-	WD SL	SL	321,600
	.065	.433	.353	F1-562x065-	WD SL	WD SL	321,600
	.083	.397	.435	F1-562x083-	SL	SL	
	.095	.373	.485	F1-562x095-	SL	SL	
	.120	.322	.580	F1-562x120-	SL	SL	
	.188	.186	.769	F1-562x188-	SL	SL	
5/8"	.010	.605	.067	F1-625x010-	SL	SL	
.6250	.016	.593	.106	F1-625x016-	SL	SL	321
15.86mm	.020	.585	.132	F1-625x020-	WD SL	SL	321
	.028	.569	.183	F1-625x028-	WD SL	WD SL	321
	.035	.555	.226	F1-625x035-	WD SL	WD SL	200,276,321,400,600,Ti2
	.049	.527	.308	F1-625x049-	WD SL	WD SL	200,321,400,600,Ti2
	.065	.495	.398	F1-625x065-	WD SL	WD SL	321,400,600
	.083	.459	.491	F1-625x083-	WD SL	WD SL	321,400,600
	.095	.435	.550	F1-625x095-	WD SL	WD SL	321,400,600
	.120	.385	.662	F1-625x120-	WD SL	WD SL	321
	.156	.313	.799	F1-625x156-	SL	SL	
	.188	.249	.897	F1-625x188-	SL	SL	
11/16"	.020	.648	.146	F1-688x020-	SL	SL	
.6875	.028	.632	.198	F1-688x028-	SL	SL	321
17.45mm	.035	.617	.249	F1-688x035-	WD SL	WD SL	321
	.049	.590	.342	F1-688x049-	WD SL	WD SL	
	.065	.558	.442	F1-688x065-	WD SL	SL	321
3/4"	.010	.730	.081	F1-750x010-	SL	SL	
.7500	.016	.718	.128	F1-750x016-	SL	SL	321
19.04mm	.020	.710	.159	F1-750x020-	WD SL	SL	321
	.028	.694	.221	F1-750x028-	WD SL	WD SL	321
	.035	.680	.273	F1-750x035-	WD SL	WD SL	200,321,400,600,Ti2
	.049	.652	.375	F1-750x049-	WD SL	WD SL	200,276,321,400,600,Ti2
	.065	.620	.486	F1-750x065-	WD SL	WD SL	200,276,321,400,600,Ti2
	.083	.584	.605	F1-750x083-	WD SL	WD SL	200,321,400,600
	.095	.560	.680	F1-750x095-	WD SL	WD SL	321,400,600
	.120	.510	.826	F1-750x120-	WD SL	WD SL	321,400,600
	.156	.438	1.012	F1-750x156-	SL	SL	
	.188	.374	1.154	F1-750x188-	SL	SL	
	.250	.250	1.365	F1-750x250-	SL	SL	
13/16"	.028	.757	.240	F1-812x028-	SL	SL	321
.8125	.035	.742	.297	F1-812x035-	SL	SL	321
20.62mm	.049	.715	.409	F1-812x049-	SL	SL	
	.065	.683	.531	F1-812x065-	SL	SL	
7/8"	.010	.855	.095	F1-875x010-	SL	SL	
.8750	.016	.843	.150	F1-875x016-	SL	SL	
22.21mm	.020	.835	.187	F1-875x020-	SL	SL	321
	.028	.819	.259	F1-875x028-	WD SL	SL	321
	.035	.805	.321	F1-875x035-	WD SL	WD SL	321,400,600
	.049	.777	.442	F1-875x049-	WD SL	WD SL	321,400,600
	.065	.745	.575	F1-875x065-	WD SL	WD SL	200,321,400,600
	.083	.709	.718	F1-875x083-	WD SL	WD SL	321
	.095	.685	.809	F1-875x095-	WD SL	WD SL	321
	.120	.635	.989	F1-875x120-	WD SL	WD SL	321
	.156	.563	1.225	F1-875x156-	SL	SL	321
	.188	.499	1.410	F1-875x188-	SL	SL	321
	.250	.375	1.706	F1-875x250-	SL	SL	321
1"	.016	.968	.17	i1-1000x016-	WD SL	SL	321
1.000	.020	.960	.21	i1-1000x020-	WD SL	SL	321
25.4mm	.028	.944	.30	i1-1000x028-	WD SL	SL	321
	.035	.930	.37	i1-1000x035-	WD SL	WD SL	200,321,400,600,Ti2
	.049	.902	.51	i1-1000x049-	WD SL	WD SL	200,276,321,400,600,Ti2
	.065	.870	.66	i1-1000x065-	WD SL	WD SL	200,276,321,400,600,Ti2
	.083	.834	.83	i1-1000x083-	WD SL	WD SL	200,321,400,600
	.095	.810	.94	i1-1000x095-	WD SL	WD SL	321,400,600
	.120	.760	1.15	i1-1000x120-	WD SL	WD SL	321,400,600
	.156	.688	1.44	i1-1000x156-	SL	SL	321
	.188	.624	1.67	i1-1000x188-	SL	SL	321
	.250	.500	2.05	i1-1000x250-	SL	SL	321
1-1/8"	.035	1.055	.42	i1-1125x035-	WD SL	WD SL	321
1.125	.049	1.027	.58	i1-1125x049-	WD SL	WD SL	321
28.57mm	.065	.995	.75	i1-1125x065-	WD SL	WD SL	321
	.083	.959	.94	i1-1125x083-	WD SL	SL	321
	.095	.935	1.07	i1-1125x095-	WD SL	SL	321
	.120	.885	1.32	i1-1125x120-	WD SL	SL	321
	.188	.749	1.92	i1-1125x188-	SL	SL	321
	.250	.625	2.39	i1-1125x250-	SL	SL	321
1-1/4"	.028	1.194	.37	i1-1250x028-	WD SL	SL	321
1.250	.035	1.180	.46	i1-1250x035-	WD SL	WD SL	321,400,600
31.75mm	.049	1.152	.64	i1-1250x049-	WD SL	WD SL	321,400,600

OD Nom	Wall Nom	ID Nom	Est Wt #/Ft	Item #	Type 304	Type 316	Other
1-1/4"	.065	1.120	.84	i1-1250x065-	WD	SL	200,321,400,600
1.250	.083	1.084	1.06	i1-1250x083-	WD	SL	321,400,600
31.75mm	.095	1.060	1.20	i1-1250x095-	WD	SL	321,400,600
	.120	1.010	1.48	i1-1250x120-	WD	SL	321,200,600
	.188	.874	2.18	i1-1250x188-	SL	SL	321
	.250	.750	2.73	i1-1250x250-	SL	SL	321
1-3/8"	.035	1.305	.50	i1-1375x035-	WD	SL	321
1.375	.049	1.277	.71	i1-1375x049-	WD	SL	321
34.92mm	.065	1.245	.93	i1-1375x065-	WD	SL	321
	.083	1.209	1.17	i1-1375x083-	WD	SL	
	.095	1.185	1.33	i1-1375x095-	WD	SL	
	.120	1.135	1.64	i1-1375x120-	WD	SL	
	.188	.999	2.44	i1-1375x188-	SL	SL	321
	.250	.875	3.07	i1-1375x250-	SL	SL	321
1-1/2"	.028	1.444	.45	i1-1500x028-	SL		
1.500	.035	1.430	.56	i1-1500x035-	WD	SL	321
38.10mm	.049	1.305	.76	i1-1500x049-	WD	SL	321,400,600
	.065	1.370	1.02	i1-1500x065-	WD	SL	200,321,400,600
	.083	1.334	1.28	i1-1500x083-	WD	SL	200,321,400,600
	.095	1.310	1.46	i1-1500x095-	WD	SL	321,400,600
	.120	1.260	1.81	i1-1500x120-	WD	SL	321,600
	.156	1.188	2.29	i1-1500x156-	SL	SL	
	.188	1.124	2.69	i1-1500x188-	SL	SL	321
	.250	1.000	3.41	i1-1500x250-	SL	SL	321
	.312	.876	4.05	i1-1500x312-	SL	SL	321
	.375	.750	4.61	i1-1500x375-	SL	SL	321
1-5/8"	.035	1.555	.61	i1-1625x035-	WD	SL	321
1.625	.049	1.527	.84	i1-1625x049-	WD	SL	321
41.27mm	.065	1.495	1.11	i1-1625x065-	WD	SL	321,400
	.083	1.459	1.40	i1-1625x083-	WD	SL	200
	.095	1.435	1.59	i1-1625x095-	SL		200
	.120	1.385	1.97	i1-1625x120-	WD	SL	
	.188	1.249	2.95	i1-1625x188-	SL	SL	321
	.250	1.125	3.75	i1-1625x250-	SL	SL	
	.375	.875	5.12	i1-1625x375-	SL	SL	321
1-3/4"	.035	1.680	.66	i1-1750x035-	WD	SL	321
1.750	.049	1.652	.91	i1-1750x049-	WD	SL	321
44.45mm	.065	1.620	1.20	i1-1750x065-	WD	SL	321,400,600
	.083	1.584	1.51	i1-1750x083-	WD	SL	321
	.095	1.560	1.72	i1-1750x095-	WD	SL	321
	.120	1.510	2.14	i1-1750x120-	WD	SL	321
	.156	1.438	2.72	i1-1750x156-	SL		
	.188	1.374	3.21	i1-1750x188-	SL	SL	321
	.250	1.250	4.10	i1-1750x250-	SL	SL	321
	.375	1.000	5.63	i1-1750x375-	SL	SL	
1-7/8"	.035	1.805	.70	i1-1875x035-	WD	SL	321
1.875"	.049	1.777	.96	i1-1875x049-	WD	SL	321
47.62mm	.065	1.745	1.28	i1-1875x065-	WD	SL	321
	.083	1.709	1.62	i1-1875x083-	SL		200
	.095	1.685	1.85	i1-1875x095-	WD	SL	
	.120	1.635	2.30	i1-1875x120-	WD	SL	
	.188	1.499	3.46	i1-1875x188-	SL	SL	321
	.250	1.375	4.44	i1-1875x250-	SL	SL	321
2"	.028	1.944	.59	i1-2000x028-	WD	SL	321
2.000	.035	1.930	.75	i1-2000x035-	WD	SL	321
50.80mm	.049	1.902	1.04	i1-2000x049-	WD	SL	321
	.065	1.870	1.37	i1-2000x065-	WD	SL	200,321,400,600
	.083	1.834	1.74	i1-2000x083-	WD	SL	200,321,400,600
	.095	1.810	1.93	i1-2000x095-	WD	SL	321,600
	.120	1.760	2.46	i1-2000x120-	WD	SL	321,400,600
	.156	1.688	3.14	i1-2000x156-	SL	SL	321
	.188	1.624	3.72	i1-2000x188-	SL	SL	321
	.250	1.500	4.78	i1-2000x250-	SL	SL	321
	.312	1.376	5.75	i1-2000x312-	SL	SL	321
	.375	1.250	6.65	i1-2000x375-	SL	SL	321
	.437	1.126	7.46	i1-2000x437-	SL		
	.500	1.000	8.19	i1-2000x500-	SL		321
2-1/8"	.035	2.055	.78	i1-2125x035-	WD	SL	321
2.125	.049	2.027	1.11	i1-2125x049-	WD	SL	321
53.97mm	.065	1.995	1.46	i1-2125x065-	WD	SL	321
	.083	1.959	1.85	i1-2125x083-	WD	SL	
	.095	1.935	2.08	i1-2125x095-	WD	SL	
	.120	1.885	2.63	i1-2125x120-	WD	SL	321
	.188	1.749	3.98	i1-2125x188-	SL	SL	
	.250	1.625	5.12	i1-2125x250-	SL	SL	321
	.375	1.375	7.17	i1-2125x375-	SL	SL	321
	.500	1.125	8.87	i1-2125x500-	SL	SL	321
2-1/4"	.035	2.180	.83	i1-2125x035-	WD	SL	321
2.250	.049	2.152	1.18	i1-2250x049-	WD	SL	321
57.15mm	.065	2.120	1.55	i1-2250x065-	WD	SL	321
	.083	2.084	1.96	i1-2250x083-	WD	SL	321
	.095	2.060	2.19	i1-2250x095-	WD	SL	
	.120	2.010	2.73	i1-2250x120-	WD	SL	321
	.188	1.874	4.23	i1-2250x188-	SL	SL	
	.250	1.750	5.46	i1-2250x250-	SL	SL	321
	.375	1.500	7.68	i1-2250x375-	SL	SL	321
	.500	1.250	9.56	i1-2250x500-	SL	SL	321

T304

T316

T321

Stock Fractional Tubing

C276, Ti

OD Nom	Wall Nom	ID Nom	Est Wt #/Ft	Item #	Type 304	Type 316	Other
2-3/8"	.035	2.305	.89	i1-2375x035-	WD SL		321
2.375	.049	2.277	1.24	i1-2375x049-	WD SL		321
60.32mm	.065	2.245	1.64	i1-2375x065-	SL	SL	
	.083	2.209	2.08	i1-2375x083-	WD SL	WD SL	
	.095	2.185	2.37	i1-2375x095-	SL		
	.120	2.135	2.96	i1-2375x120-	SL		
	.188	1.999	4.49	i1-2375x188-	SL	SL	321
	.250	1.875	5.80	i1-2375x250-	SL	SL	321
	.375	1.625	8.19	i1-2375x375-	SL	SL	321
	.500	1.375	10.24	i1-2375x500-	SL	SL	
2-1/2"	.035	2.430	.92	i1-2500x035-	WD SL	SL	321
2.500	.049	2.402	1.31	i1-2500x049-	WD SL	WD SL	321
63.50mm	.065	2.370	1.73	i1-2500x065-	WD SL	WD SL	200,321,400
	.083	1.834	1.70	i1-2500x083-	WD SL	WD SL	200,321,400
	.095	1.810	1.93	i1-2500x095-	WD SL	WD SL	321
	.120	2.260	3.12	i1-2500x120-	WD SL	WD SL	321
	.188	2.124	4.75	i1-2500x188-	SL	SL	321
	.250	2.000	6.14	i1-2500x250-	SL	SL	321
	.375	1.750	8.70	i1-2500x375-	SL	SL	321
	.500	1.500	10.68	i1-2500x500-	SL	SL	321
2-5/8"	.049	2.527	1.38	i1-2625x049-	WD SL		321
2.625	.065	2.495	1.82	i1-2625x065-	WD SL	WD SL	321
66.67mm	.095	2.435	2.59	i1-2625x095-	SL		
	.120	2.385	3.28	i1-2625x120-	SL	S	321
	.188	2.249	5.00	i1-2625x188-	SL	SL	321
	.250	2.125	6.48	i1-2625x250-	SL	SL	
	.375	1.875	9.21	i1-2625x375-	SL	SL	321
	.500	1.625	11.35	i1-2625x500-	SL	SL	321
2-3/4"	.035	2.680	1.02	i1-2750x035-	WD SL		321
2.750	.049	2.660	1.41	i1-2750x049-	WD SL		321
69.85mm	.065	2.620	1.91	i1-2750x065-	WD SL	WD SL	321
	.083	2.584	2.36	i1-2750x083-	WD SL	WD SL	321
	.120	2.510	3.45	i1-2750x120-	WD SL	WD SL	321
	.188	2.374	5.26	i1-2750x188-	SL	SL	321
	.250	2.250	6.83	i1-2750x250-	SL	SL	321
	.375	2.000	9.73	i1-2750x375-	SL	SL	321
	.500	1.750	12.29	i1-2750x500-	SL	SL	321

OD Nom	Wall Nom	ID Nom	Est Wt #/Ft	Item #	Type 304	Type 316	Other
3"	.035	2.930	1.11	i1-3000x035-	WD SL	SL	321
3.000	.049	2.902	1.58	i1-3000x049-	WD SL	WD SL	321
76.20mm	.065	2.870	2.08	i1-3000x065-	WD SL	WD SL	200,321,400,600
	.083	2.834	2.64	i1-3000x083-	WD SL	WD SL	321,400
	.095	2.810	2.95	i1-3000x095-	WD SL	WD SL	321
	.120	2.760	3.77	i1-3000x120-	WD SL	WD SL	321,600
	.156	2.688	4.84	i1-3000x156-	SL	SL	
	.188	2.624	5.77	i1-3000x188-	SL	SL	321
	.250	2.500	7.51	i1-3000x250-	SL	SL	321
	.312	2.376	9.16	i1-3000x312-	SL	SL	
	.375	2.250	10.75	i1-3000x375-	SL	SL	321
	.500	2.000	13.65	i1-3000x500-	SL	SL	321
	.625	1.750	16.21	i1-3000x625-	SL	SL	321
	.750	1.500	18.43	i1-3000x750-	SL	SL	321

Tolerance Table: Fractional Tubing

Tolerances	Standard Tol. -	Close Tol. -
OD	OD	Wall
Inches	Tolerance	Tolerance
Inches	Inches	%
< 3/32	+ .002/- .002	+ /- 15%
3/32 to < 3/16	+ .003/- .003	+ /- 15%
3/16 to < 1/2	+ .004/- .004	+ /- 15%
1/2 to < 1-1/2	+ .005/- .005	+ /- 10%
1-1/2 to < 3-1/2	+ .010/- .010	+ /- 10%
		NA

T316

Stock Metric Tubing

T316

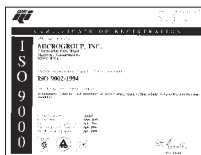
Description: Metric tubing is stocked in seamless 304 and 316 stainless steel, from 1 millimeter to 24 mm. Can be supplied in other grades on a custom basis. Primarily stocked in annealed temper.

Application: Commonly used with standard metric compression fittings, metric tubing can also be used in other commercial applications that require corrosion resistance, strength, and uniformity.

OD Nom	Wall Nom	ID Nom	Est Wt #/Ft	Item #	Type 304	Type 316
1 (.0394)	.20 (.008)	.59 (.023)	.003	m1-1x.2-	SL	
2 (.0787)	.50 (.020)	.98 (.039)	.013	m1-2x.5-	SL	
3 (.1181)	.50 (.020)	1.98 (.078)	.021	m1-3x.5-	SL	SL
4 (.1575)	.50 (.020)	2.98 (.118)	.030	m1-4x.5-	SL	SL
5 (.197)	.50 (.020)	3.98 (.157)	.039	m1-5x.5-	SL	SL
	.70 (.028)	3.58 (.141)	.052	m1-5x.7-	SL	SL
6 (.2362)	.50 (.020)	4.98 (.196)	.047	m1-6x.5-	SL	SL
	1.00 (.039)	4.02 (.158)	.084	m1-6x1.0-	SL	SL
7 (.2758)	.50 (.020)	5.98 (.236)	.056	m1-7x.5-	SL	SL
	1.00 (.039)	5.02 (.198)	.101	m1-7x1.0-	SL	SL
8 (.315)	.50 (.020)	6.98 (.275)	.064	m1-8x.5-	SL	SL
	1.00 (.039)	6.02 (.237)	.118	m1-8x1.0-	SL	SL
	1.50 (.059)	5.00 (.197)	.165	m1-8x1.5-	SL	

OD Nom	Wall Nom	ID Nom	Est Wt #/Ft	Item #	Type 304	Type 316
9 (.3543)	.50 (.020)	7.98 (.314)	.073	m1-9x.5-	SL	SL
	1.00 (.039)	7.01 (.276)	.134	m1-9x1.0-	SL	SL
	1.50 (.059)	6.00 (.236)	.188	m1-9x1.5-	SL	SL
10 (.394)	.50 (.020)	8.98 (.354)	.082	m1-10x.5-	SL	SL
	1.00 (.039)	8.02 (.316)	.151	m1-10x1.0-	SL	SL
	1.50 (.059)	7.01 (.276)	.216	m1-10x1.5-	SL	
	2.00 (.079)	5.99 (.236)	.272	m1-10x2.0-	SL	
11 (.4331)	1.00 (.039)	9.01 (.355)	.168	m1-11x1.0-	SL	SL
12 (.4728)	.50 (.020)	10.98 (.433)	.099	m1-12x.5-	SL	SL
	.70 (.028)	10.58 (.417)	.136	m1-12x.7-	SL	
	1.00 (.039)	10.02 (.395)	.185	m1-12x1.0-	SL	SL
	1.50 (.059)	9.01 (.355)	.267	m1-12x1.5-	SL	
	2.00 (.079)	7.99 (.315)	.340	m1-12x2.0-	SL	
14 (.5512)	1.50 (.059)	10.99 (.433)	.317	m1-14x1.5-	SL	SL
16 (.6299)	1.50 (.059)	12.99 (.512)	.368	m1-16x1.5-	SL	SL
20 (.7874)	1.50 (.059)	17.00 (.748)	.428	m1-20x1.5-	SL	SL
20 (.7874)	1.50 (.059)	16.99 (.669)	.469	m1-20x1.5-	SL	SL
22 (.8661)	1.50 (.059)	18.99 (.748)	.520	m1-22x1.5-	SL	SL
24 (.9449)	1.50 (.059)	20.99 (.827)	.571	m1-24x1.5-	SL	SL

All dimensions are measured in inches except where designated mm (millimeters). Please contact our sales office regarding availability. Some items may not be available for immediate delivery.



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Tolerance Table: Metric Tubing

OD (mm)	OD Tolerance	Wall Tolerance
< 3mm	+ .000/- .050	+15%/-0%
3mm to < 6mm	+ .000/- .080	+15%/-0%
6mm to < 14mm	+ .000/- .100	+20%/-0%
14mm to < 24mm	+ .000/- .130	+20%/-0%

T316L

Stock Medical Grade Tubing

T316L

Description: Medical-quality grade ("MQ") tubing is 316L welded and mandrel drawn, manufactured to tight I.D. dimensions. Supplied in 1/8 hard to 1/4 hard temper, stock sizes range from 1/8" to 1" O.D.

Application: Ideal for applications requiring tighter than normal tolerances. Some temper is added for applications that require more rigidity, such as in medical instrumentation.

OD Nom	Wall Nom	ID Min/Max	OD Min/Max	Est Wt #/Ft	Item #
1/8"	.006	.1120/.1140	.1228/.1272	.008	316L-F9-125x006-MQ
.125	.010	.1040/.1060	.1220/.1280	.013	316L-F9-125x010-MQ
3.17mm	.016	.0920/.0940	.1208/.1292	.019	316L-F9-125x016-MQ
	.020	.0840/.0860	.1200/.1300	.020	316L-F9-125x020-MQ
5/32"	.006	.1433/.1453	.1541/.1585	.010	316L-F9-156x006-MQ
.156	.010	.1353/.1373	.1533/.1593	.016	316L-F9-156x010-MQ
3.97mm	.016	.1233/.1253	.1521/.1605	.025	316L-F9-156x016-MQ
	.020	.1153/.1173	.1513/.1613	.030	316L-F9-156x020-MQ
3/16"	.006	.1745/.1765	.1853/.1897	.012	316L-F9-188x006-MQ
.188	.010	.1665/.1685	.1845/.1905	.019	316L-F9-188x010-MQ
4.76mm	.016	.1545/.1565	.1833/.1917	.030	316L-F9-188x016-MQ
	.020	.1465/.1485	.1825/.1925	.037	316L-F9-188x020-MQ
1/4"	.006	.2370/.2390	.2478/.2522	.016	316L-F9-250x006-MQ
.250	.010	.2290/.2310	.2470/.2530	.026	316L-F9-250x010-MQ
6.35mm	.016	.2170/.2190	.2458/.2542	.041	316L-F9-250x016-MQ
	.020	.2090/.2110	.2450/.2550	.050	316L-F9-250x020-MQ
3/8"	.006	.3620/.3640	.3728/.3772	.026	316L-F9-375x006-MQ
.375	.010	.3540/.3560	.3720/.3780	.040	316L-F9-375x010-MQ
9.52mm	.016	.3420/.3440	.3708/.3792	.063	316L-F9-375x016-MQ
	.020	.3340/.3360	.3700/.3800	.078	316L-F9-375x020-MQ
1/2"	.006	.4865/.4895	.4973/.5027	.032	316L-F9-500x006-MQ
.500	.010	.4785/.4815	.4965/.5035	.054	316L-F9-500x010-MQ
12.69mm	.016	.4665/.4695	.4953/.5047	.085	316L-F9-500x016-MQ
	.020	.4585/.4615	.4945/.5055	.105	316L-F9-500x020-MQ
5/8"	.010	.6035/.6065	.6215/.6285	.067	316L-F9-625x010-MQ
.625	.020	.5835/.5865	.6195/.6305	.132	316L-F9-625x020-MQ
3/4"	.010	.7285/.7315	.7465/.7535	.081	316L-F9-750x010-MQ
.750	.020	.7085/.7115	.7445/.7555	.159	316L-F9-750x020-MQ
7/8"	.010	.8535/.8565	.8715/.8785	.095	316L-F9-875x010-MQ
.875	.016	.8415/.8445	.8703/.8797	.150	316L-F9-875x016-MQ
22.21mm	.020	.8335/.8365	.8695/.8805	.187	316L-F9-875x020-MQ
1"	.010	.9785/.9815	.9965/1.0035	.108	316L-i9-1000x010-MQ
1.000	.020	.9585/.9615	.9945/1.0055	.214	316L-i9-1000x020-MQ
25.38mm					



T304

Pipe

T316

Description: A special range of tubing sizes designated by dimension and wall thickness. Generally available in any drawable metal or alloy, with method of manufacture (seamless or welded) dictated by material, to OD/Wall ratio and wall thickness. Standards cover actual dimensions, tolerances, chemical and physical requirements. Call for pricing and availability.

Application: Pipe is a tubular product intended primarily for such purposes as the conveying of water, fuel, gas, air, steam, etc. It has also been found to be a convenient form for use as structural members, such as columns and railings.

