Connector and Tubing Solutions Technical Guide

ENGINEERING **YOUR** SUCCESS.

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⚠ WARNING USER RESPONSIBILITY

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The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. Any Order accepted by Parker Hannifin will be subject to our terms and conditions of sale, copy available on request.

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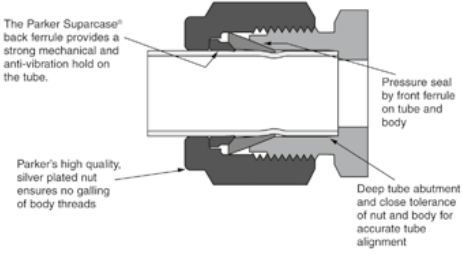
A-LOK® Principle

The A-LOK® two ferrule fitting consists of four precision engineered parts designed to provide secure leak-proof joints capable of satisfying high pressure, vacuum and vibration applications.

Fittings are supplied complete and ready for use. The front ferrule compresses onto the tube as it moves down the cone of the body creating a pressure/vacuum-tight seal on both tube and body by the interface pressure and surface finish of mating components. The Suparcase® back ferrule then deforms inwards in the cone of the front ferrule, forming into the tube and creating a strong mechanical hold on the tube.

The internal diameter of the body and nut are closely controlled diameters which constrain the tube within a close tolerance of its axis, ensuring accurate alignment within the assembled fitting.



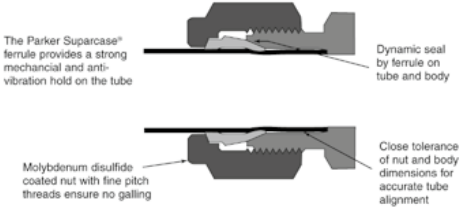
CPI™ Principle

The CPI™ single ferrule fitting consists of three precision engineered parts designed to provide secure leak-proof joints capable of satisfying high pressure, vacuum and vibration applications.

Fittings are supplied complete and ready for use. The ferrule compresses onto the tube as it moves down the cone of the body creating a pressure/vacuum-tight seal on both tube and body by the interface pressure and surface finish of mating components.

The Suparcase® ferrule forms into the cone of the body and grips onto the tube, thus creating a strong mechanical hold.

The internal diameter of the body and nut are closely controlled diameters which constrain the tube within a close tolerance of its axis, ensuring accurate alignment within the assembled fitting.



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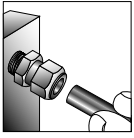
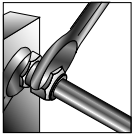
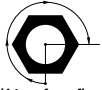
A-LOK® and CPI™ Assembly and remake instructions





INCH SIZE 1 thru 3 (1/16" - 3/16")
METRIC SIZE 2 thru 4 (2-4mm)



Only 3/4 turn from finger tight is necessary to seal and will result in additional remakes of the fitting

INCH SIZE 4 thru 16 (1/4" - 1")
METRIC SIZE 6 thru 25 (6-25mm)

1-1/4 Turns from Finger Tight

1. Parker A-LOK® and CPI™ instrument tube fittings are sold completely assembled and ready for immediate use. Simply insert the tube as illustrated until it bottoms in the fitting body. (If the fitting is disassembled, note that the small tapered end of the ferrule(s) go into the fitting body.)

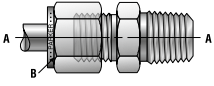
2. Tighten nut finger tight. Then tighten nut with spanner the appropriate amount as indicated on the diagram to the left. Hold fitting body with a second spanner to prevent body from turning. It is helpful to mark the nut to facilitate counting the number of turns.

For maximum number of remakes, mark the fitting and nut before disassembly. Before retightening, make sure the assembly has been inserted into the fitting until the ferrule seats in the fitting. Retighten the nut by hand.

Rotate the nut with a spanner to the original position as indicated by the previous marks lining up. (A noticeable increase in mechanical resistance will be felt indicating the ferrule is being re-sprung into sealing position.)

Only after several remakes will it become necessary to advance the nut slightly past the original position. This advance (indicated by B) need only be 10°-20° (less than 1/3 of a hex flat).

For Sizes above 16 (1"), the Parker IPD hydraulic presetting tool or Rotary spanner tool should be used. Cat. 4290-INST.



Parker CPI™/A-LOK® Tube Fitting part numbers use symbols to identify the size, style, and material. Tube and pipe thread sizes begin with a number indicating their size in sixteenths of an inch. For example, 4=4/16" or 1/4"; 16=16/16" or 1.

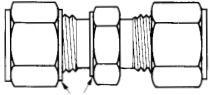
NOTE: Lubrication of the nut is REQUIRED for proper assembly on all LARGER size fittings in both inch and metric sizes. This requirement applies to:

- **inch sizes of 20 and higher**
- **metric sizes of 25 and higher**

For additional information please contact your local authorized Parker Instrumentation distributor or call Parker Instrumentation Products Division and ask for Bulletin 4230-B10.

How to identify metric fittings

Metric tube fittings are identified by a stepped shoulder on both the body and the threaded end of the nut as illustrated.



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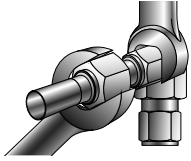
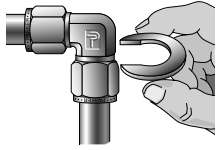
Gaugeability instructions for A-LOK®/CPI™

1. From “finger tight” position, spanner 1-1/4 turns for 1/4” to 1” size fittings (6mm to 25mm) (1/16”, 1/8”, 3/16”, 2mm 3mm and 4mm size tube fittings only spanner 3/4 turn from finger tight position).



Hold fitting body hex with second spanner to prevent body from turning as you tighten. It is a good idea to mark the nut (scribe or ink) to help you count the turns.

2. Now select the proper size inspection gauge and try to place it, as shown, between the nut and the body hex. If gauge DOES NOT FIT AT ANY POINT between them, you have correctly tightened the nut. If you can slip the gauge into the space, the fitting is not properly made up, and you must repeat the assembly procedure.



Gap gauge sizes

Part number	Tube size Inch	Metric mm
2 Gap Gauge	1/8	2-3
3 Gap Gauge	3/16	4
4 Gap Gauge	1/4	6
5 Gap Gauge	5/8	8
6 Gap Gauge	3/8	-
M10 Gap Gauge	-	10
8 Gap Gauge	1/2	12
10 Gap Gauge	5/8	14-15-16
12 Gap Gauge	3/4	18
14 Gap Gauge	7/8	20-22
16 Gap Gauge	1	25

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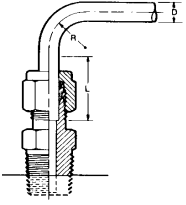
Minimum tube insertion length for A-LOK®/CPI™

*The bend radii shown is only an indication of what minimum bend radius may be expected.
These figures may vary depending on tube material, wall thickness and the type of equipment used.
Directions and recommendations should be followed as stated by the tube bender manufacturer.

D	inch	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
	mm	3	6	8	10	12	16	18	25
L (recommended)		18	21	22	23	28	30	32	35
L (minimum)		15	17	18	19	25	27	28	33
R (*min tube bend radius)		9.5	14	18	24	38	38	45	76



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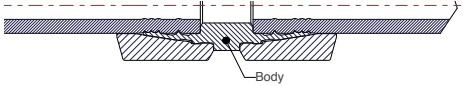
PHastite® Principle

A Ferrule-less Push-Fit Connector
PHastite® is a breakthrough in tube connection systems; its innovative design concept combines quick installation with a simple assembly process achieving a tube connector that can be used in applications up to 20,000 psi/ 1380 bar (see page 29).

The product is manufactured from standard materials and requires no special processes to be adopted.

PHastite® makes the perfect replacement for other fitting methods currently being utilised and performance parameters are such that it is suitable for pressure applications up to 20,000 psi/1380 bar (see page 29). Specifically, PHastite® is a reliable alternative to high pressure connections and/ or welded connectors in these applications.

Sealing
The excellent sealing and holding properties of PHastite® is achieved by its unique design. It not only secures metal to metal sealing points onto the tubing from its unique formed peaks within the bore of the connector body but allows the tubing to expand into the pre-machined cavities giving additional holding properties.



Testing
PHastite® meets all the relevant performance and functional requirements of industry standards, including pressure containment to a safety factor of a minimum of 4:1, proven by actual tubing burst tests. Throughout the development of PHastite®, product performance and integrity were paramount. A rigorous testing program including Thermal Cycling, Shock, Vibration, Helium Leak, Gas Tight and Hydrostatic testing has been completed.

PHastite®: The Benefits

Safety

- Supplied pre-assembled, no loose parts thus eliminating potential assembly errors.
- No additional operations using equipment that could lead to injury (such as hand held angle grinders) are required.
- Permanent assembly is tamper proof.
- Permanent leak free connections without the need for threaded components, thus removing potential loosening problems due to excess movement.
- No Hot Work! Fire or explosion risks are eliminated along with any potential fume inhalation.
- No disposal of hazardous materials used in any Hot Work activities.
- No brittleness or corrosion implications (caused by welding heat for example).

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PHastite® permanent connectors - The assembly process

The PHastite® fitting is supplied complete with the collars pre-assembled to the body, thus removing the risk of losing or incorrectly assembling components.

The tubes are simply inserted into the PHastite® connector, adequate tube insertion is assured by using the PHastite® tube marker.

Simple assembly to a metal to metal stop face ensures correct assembly every time, without counting turns or monitoring torque levels.

A series of formed ridges makes contact with the tubing surface uniformly to create both a multiple seal and a secure mechanical grip.

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PHastite® termination connectors - The assembly process

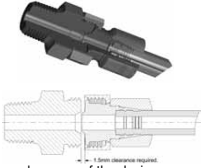
The PHastite® fitting is supplied complete with the collars pre-assembled to the body, retaining the swivel nut, thus removing the risk of losing or incorrectly assembling components.

The tubes are simply inserted into the PHastite® connector, adequate tube insertion is assured by using the PHastite® tube marker.

Simple assembly to a metal to metal stop face ensures correct assembly every time, without counting turns or monitoring torque levels.

A series of formed ridges makes contact with the tubing surface uniformly to create both a multiple seal and a secure mechanical grip.

A mating conical arrangement provides leak tight sealing at the breakable joint, while correct assembly is ensured by a metal to metal stop face, without counting turns or monitoring torque levels.



The ability to 'break' and 'remake' the joint is dramatically enhanced by the virtual zero clearance of the design. Allowing the joint to be completely disconnected and removed without large pull out being required.

Tube markers

Adequate tube insertion is essential.

To achieve this, a range of PHastite® Tube Markers are available. The PHastite® Tube Marker generates two visible lines on to the outside diameter of the tube.

When inserting the tube into a PHastite® connector the two lines should not be visible. This ensures adequate tube insertion prior to assembly.

After assembly only one of the lines will be visible, ensuring that tube slippage has not occurred during assembly.

Two versions of these markers are available as follows:

Permanent tube marker
This style of tube marker generates two permanent lines onto the tube. These lines can be used for initial inspection during assembly and for future inspection. These tube markers generate the marks by means of a metallic ball bearing being rotated against the tube.

Temporary tube marker

This style of tube marker acts as a pen guide. This allows the user to mark the tube using a pen. These lines can be used for initial inspection during assembly however they cannot be used for future inspection.

Tube marker part numbers
Tube marker part numbers are as

follows:

PH-TUBEMARKER-*-#.

Where * must be replaced by ‘P’ for the permanent tube marker and ‘T’ for the temporary pen tube marker.

And # must be replaced with the tube size as follows:
For imperial sizes add the size in 1/16” of an inch increments i.e. 4 = 1/4” and 10 = 5/8”.
For metric sizes add ‘M’ followed by the size i.e. M6 = 6mm and M18 = 18mm.

Phastool

For connections up to 1/2” and 12mm.
For the smaller sizes of PHastite® a light weight hand tool is available for ease of installation. The hand tool is supplied complete with a 2 meter hose and quick connectors to suit a 3/8-14 NPT pump connection port.

Bench Mounting
The hand tool can also be supplied complete with an optional bench mountable tool holder.

For connections 1/2” to 1” and 12mm to 25mm
For larger sizes of PHastite® a light weight bench tool is available for ease of installation. The bench tool is supplied complete with a 2 meter hose and quick connectors to suit a 3/8-14 NPT pump connections port. The unit is also supplied complete with all required jaw inserts for assembling all PHastite® connectors including shapes and termination product from 1/2” to 1” and 12mm to 25mm.

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MPI™ Principle

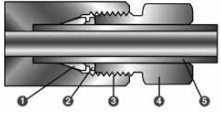
Introduction

Parker Hannifin MPI™ Fittings* are engineered and manufactured to provide secure, tight and leak resistant connections throughout industry, including off-shore oil and gas exploration platforms, research labs, and other facilities that require operating pressures in the range of 6,000 to 15,000 psi (414 to 1,034 bar). Please refer to pages 30/31 for further information.

MPI™ Fittings are ideally suited to handle liquids, gases, or chemicals and can be used on a wide variety of tubing materials including cold drawn - 1/8 hard (unannealed) tubing or instrument grade thick-walled annealed stainless steel. Every Parker MPI™ Fitting is supplied complete and ready to install.

Advanced Features

Every MPI™ Fitting has the features shown below:



1. Front ferrule with corrosion-resistant Parker SUPARCASE® forms a tight pressure seal between the body and ferrule in a second strong mechanical hold on the tube.
2. Rear ferrule with corrosion-resistant Parker SUPARCASE® provides a strong mechanical hold on the tube.
3. Longer thread area for improved resistance to pressure and load on the ferrules.
4. Molybdenum disulfide-coated inverted nut helps prevent galling, provides easier assembly, and permits multiple remakes.
5. Long tube-support area improves resistance to vibration and line loads.

Assembly

MPI™ Fittings are installed with standard hand tools. Each size can be preset with a Parker hydraulic preset tool. Tube preparation does not require cutting of threads or tube end "coning".

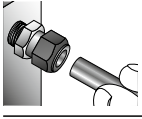
Dedication to quality

Our resources and vast product line, is available through our worldwide distribution network. For more information regarding our products and services, please contact your authorised Parker Instrumentation Distributor.

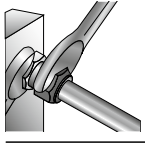
*U.S. Patent No. 6,851,729

MPI™ assembly, remake & gaugeability instructions

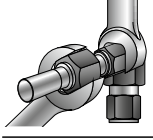
1. Parker MPI™ Fittings are sold completely assembled and ready for immediate use. Simply insert the tube as illustrated until it bottoms in the fitting body. (If the fitting is disassembled, note that the small tapered end of the ferrule(s) go into the fitting body.)



2. For MPI™ Fittings, turn the nut to the “finger-tight” position. Hold the fitting body with a second spanner to prevent the body from turning as you continue tightening the nut. For hand assembly, tighten the nut 1-1/2 turns and for a preset connection (required for 3/4” and 1”) tighten the nut 1/2 turn only. Parker recommends that you mark the nut (using a scribe or ink) to help you count the turns.



3. For maximum number of remakes, mark the fitting and nut before disassembly. Before retightening, make sure the assembly has been inserted into the fitting until the ferrule seats in the fitting. Retighten the nut by hand. Rotate the nut with a spanner to the original position as indicated by the previous marks lining up. (A noticeable increase in mechanical resistance will be felt indicating the ferrule is being re-sprung into sealing position.)



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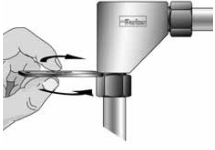
4. Finally, check the gap between the nut and the body hex with the end of the gauge by inserting the gauge (as shown) into the beveled gap between the nut and body hex. Gently turn the gauge (that is, it “twists out”). **However, if the gauge slides into the beveled gap, (does not “twist out”) the fitting is not properly made up and you must check the entire assembly procedure.**



Gaugeability tools

MPI™ inspection gauge
This one handy gauge works for all MPI™ sizes. The end of the gauge checks the fitting gap after make-up.

Suparcase® - ferrule hardening

In order to ensure effective tube grip for high pressure applications thicker wall tubing, ferrules should be hardened.
At Parker Hannifin we have invested large resources into our research and development area to perfect a process which will overcome the problems associated with other hardening processes of austenitic stainless steel. This revolutionary process gives an infusion of hardness as an all over treatment, but also increases the corrosion resistance.
The CPI™ ferrule, both MPI™ ferrules and the back ferrule of the A-LOK® fittings all undergo Suparcase® treatment for optimum performance.

Traditional nitride hardening of the leading edge of a back ferrule
Nitriding is a method of infusing hardness over a selected area. It increases the carbon level in the surface of the area and ensures a correct and consistent level of hardness. However it changes the structure of austenitic stainless steels and reduces its corrosion resistant properties.

A Suparcase® ferrule
The photograph below illustrates the all over hardness zone of Suparcase® which has been highlighted by etching. As one can see, the zone itself is unaffected by the acid attack.

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Typical raw material specifications for Parker Instrumentation fittings

Basic fitting material	Bar stock	Forging	Common tubing specification
Brass	CA-360 QQ-B 626 Alloy 360 ASTM-B16 Alloy 360 CA-345 ASTM-B-453 Alloy 345	CA-377 QQ-B 626 Alloy 377 ASTM-B-124 Alloy 377 BS2872 CZ122	ASTM-B75 ASME-SB75 (TEMPER "O")
Stainless steel (Type 316)[1)]	ASME-SA-479 Type 316-SS BS970 316-S31 DIN 4401 ASTM A276 Type 316 EN 10088-3 Type 1.4401	ASME-SA-182 316 BS970 316-S31 DIN 4401	ASME-SA-213 ASTM-A-213 ASTM-A-249 ASTM-A-269[2)] MIL T-8504 MIL T-8506
Steel	ASTM-A-108 QQ-S-637	ASTM-A-576	SAE J524b SAE J525b ASTM-A-179
Aluminium	2017-T4 or 2024-T4 ASTM-B211 QQ-A-225/5 or 6	2014T (as fabricated) ASTM-B-211 QQ-A-225/4	303, 6061T6 ASTM-B-210

Typical Raw Material Specifications for Parker Instrumentation fittings continued

Basic fitting material	Bar stock	Forging	Common tubing specification
NICKEL-COPPER ALLOY 400	ASTM B 164 QQ-N-281 BS3076 NA13	ASTM B 164 QQ-N-281 BS3076 NA13	ASTM B 165
HASTELLOY C-276®	ASTM B 574 ASTMB575	ASTM B 574	ASTM B 622 ASTM B 626
ALLOY 600	ASTM-B-166 ASME-SB-166	ASTM-B-564	ASTM-B-163
CARPENTER	ASTM-B-473	ASTM-B-462 ASTM-B-472	ASTM-B-468
TITANIUM	ASTM B 348	ASTM B 381	ASTM B 338
INCOLOY ALLOY 625	ASTM B 446 UNS N06625 BS3072 NA21	ASTM B 564 UNS NO6625	ASTM B 444 UNS NO6625 ASTM B B829
INCOLOY ALLOY 825	ASTM B425 UNS NO8825	ASTM B564 UNS NO8825	ASTM B 163/B423 UNS NO 8825 ASTM B 829
6MO	ASTM A 479/276 UNS S31254	ASTM A 182 GRDE F44	ASTM A 269/UNS 531254

(1) If more specific information, including heat code traceability, is required, your Parker Hannifin distributor will provide details.
(2) Stainless steel tube fittings work reliably on both seamless and welded-redrawn, fully annealed type 304, 316 and 316L tubing.

Heat code traceability

Parker Hannifin's Instrumentation Connectors Division offers Heat Code Traceability (HCT) on CPI™, A-LOK®, Instrumentation Pipe, Automatic Buttweld, Weld-lok®, PHastite®, MPI™, and Sandvik. HCT refers to the fact that a specific part can be traced back to the original mill heat of metal from which it was made. Beginning with the original melt, a package of documents is created which completely describes the metal in physical and chemical terms. The end result is that a number, which is permanently stamped to the part, refers back to the document package.
The HCT number is stamped on the material (bar stock or forging) prior to manufacturing. The concept is useful because it provides a method for complete material accountability for the manufacturer and end customer.

HCT Numbers

HCT offers these advantages:

- Raw materials for manufacture must meet code requirements. This can be verified through documentation so that the customer is certain that what is ordered is received.
- HCT provides a record of chemical analysis with the raw material thus, in areas requiring welding, the correct welding technique is applied.
- HCT relieves the user of Parker Instrumentation tube fittings of any doubts. It acts as an assurance for today and for tomorrow.

Parker grade tubing

Reduce your lifecycle costs
When selecting tubes for your hydraulic or instrumentation systems, some critical questions are often raised. For example, how knowledgeable are your suppliers about your process? How good are their products? If something goes wrong, how quickly can you get support or a replacement part?

As a leading worldwide supplier of seamless stainless tubes in both straight lengths and coils, Sandvik is uniquely equipped to help you address these challenges. With more than 100 years of experience in producing stainless steel, we continue to support our customers with the following:
Sandvik's technical knowledge is based on a long tradition of

R&D, which has resulted in a wide range of new products over the years. Combined with hands-on experience dealing with a variety of process environments, Sandvik and its representatives are equipped with the knowledge you need for the solution you want.
Our integrated production system ensures quality control through the entire manufacturing chain, from our steel melting plant to the finished product. Our quality standards help to ensure the long lifecycle of the tubes we deliver, as well as their traceability.

With a wide stock assortment and distribution capacity, we can deliver the product you want when you want it. Our tubes are end-capped and carefully packed to ensure you get the product you want in the same shape it left the mill.

And, finally, with an extensive global network of sales and service units, together with the Parker tube fitting partnership, our representatives are locally available to help you find the most cost-effective long-term solution. You are in safe hands.

What makes a high-quality tube? The tubes we manufacture and deliver for hydraulic and instrumentation systems are noted for their quality and low lifecycle

costs for the following reasons:

✔ We control every step in the tube production process, ensuring consistent quality in our product.

✔ We have well equipped corrosion testing laboratories, used for research purposes and for control of the influence of the production procedures on the material, that result in a product that offers high corrosion resistance.

✔ High surface smoothness and

close dimensional tolerances ensure there are no leakages when connecting straight tubes with couplings.

✔ All our products are characterized by the ovality, eccentricity and controlled hardness required for superior performance for hydraulic and instrumentation systems.

Two delivery forms: straight lengths and coiled
In answer to our customers' needs, we have developed two primary delivery forms of seamless stainless tubes – straight lengths and coiled. Your choice will depend on your process environment and your requirements. We can help you arrive at the most cost-effective solution for your needs.

Sandvik materials technology
Sandvik Materials Technology is a world-leading manufacturer of high value-added products in advanced stainless steels and special alloys.

Quality Assurance
Sandvik Materials Technology has Quality Management Systems approved by internationally recognized organizations. We hold for example: the ASME Quality System Certificate as a Materials Organization; approval to ISO 9001, QS-9000 and PED 97/23/EC, as well as approvals from LRQA, JIS, TÜV and others as a materials manufacturer.

Environment
Environmental awareness is an integral part of our business and is at the forefront of all activities within our operation. We hold ISO 14001 approval.

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Engineer your cost savings with Sandvik and Parker

When you want to reduce the risk of leakages in your hydraulic and instrumentation system, consider Sandvik seamless stainless steel tubing, together with the appropriate Parker connector, increases the integrity of the overall system, reducing not only the risk of leakage but maintenance costs as well.

A material of choice

Our coiled tubing is the material of choice for control lines and chemical injection lines, instrument lines, steam or electrically traced tubing, pre-insulated tubing, stack tubing and heater hose, among others.

Key advantages of Sandvik tubing together with Parker fittings

- Good quality surface finishes together with close tolerance manufacturing, reduces the risk of leakage and the need for inspection and maintenance.
- High degree of material utilisation reduces scrap generation.
- Compact packaging facilitates easy shipping and storage.
- Improved system integrity enhances operational safety and security.

Parker tubing part numbers

Imperial tubing

Tubing size	Part no.
1/4 OD x .028	TUBE-316-1/4 OD X .028
1/4 OD x .035	TUBE-316-1/4 OD X .035
1/4 OD x .049	TUBE-316-1/4 OD X .049
1/4 OD x .065	TUBE-316-1/4 OD X .065
5/16 OD x .035	TUBE-316-5/16 OD X .035
5/16 OD x .049	TUBE-316-5/16 OD X .049
5/16 OD x .065	TUBE-316-5/16 OD X .065
3/8 OD x .028	TUBE-316-3/8 OD X .028
3/8 OD x .035	TUBE-316-3/8 OD X .035
3/8 OD x .049	TUBE-316-3/8 OD X .049
3/8 OD x .065	TUBE-316-3/8 OD X .065
1/2 OD x .035	TUBE-316-1/2 OD X .035
1/2 OD x .049	TUBE-316-1/2 OD X .049
1/2 OD x .065	TUBE-316-1/2 OD X .065
1/2 OD x .083	TUBE-316-1/2 OD X .083

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5/8 OD x .035	TUBE-316-5/8 OD X .035
5/8 OD x .049	TUBE-316-5/8 OD X .049
5/8 OD x .065	TUBE-316-5/8 OD X .065
5/8 OD x .083	TUBE-316-5/8 OD X .083
5/8 OD x .095	TUBE-316-5/8 OD X .095
5/8 OD x .120	TUBE-316-5/8 OD X .120
3/4 OD x .035	TUBE-316-3/4 OD X .035
3/4 OD x .049	TUBE-316-3/4 OD X .049
3/4 OD x .065	TUBE-316-3/4 OD X .065
3/4 OD x .083	TUBE-316-3/4 OD X .083
3/4 OD x .095	TUBE-316-3/4 OD X .095
3/4 OD x .109	TUBE-316-3/4 OD X .109
3/4 OD x .120	TUBE-316-3/4 OD X .120
1 OD x .035	TUBE-316-1 OD X .035
1 OD x .049	TUBE-316-1 OD X .049
1 OD x .065	TUBE-316-1 OD X .065
1 OD x .083	TUBE-316-1 OD X .083
1 OD x .095	TUBE-316-1 OD X .095
1 OD x .109	TUBE-316-1 OD X .109
1 OD x .120	TUBE-316-1 OD X .120

Metric tubing

Tubing size	Part no.
6 OD x 1.0	TUBE-316-6MM OD X 1.0
6 OD x 1.5	TUBE-316-6MM OD X 1.5
8 OD x 1.0	TUBE-316-8MM OD X 1.0
8 OD x 1.5	TUBE-316-8MM OD X 1.5
10 OD x 1.0	TUBE-316-10MM OD X 1.0
10 OD x 1.5	TUBE-316-10MM OD X 1.5
10 OD x 2.0	TUBE-316-10MM OD X 2.0
12 OD x 1.0	TUBE-316-12MM OD X 1.0
12 OD x 1.5	TUBE-316-12MM OD X 1.5
12 OD x 2.0	TUBE-316-12MM OD X 2.0
16 OD x 1.0	TUBE-316-16MM OD X 1.0
16 OD x 1.5	TUBE-316-16MM OD X 1.5
16 OD x 2.0	TUBE-316-16MM OD X 2.0
18 OD x 1.0	TUBE-316-18MM OD X 1.0
18 OD x 1.5	TUBE-316-18MM OD X 1.5
18 OD x 2.0	TUBE-316-18MM OD X 2.0
20 OD x 2.0	TUBE-316-20MM OD X 2.0
22 OD x 2.0	TUBE-316-22MM OD X 2.0
25 OD x 2.0	TUBE-316-25MM OD X 2.0
25 OD x 2.5	TUBE-316-25MM OD X 2.5

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Pressure ratings and wall thicknesses of tubes used with Parker A-LOK®, CPI™, MPI™ and PHastite® connector ranges.

For temperatures up to 93° C (200° F) when used with the appropriate Parker connector ranges. These tables also show the minimum and maximum wall thickness of tubing that shall be used within the scope of the appropriate Parker connector design range.

If a user chooses a tube wall thickness outside of those recommended in the tables, the user should first consult the Technical Department of Parker Instrumentation Products Division.

Derivation of pressure ratings

The working pressure ratings for stainless steel tubing have been derived from stress values and methodologies listed in ASME B31.3, Chemical Plant and Petroleum Refinery Piping Standard and based on the recommendations of ASTM A269. A pressure rating calculator to derive pressure ratings according to Swedish RN78 standard and Din 2413 can be accessed on www.sandvik.com.

Tubing hardness

Acceptable tubing hardness is indicated on the following tables.