Nominal OD		Schedule Number (Wall Thickness Shown in table below)								
Pipe Size	Inches	Sch# 5S	Sch# 5	Sch# 10/S	Sch# 40S	Sch# 40Std	Sch# 40	Sch# 80/S	Sch# 160	Sch# XXH
1/8	0.405	.035	.035	.049	.068	.068	.068	.095	N/A	N/A
1/4	0.54	.049	.049	.065	.088	.088	.088	.119	N/A	N/A
3/8	0.675	.049	.049	.065	.091	.091	.091	.126	N/A	N/A
1/2	0.84	.065	.065	.083	.109	.109	.109	.147	.187	.294
3/4	1.05	.065	.065	.083	.113	.113	.113	.154	.218	.308
1	1.315	.065	.065	.109	.133	.133	.133	.179	.250	.358
1-1/4	1.66	.065	.065	.109	.140	.140	.140	.191	.250	.382
1-1/2	1.9	.065	.065	.109	.145	.145	.145	.200	.281	.400
2	2.375	.065	.065	.109	.154	.154	.154	.218	.343	.436
2-1/2	2.875	.083	.083	.120	.203	.203	.203	.276	.375	.552

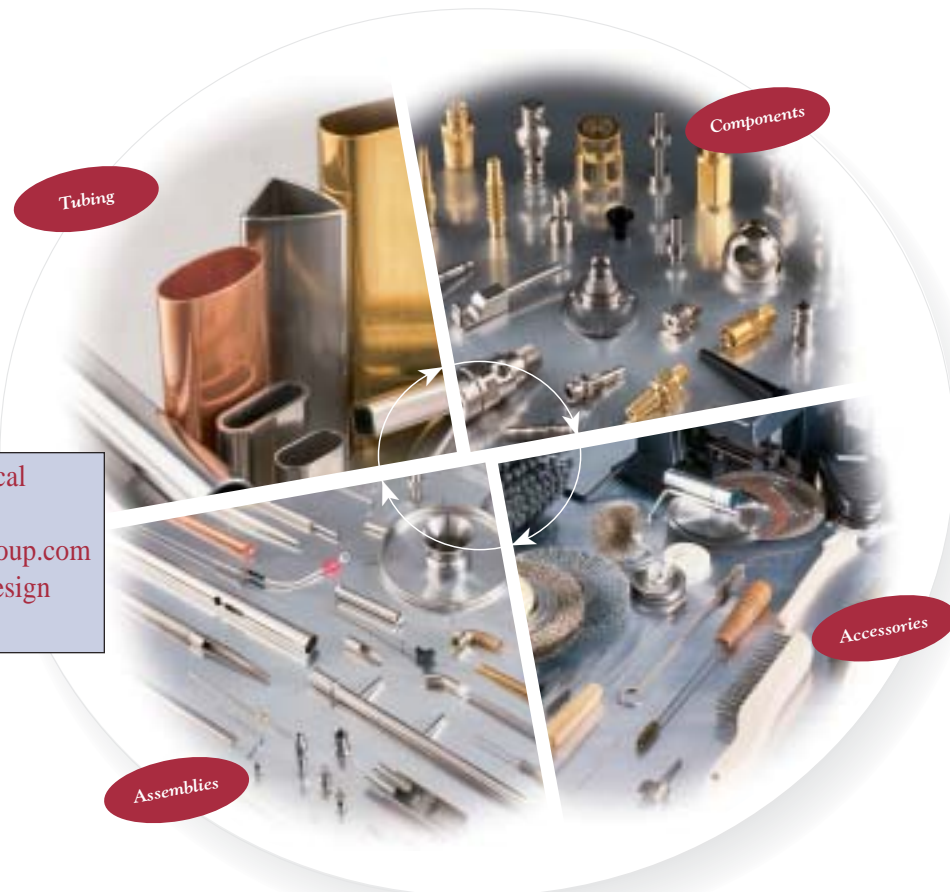
Tolerance Table: Pipe				
STAINLESS STEEL PIPE TOLERANCES (ASTM A-312)				
Nom Size	OD Tol		Wall Tol	
	+	-	+	-
1/8 to 1-1/2	1/64 (.015)	1/32 (.031)	12.5%	12.5%
1-1/2+ thru 4	1/32 (.031)	1/32 (.031)	12.5%	12.5%
4+ thru 8	1/16 (.062)	1/32 (.031)	12.5%	12.5%
8+ thru 18	3/32 (.093)	1/32 (.031)	12.5%	12.5%
18+ thru 24	1/8 (.125)	1/32 (.031)	12.5%	12.5%

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Seamless Fractional Tubing

Description: "Fractional" refers to any tubing that is less than 3" in outside diameter and whose outside diameter is an even increment of 1/64" (.016). Fractional tubing can generally be produced by any method of manufacture and in any drawable metal. Available in random lengths and TubeKITS™. Material is manufactured to O.D. and wall dimensions.

Application: Fractional tubing is most common in T304 and T316 stainless steel for general commercial applications due to availability and relatively low cost.

Size	Wall Nom	ID Theo	T304 Item #	\$ ea	T316 Item #	\$ ea Meter
1/16"	.010	.043	TK4FS-062x010	<i>Call or access web for pricing</i>	TK6FS-062x010	<i>Call or</i>
3/32"	.016	.061	TK4FS-093x016		TK6FS-093x016	<i>access</i>
1/8"	.016	.093	TK4FS-125x016		TK6FS-125x016	<i>web for pricing</i>
	.028	.069	TK4FS-125x028		TK6FS-125x028	
3/16"	.028	.132	TK4FS-188x028		TK6FS-188x028	<i>web for pricing</i>
1/4"	.028	.194	TK4FS-250x028		TK6FS-250x028	
	.035	.180	TK4FS-250x035		TK6FS-250x035	
	.049	.152	TK4FS-250x049		TK6FS-250x049	
	.065	.120	TK4FS-250x065		TK6FS-250x065	
5/16"	.028	.257	TK4FS-312x028		TK6FS-312x028	<i>web for pricing</i>
3/8"	.028	.319	TK4FS-375x028		TK6FS-375x028	
	.035	.305	TK4FS-375x035		TK6FS-375x035	
	.049	.277	TK4FS-375x049		TK6FS-375x049	
	.065	.245	TK4FS-375x065		TK6FS-375x065	<i>web for pricing</i>
1/2"	.028	.444	TK4FS-500x028		TK6FS-500x028	
	.035	.430	TK4FS-500x035		TK6FS-500x035	
	.049	.402	TK4FS-500x049		TK6FS-500x049	
	.065	.370	TK4FS-500x065		TK6FS-500x065	
5/8"	.028	.569	TK4FS-625x028	<i>web for pricing</i>	TK6FS-625x028	<i>web for pricing</i>
	.035	.555	TK4FS-625x035		TK6FS-625x035	
	.049	.527	TK4FS-625x049		TK6FS-625x049	
	.065	.495	TK4FS-625x065		TK6FS-625x065	
3/4"	.035	.680	TK4FS-750x035	<i>web for pricing</i>	TK6FS-750x035	<i>web for pricing</i>
	.049	.652	TK4FS-750x049		TK6FS-750x049	
	.065	.620	TK4FS-750x065		TK6FS-750x065	
1"	.035	.930	TK4FS-1000x035	<i>web for pricing</i>	TK6FS-1000x035	<i>web for pricing</i>
	.049	.920	TK4FS-1000x049		TK6FS-1000x049	
	.065	.870	TK4FS-1000x065		TK6FS-1000x065	
1-1/4"	.049	1.152	TK4FS-1250x049	<i>web for pricing</i>	TK6FS-1250x049	<i>web for pricing</i>

Seamless Metric Tubing

Description: With its OD expressed evenly in millimeters (mm), metric tubing can generally be produced by any method of manufacture and in any drawable material. Standards cover actual dimensions and tolerances plus chemical and physical requirements. Due to its custom nature, metric tubing is sometimes limited in availability.

Application: Stocked metric tubing is most common in T304 and T316 stainless steel for general commercial applications with standard metric compression fittings.

OD Nom mm	OD Nom Inches	Wall Nom mm	Wall Nom Inches	ID Nom mm	ID Nom Inches	T304 Item #	\$ ea	T316 Item #	\$ ea Meter
1	.039	.20	.008	.60	.024	TK4mS-1x.20	<i>Call or access web for pricing</i>	TK6mS-1x.20	<i>Call or</i>
2	.079	.50	.020	1.00	.039	TK4mS-2x.50		TK6mS-2x.50	<i>access</i>
3	.118	.50	.020	2.00	.079	TK4mS-3x.50		TK6mS-3x.50	<i>web for pricing</i>
4	.158	.50	.020	3.00	.118	TK4mS-4x.50		TK6mS-4x.50	
5	.197	.50	.020	4.00	.158	TK4mS-5x.50		TK6mS-5x.50	<i>web for pricing</i>
6	.236	1.00	.039	4.00	.158	TK4mS-6x1.00		TK6mS-6x1.00	
8	.315	1.00	.039	6.00	.236	TK4mS-8x1.00		TK6mS-8x1.00	
10	.394	1.00	.039	8.00	.315	TK4mS-10x1.00		TK6mS-10x1.00	
12	.473	1.00	.039	10.00	.394	TK4mS-12x1.00		TK6mS-12x1.00	<i>web for pricing</i>
14	.552	1.50	.059	11.00	.433	TK4mS-14x1.50		TK6mS-14x1.50	
16	.630	1.50	.059	13.00	.512	TK4mS-16x1.50		TK6mS-16x1.50	
20	.788	1.50	.059	17.00	.670	TK4mS-20x1.50		TK6mS-20x1.50	
22	.867	1.50	.059	19.00	.749	TK4mS-22x1.50		TK6mS-22x1.50	
24	.945	1.50	.059	21.00	.827	TK4mS-24x1.50		TK6mS-24x1.50	

Hypodermic Tubing

Description: Often referred to as "seamless" because of its smooth appearance, hypo tubing is manufactured, welded and drawn to tight O.D. and I.D. tolerances. Stocked in grades 304 & 316 stainless steel in the full hard condition.

Application: Ideal for medical and industrial components that require strength, uniformity, and corrosion resistance. Not manufactured for pressure service. Wide selection, economical and quick delivery.

Gage	OD Nom	Wall Theo	ID Nom	T304 Item #	\$ ea	T316 Item #	\$ ea Meter
6RW	.2030	.015	.173"	TK4H-6RW	Call or access web for pricing	TK6H-6RW	Call or access web for pricing
7RW	.1800	.015	.150	TK4H-7RW		TK6H-7RW	
8RW	.1650	.015	.135	TK4H-8RW		TK6H-8RW	
9RW	.1480	.015	.118	TK4H-9RW		TK6H-9RW	
10RW	.1340	.014	.106	TK4H-10RW		TK6H-10RW	
11RW	.1200	.013	.094	TK4H-11RW		TK6H-11RW	
11TW	.1200	.010	.100	TK4H-11TW		TK6H-11TW	
12RW	.1090	.012	.085	TK4H-12RW		TK6H-12RW	
12TW	.1090	.009	.091	TK4H-12TW		TK6H-12TW	
13RW	.0950	.012	.071	TK4H-13RW		TK6H-13RW	
13TW	.0950	.009	.077	TK4H-13TW		TK6H-13TW	
14RW	.0830	.010	.063	TK4H-14RW		TK6H-14RW	
14TW	.0830	.006	.072	TK4H-14TW		TK6H-14TW	
15RW	.0720	.009	.054	TK4H-15RW		TK6H-15RW	
15TW	.0720	.006	.060	TK4H-15TW		TK6H-15TW	
16RW	.0650	.009	.047	TK4H-16RW		TK6H-16RW	
16TW	.0650	.006	.053	TK4H-16TW		TK6H-16TW	
17RW	.0590	.009	.041	TK4H-17RW		TK6H-17RW	
17TW	.0590	.007	.046	TK4H-17TW		TK6H-17TW	
18RW	.0500	.009	.033	TK4H-18RW		TK6H-18RW	
18TW	.0500	.004	.042	TK4H-18TW		TK6H-18TW	
19RW	.0425	.008	.028	TK4H-19RW		TK6H-19RW	
19TW	.0425	.005	.033	TK4H-19TW		TK6H-19TW	
20RW	.0355	.006	.024	TK4H-20RW		TK6H-20RW	
20TW	.0355	.005	.026	TK4H-20TW		TK6H-20TW	
21RW	.0320	.006	.020	TK4H-21RW		TK6H-21RW	
21TW	.0320	.005	.023	TK4H-21TW		TK6H-21TW	
22RW	.0280	.006	.016	TK4H-22RW		TK6H-22RW	
22TW	.0280	.004	.020	TK4H-22TW		TK6H-22TW	
23RW	.0250	.006	.013	TK4H-23RW		TK6H-23RW	
23TW	.0250	.004	.017	TK4H-23TW		TK6H-23TW	
24RW	.0220	.005	.012	TK4H-24RW		TK6H-24RW	
24TW	.0220	.004	.014	TK4H-24TW		TK6H-24TW	
25RW	.0200	.005	.010	TK4H-25RW		TK6H-25RW	
25TW	.0200	.004	.012	TK4H-25TW		TK6H-25TW	
26RW	.0180	.004	.010	TK4H-26RW		TK6H-26RW	
27RW	.0160	.004	.008	TK4H-27RW		TK6H-27RW	
28RW	.0140	.003	.007	TK4H-28RW		TK6H-28RW	
29RW	.0130	.003	.007	TK4H-29RW		TK6H-29RW	
30RW	.0120	.003	.006	TK4H-30RW		TK6H-30RW	

Convenient TubeKIT
Sizes Shipped
Within 24 Hours

Seamless Pipe

Description: A special range of tubing sizes designated by dimension and wall thickness. Generally available in any draw-able metal or alloy, with method of manufacture (seamless or welded) dictated by material, to OD/Wall ratio and wall thickness.

Application: Pipe is a tubular product intended primarily for such purposes as the conveying of water, fuel, gas, air, steam, etc. It has also been found to be a convenient form for use as structural members such as columns and railings.

Pipe Size	Schedule #	T304 Item #	\$/ea	T316 Item #	\$ ea Meter
1/8	10	TK4PS-125x10	21.00	TK6PS-125x10	Call or access web for pricing
1/8	40	TK4PS-125x40	18.19	TK6PS-125x40	
1/4	10	TK4PS-250x10	28.51	TK6PS-250x10	
1/4	40	TK4PS-250x40	23.15	TK6PS-250x40	
3/8	10	TK4PS-375x10	34.89	TK6PS-375x10	
3/8	40	TK4PS-375x40	29.98	TK6PS-375x40	
1/2	5	TK4PS-500x5	40.92	TK6PS-500x5	
1/2	10	TK4PS-500x10	47.26	TK6PS-500x10	
1/2	40	TK4PS-500x40	36.46	TK6PS-500x40	
3/4	5	TK4PS-750x5	49.64	TK6PS-750x5	
3/4	10	TK4PS-750x10	59.44	TK6PS-750x10	
3/4	40	TK4PS-750x40	43.73	TK6PS-750x40	
1	5	TK4PS-1000x5	72.28	TK6PS-1000x5	
1	10	TK4PS-1000x10	82.41	TK6PS-1000x10	
1	40	TK4PS-1000x40	53.42	TK6PS-1000x40	

Convenient TubeKIT
Sizes Shipped
Within 24 Hours

Medical Grade Tubing

Description: A medical-quality ("MQ"), T316L certified, stainless steel tubing manufactured in IDs from .020" to .500" with +/- .001" OD tolerances, or .500" to 1.000" ID with +/- .0015" ID tolerances. Available in thin wall fractional OD (Category-F).

Application: Ideal for any application requiring the highest quality tubing. Extremely close ID tolerances meet Class-9 applications. Tubing is welded and drawn to approximately 1/8-1/4 hard temper.

OD Theo	Wall Nom	ID Nom	T316 Item #	\$ ea Meter
1/8"	.006	.113	TK6MQ-125x006	Call or access web for pricing
1/8"	.010	.105	TK6MQ-125x010	
5/32"	.006	.144	TK6MQ-156x006	
5/32"	.010	.136	TK6MQ-156x010	
3/16"	.006	.176	TK6MQ-188x006	
3/16"	.010	.168	TK6MQ-188x010	
1/4"	.006	.238	TK6MQ-250x006	
1/4"	.010	.230	TK6MQ-250x010	
3/8"	.006	.363	TK6MQ-375x006	
3/8"	.010	.355	TK6MQ-375x010	
1/2"	.006	.488	TK6MQ-500x006	
1/2"	.010	.480	TK6MQ-500x010	



Stainless Steel Tubing

ODD-LOT Surplus Tubing Store is open and ready to exceed your tubing needs!

Selection of ODD-LOT surplus tubing is bigger and better than ever. Great for prototyping requirements, customs without the long lead times, short runs and much more, ODD-LOT is the best value for many of your tubing purchases. What's more, this wide assortment of surplus is now available online, updated daily in a easy-to-order and secure environment.

**100% Prime
Material**

**ODD-LOT's wide variety of choices -
many at bargain prices include:**

- Sizes ranging from .004" to 6" in diameter
- Welded and drawn/seamless
- Hypo, metric, fractional and pipe
- Types 304, 310, 316, 321, Ni200, 400, 600, C276 and more

Look at all that ODD-LOT has to offer!

- Fast delivery
- Large selection
- Unique sizes
- Bargain prices

ODD-LOT is your best choice for:

- Prototyping needs
- Customs in-stock
- Short runs
- And much more!



Custom Small Diameter Tubing

Round • Shaped • Composite

*Most orders shipped
within 5 days !*

> ex-USA

Transit ~10days

Import > Australia

Min ORDER AUD100

- ◀ **RAW MATERIALS
IN-STOCK**
- ◀ **MINI-REDRAW MILL**
- ◀ **STRAIGHTENING**
- ◀ **HYDROGEN ANNEALING**
- ◀ **DRAW DIES MANUFACTURED
IN-HOUSE**
- ◀ **FULL FABRICATION SERVICES**
- ◀ **100% BURR-FREE CUTTING**

- Pricing
- Filing
- Ordering
- Product Updates
- And More!



Drawing & Centerless Grinding

Drawing is the process used to size tubing by reducing a larger tube to a smaller one while maintaining or reducing the wall thickness based on the specifications required.

This is accomplished by using a draw bench and dies. Pulling the material through a die and over a mandrel at the same time controls both the Outside Diameter (OD) and usually the Wall thickness, or the Inside Diameter (ID).

MicroGroup can draw most metals, although we specialize in Stainless Steel and Nickel Based Alloys.

Centerless Grinding reduces the Outside Diameter (OD) of the tubing length and cylindrical parts. Tight tolerances can be maintained. Selecting standard Inside Diameter (ID) sizes and grinding to the desired OD size can often be a cost effective approach to producing a custom sized tube. This eliminates the sometimes costly set-up charges of redrawing. See table below for other alloys.



Round

Custom Round tubing can generally be produced by MicroGroup in most metals. Customs are achievable with tolerances to meet your needs, from standard to tight.

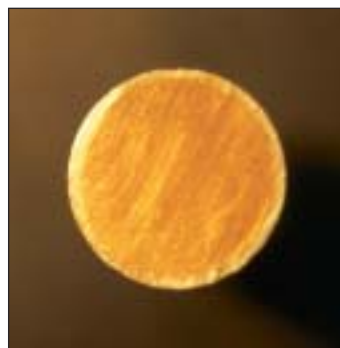
Delivery of customs are set-up to meet your needs. Prompt deliveries are our goal, however, they depend on volume and availability of raw material.



Shape

Shaped tubing can be produced by different methods. Most materials that can be drawn or rolled are capable of being formed into various shapes. Examples are; squares, rectangles, ovals, keyholes, triangles and teardrops.

**ISO 9002
Registered**



Composite

Composite refers to any tubing that is drawn (layered) over another tube (tubes) or solid. No standards apply - please call for details. Typically used to produce extremely high pressure (heavy walls) or add a layer of corrosion resistance to a less resistant tube, most applications are extremely specialized. Delivery of composites are dependent on process required to manufacture.

**We Also Work
with Aluminum, Brass
and Copper**

Prototypes

Production

Other Materials

Stainless Steels

303Se	303Se Stainless Steel
304	304 Stainless Steel
304L	304L Stainless Steel
305	305 Stainless Steel
309S	309S Stainless Steel
310S	310S Stainless Steel
316	316 Stainless Steel
316L	316L Stainless Steel
317	317 Stainless Steel
321	321 Stainless Steel
347	347 Stainless Steel
348	348 Stainless Steel
405	405 Stainless Steel
408	408 Stainless Steel
410	410 Stainless Steel
416e	416e Stainless Steel
430	430 Stainless Steel
430T	430Ti Stainless Steel
446	446 Stainless Steel
16-6	16-6 PH Stainless Steel

177	17-7 PH Stainless Steel
2169	21Cr-6Ni-9Mn Stainless Steel
A286	A-286 Stainless Steel
261	Alloy 26-1 Stainless Steel
N55	N-55 Stainless Steel
C20	Carpenter-20® (4)

Carbon and Alloy Steels

1010	1010 Steel
1012	1012 Steel
1015	1015 Steel
1018	1018 Steel
1020	1020 Steel
1021	1021 Lead Steel

Nickel and Nickel Alloys

188	Alloy 188
200	Nickel 200 ("A" Nickel)
201	Nickel 201 (Low Carbon Nickel)
211	Nickel 211 ("D" Nickel)
270	Nickel 270
301	Duranickel Alloy 301® (1)

400	Monel Alloy 400 (Monel)® (1)
404	Monel Alloy 404
500	Monel Alloy K-500 ("K" Monel)® (1)
600	Inconel Alloy 600® (1)
601	Inconel Alloy 601® (1)
617	Inconel Alloy 617® (1)
625	Inconel Alloy 625® (1)
702	Inconel Alloy 702® (1)
718	Inconel Alloy 718® (1)
800	Inconel Alloy 800® (1)
825	Inconel Alloy 825 (Incoloy)® (1)
902	NI-SPAN ALLOY 902 (Ni-Span C)®
8020	Alloy 80-20
C276	Alloy C-276
CN30	30% Cupronickel
HX	Alloy HX®
L605	Alloy L-605
Wasp	Waspaloy® (3)
HASB	HASTELLOY alloy B® (2)

HASC	HASTELLOY alloy C® (2)
X750	Inconel Alloy X-750® (1)

Nickel-Iron Alloys

NI36	36% Nickel-Iron Alloy
NI42	42% Nickel-Iron Alloy
NI52	52% Nickel-Iron Alloy
N4	#4 Alloy
2917	Alloy 29-17 (Kovar)

Other Materials and Alloys

A-40	Unalloyed Titanium A-40
32.5	Titanium Alloy 3Al-2.5V
6-4V	Titanium Alloy 6Al-4V
Mo	Molybdenum
15-3	Titanium Alloy 15-3

* 48 hour delivery is contingent upon materials availability.

For electropolishing and other finishing services.

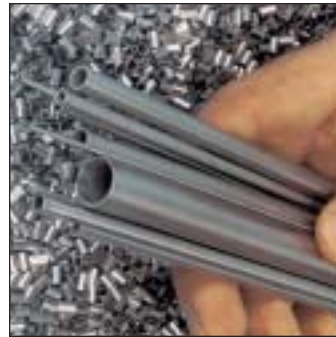
100% Burr-Free Cutting

Tubing • Solids

*Most orders shipped
within 48 HOURS!
ex-USA
Transit ~10days
Import > Australia
Min ORDER AUD100*

- ◀ **ELECTROCHEMICAL**
- ◀ **COLD SAWING**
- ◀ **ABRASIVE CUTTING**
- ◀ **DEBURRING**
- ◀ **PASSIVATION**
- ◀ **ELECTROPOLISHING**

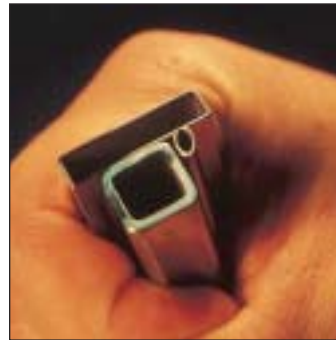
- Pricing
- Filing
- Ordering
- Product Updates
- And More!



100% Burr-Free Cuts: Tubing & Solids

> can supply 100% burr free cuts on diameters from .004". This is the superior method for cutting small diameter thin walled tubes and shapes where edge quality is critical. Various edge conditions can be achieved from sharp to well radiused. Many catheters are cut in this manner. This process also does not change the physical characteristics of the material.

* See cutting tolerance options chart below.



Deburring

Deburring can be accomplished from state of the art Electrochemical methods to more traditional vibratory and wire wheel, depending on the specifications. Selecting a cost effective method is based on the number of parts, size, shape and length. Electrochemical is very well suited for controlling edge breaking.



Abrasive Cutting

Abrasive Cutting can be performed on most metals. Tubing, solids and shapes can be cut using this method. Both Dry and Wet cutting is done with wet cutting minimizing burrs. Sizes range from .008" diameter and up. Fairly tight tolerances can be maintained with this process, which is dependent on diameter and lengths.



Cold Sawing

Cold sawing is primarily used for precise length cuts in heavier walled tubes and solids. Diameters range from .062" and up. Most metals can be cold sawed, and deburred at MicroGroup.

* 48 hour delivery is contingent upon materials availability.

100% Burr-Free Cutting Tolerance Options

For cutting lengths:	Standard Tolerance "C1"	Optional Tolerance "C2"
up to 1.0"	±.010	±.005
1.01" to 6.0"	±.015	±.010
6.01" to 12.0" (1')	±.030	±.015
12.01" (1') to 72.0" (6')	±.060	±.030
72.01" (6') to 144.0" (12')	±.100	±.060
144.01" (12') to 288.0" (24')	±.250	±.100



Precision Manufacturing Services

Fast Turnaround!