Tubing ordering suggestions

Tubing for use with Parker connectors must be carefully ordered to ensure adequate quality for good performance. Parker recommends that Sandvik tubing manufactured to ASTM A269 standards should be specified and that any order should include the required tube diameter & wall thickness. More stringent requirements are sometimes added by user which include statements such as free from scratches, suitable for bending, capped ends.

Sandvik tubing will comply with these requirements as standard.

Table 1 **Pressure rating (BAR) for metric size 316/316 Stainless Steel tubing for A-LOK® and CPI™ connectors**

- Not recommended for gas service
- Recommended for all services - standard assembly
- Recommended for all services - Use pre-assembly tool
- Recommended for all services - Use 'Hyferset' pre-assembly tool
- No data/Not recommended/No solution

Table 1	316/316 Stainless Steel									Metric
Tube O.D. Size	Wall Thickness, mm									
	0.8	1.0	1.2	1.5	1.8	2.0	2.2	2.5	2.8	3.0
3	720									
6	330	430	520	680						
8		310	380	490						
10		240	300	380	470					
12		200	240	310	380	430				
14		180	220	280	340	390	430			
15		170	200	260	320	360	400			
16			190	240	300	330	370	430		
18			170	210	260	290	330	380		
20			150	190	230	260	290	330	380	
22			140	170	210	230	260	300	340	
25					180	200	230	260	300	320

Special care must be taken when selecting tubing for Gas service utilising either A-LOK® or CPI™ connectors. In order to achieve a gas-tight seal, ferrules in these design ranges of connectors must seal against any surface imperfections. This is accomplished by the ferrules penetrating the surface of the tubing. Penetration can only be achieved if the tubing provides radial resistance and if the tubing material is softer than the ferrules. Thicker walled tubing helps to provide this resistance. Tables 1 and 2 indicates the minimum acceptable wall thickness for 304 or 316 stainless steel material in gas service. The ratings in the unshaded area indicates the combination of diameter and wall thickness which are suitable for Gas Service.

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Table 2 Pressure rating (PSIG) for inch size 316/316 stainless steel tubing for A-LOK® and CPI™ connectors

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

Please refer to page 28 for NPT/BSPT pipe pressure rating chart.

Pipe Pressure Ratings

NPT/BSPT Pipe Size	Stainless Steel			
	Male		Female	
	Straight	Shape	Straight	Shape
1/16	10000	9500	7500	7000
1/8	9100	9100	6400	5500
1/4	7500	7500	6600	5600
3/8	7200	7200	5300	5000
1/2	6600	5800	5200	4500
3/4	6400	6400	4300	3500
1	4600	4600	4500	3900
1-1/4	3500	3500	3500	3100
1-1/2	2900	2900	3200	2500
2	2600	2600	2700	2300

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Table 3 Pressure rating (PSIG) for inch size Tungum (Seamless) tubing for A-LOK® and CPI™ connectors

Table 3	Tungum						Imperial	
Tube O.D. Size	Wall Thickness, inches							
	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.12
1/8	6400	8400						
3/16	4100	5300	7900					
1/4		3800	5600	7900				
5/16		3000	4400	6100	8100			
3/8		2500	3600	4900	6500	7700		
1/2			2800	3800	5000	5900	6900	
5/8			2200	3000	3900	4600	5300	
3/4			1800	2400	3200	3700	4300	
7/8				2100	2700	3100	3700	4100
1					2300	2700	3200	3500

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Table 4 Pressure rating (BAR) for metric size Tungum (Seamless) tubing for A-LOK® and CPI™ connectors

Table 4	Tungum							Metric
Tube O.D. Size	Wall Thickness, mm							
	0.8	1	1.2	1.5	2	2.5	2.8	3
3	400							
6	250	320	400	520				
8		230	290	370	520			
10		180	220	290	400			
12			180	23-0	320	420	480	
16			140	180	250	320	370	
18			130	160	220	280	320	
20			110	140	200	250	290	
22				130	180	230	260	280
25					150	200	220	240

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Table 5 Pressure rating (PSIG) for inch size 6Mo (Seamless) tubing for A-LOK® and CPI™ connectors

Table 5	6Mo						Imperial
Tube O.D. Size	Wall Thickness, inches						
	0.02	0.028	0.035	0.049	0.065	0.083	0.095
1/16							
1/8	7100	10500					
3/16		6700	8600				
1/4		4900	6300				
5/16			4900	7100			
3/8			4000	5800	8000		
1/2			3200	4600	6200		
5/8				3600	4900		
3/4				3000	4000	5200	
7/8				2500	3400	4400	
1					2900	3800	4400

Table 6 Pressure rating for metric (BAR) size 6Mo (Seamless) tubing for A-LOK® and CPI™ connectors

Table 6	6Mo							Metric
Tube O.D. Size	Wall Thickness, mm							
	0.8	1	1.2	1.5	1.8	2	2.2	2.5
3	550							
6	410	520						
8		380	470					
10		300	370	470				
12		250	300	380	470			
14			270	340	420			
15			250	320	390			
16			230	300	360			
18			210	260	320	360		
20			180	230	290	320		
22				210	260	290	320	
25					220	250	280	320

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Table 7 Pressure rating (PSIG) for inch size Alloy 400 (Seamless) tubing for A-LOK® and CPI™ connectors

Table 7	Alloy 400							Imperial
Tube O.D. Size	Wall Thickness, inches							
	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.12
1/8	8000	10400						
1/4	3700	4800	7000	9800				
5/16		3700	5400	7500				
3/8		3100	4400	6100				
1/2		2400	3500	4700	6200			
3/4			2200	3000	4000	4600	5400	
1				2200	2900	3400	3900	4300

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Table 8 Pressure rating (PSIG) for metric size Alloy 400 (Seamless) tubing for A-LOK® and CPI™ connectors

Table 8	Alloy 400							Metric
Tube O.D. Size	Wall Thickness, mm							
	0.8	1	1.2	1.5	2	2.5	2.8	3
3	670	890						
6	310	400	490	640				
8		290	350	460				
10		230	280	360				
12		190	230	290	400			
18			160	200	270			
20			140	180	240	310	350	
25				140	190	240	280	300

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Table 9 Pressure rating (PSIG) for inch size Alloy 625 tubing for A-LOK® and CPI™ connectors

Table 9	Alloy 625		
Tube O.D. Size	Wall Thickness, inches		
	0.035	0.049	0.065
1/4	6800		
3/8	4400	6400	8700
1/2		5000	6800
3/4			4400

Table 10 Pressure rating (BAR) for metric size Alloy 625 tubing PSI (bar) for A-LOK® and CPI™ connectors

Table 10	Alloy 625				Metric
Tube O.D. Size	Wall Thickness, mm				
	0.8	1	1.2	1.5	1.8
6	440	570			
10	260	330	400	510	630
12			330	420	

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Table 11 Pressure rating (PSIG) for inch size Alloy 825 tubing for A-LOK® and CPI™ connectors

Table 11	Alloy 825			Imperial
Tube O.D. Size	Wall Thickness, inches			
	0.035	0.049	0.065	0.083
1/4	5400	8700	11100	
3/8	3500	5500	7600	
1/2	2700	4300	5900	

Table 12 Pressure rating (BAR) for metric size Alloy 825 tubing for A-LOK® and CPI™ connectors

Table 12	Alloy 825				Metric
Tube O.D. Size	Wall Thickness, mm				
	0.8	1	1.2	1.5	2
6	260	450	610	730	
10		260	350	440	
12		210	280	360	

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Table 13 Pressure rating (PSIG) for inch size Alloy C276 (Seamless) tubing for A-LOK® and CPI™ connectors

Table 13	Alloy C276			Imperial
Tube O.D. Size	Wall Thickness, inches			
	0.028	0.035	0.049	0.065
1/4	5500			
3/8		4500	6500	8900
1/2		3500	5100	6900
5/8		2800		

Table 14 Pressure rating (BAR) for metric size Alloy C276 (Seamless) tubing for A-LOK® and CPI™ connectors

Table 14	Alloy C276			Metric
Tube O.D. Size	Wall Thickness, mm			
	0.8	1	1.2	1.5
6	450	580		
10		330	410	520
12		270	330	430
15		230		

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Table 15 Pressure rating (PSIG) for inch size Titanium Grade 2 (Seamless) tubing for A-LOK® and CPI™ connectors

Table 15	Titanium Grade 2			Imperial
Tube O.D. Size	Wall Thickness, inches			
	0.028	0.035	0.049	0.065
1/4	3300	4200	6200	
3/8		2700	4000	5400
1/2		2100	3100	

Table 16 Pressure rating (BAR) for metric size Titanium Grade 2 (Seamless) tubing for A-LOK® and CPI™ connectors

Table 16	Titanium Grade 2			Metric
Tube O.D. Size	Wall Thickness, mm			
	0.8	1	1.2	1.5
6	280	350	440	
10		200	250	320
12		170	200	

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Table 17 Pressure rating for inch size stainless steel tubing PSI (bar) used with PHastite® Connectors

		Wall thickness in millimetres												
Tube OD mm	PHastite max product rating PSI (Bar)*	0.8**	1.0	1.2	1.5	1.8	2.0	2.2	2.5	2.8	3.0	3.5	4.0	4.5
6	20000 (1379)	4800 (331)	6200 (427)	7600 (524)	9800 (676)	1190 (820)	13300 (917)							
8	17000 (1172)		4500 (310)	5500 (379)	7200 (497)	8800 (607)	9900 (683)	10900 (752)						
10	15500 (1069)		3600 (248)	4300 (297)	5600 (386)	6900 (476)	7700 (531)	8600 (593)	9900 (683)					
12	15000 (1034)		2900 (200)	3600 (248)	4600 (317)	5600 (386)	6300 (434)	7000 (483)	8100 (558)	9200 (634)	9900 (683)			
14	12500 (8620)		2650 (183)	3250 (224)	4100 (283)	5050 (348)	5650 (390)	6300 (434)	7300 (503)	8250 (569)	8900 (614)			
16	10000 (689)		2300 (159)	2800 (193)	3550 (245)	4350 (300)	4900 (338)	5400 (372)	6250 (431)	7150 (493	7700 (531)	9150 (631)		
18	10000 (689)				3150 (217)	3850 (265)	4300 (296)	4750 (328)	5500 (379)	6250 (431)	6750 (465)	8050 (555)		
20	10000 (689)				2800 (193)	3400 (234)	3800 (262)	4250 (293)	4900 (338)	5550 (383)	6000 (414)	7150 (493)	8300 (572)	
22	8750 (603)				2550 (176)	3100 (214)	3450 (238)	3850 (265)	4400 (303)	5000 (345)	5400 (372)	6400 (441)	7450 (514)	
25	8750 (603)				2200 (152)	2700 (186)	3000 (207)	3350 (231)	3800 (262)	4350 (300)	4700 (324)	5550 (383)	6450 (445)	7400 (510)

Table 18 Pressure rating for inch size stainless steel tubing PSI (bar) used with PHastite® Connectors

		Wall thickness in millimetres									
Tube OD inch	PHastite max product rating PSI (Bar)*	0.035**	0.049	0.065	0.083	0.095	0.109	0.120	0.125	0.156	0.188
1/4"	20000 (1379)	5100 (352)	7500 (517)	10300 (710)	13300 (917)						
3/8"	15000 (1069)	3300 (228)	4800 (331)	6600 (455)	8600 (593)	10000 (689)					
1/2"	15500 (1034)	2600 (179)	3700 (255)	5100 (352)	6700 (462)	7800 (538)	9100 (627)	10100 (696)	10500 (696)		
5/8"	12500 (8620)		3000 (207)	4000 (276)	5200 (359)	6100 (421)	7100 (490)	7900 (545)	7900 (545)		
3/4"	10000 (689)		2400 (166)	3300 (228)	4300 (297)	5000 (345)	5800 (400)	6450 (445)	6450 (445)	8650 (596)	
7/8"	8750 (603)		2100 (145)	2800 (193)	3600 (248)	4200 (290)	4900 (338)	5400 (372)	5400 (372)	7300 (503)	
1"	8750 (603)			2400 (166)	3200 (221)	3700 (255)	4200 (290)	4700 (324)	4700 (324)	6250 (431)	7750 (534)

*Pressure ratings verified by tests based on 4:1 factor of safety, utilising ASTM A269 - 316 tubing with typical ultimate tensile strength of 600Mpa and hardness of between Rb 80 and Rb 90.

**0.035" and 0.8mm wall thickness tubes are not suitable for heavy vibration applications particularly where pressure pulsation is present, due to tube fatigue.

MPI™ Medium Pressure Fittings

Tables 1, 2 and 3 list the maximum suggested working pressure of various tubing sizes, according to material. Acceptable tubing diameters and wall thicknesses are those for which a rating is listed. Combinations which do not have a pressure rating are not recommended for use with MPI™ Fittings.

MPI™ Tubing
MPI™ tubing is marked "MPI" and is designed to provide optimum performance for MPI™ fittings. MPI™ tubing is nominal OD ±.003") 316 seamless stainless steel, cold drawn - 1/8 hard (unannealed) tubing. Tensile strength is approximately 40% higher than annealed tubing.

Table 1 **316 Stainless Steel (Seamless/Unannealed - 1/8 Hard)**

Tube Size inch	Nominal O.D. inch	Nominal I.D.	Working Pressure	MPI™ Tube Part No.
1/4	0.250	0.125	15,000	4-240 MPITUBE-SS-15K
3/8	0.375	0.216	15,000	6-240 MPITUBE-SS-15K
9/16	0.562	0.344	15,000	9-240 MPITUBE-SS-15K
3/4	0.750	0.469	15,000	12-240 MPITUBE-SS-15K
1	1.000	0.656	12,500	16-240 MPITUBE-SS-15K

NOTE: Working pressures calculated using an allowable stress of 35,000 psi for 1/8 hard 316 stainless steel tubing with a minimum tensile strength of 105,000 psi.

NOTE: Sizes 3/4" and 1" require hydraulic presetting when used with MPI™ fittings.

***Consult factory for pressure tables regarding other material.**

Cone & Thread Tubing
Cone & Thread (C&T) tubing is available as 1/8 hard 316 seamless stainless steel tubing and is designed to work with existing C&T fittings. C&T tubing has an undersized OD by as much as .010" to better facilitate the coning and threading operations required for use with C&T fittings. MPI™ fittings work effectively with C&T tubing as listed right but require hydraulic presetting for optimum performance.

Table 2 316 Stainless Steel (Undersized OD, Seamless (Unannealed - 1/8 Hard)

Tube Size inch	Max O.D. inch	Nominal I.D. inch	Working Pressure (PSI)	Tube Size inch	Max O.D. inch	Nominal I.D. inch	Working Pressure (PSI)
1/4	0.250	0.109	12,500	9/16	0.562	0.359	10,000
3/8	0.375	0.203	12,500	3/4	0.750	0.516	10,000
9/16	0.562	0.312	12,500	1	1.000	0.688	10,000

Instrumentation Grade Heavy Wall Tubing

Table 3 316 Stainless Steel (Seamless/Annealed)

Tube Size inch	O.D. 0.065	0.083	0.095	0.109	0.120	0.134	0.156	0.188	0.220
1/4	10,300	13,300							
3/8	6,600	8,600	10,000	11,700					
1/2		6,700	7,800	9,100	10,000	11,400			
3/4				5,800	6,400	7,300	8,600	10,600	
1					4,700	5,300	6,200	7,700	9,200

NOTE: Working pressures calculated using an allowable stress of 20,000 psi for annealed 316 stainless steel tubing with a nominal O.D. tolerance of ± 0.005".

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Table 4 Elevated Temperature Rating Factors

System Temperature

Operating temperature is another factor in determining the proper tubing material. While Alloy 400 tubing, for instance, is suitable for very low temperature media, materials such as Stainless steel tubing are suitable for higher temperature media. Special alloys such as Alloy C276 are recommended for extremely high temperatures.

Table 4 lists the de-rating factors which should be applied to the working pressures listed in Tables 1-16 for elevated temperature conditions. Simply locate the correct factor in Table 17 and multiply this by the appropriate value in Tables 1-16 for elevated temperature working pressure.

EXAMPLE:

Tubing Type 316 stainless steel seamless, 1/2 in. x 0.049 in. wall at 100 °F

- The allowable working pressure at room temperature (up to 100 °F) is 2800 psi (Refer to Table 1)
- The elevated temperature factor for 316 stainless steel is 0.77 at 1000 °F (Refer to Table 17)
- The allowable working pressure for 316 stainless steel tubing ½ in. x 0.049 in. wall at 1000 °F is then: 2800 psi x 0.77 = 2156 psi

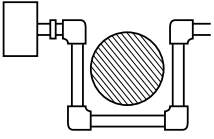
Table 4		Elevated Temperature Rating Factors						
Temperature		Tubing Material						
°F	°C	Stainless 316/316L*	6Mo	Alloy 400	Alloy 625	Alloy 825	Alloy C276	Titanium Gr. 2
100	38	1	1	1	1	1	1	1
200	93	1	1	0.88	0.93	0.92	0.91	0.87
300	149	1	0.95	0.81	0.88	0.87	0.84	0.72
400	204	0.97	0.9	0.79	0.85	0.83	0.78	0.62
500	260	0.9	0.87	0.79	0.82	0.79	0.73	0.53
600	315	0.85	0.86	0.79	0.79	0.76	0.69	0.45
700	371	0.82	0.84	0.78	0.77	0.74	0.65	--
800	426	0.8	--	0.76	0.75	0.73	0.63	--
900	482	0.78	--	0.43	0.74	--	0.61	--
1000	537	0.77	--	--	0.73	--	0.6	--
1100	593	0.62	--	--	0.73	--	--	--
1200	649	0.37	--	--	0.72	--	--	--

* Dual-certified grades such as 316/316L, meet the minimum chemistry and the mechanical properties of both alloy grades.

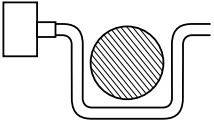
Tubing vs Piping

Standard fluid line systems, whether for simple household use or for the more exacting requirements of industry, were for many years constructed from threaded pipe of assorted materials and were assembled with various standard pipe fitting shapes, unions and nipples. Such systems under high pressures were plagued with leakage problems besides being cumbersome, inefficient and costly to assemble and maintain. Therefore, the use of pipe in these systems has largely been replaced by tubing because of the many advantages it offers.

Tubing provides simplified, free flow system.



Old Method - Each connection is threaded - requires numerous fittings - system not flexible or easy to install and service connections not smooth inside - pockets obstruct flow.



Modern Method - Bendable tubing needs fewer fittings - no threading required - system light and compact - easy to install and service - no internal pockets or obstructions to free flow.

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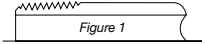
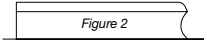
Major advantages of Tubing vs. Pipe

1. Bending Quality - Tubing has strong but relatively thinner walls; is easy to bend.Tube fabrication is simple.
2. Greater Strength - Tubing is stronger. No weakened sections from reduction of wall thickness by threading.



Pipe



Tubing

Figure 2
With no threading necessary, tubing does not require extra wall thickness

3. Less turbulence - Smooth bends result in streamlined flow passage and less pressure drop.

4. Economy of space and weight - With its better bending qualities and a smaller outside diameter, tubing saves space and permits working in close quarters. Tube fittings are smaller and also weigh less.

5. Flexibility - Tubing is less rigid, has less tendency to transmit vibration from one connection to another.

6. Fewer fittings - Tubing bends substitute for elbows. Fewer fittings mean fewer joints, fewer leak paths.

7. Tighter joints - Quality tube fittings, correctly assembled, give better assurance of leak-free systems.

8. Better appearance - Tubing permits smoother contours with fewer fittings for a professional look to tubing systems.

9. Cleaner fabrication - No sealing compounds on tube connections. Again no threading; minimum chance of scale, metal chips, foreign particles in system.

10. Easier assembly and disassembly - Every tube connection serves as a union. Tube connections can be reassembled repeatedly with easy spanner action.

11. Less maintenance - Advantages of tubing and tube fittings add up to dependable, trouble-free installations.

Common causes of imperfect bends

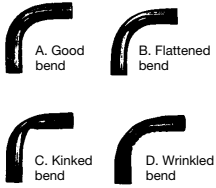
Figure A shows an ideal bend. Bends with little or no flattening are produced when correct equipment and methods are employed; when proper consideration is given to co-relationship of the radius of the bend, material wall thickness and hardness of the tube.

Figure B shows a flattened bend, caused by trying to bend too short a radius, or bending smaller diameter tube in larger radius block.

Figure C shows a kinked and flattened bend, caused by the tube slipping in the bender, or by using non-annealed tubing. Tubes must be firmly clamped by clamp block to prevent slippage during bending process.

Figure D shows a wrinkled bend, sometimes produced when thin wall tube is bent.

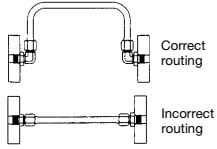
Breakage will sometimes occur when mandrel is too far forward in tube, or when too short a radius is attempts with hard tube.



Routing of bends

Routing of lines is probably the most difficult yet most significant of these system design considerations. Proper routing involves getting a connecting line from one point to another through the most logical path. The most logical path should:

Avoid excessive strain on joints - A strained joint will eventually leak.



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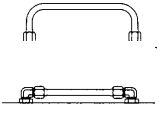
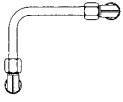
Correct routing

Incorrect routing

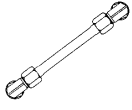


Correct routing

Incorrect routing

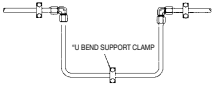


Correct routing



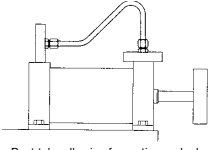
Incorrect routing

Allow for expansion and contraction - Use a “U” bend in long lines to allow expansion and contraction.



U-bend allowing for expansion and contraction

Allow for motion under load - Even some apparently rigid systems do move under load.



Bent tube allowing for motion under load

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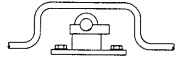
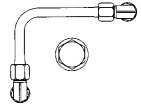
Get around obstructions without using excessive amount of 90° bends - Pressure drop due to one 90° bend is greater than that due to two 45° bends.

Correct



Incorrect

Keep tube lines away from components that require regular maintenance



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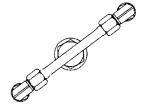
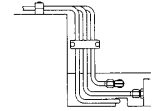
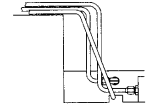


Incorrect

Have a neat appearance and allow for easy trouble shooting, maintenance and repair



Correct



Incorrect

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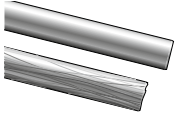
Proper tubing preparation

Tube end preparation is essential in assuring leak-free systems. Some important points to consider are:

- Handling Tubing
- Cutting Tube End with either a tube cutter or hacksaw
- Deburring the tube end
- Cleaning the tube end

Handling tubing

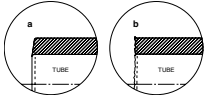
After tubing has been properly selected and ordered, careful handling is important.
From the receiving dock to point of installation, special attention is necessary to prevent scratching and burring the O.D. of the tubing. This is especially important for gas service. Low-density gases such as helium and argon cannot be sealed with damaged tubing.



Make certain not to drag tubing across any surfaces such as truckbeds, shelves, or storage racks, the floor and (or) ground of any plant/construction site. This is important for tubing of all materials. Besides scratching, improper handling can create out-of-round tubing. Out-of-round tubing will not fit the I.D. of the ferrule(s) or the body bore properly and will cause leakage.

Cutting the tube end

To insure a good joint, tube must be cut off square. This can be accomplished with either a tube cutter or hacksaw.



Enlarged section of tube showing differences in tubing cut with a tube cutter (a) and a hacksaw (b).

Tubing cutters

More commonly utilized on softer tubing such as copper, aluminum

or even “soft” steel tubing. If a tube cutter is utilized with stainless steel tubing, remember that a special cutting wheel, designed for use with stainless steel tubing should be employed. The use of dull or improper cutting wheels can work harden the stainless steel tubing near the cut area. This CAN adversely affect the fittings sealing ability.

Cutting with a Hacksaw

When using a hacksaw to cut off tubing, it is essential to use a guide to assure square cutoffs. We recommend our Tru-Kut vise Model #710439 (see picture on the left). Further, to minimize the residual burrs, a hacksaw blade of 32 teeth per inch minimum is suggested.

Deburring the tube end

The burrs formed by either the tube cutter or hacksaw must be removed prior to assembly to prevent those burrs from eventually damaging the system. O.D. burrs can prevent tubing from seating properly in a fitting body. I.D. burrs can restrict flow, as well as possibly break loose and damage fine filtration elements.

Note: Do not over deburr the O.D. of tubing.
You may deburr the tubing with your choice of file(s), or utilize Parker’s IN-EX De-Burring tool Model #226. This tool can be used to deburr both the I.D. & O.D. of tubing sizes 1/8” to 1 5/8” (3mm-41mm).

Cleaning the tube end
After you deburr the tubing, it is essential to remove burrs from the tubing line. This can be accomplished by:

1. Flushing with solvent or low pressure compressed air.
2. Swab with lint-free cloth.

Again, this should prevent entrapping one of these small burrs down-stream where it might do some system damage.

Tube fabrication equipment

PAR-L0K Spanner

Hex A/F inch	Part number	Hex A/F inch	Part number	Hex A/F mm	Part number
3/8	860062-6	1 1/8	860062-17	10	860063-10
7/16	860062-7	1 1/4	860062-18	11	860063-11
1/2	860062-8	1 3/8	860062-19	12	860063-12
9/16	860062-9	1 1/2	860062-20	13	860063-13
5/8	860062-10	1 5/8	860062-21	14	860063-14
1 1/16	860062-11	1 7/8	860062-22	16	860063-16
3/4	860062-12	2	860062-23	17	860023-17
13/16	860062-13	2 1/4	860062-24	19	860063-19
7/8	860062-14			21	860063-21
15/16	860062-15			22	860063-22
1	860062-16				
Full kit of all eleven spanners	860062-KIT	Full kit of all eight spanners	860062-KIT2	Full kit of all ten spanners	860063-KIT

Par-Lok Spanner Kit

Easy access ratchet spanner speeds fittings installation in tight locations. Rugged, snap-action jaws can be opened over tube lines, locked onto fitting hex and ratcheted with 1/8 turn. Full six point contact prevents fitting distortion common with spanner slippage. Ideal for tube line installations where compact runs require multiple fittings make-up disassembly and remakes.
360 degree snap-action ratchet spanners are available individually or

in three different kit combinations. Par-lok jaws are constructed from drop-forged high carbon steel material with a black conversion coat finish. Par-lok handles are made from heavy gauge steel material heat treated and with a corrosion resistant black finish. Solid stainless steel rivets and tempered jaw springs are designed into every spanner for maximum strength.

Hand tube bender

Imperial

Tube O.D. inch	Part number	Bend radius inch	Weight kgs.
1/4	PTB-4T	9/16	0.54
3/8	PTB-6T	15/16	1.68
1/2	PTB-8T	1 1/2	3.45

Metric

Tube O.D. mm	Part number	Bend radius mm
6	PTB-6M	14.3
8	PTB-8M	23.8
10	PTB-10M	23.8
12	PTB-12M	38.1

Sturdy easy to use hand tools for fast accurate bending without kinks or visible flattening.

These benders can also be used in a vice for additional comfort and convenience.

Tube bender - sets

Description	Part number
Bench or vice mounted tube bender sets to suit a full range of imperial and metric tube sizes	412-EXACTOL 1/4”-3/4” O.D. (6mm-20mm) 420-EXACTOL 1/4”-1.1/4” O.D. (6mm-32mm) 424-EXACTOL 1/4”-1.1/2” O.D. (6mm-38mm)

Requires less force to operate than similar tube benders.

Designed for bending copper, Aluminium, coated and stainless steel tubing in both metric and imperial sizes. Bends up to 180°.

Tube cutters

Description	Part number
Tube cutter	PT - C
Spare cutter wheels	PT - CS
Tube cutter for exotic materials	PT - CE
Spare cutter wheels	PT - CES

Adjustable tube cutters which produces a clean square end with no external burr and minimum internal burrs.

The design of these cutters not only allows accurate positioning of the tubing onto the rollers but also allows the cutter wheel to be positioned both quickly and easily.

The 218B cutter is suitable to be used on copper, aluminium, steel and stainless steel tubing from 1/8" to 1.1/8" O.D. (3mm to 27mm O.D.) and the 635B is designed for use on harder exotic materials for tubing from 1/4" to 1.3/8" O.D. (6mm to 35mm).

TRU-KUT sawing vice

Description	Part number
TRU-KUT (for 3/16" to 2"O.D. (5-50mm)	PT - V

A robust hacksaw guide to accommodate tube, pipe and hose in sizes 3/16" to 2" O.D. (5mm to 50mm O.D.) and assures square cut-offs, clean ends and minimum bending.

This guide is used by mounting into a vice or it can be bolted to a bench for a more permanent fixture.

The tube is clamped into position and cut utilising the guide which gives accurate square cuts every time.

IN-EX Tube de-burring tool

Description	Part number
IN-EX de-burring tool	PT - D
Replacement blade	PT -DS

De-burrs both inside and outside of tubing from 1/8" to 1.5/8" O.D. (3mm to 41mm O.D.). The tool has two special cutting blades arranged to present four cutting edges either internal or external de-burring.

This tool is used by inserting the tube into one end for inside de-burring and the opposite end for outside de-burring.

Rotate in either direction, the tool centres itself on the tubing.

Visual Index A-LOK®/CPI™

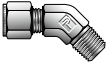
Tube to male Pipe

FBZ, MSCN, MSCK, MSCR Male connector – pages 69-72

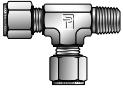
FH2BZ, MBCN Male bulkhead connector – page 73

FH4BZ, MTCN Thermocouple connector – page 73

CBZ, MSELN, MSELK Male elbow – pages 74-75



VBZ, MVELN NPT Male 45° elbow – page 76



RBZ, MRTN NPT Male run tee – page 77

SBZ, MBTN NPT Male branch tee – page 77

Tube to female Pipe

GBZ, FSCN, FSCK Female connector – pages 78-79

GH2BZ, FBCN Female bulkhead connector – page 80

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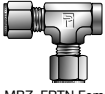
GBZ, FSC GC Gauge connector page – 80

DBZ, FELN Female elbow – page 81



MBZ, FRTN Female run tee – page 82

OBZ, FBTN Female branch tee – page 82

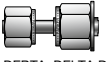
Tube to tube unions

HBZ, SC, SCM Union – page 83

HBZ, CU Conversion union – page 84

HBZ, RU, RUM Reducing union – page 84

WBZ, BC, BCM Bulkhead union page 85



DEBTA, DELTA Dielectric union adapter, Dielectric assembly – pages 85-86

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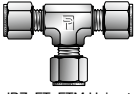
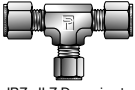
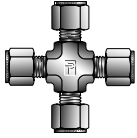
EBZ, EE, EEM, ELZ Union elbow – pages 86, 87



JBZ, ET, ETM Union tee – page 87



JBZ, JLZ Drop size tee – page 88



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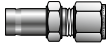
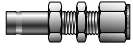


TRBZ, TUR, TUCM, TURM Tube end reducer – pages 89-91



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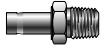

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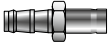

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37° Flare (AN) to CPI™/A-LOK®

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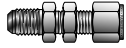
XHBZ XASC 37° Flare connector to CPI™/A-LOK® – page 100



XH2BZ, XABC 37° Flare bulkhead connector to CPI™/A-LOK® – page 100

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C5BZ, M5SEL Male SAE straight thread elbow – page 101

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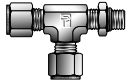
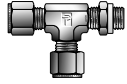
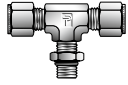


R5BZ, M5RT Male run tee SAE straight thread – page 102



RBZ (R), MRT (R) Male BSPP run tee straight thread – page 102



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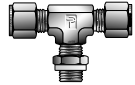

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Z3HCZ7, Z3HLZ7 Column end fitting – page 108

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ZHCZ, ZHLZ Column end fitting (without frit) – page 109

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BZI Inverted tube nut – page 113

BZP Knurled nut – page 113

TZ Ferrules – page 114

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WLZ, WLN Bulkhead locknut – page 118-119

BN Bulkhead locknut – page 119

L5N Accessory locknut – page 119

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PC Permanent union equal cross – page 122

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TFS-N Termination female straight - NPT – page 125

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TXAS Termination male straight 20,000 PSI medium pressure – page 128 - 129

Visual Index MPI™

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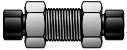

WBMP7 MPI™ Bulkhead union connector – page 133

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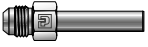

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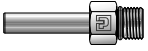
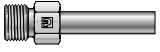


T7HOA MPI™ tube stub to male SAE O-ring – page 136



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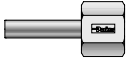

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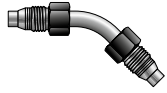

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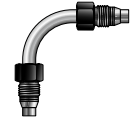

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CBMP7 MPI™ to male NPT elbow – page 139

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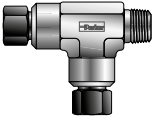

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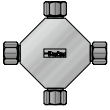

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FNMP7 MPI™ plug – page 141

FNM7 MPI™ plug – page 142

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PNBMP7 MPI™ cap – page 142

MPFF MPI™ front ferrule – page 142

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A-LOK® and CPI™ connector selection

Tube to male pipe

FBZ, MSCN - NPT male connector

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/16	1MSC1N	1-1 FBZ
1/16	1/8	1MSC2N	1-2 FBZ
1/16	1/4	1MSC4N	1-4 FBZ
1/8	1/16	2MSC1N	2-1 FBZ
1/8	1/8	2MSC2N	2-2 FBZ
1/8	1/4	2MSC4N	2-4 FBZ
1/8	3/8	2MSC6N	2-6 FBZ
1/8	1/2	2MSC8N	2-8 FBZ
3/16	1/16	3MSC1N	3-1 FBZ
3/16	1/8	3MSC2N	3-2 FBZ
3/16	1/4	3MSC4N	3-4 FBZ
1/4	1/16	4MSC1N	4-1 FBZ
1/4	1/8	4MSC2N	4-2 FBZ
1/4	1/4	4MSC4N	4-4 FBZ
1/4	3/8	4MSC6N	4-6 FBZ
1/4	1/2	4MSC8N	4-8 FBZ
1/4	3/4	4MSC12N	4-12 FBZ
5/16	1/8	5MSC2N	5-2 FBZ
5/16	1/4	5MSC4N	5-4 FBZ
5/16	3/8	5MSC6N	5-6 FBZ
5/16	1/2	5MSC8N	5-8 FBZ
3/8	1/8	6MSC2N	6-2 FBZ
3/8	1/4	6MSC4N	6-4 FBZ
3/8	3/8	6MSC6N	6-6 FBZ
3/8	1/2	6MSC8N	6-8 FBZ
3/8	3/4	6MSC12N	6-12 FBZ
1/2	1/8	8MSC2N	8-2 FBZ
1/2	1/4	8MSC4N	8-4 FBZ
1/2	3/8	8MSC6N	8-6 FBZ
1/2	1/2	8MSC8N	8-8 FBZ
1/2	3/4	8MSC12N	8-12 FBZ
1/2	1	8MSC16N	8-16 FBZ
5/8	3/8	10MSC6N	10-6 FBZ
5/8	1/2	10MSC8N	10-8 FBZ
5/8	3/4	10MSC12N	10-12 FBZ
3/4	1/2	12MSC8N	12-8 FBZ
3/4	3/4	12MSC12N	12-12 FBZ
3/4	1	12MSC16N	12-16 FBZ
7/8	3/4	14MSC12N	14-12 FBZ
7/8	1	14MSC16N	14-16 FBZ
1	1/2	16MSC8N	16-8 FBZ
1	3/4	16MSC12N	16-12 FBZ
1	1	16MSC16N	16-16 FBZ
1-1/4	1-1/4	20MSC20N	20-20 FBZ
1-1/2	1-1/2	24MSC24N	24-24 FBZ
2	2	32MSC32N	32-32 FBZ

Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
2	1/8	M2MSC1/8N	FBZ 2-1/8
3	1/8	M3MSC1/8N	FBZ 3-1/8
3	1/4	M3MSC1/4N	FBZ 3-1/4
4	1/8	M4MSC1/8N	FBZ 4-1/8
4	1/4	M4MSC1/4N	FBZ 4-1/4
6	1/8	M6MSC1/8N	FBZ 6-1/8
6	1/4	M6MSC1/4N	FBZ 6-1/4

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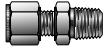
6	3/8	M6MSC3/8N	FBZ 6-3/8
6	1/2	M6MSC1/2N	FBZ 6-1/2
8	1/8	M8MSC1/8N	FBZ 8-1/8
8	1/4	M8MSC1/4N	FBZ 8-1/4
8	3/8	M8MSC3/8N	FBZ 8-3/8
8	1/2	M8MSC1/2N	FBZ 8-1/2
10	1/8	M10MSC1/8N	FBZ 10-1/8
10	1/4	M10MSC1/4N	FBZ 10-1/4
10	3/8	M10MSC3/8N	FBZ 10-3/8
10	1/2	M10MSC1/2N	FBZ 10-1/2
10	3/4	M10MSC3/4N	FBZ 10-3/4
10	1	M10MSC1N	FBZ 10-1
12	1/4	M12MSC1/4N	FBZ 12-1/4
12	3/8	M12MSC3/8N	FBZ 12-3/8
12	1/2	M12MSC1/2N	FBZ 12-1/2
12	3/4	M12MSC3/4N	FBZ 12-3/4
14	1/4	M14MSC1/4N	FBZ 14-1/4
14	3/8	M14MSC3/8N	FBZ 14-3/8
14	1/2	M14MSC1/2N	FBZ 14-1/2
15	1/2	M15MSC1/2N	FBZ 15-1/2
16	3/8	M16MSC3/8N	FBZ 16-3/8
16	1/2	M16MSC1/2N	FBZ 16-1/2
16	3/4	M16MSC3/4N	FBZ 16-3/4
18	1/2	M18MSC1/2N	FBZ 18-1/2
18	3/4	M18MSC3/4N	FBZ 18-3/4
20	1/2	M20MSC1/2N	FBZ 20-1/2
20	3/4	M20MSC3/4N	FBZ 20-3/4
20	1	M20MSC1N	FBZ 20-1
22	3/4	M22MSC3/4N	FBZ 22-3/4
25	1/2	M25MSC1/2N	FBZ 24-1/2
25	3/4	M25MSC3/4N	FBZ 25-3/4
25	1	M25MSC1N	FBZ 25-1



FBZ, MSCK - BSP taper male connector

Imperial tubing

Tube O.D. inch	BSPT thread	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2MSC2K	2-2K FBZ
1/8	1/4	2MSC4K	2-4K FBZ
1/4	1/8	4MSC2K	4-2K FBZ
1/4	1/4	4MSC4K	4-4K FBZ
1/4	3/8	4MSC6K	4-6K FBZ
1/4	1/2	4MSC8K	4-8K FBZ
5/16	1/8	5MSC2K	5-2K FBZ
5/16	1/4	5MSC4K	5-4K FBZ
3/8	1/8	6MSC2K	6-2K FBZ
3/8	1/4	6MSC4K	6-4K FBZ
3/8	3/8	6MSC6K	6-6K FBZ
3/8	1/2	6MSC8K	6-8K FBZ
1/2	1/4	8MSC4K	8-4K FBZ
1/2	3/8	8MSC6K	8-6K FBZ
1/2	1/2	8MSC8K	8-8K FBZ

Metric tubing

Tube O.D. mm	BSPT thread	A-LOK® Part no.	CPI™ Part no.
2	1/8	M2MSC1/8K	FBZ 2-1/8K
3	1/8	M3MSC1/8K	FBZ 3-1/8K
3	1/4	M3MSC1/4K	FBZ 3-1/4K
4	1/8	M4MSC1/8K	FBZ 4-1/8K
4	1/4	M4MSC1/4K	FBZ 4-1/4K
6	1/8	M6MSC1/8K	FBZ 6-1/8K
6	1/4	M6MSC1/4K	FBZ 6-1/4K
6	3/8	M6MSC3/8K	FBZ 6-3/8K
6	1/2	M6MSC1/2K	FBZ 6-1/2K
8	1/8	M6MSC1/8K	FBZ 8-1/8K

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8	1/4	M8MSC1/4K	FBZ 8-1/4K
8	3/8	M8MSC3/8K	FBZ 8-3/8K
8	1/2	M8MSC1/2K	FBZ 8-1/2K
10	1/8	M10MSC1/8K	FBZ 10-1/8K
10	1/4	M10MSC1/4K	FBZ 10-1/4K
10	3/8	M10MSC3/8K	FBZ 10-3/8K
10	1/2	M10MSC1/2K	FBZ 10-1/2K
12	1/4	M12MSC1/4K	FBZ 12-1/4K
12	3/8	M12MSC3/8K	FBZ 12-3/8K
12	1/2	M12MSC1/2K	FBZ 12-1/2K
12	3/4	M12MSC3/4K	FBZ 12-3/4K
15	1/2	M15MSC1/2K	FBZ 15-1/2K
16	3/8	M16MSC3/8K	FBZ 16-3/8K
16	1/2	M16MSC1/2K	FBZ 16-1/2K
16	3/4	M16MSC3/4K	FBZ 16-3/4K
18	1/2	M18MSC1/2K	FBZ 18-1/2K
18	3/4	M18MSC3/4K	FBZ 18-3/4K
20	1/2	M20MSC1/2K	FBZ 20-1/2K
20	3/4	M20MSC3/4K	FBZ 20-3/4K
22	3/4	M20MSC3/4K	FBZ 22-3/4K
25	3/4	M25MSC3/4K	FBZ 25-3/4K
25	1	M25MSC1K	FBZ 25-1K

FBZ, MSCR - BSPP male connector

Imperial tubing

Tube O.D. inch	BSPP thread	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2MSC2R	2-2R FBZ
1/8	1/4	2MSC4R	2-4R FBZ
1/8	3/8	2MSC6R	2-6R FBZ
1/4	1/8	4MSC2R	4-2R FBZ
1/4	1/4	4MSC4R	4-4R FBZ
1/4	3/8	4MSC6R	4-6R FBZ
1/4	1/2	4MSC8R	4-8R FBZ
3/8	1/8	6MSC2R	6-2R FBZ
3/8	1/4	6MSC4R	6-4R FBZ
3/8	3/8	6MSC6R	6-6R FBZ
3/8	1/2	6MSC8R	6-8R FBZ
1/2	1/4	8MSC4R	8-4R FBZ
1/2	3/8	8MSC6R	8-6R FBZ
1/2	1/2	8MSC8R	8-8R FBZ
3/4	1/2	12MSC8R	12-8R FBZ
3/4	3/4	12MSC12R	12-12R FBZ
1	1/2	16MSC8R	16-8R FBZ
1	1	16MSC16R	16-16R FBZ

Metric tubing

Tube O.D. mm	BSPP thread	A-LOK® Part no.	CPI™ Part no.
2	1/8	M2MSC1/8R	FBZ 2-1/8R
3	1/8	M3MSC1/8R	FBZ 3-1/8R
3	1/4	M3MSC1/4R	FBZ 3-1/4R
6	1/8	M6MSC1/8R	FBZ 6-1/8R
6	1/4	M6MSC1/4R	FBZ 6-1/4R
6	3/8	M6MSC3/8R	FBZ 6-3/8R
6	1/2	M6MSC1/2R	FBZ 6-1/2R
8	1/8	M8MSC1/8R	FBZ 8-1/8R
8	1/4	M8MSC1/4R	FBZ 8-1/4R
8	3/8	M8MSC3/8R	FBZ 8-3/8R
8	1/2	M8MSC1/2R	FBZ 8-1/2R
10	1/4	M10MSC1/4R	FBZ 10-1/4R
10	3/8	M10MSC3/8R	FBZ 10-3/8R
10	1/2	M10MSC1/2R	FBZ 10-1/2R

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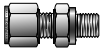
12	1/4	M12MSC1/4R	FBZ 12-1/4R
12	3/8	M12MSC3/8R	FBZ 12-3/8R
12	1/2	M12MSC1/2R	FBZ 12-1/2R
12	3/4	M12MSC3/4R	FBZ 12-3/4R
16	3/8	M16MSC3/8R	FBZ 16-3/8R
16	1/2	M16MSC1/2R	FBZ 16-1/2R
18	1/2	M18MSC1/2R	FBZ 18-1/2R
18	3/4	M18MSC3/4R	FBZ 18-3/4R
20	1/2	M20MSC1/2R	FBZ 20-1/2R
20	3/4	M20MSC3/4R	FBZ 20-3/4R
22	3/4	M22MSC3/4R	FBZ 22-3/4R
25	3/4	M25MSC3/4R	FBZ 25-3/4R
25	1	M25MSC1R	FBZ 25-1R



FBZ, MSCR - BSPP male connector with ED seal

Imperial tubing

Tube O.D. inch	BSPP thread	A-LOK® Part no.	CPI™ Part no.
1/4	1/4	4MSC4R-ED	4-4R-ED FBZ
1/4	1/2	4MSC8R-ED	4-8R-ED FBZ
3/8	3/8	6MSC6R-ED	6-6R-ED FBZ
1/2	1/4	8MSC4R-ED	8-4R-ED FBZ
1/2	3/8	8MSC6R-ED	8-6R-ED FBZ
1/2	1/2	8MSC8R-ED	8-8R-ED FBZ
3/4	3/4	12MSC12R-ED	12-12R-ED FBZ

Metric tubing

Tube O.D. mm	BSPP thread	A-LOK® Part no.	CPI™ Part no.
6	1/8	M6MSC1/8R-ED	FBZ6-1/8R-ED
6	1/4	M6MSC1/4R-ED	FBZ6-1/4R-ED
6	3/8	M6MSC3/8R-ED	FBZ6-3/8R-ED
6	1/2	M6MSC1/2R-ED	FBZ6-1/2R-ED
10	1/4	M10MSC1/4R-ED	FBZ10-1/4R-ED
10	3/8	M10MSC3/8R-ED	FBZ10-3/8R-ED
10	1/2	M10MSC1/2R-ED	FBZ10-1/2R-ED
12	1/4	M12MSC1/4R-ED	FBZ12-1/4R-ED
12	3/8	M12MSC3/8R-ED	FBZ12-3/8R-ED
12	1/2	M12MSC1/2R-ED	FBZ12-1/2R-ED

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FH2BZ, MBCN - NPT male bulkhead connector

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/16	1MBC1N	1-1 FH2BZ
1/16	1/8	1MBC2N	1-2 FH2BZ
1/8	1/8	2MBC2N	2-2 FH2BZ
3/16	1/8	3MBC2N	3-2 FH2BZ
1/4	1/8	4MBC2N	4-2 FH2BZ
1/4	1/4	4MBC4N	4-4 FH2BZ
1/4	3/8	4MBC6N	4-6 FH2BZ
1/4	1/2	4MBC8N	4-8 FH2BZ
5/16	1/8	5MBC2N	5-2 FH2BZ
5/16	1/4	5MBC4N	5-4 FH2BZ
3/8	1/8	6MBC2N	6-2 FH2BZ
3/8	1/4	6MBC4N	6-4 FH2BZ
3/8	3/8	6MBC6N	6-6 FH2BZ
3/8	1/2	6MBC8N	6-8 FH2BZ
1/2	1/4	8MBC4N	8-4 FH2BZ
1/2	3/8	8MBC6N	8-6 FH2BZ
1/2	1/2	8MBC8N	8-8 FH2BZ
1/2	3/4	8MBC12N	8-12 FH2BZ
5/8	3/8	10MBC6N	10-6 FH2BZ
5/8	1/2	10MBC8N	10-8 FH2BZ
3/4	1/2	12MBC8N	12-8 FH2BZ
3/4	3/4	12MBC12N	12-12 FH2BZ
7/8	3/4	14MBC12N	14-12 FH2BZ
1	3/4	16MBC12N	16-12 FH2BZ
1	1	16MBC16N	16-16 FH2BZ

Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
6	1/8	M6MBC1/8N	FH2BZ 6-1/8
6	1/4	M6MBC1/4N	FH2BZ 6-1/4
8	1/8	M8MBC1/8N	FH2BZ 8-1/8
8	1/4	M8MBC1/4N	FH2BZ 8-1/4
10	1/4	M10MBC1/4N	FH2BZ 10-1/4
10	3/8	M10MBC3/8N	FH2BZ 10-3/8
10	1/2	M10MBC1/2N	FH2BZ 10-1/2
12	1/4	M12MBC1/4N	FH2BZ 12-1/4
12	3/8	M12MBC3/8N	FH2BZ 12-3/8
12	1/2	M12MBC1/2N	FH2BZ 12-1/2

FH4BZ, MTCN - Thermocouple connector

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/16	1MTC1N	1-1 FH4BZ
1/16	1/8	1MTC2N	1-2 FH4BZ
1/16	1/4	1MTC4N	1-4 FH4BZ
1/8	1/16	2MTC1N	2-1 FH4BZ
1/8	1/8	2MTC2N	2-2 FH4BZ
1/8	1/4	2MTC4N	2-4 FH4BZ
3/16	1/8	3MTC2N	3-2 FH4BZ
3/16	1/4	3MTC4N	3-4 FH4BZ

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1/4	1/8	4MTC2N	4-2 FH4BZ
1/4	1/4	4MTC4N	4-4 FH4BZ
1/4	3/8	4MTC6N	4-6 FH4BZ
1/4	1/2	4MTC8N	4-8 FH4BZ
5/16	1/4	5MTC4N	5-4 FH4BZ
3/8	1/4	6MTC4N	6-4 FH4BZ
3/8	3/8	6MTC6N	6-6 FH4BZ
3/8	1/2	6MTC8N	6-8 FH4BZ
3/8	3/4	6MTC12N	6-12 FH4BZ
1/2	1/2	8MTC8N	6-8 FH4BZ
1/2	3/4	8MTC12N	8-12 FH4BZ
5/8	3/4	10MTC12N	10-12 FH4BZ
3/4	3/4	12MTC12N	12-12 FH4BZ
1	1	6MTC16N	16-16 FH4BZ

CBZ, MSELN - NPT male elbow

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/16	1MSEL1N	1-1 CBZ
1/16	1/8	1MSEL2N	1-2 CBZ
1/8	1/16	2MSEL1N	2-1 CBZ
1/8	1/8	2MSEL2N	2-2 CBZ
1/8	1/4	2MSEL4N	2-4 CBZ
3/16	1/8	3MSEL2N	3-2 CBZ
3/16	1/4	3MSEL4N	3-4 CBZ
1/4	1/16	4MSEL1N	4-1 CNZ
1/4	1/8	4MSEL2N	4-2 CBZ
1/4	1/4	4MSEL4N	4-4 CNZ
1/4	3/8	4MSEL6N	4-6 CBZ
1/4	1/2	4MSEL8N	4-8 CBZ
5/16	1/8	5MSEL2N	5-2 CBZ
5/16	1/4	5MSEL4N	5-4 CBZ
3/8	1/8	6MSEL2N	6-2 CBZ
3/8	1/4	6MSEL4N	6-4 CBZ
3/8	3/8	6MSEL6N	6-6 CBZ
3/8	1/2	6MSEL8N	6-8 CBZ
3/8	3/4	6MSEL12N	6-12 CBZ
1/2	1/4	8MSEL4N	8-4 CBZ
1/2	3/8	8MSEL6N	8-6 CBZ
1/2	1/2	8MSEL8N	8-8 CBZ
1/2	3/4	8MSEL12N	8-12 CBZ
5/8	3/8	10MSEL6N	10-6 CBZ
5/8	1/2	10MSEL8N	10-8 CBZ
5/8	3/4	10MSEL12N	10-12 CBZ
3/4	1/2	12MSEL8N	12-8 CBZ
3/4	3/4	12MSEL12N	12-12 CBZ
7/8	3/4	14MSEL12N	14-12 CBZ
1	3/4	16MSEL12N	16-12 CBZ
1	1	16MSEL16N	16-16 CBZ
1-1/4	1-1/4	20MSEL20N	20-20 CBZ
1-1/2	1-1/2	24MSEL24N	24-24 CBZ
2	2	32MSEL32N	32-32 CBZ

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Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
3	1/8	M3MSEL1/8N	CBZ 3-1/8
3	1/4	M3MSEL1/4N	CBZ 3-1/4
4	1/8	M4MSEL1/8N	CBZ 4-1/8
4	1/4	M4MSEL1/4N	CBZ 4-1/4
6	1/8	M6MSEL1/8N	CBZ 6-1/8
6	1/4	M6MSEL1/4N	CBZ 6-1/4
6	3/8	M6MSEL3/8N	CBZ 6-3/8
6	1/2	M6MSEL1/2N	CBZ 6-1/2
8	1/8	M8MSEL1/8N	CBZ 8-1/8
8	1/4	M8MSEL1/4N	CBZ 8-1/4
8	3/8	M8MSEL3/8N	CBZ 8-3/8
8	1/2	M8MSEL1/2N	CBZ 8-1/2
10	1/8	M10MSEL1/8N	CBZ 10-1/8
10	1/4	M10MSEL1/4N	CBZ 10-1/4
10	3/8	M10MSEL3/8N	CBZ 10-3/8
10	1/2	M10MSEL1/2N	CBZ 10-1/2
12	1/4	M12MSEL1/4N	CBZ 12-1/4
12	3/8	M12MSEL3/8N	CBZ 12-3/8
12	1/2	M12MSEL1/2N	CBZ 12-1/2
12	3/4	M12MSEL3/4N	CBZ 12-3/4
15	1/2	M15MSEL1/2N	CBZ 15-1/2
16	3/8	M16MSEL3/8N	CBZ 16-3/8
16	1/2	M16MSEL1/2N	CBZ 16-1/2
16	3/4	M16MSEL3/4N	CBZ 16-3/4
18	1/2	M18MSEL1/2N	CBZ 18-1/2
18	3/4	M18MSEL3/4N	CBZ 18-3/4
20	1/2	M20MSEL1/2N	CBZ 20-1/2
20	3/4	M20MSEL3/4N	CBZ 20-3/4
22	3/4	M22MSEL3/4N	CBZ 22-3/4
25	3/4	M25MSEL3/4N	CBZ 25-3/4
25	1	M25MSEL1N	CBZ 25-1

CBZ, MSELK - BSP taper male elbow

Imperial tubing

Tube O.D. inch	BSPT thread	A-LOK® Part no.	CPI™ Part no.
1/4	1/8	4MSEL2K	4-2K CBZ
1/4	1/4	4MSEL4K	4-4K CBZ
1/4	3/8	4MSEL6K	4-6K CBZ
1/4	1/2	4MSEL8K	4-8K CBZ
5/16	1/4	5MSEL4K	5-4K CBZ
3/8	1/4	6MSEL4K	6-4K CBZ
3/8	3/8	6MSEL6K	6-6K CBZ
1/2	3/8	8MSEL6K	8-6K CBZ
1/2	1/2	8MSEL8K	8-8K CBZ

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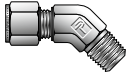
Metric tubing

Tube O.D. mm	BSPT thread	A-LOK® Part no.	CPI™ Part no.
3	1/8	M3MSEL1/8K	CBZ 3-1/8
3	1/4	M3MSEL1/4K	CBZ 3-1/4
4	1/8	M4MSEL1/8K	CBZ 4-1/8
4	1/4	M4MSEL1/4K	CBZ 4-1/4
6	1/8	M6MSEL1/8K	CBZ 6-1/8
6	1/4	M6MSEL1/4K	CBZ 6-1/4
6	3/8	M6MSEL3/8K	CBZ 6-3/8
6	1/2	M6MSEL1/2K	CBZ 6-1/2
8	1/8	M8MSEL1/8K	CBZ 8-1/8
8	1/4	M8MSEL1/4K	CBZ 8-1/4
8	3/8	M8MSEL3/8K	CBZ 8-3/8
8	1/2	M8MSEL1/2K	CBZ 8-1/2
10	1/8	M10MSEL1/8K	CBZ 10-1/8
10	1/4	M10MSEL1/4K	CBZ 10-1/4
10	3/8	M10MSEL3/8K	CBZ 10-3/8
10	1/2	M10MSEL1/2K	CBZ 10-1/2
12	1/4	M12MSEL1/4K	CBZ 12-1/4
12	3/8	M12MSEL3/8K	CBZ 12-3/8
12	1/2	M12MSEL1/2K	CBZ 12-1/2
12	3/4	M12MSEL3/4K	CBZ 12-3/4
16	3/8	M16MSEL3/8K	CBZ 16-3/8
16	1/2	M16MSEL1/2K	CBZ 16-1/2
18	1/2	M18MSEL1/2K	CBZ 18-1/2
18	3/4	M18MSEL3/4K	CBZ 18-3/4
20	3/4	M20MSEL3/4K	CBZ 20-3/4
25	3/4	M25MSEL3/4K	CBZ 25-3/4
25	1	M25MSEL1K	CBZ 25-1