- ◀ **TUBE FORMING**
- ◀ **MICRO-MACHINING**
- ◀ **LASER-WELDING**
- ◀ **LASER MACHINING**
- ◀ **ELECTROPOLISHING**
- ◀ **POST PROCESSING**
- ◀ **CLEANING**
- ◀ **WIRE & RAM EDM SERVICES**
- ◀ **DEVICE ASSEMBLY**





100% Burr-Free Holes & Slots

100% Burr-Free holes and slots can be achieved by the electrochemical process referred to as ECG. ECG is well suited for slotting, applying angles, radiusing the walls on the end of tubes and finishing the ends of shaped tubes which are normally very difficult to deburr by conventional means.



Bending

> employs compression, rotary and mandrel bending techniques to provide quality bent components in prototype to production quantities. Stock bent tubes and fittings are also available.



Flaring

> performs flaring on stainless steel and other metals, in angles from 1 degree to 180 degrees (depending on thickness of the tube), and wall thicknesses from .003". Its many applications include stops, as a lead in or guide to aid insertion. Flaring is highly repeatable with proper preparation, cost effective and well-suited for volume applications.



Upsetting/Bulging/Bending

Cost effective hose barbs and stops for orientation or registration can be created by bulging or upsetting the tube wall, as pictured. Wall thickness and temper will affect the size and ease of the bulge. Process is best suited for precision applications in high volumes.



Swaging

Rotary Swaging is generally used to reduce the diameter of tubing and solids or to forge a tube over another tube or solid. Diameters from .020" to 1.0" in tubing and solids can be rotary swaged, overall lengths can vary from 1/4" to 20 feet or more, with a maximum tapered length of 3" in a single pass. The ideal swage angle is 15 degrees included, but angles to 90 degrees included are possible. Most metals can be rotary swaged.



Closures

Tube ends can be closed to customer specifications, with radius, flat and bullet nose tip options available. Wall thickness can be maintained throughout the end if desired. Dimensional and tolerance requirements on these features determine the manufacturing process.

MicroGroup's closures are used for a variety of products from sensor housings to inner and outer matched arthroscopic surgery cutters. Different end configurations are available.





Twin Spindle CNC Machining

Almost every metal can be efficiently cut and machined using our state-of-the-art twin spindle CNC micro-machining centers. These twin spindle machines are extremely competitive – eliminating all secondary operations and handling resulting in repetitive orientation of holes, slots, etc. All machining operations are accomplished within the machine for outstanding accuracy and control – turning, milling, drilling, deburring, etc.



EDM • Electrochemical Discharge Machining

> has CNC RAM and five axis wire capability in house. We fabricate our own electrodes which are used to create precision holes, slots, angles and skives – used primarily for precision, holding tolerances to .0001. MicroGroup can handle prototype to production quantities, is able to convert dxf files to EDM programs and can cut any conductive material as well as odd



ECG • Electrochemical Grinding

Burr-free, tight tolerance slots, angled bevels and cut lengths are produced by MicroGroup's electrochemical grinders. Most metals can be electrochemically cut and ground in diameters from .004" to 1-1/2", in tubing and solids. Tolerances of +/- .0001" or better can be maintained using electrochemical processes. ECG can be applied to almost any part that can be fixtured on a conventional surface grinder, with results considerably beyond those provided by conventional methods.



Laser Machining

YAG laser with varying beam widths is used for a variety of applications, including slotting, cutting and creating holes. Conventional and fiber optic beam delivery are suited for unique machining applications. Its proper fixturing allows for tight tolerances to be held. Laser machining is highly repeatable, fast and efficient. Plus, MicroGroup can handle prototype to production volumes.



Punching

Shaped dies are used to pierce tubing or flat stock to create a hole of a specific size or shape, or a component from flat stock. Punching can be performed on various metals (from stainless steel to brass), is cost effective and suitable for medium and high volume applications. Thickness of material to be punched affects size and tolerance of punch. Circles are most common, however, since we make dies in-house other shapes are available. MicroGroup is ready to consult and execute your requirements that will benefit from punching services.



Prototyping/Tooling

Our engineering group designs tooling for small prototype through large production runs. We are capable of working on your projects from the design phase through production. In-house prototyping services save time and money, as well as guarantee quality and consistency from concept to completion.





Laser Micro-Welding

Laser welding offers several advantages which include: minimal heat effect in the weld zone, welding of walls as thin as .002" and process repeatability in prototype through production quantities because of CNC control. Most metals can be laser beam welded. It's also ideal for welding small, thin-walled objects such as hypodermic tubing, pacemaker cases, diaphragms and bellows.



TIG Micro-Welding

? uses TIG welding techniques suited for precision components and assemblies. MicroGroup designs fixturing in-house for each application which results in superior tolerancing and joint finishes. Walls as thin as .002" can be welded, but TIG is better suited for thicker walls. MicroGroup has also developed expertise in TIG fusion welding, which eliminates the use of unwanted filler materials.



Induction Brazing

Induction is ideally suited as a closely controlled heat source for brazing. A wide variety of materials can be brazed, including some combinations that are unweldable. Brazing can be more economical than welding smaller parts and is often preferred for joining thin sections to thick sections because reduced heat minimizes distortion. Brazing is used extensively for joining many dissimilar material combinations. Inaccessible joint areas that could not be made by gas metal arc, gas tungsten arc, and spot or seam welding can be joined by brazing.



Micro-Torch Brazing

A wide variety of materials can be brazed, including some combinations that are unweldable. Brazing can be more economical than welding smaller parts and is often preferred for joining thin sections to thick ones since reduced heat minimizes distortion. MicroGroup uses state-of-the-art equipment to join components, where other welding techniques are not applicable, such as dissimilar materials and complex joint configurations.



Fixturing

Customized to meet stringent requirements, MicroGroup performs fixturing services in-house for prototype and production quantities. We handle fixturing of both single and multiple parts. And since MicroGroup has welding experience, we understand what requirements the fixturing must meet. We also know the idiosyncrasies of tubing, enabling us to always create the proper fixtures.



MIG Welding

Used typically in thicknesses .020" and up for tubing, sheet and solids, this process uses filler metals for joining materials. Exacting assembly tolerances of +/- .001 can be maintained if specified and with proper fixturing. Most metals can be precision MIG welded. It's also perfect for producing welds that require a fillet or for building thickness. MIG is applicable for prototype to high quantity production applications.



ISO 9002
Registered

Finishing/Post Processing

Short Lead Times
Tough Jobs



Catheter Cleaning

> custom cleaning equipment is designed to perform production volume cleaning on an individual tube basis. ID and OD cleanliness problems associated with batch cleaning processes are eliminated by employing automated systems to clean, rinse, flush solvents, passivate and purge.



Electropolishing

Electropolishing is a controlled chemical process that removes a slight amount of the component or tube's surface. It helps create a clean and bright surface, enhances corrosion resistance and removes feather burrs.



Vacuum Oven

The use of high vacuum ovens enhance cleaning and stress relieving. When employed during the cleaning process drying is ensured and cleanliness is improved by the outgassing of trace elements of contaminants. Additionally, pyrogens are removed and corrosion resistance is improved. High vacuum furnaces also provide contaminant and discoloration free stress relieving.



Vibratory Polishing

Vibrating parts in a special container with media and detergent removes burrs, breaks edges, cleans and creates a nice surface finish. Metal, ceramic, plastic and other media are used, as well as different detergents. MicroGroup is also able to meet custom requests.



Pyrolyzation

In pyrolyzation, a nitrogen purged container is loaded with components and heated in an oven. The resulting pyrogen free parts are immediately packaged.



Microblasting

In microblasting, the surface of a component is roughened through blasting with abrasive media (including glass beads, Aluminum Oxide, Silicone carbide and Sodium carbonate) and air. The roughened surface allows for better adhesion of plastics to metal during injection molding. Microblasting creates a non-reflective surface and can be used to deburr and clean.



Ultrasonic with Filtration

Ultrasonic cleaning is a primary method of removing contaminants and debris from tubing that has been processed. High frequency soundwaves combine with liquid media to remove dirt, grease, oil and residual contaminants. The process is quick and involves a limited handling of parts.

MicroGroup has custom ultrasonic tanks capable of cleaning small parts of tubing up to 6 feet in length, in both single pieces and batches.



Passivation

Passivation is a chemical process used to increase the corrosion inhibiting properties of stainless steel and clean discoloration from welding and cutting. MicroGroup performs passivation to customer requirements, as well as QQP35 Type VI, Type II and A967-96.



Assembly Services

With over 25 years of stainless steel tubing experience and support manufacturing services, MicroGroup welcomes the opportunity to produce your final product or subassembly components. Whether you acquire your raw materials from our inventory of over 5 million feet of tubing or supply your own, MicroGroup is prepared to be your one-stop source – from materials to complete product manufacturing.

The following outlines the process we've designed to both help your work teams and manage all of the details. It's a process that guarantees your quality and delivery requirements are always exceeded.



Project Review

When you work with Us!, our initial step is conducting a thorough project review. This allows us to go over all of the project's specifications, ensuring that we fully understand your objectives. We'll then discuss your quality requirements, determine if prints or additional drawings are necessary and create a production schedule with milestones.



Drafting Services

> capabilities include creating internal drawings for fixtures, as well as component and assembly drawings, if required (with AutoCAD used most often). We can e-mail drawings to you and if a complete drawing package is needed, MicroGroup can provide this service as well.



Project Engineers

> advantage includes an exceptional staff of the industry's finest engineers. This hard working group of highly-trained professionals will work with you from design concept through manufacturing and assembly. Our dedicated project engineers closely monitor all details – and work with you every step of the way.



**Quality
Assured!**

Quality Control

> quality system has earned us ISO 9002 certification. What's more, although ISO registered, MicroGroup offers continuous employee training programs, assuring that the highest level of quality systems and products are produced.

From raw materials to manufacturing and assembly, As your your vendor partner offering all of the services you need in one place. This means that every one of your stainless steel tubing and related manufacturing requirements can be taken care of by one supplier.

From concept through completion, you'll get the kind of control over production, delivery and product consistency you're looking for. And we're not only are focused on taking care of all of the details of every project, we're also able to respond to your custom design requests and tight deadlines. Our skills are focused on creating the highest caliber products, as quickly as possible.

Stainless Steel Tube & Hose Fittings

Economical!

- ◀ 1/32" TO 1" DIAMETERS
- ◀ T316 STAINLESS STEEL
- ◀ LIGHTWEIGHT
- ◀ STOCK AND CUSTOM
- ◀ EASY TO USE
- ◀ WELD/SOLDER/EPOXY/BRAZE

*Most orders shipped
within 48 HOURS!
ex-USA
Transit ~10days
Import > Australia
Min ORDER AUD100*

About Tube Fittings

Offering a Unique Concept...

These Stainless Steel tube fittings are fabricated from thin wall tubing in actual tube OD sizes. Braze/HozeTyte® was created to satisfy the need for a standard line of versatile fittings compatible with thin wall stainless steel tubing and suitable for reliable permanent type assemblies.

Material

Over the years, the use of the "Modern Metal" (stainless steel) has increased steadily. Its corrosion resistant qualities and high strength characteristics have inspired design engineers to specify stainless. Now with Braze/HozeTyte®, quality is available at a reasonable cost.

Application

Braze/HozeTyte® fittings lend themselves ideally to industrial applications in the beverage, chemical, food, marine, medical, photography, refrigeration industries and many other areas.

How to Specify BrazeTyte® Tube Fittings

Nomenclature:

BrazeTyte® fitting part numbers are constructed from symbols that identify the size and style of the fitting.

The dash numbers indicate tube OD size by 1/16 inches, thus -4 means 4/16" or 1/4", -10 means 10/16" or 5/8", etc. The first series of numbers identifies the style or configuration of the fitting. The letters designate combinations of male, female and swivel ends of the part (see below).

Letter Designation		Example: 15MF-8		
FF	All Female	15	MF	-8
MM	All Male	style	male	tube OD
MF	Male and Female	TEE	and	size
SF	Swivel and Female	male run	female	1/2"
SM	Swivel and Male			

How to Specify HozeTyte® Tube Fittings

Nomenclature:

HozeTyte® fitting part numbers are constructed from symbols that identify the size and style of the fitting.

The first dash number indicates hose ID size by 1/16 inches, thus -4 means 4/16" or 1/4", -10 means 10/16" or 5/8", etc. The first series of numbers identifies the style or configuration of the fitting. The letters designate combinations of male, hose and pipe ends of the part.

Pipe ends are designated by the dash number. These are not outside diameters, but rather standard NPTF screw thread sizes.

Letter Designation		Example: 90MH-8		
HH	All Hose	90	MH	-8
MH	Male and Hose	style	male	Hose ID
PH	Pipe and Hose	90°	and	size
		elbow	hose	1/2"

Advantages

This new line of fittings, as its name implies, is fabricated from thin wall type 316L stainless steel tubing to provide maximum corrosion resistance with minimum bulk and weight. All elbows incorporate smooth radius bends for maximum flow and minimum turbulence.

Because Braze/HozeTyte® fittings utilize thin wall tubing, they are light in weight and provide larger tube inside dimensions for increased capacity and flow. These fittings afford a substitute for the present heavy machined fittings produced from bulky expensive forgings. Braze/HozeTyte's construction facilitates the use of thin wall tubing throughout the complete system.

Installation costs are reduced, because Braze/HozeTyte fittings are easy to use. Special tools are not required and quick connections may be made utilizing standard processing.

Methods for Installing BrazeTyte® Fittings

The most effective means for making a stainless connection is by either soldering, brazing or welding. Such joints are strong, leak-tight, corrosion resistant, economical and have a good appearance. BrazeTyte tube fittings are designed to provide for these assembly methods.

Soldering and Brazing

Soldered or brazed joints resist most corrosive media. The very nature of the process leaves only a small seam exposed to atmosphere. It is important to choose the proper solder or brazing alloy and this is usually determined by the application and environment of the assembly being fabricated. Certain alloys are formulated with precious metals which give them corrosive resistance equal to stainless steel itself.

Soldered or brazed stainless steel connections are extremely strong in both tensile and shear strength. This high strength characteristic is based on the ability of molten brazing alloy to penetrate and fill the gap between bonding areas through "capillary action."

Welding

The other means of making a permanent joint with BrazeTyte fittings is by welding. Depending upon the configuration chosen, connections may be made by either of two basic methods, Butt or Lap welding. The technique chosen will be governed by the actual tubing application, the welding equipment available and the skill of the welding operator.

Bonding with Epoxy

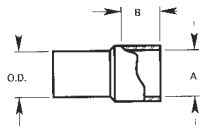
BrazeTyte fittings can also be assembled using epoxy adhesives. Epoxy provides a permanent joint for low pressure assemblies and is an easy, inexpensive method to accomplish a connection. A joint may be made quickly, using unskilled labor and simple techniques.

There are many types of commercial and industrial epoxy adhesives on the market. These usually are offered as two component kits, one part being the catalyst which activates the curing of the material. Curing methods of these epoxy adhesives vary. Some cure at room temperatures and in other cases curing is accelerated by the application of heat.

Properly prepared and fully cured bonds are possible that will yield tensile shear strengths of up to 3,500 psi when tested at room temperature.

Epoxy adhesive is not recommended for systems where temperatures exceed 200° or for use with certain chemicals that might tend to attack the epoxy joint. The manufacturer usually supplies this type of information in the form of chemical corrosion resistance table.

Brazetyte® Fittings

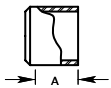


Cup Dimensions

The chart below is a reference guide to be used for your convenience listing the dimensions of each item number by size.

Item #	O.D.	Wall	A	B (Cup Depth)	
-4	1/4	.025	.254	1/4	Call or access web for pricing ↓
-5	5/16	.025	.316	1/4	
-6	3/8	.028	.379	1/4	
-8	1/2	.032	.504	5/16	
-10	5/8	.035	.629	7/16	
-12	3/4	.042	.754	1/2	
-16	1	.049	1.005	3/4	
-20	1-1/4	.049	1.255	13/16	
-24	1-1/2	.049	1.505	15/16	

Tol: A = ± .005 B = ± .032

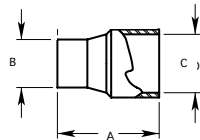


Cap

Female Closed

Used to terminate a line or fitting. Fits over male end of BrazeType fitting or over the O.D. of tubing.

Item #	Sizes	Wall	A	\$ ea
10F-4	1/4	.032	1/4	Call or access web for pricing ↓
10F-5	5/16	.032	1/4	
10F-6	3/8	.032	1/4	
10F-8	1/2	.032	5/16	
10F-10	5/8	.032	7/16	
10F-12	3/4	.049	1/2	
10F-16	1	.049	3/4	
10F-20	1-1/4	.049	13/16	
10F-24	1-1/2	.049	15/16	

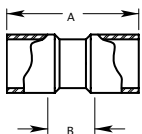


Expander

Male OD <> Female ID

Used as an adapter where an expansion from a smaller OD to a larger OD is required. Can be employed in conjunction with the 10FF union to join different OD sizes of tubing. May also be utilized with any MF, FF or SF style fitting.

Item #	Sizes	Wall	A	B	C	\$ ea
10MF-4-5	1/4 x 5/16	.025	15/16	1/4	.316	Call or access web for pricing ↓
10MF-4-6	1/4 x 3/8	.025	7/8	1/4	.379	
10MF-5-6	5/16 x 3/8	.025	1-1/32	5/16	.379	
10MF-6-8	3/8 x 1/2	.032	1-9/32	3/8	.504	
10MF-8-10	1/2 x 5/8	.035	1-3/8	1/2	.629	
10MF-8-12	1/2 x 3/4	.035	1-3/8	1/2	.754	
10MF-10-12	5/8 x 3/4	.035	1-3/8	5/8	.754	
10MF-12-16	3/4 x 1	.049	2-7/16	3/4	1.005	
10MF-16-20	1" x 1-1/4	.049	2-7/16	1	1.255	
10MF-16-24	1" x 1-1/2	.049	2-1/16	1	1.505	
10MF-20-24	1-1/4 x 1-1/2	.049	2-3/8	1-1/4	1.505	

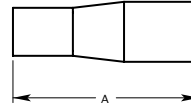


Union

Female <> Female

Used as a coupling. Both ends will accept either tube OD or male end of BrazeType fitting. When connecting different OD sizes, either the 5MF reducer or the 10MF expander should be employed.

Item #	Sizes	Wall	A	B	\$ ea
10FF-4	1/4	.025	15/16	11/16	Call or access web for pricing ↓
10FF-5	5/16	.025	1	3/4	
10FF-6	3/8	.028	1	3/4	
10FF-8	1/2	.032	1-5/32	27/32	
10FF-10	5/8	.035	1-11/32	29/32	
10FF-12	3/4	.042	1-9/16	1-1/16	
10FF-16	1	.049	2-1/4	1-1/2	
10FF-20	1-1/4	.049	2-1/2		
10FF-24	1-1/2	.049	2-11/16		

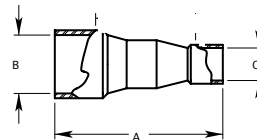


Transition

Male <> Male

Used as a reducer or expander to accomplish a change in O.D. size. Can be employed in conjunction with any MF, FF or SF style fitting to obtain a reduced or expanded male end. Also can be used as a butt weld connector when a change in O.D. is desired.

Item #	Sizes	Wall	A	\$ ea
5MM-4-5	1/4 x 5/16	.025	31/32	Call or access web for pricing ↓
5MM-4-6	1/4 x 3/8	.025	15/16	
5MM-5-6	5/16 x 3/8	.025	1-1/165	
5MM-6-8	3/8 x 1/2	.032	1-5/16	
5MM-8-10	1/2 x 5/8	.035	1-7/16	
5MM-8-12	1/2 x 3/4	.035	1-7/16	
5MM-10-12	5/8 x 3/4	.035	1-7/16	
5MM-12-16	3/4 x 1	.049	2-1/2	
5MM-16-20	1 x 1-1/4	.049	2-1/2	
5MM-16-24	1 x 1-1/2	.049	2-1/8	
5MM-20-24	1-1/4 x 1-1/2	.049	2-7/16	

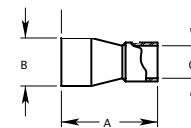


Reducing Union

Female <> Female: in tube OD sizes

Used as a coupling. Both ends will accept either tube OD or male end of BrazeType fitting.

Item #	Sizes	Wall	A	B	C	\$ ea
5FF-5-4	5/16 x 1/4	.025	7/8	.316	.254	Call or access web for pricing ↓
5FF-6-4	3/8 x 1/4	.025	2-7/32	.379	.254	
5FF-6-5	3/8 x 5/16	.025	1	.379	.316	
5FF-8-6	1/2 x 3/8	.032	1-1/4	.504	.379	
5FF-10-8	5/8 x 1/2	.035	1-5/16	.629	.504	
5FF-12-8	3/4 x 1/2	.035	1-5/16	.754	.504	
5FF-12-10	3/4 x 5/8	.035	1-5/16	.754	.629	
5FF-16-12	1 x 3/4	.049	2-3/8	1.005	.754	
5FF-20-16	1-1/4 x 1	.049	2-3/8	1.255	1.005	
5FF-24-16	1-1/2 x 1	.049	2	1.505	1.005	
5FF-24-20	1-1/2" x 1-1/4"	.049	2-5/16	1.505	1.255	



Reducer

Male OD <> Female ID

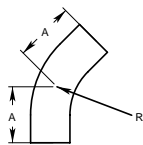
Used as an adapter where a reduction from larger OD to a smaller OD is required. Can be employed in conjunction with any MF, FF or SF style fitting to reduce female BrazeType end.

Item #	Sizes	Wall	A	B	C	\$ ea
5MF-5-4	5/16 x 1/4	.025	15/16	5/16	.254	Call or access web for pricing ↓
5MF-6-4	3/8 x 1/4	.025	7/8	3/8	.254	
5MF-6-5	3/8 x 5/16	.025	1-1/32	3/8	.316	
5MF-8-6	1/2 x 3/8	.032	1-9/32	1/2	.379	
5MF-10-8	5/8 x 1/2	.035	1-3/8	5/8	.504	
5MF-12-8	3/4 x 1/2	.035	1-3/8	3/4	.504	
5MF-12-10	3/4 x 5/8	.035	1-3/8	3/4	.629	
5MF-16-12	1 x 3/4	.049	2-7/16	1	.754	
5MF-20-16	1-1/4 x 1	.049	2-7/16	1-1/4	1.005	
5MF-24-16	1-1/2 x 1	.049	2-1/16	1-1/2	1.005	
5MF-24-20	1-1/2 x 1-1/4	.049	2-3/8	1-1/2	1.225	

Customs Made To Order!



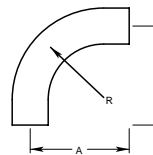
Brazetyte® Fittings



45° Elbow

Male <> Male

For direct assembly into machined ports and flanges or into female BrazeTyte expansions. can be used as a Butt-Weld fitting.



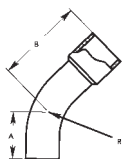
90° Elbow

Male <> Male

For direct assembly into machined ports and flanges or into female BrazeTyte expansions. Can be used as a Butt-Weld fitting.

Item #	Sizes	Wall	R	A	\$ ea
45MM-4	1/4	.025	3/8	19/32	<i>Call or access web for pricing</i>
45MM-5	5/16	.025	15/32	5/8	
45MM-6	3/8	.028	9/16	21/32	
45MM-8	1/2	.032	3/4	25/32	
45MM-10	5/8	.035	15/16	1	
45MM-12	3/4	.042	1-1/8	1-7/32	
45MM-16	1	.049	1-1/2	1-19/32	
45MM-20	1-1/4	.049	1-7/8	1-27/32	
45MM-24	1-1/2	.049	2-1/4	2-1/16	

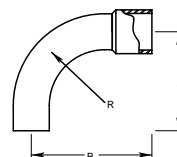
Item #	Sizes	Wall	R	A	\$ ea
90MM-4	1/4	.025	3/8	13/16	<i>Call or access web for pricing</i>
90MM-5	5/16	.025	15/32	29/32	
90MM-6	3/8	.028	9/16	1	
90MM-8	1/2	.032	3/4	1-1/4	
90MM-10	5/8	.035	15/16	1-9/16	
90MM-12	3/4	.042	1-1/8	1-7/8	
90MM-16	1	.049	1-1/2	2-15/32	
90MM-20	1-1/4	.049	1-7/8	2-15/16	
90MM-24	1-1/2	.049	2-1/4	3-13/32	



45° Elbow

Male <> Female

For direct assembly into machined ports or into female BrazeTyte expansions, female end will accept tube OD or male end of BrazeTyte fitting. When connecting different OD sizes, either the 5MF reducer or the 10MF expander can be employed.



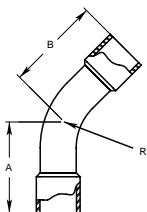
90° Elbow

Male <> Female

For direct assembly into machined ports or into female BrazeTyte expansions, female end will accept tube OD or male end of BrazeTyte fitting. When connecting different OD sizes, either the 5MF reducer or the 10MF expander can be employed.

Item #	Tube O.D.	Tube Wall	Radius R	A	B	\$ ea
45MF-4	1/4	.025	3/8	19/32	17/32	<i>Call or access web for pricing</i>
45MF-5	5/16	.025	15/32	5/8	9/16	
45MF-6	3/8	.028	9/16	21/32	19/32	
45MF-8	1/2	.032	3/4	25/32	25/32	
45MF-10	5/8	.035	15/16	1	1	
45MF-12	3/4	.042	1 1/8	1 7/32	1 7/32	
45MF-16	1	.049	1 1/2	1 19/32	1 19/32	
45MF-20	1 1/4	.049	1 7/8	1 27/32	1 27/32	
45MF-24	1 1/2	.049	2 1/4	2 1/16	2 1/16	

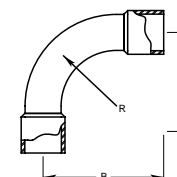
Item #	Sizes	Wall	R	A	B	\$ ea
90MF-4	1/4	.025	3/8	13/16	3/4	<i>Call or access web for pricing</i>
90MF-5	5/16	.025	15/32	29/32	27/32	
90MF-6	3/8	.028	9/16	1	15/16	
90MF-8	1/2	.032	3/4	1-1/4	1-1/4	
90MF-10	5/8	.035	15/16	1-9/16	1-9/16	
90MF-12	3/4	.042	1-1/8	1-7/8	1-7/8	
90MF-16	1	.049	1-1/2	2-15/32	2-15/32	
90MF-20	1-1/4	.049	1-7/8	2-15/16	2-15/16	
90MF-24	1-1/2	.049	2-1/4	3-13/32	3-13/32	



45° Elbow

Female <> Female

Used as a coupling. Both ends will accept either tube OD or male end of BrazeTyte fitting. When connecting different OD sizes, either the 5MF reducer or the 10MF expander should be employed.



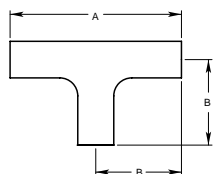
90° Elbow

Female expansions both ends

Both ends will accept either tube OD or male end of BrazeTyte fittings. When connecting different OD sizes, either the 5MF reducer or the 10MF expander should be employed.

Item #	Sizes	Wall	R	B	\$ ea
45FF-4	1/4	.025	3/8	17/32	<i>Call or access web for pricing</i>
45FF-5	5/16	.025	15/32	9/16	
45FF-6	3/8	.028	9/16	19/32	
45FF-8	1/2	.032	3/4	25/32	
45FF-10	5/8	.035	1-5/16	1	
45FF-12	3/4	.042	1-1/8	1-7/32	
45FF-16	1	.049	1-1/2	1-19/32	
45FF-20	1-1/4	.049	1-7/8	1-27/32	
45FF-24	1-1/2	.049	2-1/4	2-1/16	

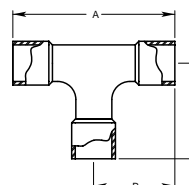
Item #	Sizes	Wall	R	B	\$ ea
90FF-4	1/4	.025	3/8	3/4	<i>Call or access web for pricing</i>
90FF-5	5/16	.025	15/32	27/32	
90FF-6	3/8	.028	9/16	15/16	
90FF-8	1/2	.032	3/4	1-1/4	
90FF-10	5/8	.035	15/16	1-9/16	
90FF-12	3/4	.042	1-1/8	1-7/8	
90FF-16	1	.049	1-1/2	2-15/32	
90FF-20	1-1/4	.049	1-7/8	2-15/16	
90FF-24	1-1/2	.049	2-1/4	3-13/32	



Tee

Male three ends

For direct assembly into machined ports and flanges or into female BrazeTyte expansions. Can be used as a Butt-Weld fitting.



Tee

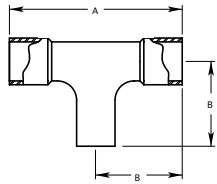
Female <> Female - Female

All ends accept either tube OD or male end of BrazeTyte fitting. When used to join different OD sizes, either the 5MF reducer or the 10MF expander can be employed.

Item #	Sizes	Wall	A	B	\$ ea
30MM-5	5/16	.025	1-3/16	19/32	<i>Call or access web for pricing</i>
30MM-6	3/8	.028	1-3/8	11/16	
30MM-8	1/2	.032	1-5/8	13/16	
30MM-10	5/8	.035	2	1	
30MM-12	3/4	.042	2-3/8	1-3/16	
30MM 16	1	.049	3-1/4	1-5/8	
30MM 20	1-1/4	.049	3-5/8	1-13/16	
30MM 24	1-1/2	.049	4-1/8	2-1/16	

Item #	Sizes	Wall	A	B	\$ ea
30FF-4	1/4	.025	1-3/16	19/32	<i>Call or access web for pricing</i>
30FF-5	5/16	.025	1-3/8	11/16	
30FF-6	3/8	.028	1-3/8	11/16	
30FF-8	1/2	.032	1-5/8	13/16	
30FF10	5/8	.035	2	1	
30FF-12	3/4	.042	2-3/8	1-3/16	
30FF-16	1	.049	3-1/4	1-5/8	
30FF-20	1-1/4	.049	3-5/8	1-13/16	
30FF-24	1-1/2	.049	4-1/8	2-1/16	

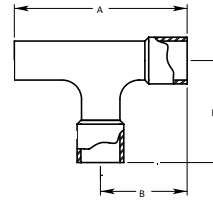
Brazetyte® Fittings



Tee

Female <> Female - Male

Male for direct assembly into machined ports or into female BrazeType expansions. Female ends to accept tube OD or male ends of BrazeType fittings. When used to join different OD sizes, either the 5MF reducer or the 10MF expander can be employed.



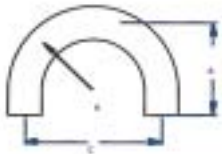
Tee

Male <> Female - Female

Male run for direct assembly into machined ports or into female BrazeType expansions. Female ends to accept tube OD or male ends of BrazeType fittings. When used to join different OD sizes, either the 5MF reducer or the 10MF expander can be employed.

Item #	Sizes	Wall	A	B	\$ ea
20MF-5	5/16	.025	1-1/16	19/32	Call or access web for pricing
20MF-6	3/8	.028	1-1/4	11/16	
20MF-8	1/2	.032	1-5/8	13/16	
20MF-10	5/8	.035	2	1	
20MF-12	3/4	.042	2-3/8	1-3/16	
20MF-16	1	.049	3-1/4	1-5/8	
20MF-20	1-1/4	.049	3-5/8	1-13/16	
20MF-24	1-1/2	.049	4-1/8	2-1/16	

Item #	Sizes	Wall	A	B	\$ ea
15MF-5	5/16	.025	1-1/8	17/32	Call or access web for pricing
15MF-6	3/8	.028	1-5/16	5/8	
15MF-8	1/2	.032	1-5/8	13/16	
15MF-10	5/8	.035	2	1	
15MF-12	3/4	.042	2-3/8	1-3/16	
15MF-16	1	.049	3-1/4	1-5/8	
15MF-20	1-1/4	.049	3-5/8	1-13/16	
15MF-24	1-1/2	.049	4-1/8	2-1/16	



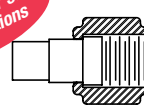
180° Return Bend

Male <> Male

For direct assembly into machined ports and flanges or into female BrazeType expansions. Can be used as a Butt-Weld fitting.

Item #	Tube O.D.	Tube Wall	Radius R	A	C	\$ ea
180MM-4	1/4	.025	3/8	13/16	3/4	Call or access web for pricing
180MM-5	5/16	.025	15/32	29/32	15/16	
180MM-6	3/8	.028	9/16	1	1 1/8	
180MM-8	1/2	.032	3/4	1 1/4	1 1/2	
180MM-10	5/8	.035	15/16	1 9/16	1 7/8	
180MM-12	3/4	.042	1 1/8	1 7/8	2 1/4	
180MM-16	1	.049	1 1/2	2 15/32	3	
180MM-20	1 1/4	.049	1 7/8	2 15/16	3 3/4	
180MM-24	1 1/2	.049	2 1/4	3 13/32	4 1/2	

Call for Other 37° Configurations

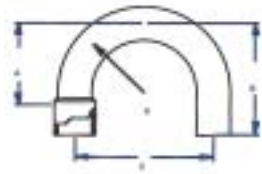


Adapter

Male <> Flare

Used to provide an easy sub-assembly disconnect. Male end mates with machine ports or female BrazeType expansions. Swivel end mates with SAE 37°, JIC 37° and AN/MS 37° flare type fittings. Type 303 Nut & Sleeve

Item #	Sizes	Wall	HEX	Thread	A	\$ ea
10SM-4	1/4	.025	9/16	7/16-20	1-1/32	Call or access web for pricing
10SM-5	5/16	.025	5/8	1/2-20	1-1/8	
10SM-6	3/8	.028	11/16	9/16-18	1-1/8	
10SM-8	1/2	.032	7/8	3/4-16	1-9/32	
10SM-10	5/8	.035	1	7/8-14	1-15/32	
10SM-12	3/4	.042	1-1/4	1-1/16-12	1-29/32	
10SM-16	1	.049	1-1/2	1-5/16-12	2-9/16	
10SM-20	1-1/4	.049	2	1-5/8-12	3-1/32	
10SM-24	1-1/2	.049	2-1/4	1-7/8-12	3-7/32	



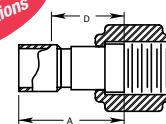
180° Return Bend

Male <> Female

For direct assembly into machined ports or into female BrazeType expansions, female end will accept tube OD or male end of BrazeType fitting. When connecting different OD sizes, either the 5MF reducer or the 10MF expander can be employed.

Item #	Tube O.D.	Tube Wall	Radius R	A	B	C	\$ ea
180MF-4	1/4	.025	3/8	13/16	3/4	3/4	Call or access web for pricing
180MF-5	5/16	.025	15/32	29/32	15/16	27/32	
180MF-6	3/8	.028	9/16	1	1 1/8	15/16	
180MF-8	1/2	.032	3/4	1 1/4	1 1/2	1 1/4	
180MF-10	5/8	.035	15/16	1 9/16	1 7/8	1 9/16	
180MF-12	3/4	.042	1 1/8	1 7/8	2 1/4	1 7/8	
180MF-16	1	.049	1 1/2	2 15/32	3	2 15/32	
180MF-20	1 1/4	.049	1 7/8	2 15/16	3 3/4	2 15/16	
180MF-24	1 1/2	.049	2 1/4	3 13/32	4 1/2	2 13/32	

Call for Other 37° Configurations

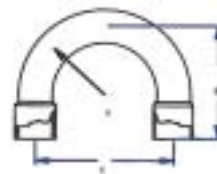


Adapter

Female <> Flare

Used to provide an easy sub-assembly disconnect. Female end to accept tube OD or male ends of BrazeType fittings. Swivel end mates with SAE 370, JIC 37° and AN/MS 37° flare type fittings. Type 303 Nut & Sleeve

Item #	Sizes	Wall	HEX	Thread	A	D	\$ ea
10SF-4	1/4	.025	9/16	7/16-20	1-1/32	25/32	Call or access web for pricing
10SF-5	5/16	.025	5/8	1/2-20	1-1/8	7/8	
10SF-6	3/8	.028	11/16	9/16-18	1-1/8	7/8	
10SF-8	1/2	.032	7/8	3/4-16	1-9/32	31/32	
10SF-10	5/8	.035	1	7/8-14	1-15/32	1-1/32	
10SF-12	3/4	.042	1-1/4	1-1/16-12	1-29/32	1-13/32	
10SF-16	1	.049	1-1/2	1-5/16-12	2-9/16	1-13/16	
10SF-20	1-1/4	.049	2	1-5/8-12	3-1/32		
10SF-24	1-1/2	.049	2-1/4	1-7/8-12	3-7/32		



180° Return Bend

Female <> Female

Both ends will accept either tube OD or male end of BrazeType fittings. When connecting different OD sizes, either the 5MF reducer or the 10MF expander should be employed.

Item #	Tube O.D.	Tube Wall	Radius R	C	B	\$ ea
180FF-4	1/4	.025	3/8	3/4	3/4	Call or access web for pricing
180FF-5	5/16	.025	15/32	15/16	27/32	
180FF-6	3/8	.028	9/16	1 1/8	15/16	
180FF-8	1/2	.032	3/4	1 1/2	1 1/4	
180FF-10	5/8	.035	15/16	1 7/8	1 9/16	
180FF-12	3/4	.042	1 1/8	2 1/4	1 7/8	
180FF-16	1	.049	1 1/2	3	2 15/32	
180FF-20	1 1/4	.049	1 7/8	3 3/4	2 15/16	
180FF-24	1 1/2	.049	2 1/4	4 1/2	2 13/32	



All dimensions are in inches unless designated millimeters (mm).

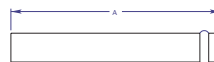
HozeTyte® Fittings

Ideally suited for industrial applications in the following industries:

- Beverage
- Chemical
- Food
- Hydraulic
- Marine
- Medical
- Photography
- Refrigeration
- And Others

Please refer to page 24 for How to Specify HozeTyte information.

Adapter

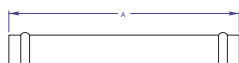


Male Tube <=> Hose Bead

Used to connect a flexible non-metallic hose to a vessel (feed tank, reservoir, etc.). Male end can be brazed or welded.

Item #	Sizes	Wall	A	\$ ea
10MH-4	1/4	.025	1-23/32	Call or access web for pricing
10MH-6	3/8	.028	1-23/32	
10MH-8	1/2	.032	1-23/32	
10MH-10	5/8	.035	1-25/32	
10MH-12	3/4	.042	1-27/32	
10MH-16	1	.049	1-27/32	
10MH-20	1-1/4	.049	1-27/32	
10MH-24	1-1/2	.049	1-7/8	

Connector

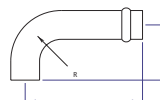


Hose Bead <=> Hose Bead

Used as a connector to join flexible non-metallic hoses.

Item #	Sizes	Wall	A	\$ ea
10HH-4	1/4	.025	3	Call or access web for pricing
10HH-6	3/8	.028	3	
10HH-8	1/2	.032	3	
10HH-10	5/8	.035	3	
10HH-12	3/4	.042	3	
10HH-16	1	.049	3	
10HH-20	1-1/4	.049	3	
10HH-24	1-1/4	.049	3	

90° Elbow

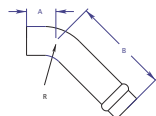


Male Tube <=> Hose Bead

Used to connect a flexible non-metallic hose to a vessel (feed tank, reservoir etc.) where a 90° angle is required. Male end can be brazed or welded.

Item #	Sizes	Wall	R	A	B	\$ ea
90MH-4	1/4	.025	3/8	13/16	1-7/8	Call or access web for pricing
90MH-6	3/8	.028	9/16	1	2-1/16	
90MH-8	1/2	.032	3/4	1-1/4	2-1/4	
90MH-10	5/8	.035	7/8	1-1/2	2-3/8	
90MH-12	3/4	.042	1-1/8	1-7/8	2-5/8	
90MH-16	1	.049	1-1/2	2-15/32	3	
90MH-20	1-1/4	.049	1-7/8	2-15/16	3-3/8	
90MH-24	1-1/2	.049	2-1/4	3-13/32	3-3/4	

45° Elbow

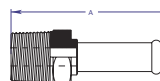


Male Tube <=> Hose Bead

Used to connect a flexible non-metallic hose to a vessel (feed tank, reservoir, etc.) where a 45° angle is required. Male end can be brazed or welded.

Item #	Sizes	Wall	R	A	B	\$ ea
45MH-4	1/4	.025	3/8	3/4	1-13/16	Call or access web for pricing
45MH-6	3/8	.028	9/16	7/8	1-15/16	
45MH-8	1/2	.032	3/4	1-3/32	2-3/32	
45MH-10	5/8	.035	7/8	1-5/16	2-3/16	
45MH-12	3/4	.042	1-1/8	1-5/8	2-3/8	
45MH-16	1	.049	1-1/2	2-5/32	2-11/16	
45MH-20	1-1/4	.049	1-7/8	2-17/32	2-31/32	
45MH-24	1-1/2	.049	2-1/4	2-15/16	3-1/4	

Adapter

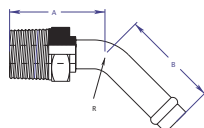


Male Pipe Thread <=> Hose Bead

Used to connect a flexible non-metallic hose to a female pipe port.

Item #	Sizes	Wall	A	HEX	NPT	\$ ea
10PH-4	1/4	.025	2-1/8	7/16	1/8	Call or access web for pricing
10PH-6	3/8	.028	2-1/4	5/8	1/4	
10PH-8	1/2	.032	2-3/8	11/16	3/8	
10PH-10	5/8	.035	2-1/2	7/8	1/2	
10PH-12	3/4	.042	2-9/16	1-1/16	3/4	
10PH-16	1	.049	2-11/16	1-3/8	1	
10PH-20	1-1/4	.049	2-13/16	1-3/4	1-1/4	
10PH-24	1-1/2	.049	3	2	1-1/2	

45° Elbow



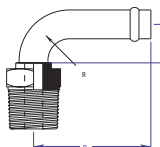
Male Pipe Thread <=> Hose Bead

Used to connect a flexible non-metallic hose to a female pipe port where a 45° angle is required.

50 Piece Minimum

Item #	Sizes	Wall	R	A	B	HEX	NPT	\$ ea
45PH-4	1/4	.025	3/8	1-1/8	1-13/16	7/16	1/8	Call or access web for pricing
45PH-6	3/8	.028	9/16	1-13/32	1-15/16	5/8	1/4	
45PH-8	1/2	.032	3/4	1-3/4	2-3/32	11/16	3/8	
45PH-10	5/8	.035	7/8	21/32	2-3/16	7/8	1/2	
45PH-12	3/4	.042	1-1/8	2-11/32	2-3/8	1-1/16	3/4	
45PH-16	1	.049	1-1/2	3	2-11/16	1-3/8	1	
45PH-20	1-1/4	.049	1-7/8	3-19/32	2-31/32	1-3/4	1-1/4	
45PH-24	1-1/2	.049	2-1/4	4-1/32	3-1/4	2	1-1/2	

90° Elbow



Male Pipe Thread <=> Hose Bead

Used to connect a flexible non-metallic hose to a pipe port where a 90° angle is required.

50 Piece Minimum

Item #	Sizes	Wall	R	A	B	HEX	NPT	\$ ea
90PH-4	1/4	.025	3/8	1-7/32	1-7/8	7/16	1/8	Call or access web for pricing
90PH-6	3/8	.028	9/16	1-17/32	2-1/16	5/8	1/4	
90PH-8	1/2	.032	3/4	1-29/32	2-1/4	11/16	3/8	
90PH-10	5/8	.035	7/8	2-7/32	2-3/8	7/8	1/2	
90PH-12	3/4	.042	1-1/8	2-19/32	2-5/8	1-1/16	3/4	
90PH-16	1	.049	1-1/2	3-5/16	3	1-3/8	1	
90PH-20	1-1/4	.049	1-7/8	3	3-3/8	1-3/4	1-1/4	
90PH-24	1-1/2	.049	2-1/4	4-17/32	3-3/4	2	1-1/2	

Miniature Luer Fittings

Stock • Custom

*Most orders shipped
within 48 HOURS!
> ex-USA
Transit ~10days
Import > Australia
Min ORDER AUD100*

FITTINGS

- ◀ LUER
- ◀ BARBED
- ◀ THREADED
- ◀ PIPE

MATERIALS OFFERED

- ◀ STAINLESS STEEL
- ◀ NICKEL PLATED BRASS
- ◀ TITANIUM
- ◀ BRASS

ISO 594/1,-2
or
ANSI/HIMA

ModuLUER Luer Fittings, Valves & Inspection Gauges

Short Lead Times
Tough Jobs



- Highest Level Medical Quality
- Manufactured to ISO 594/1,-2
- Immediate Delivery
- Over 2,000 Combinations
- T316 Stainless Steel
- Nickel Plated Brass
- Delrin
- Titanium & Other Materials
- Specials Become Standard

ISO 594/1,2

All fittings are made to the **ISO 594/1-1986** and **ISO 594/2-1991** Standards which cover conical fittings with a 6% luer taper. Together, these ISO Standards replace the ISO Recommendation **R 594-1967** for conical fittings made of rigid and semi-rigid materials for use with hypodermic syringes and needles and with certain other apparatus for medical use.

Applying the most recent ISO Standards to the manufacturing processes of our LUER fittings allows us to offer our customers the most up-to-date products available on the market. If you do require LUERS made to ANSI/HIMA standards, they are still being manufactured and there are many in stock in both brass and stainless steel. Feel free to call for more information if you need a special fitting designed, or if you are unsure of the fitting to correctly suit your needs.

- Stock LUERS
- Machined Parts
- Custom
- Laser Welded Assemblies

See our extensive list of standards on the following pages. If you cannot find the one you're looking for in our standards, send us any drawings or application descriptions you have. We will be glad to work with you to get you the exact fitting you need.

The basic concept of the ModuLUER line of LUER fittings is that all standards and components are in stock. With our extensive precision welding capabilities and these stocked parts, almost any fitting configuration has a short lead time.

Your "special" is probably already sitting on our shelf.



Over 2,000 Combinations Available!

Do you have a special application that requires a unique configuration? Let MicroGroup assist you in designing a configuration from over 2,000 combinations available from ModuLUER components listed. Call now and let's work together on that new design!

ISO 594/1,-2
or
ANSI/HIMA

ModuLuer Luer Fittings, Valves & Inspection Gauges

Short Lead Times
Tough Jobs



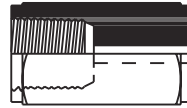
Male LUER (ML)*



Female Straight Thread



Male LUER-Lock (MLL)*



Female Pipe Thread (FP)



Female LUER (FL)



Barb (B)



Female LUER Thread (FLT)



Caps (CAP)



Male Straight Thread (MT)



Elbows (LB)



Male Pipe Thread (MP)



Tees (T)

Standard Part Numbering

Ex.: P/N #316 - MLL/BHB062-6H2

Alloy - 316	Left Termination - MLL	Right Termination - BHB062	Body Diameter - 6	Body Type - H	Inside Diameter - 2
303 303 Stainless Steel	B032 1/32" Barb	B032 1/32" Barb	1 1/16"	H Hex Body	1 .018/.020
304 304 Stainless Steel	B062 1/16" Barb	B062 1/16" Barb	2 1/8"	K Knurl Body	2 .060/.062
316 316 Stainless Steel	B125 1/8" Barb	B125 1/8" Barb	3 3/16"	R Round Body	3 .093/.094
NPB Nickel Plated Brass	B188 3/16" Barb	B188 3/16" Barb	4 1/4"	S Square Body	B No Bore smallest I.D.
BRS 360 Brass	B250 1/4" Barb	B250 1/4" Barb	5 5/16"		
TI Titanium	Cap2528 1/4-28 Cap	BHB032 1/32" Bulkhead Barb	6 3/8"		
DEL Delrin	Cap2532 1/4-32 Cap	BHB062 1/16" Bulkhead Barb	7 7/16"		
NYL Nylon		BHB125 1/8" Bulkhead Barb			
Note: Other materials available upon request.	FL Female Luer	FL Female Luer	8 1/2"		
	FLT Female Luer Thread	FLT Female Luer Thread	9 9/16"		
	FP125 1/8" Female Pipe		10 5/8"		
	FT1032 10-32 Female Thread	FT1032 10-32 Female Thread	11 11/16"		
	FT2528 1/4-28 Female Thread	FT2528 1/4-28 Female Thread	12 3/4"		
	FT2532 1/4-32 Female Thread	FT2532 1/4-32 Female Thread			
	ML Male Luer	Hub Hub			
	MLL Male Luer Lock	ML Male Luer			
	MP062 1/16" Male Pipe	MLL Male Luer Lock			
	MP125 1/8" Male Pipe	MP062 1/16" Male Pipe			
	MP250 1/4" Male Pipe	MP125 1/8" Male Pipe			
	MT1032 10-32 Male Thread	MP250 1/4" Male Pipe			
	MT2528 1/4-28 Male Thread	MT1032 10-32 Male Thread			
	MT2532 1/4-32 Male Thread	MT2528 1/4-28 Male Thread			
	NUT Nut	MT2532 1/4-32 Male Thread			
	SK Sink				

We also custom manufacture with Tuohy Borst compression style connectors. Please refer to www.microgroup.com for additional product and pricing information.

- As an option we can add "O-Rings" to male LUERS and LUER Locks.
- Actual barb O.D.'s are manufactured oversized (refer to page 42).

ISO 594/1,-2
or
ANSI/HIMA

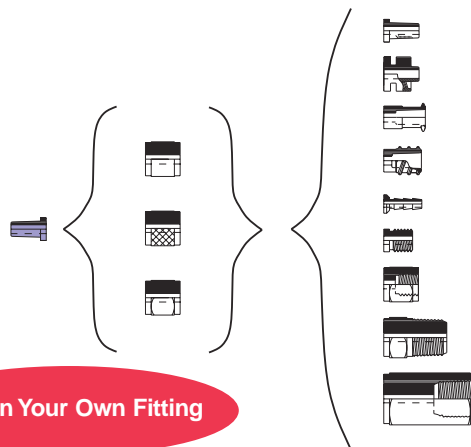
Male LUER

Short Lead Times
Tough Jobs

Call For Quantity Discounts



Male ModuLUER fittings are manufactured to ISO 594/1,-2 and are available in several modular lengths and sections. Specials quoted on request.