VBZ, MVELN - NPT male 45° elbow

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/16	1MVEL1N	1-1 VBZ
1/8	1/8	2MVEL2N	2-2 VBZ
3/16	1/8	3MVEL2N	3-2 VBZ
1/4	1/8	4MVEL2N	4-2 VBZ
1/4	1/4	4MVEL4N	4-4 VBZ
5/16	1/8	5MVEL2N	5-2 VBZ
3/8	1/8	6MVEL2N	6-2 VBZ
3/8	1/4	6MVEL4N	6-4 VNZ
3/8	3/8	6MVEL6N	6-6 VBZ
1/2	3/8	8MVEL6N	8-6 VBZ
5/8	1/2	10MVEL8N	10-8 VBZ
3/4	3/4	12MVEL12N	12-12 VBZ
7/8	3/4	14MVEL12N	14-12 VBZ
1	1	16MVEL16N	16-16 VBZ

Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
6	1/8	M6MVEL1/8N	VBZ 6-1/8
6	1/4	M6MVEL1/4N	VBZ 6-1/4
8	1/8	M8MVEL1/8N	VBZ 8-1/8
10	1/4	M10MVEL1/4N	VBZ 10-1/4
12	3/8	M12MVEL3/8N	VBZ 12-3/8
12	1/2	M12MVEL1/2N	VBZ 12-1/2
16	1/2	M16MVEL1/2N	VBZ 16-1/2

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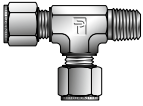

RBZ, MRTN - NPT male run tee

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2MRT2N	2-2-2 RBZ
1/8	1/4	2MRT4N	2-4-2 RBZ
3/16	1/8	3MRT2N	3-2-3 RBZ
1/4	1/8	4MRT2N	4-2-4 RBZ
1/4	1/4	4MRT4N	4-4-4 RBZ
5/16	1/8	5MRT2N	5-2-5 RBZ
5/16	1/4	5MRT4N	5-4-5 RBZ
3/8	1/4	6MRT4N	6-4-6 RBZ
3/8	3/8	6MRT6N	6-6-6 RBZ
1/2	3/8	8MRT6N	8-6-8 RBZ
1/2	1/2	8MRT8N	8-8-8 RBZ
5/8	1/2	10MRT8N	10-8-10 RBZ
3/4	3/4	12MRT12N	12-12-12 RBZ
7/8	3/4	14MRT12N	14-12-14 RBZ
1	3/4	16MRT12N	16-12-16 RBZ
1	1	16MRT16N	16-16-16 RBZ

Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
6	1/8	M6MRT1/8N	RBZ 6-1/8-6
6	1/4	M6MRT1/4N	RBZ 6-1/4-6
8	1/8	M8MRT1/8N	RBZ 8-1/8-8
8	1/4	M8MRT1/4N	RBZ 8-1/4-8
10	1/4	M10MRT1/4N	RBZ 10-1/4-10
10	1/2	M10MRT1/2N	RBZ 10-1/2-10
12	1/4	M12MRT1/4N	RBZ 12-1/4-12
12	3/8	M12MRT3/8N	RBZ 12-3/8-12
12	1/2	M12MRT1/2N	RBZ 12-1/2-12
16	1	M16MRT1N	RBZ 16-1-16

SBZ, MBTN - NPT male branch tee

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2MBT2N	2-2-2 SBZ
1/8	1/4	2MBT4N	2-2-4 SBZ
3/16	1/8	3MBT2N	3-3-2 SBZ
1/4	1/8	4MBT2N	4-4-2 SBZ
1/4	1/4	4MBT4N	4-4-4 SBZ
5/16	1/8	5MBT2N	5-5-2 SBZ
5/16	1/4	5MBT4N	5-5-4 SBZ
3/8	1/4	6MBT4N	6-6-4 SBZ
3/8	3/8	6MBT6N	6-6-6 SBZ
1/2	3/8	8MBT6N	8-8-6 SBZ

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1/2	1/2	8MBT8N	8-8-8 SBZ
5/8	1/2	10MBT8N	10-10-8 SBZ
3/4	3/4	12MBT12N	12-12-12 SBZ
7/8	3/4	14MBT12N	14-14-12 SBZ
1	3/4	16MBT12N	16-16-12 SBZ
1	1	16MBT16N	16-16-16 SBZ

Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
6	1/8	M6MBT1/8N	SBZ 6-6-1/8
6	1/4	M6MBT1/4N	SBZ 6-6-1/4
8	1/8	M8MBT1/8N	SBZ 8-8-1/8
8	1/4	M8MBT1/4N	SBZ 8-8-1/4
10	1/4	M10MBT1/4N	SBZ 10-10-1/4
10	3/8	M10MBT3/8N	SBZ 10-10-3/8
12	1/4	M12MBT1/4N	SBZ 12-12-1/4
12	3/8	M12MBT3/8N	SBZ 12-12-3/8
12	1/2	M12MBT1/2N	SBZ 12-12-1/2
16	1/2	M16MBT1/2N	SBZ 16-16-1/2

Tube to female pipe

GBZ, FSCN - NPT female connector

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/16	1FSC1N	1-1 GBZ
1/16	1/8	1FSC2N	1-2 GBZ
1/8	1/8	2FSC2N	2-2 GBZ
1/8	1/4	2FSC4N	2-4 GBZ
3/16	1/8	3FSC2N	3-2 GBZ
3/16	1/4	3FSC4N	3-4 GBZ
1/4	1/8	4FSC2N	4-2 GBZ
1/4	1/4	4FSC4N	4-4 GBZ
1/4	3/8	4FSC6N	4-6 GBZ
1/4	1/2	4FSC8N	4-8 GBZ
5/16	1/8	5FSC2N	5-2 GBZ
5/16	1/4	5FSC4N	5-4 GBZ
5/16	3/8	5FSC6N	5-6 GBZ
3/8	1/8	6FSC2N	6-2 GBZ
3/8	1/4	6FSC4N	6-4 GBZ
3/8	3/8	6FSC6N	6-6 GBZ
3/8	1/2	6FSC8N	6-8 GBZ
3/8	3/4	6FSC12N	6-12 GBZ
1/2	1/4	8FSC4N	8-4 GBZ
1/2	3/8	8FSC6N	8-6 GBZ
1/2	1/2	8FSC8N	8-8 GBZ
1/2	3/4	8FSC12N	8-12 GBZ
5/8	3/8	10FSC6N	10-6 GBZ
5/8	1/2	10FSC8N	10-8 GBZ
5/8	3/4	10FSC12N	10-12 GBZ
3/4	1/2	12FSC8N	12-8 GBZ
3/4	3/4	12FSC12N	12-12 GBZ
7/8	3/4	14FSC12N	14-12 GBZ
1	3/4	16FSC12N	16-12 GBZ
1	1	16FSC16N	16-16 GBZ
1-1/4	1-1/4	20FSC20N	20-20 GBZ
1-1/2	1-1/2	24FSC24N	24-24 GBZ
2	2	32FSC32N	32-32 GBZ

Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
3	1/8	M3FSC1/8N	GBZ 3-1/8
3	1/4	M3FSC1/4N	GBZ 3-1/4
4	1/8	M4FSC1/8N	GBZ 4-1/8
6	1/8	M6FSC1/8N	GBZ 6-1/8
6	1/4	M6FSC1/4N	GBZ 6-1/4
6	3/8	M6FSC3/8N	GBZ 6-3/8
6	1/2	M6FSC1/2N	GBZ 6-1/2
8	1/8	M8FSC1/8N	GBZ 8-1/8
8	1/4	M8FSC1/4N	GBZ 8-1/4
8	3/8	M8FSC3/8N	GBZ 8-3/8
10	1/4	M10FSC1/4N	GBZ 10-1/4
10	3/8	M10FSC3/8N	GBZ 10-3/8
10	1/2	M10FSC1/2N	GBZ 10-1/2
12	1/4	M12FSC1/4N	GBZ 12-1/4
12	3/8	M12FSC3/8N	GBZ 12-3/8
12	1/2	M12FSC1/2N	GBZ 12-1/2
16	3/8	M16FSC3/8N	GBZ 16-3/8
16	1/2	M16FSC1/2N	GBZ 16-1/2
20	1/2	M20FSC1/2N	GBZ 20-1/2
20	3/4	M20FSC3/4N	GBZ 20-3/4
22	3/4	M22FSC3/4N	GBZ 22-3/4
25	3/4	M25FSC3/4N	GBC 25-3/4
25	1	M25FSC1N	GBC 25-1

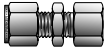
GBZ, FSCK - BSP taper female connector

Imperial tubing

Tube O.D. inch	BSPT thread	A-LOK® Part no.	CPI™ Part no.
1/4	1/8	4FSC2K	4-2K GBZ
1/4	1/4	4FSC4K	4-4K GBZ
1/4	3/8	4FSC6K	4-6K GBZ
1/4	1/2	4FSC8K	4-8K GBZ
3/8	1/4	6FSC4K	6-4KGBZ
3/8	3/8	6FSC6K	6-6K GBZ
3/8	1/2	6FSC8K	6-8K GBZ
1/2	1/4	8FSC4K	8-4K GBZ
1/2	3/8	8FSC6K	8-6K GBZ
1/2	1/2	8FSC8K	8-8K GBZ

Metric tubing

Tube O.D. mm	BSPT thread	A-LOK® Part no.	CPI™ Part no.
3	1/8	M3FSC1/8K	GBZ 3-1/8K
6	1/8	M6FSC1/8K	GBZ 6-1/8K
6	1/4	M6FSC1/4K	GBZ 6-1/4K
6	3/8	M6FSC3/8K	GBZ 6-3/8K
6	1/2	M6FSC1/2K	GBZ 6-1/2K
8	1/8	M8FSC1/8K	GBZ 8-1/8K
8	1/4	M8FSC1/4K	GBZ 8-1/4K
8	3/8	M8FSC3/8K	GBZ 8-3/8K
8	1/2	M8FSC1/2K	GBZ 8-1/2K
10	1/8	M8FSC1/8K	GBZ 10-1/8K
10	1/4	M10FSC1/4K	GBZ 10-1/4K
10	3/8	M10FSC3/8K	GBZ 10-3/8K
10	1/2	M10FSC1/2K	GBZ 10-1/2K
12	1/4	M12FSC1/4K	GBZ 12-1/4K
12	3/8	M12FSC3/8K	GBZ 12-3/8K
12	1/2	M12FSC1/2K	GBZ 12-1/2K
16	1/2	M16FSC1/2K	GBZ 16-1/2K
20	1/2	M20FSC1/2K	GBZ 20-1/2K
20	3/4	M20FSC3/4K	GBZ 20-3/4K
22	1	M22FSC1K	GBZ 22-1K
25		M25FSC3/4K	GBZ 25-3/4K
25		M25FSC1K	GBZ 25-1K



GH2BZ, FBCN - NPT female bulkhead connector

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2FBC2N	2-2 GH2BZ
3/16	1/8	3FBC2N	3-2 GH2BZ
1/4	1/8	4FBC2N	4-2 GH2BZ
1/4	1/4	4FBC4N	4-4 GH2BZ
5/16	1/8	5FBC2N	5-2 GH2BZ
5/16	1/2	5FBC8N	5-8 GH2BZ
3/8	1/4	6FBC4N	6-4 GH2BZ
1/2	3/8	8FBC6N	8-6 GH2BZ
1/2	1/2	8FBC8N	8-8 GH2BZ
5/8	1/2	10FBC8N	10-8 GH2BZ
3/4	3/4	12FBC12N	12-12 GH2BZ
7/8	3/4	14FBC12N	14-12 GH2BZ
1	1	16FBC16N	16-16 GH2BZ

Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
6	1/8	M6FBC1/8N	GH2BZ 6-1/8
6	1/4	M6FBC1/4N	GH2BZ 6-1/4
8	1/8	M8FBC1/8N	GH2BZ 8-1/8
10	1/4	M10FBC1/4N	GH2BZ 10-1/4
12	3/8	M12FBC3/8N	GH2BZ 12-3/8
12	1/2	M12FBC1/2N	GH2BZ 12-1/2

GBZ, FSC GC - BSPP gauge connector

Imperial tubing

Tube O.D. inch	BSPP thread	A-LOK® Part no.	CPI™ Part no.
1/4	1/4	4FSC4GC	4-4GC GBZ
1/4	3/8	4FSC6GC	4-6GC GBZ
1/4	1/2	4FSC8GC	4-8GC GBZ
5/16	1/4	5FSC4GC	5-4GC GBZ
5/16	1/2	5FSC8GC	5-8GC GBZ
3/8	1/4	6FSC4GC	6-4GC GBZ
3/8	3/8	6FSC6GC	6-6GC GBZ
3/8	1/2	6FSC8GC	6-8GC GBZ
1/2	1/4	8FSC4GC	8-4GC GBZ
1/2	3/8	8FSC6GC	8-6GC GBZ
1/2	1/2	8FSC8GC	8-8GC GBZ

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Metric tubing

Tube O.D. mm	BSPP thread	A-LOK® Part no.	CPI™ Part no.
3	1/4	M3GC1/4R	GBZ 3-1/4GC
6	1/4	M6GC1/4R	GBZ 6-1/4GC
6	3/8	M6GC3/8R	GBZ 6-3/8GC
6	1/2	M6GC1/2R	GBZ 6-1/2GC
8	1/4	M8GC1/4R	GBZ 8-1/4GC
8	3/8	M8GC3/8R	GBZ 8-3/8GC
8	1/2	M8GC1/2R	GBZ 8-1/2GC
10	1/4	M10GC1/4R	GBZ 10-1/4GC
10	3/8	M10GC3/8R	GBZ 10-3/8GC
10	1/2	M10GC1/2R	GBZ 10-1/2GC
12	1/4	M12GC1/4R	GBC 12-1/4GC
12	3/8	M12GC3/8R	GBC 12-3/8GC
12	1/2	M12GC1/2R	GBC 12-1/2GC

DBZ, FELN - NPT female elbow

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/16	1FEL1N	1-1 DBZ
1/16	1/16	1FEL2N	1-2 DBZ
1/8	1/8	2FEL2N	2-2 DBZ
1/8	1/4	2FEL4N	2-4 DBZ
3/16	1/8	3FEL2N	3-2 DBZ
1/4	1/8	4FEL2N	4-2 DBZ
1/4	1/4	4FEL4N	4-4 DBZ
1/4	3/8	4FEL6N	4-6 DBZ
1/4	1/2	4FEL8N	4-8 DBZ
5/16	1/8	5FEL2N	5-2 DBZ
5/16	1/4	5FEL4N	5-4 DBZ
3/8	1/8	6FEL2N	6-2 DBZ
3/8	1/4	6FEL4N	6-4 DBZ
3/8	3/8	6FEL6N	6-6 DBZ
3/8	1/2	6FEL8N	6-8 DBZ
1/2	1/4	8FEL4N	8-4 DBZ
1/2	3/8	8FEL6N	8-6 DBZ
1/2	1/2	8FEL8N	8-8 DBZ
5/8	3/8	10FEL6N	10-6 DBZ
5/8	1/2	10FEL8N	10-8 DBZ
3/4	1/2	12FEL8N	12-8 DBZ
3/4	3/4	12FEL12N	12-12 DBZ
7/8	3/4	14FEL12N	14-12 DBZ
1	3/4	16FEL12N	16-12 DBZ
1	1	16FEL16N	16-16 DBZ

Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
6	1/8	M6FEL1/8N	DBZ 6-1/8
6	1/4	M6FEL1/4N	DBZ 6-1/4
8	1/8	M8FEL1/8N	DBZ 8-1/8
8	1/4	M8FEL1/4N	DBZ 8-1/4
10	1/4	M10FEL1/4N	DBZ 10-1/4
10	3/8	M10FEL3/8N	DBZ 10-3/8
10	1/2	M10FEL1/2N	DBZ 10-1/2

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12	1/4	M12FEL1/4N	DBZ 12-1/4
12	3/8	M12FEL3/8N	DBZ 12-3/8
12	1/2	M12FEL1/2N	DBZ 12-1/2
16	3/8	M16FEL3/8N	DBZ 16-3/8
16	1/2	M16FEL1/2N	DBZ 16-1/2

MBZ, FRTN - NPT female run tee

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2FRT2N	2-2-2 MBZ
3/16	1/8	3FRT2N	3-2-3 MBZ
1/4	1/8	4FRT2N	4-2-4 MBZ
1/4	1/4	4FRT4N	4-4-4 MBZ
5/16	1/8	5FRT2N	5-2-5 MBZ
3/8	1/4	6FRT4N	6-4-6 MBZ
1/2	1/4	8FRT4N	8-4-8 MBZ
1/2	3/8	8FRT6N	8-6-8 MBZ
1/2	1/2	8FRT8N	8-8-8 MBZ
5/8	1/2	10FRT8N	10-8-10 MBZ
3/4	3/4	12FRT12N	12-12-12 MBZ
7/8	1/2	14FRT8N	14-8-14 MBZ
7/8	3/4	14FRT12N	14-12-14 MBZ
1	3/4	16FRT12N	16-12-16 MBZ
1	1	16FRT16N	16-16-16 MBZ

Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
6	1/8	M6FRT1/8N	MBZ 6-1/8-6
6	1/4	M6FRT1/4N	MBZ 6-1/4-6
8	1/8	M8FRT1/8N	MBZ 6-1/8-6
10	1/4	M10FRT1/4N	MBZ 10-1/4-10
12	1/4	M12FRT1/4N	MBZ 12-1/4-12
12	3/8	M12FRT3/8N	MBZ 12-3/8-12
12	1/2	M12FRT1/2N	MBZ 12-1/2-12
16	1/2	M16FRT1/2N	MBZ 16-1/2-16

OBZ, FBTN - NPT female branch tee

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2FBT2N	2-2-2 OBZ
3/16	1/8	3FBT2N	3-3-2 OBZ
1/4	1/8	4FBT2N	4-4-2 OBZ
1/4	1/4	4FBT4N	4-4-4 OBZ
5/16	1/8	5FBT2N	5-5-2 OBZ
3/8	1/4	6FBT4N	6-6-4 OBZ
1/2	1/4	8FBT4N	8-8-4 OBZ
1/2	3/8	8FBT6N	8-8-6 OBZ
1/2	1/2	8FBT8N	8-8-8 OBZ
5/8	1/2	10FBT8N	10-10-8 OBZ
3/4	3/4	12FBT12N	12-12-12 OBZ
7/8	3/4	14FBT12N	14-14-12 OBZ
1	3/4	16FBT12N	16-16-12 OBZ
1	1	16FBT16N	16-16-16 OBZ

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Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
6	1/8	M6FBT1/8N	OBZ 6-6-1/8
6	1/4	M6FBT1/4N	OBZ 6-6-1/4
8	1/8	M8FBT1/8N	OBZ 8-8-1/8
10	1/4	M10FBT1/4N	OBZ 10-10-1/4
12	1/8	M12FBT1/8N	OBZ 12-12-1/8
12	1/4	M12FBT1/4N	OBZ 12-12-1/4
12	3/8	M12FBT3/8N	OBZ 12-12-3/8
12	1/2	M12FBT1/2N	OBZ 12-12-1/2
16	1/2	M16FBT1/2N	OBZ 16-16-1/2

Tube to tube unions

HBZ, SC - Union

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/16	1SC1	1-1 HBZ
1/8	2SC2	2-2 HBZ
3/16	3SC3	3-3 HBZ
1/4	4SC4	4-4 HBZ
5/16	5SC5	5-5 HBZ
3/8	6SC6	6-6 HBZ
1/2	8SC8	8-8 HBZ
5/8	10SC10	10-10 HBZ
3/4	12SC12	12-12 HBZ
7/8	14SC14	14-14 HBZ
1	16SC16	16-16 HBZ
1-1/4	20SC20	20-20 HBZ
1-1/2	24SC24	24-24 HBZ
2	32SC32	32-32 HBZ

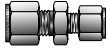
Metric tubing

Tube O.D. mm	A-LOK® Part number	CPI™ Part number
2	SCM2	HBZ 2-2
3	SCM3	HBZ 3-3
4	SCM4	HBZ 4-4
6	SCM6	HBZ 6-6
8	SCM8	HBZ 8-8
10	SCM10	HBZ 10-10
12	SCM12	HBZ 12-12
14	SCM14	HBZ 14-14
15	SCM15	HBZ 15-15
16	SCM16	HBZ 16-16
18	SCM18	HBZ 18-18
20	SCM20	HBZ 20-20
22	SCM22	HBZ 22-22
25	SCM25	HBZ 25-25

HBZ, CU - Conversion union

Metric tubing

Tube O.D. mm	Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
3	1/8	M3CU2	HBZ 3-1/8
4	1/8	M4CU2	HBZ 4-1/8
4	1/4	M4CU4	HBZ 4-1/4
6	1/8	M6CU2	HBZ 6-1/8
6	1/4	M6CU4	HBZ 6-1/4
6	5/16	M6CU5	HBZ 6-5/16
8	1/4	M8CU4	HBZ 8-1/4
8	6	M8CU6	HBZ 8-6
10	1/8	M10CU2	HBZ 10-1/8
10	1/4	M10CU4	HBZ 10-1/4
10	3/8	M10CU6	HBZ 10-3/8
12	3/8	M12CU6	HBZ 12-3/8
12	1/2	M12CU8	HBZ 12-1/2
15	1/2	M15CU8	HBZ 15-1/2
16	3/8	M16CU6	HBZ 16-3/8
18	3/4	M18CU12	HBZ 18-3/4



HBZ, RU - Reducing union

Imperial tubing

Tube O.D. inch	Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/8	1/16	2RU1	2-1 HBZ
3/16	1/16	3RU1	3-1 HBZ
3/16	1/8	3RU2	3-2 HBZ
1/4	1/16	4RU1	4-1 HBZ
1/4	1/8	4RU2	4-2 HBZ
1/4	3/16	4RU3	4-3 HBZ
5/16	1/8	5RU2	5-2 HBZ
5/16	1/4	5RU4	5-4 HBZ
3/8	1/16	6RU1	6-1 HBZ
3/8	1/8	6RU2	6-2 HBZ
3/8	1/4	6RU4	6-4 HBZ
3/8	5/16	6RU5	6-5 HBZ
1/2	1/8	8RU2	8-2 HBZ
1/2	1/4	8RU4	8-4 HBZ
1/2	3/8	8RU6	8-6 HBZ
5/8	3/8	10RU6	10-6 HBZ
5/8	1/2	10RU8	10-8 HBZ
3/4	1/4	12RU4	12-4 HBZ
3/4	3/8	12RU6	12-6 HBZ
3/4	1/2	12RU8	12-8 HBZ
3/4	5/8	12RU10	12-10 HBZ
1	1/2	16RU8	16-8 HBZ
1	3/4	16RU12	16-12 HBZ

Metric tubing

Tube O.D. mm	Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
3	2	M3RUM2	HBZ 3-2
6	2	M6RUM2	HBZ 6-2
6	3	M6RUM3	HBZ 6-3
6	4	M6RUM4	HBZ 6-4
8	6	M8RUM6	HBZ 8-6
10	6	M10RUM6	HBZ 10-6
10	8	M10RUM8	HBZ 10-8
12	6	M12RUM6	HBZ 12-6
12	8	M12RUM8	HBZ 12-8
12	10	M12RUM10	HBZ 12-10
16	10	M16RUM10	HBZ 16-10
16	12	M16RUM12	HBZ 16-12

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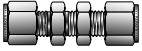
18	12	M18RUM12	HBZ 18-12
25	18	M25RUM18	HBZ 25-18
25	20	M25RUM20	HBZ 25-20



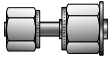
WBZ, BC - Bulkhead union

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/16	1BC1	1-1 WBZ
1/8	2BC2	2-2 WBZ
3/16	3BC3	3-3 WBZ
1/4	4BC2	4-2 WBZ
1/4	4BC4	4-4 WBZ
5/16	5BC5	5-5 WBZ
3/8	6BC6	6-6 WBZ
1/2	8BC8	8-8 WBZ
5/8	10BC10	10-10 WBZ
3/4	12BC12	12-12 WBZ
7/8	14BC14	14-14 WBZ
1	16BC16	16-16 WBZ

Metric tubing

Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
3	BCM3	WBZ 3-3
4	BCM4	WBZ 4-4
6	BCM6	WBZ 6-6
8	BCM8	WBZ 8-8
10	BCM10	WBZ 10-10
12	BCM12	WBZ 12-12
15	BCM15	WBZ 15-15
16	BCM16	WBZ 16-16
18	BCM18	WBZ 18-18
20	BCM20	WBZ 20-20
25	BCM25	WBZ 25-25



DEBTA, DELTA - Dielectric union adapter

Imperial tubing

Tube O.D. inch	Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
3/8	1/2	6-8 DELTA	6-8 DEBTA-SS
1/2	5/8		8-10 DEBT2-SS

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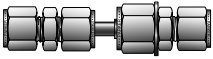
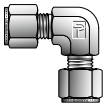


DEBTA, DELTA - Dielectric assembly

Imperial tubing

Tube O.D. inch	A-LOK® Part no. Compression	CPI™ Part no. Compression
4.08	4H DELTA	4H DEBTA
4.20	6H DELTA	6H DEBTA
4.79	8H DELTA	8H DEBTA
	Compression Female pipe	Compression Female Pipe
3.59	4G DELTA	4G DEBTA
3.71	6G DELTA	6G DEBTA
4.40	8G DELTA	8G DEBTA
	Compression Male pipe	Compression Male pipe
3.80	4F DELTA	4F DEBTA
3.80	6F DELTA	6F DEBTA
4.58	8F DELTA	8F DEBTA



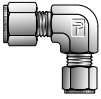
EBZ, EE - Union elbow

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/16	1EE1	1-1 EBZ
1/8	2EE2	2-2 EBZ
3/16	3EE3	3-3 EBZ
1/4	4EE4	4-4 EBZ
5/16	5EE5	5-5 EBZ
3/8	6EE6	6-6 EBZ
1/2	8EE8	8-8 EBZ
5/8	10EE10	10-10 EBZ
3/4	12EE12	12-12 EBZ
7/8	14EE14	14-14 EBZ
1	16EE16	16-16 EBZ
1-1/4	20EE20	20-20 EBZ
1-1/2	24EE24	24-24 EBZ
2	32EE32	32-32 EBZ

Metric tubing

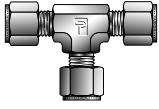
Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
3	EEM3	EBZ 3-3
4	EEM4	EBZ 4-4
6	EEM6	EBZ 6-6
8	EEM8	EBZ 8-8
10	EEM10	EBZ 10-10
12	EEM12	EBZ 12-12
14	EEM14	EBZ 14-14
15	EEM15	EBZ 15-15
16	EEM16	EBZ 16-16
18	EEM18	EBZ 18-18
20	EEM20	EBZ 20-20
22	EEM22	EBZ 22-22
25	EEM25	EBZ 25-25



EBZ, ELZ - Drop size elbow

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
3/16-1/8	3-2 ELZ	3-2 EBZ
1/4-1/8	4-2 ELZ	4-2 EBZ
5/16-1/8	5-2 ELZ	5-2 EBZ
5/16-1/4	5-4 ELZ	5-4 EBZ
3/8-1/8	6-2 ELZ	6-2 EBZ
3/8-1/4	6-4 ELZ	6-4 EBZ
3/8-5/16	6-5 ELZ	6-5 EBZ
1/2-1/4	8-4 ELZ	8-4 EBZ
1/2-5/16	8-5 ELZ	8-5 EBZ
1/2-3/8	8-6 ELZ	8-6 EBZ
5/8-3/8	10-6 ELZ	10-6 EBZ
5/8-1/2	10-8 ELZ	10-8 EBZ
3/4-1/4	12-4 ELZ	12-4 EBZ
3/4-3/8	12-6 ELZ	12-6 EBZ
3/4-1/2	12-8 ELZ	12-8 EBZ
7/8-1/4	14-4 ELZ	14-4 EBZ
1-1/2	16-8 ELZ	16-8 EBZ
1-3/4	16-12 ELZ	16-12 EBZ