24 hrs.! ▼



316-ML/-4R3
NPB-ML/-4R3



316-ML/-4RB



316-ML/-5HB
NPB-ML/-5KB



316-ML/-6H3
NPB-ML/5K-3



316-ML/-6HB



316-ML/B062-6H2
NPB-ML/B062-5K2



316-ML/B125-6H3
NPB-ML/B125-5K3



316-ML/B188-6H3
NPB-ML/B188-6K3



316-ML/B250-6H3
NPB-ML/B250-6K3



316-ML/BH-6H3



316-ML/BHB062-6H2
NPB-ML/BHB062-6K2



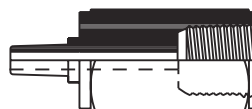
316-ML/BHB125-6H3
NPB-ML/BHB125-6K3



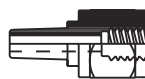
316-ML/FL-6H3



316-ML/FLT-6H3
NPB-ML/FLT-5K3



316-ML/FP125-9H3



316-ML/FT1032-6H3
NPB-ML/FT1032-6H3



316-ML/FT2528-6H3
NPB-ML/FT2528-6H3



316-ML/FT2532-6H3
NPB-ML/FT2532-6H3



316-ML/ML-6H3
NPB-ML/ML-6K3



316-ML/MLL-6H3
NPB-ML/MLL-6K3



316-ML/MP062-6H3
NPB-ML/MP062-6H3



316-ML/MP125-7H3
NPB-ML/MP125-7H3



316-ML/MP250-9H3
NPB-ML/MP250-9H3



316-ML/MT1032-6H3
NPB-ML/MT1032-6H3



316-ML/MT2528-6H3
NPB-ML/MT2528-6H3



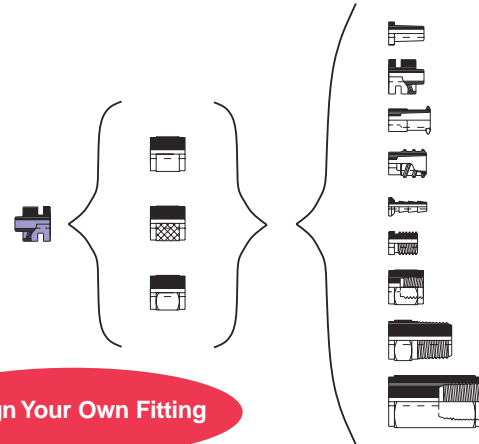
316-ML/MT2532-6H3
NPB-ML/MT2532-6H3

ISO 594/1,-2
or
ANSI/HIMA**Male LUER Lock**Short Lead Times
Tough Jobs

Call For Quantity Discounts



Male-LUER-Lock ModuLUER fittings are manufactured to ISO 594/1,-2 and are available in several modular lengths and sections. Specials quoted on request.



24 hrs.!

316-MLL-6H3
NPB-MLL-6K3316-MLL-6HB
NPB-MLL-6KB316-MLL-6R3
NPB-MLL-6RB

316-MLL-6RB



316-MLL/B032-6H1

316-MLL/B062-6H2
NPB-MLL/B062-6K2316-MLL/B125-6H3
NPB-MLL/B125-6K3316-MLL/B188-6H3
NPB-MLL/B188-6K3316-MLL/B250-6H3
NPB-MLL/B250-6K3

316-MLL/BH-6H3

316-MLL/BHB032-6H1
NPB-MLL/BHB032-6K1316-MLL/BHB062-6H2
NPB-MLL/BHB062-6K2316-MLL/BHB125-6H3
NPB-MLL/BHB125-6K3316-MLL/FL-6H3
NPB-MLL/FL-6K3316-MLL/FLT-6H3
NPB-MLL/FLT-6K3

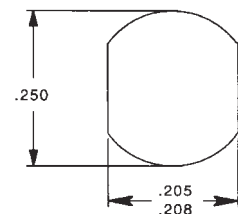
NPB-MLL/MLL-6R3



316-MLL/MLL-6H3

316-MLL/FP125-9H3
NPB-MLL/FP125-9H3316-MLL/FT1032-6H3
NPB-MLL/FT1032-6H3316-MLL/FT2528-6H3
NPB-MLL/FT2528-6H3316-MLL/FT2532-6H3
NPB-MLL/FT2532-6H3316-MLL/MP062-6H3
NPB-MLL/MP062-6H3316-MLL/MP125-7H3
NPB-MLL/MP125-7H3316-MLL/MP250-9H3
NPB-MLL/MP250-9H3316-MLL/MT1032-6H3
NPB-MLL/MT1032-6H3316-MLL/MT2528-6H3
NPB-MLL/MT2528-6H3316-MLL/MT2532-6H3
NPB-MLL/MT2532-6H3**Bulkhead Specifications**

Bulkhead fittings come equipped with panel nuts and lock washers. The 1/4"-32 thread is finished with flats on either side to prevent turning. The recommended panel hole size is shown below.



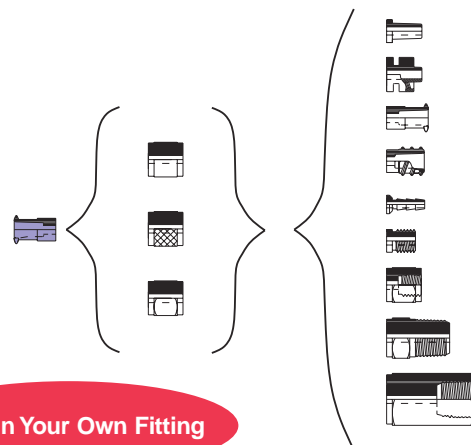
ISO 594/1,-2
or
ANSI/HIMA

Female LUER

Short Lead Times
Tough Jobs



Female ModuLUER fittings are manufactured to ISO 594/1,-2 and are available in several modular lengths and sections. Specials quoted on request.



24 hrs.! ▼



316-FL/-4R3



316-FL/-5H3



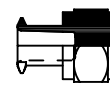
316-FL/-5HB
NPB-FL/-5KB



316-FL/HUB-5HB
NPB-FL/HUB-5KB



316-FL/-6H3



316-FL/6HB



316-FL/B032-5H1



316-FL/B062-5H2
NPB-FL/B062-5K2



316-FL/B125-5H3
NPB-FL/B125-5K3



316-FL/B188-6H3
NPB-FL/B188-6K3



316-FL/B250-6H3
NPB-FL/B250-6K3



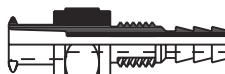
316-FL/BH-6H3



316-FL/BHB032-6H1



316-FL/BHB062-6H2



316-FL/BHB125-6H3
NPB-FL/BHB125-6K3



316-FL/FL-5H3
NPB-FL/FL-5K3



316-FL/FT1032-6H3
NPB-FL/FT1032-6H3



316-FL/FT2528-6H3
NPB-FL/FT2528-6H3



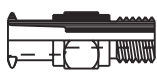
316-FL/FT2532-6H3
NPB-FL/FT2532-6H3



316-FL/FP-125-9H3
NPB-FL/FP-125-9H3



316-FL/MT1032-5H3
NPB-FL/MT1032-5H3



316-FL/MT2528-5H3
NPB-FL/MT2528-5H3



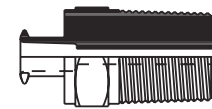
316-FL/MT2532-5H3
NPB-FL/MT2532-5H3



316-FL/MP062-6H3



316-FL/MP125-7H3
NPB-FL/MP125-7H3



316-FL/MP250-9H3

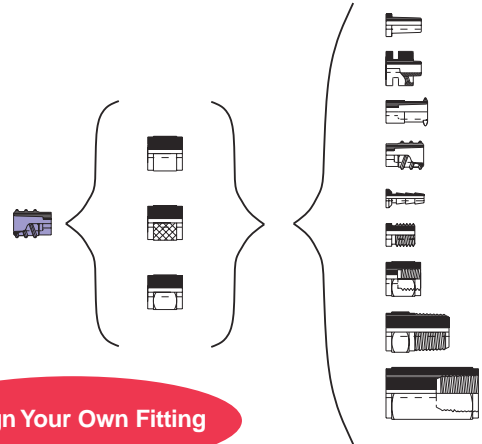
ISO 594/1,-2
or
ANSI/HIMA

Female LUER Thread

Short Lead Times
Tough Jobs

Call For Quantity Discounts

Female LUER Threads ModuLUER fittings are manufactured to ISO 594-1,-2 and are available in several modular lengths and sections. Specials quoted on request.



24 hrs.!



316-FLT/-4R3



316-FLT/-5H3
NPB-FLT/-5K3



316-FLT/-5HB
NPB-FLT/-5KB



316-FLT/HUB-5HB
NPB-FLT/HUB-5KB



316-FLT/-6H3
NPB-FLT/6K3



316-FLT/-6HB
NPB-FLT/6KB



316-FLT/B032-5H1
NPB-FLT/B032-5K1



316-FLT/B062-5H2
NPB-FLT/B062-5K2



316-FLT/B125-5H3
NPB-FLT/B125-5K3



316-FLT/B188-6H3
NPB-FLT/B188-6K3



316-FLT/B250-6H3
NPB-FLT/B250-6K3



316-FLT/BH-6H3



316-FLT/BHB032-6H1



316-FLT/BHB062-6H2
NPB-FLT/BHB062-6K2



316-FLT/BHB125-6H3
NPB-FLT/BHB125-6K3



316-FLT/FLT-5H3
NPB-FLT/FLT-5K3



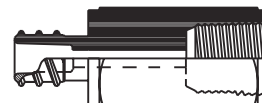
316-FLT/FT1032-6H3
NPB-FLT/FT1032-6H3



316-FLT/FT2528-6H3
NPB-FLT/FT2528-6H3



316-FLT/FT2532-6H3
NPB-FLT/FT2532-6H3



316-FLT/FP125-9H3



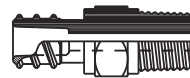
316-FLT/MT1032-5H3
NPB-FLT/MT1032-5H3



316-FLT/MT2528-5H3
NPB-FLT/MT2528-5H3



316-FLT/MT2532-5H3
NPB-FLT/MT2532-5H3



316-FLT/MP062-6H3



316-FLT/MP125-7H3
NPB-FLT/MP125-7H3



316-FLT/MP250-9H3

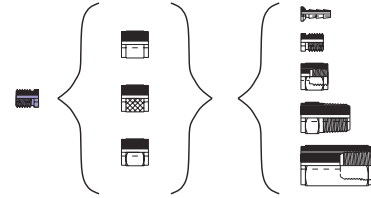
MINIATURE LUER FITTINGS

Call For Quantity Discounts

ISO 594/1,-2

Male Straight Thread

ModuLuer straight thread fittings are manufactured to applicable standards in 10-32, 1/4-28, and 1/4-32.

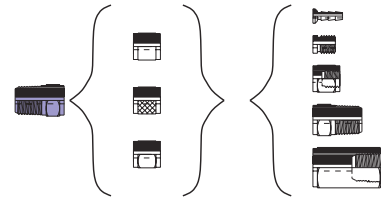


ANSI/HIMA









Male Pipe Thread (NPT)

Tough Jobs

Pipe fittings are manufactured to applicable standards in 1/16 NPT (spl order), 1/8 NPT, and 1/4 NPT. Specials quoted on request.



24 hrs.!

					
316-MT1032/-4R3	316-MT2528/-4R3	316-MT2532/-4R3	316-MT1032/-5H3 NPB-MT1032/-6H3	316-MT2528/-5H3	316-MT2532/-5H3
					
316-MT1032/-6H3	316-MT2528/-6H3 NPB-MT2528/-6H3	316-MT2532/-6H3 NPB-MT2532/-6H3	316-MP062-6HB 316-MP062-6H3 NPB-MP062-6HB	316-MP125-7HB 316-MP125-7H3 NPB-MP125-7HB	316-MP250-9HB 316-MP250-9H3 NPB-MP250-9HB
					
316-MT1032/B032-5H1	316-MT2528/B032-5H1 NPB-MT2528/B032-5H1	316-MT2532/B032-5H1	316-MP062/B032-6H1	316-MP125/B032-7H1	316-MP250/B032-9H1
					
316-MT1032/B062-5H2	316-MT2528/B062-5H2 NPB-MT2528/B062-5H2	316-MT2532/B062-5H2 NPB-MT2532/B062-5H2	316-MP062/B062-6H2 NPB-MP062/B062-6H2	316-MP125/B062-7H2 NPB-MP125/B062-7H2	316-MP250/B062-9H2 NPB-MP250/B062-9H2
					
316-MT1032/B125-5H3 NPB-MT1032/B125-5H3	316-MT2528/B125-5H3 NPB-MT2528/B125-5H3	316-MT2532/B125-5H3 NPB-MT2532/B125-5H3	316-MP062/B125-6H3	316-MP125/B125-7H3 NPB-MP125/B125-7H3	316-MP250/B125-9H3 NPB-MP250/B125-9H3
					
316-MT1032/B188-6H3 NPB-MT1032/B188-6H3	316-MT2528/B188-6H3	316-MT2532/B188-6H3	316-MP062/B188-6H3	316-MP125/B188-7H3 NPB-MP125/B188-7H3	316-MP250/B188-9H3 NPB-MP250/B188-9H3
					
316-MT1032/B250-6H3	316-MT2528/B250-6H3 NPB-MT2528/B250-6H3	316-MT2532/B250-6H3 NPB-MT2532/B250-6H3	316-MP062/B250-6H3	316-MP125/B250-7H3	316-MP250/B250-9H3

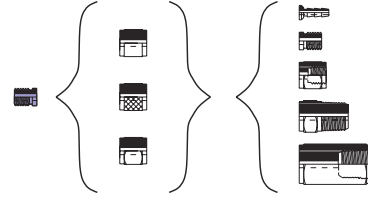
Call For Quantity Discounts

ISO 594/1,-2

Female Straight Thread

Short Lead Times

ModuLuer straight thread fittings are manufactured to applicable standards in 10-32, 1/4-28, and 1/4-32.

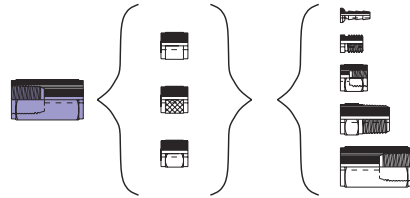


ANSI/HIMA

Female Pipe Thread (NPT)

Tough Jobs

Pipe fittings are manufactured to applicable standards in 1/16 NPT (spl order), 1/8 NPT, and 1/4 NPT. Specials quoted on request.



24 hrs.! ▼



316-FT1032-6H3
NPB-FT1032-6H3



316-FT2528-6H3



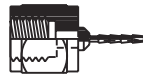
316-FT2532-6H3



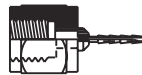
316-FP125-9H3



316-FT1032/B032-6H1
NPB-FT1032/B032-6H1



316-FT2528/B032-6H1
NPB-FT2528/B032-6H1



316-FT2532/B032-6H1



316-FP125/B032-9H1



316-FT1032/B062-6H2
NPB-FT1032/B062-6H2



316-FT2528/B062-6H2
NPB-FT2528/B062-6H2



316-FT2532/B062-6H2
NPB-FT2532/B062-6H2



316-FP125/B062-9H2



316-FT1032/B125-6H3
NPB-FT1032/B125-6H3



316-FT2528/B125-6H3
NPB-FT2528/B125-6H3



316-FT2532/B125-6H3



316-FP125/B125-9H3



316-FT1032/B188-6H3
NPB-FT1032/B188-6H3



316-FT2528/B188-6H3



316-FT2532/B188-6H3



316-FP125/B188-9H3



316-FT1032/B250-6H3
NPB-FT1032/B250-6H3



316-FT2528/B250-6H3
NPB-FT2528/B250-6H3



316-FT2532/B250-6H3
NPB-FT2532/B250-6H3



316-FP125/B250-9H3

ISO
594/1,-2
or ANSI/HIMA

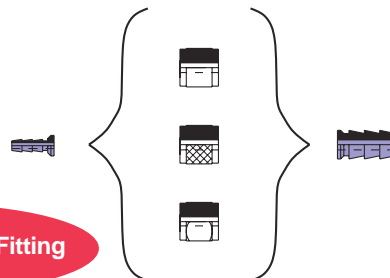
Barb

Short Lead Times
Tough Jobs

24 hrs.!

Barb fittings are used to connect rubber and/or plastic tubing (1/32 - 1/4 ID) to ModuLUER assemblies. Specials quoted on request.

Design Your Own Fitting



Actual Barb Diameter

barb O.D.=.046

barb O.D.=.120

barb O.D.=.200

barb O.D.=.240

barb O.D.=.280



316-B032/-2R1



316-B062/-4R2



316-B125/-4R3



316-B188/-4R3



316-B250/-4R3



316-B032/B032-5H1



316-B062/B062-6H2



316-B032/B062-6H1
NPB-B032/B062-6K1



316-B062/B125-6H2



316-B125/B125-6H3



316-B188-B188-6H3



316-B250/B250-6H3
NPB-250/B250-6K3

For further details – refer to
www.microgroup.com

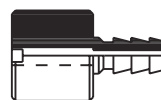
Sinkers

24 hrs.!

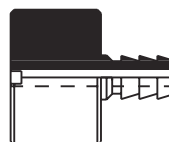
Sinkers are used to terminate plastic and/or rubber tubing when the application requires the end to be submerged.



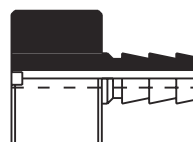
316-SK50/B032-1



316-SK100/B125-3



316-SK200/B188-3
NPB-SK200/B188-3



NPB-SK200/B250-3



Caps

Caps are used to provide a leak tight, metal-to-metal closure on 1/4-28 male thread ModuLUER fittings.

316-CAP2528-6HB



Tees

Tees are readily available as special order items, usually fabricated from 1/4", 3/8", or 1/2" solid stock.



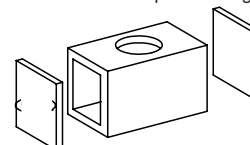
Elbows

Elbows are readily available as special order items, usually fabricated from 1/4", 3/8", or 1/2" solid stock.



Manifolds

Manifolds are readily available as special order items, usually fabricated from 3/8" O.D. x .065" Wall square tubing.



ISO
594/1,-2
or ANSI/HIMA

Luer Taper Gauges

Short Lead Times
Tough Jobs



A full line of Luer Standards Documentation and Taper Gauges are available for either the ANSI/HIMA MD70. 1-1983 or the newer ISO 594/1,2 1986-1991 Standards. All Gauges are hardened and ground. Each gauge is available with written certification at an additional charge. When inquiring, please specify the type of material from which the Luers to be checked are made, since differences occur between rigid and non-rigid materials.

ISO 594/1,2

ISO 594/1,2		
Item #	Description	\$ ea.
ISO 594/1-86 E Paragraph 5.1 Gage Testing		Call for pricing ↓
LTG-3A	Female stepped cone ring gage for testing dimensional characteristics and taper size of <u>rigid male luer fittings</u> .	
LTG-3B	Female stepped cone ring gage for testing dimensional characteristics and taper size of <u>semi-rigid male luer fittings</u> .	
LTG-3C	Male stepped cone plug gage for testing dimensional characteristics and taper size of <u>female luer fittings</u> in all materials.	
ISO 594/1-86 E Paragraph 5.2 Liquid Leakage		
LTG-4	Female conical fitting for leak testing <u>male luer fittings</u> . <i>Requires application of water at 300 kpa, not for use with lock nut in place.</i>	
LTG-5M	Male conical fitting for leak testing <u>female luer fittings</u> . <i>Requires application of water at 300 kpa.</i>	
ISO 594/2-91 E Paragraph 5.2 Leak Testing		
LTG-5F	Female conical fitting with lugs for leak testing <u>male luer fittings</u> with lock nut in place. <i>Requires application of water at 300 kpa.</i>	
LTG-7	Male conical fitting with lock nut in place for leak testing <u>female luer fittings</u> with lugs. <i>Requires application of water at 300 kpa.</i>	
ISO 594/2-91 E Paragraph 5.4 Separation Force		
LTG-6	Female conical fitting with lugs for separation force testing <u>male luer fittings</u> with lock nut in place.	
LTG-8	Male conical fitting with lock nut for separation force testing <u>female luer fittings</u> with lugs in place.	

ANSI/HIMA

ANSI/HIMA		
Item #	Description	\$ ea.
ANSI/HIMA MD70.1-83 Paragraph 4.2 Gage Testing		Call for pricing
LTG-4-AH	Female stepped cone ring gage for testing dimensional characteristics and taper size of <u>rigid and nonrigid male luer fittings</u> .	
LTG-5-AH	Male stepped cone plug gage for testing dimensional characteristics and taper size of <u>rigid and nonrigid female luer fittings</u> .	↓
ANSI/HIMA MD70.1-83 Paragraph 5.2.1 Liquid Leakage		
LTG-6A-AH	Female conical fitting for leak testing <u>male luer fittings</u> . <i>Requires application of water at 310 kpa, not for use with lock nut in place.</i>	
LTG-6B-AH	Male conical fitting for leak testing <u>female luer fittings</u> . <i>Requires application of water at 310 kpa.</i>	
ANSI/HIMA MD70.1-83 Paragraph 8.2.1 Leak Testing		
LTG-8-AH	Female conical fitting with lugs place for leak testing <u>male luer fittings</u> with lock nut in place. <i>Requires application of water at 310 kpa.</i>	↓
LTG-9-AH	Male conical fitting with lock nut in place for leak testing <u>female luer fittings</u> with lugs. <i>Requires application of water at 310 kpa.</i>	

Special Orders Welcome! If You Don't See It THIS In Catalog ... Call Us > for ALTs ?

✓ Check Here

LEFT TERMINATION

VALVE BODY

RIGHT TERMINATION

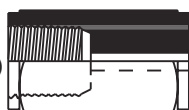
Check Here ✓

☐ Male LUER (ML)☐ Male LUER-Lock (MLL)☐ Female LUER (FL)☐ Female LUER-Thread (FLT)☐ Male Thread (MT)MT1032
MT2528
MT2532☐ Female Thread (FT)FT1032
FT2528
FT2532☐ Barb (B)

For Tube I.D.	Actual Barb O.D.
1/32" (B032)	.046
1/16" (B062)	.120
1/8" (B125)	.200
3/16" (B188)	.240
1/4" (B250)	.280

☐ Female Pipe Thread (FP)

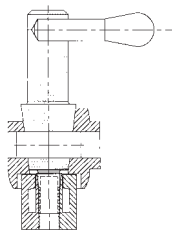
1/8" NPT (FP125)

☐ Male Pipe Thread (MP)1/16" NPT (MP062)
1/8" NPT (MP125)
1/4" NPT (MP250)☐ Specials (SPL) _____

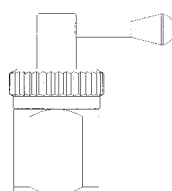
SPECIALS

PLUG

(Special)

**or
SPINDLE**

(Stock)

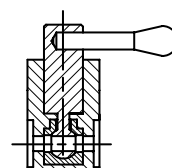
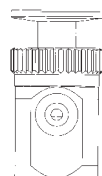


1/8"

**or
BALL**

(Special)

25 Dia. Thru

1/8" Ball
.062" Dia. Thru**or
TRUMPET**
(Stock)

.059" Dia. Thru



Male LUER (ML)

☐

Male LUER-Lock (MLL)

☐

Female LUER (FL)

☐

Female LUER-Thread (FLT)

☐

Male Thread (MT)

☐

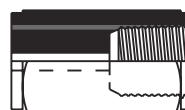
Female Thread (FT)

☐

Barb (B)

☐

For Tube I.D.	Actual Barb O.D.
1/32" (B032)	.046
1/16" (B062)	.120
1/8" (B125)	.200
3/16" (B188)	.240
1/4" (B250)	.280



Female Pipe Thread (FP)

☐

1/8" NPT (FP125)



Male Pipe Thread (MP)

☐1/16" NPT (MP062)
1/8" NPT (MP125)
1/4" NPT (MP250)

SPECIALS

Specials (SPL) _____

☐

FOR QUOTE REQUEST, PLEASE CHECK OFF THE ABOVE TERMINATIONS OR DESIGN
YOUR OWN SPECIAL CONFIGURATION

Miniature Valves

Stock • Custom

*Most orders shipped
within 48 HOURS!*

> ex-USA

Transit ~10days

Import > Australia

Min ORDER AUD100

- ◀ SPINDLE
- ◀ TRUMPET
- ◀ BALL
- ◀ PLUG

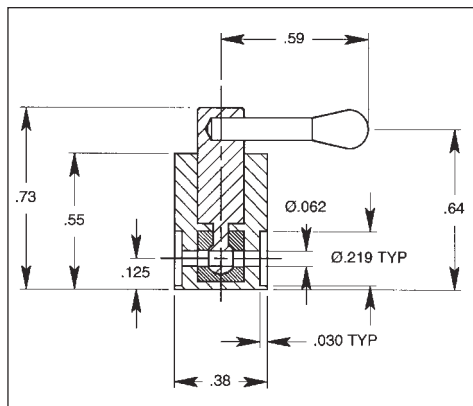
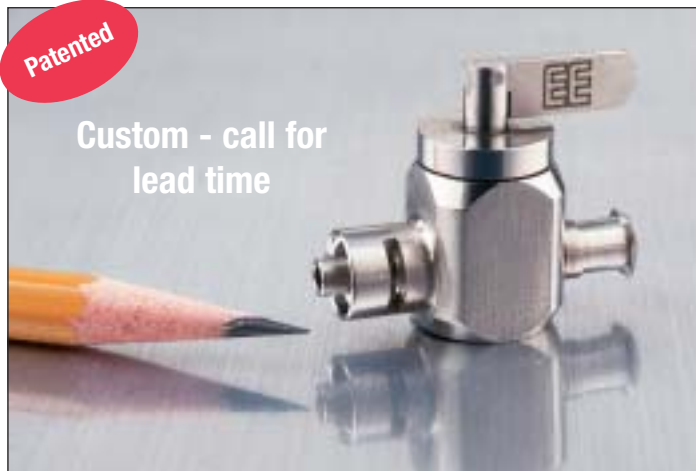


Miniature Ball and Plug Valves

Ball Valves

These custom designed 2-way valves feature a unique seal design, which allows liquid ratings up to 100 PSI and helps eliminate galling of metal-to-metal contact points. Their miniature size and the availability of custom configurations from stock – including ModuLuer fittings – allow maximum flexibility in making connections to standard, small diameter components. A variety of inlet and outlet configurations may be specified.

Our patented design requires no lubrication, features low and constant torque, the ability to interchange parts for additional applications, and low cost replaceable seals to ensure long life.



Detailed
schematic
drawing of
Ball Valve

Customs only with stock design!