JBZ, ET - Union tee

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/16	1ET1	1-1-1 JBZ
1/8	2ET2	2-2-2 JBZ
3/16	3ET3	3-3-3 JBZ
1/4	4ET4	4-4-4 JBZ
5/16	5ET5	5-5-5 JBZ
3/8	6ET6	6-6-6 JBZ
1/2	8ET8	8-8-8 JBZ
5/8	10ET10	10-10-10 JBZ
3/4	12ET12	12-12-12 JBZ
7/8	14ET14	14-14-14 JBZ
1	16ET16	16-16-16 JBZ
1-1/4	20ET20	20-20-20 JBZ
1-1/2	24ET24	24-24-24 JBZ
2	32ET32	32-32-32 JBZ

Metric tubing

Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
2	ETM2	JBZ 2-2-2
3	ETM3	JBZ 3-3-3
4	ETM4	JBZ 4-4-4
6	ETM6	JBZ 6-6-6
8	ETM8	JBZ 8-8-8
10	ETM10	JBZ 10-10-10
12	ETM12	JBZ 12-12-12
14	ETM14	JBZ 14-14-14
15	ETM15	JBZ 15-15-15

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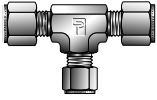
16	ETM16	JBZ 16-16-16
18	ETM18	JBZ 18-18-18
20	ETM20	JBZ 20-20-20
22	ETM22	JBZ 22-22-22
25	ETM25	JBZ 25-25-25



JBZ, JLZ - Drop size tees

Imperial tubing

Tube O.D. inch	Tube O.D. inch	Tube O.D. inch	A-LOK Part no.	CPI Part no.
1/4	1/4	1/8	4-4-2 JLZ	4-4-2 JBZ
3/8	3/8	1/4	6-6-4 JLZ	6-6-4 JBZ
3/8	1/4	3/8	6-4-6 JLZ	6-4-6 JBZ
3/8	1/4	1/4	6-4-4 JLZ	6-4-4 JBZ
1/2	1/2	3/8	8-8-6 JLZ	8-8-6 JBZ
1/2	1/2	1/4	8-8-4 JLZ	8-8-4 JBZ
1/2	3/8	1/2	8-6-8 JLZ	8-6-8 JBZ

1/2	1/4	1/2	8-4-8 JLZ	8-4-8 JBZ
1/2	3/8	3/8	8-6-6 JLZ	8-6-6 JBZ
1/2	1/4	1/4	8-4-4 JLZ	8-4-4 JBZ
5/8	5/8	1/2	10-10-8 JLZ	10-10-8 JBZ
5/8	5/8	3/8	10-10-6 JLZ	10-10-6 JBZ
5/8	1/2	1/2	10-8-8 JLZ	10-8-8 JBZ
5/8	1/2	3/8	10-8-6 JLZ	10-8-6 JBZ
5/8	3/8	3/8	10-6-6 JLZ	10-6-6 JBZ
5/8	3/8	1/2	10-6-8 JLZ	10-6-8 JBZ
3/4	3/4	5/8	12-12-10 JLZ	12-12-10 JBZ
3/4	3/4	1/2	12-12-8 JLZ	12-12-8 JBZ
3/4	3/4	3/8	12-12-6 JLZ	12-12-6 JBZ
3/4	3/4	1/4	12-12-4 JLZ	12-12-4 JBZ
3/4	5/8	5/8	12-10-10 JLZ	12-10-10 JBZ
3/4	1/2	1/2	12-8-8 JLZ	12-8-8 JBZ
3/4	3/8	3/8	12-6-6 JLZ	12-6-6 JBZ
3/4	5/8	1/2	12-10-8 JLZ	12-10-8 JBZ
3/4	5/8	3/8	12-10-6 JLZ	12-10-6 JBZ
3/4	1/2	3/8	12-8-6 JLZ	12-8-6 JBZ
7/8	7/8	3/8	14-14-6 JLZ	14-14-6 JBZ
7/8	7/8	1/4	14-14-4 JLZ	14-14-4 JBZ
7/8	3/4	3/4	14-12-12 JLZ	14-12-12 JBZ
7/8	3/4	1/2	14-12-8 JLZ	14-12-8 JBZ
7/8	3/4	3/8	14-12-6 JLZ	14-12-6 JBZ
7/8	5/8	3/8	14-10-6 JLZ	14-10-6 JBZ
7/8	1/2	3/4	14-8-12 JLZ	14-8-12 JBZ
1	1	3/4	16-16-12 JLZ	16-16-12 JBZ
1	1	5/8	16-16-10 JLZ	16-16-10 JBZ
1	1	1/2	16-16-8 JLZ	16-16-8 JBZ

1	1	3/8	16-16-6 JLZ	16-16-6 JBZ
1	1	1/4	16-16-4 JLZ	16-16-4 JBZ
1	3/4	1	16-12-16 JLZ	16-12-16 JBZ
1	7/8	7/8	16-14-14 JLZ	16-14-14 JBZ
1	7/8	3/4	16-14-12 JLZ	16-14-12 JBZ
1	7/8	1/2	16-14-8 JLZ	16-14-8 JBZ
1	7/8	3/8	16-14-6 JLZ	16-14-6 JBZ
1	7/8	1/4	16-14-4 JLZ	16-14-4 JBZ
1	1	7/8	16-16-14 JLZ	16-16-14 JBZ
1	3/4	5/8	16-12-10 JLZ	16-12-10 JBZ
1	3/4	1/2	16-12-8 JLZ	16-12-8 JBZ
1	5/8	3/8	16-10-6 JLZ	16-10-6 JBZ
1	1/2	1	16-8-16 JLZ	16-8-16 JBZ
1	1/2	1/2	16-8-8 JLZ	16-8-8 JBZ
1	1/2	3/8	16-8-6 JLZ	16-8-6 JBZ
1	1/2	1/4	16-8-4 JLZ	16-8-4 JBZ
1	3/8	3/8	16-6-6 JLZ	16-6-6 JBZ

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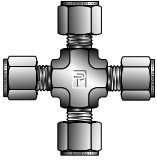


KBZ, ECR -Union cross

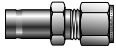
Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/8	2ECR2	2 KBZ
3/16	3ECR3	3 KBZ
1/4	4ECR4	4 KBZ
5/16	5ECR5	5 KBZ
3/8	6ECR6	6 KBZ
1/2	8ECR8	8 KBZ
5/8	10ECR10	10 KBZ
3/4	12 ECR12	12 KBZ
7/8	14ECR14	14 KBZ
1	16ECR16	16 KBZ

Metric tubing

Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
3	ECRM3	KBZ 3
4	ECRM4	KBZ 4
6	ECRM6	KBZ 6
8	ECRM8	KBZ 8
10	ECRM10	KBZ 10
12	ECRM12	KBZ 12
16	ECTM16	KBZ 16
18	ECRM18	KBZ 18

Port connectors



TRBZ, TUR - Tube end reducer

Imperial tubing

Tube O.D. inch	Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/8	1/16	2TUR1	2-1 TRBZ
3/16	1/16	3TUR1	3-1 TRBZ
1/4	1/16	4TUR1	4-1 TRBZ
1/16	1/8	1TUR2	1-2 TRBZ
1/8	1/8	2TUR2	2-2 TRBZ
3/16	1/8	3TUR2	3-2 TRBZ
1/4	1/8	4TUR2	4-2 TRBZ
3/8	1/8	6TUR2	6-2 TRBZ
1/2	1/8	8TUR2	8-2 TRBZ
1/8	3/16	2TUR3	2-3 TRBZ

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1/4	3/16	4TUR3	4-3 TRBZ
1/8	1/4	2TUR4	2-4 TRBZ
3/16	1/4	3TUR4	3-4 TRBZ
1/4	1/4	4TUR4	4-4 TRBZ
5/16	1/4	5TUR4	5-4 TRBZ
3/8	1/4	6TUR4	6-4 TRBZ
1/2	1/4	8TUR4	8-4 TRBZ
5/8	1/4	10TUR4	10-4 TRBZ
3/4	1/4	12TUR4	12-4 TRBZ
3/8	5/16	6TUR5	6-5 TRBZ
1/2	5/16	8TUR5	8-5 TRBZ
1/4	3/8	4TUR6	4-6 TRBZ
3/8	3/8	6TUR6	6-6 TRBZ
1/2	3/8	8TUR6	8-6 TRBZ
5/8	3/8	10TUR6	10-6 TRBZ
3/4	3/8	12TUR6	12-6 TRBZ
1/4	1/2	4TUR8	4-8 TRBZ
3/8	1/2	6TUR8	6-8 TRBZ
5/8	1/2	10TUR8	10-8 TRBZ
3/4	1/2	12TUR8	12-8 TRBZ
1	1/2	16TUR8	16-8 TRBZ
3/4	5/8	12TUR10	12-10 TRBZ
7/8	5/8	14TUR10	14-10 TRBZ
1	5/8	16TUR10	16-10 TRBZ
1/2	3/4	8TUR12	8-12 TRBZ

1	3/4	16TUR12	16-12 TRBZ
1-1/2	1	24TUR16	24-16 TRBZ
1-1/2	1-1/4	24TUR20	24-20 TRBZ
2	1-1/2	32TUR24	32-24 TRBZ

Metric tubing

Tube O.D. mm	Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
3	2	M3TURM2	TRBZ 3-2
3	6	M3TURM6	TRBZ 3-6
4	3	M4TURM3	TRBZ 4-3
6	3	M6TURM3	TRBZ 6-3
6	4	M6TURM4	TRBZ 6-4
6	8	M6TURM8	TRBZ 6-8
6	10	M6TURM10	TRBZ 6-10
6	12	M6TURM12	TRBZ 6-12
8	6	M8TURM6	TRBZ 8-6
8	10	M8TURM10	TRBZ 8-10
10	3	M10TURM3	TRBZ 10-3
10	6	M10TURM6	TRBZ 10-6
10	8	M10TURM8	TRBZ 10-8
10	12	M10TURM12	TRBZ 10-12
12	6	M12TURM6	TRBZ 12-6
12	8	M12TURM8	TRBZ 12-8

12	10	M12TURM10	TRBZ 12-10
12	16	M12TURM16	TRBZ 12-16
12	18	M12TURM18	TRBZ 12-18
15	10	M15TURM10	TRBZ 15-10
16	12	M16TURM12	TRBZ 16-12
16	18	M16TURM18	TRBZ 16-18
16	20	M16TURM20	TRBZ 16-20
16	25	M16TURM25	TRBZ 16-15
18	12	M18TURM12	TRBZ 18-12
18	16	M18TURM16	TRBZ 18-16
18	20	M18TURM20	TRBZ 18-20
18	25	M18TURM25	TRBZ 18-25
20	12	M20TURM12	TRBZ 20-12
20	16	M20TURM16	TRBZ 20-16
20	18	M20TURM18	TRBZ 20-18
20	25	M20TURM25	TRBZ 20-25
22	18	M22TURM18	TRBZ 22-18
22	20	M22TURM20	TRBZ 22-20
25	12	M25TURM12	TRBZ 25-12
25	16	M25TURM16	TRBZ 25-16
25	18	M25TURM18	TRBZ 25-18
25	20	M25TURM20	TRBZ 25-20

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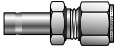
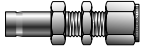


TRBZ, TUCM - Tube end reducer

Metric tubing

Tube O.D. inch	Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
1/8	3	2TUCM3	TRBZ 3-2
1/4	3	4TUCM3	TRBZ 3-4
1/4	6	4TUCM6	TRBZ 6-4
5/16	6	5TUCM6	TRBZ 6-5
3/8	6	6TUCM6	TRBZ 6-6
1/2	6	8TUCM6	TRBZ 6-8
3/8	8	6TUCM8	TRBZ 8-6
1/2	8	8TUCM8	TRBZ 10-6
3/8	10	6TUCM10	TRBZ 10-6
1/2	10	8TUCM10	TRBZ 10-8
1/2	12	8TUCM12	TRBZ 12-8
3/4	12	12TUCM12	TRBZ 12-12
3/4	18	12TUCM18	TRBZ 18-12



T2H2BZ, TUBC - Tube end bulkhead adapter

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no
1/8	2TUBC2	2-2 T2H2BZ
1/4	4TUBC4	4-4 T2H2BZ
3/8	6TUBC6	6-6 T2H2BZ
1/2	8TUBC8	8-8 T2H2BZ

ZPC, PC - Port connector

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/16	1PC1	1-1 ZPC
1/16-1/8	1PC2	1-2 ZPC
1/16-1/4	1PC4	1-4 ZPC
1/8	2PC2	2-2 ZPC
1/8-1/4	2PC4	2-4 ZPC
1/8-3/8	2PC6	2-6 ZPC
3/16	3PC3	3-3 ZPC
1/4	4PC4	4-4 ZPC
1/4-3/8	4PC6	4-6 ZPC
1/4-1/2	4PC8	4-8 ZPC
3/8	6PC6	6-6 ZPC
3/8-1/2	6PC8	6-8 ZPC
1/2	8PC8	8-8 ZPC
1/2-3/4	8PC12	8-12 ZPC
3/4	12PC12	12-12 ZPC
1	16PC16	16-16 ZPC

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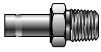
Metric tubing

Tube O.D. mm	Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
3	3	PCM3	ZPC 3-3
6	6	PCM6	ZPC 6-6
8	8	PCM8	ZPC 8-8
10	10	PCM10	ZPC 10-10
12	12	PCM12	ZPC 12-12
16	16	PCM16	ZPC 16-16
18	18	PCM18	ZPC 18-18
3	6	M3PCM6	ZPC 3-6
6	8	M6PCM8	ZPC 6-8
6	10	M6PCM10	ZPC 6-10
6	12	M6PCM12	ZPC 6-12
8	10	M8PCM10	ZPC 8-10
8	12	M8PCM12	ZPC 8-12



T2HF, MAN - NPT tube end male adapter

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/8	1MA2N	1-2 T2HF
1/8	1/8	2MA2N	2-2 T2HF
1/8	1/4	2MA4N	2-4 T2HF
3/16	1/8	3MA2N	3-2 T2HF
3/16	1/4	3MA4N	3-4 T2HF
1/4	1/8	4MA2N	4-2 T2HF
1/4	1/4	4MA4N	4-4 T2HF
1/4	3/8	4MA6N	4-6 T2HF
1/4	1/2	4MA8N	4-8 T2HF
5/16	1/8	5MA2N	5-2 T2HF
5/16	1/4	5MA4N	5-4 T2HF
5/16	3/8	5MA6N	5-6 T2HF
5/16	1/2	5MA8N	5-8 T2HF
3/8	1/8	6MA2N	6-2 T2HF
3/8	1/4	6MA4N	6-4 T2HF
3/8	3/8	6MA6N	6-6 T2HF
3/8	1/2	6MA8N	6-8 T2HF
1/2	1/4	8MA4N	8-4 T2HF
1/2	3/8	8MA6N	8-6 T2HF
1/2	1/2	8MA8N	8-8 T2HF
5/8	1/2	10MA8N	10-8 T2HF
3/4	1/2	12MA8N	12-8 T2HF
3/4	3/4	12MA12N	12-12 T2HF
3/4	1	12MA16N	12-16 T2HF
1	3/4	16MA12N	16-12 T2HF
1	1	16MA16N	16-16 T2HF
1-1/4	1-1/4	20MA20N	20-20 T2HF
1-1/2	1-1/2	24MA24N	24-24 T2HF
2	2	32MA32N	32-32 T2HF

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T2HF, MAR - BSPP tube end male adapter

Imperial tubing

Tube O.D. inch	BSPP thread	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2MA2R	2-2R T2HF
1/8	1/4	2MA4R	2-4R T2HF
1/4	1/8	4MA2R	4-2R T2HF
1/4	1/4	4MA4R	4-4R T2HF
3/8	1/8	6MA2R	6-2R T2HF
3/8	1/4	6MA4R	6-4R T2HF
3/8	3/8	6MA6R	6-6R T2HF
3/8	1/2	6MA8R	6-8R T2HF
1/2	1/4	8MA4R	8-4R T2HF
1/2	3/8	8MA6R	8-6R T2HF
1/2	1/2	8MA8R	8-8R T2HF
5/8	1/2	10MA8R	10-8R T2HF
3/4	3/4	12MA12R	12-12R T2HF
1	1	16MA16R	16-16R T2HF

Metric tubing

Tube O.D. mm	BSPP thread	A-LOK® Part no.	CPI™ Part no.
3	1/8	M3MA1/8R	T2HF 3-1/8R
4	1/8	M4MA1/8R	T2HF 4-1/8R
6	1/8	M6MA1/8R	T2HF 6-1/8R
6	1/4	M6MA1/4R	T2HF 6-1/4R
8	1/4	M8MA1/4R	T2HF 8-1/4R
10	1/4	M10MA1/4R	T2HF 10-1/4R
10	3/8	M10MA3/8R	T2HF 10-3/8R
10	1/2	M10MA1/2R	T2HF 10-1/2R
12	1/4	M12MA1/4R	T2HF 12-1/4R
12	3/8	M12MA3/8R	T2HF 12-3/8R
12	1/2	M12MA1/2R	T2HF 12-1/2R
16	1/2	M16MA1/2R	T2HF 16-1/2R
18	3/4	M18MA3/4R	T2HF 18-3/4R
20	3/4	M20MA3/4R	T2HF 20-3/4R
25	1	M25MA1R	T2HF 25-1R

T2HF, MAR - BSPP tube end male adapter with ED seal

Imperial tubing

Tube O.D. inch	BSPP thread	A-LOK® Part no.	CPI™ Part no.
1/4	1/4	4MA4R-ED	4-4R-ED T2HF
1/4	3/8	4MA6R-ED	4-6R-ED T2HF
1/2	1/4	8MA4R-ED	8-4R-ED T2HF
1/2	3/8	8MA6R-ED	8-6R-ED T2HF
1/2	1/2	8MA8R-ED	8-8R-ED T2HF

Metric tubing

Tube O.D. mm	BSPP thread	A-LOK® Part no.	CPI™ Part no.
6	1/4	M6MA1/4R-ED	T2HF 6-1/4R-ED
6	1/2	M6MA1/2R-ED	T2HF 6-1/2R-ED

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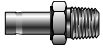
10	1/4	M10MA1/4R-ED	T2HF 10-1/4R-ED
10	1/2	M10MA1/2R-ED	T2HF 10-1/2R-ED
12	1/4	M12MA1/4R-ED	T2HF 12-1/4R-ED
12	3/8	M12MA3/8R-ED	T2HF 12-3/8R-ED
12	1/2	M12MA1/2R-ED	T2HF 12-1/2R-ED



T2HF, MAN - NPT Male adapter

Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
3	1/8	M3MA1/8N	T2HF 3-1/8
4	1/8	M4MA1/8N	T2HF 4-1/8
6	1/8	M6MA1/8N	T2HF 6-1/8
6	1/4	M6MA1/4N	T2HF 6-1/4
6	3/8	M6MA3/8N	T2HF 6-3/8
6	1/2	M6MA1/2N	T2HF 6-1/2
8	1/4	M8MA1/4N	T2HF 8-1/4
8	3/8	M8MA3/8N	T2HF 8-3/8
10	1/4	M10MA1/4N	T2HF 10-1/4
10	3/8	M10MA3/8N	T2HF 10-3/8
10	1/2	M10MA1/2N	T2HF 10-1/2
12	1/4	M12MA1/4N	T2HF 12-1/4
12	3/8	M12MA3/8N	T2HF 12-3/8
12	1/2	M12MA1/2N	T2HF 12-1/2
16	1/2	M16MA1/2N	T2HF 16-1/2
16	3/4	M16MA3/4N	T2HF 16-3/4
18	1/2	M18MA1/2N	T2HF 18-1/2
18	3/4	M18MA3/4N	T2HF 18-3/4
20	1/2	M20MA1/2N	T2HF 20-1/2
20	3/4	M20MA3/4N	T2HF 20-3/4
25	1	M25MA1N	T2HF 25-1

T2HF, MAK - BSP taper male adapter

Imperial tubing

Tube O.D. inch	BSPT thread	A-LOK® Part no.	CPI™ Part no.
1/4	1/8	4MA2K	4-2K T2HF
1/4	1/4	4MA4K	4-4K T2HF
1/4	3/8	4MA6K	4-6K T2HF
1/4	1/2	4MA8K	4-8K T2HF
5/16	1/8	5MA2K	5-2 T2HF
5/16	1/4	5MA4K	5-4 T2HF
3/8	1/4	6MA4K	6-4 T2HF
3/8	3/8	6MA6K	6-6 T2HF
3/8	1/2	6MA8K	6-8 T2HF
1/2	1/4	8MA4K	8-4 T2HF
1/2	3/8	8MA6K	8-6 T2HF
1/2	1/2	8MA8K	8-8 T2HF
5/8	1/2	10MA8K	10-8 T2HF

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Metric tubing

Tube O.D. mm	BSPT thread	A-LOK® Part no.	CPI™ Part no.
3	1/8	M3MA1/8K	T2HF 3-1/8K
4	1/8	M4MA1/8K	T2HF 4-1/8K
6	1/8	M6MA1/8K	T2HF 6-1/8K
6	1/4	M6MA1/4K	T2HF 6-1/4K
8	1/4	M8MA1/4K	T2HF 8-1/4K
8	3/8	M8MA3/8K	T2HF 8-3/8K
10	1/4	M10MA1/4K	T2HF 10-1/4K
10	3/8	M10MA3/8K	T2HF 10-3/8K
10	1/2	M10MA1/2K	T2HF 10-1/2K
12	1/4	M12MA1/4K	T2HF 12-1/4K
12	3/8	M12MA3/8K	T2HF 12-3/8K
12	1/2	M12MA1/2K	T2HF 12-1/2K
16	1/2	M16MA1/2K	T2HF 16-1/2K
18	3/4	M18MA3/4K	T2HF 18-3/4K
20	3/4	M20MA3/4K	T2HF 20-3/4K
25	1	M25MA1K	T2HF 25-1K

T2HOA, TUHA - Tube end to SAE straight thread adapter

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
3/8	6TUHOA4	6-4 T2HOA
3/8	6TUHOA8	6-8 T2HOA
1/2	8TUHOA6	8-6 T2HOA
5/8	10TUHOA10	10-10 T2HOA
1-1/2	24TUHOA24	24-24 T2HOA

Add -Z6 for assembly of nuts and ferrules on the tube stub end.

T2HG, FAN - Tube end NPT female adapter

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/8	1FA2N	1-2 T2HG
1/8	1/8	2FA2N	2-2 T2HG
1/8	1/4	2FA4N	2-4 T2HG
3/16	1/8	3FA2N	3-2 T2HG
3/16	1/4	3FA4N	3-4 T2HG
1/4	1/8	4FA2N	4-2 T2HG
1/4	1/4	4FA4N	4-4 T2HG
1/4	3/8	4FA6N	4-6 T2HG
1/4	1/2	4FA8N	4-8 T2HG
5/16	1/8	5FA2N	5-2 T2HG
5/16	1/4	5FA4N	5-4 T2HG
5/16	3/8	5FA6N	5-6 T2HG

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3/8	1/8	6FA2N	6-2 T2HG
3/8	1/4	6FA4N	6-4 T2HG
3/8	3/8	6FA6N	6-6 T2HG
3/8	1/2	6FA8N	6-8 T2HG
1/2	1/4	8FA4N	8-4 T2HG
1/2	3/8	8FA6N	8-6 T2HG
1/2	1/2	8FA8N	8-8 T2HG
5/8	3/8	10FA6N	10-6 T2HG
5/8	1/2	10FA8N	10-8 T2HG
3/4	1/2	12FA8N	12-8 T2HG
3/4	3/4	12FA12N	12-12 T2HG
3/4	1	12FA16N	12-16 T2HG
7/8	3/4	14FA12N	14-12 T2HG
1	3/4	16FA12N	16-12 T2HG
1	1	16FA16N	16-16 T2HG
1-1/4	1-1/4	20FA20N	20-20 T2HG
1-1/2	1-1/2	24FA24N	24-24 T2HG
2	2	32FA32N	32-32 T2HG

Metric tubing

Tube O.D. mm	NPT thread	A-LOK® Part no.	CPI™ Part no.
3	1/8	M3FA1/8N	T2HG 3-1/8
4	1/8	M4FA1/8N	T2HG 4-1/8
6	1/8	M6FA1/8N	T2HG 6-1/8
6	1/4	M6FA1/4N	T2HG 6-1/4
8	1/8	M8FA1/8N	T2HG 8-1/8
8	1/4	M8FA1/4N	T2HG 8-1/4
8	3/8	M8FA3/8N	T2HG 8-3/8
10	1/4	M10FA1/4N	T2HG 10-1/4
10	3/8	M10FA3/8N	T2HG 10-3/8
10	1/2	M10FA1/2N	T2HG 10-1/2
12	1/4	M12FA1/4N	T2HG 12-1/4
12	3/8	M12FA3/8N	T2HG 12-3/8
12	1/2	M12FA1/2N	T2HG 12-1/2
16	1/2	M16FA1/2N	T2HG 16-1/2
18	3/4	M18FA3/4N	T2HG 18-3/4
20	1/2	M20FA1/2N	T2HG 20-1/2
20	3/4	M20FA3/4N	T2HG 20-3/4
25	1	M25FA1N	T2HG 25-1

T2HG, FAK - BSP taper female adapter

Imperial tubing

Tube O.D. inch	BSPT thread	A-LOK® Part no.	CPI™ Part no.
1/4	1/8-28	4FA2K	4-2K T2HG
1/4	1/4-19	4FA4K	4-4K T2HG
3/8	1/4-19	6FA4K	6-4K T2HG
3/8	3/8-19	6FA6K	6-6K T2HG
1/2	1/4-19	8FA4K	8-4K T2HG
1/2	3/8-19	8FA6K	8-6K T2HG
1/2	1/2-14	8FA8K	8-8K T2HG

Metric tubing

Tube O.D. mm	BSPT thread	A-LOK® Part no.	CPI™ Part no.
3	1/8	M3FA1/8K	T2HG 3-1/8K
4	1/8	M4FA1/8K	T2HG 4-1/8K

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6	1/8	M6FA1/8K	T2HG 6-1/8K
8	1/4	M8FA1/4K	T2HG 8-1/4K
10	1/4	M10FA1/4K	T2HG 10-1/4K
10	3/8	M10FA3/8K	T2HG 10-3/8K
10	1/2	M10FA1/2K	T2HG 10-1/2K
12	1/4	M12FA1/4K	T2HG 12-1/4K
12	3/8	M12FA3/8K	T2HG 12-3/8K
12	1/2	M12FA1/2K	T2HG 12-1/2K
16	1/2	M16FA1/2K	T2HG 16-1/2K
18	3/4	M18FA3/4K	T2HG 18-3/4K
20	3/4	M20FA3/4K	T2HG 20-3/4K
25	1	M25FA1K	T2HG 25-1K

T2HG, FAR - BSPP female adapter

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/4	4FA4R	4-4R T2HG
3/8	6FA6R	6-6R T2HG
1/2	8FA8R	8-8R T2HG

Metric tubing

Tube O.D. mm	BSPP thread	A-LOK® Part no.	CPI™ Part no.
3	1/8	M3FA1/8R	T2HG 3-1/8R
3	1/4	M3FA1/4R	T2HG 3-1/4R
4	1/8	M4FA1/8R	T2HG 4-1/8R
6	1/8	M6FA1/8R	T2HG 6-1/8R
6	1/4	M6FA1/4R	T2HG 6-1/4R
8	1/4	M8FA1/4R	T2HG 8-1/4R
10	1/4	M10FA1/4R	T2HG 10-1/4R
10	1/2	M10FA1/2R	T2HG 10-1/2R
12	3/8	M12FA3/8R	T2HG 12-3/8R
12	1/2	M12FA1/2R	T2HG 12-1/2R
16	1/2	M16FA1/2R	T2HG 16-1/2R
18	3/4	M18FA3/4R	T2HG 18-3/4R
20	3/4	M20FA3/4R	T2HG 20-3/4R
25	1	M25FA1R	T2HG 25-1R

P2T2, P2TU - Push-Lok® to tube adapter

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/4	4P2TU4	4-4 P2T2
3/8	6P2TU6	6-6 P2T2
1/2	8P2TU8	8-8 P2T2

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P2HF - Push-Lok® to male adapter

Imperial tubing

Tube O.D. inch	NPT thread	A-LOK® Part no.	CPI™ Part no.
1/4	1/4	4-4 P2HF	4-4 P2HF
3/8	3/8	6-6 P2HF	6-6 P2HF
1/2	1/2	8-8 P2HF	8-8 P2HF

P2BZ6, P2LZ6 - Push-Lok® to CPI™/A-LOK®

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/4	4-4 P2LZ6	4-4 P2BZ6
3/8	6-6 P2LZ6	6-6 P2BZ6
1/2	8-8 P2LZ6	8-8 P2BZ6

ZPB2, ZPC2 - Push-Lok® to port connector

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
3/8	4-6 ZPC2	4-6 ZPB2

LJFBZ, LJF - Lapped joint tube adapters

Metric tubing

Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
10	M10LJF-5	LJFBZ10-5
10	M10LJF-9	LJFBZ10-9
12	M12LJF-5	LJFBZ12-5
12	M12LJF-9	LJFBZ12-9

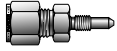
ZH2X - DP transmitter calibration adapters

for Rosemount/Foxboro DP transmitters

Imperial tubing

A-LOK® Part no.
4-2 ZH2LX-SS-D950373

CPI™ Part no.
4-2 ZH2BX-SS-D950373



ZH2X - DP transmitter calibration adapters

for Honeywell DP Transmitters

Imperial tubing

A-LOK® Part no.
4-2 ZH2LX-SS-D940336

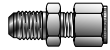
CPI™ Part no.
4-2 ZH2BX-SS-D940336

37° Flare (AN) to A-LOK®

X6HBZ6, X6TU - 37° Flare (AN) to CPI™/A-LOK®

Imperial tubing

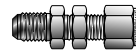
Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/8	2X6TU2	2-2 X6HBZ6
1/4	4X6TU4	4-4 X6HBZ6
3/8	6X6TU6	6-6 X6HBZ6
1/2	8X6TU8	8-8 X6HBZ6
3/4	12X6TU12	12-12 X6HBZ6
1	16X6TU16	16-16 X6HBZ6



XHBZ, XASC - 37° flare connector

Imperial tubing

Tube O.D. inch	Flare end	A-LOK® Part no.	CPI™ Part no.
1/16	1/8	2XASC1	2-1 XHBZ
1/8	1/8	2XASC2	2-2 XHBZ
1/8	1/4	4XASC2	4-2 XHBZ
3/16	3/16	3XASC3	3-3 XHBZ
1/4	1/4	4XASC4	4-4 XHBZ
5/16	5/16	5XASC5	5-5 XHBZ
3/8	1/4	4XASC6	4-6 XHBZ
3/8	3/8	6XASC6	6-6 XHBZ
1/2	1/2	8XASC8	8-8 XHBZ
5/8	5/8	10XASC10	10-10 XHBZ
3/4	3/4	12XASC12	12-12XHBZ
1	1	16XASC16	16-16 XHBZ



XH2BZ, XABC - 37° flare Bulkhead connector

Imperial tubing

Tube O.D. inch	Flare end	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2XABC2	2-2 XH2BZ
1/8	1/4	4XABC2	3-2 XH2BZ
3/16	3/16	3XABC3	4-2 XH2BZ
1/4	1/4	4XABC4	4-2 XH2BZ
5/16	5/16	5XABC5	5-2 XH2BZ
3/8	1/4	4XABC6	4-2 XH2BZ
3/8	3/8	6XABC6	6-2 XH2BZ
1/2	1/2	8XABC8	8-2 XH2BZ
5/8	5/8	10XABC10	10-2 XH2BZ
3/4	3/4	12XABC12	12-2 XH2BZ
1	1	16XABC16	16-2 XH2BZ

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Tube to O-Ring seal

ZHBA, M1SC - Male connector to SAE straight thread

Imperial tubing

Tube O.D. inch	Straight thread	A-LOK® Part no.	CPI™ Part no.
1/16	5/16-24	1M1SC2	1-2 ZHBA
1/8	5/16-24	2M1SC2	2-2 ZHBA
1/8	9/16-18	2M1SC6	2-6 ZHBA
3/16	3/8-24	3M1SC3	3-3 ZHBA
1/4	7/16-20	4M1SC4	4-4 ZHBA
1/4	9/16-18	4M1SC6	4-6 ZHBA
1/4	3/4-16	4M1SC8	4-8 ZHBA
1/4	7/8-14	4M1SC10	4-10 ZHBA
5/16	1/2-20	5M1SC5	5-5 ZHBA
3/8	7/16-20	6M1SC4	6-4 ZHBA
3/8	9/16-18	6M1SC6	6-6 ZHBA
3/8	3/4-16	6M1SC8	6-8 ZHBA
3/8	7/8-14	6M1SC10	6-10 ZHBA
1/2	9/16-18	8M1SC6	8-6 ZHBA
1/2	3/4-16	8M1SC8	8-8 ZHBA
1/2	1.1/16-12	8M1SC12	8-12 ZHBA
5/8	7/8-14	10M1SC10	10-10 ZHBA
3/4	7/8-14	12M1SC10	12-10 ZHBA
3/4	1.16-12	12M1SC12	12-12 ZHBA
7/8	1.3/16-12	14M1SC14	12-14 ZHBA
1	1-1/16-12	16M1SC12	16-12 ZHBA
1	1-5/16-12	16M1SC16	16-16 ZHBA
1 1/4	1-5/8-12	20M1SC20	20-20 ZHBA
1 1/2	1-7/8-12	24M1SC24	24-24 ZHBA
2	2-1/2-12	32M1SC32	32-32 ZHBA

C5BZ, M5SEL - Male SAE straight thread elbow

Imperial tubing

Tube O.D. inch	Straight thread	A-LOK® Part no.	CPI™ Part no.
1/4	7/16-20	4M5SEL4	4-4 C5BZ
3/8	9/16-18	6M5SEL6	6-6 C5BZ
1/2	3/4-16	8M5SEL8	8-8 C5BZ
3/4	1-1/16-12	12M5SEL12	12-12 C5BZ
1	1-5/16-12	16M5SEL16	16-16 C5BZ
1 1/2		24M5SEL24	24-24 C5BZ

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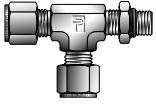
CBZ, MSEL (R) - BSPP Male elbow (positionable)

Imperial tubing

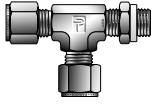
Tube O.D. inch	BSPP thread	A-LOK® Part no.	CPI™ Part no.
1/4	1/8-28	4MSEL2R	4-2R CBZ
1/4	1/4-19	4MSEL4R	4-4R CBZ
3/8	1/4-19	6MSEL4R	6-4R CBZ
3/8	1/4-19	6MSEL6R	6-6R CBZ
1/2	1/4-19	8MSEL4R	8-8R CBZ
1/2	3/8-19	8MSEL6R	8-6R CBZ
1/2	1/2-14	8MSEL8R	8-8R CBZ
5/8	1/2-14	10MSEL8R	10-102R CBZ
3/4	1/2-14	12MSEL8R	12-8R CBZ
3/4	3/4-14	12MSEL12R	12-12R CBZ
1	3/4-14	16MSEL12R	16-12R CBZ
1	1-11	16MSEL16R	16-16R CBZ



R5BZ, M5RT - Male run tee SAE straight thread

Imperial tubing

Tube O.D. inch	Straight thread	A-LOK® Part no.	CPI™ Part no.
1/4	7/16-20	4M5RT4	4-4-4 R5BZ
3/8	9/16-18	6M5RT6	6-6-6 R5BZ
1/2	3/4-16	8M5RT8	8-8-8 R5BZ
3/4	1-1/16-12	12M5RT12	12-12-12 R5BZ
1	1-5/16-12	16M5RT16	16-16-16 R5BZ



RBZ, MRT - BSPP male run tee (Positionable)

Imperial tubing

Tube O.D. inch	BSPP thread	A-LOK® Part no.	CPI™ Part no.
1/4	1/8-28	4MRT2R	4-2R-4-RBZ
1/4	1/4-19	4MRT4R	4-4R-4 RBZ
3/8	1/4-19	6MRT6R	6-6R-6 RBZ
1/2	3/8-19	8MRT8R	8-6R-8 RBZ
1/2	1/2-14	8MRT8R	8-8R-8 RBZ

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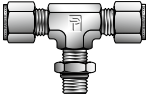
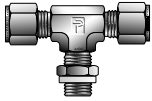
5/8	1/2-14	10MRT8R	10-8R-10 RBZ
3/4	1/2-14	12MRT8R	12-8R-12 RBZ
3/4	3/4-14	12MRT12R	12-12R-12 RBZ
1	1-11	16MRT16R	16-16R-16 RBZ



S5BZ, M5BT - Male branch tee SAE straight thread

Imperial tubing

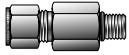
Tube O.D. inch	Straight thread	A-LOK® Part no.	CPI™ Part no.
1/4	7/16-20	4M5BT4	4-4-4 S5BZ
3/8	9/16-18	6M5BT6	6-6-6 S5BZ
1/2	3/4-16	8M5BT8	8-8-8 S5BZ
3/4	1-1/16-12	12M5BT12	12-12-12 S5BZ
1	1-5/16-12	16M5BT16	16-16-16 S5BZ



SBZ, MBT (R) - BSPP Male branch tee (positionable)

Imperial tubing

Tube O.D. inch	BSPP thread	A-LOK® Part no.	CPI™ Part no.
1/4	1/8-28	4MBT2R	4-4-2R SBZ
1/4	1/4-19	4MBT4R	4-4-4R SBZ
3/8	1/4-19	6MBT4R	6-6-4R SBZ
1/2	3/8-19	8MBT6R	8-8-6R SBZ
1/2	1/2-14	8MBT8R	8-8-8R SBZ
5/8	1/2-14	10MBT8R	10-10-8R SBZ
3/4	1/2-14	12MBT8R	12-12-8R SBZ
3/4	3/4-14	12MBT12R	12-12-12R SBZ
1	1-11	16MBT16R	16-16-16R SBZ



ZH3BA, ZH3LA - Long male connector SAE/ MS straight thread

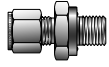
Imperial tubing

Tube O.D. inch	S-SAE/MS thread	A-LOK® Part no.	CPI™ Part no.
1/4	7/16-20	4-4 ZH3LA	4-4 ZH3BA
3/8	9/16-18	6-6 ZH3LA	6-6 ZH3BA
1/2	3/4-16	8-8 ZH3LA	8-8 ZH3BA
3/4	1-1/16-12	12-12 ZH3LA	12-12 ZH3BA
1	1-5/16-12	16-16 ZH3LA	16-16 ZH3BA

V5BZ, M5VEL - 45° positionable male elbow SAE/MS straight thread

Imperial tubing

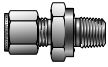
Tube O.D. inch	Thread size	A-LOK® Part no.	CPI™ Part no.
1/4	7/16-20	4M5VEL4	4-4 V5BZ
3/8	9/16-18	6M5VEL6	6-6 V5BZ
1/2	3/4-16	8M5VEL8	8-8 V5BZ
3/4	1-1/16-12	12M5VEL12	12-12 V5BZ
1	1-5/16-12	16M5VEL16	16-16 V5BZ



ZHBA5, M2SC - Male connector to O-ring straight thread

Imperial tubing

Tube O.D. inch	Straight thread	A-LOK® Part no.	CPI™ Part no.
1/16	5/16-24	1M2SC2	1-2 ZHBA5
1/8	5/16-24	2M2SC2	2-2 ZHBA5
3/16	3/8-24	3M2SC3	3-3 ZHBA5
1/4	7/16-20	4M2SC4	4-4 ZHBA5
5/16	1/2-20	1M2SC5	5-5 ZHBA5
3/8	9/16-18	6M2SC6	6-6 ZHBA5
1/2	3/4-16	8M2SC8	8-8 ZHBA5
5/8	7/8-14	10M2SC10	10-10 HBA5
3/4	1-1/16-12	12M2SC12	12-12 HBA5
7/8	1-1/16-12	14M2SC12	14-12 HBA5
1	1-5/16-12	16M2SC16	16-16 HBA5

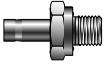


ZHBF5, M3SC - Male connector to O-ring pipe thread

Imperial tubing

Tube O.D. inch	NPT pipe thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/8	1M3SC2	1-2 ZHBF5
1/8	1/8	2M3SC2	2-2 ZHBF5
1/8	1/4	2M3SC4	2-4 ZHBF5
3/16	1/8	3M3SC2	3-2 ZHBF5
3/16	1/4	3M3SC4	3-4 ZHBF5
1/4	1/8	4M3SC2	4-2 ZHBF5
1/4	1/4	4M3SC4	4-4 ZHBF5
1/4	3/8	4M3SC6	4-6 ZHBF5
5/16	1/8	5M3SC2	5-2 ZHBF5
5/16	1/4	5M3SC4	5-4 ZHBF5
3/8	1/8	6M3SC2	6-2 ZHBF5
3/8	1/4	6M3SC4	6-4 ZHBF5

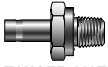
3/8	3/8	6M3SC6	6-6 ZHBF5
3/8	1/2	6M3SC8	6-8 ZHBF5
1/2	1/4	8M3SC4	8-4 ZHBF5
1/2	3/8	8M3SC6	8-6 ZHBF5
1/2	1/2	8M3SC8	8-8 ZHBF5
5/8	1/2	10M3SC8	10-8 ZHBF5
5/8	3/4	10M3SC12	10-12 ZHBF5
3/4	1/2	12M3SC8	12-8 ZHBF5
3/4	3/4	12M3SC12	12-12 ZHBF5
1	3/4	16M3SC12	16-12 ZHBF5
1	1	16M3SC16	16-16 ZHBF5



T2HOA5, M2TU - Tube end to O-ring straight thread

Imperial tubing

Tube O.D. inch	Straight thread	A-LOK® Part no.	CPI™ Part no.
1/8	5/16-24	2M2TU2	2-2 T2HOA5
3/16	3/8-24	3M2TU3	3-3 T2HOA5
1/4	7/16-20	4M2TU4	4-5 T2HOA5
5/16	1/2-20	5M2TU5	5-5 T2HOA5
3/8	9/16-18	6M2TU6	6-6 T2HOA5
1/2	3/4-16	6M2TU8	8-8 T2HOA5
5/8	7/8-14	10M2TU10	10-10 T2HOA5
3/4	1-1/16-12	12M2TU12	12-12 T2HOA5
1	1-5/16-12	16M2TU16	16-16 T2HOA5



T2HOF5, M3TU - Tube end to O-ring pipe thread

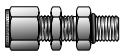
Imperial tubing

Tube O.D. inch	NPT Pipe thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/8	1M3TU2	1-2 T2HOF5
1/4	1/8	4M3TU2	4-2 T2HOF5
1/4	1/4	4M3TU4	4-4 T2HOF5
1/4	3/8	4M3TU6	4-6 T2HOF5
5/16	1/8	5M3TU2	5-2 T2HOF5
5/16	1/4	5M3TU4	5-4 T2HOF5
3/8	1/8	6M3TU2	6-2 T2HOF5
3/8	1/4	6M3TU4	6-4 T2HOF5
3/8	3/8	6M3TU6	6-6 T2HOF5
1/2	3/8	8M3TU6	8-6 T2HOF5
5/8	1/2	10M3TU8	10-8 T2HOF5
3/4	3/4	12M3TU12	12-2 T2HOF5
1	1	16M3TU16	16-2 T2HOF5

FH0A, FH0A - Pipe thread to SAE straight thread adapter

Imperial tubing

Straight thread inch	NPT pipe thread	A-LOK® Part no.	CPI™ Part no.
1/4-18	7/16-20	4-4 FH0A	4-4 FH0A
3/8-18	9/16-18	6-6 FH0A	6-6 FH0A
1/2-14	3/4-16	8-8 FH0A	8-8 FH0A
3/4-14	1-1/16-12	12-12 FH0A	12-12 FH0A
1-11-1/2	1-5/16-12	16-16 FH0A	16-16 FH0A



AH2BZ, AH2LZ - Bulkhead to conversion adapter

Imperial tubing

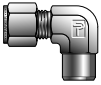
Tube O.D. inch	Straight thread	A-LOK® Part no.	CPI™ Part no.
1/4	9/16-18	4-6 AH2LZ	4-6 AH2BZ
3/8	9/16-18	6-6 AH2LZ	6-6 AH2BZ

Tube to welded systems

ZEBW, ZELW - Socket weld elbow

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/8	2-2 ZELW	2-2 ZEBW
3/16	3-3 ZELW	3-3 ZEBW
1/4	4-4 ZELW	4-4 ZEBW
3/8	6-6 ZELW	6-6 ZEBW
1/2	8-8 ZELW	8-8 ZEBW
5/8	10-10 ZELW	10-10 ZEBW
3/4	12-12 ZELW	12-12 ZEBW
1	16-16 ZELW	16-16 ZEBW



ZEBW2, ZELW2 - Buttweld elbow

Imperial tubing

Tube O.D. inch	Buttweld pipe size	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2-1/8 ZELW2	2-1/8 ZEBW2
3/16	1/8	3-1/8 ZELW2	3-1/8 ZEBW2
1/4	1/8	4-1/8 ZELW2	4-1/8 ZEBW2
1/4	1/4	4-1/4 ZELW2	4-1/4 ZEBW2
3/8	1/4	6-1/4 ZELW2	6-1/4 ZEBW2
1/2	3/8	8-3/8 ZELW2	8-3/8 ZEBW2
1/2	1/2	8-1/2 ZELW2	8-1/2 ZEBW2
5/8	1/2	10-1/2 ZELW2	10-1/2 ZEBW2
3/4	3/4	12-3/4 ZELW2	12-3/4 ZEBW2
1	3/4	16-3/4 ZELW2	16-3/4 ZEBW2
1	1	16-1 ZELW2	16-1 ZEBW2

ZHBW, ZHLW - Socket weld connector

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/8	2-2 ZHLW	2-2 ZHBW
3/16	3-3 ZHLW	3-3 ZHBW
1/4	4-4 ZHLW	4-4 ZHBW
3/8	6-6 ZHLW	6-6 ZHBW
1/2	8-8 ZHLW	8-8 ZHBW
5/8	10-10 ZHLW	10-10 ZHBW
3/4	12-12 ZHLW	12-12 ZHBW
1	16-16 ZHLW	16-16 ZHBW

ZHBW2, ZHLW2 - Buttweld connector

Imperial tubing

Tube O.D. inch	Buttweld pipe size	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2-1/8 ZHLW2	2-1/8 ZHBW2
3/16	1/8	3-1/8 ZHLW2	3-1/8 ZHBW2
1/4	1/8	4-1/8 ZHLW2	4-1/8 ZHBW2
1/4	1/4	4-1/8 ZHLW2	4-1/8 ZHBW2
5/16	1/8	5-1/8 ZHLW2	5-1/8 ZHBW2
5/16	1/4	5-1/8 ZHLW2	5-1/8 ZHBW2
3/8	1/4	6-1/8 ZHLW2	6-1/8 ZHBW2
3/8	3/8	6-1/8 ZHLW2	6-1/8 ZHBW2
3/8	1/2	6-1/8 ZHLW2	6-1/8 ZHBW2
3/8	3/4	6-1/8 ZHLW2	6-1/8 ZHBW2
1/2	3/8	8-1/8 ZHLW2	8-1/8 ZHBW2
1/2	1/2	8-1/8 ZHLW2	8-1/8 ZHBW2
1/2	3/4	8-1/8 ZHLW2	8-1/8 ZHBW2

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5/8	1/2	10-1/8 ZHLW2	10-1/8 ZHBW2
3/4	3/4	12-1/8 ZHLW2	12-1/8 ZHBW2
1	1	16-1/8 ZHLW2	16-1/8 ZHBW2

Metric tubing

Tube O.D. inch	Buttweld pipe size	A-LOK® Part no.	CPI™ Part no.
3	1/8	ZHLW2 3-1/8	ZHBW2 3-1/8
4	1/8	ZHLW2 4-1/8	ZHBW2 4-1/8
6	1/8	ZHLW2 6-1/8	ZHBW2 6-1/8
6	1/4	ZHLW2 6-1/4	ZHBW2 6-1/4
8	1/8	ZHLW2 8-1/8	ZHBW2 8-1/8
8	1/4	ZHLW2 8-1/4	ZHBW2 8-1/4
8	1/2	ZHLW2 8-1/2	ZHBW2 8-1/2
10	1/4	ZHLW2 10-3/8	ZHBW2 10-1/4
10	3/8	ZHLW2 10-1/4	ZHBW2 10-3/8
10	1/2	ZHLW2 10-1/2	ZHBW2 10-1/2
12	1/4	ZHLW2 12-1/4	ZHBW2 12-1/4
12	3/8	ZHLW2 12-3/8	ZHBW2 12-3/8
12	1/2	ZHLW2 12-1/2	ZHBW2 12-1/2
	1/2	ZHLW2 15-1/2	ZHBW2 15-1/2
16	1/2	ZHLW2 16-1/2	ZHBW2 16-1/2
18	1/2	ZHLW2 18-1/2	ZHBW2 18-1/2

Analytical fittings

Z2HCZ7, Z2HLZ7 - Column end fitting

Low internal volume with frit

Imperial tubing

Tube O.D. inch	Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/8	1/16	2-1 Z2HLZ7	2-1 Z2HCZ7
1/4	1/16	4-1 Z2HLZ7	4-1 Z2HCZ7
3/8	1/16	6-1 Z2HLZ7	6-1 Z2HCZ7

Z3HCZ7, Z3HLZ7 - Column end fitting

Low internal volume

Imperial tubing

Tube O.D. inch	Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/4	1/16	4-1 Z3HLZ7	4-1 Z3HCZ7
3/8	1/16	6-1 Z3HLZ7	6-1 Z3HCZ7
1/2	1/16	8-1 Z3HLZ7	8-1 Z3HCZ7
1	1/16	16-1 Z3HLZ7	16-1 Z3HCZ7

ZHCZ7, ZHLZ7 - Column end fitting

Low internal volume without frit

Imperial tubing

Tube O.D. inch	Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/8	1/16	2-1 ZHL7	2-1 ZHCZ7
1/4	1/16	4-1 ZHL7	4-1 ZHCZ
3/8	1/16	6-1 ZHL7	6-1 Z2HCZ7

Z2HCZ, Z2HLZ - Column end fitting

with frit

Imperial tubing

Tube O.D. inch	Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/8	1/16	2-1 Z2HLZ	2-1 Z2HCZ
1/4	1/16	4-1 Z2HLZ	4-1 Z2HCZ
3/8	1/16	6-1 Z2HLZ	6-1 Z2HCZ

ZHCZ, ZHLZ - Column end fitting

without frit

Imperial tubing

Tube O.D. inch	Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/8	1/16	2-1 ZH2Z	2-1 ZHCZ
1/4	1/16	4-1 ZH2Z	4-1 ZHCZ
3/8	1/16	6-1 ZH2Z	6-1 ZHCZ

Z7HBZ7-SS, Z7HLZ7 - Union connector

low dead volume

Imperial tubing

Tube O.D. inch	Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/16	1/16	1-1 Z7HLZ7	1-1 Z7HBZ7-SS
1/8	1/16	2-1 Z7HLZ7	2-1 Z7HBZ7-SS
1/8	1/8	2-2 Z7HLZ7	2-2 Z7HBZ7-SS

FBZ7, FLZ7 - Male connector

low dead volume

Imperial tubing

NPT tube O.D. inch	Pipe thread	A-LOK® Part no.	CPI™ Part no.
1/16	1/16	1-4 FLZ7	1-1 FBZ7
1/16	1/8	1-2 FLZ7	1-2 FBZ7
1/16	1/4	1-4 FLZ7	1-4 FBZ7

ZHBS, ZHLS - Sanitary flange fitting

Imperial tubing

Tube O.D. inch	Sanitary flange	A-LOK® Part no.	CPI™ Part no.
1/4	1/2	4-8 ZHLS-SS	4-8 ZHBS
1/4	3/4	4-12 ZHLS-SS	4-12 ZHBS
1/4	1	4-16 ZHLS-SS	4-16 ZHBS
1/4	1 1/2	4-24 ZHLS-SS	4-24 ZHBS
3/8	1/2	6-8 ZHLS-SS	6-8 ZHBS
3/8	3/4	6-12 ZHLS-SS	6-12 ZHBS
3/8	1	6-16 ZHLS-SS	6-16 ZHBS
3/8	1 1/2	6-24 ZHLS-SS	6-24 ZHBS
1/2	1/2	8-8 ZHLS-SS	8-8 ZHBS
1/2	3/4	8-12 ZHLS-SS	8-12 ZHBS
1/2	1	8-16 ZHLS-SS	8-16 ZHBS
1/2	1 1/2	8-24 ZHLS-SS	8-24 ZHBS

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Barbed fittings

B2HF, B2HF - Barbed connector to male pipe

Imperial tubing

Hose I.D. inch	Male Pipe	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2-2 B2HF	2-2 B2HF
1/8	1/4	2-4 B2HF	2-4 B2HF
1/4	1/8	4-2 B2HF	4-2 B2HF
1/4	1/4	4-4 B2HF	4-4 B2HF
5/16	1/8	5-2 B2HF	5-2 B2HF
5/16	1/4	5-4 B2HF	5-4 B2HF
3/8	1/4	6-4 B2HF	6-4 B2HF
3/8	3/8	6-6 B2HF	6-6 B2HF
1/2	3/8	8-6 B2HF	8-6 B2HF
1/2	1/2	8-8 B2HF	8-8 B2HF
3/4	3/4	12-12 B2HF	12-12 B2HF

B2HT2, B2TU - Barbed connector to tube adapter

Imperial tubing

Hose I.D. inch	Hose O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/8	1/8	2B2TU2	2-2 B2HT2
1/8	1/4	2B2TU4	2-4 B2HT2
1/4	1/4	4B2TU4	4-4 B2HT2
3/8	3/8	6B2TU6	6-6 B2HT2

HCS, HCS - Hose connector sleeve

Imperial tubing

Hose I.D. inch	Hose O.D. inch	Parker Part no.
1/8	1/4	HCS 2-4
1/4	3/8	HCS 4-6
1/4	7/16	HCS 4-7
1/4	1/2	HCS 4-8
1/4	9/16	HCS 4-9
5/16	7/16	HCS 5-7
3/8	1/2	HCS 6-8
3/8	9/16	HCS 6-9
1/2	11/16	HCS 8-11
3/4	1	HCS 12-16

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Components

TIZ - Insert

Imperial tubing

Tube O.D. inch	Parker Part no.
3/16	3 TIZ (.125)
1/4	4 TIZ (.125)
1/4	4 TIZ (.170)
1/4	4 TIZ (.188)
5/16	5 TIZ (.125)
5/16	5 TIZ (.188)
5/16	5 TIZ (.250)
3/8	6 TIZ (.188)
3/8	6 TIZ (.250)
1/2	8 TIZ (.250)
1/2	8 TIZ (.375)
5/8	10 TIZ (.375)
5/8	10 TIZ (.500)
3/4	12 TIZ (.500)
3/4	12 TIZ (.625)
1	16 TIZ (.750)
1	16 TIZ (.875)

Metric tubing

Tube O.D. mm	Parker Part no.
6	TIZ 6 (4)
8	TIZ 8 (6)
10	TIZ 10 (6)
10	TIZ 10 (8)
12	TIZ 12 (8)
12	TIZ 12 (10)
15	TIZ 15 (10)

BZ, NU - Tube nut

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/16	1NU1	1 BZ
1/8	2NU2	2 BZ
3/16	3NU3	3 BZ
1/4	4NU4	4 BZ
5/16	5NU5	5 BZ
3/8	6NU6	6 BZ
1/2	7NU8	8 BZ
5/8	10NU10	10 BZ
3/4	12NU12	12 BZ
7/8	14NU14	14 BZ
1	16NU16	16 BZ
1 1/4	20NU20	20 BZ
1 1/2	24NU24	24 BZ
2	32NU32	32 BZ

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Metric tubing

Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
5/16-20	NUM2	BZ 2
5/16-20	NUM3	BZ 3
3/8-20	NUM4	BZ 4
7/16-20	NUM6	BZ 6
1/2-20	NUM8	BZ 8
5/8-20	NUM10	BZ 10
3/4-20	NUM12	BZ 12
7/8-20	NUM14	BZ 14
7/8-20	NUM15	BZ 15
7/8-20	NUM16	BZ 16
1-20	NUM18	BZ 18
1.1/8-20	NUM20	BZ 20
1.1/8-20	NUM22	BZ 22
1.5/16-20	NUM25	BZ 25