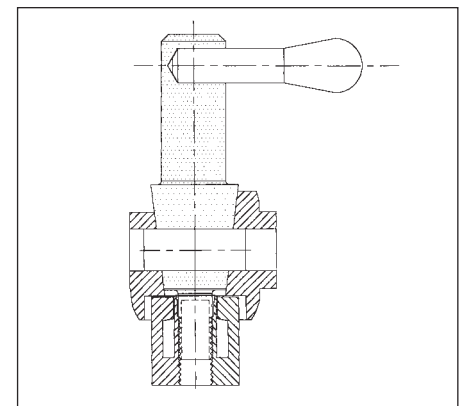
Features:

- Durable 316 stainless steel body construction. Also available in titanium, brass and other custom materials
- Seal is made of Buna-N
- Interchangeable parts
- Long life (replaceable seals)
- Smooth, low torque operation
- Straight-thru bore (low loss)

Plug Valves

Customized to your requirements, these 2-way tapered Plug Valves can be used to serve a wide variety of low pressure applications. Featuring stainless steel and brass construction with lubricated metal-to-metal contacts, these valves utilize the same ModuLuer connections as the Ball Valves, enhancing the flexibility of their use.

Other features include low torque operation, straight-thru bore and a variety of fittings to select from. The valves are also fully autoclavable and easily disassembled for cleaning. Custom Miniature Plug Valves are manufactured in accordance with our high quality standards.



Detailed
schematic
drawing of
Plug Valve

Customs only with stock design!

Features:

- Durable 316 stainless steel and brass body construction. Also available in titanium, brass and other custom materials
- Autoclavable
- Straight-thru bore (low loss)
- Wide range of fittings for right and left terminations
- Easily disassembled for cleaning

** Please call to discuss custom designs and applications*

✓ Check Here

LEFT TERMINATION

VALVE BODY

RIGHT TERMINATION

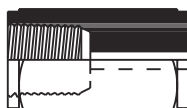
Check Here ✓

☐ Male LUER (ML)☐ Male LUER-Lock (MLL)☐ Female LUER (FL)☐ Female LUER-Thread (FLT)☐ Male Thread (MT)MT1032
MT2528
MT2532☐ Female Thread (FT)FT1032
FT2528
FT2532☐ Barb (B)

For Tube I.D.	Actual Barb O.D.
1/32" (B032)	.046
1/16" (B062)	.120
1/8" (B125)	.200
3/16" (B188)	.240
1/4" (B250)	.280

☐ Female Pipe Thread (FP)

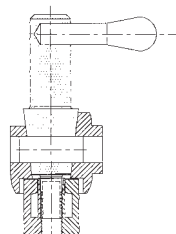
1/8" NPT (FP125)

☐ Male Pipe Thread (MP)1/16" NPT (MP062)
1/8" NPT (MP125)
1/4" NPT (MP250)☐ Specials (SPL) _____

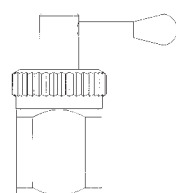
SPECIALS

PLUG

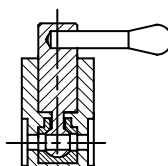
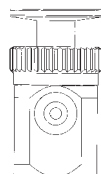
(Special)

**or
SPINDLE**

(Stock)



1/8"

**or
BALL**(Special)
25 Dia. Thru1/8" Ball
.062" Dia. Thru**or
TRUMPET**
(Stock)

.059" Dia. Thru



Male LUER (ML)

☐

Male LUER-Lock (MLL)

☐

Female LUER (FL)

☐

Female LUER-Thread (FLT)

☐

Male Thread (MT)

☐

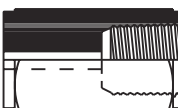
Female Thread (FT)

☐

Barb (B)

☐

For Tube I.D.	Actual Barb O.D.
1/32" (B032)	.046
1/16" (B062)	.120
1/8" (B125)	.200
3/16" (B188)	.240
1/4" (B250)	.280



Female Pipe Thread (FP)

☐

1/8" NPT (FP125)



Male Pipe Thread (MP)

☐1/16" NPT (MP062)
1/8" NPT (MP125)
1/4" NPT (MP250)

SPECIALS

Specials (SPL) _____

☐

FOR QUOTE REQUEST, PLEASE CHECK OFF THE ABOVE TERMINATIONS
OR DESIGN YOUR OWN SPECIAL CONFIGURATION

Dispensing Products

Stock • Custom

*Most orders shipped
within 48 HOURS!
> ex-USA
Transit ~10days
Import > Australia
Min ORDER AUD100*

◀ SYRINGES

◀ BOTTLES

◀ PUMPS

◀ TIPS

◀ NEEDLES



Disposable Dispensing Tips

**FEMALE
LUER HUBS**



- Stainless Blunt Tips are standard for epoxies, glues, solvents, grease, sealants, etc...
- Flexible Poly Tips prevent surface scratching – use for all basic applications, including CA's.
- Tapered Max Flow Tips are Ideal for highly filled compounds such as solder pastes.

EA Series Stainless Blunt Needles

Item #	OD	ID	Std. Length	Hub	\$ ea.
EEA-30S-5/16	.012" (.30mm)	.006" (.15mm)	.312" (8mm)	Female Luer	Call or access web for pricing
EEA-27S-5/16	.016" (.41mm)	.008" (.20mm)	.312" (8mm)	Female Luer	
EEA-26S-1/2	.018" (.46mm)	.009" (.23mm)	.500" (13mm)	Female Luer	
EEA-25S-1/2	.020" (.51mm)	.010" (.25mm)	.500" (13mm)	Female Luer	
EEA-23S-1/2	.025" (.63mm)	.013" (.33mm)	.500" (13mm)	Female Luer	
EEA-23S-1	.025" (.63mm)	.013" (.33mm)	1.000" (25mm)	Female Luer	
EEA-22S-1	.028" (.71mm)	.016" (.41mm)	1.000" (25mm)	Female Luer	
EEA-22S-1/2	.028" (.71mm)	.016" (.41mm)	.500" (13mm)	Female Luer	
EEA-21S-1	.032" (.81mm)	.020" (.51mm)	1.000" (25mm)	Female Luer	
EEA-21S-1/2	.032" (.81mm)	.020" (.51mm)	.500" (13mm)	Female Luer	
EEA-20S-1/2	.035" (.89mm)	.023" (.58mm)	1.000" (25mm)	Female Luer	
EEA-20S-1	.035" (.89mm)	.023" (.58mm)	1.000" (25mm)	Female Luer	
EEA-19S-1/2	.042" (1.07mm)	.027" (.69mm)	.500" (13mm)	Female Luer	
EEA-19S-1	.042" (1.07mm)	.027" (.69mm)	1.000" (25mm)	Female Luer	
EEA-18S-1/2	.049" (1.24mm)	.033" (.84mm)	.500" (13mm)	Female Luer	
EEA-18S-1	.049" (1.24mm)	.033" (.84mm)	1.000" (25mm)	Female Luer	
EEA-15S-1/2	.072" (1.83mm)	.054" (1.37mm)	.500" (13mm)	Female Luer	
EEA-15S-1	.072" (1.83mm)	.054" (1.37mm)	1.000" (25mm)	Female Luer	
EEA-15S-1-1/2	.072" (1.83mm)	.054" (1.37mm)	1.500" (38mm)	Female Luer	
EEA-14S-1/2	.083" (2.11mm)	.063" (1.60mm)	.500" (13mm)	Female Luer	
EEA-14S-1	.083" (2.11mm)	.063" (1.60mm)	1.000" (25mm)	Female Luer	
EEA-14S-2	.083" (2.11mm)	.063" (1.60mm)	2.000" (51mm)	Female Luer	

P Series Flexible Poly Tips

Item #	OD	ID	Std. Length	Hub	\$ ea
EEA-25P-1-1/2	.029" (.74mm)	.013" (.33mm)	1.500" (38mm)	Female Luer	Call or access web for pricing
EEA-22P-1-1/2	.032" (.81mm)	.015" (.38mm)	1.500" (38mm)	Female Luer	
EEA-20P-1-1/2	.039" (.99mm)	.024" (.61mm)	1.500" (38mm)	Female Luer	
EEA-18P-1-1/2	.053" (1.35mm)	.032" (.81mm)	1.500" (38mm)	Female Luer	
EEA-14T-1-1/4	.062" (1.57mm)	.024" (.61mm)	1.500" (38mm)	Female Luer	
EEA-16P-1-1/2	.067" (1.70mm)	.047" (1.19mm)	1.500" (38mm)	Female Luer	
EEA-15P-1-1/2	.072" (1.83mm)	.024" (.61mm)	1.500" (38mm)	Female Luer	

Poly Tapered Rigid Tips

Item #	ID	Lgth.	Hub	\$ ea
EEA-22T-1-1/4	.015" (.38mm)	1.250" (32mm)	Female Luer	Call or access web for pricing
EEA-22GT-1-1/4	.015" (.38mm)	1.250" (32mm)	Female Luer	
EEA-20GT-1-1/4	.024" (.61mm)	1.250" (32mm)	Female Luer	
EEA-20T-1-1/4	.024" (.61mm)	1.250" (32mm)	Female Luer	
EEA-18T-1-1/4	.032" (.81mm)	1.250" (32mm)	Female Luer	
EEA-18GT-1-1/4	.032" (.81mm)	1.250" (32mm)	Female Luer	
EEA-16T-1-1/4	.047" (1.19mm)	1.250" (32mm)	Female Luer	
EEA-14GT-1-1/4	.062" (1.57mm)	1.250" (32mm)	Female Luer	
EEA-16GT-1-1/4	.062" (1.57mm)	1.250" (32mm)	Female Luer	

Dispensing Poly Bottles

Squeez-Drop • No drip!

- Designed to apply accurate drops of epoxies, fluxes, Cyanoacrylate, Anaerobics and solvent adhesives.
- Use with any flowable liquid.
- Variety of "locking" needles (tips) available, see above.
- Economy of bulk and transfer to these low cost dispensers saves money.



**MALE LUER
CONNECTIONS**

Item #	Description	\$ ea
EEA-S50-7	.5 oz. Dispensing Bottle Male Luer	Call or access web for pricing
EEA-S50-5	.75 oz. Dispensing Bottle Male Luer	
EEA-S70-3	2 oz. Dispensing Bottle Male Luer	
EEA-S90-2	4 oz. Dispensing Bottle Male Luer	

**LUER
CONNECTIONS**

Johnson Pump

Hand-Held!

850 P.S.I.!

Features:

- Self priming, will siphon
- Pumps wide range of viscosities
- Adapts to standard luer fittings, accepts syringes on input side for prepackaged dispensing of fluids, adhesives, etc.

Material: Polycarbonate
Length: 6"
Width: 3"
Cross Section: 3/4"
Pressure: Up to 850 PSI
Capacity/STK: 1/4 cc
Fittings: Male Luer Outlet
Female Luer Inlet



Item #	Description	\$ ea
J-800	Johnson Pump	Call or access web for pricing

Company History

1971 MicroGroup® was founded in 1971 as MicroWELD, Inc. by William Hulbig and a partner, both former employees of Metal Bellows, Inc. MicroWELD initially began business as a micro-welding job shop, which performed intricate and complex TIG welding of small diameter precision tubing primarily for medical devices. The company quickly gained a reputation for extremely high quality work and the ability to solve complex welding problems involving stainless steel and exotic alloys. MicroGroup was first in national direct marketing high technology contract manufacturing services.

1978 As the company continued to grow during the late 1970's, it recognized a substantial opportunity in stocking and producing small diameter tubing to expand its device fabrication sales while providing a more predictable source of revenue. Tubing uniquely enabled the company to provide additional value to its customers while enhancing and stabilizing its revenues. With this addition, customers could procure tubing and have it fabricated at one location with exceptionally short lead times. The concept of continually looking to expand the breadth of products and services to its customers has been and continues to be the central focus of MicroGroup's "Diversity By Design" strategy. Hulbig purchased his partner's interest in the company.

During the 1980's, the Company broadened its scope of in-house processes and services and added tools to enable customers to do some of their own prototyping – technologically advanced cutting methods, laser welding, and superior finishing and cleaning methods. In addition, it began distributing third party valves and fittings. Customers could combine these components with the company's tubing products to create finished products. MicroGroup was first to use informational tabular ads in Thomas Register.

1983 The company purchased a 37,000 SF facility in Medway, MA.

1985 MicroGroup became the first Thomas Register super-advertiser.

Hulbig bought the Macintosh Division of Desktop Software to provide state-of-the-art information systems mandatory to grow MicroGroup. Incorporated as 1stDESK® Systems, Inc., and it operates as independent corporation.

1990 MicroGroup concluded that the tubing market was declining at such an accelerated pace it would be unable to grow sufficiently without becoming a production manufacturer – verses historically being a low volume specialty job shop.

1992 Hulbig founded EngineersEXPRESS® to sell products other than tubing to MicroGroup's customer base and to diversify into other markets. Products included the MINITUL® small tool line previously sold by MicroGroup, shaft couplings, and miniature valves and fittings. It was a visionary idea, but ahead of its time due to a lack of marketing technology (e.g. Internet/e-commerce) which resulted primarily in expanding MicroGroup's customer base and securing itself as the dominate supplier of luer fittings.

1993 1stDESK was commissioned to create a next generation real-time database for MicroGroup.

1996 MicroGroup received ISO 9002 registration.

1998 A "Build It And They Will Come" philosophy resulted in a significant expansion into CNC micro-machining, a 42,000 SF plant expansion, and \$6,000,000 in capital expenses. MicroGroup could exponentially slash lead times compared to all other suppliers and competitors – from months to weeks, weeks to days, days to hours, providing it with a substantial competitive advantage. The new facility would allow the company to focus on high volume production work for the first time.

1999 MicroGroup is swamped with first-time jobs for preferred accounts, considers future growth through acquisitions, became FDA registered, continues to enhance its quality, image, and dominance within the medical industry.

2000 MicroGroup seeks ISO-EN-46002 (medical device specific) registration continuing to enhance its quality and image within the medical industry.

Manufacturing bookings show an exciting transition from "Our Work" based on exotic technology with a high capital costs needed to purchase expensive equipment, to generating vertical business within "Our Customer," thereby offering more services to satisfy the customers' needs, both exotic and traditional. Most new business is being generated for long term production components and assemblies where it has truly "partnered" with the customer. The new state-of-the-art micro-machining capability dramatically expanded MicroGroup's unmatched breadth of products and services and expected to contribute substantially to the company's growth.



Glass Borosilicate Syringes

- Made of durable borosilicate glass.
- Precision ground

Item #	Size	Graduation	Hub	\$ ea
GL 1	1 ml	.01 ml	Ni-Plated Brass Male Luer-Lock	Call or access web for pricing ↓
GT 2	2 ml	.10 ml	Glass Male Luer-Slip	
GL 2	2 ml	.10 ml	Ni-Plated Brass Male Luer-Lock	
GM 2	2 ml	.10 ml	Ni-Plated Brass Male Luer-Slip	
GT 5	5 ml	.20 ml	Glass Male Luer-Slip	
GL 5	5 ml	.20 ml	Ni-Plated Brass Male Luer-Lock	
GM 5	5 ml	.20 ml	Ni-Plated Brass Male Luer-Slip	
GT 10	10 ml	1 ml	Glass Male Luer-Slip	
GL 10	10 ml	1 ml	Ni-Plated Brass Male Luer-Lock	
GM 10	10 ml	1 ml	Ni-Plated Brass Male Luer-Slip	
GT 20	20 ml	1 ml	Glass Male Luer-Slip	
GL 20	20 ml	1 ml	Ni-Plated Brass Male Luer-Lock	
GM 20	20 ml	1 ml	Ni-Plated Brass Male Luer-Slip	
GT 30	30 ml	1 ml	Glass Male Luer-Slip	
GL 30	30 ml	1 ml	Ni-Plated Brass Male Luer-Lock	
GM 30	30 ml	1 ml	Ni-Plated Brass Male Luer-Slip	
GT 50	50 ml	1 ml	Glass Male Luer-Slip	
GL 50	50 ml	1 ml	Ni-Plated Brass Male Luer-Lock	
GM 50	50 ml	1 ml	Ni-Plated Brass Male Luer-Slip	
GT 100	100 ml	5 ml	Glass Male Luer-Slip	
GL 100	100 ml	5 ml	Ni-Plated Brass Male Luer-Lock	
GM 100	100 ml	5 ml	Ni-Plated Brass Male Luer-Slip	

Disposable Poly Plastic Syringes

- Disposable for ease-of-use.
- Economical
- Non-toxic pyrogenic plastic
- Laboratory
- Industrial
- Scientific

Call for box
quantity pricing

Item #	Size	Graduation	Type	\$ ea
5001-DV	1 ml	.10 ml	Male Luer-Slip	Call or access web for pricing ↓
5002-DV	2 ml	.20 ml	Male Luer-Slip	
5005-DV	5 ml	.10 ml	Male Luer-Slip	
5010-DV	10 ml	.20 ml	Male Luer-Slip	
5020-DV	20 ml	.20 ml	Male Luer-Slip	



CUSTOM TUBING



MICRO-MACHINED PARTS



FITTINGS & VALVES

Tubing

Abrasive Bead Blasting
Abrasive Slurry
Cut-Off & Deburr, Laser
Deburring, Electrochemical
Drawing
EDM, Ram
EDM, Wire
Electropolishing
Etching, Chemical
Grinding, Centerless
Grinding, Centerless CNC
Honing
Hydrogen Furnace
Knurling, Laser
Machining, General
Passivating
Perforating
Pipe
Polishing, Belt
Sawing, Abrasive
Sawing, Cold (Milling)
Sawing, Electrochemical
Sawing, High Speed Carbide
Straightening
Tubing, Beverage
Tubing, Cable Crimp
Tubing, Capillary
Tubing, Carbide
Tubing, Catheter
Tubing, Chromatographic
Tubing, Custom
Tubing, Cut & Deburred
Tubing, Fractional
Tubing, Hypodermic
Tubing, Layered
Tubing, Manufactured Types
Tubing, Medical
Tubing, Metric
Tubing, Multi-lumen
Tubing, Round
Tubing, Shaped
Tubing, Specifications
Tubing, Stent
Tubing, Surplus
Tubing, Telescoping
Tubing, Tolerances
Tumbling, Vibratory & Barrel
Turning, CNC
Vacuum Stress Relieving

Custom Products

Assemblies, Aircraft & Aerospace
Assemblies, Bellows
Assemblies, Carbide
Assemblies, Exotic Alloys
Assemblies, Medical & Dental
Assemblies, Stainless Steel
Assemblies, Titanium
Assemblies, Tubing
Bellows, Metal
Belts, Metal
Blades, Surgical
Blades, Tubular
Bone Screws
Catheters & Stents
Fasteners
Fittings, Miniature
Fittings, Tubular
Machined Springs
Manifolds, Miniature
Medical Devices
Needles
Perforated Tubing
Shaft Couplings
Stamping & Punching
Tubing Components
Tubing Components
Valves, Miniature
Wire Forms

Contract Services

Brazing & Soldering

Hydrogen Furnace
Induction
Micro-Torch
Vacuum Furnace

Cut-Off & Deburring

Abrasive Bead Blasting
Cut-Off & Deburr, Laser
Deburring, Abrasive Slurry
Deburring, Electrochemical
EDM, Ram
EDM, Wire
Electropolishing
Sawing, Abrasive
Sawing, Cold (Milling)
Sawing, Electrochemical
Sawing, High Speed Carbide
Tumbling, Vibratory & Barrel
Turning, CNC

Drawing & Straightening

Drawing
Bright Annealing
Straightening

Engineering & Quality

Design Review
Inspection
Project Management
Quality Control
Registrations, ISO & FDA
SPC
Testing, Metallurgy
Testing, Pressure
Testing, Tensile
Tooling

Finishing

Abrasive Bead Blasting
Cleaning, Catheter
Cleaning, Filtered Ultrasonic
Electropolishing
Etching, Chemical
Laser Engraving
Packaging
Passivating
Pyrolyzation
Tumbling, Vibratory & Barrel

Grinding & Polishing

Electropolishing
Grinding, Centerless
Grinding, Centerless CNC
Grinding, CNC
Honing
Needles
Polishing, Belt
Surgical Blades

Heat Treating

Hydrogen Furnace
Induction Heating
Vacuum Oven

Specialty Tools

Benders

Blades, Cut-Off Saw
Brushes, Deburring
Brushes, Hand, Stainless Steel
Brushes, Stem, Abrasive
Brushes, Stem, Miniature
Brushes, Stem, Stainless Steel
Brushes, Wheel, Abrasive
Brushes, Wheel, Stainless Steel
Flexhone® Flexible Hones
Lubricants
Saws, Cut-Off

Machining, CNC

EDM, CNC Ram
EDM, CNC Wire
Grinding, CNC
Laser, CNC
Milling, CNC
Prototyping, CNC
Turning, CNC

Machining, Electrochemical

Deburring, Electrochemical
EDM, Ram
EDM, Wire
Electropolishing
Grinding, Electrochemical
Sawing, Electrochemical

Machining, General

Prototype
Production

Machining, Laser

Cut-Off & Deburr, Laser
Cutting, Laser
Drilling, Laser
Knurling, Laser
Machining, Laser

Perforating, Metals

Cutting, Laser
Etching, Photo
Perforating, Tubing
Punching
Ram EDM
Stamping

Stamping & Punching

Cutting, Laser
Foil & Sheet, Perforated
Products, Foil & Sheet

Surface Abrading

Abrasive Bead Blasting
Etching, Chemical
Knurling, Laser

Tube Forming

Closures
End Forming
Flaring, Tube
Roll Forming
Swaging
Tube Bending
Tube Forming

Welding

Welding, Laser
Welding, MIG
Welding, Plasma
Welding, Resistance (Spot)
Welding, TIG

Fluid Handling

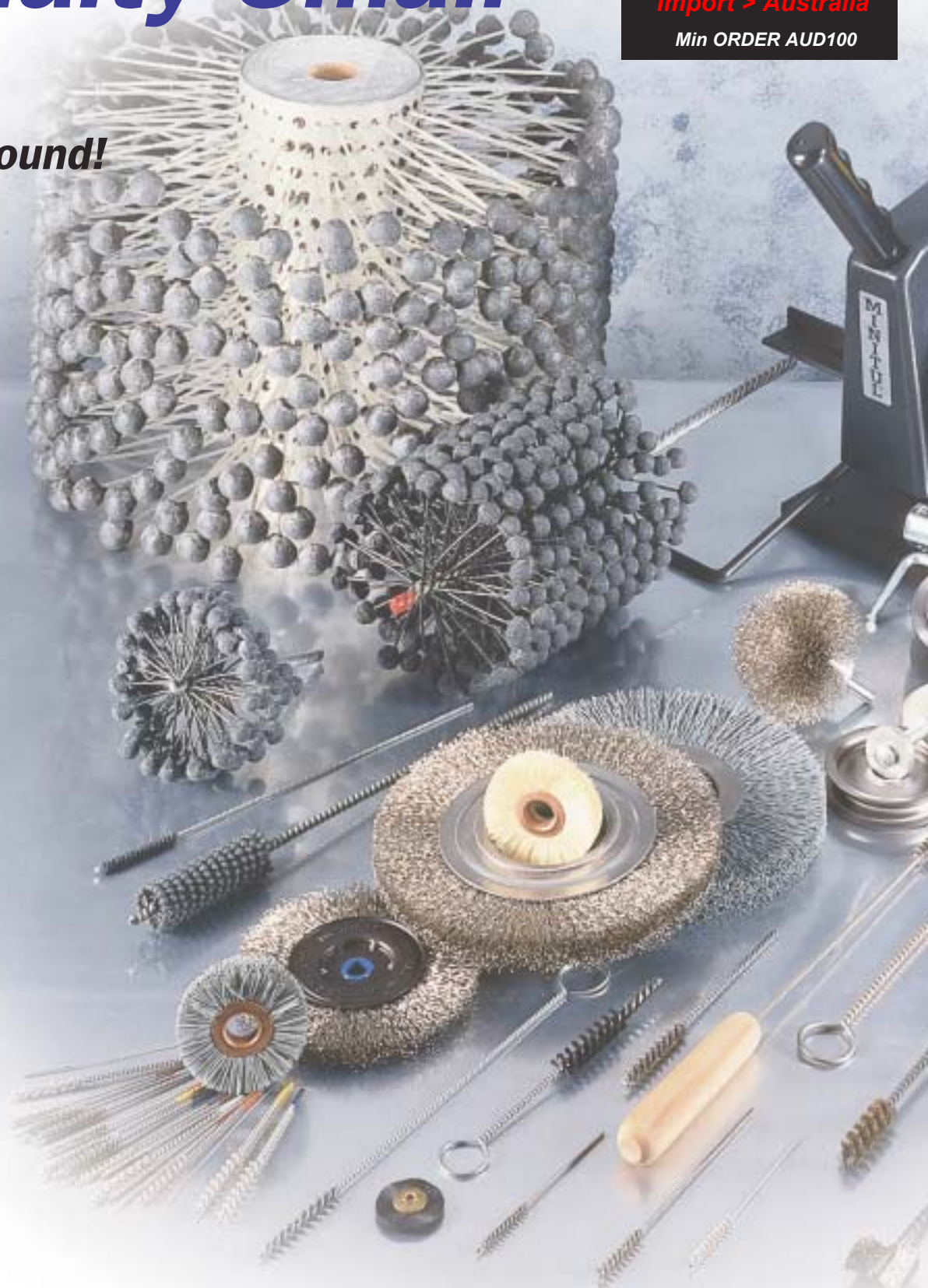
Dispensing Bottles
Dispensing Needles
Dispensing Tips
Fittings, Medical
Fittings, Miniature
Fittings, Tubular
Fittings, Tubular
Inspection Gages, Luer
Manifolds, Miniature
Pumps
Syringes, Glass
Syringes, Plastic
Valves, Miniature

Specialty Small Tools

Fast Turnaround!