BZ- Inverted tube nut

Imperial tubing

Tube O.D. inch	Parker Part no.
1/16	1 BZI
1/8	2 BZI

BZP - Knurled nut

Imperial tubing

Tube O.D. inch	Parker Part no.
1/16	1 BZP
1/8	2 BZP
3/16	3 BZP
1/4	4 BZP
5/16	5 BZP
3/8	6 BZP
1/2	8 BZP
5/8	10 BZP

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TZ - Ferrules

Imperial tubing

Tube O.D. inch	Parker Part no.
1/16	1 TZ
1/8	2 TZ
3/16	3 TZ
1/4	4 TZ
5/16	5 TZ
3/8	6 TZ
1/2	8 TZ
5/8	10 TZ
3/4	12 TZ
7/8	14 TZ
1	16 TZ
1 1/4	20 TZ
1 1/2	24 TZ
2	32 TZ

Metric tubing

Tube O.D. mm	Parker Part no.
	TZ 3
6	TZ 6
8	TZ 8
10	TZ 10
12	TZ 12
16	TZ 16
	TZ 20
	TZ 25

FF- Front ferrule

Imperial tubing

Tube O.D. inch	Parker Part no.
1/16	1 FF1
1/8	2 FF2
3/16	3 FF3
1/4	4 FF4
5/16	5 FF5
3/8	6 FF6
1/2	8 FF81
5/8	10 FF10
3/4	12 FF12
7/8	14 FF14
1	16 FF16
1 1/4	20 FF20
1 1/2	24 FF24
2	32 FF32

Metric tubing

Tube O.D. mm	Parker Part no.
2	FFM2
3	FFM3
4	FFM4
6	FFM6
8	FFM8
10	FFM10
12	FFM12
14	FFM14
15	FFM15
16	FFM16
18	FFM18
20	FFM20
22	FFM22
25	FFM25

BF-
Back ferrule

Imperial tubing

Tube O.D. inch	Parker Part no.
1/16	1 BF1
1/8	2 BF2
3/16	3 BF3
1/4	4 BF4
5/16	5 BF5
3/8	6 BF6
1/2	8 BF81
5/8	10 BF10
3/4	12 BF12
7/8	14 BF14
1	16 BF16
1 1/4	20 BF20
1 1/2	24 BF24
2	32 BF32

Metric tubing

Tube O.D. mm	Parker Part no.
2	BFM2
3	BFM3
4	BFM4
6	BFM6
8	BFM8
10	BFM10
12	BFM12
14	BFM14
15	BFM15
16	BFM16
18	BFM18
20	BFM20
22	BFM22
25	BFM25

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Ferrule holder

Imperial tubing

Tube O.D. inch	A-LOK® Part no. 1 holder	CPI™ Part no. 1 holder
1/8	2 ALOK-*-SET	2 CPI-*-SET
1/4	4 ALOK-*-SET	4 CPI-*-SET
3/8	6 ALOK-*-SET	6 CPI-*-SET
1/2	8 ALOK-*-SET	8 CPI-*-SET
3/4	12 ALOK-*-SET	12 CPI-*-SET
1	16 ALOK-*-SET	16 CPI-*-SET

Metric tubing

Tube O.D. mm	A-LOK® Part no. 1 holder	CPI™ Part no. 1 holder
6	M6 ALOK-*-SET	M6 CPI-*-SET
8	M8 ALOK-*-SET	M8 CPI-*-SET
10	M10 ALOK-*-SET	M10 CPI-*-SET
12	M12 ALOK-*-SET	M12 CPI-*-SET

*Material designator –
316-SS, B-Brass, S-Steel

FNZ, BLP - Plug

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/16	1BLP1	1 FNZ
1/8	2BLP2	2 FNZ
3/16	3BLP3	3 FNZ
1/4	4BLP4	4 FNZ
5/16	5BLP5	5 FNZ
3/8	6BLP6	6 FNZ
1/2	8BLP8	8 FNZ
5/8	10BLP10	10 FNZ
3/4	12BLP12	12 FNZ
7/8	14BLP14	14 FNZ
1	16BLP16	16 FNZ
1 1/4	20BLP20	20 FNZ
1 1/2	24BLP24	24 NZ
2	32BLP32	32 FNZ

Metric tubing

Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
2	BLPM2	FNZ 2
3	BLPM3	FNZ 3
4	BLPM4	FNZ 4
6	BLPM6	FNZ 6
8	BLPM8	FNZ 8
10	BLPM10	FNZ 10
12	BLPM12	FNZ 12
14	BLPM14	FNZ 14
15	BLPM15	FNZ 15
16	BLPM16	FNZ 16
18	BLPM18	FNZ 18
20	BLPM20	FNZ 20
22	BLPM22	FNZ 22
25	BLPM25	FNZ 25

PNBZ, BLEN - Cap

Imperial tubing

Tube O.D. inch	A-LOK® Part no.	CPI™ Part no.
1/16	1BLEN1	1 PNBZ
1/8	2BLEN2	2 PNBZ
3/16	3BLEN3	3 PNBZ
1/4	4BLEN4	4 PNBZ
5/16	5BLEN5	5 PNBZ
3/8	6BLEN6	6 PNBZ
1/2	8BLEN8	8 PNBZ
5/8	10BLEN10	10 PNBZ
3/4	12BLEN12	12 PNBZ
7/8	14BLEN14	14 PNBZ
1	16BLEN16	16 PNBZ
1 1/4	20BLEN20	20 PNBZ
1 1/2	24BLEN24	24 PNBZ
2	32BLEN32	32 PNBZ

Metric tubing

Tube O.D. mm	A-LOK® Part no.	CPI™ Part no.
2	BLENM2	PNBZ 2
3	BLENM3	PNBZ 3
4	BLENM4	PNBZ 4
6	BLENM6	PNBZ 6
8	BLENM8	PNBZ 8
10	BLENM10	PNBZ 10
12	BLENM12	PNBZ 12
14	BLENM14	PNBZ 14
15	BLENM15	PNBZ 15
16	BLENM16	PNBZ 16
18	BLENM18	PNBZ 18
20	BLENM20	PNBZ 20
22	BLENM22	PNBZ 22
25	BLENM25	PNBZ 25

MDF - Vent protector NPT male pipe thread

Imperial tubing

NPT thread inch	Parker Part no.
1/8-27	2 MDF
1/4-18	4 MDF
3/8-18	6 MDF
1/2-14	8 MDF
3/4-14	12 MDF
1-11-1/2	16 MDF

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Sealing Washers - Bonded seals

Imperial tubing

BSPP thread inch	Parker Part no.
1/8	M30201-SS
1/4	M30202-SS
3/8	M30203-SS
1/2	M30204-SS
3/4	M30206-SS
1	M30208-SS

Copper washers

For BSPP male thread sealing

thread inch	Parker Part no.
1/8	M28329-CU
1/4	M28330-CU
3/8	M28331-CU
1/2	M28332-CU
3/4	M28334-CU
1	M28336-CU

For BSPP female thread sealing

thread inch	Parker Part no.
1/8	M25179-CU
1/4	M25180-CU
3/8	M25181-CU
1/2	M25182-CU
3/4	M25184-CU
1	M25186-CU

WLZ- Bulkhead locknut

Imperial tubing

A-LOK® thread inch	Parker Part no.
10/32	1 WLZ
5/16-20	2 WLZ
3/8-20	3 WLZ
7/16-20	4 WLZ
1/2-20	5 WLZ
9/16-20	6 WLZ
3/4-20	8 WLZ
7/8-20	10 WLZ
1"-20	12 WLZ
1-1/8-20	14 WLZ
1-5/16-20	16 WLZ

WLN-
Bulkhead locknut

Imperial tubing

SAE ADJ straight thread inch	Parker Part no.
7/16-20	4 WLN
9/16-18	6 WLN
3/4-16	8 WLN
1-1/16-12	12 WLN
1/5/15-12	16 WLN

BN-
Bulkhead locknut

Metric tubing

SAE ADJ straight thread mm	Parker Part no.
5/16-20	2BN2
3/8-20	3BN3
7/16-20	4BN4
1/2-20	5BN5
5/8-20	BNM10
3/4-20	8BN8
7/8-20	10BN10
1-20	12BN12
1-1/8-20	14BN14
1-5/16-20	16BN16

L5N-
Accessory locknut

Imperial tubing

Straight thread inch	Parker Part no.
5/16-24	2 L5N
3/8-24	3 L5N
7/16-20	4 L5N
1/2-20	5 L5N
9/16-18	6 L5N
3/4-16	8 L5N
7/8-14	10 L5N
1-1/16-12	12 L5N
1-3/16-12	14 L5N
1-5/16-12	16 L5N

PHastite tube connectors

PS - Permanent union equal straight

Imperial tubing

Tube O.D. inch	Parker Part no.
1/4	PH-4-PS
3/8	PH-6-PS
1/2	PH-8-PS
5/8	PH-10-PS
3/4	PH-12-PS
7/8	PH-14-PS
41	PH-16-PS

Metric tubing

Tube O.D. mm	Parker Part no.
6	PH-M6-PS
8	PH-M8-PS
10	PH-M10-PS
12	PH-M12-PS
14	PH-M14-PS
16	PH-M16-PS
18	PH-M18-PS
20	PH-M20-PS
22	PH-M22-PS
25	PH-M25-PS

PE - Permanent union equal elbow

Imperial tubing

Tube O.D. inch	Parker Part no.
1/4	PH-4-PE
3/8	PH-6-PE
1/2	PH-8-PE
5/8	PH-10-PE
3/4	PH-12-PE
7/8	PH-14-PE
1	PH-16-PE

Metric tubing

Tube O.D. mm	Parker Part no.
6	PH-M6-PE
8	PH-M8-PE
10	PH-M10-PE
12	PH-M12-PE
14	PH-M14-PE
16	PH-M16-PE
18	PH-M18-PE
20	PH-M20-PE
22	PH-M22-PE
25	PH-M25-PE

PT - Permanent union equal tee

Imperial tubing

Tube O.D. inch	Parker Part no.
1/4	PH-4-PT
3/8	PH-6-PT
1/2	PH-8-PT
5/8	PH-10-PT
3/4	PH-12-PT
7/8	PH-14-PT
1	PH-16-PT

Metric tubing

Tube O.D. mm	Parker Part no.
6	PH-M6-PT
8	PH-M8-PT
10	PH-M10-PT
12	PH-M12-PT
14	PH-M14-PT
16	PH-M16-PT
18	PH-M18-PT
20	PH-M20-PT
22	PH-M22-PT
25	PH-M25-PT

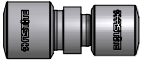
PC - Permanent union equal cross

Imperial tubing

Tube O.D. inch	Parker Part no.
1/4	PH-4-PC
3/8	PH-6-PC
1/2	PH-8-PC
5/8	PH-10-PC
3/4	PH-12-PC
7/8	PH-14-PC
1	PH-16-PC

Metric tubing

Tube O.D. mm	Parker Part no.
6	PH-M6-PC
8	PH-M8-PC
10	PH-M10-PC
12	PH-M12-PC
14	PH-M14-PC
16	PH-M16-PC
18	PH-M18-PC
20	PH-M20-PC
22	PH-M22-PC
25	PH-M25-PC



PS - Permanent union drop size straight

Imperial tubing

Tube O.D. inch	Tube O.D. inch	Parker Part no.
3/8	1/4	PH-6-4-PS
1/2	3/8	PH-8-6-PS
5/8	1/2	PH-10-8-PS
3/4	5/8	PH-12-10-PS
7/8	3/4	PH-14-12-PS
1	7/8	PH-16-14-PS

Metric tubing

Tube O.D. mm	Tube O.D. mm	Parker Part no.
8	6	PH-M8-M6-PS
10	8	PH-M10-M8PS
12	10	PH-M12-M10PS
14	12	PH-M14-M12-PS
16	14	PH-M16-M14-PS
18	16	PH-M18-M16-PS
20	18	PH-M20-M18-PS
22	20	PH-M22-M20-PS
25	22	PH-M25-M22-PS

TR - Tube reducer

Imperial tubing

Tube O.D. inch	Tube O.D. inch	Parker Part no.
3/8	1/4	PH-6-4-TR
1/2	1/4	PH-8-4-TR
1/2	3/8	PH-8-6-TR
5/8	3/8	PH-10-6-TR
5/8	1/2	PH-10-8-TR
3/4	1/2	PH-12-8-TR
3/4	5/8	PH-12-10-TR
7/8	1/2	PH-14-8-TR
7/8	5/8	PH-14-10-TR
7/8	3/4	PH-14-12-TR
1	1/2	PH-16-8-TR
1	5/8	PH-16-10-TR
1	3/4	PH-16-12-TR
1	7/8	PH-16-14-TR

Metric tubing

Tube O.D. mm	Tube O.D. mm	Parker Part no.
8	6	PH-M8-M6-TR
10	6	PH-M10-M6-TR
10	8	PH-M10-M8-TR
12	6	PH-M12-M6-TR
12	8	PH-M12-M8-TR
12	10	PH-M12-M10-TR
14	10	PH-M14-M10-TR
14	12	PH-M14-M12-TR
16	12	PH-M16-M12-TR
16	14	PH-M16-M14-TR
18	14	PH-M18-M14-TR
18	16	PH-M18-M16-TR
20	16	PH-M20-M16-TR
20	18	PH-M20-M18-TR
22	16	PH-M22-M16-TR
22	18	PH-M22-M18-TR
22	20	PH-M22-M20-TR
25	12	PH-M25-M12-TR
25	14	PH-M25-M14-TR
25	16	PH-M25-M16-TR

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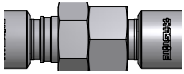
25	18	PH-M25-M18-TR
25	20	PH-M25-M20-TR
25	22	PH-M25-M22-TR



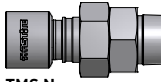
TPS - Termination to permanent union equal straight

Imperial tubing

Tube O.D. inch	Parker Part no.
1/4	PH-4-4-TPS
3/8	PH-6-6-TPS
1/2	PH-8-8-TPS
5/8	PH-10-10-TPS
3/4	PH-12-12-TPS
7/8	PH-14-14-TPS
1	PH-16-16-TPS

Metric tubing

Tube O.D. mm	Parker Part no.
6	PH-M6-M6-TPS
8	PH-M8-M8-TPS
10	PH-M6-M6-TPS
12	PH-M6-M6-TPS
14	PH-M6-M6-TPS
16	PH-M6-M6-TPS
18	PH-M6-M6-TPS
20	PH-M6-M6-TPS
22	PH-M6-M6-TPS
25	PH-M6-M6-TPS



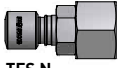
TMS N - Termination male straight NPT

Imperial tubing

Tube O.D. inch	NPT thread	Parker Part no.
1/4	1/4	PH-4-4N-TMS
3/8	1/4	PH-6-4N-TMS
3/8	3/8	PH-6-6N-TMS
1/2	1/2	PH-8-8N-TMS
5/8	3/4	PH-10-12N-TMS
3/4	3/4	PH-12-12N-TMS
7/8	1	PH-14-16N-TMS
1	1	PH16-16N-TMS

Metric tubing

Tube O.D. mm	NPT thread	Parker Part no.
6	1/4	PH-M6-4N-TPS
8	1/4	PH-M8-4N-TPS
8	3/8	PH-M8-6N-TPS
10	1/4	PH-M10-4N-TPS
10	3/8	PH-M10-6N-TPS
12	1/2	PH-M12-8N-TPS
14	1/2	PH-M14-8N-TPS
16	3/4	PH-M16-12N-TPS
18	3/4	PH-M18-12N-TPS
20	3/4	PH-M20-12N-TPS
22	1	PH-M22-16N-TPS
25	1	PH-M25-16N-TPS



TFS N - Termination female straight NPT

Imperial tubing

Tube O.D. inch	NPT thread	Parker Part no.
1/4	1/4	PH-4-4N-TFS
3/8	1/4	PH-6-4N-TFS
3/8	3/8	PH-6-6N-TFS
1/2	1/2	PH-8-8N-TFS
5/8	3/4	PH-10-12N-TFS
3/4	3/4	PH-12-12N-TFS
7/8	1	PH-14-16N-TFS
1	1	PH16-16N-TFS

Metric tubing

Tube O.D. mm	NPT thread	Parker Part no.
6	1/4	PH-M6-4N-TFS
8	1/4	PH-M8-4N-TFS
8	3/8	PH-M8-6N-TFS
10	1/4	PH-M10-4N-TFS
10	3/8	PH-M10-6N-TFS
12	1/2	PH-M12-8N-TFS
14	1/2	PH-M14-8N-TFS
16	3/4	PH-M16-12N-TFS
18	3/4	PH-M18-12N-TFS
20	3/4	PH-M20-12N-TFS
22	1	PH-M22-16N-TFS
25	1	PH-M25-16N-TFS

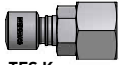
TMS K - Termination male straight BSPT

Imperial tubing

Tube O.D. inch	BSPT thread	Parker Part no.
1/4	1/4	PH-4-4K-TMS
3/8	1/4	PH-6-4K-TMS
3/8	3/8	PH-6-6K-TMS
1/2	1/2	PH-8-8K-TMS
5/8	3/4	PH-10-12K-TMS
3/4	3/4	PH-12-12K-TMS
7/8	1	PH-14-16K-TMS
1	1	PH16-16K-TMS

Metric tubing

Tube O.D. mm	BSPT thread	Parker Part no.
6	1/4	PH-M6-4K-TMS
8	1/4	PH-M8-4K-TMS
8	3/8	PH-M8-6K-TMS
10	1/4	PH-M10-4K-TMS
10	3/8	PH-M10-6K-TMS
12	1/2	PH-M12-8K-TMS
14	1/2	PH-M14-8K-TMS
16	3/4	PH-M16-12K-TMS
18	3/4	PH-M18-12K-TMS
20	3/4	PH-M20-12K-TMS
22	1	PH-M22-16K-TMS
25	1	PH-M25-16K-TMS



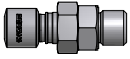
TFS K - Termination female straight BSPT

Imperial tubing

Tube O.D. inch	BSPT thread	Parker Part no.
1/4	1/4	PH-4-4K-TFS
3/8	1/4	PH-6-4K-TFS
3/8	3/8	PH-6-6K-TFS
1/2	1/2	PH-8-8K-TFS
5/8	3/4	PH-10-12K-TFS
3/4	3/4	PH-12-12K-TFS
7/8	1	PH-14-16K-TFS
1	1	PH16-16K-TFS

Metric tubing

Tube O.D. mm	BSPT thread	Parker Part no.
6	1/4	PH-M6-4K-TFS
8	1/4	PH-M8-4K-TFS
8	3/8	PH-M8-6K-TFS
10	1/4	PH-M10-4K-TFS
10	3/8	PH-M10-6K-TFS
12	1/2	PH-M12-8K-TFS
14	1/2	PH-M14-8K-TFS
16	3/4	PH-M16-12K-TFS
18	3/4	PH-M18-12K-TFS
20	3/4	PH-M20-12K-TFS
22	1	PH-M22-16K-TFS
25	1	PH-M25-16K-TFS



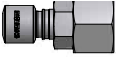
TMS R - Termination male straight BSPP

Imperial tubing

Tube O.D. inch	BSPP thread	Parker Part no.
1/4	1/4	PH-4-4R-TMS
3/8	1/4	PH-6-4R-TMS
3/8	3/8	PH-6-6R-TMS
1/2	1/2	PH-8-8R-TMS
5/8	3/4	PH-10-12R-TMS
3/4	3/4	PH-12-12R-TMS
7/8	1	PH-14-16R-TMS
1	1	PH16-16R-TMS

Metric tubing

Tube O.D. mm	BSPP thread	Parker Part no.
6	1/4	PH-M6-4R-TMS
8	1/4	PH-M8-4R-TMS
8	3/8	PH-M8-6R-TMS
10	1/4	PH-M10-4R-TMS
10	3/8	PH-M10-6R-TMS
12	1/2	PH-M12-8R-TMS
14	1/2	PH-M14-8R-TMS
16	3/4	PH-M16-12R-TMS
18	3/4	PH-M18-12R-TMS
20	3/4	PH-M20-12R-TMS
22	1	PH-M22-16R-TMS
25	1	PH-M25-16R-TMS



TFS R - Termination female straight BSPP

Imperial tubing

Tube O.D. inch	BSPP thread	Parker Part no.
1/4	1/4	PH-4-4R-TFS
3/8	1/4	PH-6-4R-TFS
3/8	3/8	PH-6-6R-TFS
1/2	1/2	PH-8-8R-TFS
5/8	3/4	PH-10-12R-TFS
3/4	3/4	PH-12-12R-TFS
7/8	1	PH-14-16R-TFS
1	1	PH16-16R-TFS

Metric tubing

Tube O.D. mm	BSPP thread	Parker Part no.
6	1/4	PH-M6-4R-TFS
8	1/4	PH-M8-4R-TFS
8	3/8	PH-M8-6R-TFS
10	1/4	PH-M10-4R-TFS
10	3/8	PH-M10-6R-TFS
12	1/2	PH-M12-8R-TFS
14	1/2	PH-M14-8R-TFS
16	3/4	PH-M16-12R-TFS
18	3/4	PH-M18-12R-TFS
20	3/4	PH-M20-12R-TFS
22	1	PH-M22-16R-TFS
25	1	PH-M25-16R-TFS

TXAS - Termination male straight 20,000 PSI* medium pressure

Imperial tubing

Tube O.D. inch	MP size	Parker Part no.
1/4	1/4	PH-4-4-TXAS
3/8	3/8	PH-6-6-TXAS
1/2	9/16	PH-8-9-TXAS
5/8	9/16	PH-10-9-TXAS
3/4	3/4	PH-12-12-TXAS
7/8	1	PH-14-16-TXAS
1	1	PH16-16-TXAS

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Metric tubing

Tube O.D. mm	MP size	Parker Part no.
6	1/4	PH-M6-4-TXAS
8	3/8	PH-M8-6-TXAS
10	3/8	PH-M10-6-TXAS
12	9/16	PH-M12-9-TXAS
14	9/16	PH-M14-9-TXAS
16	9/16	PH-M16-9-TXAS
18	3/4	PH-M18-12-TXAS
20	3/4	PH-M20-12-TXAS
22	1	PH-M22-16-TXAS
25	1	PH-M25-16-TXAS

MPI™ Medium pressure fittings

FBMP7 - MPI™ to male NPT connector

Imperial tubing

MPI™ size	NPT thread	Parker Part no.
1/4	1/8	4-2 FBMP7
1/4	1/4	4-4 FBMP7
1/4	3/8	4-6 FBMP7
1/4	1/2	4-8 FBMP7
3/8	1/4	6-4 FBMP7
3/8	3/8	6-6 FBMP7
3/8	1/2	6-8 FBMP7
1/2	3/8	8-6 FBMP7
1/2	1/2	8-8 FBMP7
9/16	3/8	9-6 FBMP7
9/16	1/2	9-8 FBMP7
3/4	1/2	12-8 FBMP7
3/4	3/4	12-12 FBMP7
1	3/4	16-12 FBMP7
1	1	16-16 FBMP7

XHBMP7 - 37° Flare to MPI™ connector

Imperial tubing

MPI™ size	37° Flare adapter	Thread	Parker Part no.
1/4	1/4	7/16	4-4 XHBMP7
1/4	1/4	7/16	4-6 XHBMP7
1/2	1/4	7/16	4-8 XHBMP7
9/16	1/4	7/16	4-9 XHBMP7
1/4	3/8	9/16	6-4 XHBMP7
3/8	3/8	9/16	6-6 XHBMP7
1/2	3/8	9/16	6-8 XHBMP7
9/16	3/8	9/16	6-9 XHBMP7
3/8	1/2	3/4	8-6 XHBMP7
1/2	1/2	3/4	8-8 XHBMP7
9/16	1/2	3/4	8-12 XHBMP7
3/4	1/2	1-1/16	12-12 XHBMP7
1	1	1-5/16	16-16 XHBMP7

MP7H2BX - 37° Flare bulkhead to MPI™ connector

Imperial tubing

MPI™ size	37° Flare adapter	Thread	Parker Part no.
1/4	1/4	7/16	4-4 MP7H2BX
3/8	3/8	9/16	6-6 MP7H2BX
1/2	1/2	3/4	8-8 MP7H2BX
9/16	1/2	3/4	9-8 MP7H2BX

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X41HBMP7 - High pressure to MPI™ connector

Imperial tubing

MPI™ size	Thread	Parker Part no.
1/4	9/16	4-4 X41HBMP7
3/8	9/16	4-6 X41HBMP7
1/4	3/4	6-4 X41HBMP7
3/8	3/4	6-6 X41HBMP7
9/16	3/4	6-9 X41HBMP7
3/8	1-1/8	9-6 X41HBMP7
9/16	1-1/8	9-9 X41HBMP7
3/4	1-1/8	9-12 X41HBMP7

X42HBMP7 - Medium pressure to MPI™ connector

Imperial tubing

MPI™ size	Thread	Parker Part no.
1/4	7/16	4-4 X42HBMP7
3/8	7/16	4-6 X42HBMP7
9/16	7/16	4-9 X42HBMP7
1/4	9/16	6-4 X42HBMP7
3/8	9/16	6-6 X42HBMP7
1/2	9/16	6-8 X42HBMP7
9/16	9/16	6-9 X42HBMP7
1/4	13/16	9-4 X42HBMP7
3/8	13/16	9-6 X42HBMP7
1/2	13/16	9-8 X42HBMP7
9/16	13/16	9-9 X42HBMP7
3/4	3/4	9-12 X42HBMP7
9/16	3/4	12-9 X42HBMP7
3/4	3/4	12-12 X42HBMP7
1	3/4	12-16 X42HBMP7

GBMP7 - MPI™ female NPT connector

Imperial tubing

MPI™ size	NPT thread	Parker Part no.
1/4	1/8	4-2 GBMP7
1/4	1/4	4-4 GBMP7
1/4	3/8	4-6 GBMP7
1/4	1/2	4-8 GBMP7
3/8	1/8	6-2 GBMP7
3/8	1/4	6-4 GBMP7
3/8	3/8	6-6 GBMP7
3/8	1/2	6-8 GBMP7
1/2	1/4	8-4 GBMP7
1/2	3/8	8-6 GBMP7
1/2	1/2	8-8 GBMP7
9/16	1/4	9-4 GBMP7
9/16	3/8	9-6 GBMP7
9/16	1/2	9-8 GBMP7
3/4	1/2	12-8 GBMP7

MP7HBA - MPI™ to SAE male O-ring connector

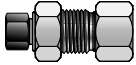
Imperial tubing

MPI™ size	Thread	Parker Part no.
1/4	7/16	4-4 MP7HBA
1/4	9/16	4-6 MP7HBA
1/4	3/4	4-8 MP7HBA
3/8	7/16	6-4 MP7HBA
3/8	9/16	6-6 MP7HBA
3/8	3/4	6-8 MP7HBA
1/2	7/16	8-4 MP7HBA
1/2	9/16	8-6 MP7HBA
1/2	3/4	8-8 MP7HBA
9/16	9/16	9-6 MP7HBA
9/16	3/4	9-8 MP7HBA

M40HBMP7 - Type “M” high pressure hose to MPI™ connector

Imperial tubing

MPI™ size	Thread	Parker Part no.
1/4	9/16	6-4 M40HBMP7
3/8	9/16	6-6 M40HBMP7
3/8	3/4	8-6 M40HBMP7
1/2	3/4	8-8 M40HBMP7
9/16	3/4	8-9 M40HBMP7
1/4	7/8	10-4 M40HBMP7
3/8	7/8	10-6 M40HBMP7
1/2	1	11-8 M40HBMP7
9/16	1	11-9 M40HBMP7
3/4	1	11-12 M40HBMP7
1	1-5/16	16-16 M40HBMP7



GH2BMP7 - MPI™ bulkhead to female NPT connector

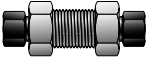
Imperial tubing

MPI™ size	NPT thread	Parker Part number
1/4	1/4	4-4 GH2BMP7
3/8	1/2	6-8 GH2BMP7
3/8	3/4	6-12 GH2BMP7
1/2	3/4	8-12 GH2BMP7
9/16	1/4	9-4 GH2BMP7