- ◀ SAWS
- ◀ BLADES
- ◀ BENDERS
- ◀ FLEXHONE
- ◀ BRUSHES

*Most orders shipped
within 48 HOURS!
> ex-USA
Transit ~10days
Import > Australia
Min ORDER AUD100*



MINITUL Model - 500 Small Diameter Cut-Off Saw

2 Free Blades
with Purchase!
(5-080-030A)

**90 Day
Warranty**



The easy-to-use MINITUL® Model-500 Cut-Off Saw is a portable tool for small diameter cutting requirements. This solidly built saw comes assembled and is ready to perform efficiently on a variety of materials from aluminum to stainless steel. **90 Day Warranty**

Features

- Cuts lengths from 1/16"
- Cuts with Minimal Burr
- Mitres to 30°
- Easy Blade Changes
- Portable 115v AC
- Cuts to 1/2" Cross Section
- Double-Acting Vise
- Cut to +/- .005" Tol.
- Positive Drive Belt
- Economical
- 2 Free BLADES (5-080-030A)

Applications

- Aluminum
- Brass
- Copper
- Glass
- Plastic
- Stainless Steel
- Most Materials
- Composites
- Braided Cables
- Coax
- Armored Cable

Item #	Description	\$ ea.
Mod500	Model 500 Miniature Cut Off Saw	Call or access web for pricing

Tube Cutter

Applications:

- Stainless steel
- Monel
- Copper
- Titanium
- Other tubing applications
- Brass

Item #	Description	\$ ea.
RR274	Tube Cutter for 1/8" to 1 1/8" OD Tubing	Call or access web for pricing
RR105	Optional - Tube Cutter with SKH Cutting Wheel	
RR374	Tube Constrictor and Cutter Combo for 1/8" to 1 1/8" OD	

* Prices subject to change without notice.



24 Hours



Stock Tubing - 24 Hours

Over 5 Million Feet in
Stock Including Specials

Hypodermic
Medical Grade
Pipe
Fractional
Metric

Need quality small diameter
stainless steel tubing, fast?

Call the industry leaders for
over 25 years –



Custom Tubing - 5 Days

Short Lead Time Mini-mill
Small Quantities Welcome

Round
Shaped
Composites
Drawing
Grinding

Model - 500 Saw & Other Abrasive Cut-Off Blades



EngineersEXPRESS sells a wide variety of saw blades for most applications and requirements. The following is a comprehensive listing of our stocked blades. However, if you don't see what you need listed, please call and we'll find it.

A = Aluminum Oxide S = Silicon Carbide HS = High Speed Steel HG = Hollow Ground High Speed Steel
● = Dry Cut ○ = Use Boelube

Custom Blades Available

Item #	General Purpose Saw Blades	Dia.	Grit /# Teeth	Thickness	Type	Arbor Size	Alum < 1/4"	Alum > 1/4"	Brass < 1/4"	Brass > 1/4"	Copper < 1/8"	Copper > 1/8"	Glass	Plastics < 1/8"	Plastics > 1/8"	Steel Stainless	Steel	Wood	\$ ea
4-240-013A	Non-Reinforced Rubber Abrasive Blade with Special Mixed Abrasive Sizes for minimum burr. Most commonly used for cutting any steels up to 1/2" diameter.	4	240	013	A	1/2		●	●							●	●		Call or access web for pricing
4-120-016A		4	120	016	A	1/2		●	●							●	●		
5-120-015A	Non-Reinforced Rubber Abrasive Blade. Recommended for cutting metals when #5-80-030 causes motor to labor excessively or when burrs are unacceptable. The blade is somewhat fragile and used for very light wall to 1/2" diameter.	5	120	015	A	1/2										●	●		
4-90-025A	Non-Reinforced Rubber Abrasive Blade. Rugged blade cuts metals, reduces motor load. Best blade if used only occasionally, due to rugged construction, to be used on most stock over 3/8" dia.	4	90	025	A	1/2		●	●							●	●		
4-060-030AR	Heavy Duty Reinforced Resin Abrasive Blade Can be used for cutting Titanium	4	60	030	A	1/2										●	●		
5-060-030AR		5	60	030	A	1/2										●	●		
5-080-030A	Heavy Duty Non-Reinforced Rubber Abrasive Blade. Similar to 4-90-025A The best all purpose blade. For heavy cuts.	5	80	030	A	1/2		●	●							●	●		
6-080-030A		6	80	030	A	1/2;5/8		●	●							●	●		
7-080-030A		7	80	030	A	1/2;5/8		●	●							●	●		
5-080-060A	For extra-heavy cuts.	5	80	060	A	1/2		●	●							●	●		
5-046-060AR	Heavy Duty Reinforced Resin Abrasive Blade. Similar to 4-90-025A For heavy cuts.	5	46	060	A	1/2		●	●										
4-SPL-009S	Non-Reinforced Rubber/Silicon Carbide Blade. Silicon abrasive allows this blade to cut through very small diameter hypodermic tubing, drill blanks and glass; However, this blade requires extreme care in handling to prevent breakage since it is only .009" thick. Use with a Boelube®.	4	—	009	S	1/2							○						
4-120-025S	Non-Reinforced Rubber/Silicon Carbide Heavy Duty Blade for cutting glass, ceramics, and thermocouple cable. Should be used with Boelube®.	4	120	025	S	1/2							○						
5-150-015S	Non-Reinforced Rubber/Silicon Carbide Heavy Duty Blade for cutting glass, ceramics, and thermocouple cable. Should be used with Boelube®.	5	150	015	S	1/2							○						
4-028-024HS	High-Speed Steel Blade.Used for plastics and wood without lubricant. Excellent for cutting copper, aluminum and brass. Use with a Boelube®. except on brass (cut dry).	4	28	024	HS	1/2	○	○	●		○	○							
5-028-024HS		5	28	024	HS	1/2	○	○	●		○	○							
4-010-030HG	Hollow-Ground High-Speed Steel Blade. Used on larger sections of soft metals and wood due to hollow ground side which prevents jamming in cut. Excellent for cutting copper, aluminum and brass. Should be used with Boelube®, except on brass (cut dry).	4	10	030	HG	1/2	○	○	●		○					●	●		
5-010-030HG		5	10	030	HG	1/2	○	○	●		○					●	●		
7-600-015A	Non-Reinforced Rubber Abrasive Blade with Fine Abrasive Sizes for Minimum Burr. Most commonly used for cutting any steels up to 1/2" diameter.	7	600	015	A	22mm										●	●		
7-600-020A		7	600	020	A	22mm										●	●		
7-220-030A		7	220	030	A	5/8										●	●		
7-240-015A		7	240	015	A	5/8										●	●		
7-320-020A		7	320	020	A	5/8										●	●		
MK-200	Premium MK-200 Wet Cutting Blades (for cutting tile, limestone, marble, glass and blocks.)	7	---	---	D	5/8							○						

*Italicized part numbers are for Model 660 not Model 500 Saw.
Customs Available!

We also carry other size blades up to 12" diameter, call for availability.

* Prices subject to change without notice.

DUO-MITE Industrial Bending Kit

Hand Bender



DUO-MITE Kits

Item #	Description	\$ ea
50000	Duo-Mite® Hand Bender Kit Gauge and Pin 3/16" Diameter Pin 1/4" Diameter Pin 1/2" Diameter Pin 1" Diameter Circle Sharp Angle Die Form Pin Follower	Call or access web for pricing
54000	Jewelry Kit Pivot Lock Handle Delrin Follower Pin Bend Stop Pin Allen Wrench Narrow Jaw Faces (2) Jaw Face Pad 3/8" Diameter Pin 1/4" Diameter Pin Ring Shank Dies (4) Sharp Angle Die Steel Dies (2) Delrin Dies (2) Gauge 1/2" Pin (2) Form-Matic Handle Tapered Jaw Face	
55000	Same as #50000 Except Includes Vari-Vise and Pivot Lock For Production Jobs and Small Parts	

DUO-MITE Accessories

Circle Pins

Item #	Description	\$ ea
51002	1/8" Diameter Pin	Call or access web for pricing
51003	3/16" Diameter Pin	
51004	1/4" Diameter Pin	
51006	3/8" Diameter Pin	
51352	1/2" Diameter Pin	

Handles

Item #	Description	\$ ea
53100	Form-Matic Handle	Call or access web for pricing
53115	Delrin Follower	
54500	YR Handle	
54501	YRT Handle - Optional	

Circle Dies (1/2" ID)

Item #	Description	\$ ea
51012	3/4" Diameter Circle	Call or access web for pricing
51014	7/8" Diameter Circle	
51016	1" Diameter Circle	
51018	1 1/4" Diameter Circle (Steel)	
51019	1 1/4" Diameter Circle (Delrin)	
51020	2" Diameter Circle	
51022	2 1/4" Diameter Circle	
51025	2 1/2" Diameter Circle (Steel)	
51026	2 1/2" Diameter Circle (Delrin)	
51028	2 3/4" Diameter Circle	
51030	3" Diameter Circle	
51040	4" Diameter Circle	

Miscellaneous

Item #	Description	\$ ea
52000	Edgebending Kit	Call or access web for pricing
53008	Bench Bracket	
53110	Small Bracelet Die (Child's) 5"-5 1/2"	
53120	Medium Bracelet Die (Lady's) 5 3/4"	
53125	Large Bracelet Die (Men's) 6"-6 1/2"	
60100	Tube Bending with YRT Tooling. 1/16, 1/8, 3/16, 1/4" tool set consisting of 4 groove jaw and follower roll. 3/4" centerline radius.	
60200	Tube Bending with YRT Tooling. 3/32, 5/16, 3/8 tool set consisting of 3 groove jaw and follower roll - 3/4" centerline radius.	

Circle Loops (for hand forming)

Item #	Description	\$ ea
51050	5" Diameter Circle	Call or access web for pricing
51060	6" Diameter Circle	
51070	7" Diameter Circle	
51080	8" Diameter Circle	

Close Follower (for best results use with #53100 handle)

Item #	Description	\$ ea
51200	Close Follower (for bending small wire forms)	Call or access web for pricing

Red Goo #2

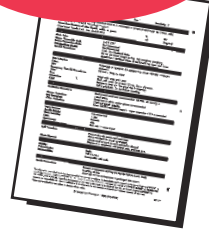
Red Goo #2 is an incredible oil lubricant developed when MicroGroup was researching new tube drawing compounds. Red Goo #2 multiplies tool life by significantly reducing heat on all metals. Red Goo #2 as the name implies is a heavy, sticky lubricant usually applied directly to a tool.

Applications:

- Spinning
- Machining
- Swaging
- Coining
- Punching
- Grinding
- Drawing

Please call and let us fax the updated Material Safety Data Sheet for Red Goo #2 to you.

Item #	Description	\$ ea.
RED - 1/2	1/2 oz.	Call or access web for pricing ↓
RED - 4	4 oz.	
RED - 32	1 qt.	
RED - 64	1/2 gal.	
RED - 128	1 gal.	



(Boelube® is a Reg. TM Boeing Co.)

Boelube® Stick Lubricant

GRINDING: Reduces burning by its unique ability to load the grinding wheel as a wax and changing to a liquid at 400°F, purging the wheel and cooling the work. Excellent for sharpening tools.

MACHINING: Significantly reduces heat on all metals, increasing tool life and decreasing burr on small parts in particular.

APPLICATION: Wax stick is used to directly press the tool while turning.

70200-13

Refer to price list

Water soluble &
Non-toxic



Stock Tubing

Over 5 Million Feet in
Stock Including Specials

Hypodermic
Medical Grade
Pipe
Fractional
Metric



Custom Tubing

Short Lead Time Mini-mill
Small Quantities Welcome

Round
Shaped
Composites
Drawing
Grinding

NEED HELP?

The Use of Industrial Brushes

Wheel Brush

The most widely used is called the standard wheel brush and the most popular diameters are 6 and 8 inch, although they are made anywhere from 3 to 15 inch. MicroGroup carries a wide assortment of sizes to select from. They come in many wire sizes depending on the work piece and the type of finish that you want. The wire fill is invariably CRIMPED. Crimping is done for mainly two purposes. The first is to make the wires stand apart from each other, and the second is to absorb the flexing and the vibrations as well as to help prevent wire fatigue and wire breakage. Be sure to investigate all of the elements that you need before ordering a very inexpensive brush.

When ordering brushes you should always pay attention to the length of trim, which is the length of the wire from the hub, and also the running face width. The running face width is the width of the brush when it is in operation and normally is a different dimension than when you get it out of the box. It is very important to reverse the brush from time to time so that the brush is then running in the opposite direction. This will extend the life of the brush and improve its cutting action. They may also be dressed in the same manner as a grinding wheel. For maximum performance a wheel brush should be operated at the highest possible safe speed within its quoted safe speed limits and the lightest possible pressure being applied by the work piece to the brush face. Your best performance should be with a soft brush. But if the cutting action required is severe or if the brush is not cutting fast enough, then you must switch to a coarser wire or to a shorter trim. Wheel diameters are important because of surface speeds. With a 3,450 RPM motor, a 4" diameter brush has a speed of 3,600 linear feet per minute (LFM). A 6" brush 5,400 LFM, a 8" diam. LFM, a 10" diam. 9,000 LFM, a 12" diam. 11,000 LFM and a 15" diam. brush 13,500 linear feet per minute. MicroGroup's wide assortment of wheel brushes assures the right tool for any job.

Narrow Face Wheel Brush

The narrow face wheel brush is normally one with a much longer trim which is used against an irregular surface enabling the wire to get down into the crevices. The longer trim is also used quite often for polishing because of the softer brushing action. As with all wheel brushes, you should use the largest diameter spindle possible because with a large wheel brush at the proper RPM, a great deal of force is exerted at its periphery.

Tampico Wheels

Tampico used to be the standard in the polishing trade. A fibre from a cactus type plant that grows in northern Mexico, it is tough as well as resistant to oils and heat. Treated tampico (the wheel is coated with a sticky type of varnish that will hold dry abrasives) also polishes such items as chromed parts, eye-glass frames, etc.

Abrasive Impregnated Nylon Wheels, etc.

Nylon mixed with abrasive and then extruded gives a filament that also polishes well. At the present there are ten sizes of filaments extruded, with fine grit in the small diameters (500 grit in .018 nylon), and coarse grit in the large diameter filaments (80 grit in .040 nylon). These are available in silicon carbide or aluminum oxide. Maximum safe free running speeds are about 3600 surface feet per minute. It's important to remember that the bristle tips are set hot, the nylon will melt and you may also have some nylon contamination on the part.

Copper Center Wheel Brushes

Copper centers are small wheel brushes from 1" to 4" in diameter. They usually have copper centers and are normally available from 1/4" to 5/8" arbor holes, depending upon the diameter. One of our major customers uses 1" to 1 3/4" copper centers with three or four of them stacked together on a speed controlled air drill for cleaning oil well tool bits prior to rewelding the hard facing. Small diameters in this type of work do have the advantage of being much easier to control by the operator, as the rotary motion does not have the same tendency to push itself away from the work area as larger diameters. These also make excellent tube brushes and can be stacked together or spaced apart by putting washers in between the brushes in order to reach an area in which dirt, scale, and other things can accumulate. These copper centers come in higher tempered carbon wire, stainless steel, nylon, tampico, and silicon carbide or aluminum oxide impregnated nylon.

Hand Scratch Brushes

These are available in many variations, which include normal long curved handle or shoe handle, in three or four row widths, 19 row lengths and variable trim lengths. They are available in bronze for non-sparking operations, and in nylon. One of our most popular is a small toothbrush-type with a stainless steel handle and fill wire, which is very useful in stainless steel welding, cleaning of threads, and a variety of other applications. Increasingly, plastic handles are used as a cost-efficient alternative to wood.

Tube Brushes

As the name implies, these are for tubes or cylinders and are not what some engineers like to call a bottle brush. These are cleaning tools and are available in almost any size of wire in carbon steel, stainless steel or nylon, etc. They come in almost any length of handle, with ring handles or loop handles, whichever fits your particular operation and is easier for your operator to use. It is easy to engineer this brush type to your particular job, saving you time and labor. One of the greatest fallacies is that you need one that is grossly oversized, or it is not going to clean well. Remember that the tips of the brush are the cutting tools even in a tube brush. Another great fallacy is the preference of usually only the first third or half of the brush does the cleaning. A long brush part will only give you a tool which creates a lot of friction and, therefore, is very difficult to use. In this particular area brush terminology is very simple. Everybody in the world knows what a 2 x 4 is and to order, specify a 2 x 4 eight feet long in fir, for example.

The standard brush terminology in the tube brush field is the diameter by the length of the brush part by the length overall. Therefore, a 2 x 4 x 8 will mean a brush 2" in diameter, 4" of brush part and 8" overall. Also specify what type of fill you want, whether it is carbon steel, stainless steel or nylon, or natural bristle or abrasive impregnated nylon. Next, pick out a the size of filament that is going to do the job you need, whether it is cleaning, deburring, or finishing. Finally, order it by its correct size. These tube brushes come in all varieties, from miniatures on up. As for the wires in the brush itself, the tips of the stainless have a tendency to work harden. The stainless stem, in being twisted, work hardens very quickly, and so you will have a stem wire which is extremely hard and relatively flexible. The majority are made with galvanized stem wire with a high tensile strength. but with a nylon tube brush there is a tendency for the ends to become sharp after much use, reducing its cleaning power. Nylon can be used in almost all cleaning solvents and mild acids without damage. For very fine and delicate work, natural bristle and pig bristle is important because it won't scratch, and the ends of the bristle will split or flag and are excellent in picking up and removing small particles of dust. The natural bristles will not pick up and carry static electricity as the nylon brush is apt to do. MicroGroup's wide assortment of these brushed ensures you will find one that is the perfect match for your job.

Four Common Factors Governing the Horsepower Necessary to Drive a Power Brush

1. Brushing pressure required.
2. Resistance between work surface and brush (trim length).
3. Speed of the brush.
4. Brush face width.

Flexhone Flexible Hones & Accessories



The FLEX-HONE®, a resilient, flexible honing tool with a soft-cutting action produces a controlled surface condition unobtainable by any other method. A construction which includes abrasive (points) globules independently suspended, assures the FLEX-HONE® to be self-centering and self-aligning to the bore, as well as self-compensating for wear.

The particular type of Flex-Hone crosshatch is extremely efficient in providing a multiplicity of oil grooves or valleys for oil retention, as opposed to the often unidirectional or uneven valleys common to the conventional type of rigid hone. A crosshatch that usually remains as the cylinder wall has been wear-reduced by the Flex-Hone. This hone will deburr a peaked finish very rapidly without the danger of much metal removal, and will aid in rapid ring seating, oil control, seepage in hydraulics, longer ring or seal life. It has also been approved by more major original equipment manufacturers than probably any other single tool of its kind.

The Flex-Hone® tool might effectively deburr your cross holes, put a radius on those ports and finish your cylinder in the one operation. It is self-centering, self-aligning, self-compensating for wear – and does not require elaborate set-up and may be used by a novice worker giving you the same consistent finish. Depending upon your particular job, it might give you 150 cylinders per hone or as high as 2,200.

Item #	Dia"	Dia(mm)	OAL	120SC	180SC	240SC	320SC
BC 4mm	.157	4.0	6.0	Call or access web for pricing	Call or access web for pricing	Call or access web for pricing	Call or access web for pricing
BC 4.5mm	.177	4.5	6.0				
BC 3/16"	.188	4.8	6.0				
BC 5mm	.197	5.0	8.0				
BC 5.5mm	.216	5.5	8.0				
BC 6.4mm	.250	6.4	8.0				
BC 7mm	.276	7.0	8.0				
BC 8mm	.315	8.0	8.0				
BC 9mm	.355	9.0	8.0				
BC 9.5mm	.375	9.5	8.0				
BC 10mm	.394	10.0	8.0				
BC 11mm	.433	11.0	8.0				
BC 12mm	.472	12.0	8.0				
BC 1/2"	.500	12.7	8.0				
BC 14mm	.552	14.0	8.0				
BC 5/8"	.625	15.9	8.0				
BC 18mm	.709	18.0	8.0				
BC 3/4"	.750	19.0	8.0				
BC 20mm	.788	20.0	8.0				
BC 7/8"	.875	22.2	8.0				
BC 1"	1.000	25.4	8.0				
BC 1-1/8"	1.125	28.6	8.0				
GB 1-1/4"	1.250	31.7	8.0				
BC 1-3/8"	1.375	34.9	8.0				
DBC 1-1/2"	1.500	38.1	5.0				
BC 1-1/2"	1.500	38.1	8.0				
BC 1-5/8"	1.625	41.2	8.0				
DBC 1-3/4"	1.750	44.4	5.0				
BC 1-3/4"	1.750	44.4	8.0				
BC 1-7/8"	1.875	48.0	8.0				
BC 2"	2.000	50.8	8.0				
GB 2"	2.000	50.8	8.0				
BC 2-1/8"	2.125	54.0	8.0				
DBC 2-1/8"	2.125	53.9	5.0				
BC 2-1/4"	2.250	57.1	8.0				
BC 2-3/8"	2.375	60.0	8.0				
DBC 2-1/2"	2.500	63.5	5.0				
BC 2-1/2"	2.500	63.5	8.0				
BC 2-5/8"	2.625	67.0	8.0				
DBC 2-3/4"	2.750	69.8	5.0				
BC 2-3/4"	2.750	69.8	8.0				
BC 2-7/8"	2.875	73.0	8.0				
BC 3"	3.000	76.1	8.0				
GBD 3"	3.000	76.1	8.0				
DBC 3-1/8"	3.125	79.3	5.0				
GB-3 1/4"	3.250	82.5	13.5				
GBD 3-1/4"	3.250	82.5	13.5				
GB 3-1/2"	3.500	88.8	13.5				
GBD 3-1/2"	3.500	88.8	13.5				
GB-3 3/4"	3.750	95.2	13.5				
GBD 3-3/4"	3.750	95.2	13.5				
GBD 4"	4.000	101.5	13.5				
GB 4-1/8"	4.125	104.7	13.5				
GBD 4-1/4"	4.250	107.9	13.5				
GBD 4-1/2"	4.500	114.2	13.5				
GB 4-5/8"	4.625	117.4	17.50				
GBD 5"	5.000	126.9	17.50				
GBD 5-1/2"	5.500	139.6	17.50				
GBD 6"	6.000	152.3	17.50				
GBD 6-1/2"	6.500	165.0	17.50				
GBD 7"	7.000	177.7	17.50				
GBD 7-1/2"	7.500	190.4	17.50				
GBD 8"	8.000	203.0	17.50				
GBDH 8"	8.000	203.0	17.50				
GBD 8-1/2"	8.500	215.7	17.50				

Item #	Dia"	Dia(mm)	OAL	120SC	180SC	240SC	320SC
GBD 9"	9.000	228.4	17.50	Call or access web for pricing	Call or access web for pricing	Call or access web for pricing	Call or access web for pricing
GBD 9-1/2"	9.500	241.1	17.50				
GBD 10"	10.000	253.8	17.50				
GBD 10-1/2"	10.500	266.5	17.50				
GBD 11"	11.000	279.2	17.50				
GBD 11-1/2"	11.500	291.9	17.50				
GBD 12"	12.000	304.6	17.50				
GBD 12-1/2"	12.500	317.3	17.50				
GBD 13"	13.000	329.9	17.50				
GBD 13 1/2"	13.500	342.6	17.50				
GBD 14"	14.000	355.3	17.50				
GBD 15"	15.000	380.7	17.50				
GBD 16"	16.000	406.1	17.50				
GBD 17"	17.000	431.5	17.50				
GBD 18"	18.000	456.9	17.50				
GBDX 19"	19.000	482.2	34.00				
GBDX 20"	20.000	507.6	34.00				
GBDX 21"	21.000	533.0	34.00				
GBDX 22"	22.000	558.4	34.00				
GBDX 23"	23.000	583.8	34.00				
GBDX 24"	24.000	609.1	34.00				
GBDX 25"	25.000	634.5	34.00				
GBDX 26"	26.000	659.9	34.00				
GBDX 27"	27.000	685.3	34.00				
GBDX 28"	28.000	710.7	34.00				
GBDX 29"	29.000	736.0	34.00				
GBDX 30"	30.000	761.4	34.00				
GBDX 31"	31.000	786.8	34.00				
GBDX 32"	32.000	812.2	34.00				
GBDX 33"	33.000	837.6	34.00				
GBDX 34"	34.000	862.9	34.00				
GBDX 35"	35.000	888.3	34.00				
GBDX 36"	36.000	913.7	34.00				

Grit Types	Grit Sizes										
	Specials				Standard				Special		
	20	40	60	80	120	180	240	320	400	600	800
SC = Silicon Carbide	X	X	X	X	X	X	X	X	X	X	X
AO = Aluminum Oxide	X	X	X	X	X	X	X	X	X	X	X
BC = Boron Carbide	X	X	X	X	X	X	X	X	X	X	X
WC = Tungsten Carbide (either 100% or 50/50)	X	X	X	X	X	X	X	X			
Z Grain = Alumina Zirconia				X	X	X	X	X		X	
No. 1525 (25% Zirconia/75% Alumina											
Levigated Alumina	Available in extra fine grit only										
Diamond	220/240 mesh available for experimental honing										
CBN	140/170 mesh available for experimental honing										

Specials Available

Ask About Other Flex-Hone Accessory Products
Available From EngineersEXPRESS

All dimensions are measured in inches unless designated millimeters.
Flexhone® is a trade mark of Brush Research.

Stock Stainless Steel Brushes

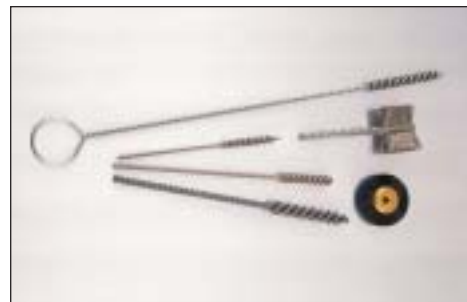
Crimped Wire Wheel Brushes



Copper Center Wheel Brushes



Thread Cleaning Brushes



Multi-Duty Narrow-Face

Item #	Brush Dia	Wire Size	Arbor Hole	Trim Lgth	Face Width	Max RPM	\$ ea.
BDM-3S	3	.006	3/8, 1/2	1/2	3/8	6000	Call or access web for pricing
	3	.0118	3/8, 1/2	1/2	3/8	6000	
BDM-4S	4	.006	3/8, 1/2	7/8	3/8	6000	
	4	.008	3/8, 1/2	7/8	3/8	6000	
	4	.0104	3/8, 1/2	7/8	3/8	6000	
	4	.0118	3/8, 1/2	7/8	3/8	6000	
BDM-6S	4	.014	3/8, 1/2	7/8	3/8	6000	
	6	.006	2	1-1/8	1/2	4500	
	6	.008	2	1-1/8	1/2	4500	
	6	.0104	2	1-1/8	1/2	4500	
	6	.0118	2	1-1/8	1/2	4500	
	6	.014	2	1-1/8	1/2	4500	
BDM-8S	8	.006	2	1-1/2	1/2	4500	Call or access web for pricing
	8	.0104	2	1-1/2	1/2	4500	
	8	.014	2	1-1/2	1/2	4500	
BDM-10S	10	.0118	2	2-3/4	5/8	3600	
BDM-12S	12	.0104	2	3	11/16	3000	

Standard Duty Medium-Face

BDA-4S	4	.014	2	5/8	7/8	6000	Call or access web for pricing
BDA-6S	6	.006	2	1-1/8	7/8	4500	
	6	.008	2	1-1/8	7/8	4500	
	6	.0118	2	1-1/8	7/8	4500	
	6	.014	2	1-1/8	7/8	4500	
BDA-7S	7	.014	2	1-5/8	7/8	4500	
BDA-8S	8	.006	2	1-1/2	7/8	4500	
	8	.0104	2	1-1/2	7/8	4500	
	8	.0118	2	1-1/2	7/8	4500	
	8	.014	2	1-1/2	7/8	4500	
BDA-10S	10	.006	2	2-1/8	1-3/8	3600	
	10	.014	2	2-1/8	1-3/8	3600	

Heavy-Duty Wide-Face

BDH-4S	4	.014	2	5/8	1-3/8	6000	Call or access web for pricing
BDH-6S	6	.006	2	1-1/8	1-3/8	4500	
BDH-7S	7	.0118	2	1-1/8	1-3/8	4500	
		.014	2	1-1/8	1-3/8	4500	
BDH-8S	8	.006	2	1-1/2	1-3/8	4500	
		.014	2	1-1/2	1-3/8	4500	

Wheel

Item #	Brush Dia	Arbor Hole	Wire Size	Max RPM	\$ ea.
C-1	1	3/8	.006	20000	Call or access web for pricing
C-1-1/4	1-1/4	3/8	.006	20000	
C-1-3/8	1-3/8	3/8	.008	20000	
C-1-1/2	1-1/2	3/8	.006	20000	
C-1-5/8	1-5/8	3/8	.008	20000	
C-2	2	1/2	.006	20000	
C-2	2	1/2	.008	20000	
C-2	2	1/2	.0104	20000	
C-2	2	1/2	.0118	20000	
C-2	2	1/2	.014	20000	
C-2-1/2	2-1/2	1/2	.006	20000	
C-2-1/2	2-1/2	1/2	.0104	20000	
C-2-1/2	2-1/2	1/2	.0118	20000	Call or access web for pricing
C-2-1/2	2-1/2	1/2	.014	20000	
C-2-1/2	2-1/2	5/8	.006	20000	
C-2-1/2	2-1/2	5/8	.0104	20000	
C-2-1/2	2-1/2	5/8	.0118	20000	
C-2-1/2	2-1/2	5/8	.014	20000	
C-3	3	1/2	.006	20000	
C-3	3	1/2	.008	20000	
C-3	3	1/2	.0118	20000	
C-3	3	1/2	.014	20000	
C-3	3	5/8	.006	20000	
C-3	3	5/8	.008	20000	
C-3	3	5/8	.0118	20000	Call or access web for pricing
C-3	3	5/8	.014	20000	
C-3-1/2	3-1/2	1/2	.006	20000	
C-3-1/2	3-1/2	1/2	.008	20000	
C-3-1/2	3-1/2	1/2	.0104	20000	
C-3-1/2	3-1/2	1/2	.0118	20000	
C-3-1/2	3-1/2	1/2	.014	20000	
C-4	4	1/2	.006	20000	
C-4	4	1/2	.008	20000	
C-4	4	1/2	.0104	20000	
C-4	4	1/2	.0118	20000	
C-4	4	1/2	.014	20000	
C-4	4	5/8	.006	20000	Call or access web for pricing
C-4	4	5/8	.008	20000	
C-4	4	5/8	.0104	20000	
C-4	4	5/8	.0118	20000	
C-4	4	5/8	.014	20000	

Butterfly Brush - Wire Fill

Item #	Brush Dia	Wire Size	Brush Part	Stem Dia	\$ ea.
BS-1/4	1/4	.005	9/16	3/32	Call or access web for pricing
BS-5/16	5/16	.005	9/16	3/32	
BS-3/8	3/8	.005	9/16	3/32	
BS-7/16	7/16	.005	9/16	3/32	
BS-1/2	1/2	.005	9/16	3/32	
BS-9/16	9/16	.005	5/8	1/8	
BS-5/8	5/8	.005	5/8	1/8	
BS-3/4	3/4	.005	5/8	1/8	
BS-7/8	7/8	.005	5/8	1/8	
BS-1	1	.005	5/8	1/8	
BS-1-1/4	1-1/4	.005	5/8	1/8	

Stem Brush - Series #83

Item #	Brush Dia	Wire Size	Brush Part	OAL	\$ ea.
83-S250	1/4	.004	1-1/2	41/2	Call or access web for pricing
83-S312	5/16	.004	1-1/2	41/2	
83-S375	3/8	.005	1-1/2	41/2	
83-S437	7/16	.005	1-1/2	5	
83-S500	1/2	.006	1-1/2	5	
83-S562	9/16	.006	1-1/2	5	
83-S625	5/8	.008	1-3/4	5	
83-S750	3/4	.008	1-3/4	5	
83-S875	7/8	.008	2	6	
83-S1000	1	.008	2	6	
83-S1250	1-1/4	.010	2-1/2	6	
83-S1500	1-1/2	.010	2-1/2	6	
83-S1750	1-3/4	.010	3	7	Call or access web for pricing
83-S2000	2	.012	3	7	

Hand Scratch Brushes



Hand Brushes

Item #	No of Rows	Handle Width	OAL	Handle	\$ ea.
B-39S	3x19	1-1/8	14	Curved Handle	Call or access web for pricing
B-49S	4x19	1-1/8	14	Curved Handle	
B-740	3x19	1-1/8	14	Curved Handle	
B-741	4x18	1-1/8	14	Curved Handle	
B-744	4x16	1-1/8	10"	Shoe Handle	
93A-S250		1/4	7-1/4	Lam. Wood	
93A-S375		3/8	7-1/4	Lam. Wood	
93A-S500		1/2	7-1/4	Lam. Wood	
93-AP			7-1/4	Poly Handle	
93-AW			7-1/4	Wood Handle	
1685SS			7-1/4	Galvanized	

Today's Brushes and Hones
Deliver Innovative, Cost-Effective
Solutions to Your Tough Manufacturing
and Engineering Problems
Custom Available!

Stock Stainless Steel Brushes

We Supply
Customs Too!

Special Industrial Brushes



Cross Hole Deburring - Series #81

Item #	Wire Size	Brush Part	Stem Dia.	OAL	\$ ea.
81-A-.024	.003	1/4	.015	3	Call or access web for pricing
81-A-.032	.002	5/8	.016	3	
81-A-.047	.003	3/4	.026	3	
81-A-.054	.003	3/4	.026	3	
81-A-.063	.003	3/4	.026	3	
81-A-.079	.003	3/4	.034	3	
81-A-.094	.003	3/4	.043	3	
81-A-.109	.003	3/4	.055	3	
81-A-.125	.003	1	.055	3	
81-A-.142	.003	1	.055	3	
81-A-.156	.003	1	.072	3	
81-A-.172	.003	1	.072	3	
81-A-.189	.003	1	.072	3	
81-B-7/32	.003	1-1/2	.072	3	
81-B-1/4	.003	1-1/2	.110	3	
81-B-5/16	.004	1-1/2	.125	3	
81-B-3/8	.004	1-1/2	.160	3	
81-B-7/16	.004	1-1/2	.160	3	
81-B-1/2	.005	1-1/2	.160	3	
81-A-1mm	.002	5/8	.016	3	
81-A-1.5mm	.003	5/8	.026	3	
81-A-2mm	.003	3/4	.026	3	
81-A-2.5mm	.003	3/4	.043	3	
81-A-3mm	.003	1	.055	3	
81-A-3.5mm	.003	1	.055	3	
81-A-4mm	.003	1	.055	3	
81-A-4.5mm	.003	1	.072	3	
81-A-5mm	.003	1	.072	3	
81-A-5.5mm	.003	1	.110	3	
81-A-6mm	.003	1	.110	3	
81-A-6.5mm	.003	1	.110	3	

Mandrel Mounted

Mandrel Mounted - Series #82

Item #	Dia.	Fill	Shank	Thickness	\$ ea.
82C-427	3/4"	.005 cr. Stainless	1/8"	single	Call or access web for pricing
82C-428	1"	.005 cr. Stainless	1/8"	double	

Mandrel Mounted Copper Center

Item #	Brush Diam.	Wire Size	Face Width	Max RPM	\$ ea.
BMC-16	1-3/4	.006	5/16	25000	Call or access web for pricing
BMC-16	1-3/4	.008	5/16	25000	
BMC-16	1-3/4	.0118	5/16	25000	
BMC-20	2	.006	5/16	25000	
BMC-20	2	.008	5/16	25000	
BMC-20	2	.0104	5/16	25000	
BMC-20	2	.0104	5/16	25000	

Mounted Flared Wheel

BMF-14	1-1/2	.006	25000
BMF-14	1-1/2	.008	25000
BMF-14	1-1/2	.0104	25000
BMF-16	1-3/4	.006	25000
BMF-16	1-3/4	.008	25000
BMF-16	1-3/4	.0118	25000
BMF-20	2	.006	25000
BMF-20	2	.008	25000
BMF-20	2	.0104	25000

Tube Brushes



Thru-Hole Stem Brush - Series #84

Item #	Brush Dia	Wire Size	Brush LSD	OAL	\$ ea.
84-S125	1/8	.002	11/4	8	Call or access web for pricing
84-S187	3/16	.003	11/2	8	
84-S250	1/4	.004	2	8	
84-S312	5/16	.004	2	8	
84-S375	3/8	.004	2	8	
84-S437	7/16	.004	21/2	10	
84-S500	1/2	.005	21/2	10	
84-S562	9/16	.006	21/2	10	
84-S625	5/8	.008	21/2	10	
84-S750	3/4	.008	21/2	10	
84-S875	7/8	.010	3	12	
84-S1000	1	.010	3	12	
84-S1125	1-1/8	.010	3	12	
84-S1250	1-1/4	.010	3	12	
84-S1375	1-3/8	.010	3	12	
84-S1500	1-1/2	.010	3	12	
84-S1625	1-5/8	.010	31/2	18	
84-S1750	1-3/4	.012	31/2	18	
84-S2000	2	.012	31/2	18	
84-S2250	2-1/4	.012	4	18	
84-S2500	2-1/2	.012	4	18	
84-S2750	2-3/4	.012	4	18	
84-S3000	3	.012	4	18	

Closed Hole Stem Brushes - Series #85

85-S2-125	1/8	.002	1	4	Call or access web for pricing
85-S3-125	1/8	.003	1	4	
85-S156	5/32	.003	1	4	
85-S187	3/16	.003	1	4	
85-S219	7/32	.003	1	4	
85-S250	1/4	.004	1-1/4	4-1/2	
85-S281	9/32	.004	1-1/4	4-1/2	
85-S312	5/16	.004	1-1/4	4-1/2	
85-S344	11/32	.004	1-1/4	4-1/2	
85-S375	3/8	.004	1-1/4	4-1/2	
85-S406	13/32	.004	1-1/4	4-1/2	
85-S437	7/16	.004	1-1/4	4-1/2	
85-S469	15/32	.005	1-1/4	4-1/2	
85-S500	1/2	.005	1-1/2	5	
85-S562	9/16	.006	1-1/2	5	
85-S625	5/8	.008	1-1/2	5	
85-S687	11/16	.008	1-1/2	5	
85-S750	3/4	.008	1-1/2	5	
85-S812	13/16	.010	1-1/2	6	
85-S875	7/8	.010	1-1/2	6	
85-S937	1-5/16	.010	1-1/2	6	
85-S1000	1	.010	2	6	
85-S1250	1-1/4	.010	2-1/2	6-1/2	
85-S1500	1-1/2	.010	2-1/2	6-1/2	
85-S1750	1-3/4	.012	3	7	
85-S2000	2	.012	3	8	
85-S2500	2-1/2	.012	3-1/2	9	
85-S3000	3	.012	4	10	

Condenser - Series #89

89-S500	1/2	.008	4	7	Call or access web for pricing
89-S625	5/8	.008	4	7	
89-S750	3/4	.010	4-1/2	7-1/2	
89-S875	7/8	.010	4-1/2	7-1/2	
89-S1000	1	.012	4-1/2	7-1/2	
89-S1250	11/4	.012	4-1/2	7-1/2	
89-S1500	11/2	.012	4-1/2	7-1/2	
89-S1750	13/4	.012	4-1/2	7-1/2	
89-S2000	2	.012	4-1/2	7-1/2	
89-S2500	21/2	.012	4-1/2	7-1/2	
89-S3000	3	.014	4-1/2	7-1/2	
89-S3500	31/2	.014	4-1/2	7-1/2	
89-S4000	4	.016	4-1/2	7-1/2	

Brush Accessories



Threaded Adapters

Item #	Arbor Dia	Stem Dia	Max Brush Dia	\$ ea.
AT1	1/2	1/4	4	Call or access web for pricing
UA1	1/2	1/4	4	
UA4	3/8	1/4	4	
UA2	3/8	1/4	4	
UA3	1/4	1/4	2	
1300	1/2	1/4	4	

Cardboard Adapters

Item #	Fits Inside	Stk Arbor Hole	Max Arbor	\$ ea.
AF3	3-1/4	5/8	2	Call or access web for pricing
AF4	4-1/4	5/8	2	
AF5	5-1/4	5/8	3-1/2	

Metal Adapters

Item #	Fits Inside	Arbor Hole	\$ ea.
(AL Type For Use With BDH, BDA, TW, and NY Styles)			Call or access web for pricing
AL3/8	2	3/8	
AL1/2	2	1/2	
AL5/8	2	5/8	
AL5/8-1/2	2	5/8-1/2	
AL3/4	2	3/4	
AL7/8	2	7/8	
AL1	2	1	
AL1-1/8	2	1-1/8	
AL1-1/4	2	1-1/4	
AL1-3/8	2	1-3/8	
AL1-1/2	2	1-1/2	Call or access web for pricing
AL1-5/8	2	1-5/8	
AL1-3/4	2	1-3/4	
(MA Type For Use With Nylon Abrasive and Tampico Styles)			
MA3	3-1/4	5/8 (2 Max.)	Call or access web for pricing
MA4	4-1/4	5/8 (2 Max.)	
MA5	5-1/4	5/8 (2 Max.)	

Snap-Out Adapters

Item #	Fits Inside	Arbor Hole	\$ ea.
SA-1214	1/2	1/4	Call or access web for pricing
SA-1238	1/2	3/8	
SA-5812	5/8	1/2	

NEED HELP?

Abrasive Nylon & Tampico Brushes

Mini Abrasive Nylon Brushes

Stem Brush

Item #	Brush Dia	Brush Part	Stem Part	OAL	Stk Grit	\$ ea.
81-AY-.032	.035	5/8	.016	3	Silicate	Call or access web for pricing
81-AY-1mm	.043	5/8	.016	3	Silicate	
81-AY-.047	.052	3/4	.026	3	Silicate	
81-AY-.054	.059	3/4	.026	3	600AO	
81-AY-1.5mm	.065	5/8	.026	3	600AO	
81-AY-.063	.069	3/4	.026	3	600AO	
81-AY-2mm	.087	3/4	.026	3	600AO	
81-AY-.079	.087	3/4	.034	3	600AO	
81-AY-.094	.103	3/4	.043	3	600AO	
81-AY-2.5mm	.108	3/4	.043	3	600AO	
81-AY-.109	.120	3/4	.055	3	600AO	
81-AY-.125	.128	1	.055	3	600AO	
8A-AY-3mm	.130	1	.055	3	600AO	
81-AY-3.5mm	.152	1	.055	3	600AO	
81-AY-.142	.156	1	.055	3	600AO	
81-AY-.156	.172	1	.072	3	600AO	
81-AY-4mm	.173	1	.055	3	600AO	
8A-AY-.172	.189	1	.072	3	600AO	
81-AY-4.5mm	.195	1	.072	3	600AO	
81-AY-.189	.208	1	.072	3	600AO	
81-AY-5mm	.217	1	.072	3	600AO	
81-AY-6mm	.236	1	.110	3	600AO	
81-AY-5.5mm	.238	1	.110	3	600AO	
81-AY-.219	.241	1-1/2	.072	3	600AO	Call or access web for pricing
81-AY-.250	.275	1-1/2	.110	3	500AO	
81-AY-6.5mm	.282	1	.110	3	600AO	
81-AY-.312	.343	1-1/2	.125	3	500AO	
81-AY-.375	.413	1-1/2	.160	3	500AO	
81-AY-.438	.482	1-1/2	.160	3	500AO	Call or access web for pricing
81-AY-.500	.550	1-1/2	.160	3	500AO	



About Abrasive Nylon Brushes ...

Nylon filaments with abrasive grain impregnated throughout. This allows sides to cut as well as the tips with new grains constantly being exposed as brush wears.

Tube Brushes - Series #85

Item #	Hole Dia	Brush Dia	Brush Part	OAL	Stem Dia	Stocked Abras.	\$ ea.
85-AY125	0.125	0.138	1	4	.083	600AO	Call or access web for pricing
85-AY156	0.156	0.172	1	4	.097	600AO	
85-AY187	0.187	0.206	1	4	.097	600AO	
85-AY219	0.219	0.241	1	4	.112	600AO	
85-AY250	0.250	0.275	1 1/4	4 1/2	.112	500AO	
85-AY281	0.281	0.309	1 1/4	4 1/2	.112	500AO	
85-AY312	0.312	0.343	1 1/4	4 1/2	.140	500AO	
85-AY344	0.344	0.378	1 1/4	4 1/2	.140	500AO	
85-AY375	0.375	0.413	1 1/4	4 1/2	.140	500AO	
85-AY406	0.406	0.447	1 1/4	4 1/2	.168	500AO	
85-AY437	0.437	0.481	1 1/4	4 1/2	.168	500AO	
85-AY469	0.469	0.516	1 1/4	4 1/2	.168	500AO	
85-AY500	0.500	0.550	1 1/2	5	.190	500AO	
85-AY562	0.562	0.618	1 1/2	5	.190	500AO	
85-AY625	0.625	0.688	1 1/2	5	.190	500AO	
85-AY687	0.687	0.756	1 1/2	5	.220	500AO	
85-AY750	0.750	0.825	1 1/2	5	.220	500AO	
85-AY812	0.812	0.893	1 1/2	6	.220	500AO	
85-AY875	0.875	0.963	1 1/2	6	.220	500AO	
85-AY937	0.937	1.031	1 1/2	6	.220	500AO	
85-AY1000	1.000	1.100	2	6	.220	500AO	
85-AY1250	1.250	1.375	2 1/2	6 1/2	.245	500AO	Call or access web for pricing
85-AY1500	1.500	1.650	2 1/2	6 1/2	.245	500AO	
85-AY1750	1.750	1.925	3	7	.292	500AO	
85-AY2000	2.000	2.200	3	8	.292	320AO	
85-AY2500	2.500	2.750	3 1/2	9	.292	320AO	
85-AY3000	3.000	3.300	4	10	.292	320AO	Call or access web for pricing

Copper Center Wheel Brush

CY-1	1	1/8	3/8	600SC	20000
CY-1-1/4	1-1/4	1/4	3/8	600SC	20000
CY-1-1/2	1-1/2	3/8	3/8	600SC	20000
CY-2	2	1/2	1/2	500SC	20000
CY-2-1/2	2-1/2	3/4	1/2	500SC	20000
CY-3	3	1	1/2	500SC	20000
CY-3-1/2	3-1/2	1-3/16	5/8	320SC	20000
CY-4	4	1-7/16	5/8	320SC	20000

Wheel

NY-6	6	2	1-1/2	500SC	6000
NY-8	8	3-1/4	1-7/8	500SC	5000
NY-10	10	3-1/4	2-7/8	500SC	4500
NY-12	12	4-1/4	3-3/8	500SC	4000
NY-14	14	5-1/4	3-7/8	500SC	3000

Mandrel Mounted Copper Center

BMC-12AY	1-1/4	1/8	1/4	500AO	25000
BMC-13AY	1-3/8	3/16	1/4	500AO	25000
BMC-14AY	1-1/2	1/4	1/4	500AO	25000
BMC-16AY	1-3/4	3/8	1/4	500AO	25000
BMC-20AY	2	1/2	1/4	500AO	25000
BMC-25AY	2-1/2	11/16	1/4	500AO	25000
BMC-30AY	3	13/16	1/4	500AO	25000
BMF-14AY	1-1/2	1/4	1/4	500AO	25000
BMF-16AY	1-3/4	3/8	1/4	500AO	25000
BMF-20AY	2	1/2	1/4	500AO	25000
BMF-25AY	2-1/2	11/16	1/4	500AO	25000
BMF-30AY	3	13/16	1/4	500AO	25000

Flexhone Accessories

Flex-Hone Oil

Item #	Quantity	\$ ea
FHP	1/2 Pint	Call or access web for pricing
FHQ	1 Quart	
FHG	1 Gallon	
FH5G	5 Gallon	

Cylinder Washing Brush

Item #	Brush OD	\$ ea
10A312	3-1/2"	Call or access web for pricing
10A4	4"	
10A412	4-1/2"	
10A5	5"	
10A512	5-1/2"	
10A6	6"	
10A612	6-1/2"	

Pipe Nipple Adapters & Extensions

Item #	OD Thread	FH Sizes	\$ ea
832A Adapter	8-32 Adapters	7mm>1/2"	Call or access web for pricing
18NPT Adapter	1/8" NPT	5/8">3"	
14NPT Adapter	1/4" NPT	3">5-1/2"	
38NPT Adapter	3/8" NPT	6">8"	
12NPT Adapter	1/2" NPT	8">12"	
* Extensions for use with pipe nipple adapters			
18 x 18 Ext.	1/8" NPT x 18" w/Cplg.		
18 x 36 Ext.	1/8" NPT x 36" w/Cplg.		
14 x 18 Ext.	1/4" NPT x 18" w/Cplg.		
14 x 36 Ext.	1/4" NPT x 36" w/Cplg.		

New! Flex-Hone for Flat Surfaces

Flex-Hone for flat surfaces utilizes the patented Flex-Hone® technology to produce the ideal surface finish on disk brake rotors and flywheels.

- More Passes Per Hone - Lasts Longer
- Produces a Non-Directional Pattern
- Lowers Harmonic Vibrations
- Is Ideal for New or Re-Turned Rotors and Flywheels

#RMFH240Z25	Fine	Call or access web for pricing
#RMFH120Z25	Medium	
#RMFH60Z25	Coarse	



Tampico Brushes



About Tampico Brushes ...

Produced from the leaf of the Mexican Agave plant, which has a soft to medium texture with good durability. Used in power brushes with and without compounds, resulting in somewhat finer finishes.

Tampico Wheel Brush

Item #	Wire Size	Arbor Hole	Face Width	Max RPM	\$ ea.
CT-2	2	1/2	3/8	20000	Call or access web for pricing
CT-2-1/2	2-1/2	1/2	3/8	20000	
CT-3	3	1/2	3/8	20000	
CT-3-1/2	3-1/2	1/2	1/2	20000	
TWA-6	6	3-1/4	1/2	6000	
TWA-8	8	3-1/4	5/8	5000	
TWA-10	10	3-1/4	3/4	4500	
TWA-12	12	4-1/4	7/8	4000	
TWA-14	14	4-1/4	7/8	3000	

Call for other types of Fibres available for special applications

Stainless Steel Tubing

ODD-LOT Surplus Tubing Store is open and ready to exceed your tubing needs!

A selection of ODD-LOT surplus tubing is bigger and better than ever. Great for prototyping requirements, customs without the long lead times, short runs and much more, ODD-LOT is the best value for many of your tubing purchases. What's more, this wide assortment of surplus is now available online, updated daily in a easy-to-order and secure environment.

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Material**

**ODD-LOT's wide variety of choices -
many at bargain prices include:**

- Sizes ranging from .004" to 6" in diameter
- Welded and drawn/seamless
- Hypo, metric, fractional and pipe
- Types 304, 310, 316, 321, Ni200, 400, 600, C276 and more

Look at all that ODD-LOT has to offer!

- Fast delivery
- Large selection
- Unique sizes
- Bargain prices

ODD-LOT is your best choice for:

- Prototyping needs
- Customs in-stock
- Short runs
- And much more!

**Selection, pricing and the service we're known for.
That's what you get when you purchase ODD-LOT Surplus Tubing.
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Transit ~10days
Import > Australia
Min ORDER AUD100

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WORK WITH THE LEADER IN HIGH-TECHNOLOGY TUBING AND FABRICATION SERVICES.
GIVE US A CALL TODAY – WE'RE YOUR ONE SOURCE THAT HAS IT ALL. > IMPORT

**OEM Availability normally 24-48hours (standard Items !
Import into Australia MOQ \$100 per Item Section**

**Purchase Order Required > Payment in ADVANCE (with Order)
Transit ? Allow 10-14days normal Import > subject to COURIER delays eg COVID**