HBMP7 - MPI™ to union connector

Imperial tubing

MPI™ size	Parker Part number
1/4	4-4 HBMP7
3/8 - 1/4	6-4 HBMP7
3/8	6-6 HBMP7
1/2 - 1/4	8-4 HBMP7
1/2 - 3/8	8-6 HBMP7
1/2	8-8 HBMP7
9/16 - 1/4	9-4 HBMP7
9/16 - 3/8	9-6 HBMP7
9/16 - 1/2	9-8 HBMP7
9/16	9-9 HBMP7
3/4 - 3/8	12-6 HBMP7
3/4 - 9/16	12-9 HBMP7
3/4	12-12 HBMP7
1	16-16 HBMP7



WBMP7 - MPI™ bulkhead union connector

Imperial tubing

MPI™ size	Parker Part number
1/4	4-4 WBMP7
3/8	6-6 WBMP7
1/2	8-8 WBMP7
1/2 - 9/16	8-9 WBMP7
9/16 - 1/2	9-8 WBMP7
9/16	9-9 WBMP7
3/4	12-12 WBMP7
1	16-16 WBMP7

GM7 - MPI™ male end to female NPT

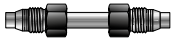
Imperial tubing

MPI™ size	Parker Part number
1/4	4-4 GM7
1/4	4-6 GM7
3/8	6-4 GM7
3/8	6-6 GM7
3/8	6-8 GM7
1/2	8-4 GM7
1/2	8-6 GM7
1/2	8-8 GM7
9/16	9-4 GM7
9/16	9-6 GM7
9/16	9-8 GM7
3/4	12-4 GM7
3/4	12-6 GM7
3/4	12-8 GM7

GM7 - MPI™ male end to high pressure C&T port

Imperial tubing

MPI™ size	C&T port size	Parker Part number
1/4	1/4	4-4HF GM7
3/8	1/4	6-4HF GM7
3/8	3/8	6-6HF GM7
1/2	1/4	8-4HF GM7
1/2	3/8	8-6HF GM7
9/16	1/4	9-4HF GM7
9/16	3/8	9-6HF GM7
3/4	1/4	12-4HF GM7
3/4	3/8	12-6HF GM7

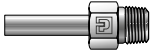


T7HBT7 - MPI™ tube port connector

Imperial tubing

MPI™ size	Parker Part number
1/4	* 4 T7HBT7-SS
1-4	4 T7HBT7-SS 4.0
1/4	4 T7HBT7-SS 6.0
1/4	4 T7HBT7-SS 8.0
1/4	4 T7HBT7-SS 10.0
1/4	4 T7HBT7-SS 12.0
3/8	* 6 T7HBT7-SS
3/8	6 T7HBT7-SS 4.0
3/8	6 T7HBT7-SS 6.0
3/8	6 T7HBT7-SS 8.0
3/8	6 T7HBT7-SS 10.0
3/8	6 T7HBT7-SS 12.0
9/16	* 9 T7HBT7-SS
9/16	9 T7HBT7-SS 6.0
9/16	9 T7HBT7-SS 8.0
9/16	9 T7HBT7-SS 10.0
9/16	9 T7HBT7-SS 12.0
3/4	* 12 T7HBT7-SS
3/4	12 T7HBT7-SS 6.0
3/4	12 T7HBT7-SS 8.0
3/4	12 T7HBT7-SS 10.0
3/4	12 T7HBT7-SS 12.0

*Same assemble length as MP7PC



T7HF - MPI™ tube stub to male NPT pipe

Imperial tubing

MPI™ size	NPT thread	Parker Part no.
1/4	1/4	4-4 T7HF
1/4	3/8	4-6 T7HF
1/4	1/2	4-8 T7HF
3/8	1/4	6-4 T7HF
3/8	3/8	6-6 T7HF
3/8	1/2	6-8 T7HF
1/2	1/4	8-4 T7HF
1/2	3/8	8-6 T7HF

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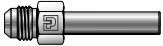
1/2	1/2	8-8 T7HF
9/16	1/4	9-4 T7HF
9/16	3/8	9-6 T7HF
9/16	1/2	9-8 T7HF
9/16	3/4	9-12 T7HF
3/4	1/2	12-8 T7HF
3/4	3/4	12-12 T7HF



XHT7 - 37° Flare to MPI™ tube stub

Imperial tubing

MPI™ size	37° Flare adapter	Parker Part no.
1/4	1/4	4-4 XHT7
3/8	1/4	4-6 XHT7
1/4	3/8	6-4 XHT7
3/8	3/8	6-6 XHT7
1/2	3/8	6-8 XHT7
9/16	3/8	6-9 XHT7
3/8	1/2	8-6 XHT7
1/2	1/2	8-8 XHT7
9/16	1/2	8-9 XHT7

X41HT7 - High pressure to MPI™ tube stub

Imperial tubing

MPI™ size	High pressure adapter	Parker Part no.
1/4	1/4	4-4 X41HT7
3/8	1/4	4-6 X41HT7
1/2	1/4	4-8 X41HT7
9/16	1/4	4-9 X41HT7
1/4	3/8	6-4 X41HT7
3/8	3/8	6-6 X41HT7
1/2	3/8	6-8 X41HT7
9/16	3/8	6-9 X41HT7
1/4	9/16	9-4 X41HT7
3/8	9/16	9-6 X41HT7
1/2	9/16	9-8 X41HT7
9/16	9/16	9-9 X41HT7

X47HT7 - Medium pressure port connector to MPI™ tube stub

Imperial tubing

MPI™ Port connector #1	MPI™ Tube stub #2	Parker Part no.
1	9/16	16-9 X47HT7
1	3/4	16-12 X47HT7
1	1	16-16 X47HT7

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X42HT7 - Medium pressure to MPI™ tube stub

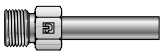
Imperial tubing

Adapter size	MPI™ size	Parker Part no.
1/4	1/4	4-4 X42HT7
1/4	3/8	4-6 X42HT7
1/4	1/2	4-8 X42HT7
1/4	9/16	4-9 X42HT7
3/8	1/4	6-4 X42HT7
3/8	3/8	6-6 X42HT7
3/8	1/2	6-8 X42HT7
3/8	9/16	6-9 X42HT7
9/16	1/4	9-4 X42HT7
9/16	3/8	9-6 X42HT7
9/16	1/2	9-8 X42HT7
9/16	9/16	9-9 X42HT7
9/16	3/4	9-12 X42HT7
3/4	9/16	12-9 X42HT7
3/4	3/4	12-12 X42HT7

T7H0A - MPI™ tube stub to male SAE O-ring

Imperial tubing

MPI™ size	SAE size	Parker Part no.
1/4	1/4	4-4 T7HOA
1/4	3/8	4-6 T7HOA
1/4	1/2	4-8 T7HOA
3/8	1/4	6-4 T7HOA
3/8	3/8	6-6 T7HOA
3/8	1/2	6-8 T7HOA
1/2	1/4	8-4 T7HOA
1/2	3/8	8-6 T7HOA
1/2	1/2	8-8 T7HOA
9/16	1/4	9-4 T7HOA
9/16	3/8	9-6 T7HOA
9/16	1/2	9-8 T7HOA



M40HT7 - Type “M” high pressure hose adapter to MPI™ tube stub

Imperial tubing

Hose adapter	MPI™ size	Thread	Parker Part no.
-6	1/4	9/16	6-4 M40HT7
-6	3/8	9/16	6-6 M40HT7
-8	3/8	3/4	8-6 M40HT7
-8	9/16	3/4	8-9 M40HT7
-11	3/8	1	11-6 M40HT7
-11	9/16	1	11-9 M40HT7
-11	3/4	1	11-12 M40HT7
-16	3/4	1-5/16	16-12 M40HT7
-16	1	1-5/16	16-16M40HT7

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TRBMP7 - MPI™ tube stub reducer

Imperial tubing

MPI™ Tube stub #1	MPI™ size #2	Parker Part no.
1/4	3/8	4-6 TRBMP7
1/4	1/2	4-8 TRBMP7
1/4	9/16	4-9 TRBMP7
3/8	1/4	6-4 TRBMP7
3/8	1/2	6-8 TRBMP7
3/8	9/16	6-9 TRBMP7
1/2	1/4	8-4 TRBMP7
1/2	3/8	8-6 TRBMP7
9/16	1/4	9-4 TRBMP7
9/16	3/8	9-6 TRBMP7
9/16	3/4	9-12 TRBMP7
3/4	1/4	12-4 TRBMP7
3/4	3/8	12-6 TRBMP7
3/4	9/16	12-9 TRBMP7

T7HG - MPI™ tube stub to female NPT pipe

Imperial tubing

MPI™ size	NPT thread	Parker Part no.
1/4	1/8	4-2 T7HG
1/4	1/4	4-4 T7HG
1/4	1/2	4-8 T7HG
3/8	1/8	6-2 T7HG
3/8	1/4	6-4 T7HG
3/8	1/2	6-8 T7HG
1/2	1/8	8-2 T7HG
1/2	1/4	8-4 T7HG
1/2	1/2	8-8 T7HG
9/16	1/4	9-4 T7HG
9/16	1/2	9-8 T7HG
3/4	1/2	12-8 T7HG
3/4	3/4	12-12 T7HG
1	1	16-16 T7HG

MP7PC - MPI™ port connector

Imperial tubing

MPI™ Tube stub #1	MPI™ port #2	Parker Part no.
1/4	1/4	4-4 MP7PC
1/4	3/8	4-6 MP7PC
3/8	3/8	6-6 MP7PC
3/8	1/2	6-8 MP7PC
3/8	9/16	6-9 MP7PC
1/2	1/2	8-8 MP7PC
9/16	9/16	9-9 MP7PC
9/16	3/4	9-12 MP7PC
3/4	3/4	12-12 MP7PC
3/4	1	12-16 MP7PC
1	1	16-16 MP7PC

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NBMP7 - 45° MPI™ union elbow

Imperial tubing

MPI™ size	Parker Part no.
1/4	4-4 NBMP7
3/8	6-6 NBMP7
1/2	8-8 NBMP7
9/16	9-9 NBMP7
3/4	12-12 NBMP7

T7NBT7 - 45° MPI™ tube stub elbow

Imperial tubing

MPI™ size	Parker Part no.
1/4	4 T7NBT7-SS
1/4	* 4 T7NBT7-SS 2.9
1/4	4 T7NBT7-SS 6.0
1/4	4 T7NBT7-SS 8.0
1/4	4 T7NBT7-SS 10.0
1/4	4 T7NBT7-SS 12.0
3/8	6 T7NBT7-SS
3/8	* 6 T7NBT7-SS 3.4
3/8	6 T7NBT7-SS 6.0
3/8	6 T7NBT7-SS 8.0
3/8	6 T7NBT7-SS 10.0
3/8	6 T7NBT7-SS 12.0
9/16	9 T7NBT7-SS
9/16	* 9 T7NBT7-SS 4.2
9/16	9 T7NBT7-SS 6.0
9/16	9 T7NBT7-SS 8.0
9/16	9 T7NBT7-SS 10.0
9/16	9 T7NBT7-SS 12.0
3/4	12 T7NBT7-SS
3/4	12 T7NBT7-SS 5.1
3/4	12 T7NBT7-SS 6.0
3/4	12 T7NBT7-SS 8.0
3/4	12 T7NBT7-SS 10.0
3/4	12 T7NBT7-SS 12.0

*Similar assembled lengths as NBMP7 with two (2) MP7PC's

EBMP7 - MPI™ union elbow

Imperial tubing

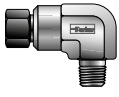
MPI™ size	Parker Part no.
1/4	4-4 EBMP7
3/8	6-6 EBMP7
1/2	8-8 EBMP7
9/16	9-9 EBMP7
3/4	12-12 EBMP7
1	16-16 EBMP7

T7EBT7 - MPI™ tube elbow

Imperial tubing

MPI™ size	Parker Part no.
1/4	4 T7EBT7-SS
1/4	* 4 T7EBT7-SS 2.9
1/4	4 T7EBT7-SS 6.0
1/4	4 T7EBT7-SS 8.0
1/4	4 T7EBT7-SS 10.0
1/4	4 T7EBT7-SS 12.0
3/8	6 T7EBT7-SS
3/8	* 6 T7EBT7-SS 3.5
3/8	6 T7EBT7-SS 6.0
3/8	6 T7EBT7-SS 8.0
3/8	6 T7EBT7-SS 10.0
3/8	6 T7EBT7-SS 12.0
9/16	* 9 T7EBT7-SS
9/16	9 T7EBT7-SS 6.0
9/16	9 T7EBT7-SS 8.0
9/16	9 T7EBT7-SS 10.0
9/16	9 T7EBT7-SS 12.0
3/4	12 T7EBT7-SS
3/4	12 T7EBT7-SS 6.0
3/4	12 T7EBT7-SS 8.0
3/4	12 T7EBT7-SS 10.0
3/4	12 T7EBT7-SS 12.0

*Same assembled lengths as EBMP7 with two (2) MP7PC's



CBMP7 - MPI™ to male NPT elbow

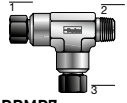
Imperial tubing

MPI™ size	NPT thread	Parker Part no.
1/4	1/4	4-4 CBMP7
1/4	3/8	4-6 CBMP7
1/4	1/2	4-8 CBMP7
3/8	1/4	6-4 CBMP7
3/8	3/8	6-6 CBMP7
3/8	1/2	6-8 CBMP7

JBMP7 - MPI™ union tee

Imperial tubing

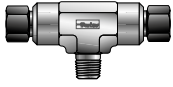
MPI™ size #1	MPI™ size #2	MPI™ size #3	Parker Part no.
1/4	1/4	1/4	4-4-4 JBMP7
3/8	3/8	3/8	6-6-6 JBMP7
1/2	1/2	1/2	8-8-8 JBMP7
9/16	9/16	9/16	9-9-9 JBMP7
3/4	3/4	3/4	12-12-12 JBMP7
1	1	1	16-16-16 JBMP7
1/4	1/4	3/8	4-4-6 JBMP7
3/8	3/8	1/4	6-6-4 JBMP7
3/8	1/4	1/4	6-4-4 JBMP7
3/8	3/8	1/2	6-6-8 JBMP7
3/8	3/8	9/16	6-6-9 JBMP7
1/2	1/2	3/8	8-8-6 JBMP7
1/2	3/8	3/8	8-6-6 JBMP7
9/16	9/16	1/4	9-9-4 JBMP7
9/16	9/16	3/8	9-9-6 JBMP7
9/16	3/8	1/4	9-6-4 JBMP7
9/16	3/8	3/8	9-6-6 JBMP7
3/4	3/4	9/16	12-12-9 JBMP7
1	1	9/16	16-16-9 JBMP7
1	1	3/4	16-16-12 JBMP7



RBMP7 - MPI™ to male run NPT tee

Imperial tubing

MPI™ size #1	NPT thr'd #2	MPI™ size #3	Parker Part no.
1/4	1/4-18	1/4	4-4-4 RBMP7
1/4	1/4-18	3/8	4-4-6 RBMP7
1/4	3/8-18	1/4	4-6-4 RBMP7
1/4	3/8-18	3/8	4-6-6 RBMP7
3/8	1-4-18	1/4	6-4-4 RBMP7
3/8	1/4-18	3/8	6-4-6 RBMP7
3/8	3/8-18	1/4	6-6-4 RBMP7
3/8	3/8-18	3/8	6-6-6 RBMP7



SBMP7 - MPI™ to male branch NPT tee

Imperial tubing

MPI™ Parker size #1	MPI™ thr'd #2	NPT size #3	Part no.
1/4	1/4	1/4-18	4-4-4 SBMP7
1/4	3/8	3/8-18	4-4-6 SBMP7
3/8	3/8	1/4-18	6-6-4 SBMP7
3/8	3/8	3/8-18	6-6-6 SBMP7

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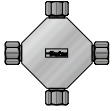
0BMP7 - MPI™ to NPT female branch tee

Imperial tubing

MPI™ size #1	MPI™ size #2	NPT thr'd #3	Parker Part no.
1/4	1/4	1/4-18	4-4-4 OBMP7
3/8	3/8	1/4-18	6-6-4 OBMP7
3/8	3/8	1/2-14	6-6-8 OBMP7
1/2	1/2	1/2-14	8-8-8 OBMP7
9/16	9/16	1/2-14	9-9-8 OBMP7
3/4	3/4	1/2-14	12-12-8 OBMP7



KBMP7 - MPI™ union cross

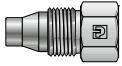
Imperial tubing

MPI™ size	Parker Part no.
1/4	4 KBMP7
3/8	6 KBMP7
1/2	8 KBMP7
9/16	9 KBMP7
3/4	12 KBMP

FNMP7 - MPI™ plug

Imperial tubing

MPI™ size	Parker Part no.
1/4	4 FNMP7
3/8	6 FNMP7
1/2	8 FNMP7
9/16	9 FNMP7
3/4	12 FNMP7
1	16 FNMP7



FNM7 - MPI™ plug

Imperial tubing

MPI™ size	Parker Part no.
1/4	4 FNM7
3/8	6 FNM7
1/2	8 FNM7
9/16	9 FNM7
3/4	12 FNM7

PNBMP7 - MPI™ cap

Imperial tubing

MPI™ size	Parker Part no.
1/4	4 PNBMP7
3/8	6 PNBMP7
1/2	8 PNBMP7
9/16	9 PNBMP7
3/4	12 PNBMP7
1	16 PNBMP7

MPFF - MPI™ front ferrule

Imperial tubing

Tube size	Parker Part no.
1/4	4 MPFF
3/8	6 MPFF
1/2	8 MPFF
9/16	9 MPFF
3/4	12 MPFF
1	16 MPFF

MPBF - MPI™ back ferrule

Imperial tubing

Tube size	Parker Part no.
1/4	4 MPBF
3/8	6 MPBF
1/2	8 MPBF
9/16	9 MPBF
3/4	12 MPBF
1	16 MPBF

BMP7 - MPI™ nut

Imperial tubing

MPI™ size	Parker Part no.
1/4	4 BMP7
3/8	6 BMP7
1/2	8 BMP7
9/16	9 BMP7
3/4	12 BMP7
1	16 BMP7

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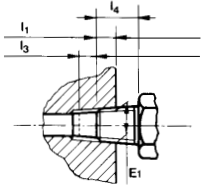
Typical fastening threads

NPT Threads
The National Pipe Taper thread has a thread angle of 60°, and is mainly used in the petrochemical and process industries.

NPT - National Pipe Taper threads for connections where pressure-tight joints are made on the threads utilising a thread sealant.

Thread standard
ANSI/ASME B.20.1-1983

Thread size	Thread per inch	E_1 inch	E_1 mm	l_1 Nominal inch	l_1 Nominal mm	l_3 Nominal threads	l_4 inch	l_4 mm	l_4 inch	l_4 mm
1/8	27	0.376	9,50	0.161	4,10	3	0.111	2,82	0.392	9,97
1/4	18	0.492	12,50	0.228	5,79	3	0.167	4,23	0.595	15,10
3/8	18	0.627	15,93	0.240	6,10	3	0.167	4,23	0.601	15,26
1/2	14	0.778	19,77	0.320	8,13	3	0.214	5,44	0.782	19,86
3/4	14	0.989	25,12	0.339	8,61	3	0.214	5,44	0.793	20,15
1	11.1/2	1.239	31,46	0.400	10,16	3	0.261	6,63	0.985	25,01
1.1/4	11.1/2	1.593	40,22	0.420	10,67	3	0.261	6,63	1.009	25,62
1.1/2	11.1/2	1.822	46,29	0.420	10,67	3	0.261	6,63	1.025	26,04



Finger tightening

Spanner tightening

Typical fastening threads (Cont'd)

BSP Threads
BSPP and BSP Taper threads have a thread angle of 55°.

The spot face surface must be square to the pitch diameter and free from longitudinal and spiral tool marks.

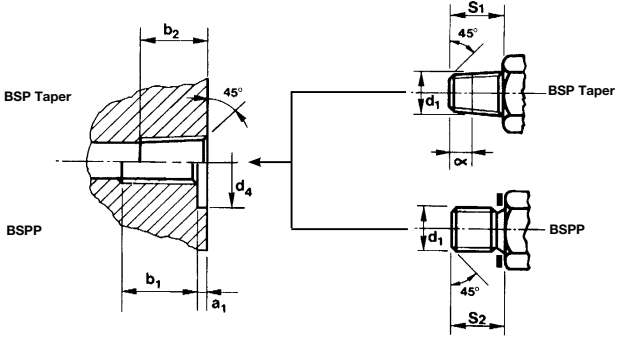
BSPP - British Standard Pipe parallel threads for tubes and fittings where pressure-tight joints are not made on the thread, i.e. a peripheral seal is used.

BSP Taper - British Standard Pipe Taper threads for tubes and fittings where pressure-tight joints are made on the threads.
See diagram on page 136

Thread standards
BSPP thread to :
ISO 228-1
BS2779
DIN 3852, part 2

BSP Taper thread to:
ISO 7/1
BS21

Threads			d_1		α		d_4		a_1		S_1		S_2		b_1		b_2	
BSPP	BSPT	per inch	nominal inch	mm	min inch	mm	max inch	mm	inch	mm	inch	mm	min. inch	mm	min. inch	mm	inch	mm
1/8	1/8	28	0.383	9,73	0.156	3,97	0.591	15	0.039	1	0.375	9,53	0.281	7,14	0.315	8	0.217	5,5
1/4	1/4	19	0.518	13,16	0.237	6,05	0.748	19	0.059	1,5	0.562	14,28	0.437	9,40	0.472	12	0.335	8,5
3/8	3/8	19	0.656	16,66	0.250	6,35	0.906	23	0.079	2	0.562	14,28	0.437	9,40	0.437	12	0.335	8,5
1/2	1/2	14	0.825	20,95	0.322	8,16	1.063	27	0.098	2,5	0.750	19,05	0.562	14,28	0.551	14	0.413	10,5
3/4	3/4	14	1.041	26,44	0.375	9,2	1.299	33	0.098	2,5	0.750	19,05	0.625	15,88	0.630	16	0.512	13
1	1	11	1.309	33,25	0.409	10,39	1.575	40	0.098	2,5	0.937	23,80	0.718	18,24	0.709	18		
1.1/4	1.1/4	11	1.650	41,91	0.500	12,7	1.969	50	0.098	2,5	1.0	2,4	0.781	19,84	0.787	20		
1.1/2	1.1/2	11	1.882	47,80	0.500	12,7	2.205	56	0.098	2,5	1.0	25,4	0.875	22,23	0.866	22		



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The sealing of threaded connections

Interference sealing of taper threads
Pressure-tight joints of screwed connections with taper threads are achieved by the application of a sealant to the surface of the external male thread.

PTFE Tape
PTFE tape should comply with BS7786 with dimensions of 12mm wide by 0.075mm±10% thick.

The procedure for applying PTFE tape should be as follows:

1) Commencing with the first thread, five layers of tape should be applied, pulling the tape firmly into the threads without breakage.

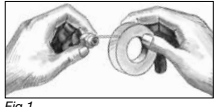

Fig 1

2) Tape should always be wrapped in the direction of the thread helix.

3) After five layers of tape have been applied the remaining exposed threads should be covered with tape using a 50% overlay.

4) The tape should be inspected to verify that no tape overhangs the front of the thread and that the tape has not been shredded.

Sealing compounds and liquid sealants
Apart from polymer joint compounds and air-drying liquid sealants, the most common thread seal is an anaerobic synthetic resin which cures in the absence of air.

Following assembly and tightening, the curing process is induced by a catalytic reaction between the resin and the metal. Resins that contain PTFE ease disassembly. For applications in food related industries, the thread sealant must be to a specified food-grade. Connections are normally made ready for operation following one hour curing time, complete curing may take up to 24 hours.

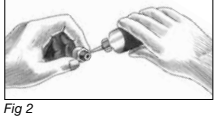

Fig 2

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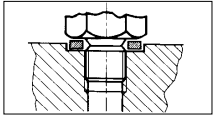
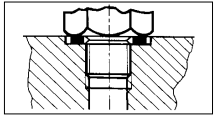
Peripheral sealing of parallel threads

Pressure-tight joints of screwed connections with parallel threads are achieved by placing a seal between the two machined faces

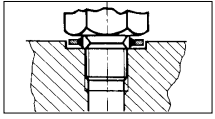


Flat seals
Washers and rings are manufactured in many different materials including fully annealed 316 stainless steel, copper, aluminium, fibre, plastics.

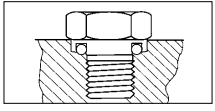
The tightening torque at assembly will vary according to the tensile strength of the fitting material, and the elasticity of the peripheral seal. The torque should be carefully selected to avoid compressing soft seals to the point of extrusion. As a general rule the fitting should be spanner tightened approximately 1/4 turn from the finger tight position.



Bonded seals
Elastomer sealing rings bonded into metal washers. Bonded seals are reusable, and cater for a variation in the quality of the machined surfaces.



ED seals
Groove machined into connector body and sealed using elastomer ring.

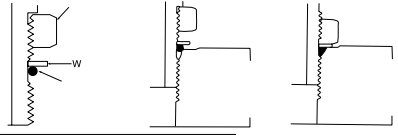


BSPP / SAE Straight Thread Fittings Installation Procedure

1. Lubricate O-ring with a lubricant that is compatible with the system.
2. Screw fitting into the straight thread port until the metal back-up washer contacts the face of the port.
3. Position the fitting by backing it out no more than one turn.
4. Hold the fitting in position and tighten the locknut until the washer contacts the face of the port. (See torque chart.)

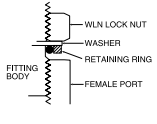
Note: WLN Lock Nuts are ordered separately by size and part number.

SAE



Size	Straight port Torque (in-lbs)	Straight port (F.F.F.T)	Adjustable port Torque (in-lbs)	Adjustable port (F.F.F.T)
4	245 ± 10	1.0 ± .25	200 ± 10	1.5 ± 25
6	630 ± 25	1.5 ± .25	400 ± 10	1.5 ± 25
8	1150 ± 50	1.5 ± .25	640 ± 10	1.5 ± 25
10	1550 ± 50	1.5 ± .25	1125 ± 50	1.5 ± 25
12	2050 ± 50	1.5 ± .25	1450 ± 50	1.5 ± 25
16	3000 ± 50	1.5 ± .25	2150 ± 50	1.5 ± 25
20	3400 ± 100	1.5 ± .25	2800 ± 100	2.0 ± 25
24	4500 ± 100	1.5 ± .25	3450 ± 100	2.0 ± 25

BSPP



Notes
- Restrain fitting body on adjustables if neessary in installation.
- Values in charts are for assemblies with)-ring lubricated.
- Use upper limits of torque ranges for stainless steel fittings

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Face Seal O-Ring Fittings Installation Procedure

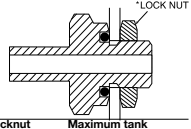
The O-ring requires a smooth, flat seating surface.This surface must be perpendicular to the axis of the threads.

1. Turn the O-ring seal fitting in the port until finger tight.
2. The “squeezing” effect on the O-ring can be felt during the last 1/4 turn.
3. Snug lightly with a spanner.

***Typical Application**
The fitting can be adapted as a bulkhead fitting on thin wall tanks or vessels, eliminating welding, brazing or threading. Simply order the L5N locknut to take advantage of this option.

Notes
Standard O-rings are nitrile material. For other O-rings, state material after the part number.

L5N locknuts are ordered separately by size and part number.



Port Size	Straight thread machine length	L5N locknut thickness	Maximum tank wall thickness
2	.297	.219	.078 = 5/64
3	.297	.219	.078 = 5/64
4	.360	.250	.109 = 7/65
5	.360	.250	.109 = 7/64
6	.391	.265	.125 = 1/8
8	.438	.312	.125 = 1/8
10	.500	.360	.140 = 9/64
12	.594	.406	.188 = 3/16
14	.594	.406	.188 = 3/16
16	.594	.406	.188 = 3/16

O-rings used with SAE/MS straight threads are nitrile. Other O-ring materials are available on request. Lubricate O-ring with a lubricant compatible with the system fluid, environment and O-ring material.

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Pressure conversion chart

Multiply given units by factor to obtain desired units

Given units \ Desired units	psi (lb./in2)	MPa (Mega pascal)	bar (10^5 pascal)	in. Hg (at 0°C)	Torr (mm Hg at 0°C)	ft. H2O (at 4°C)	in H2O (at 4°C)	dtm (A_N)
Psi (lb./in2)	1.0	$6.8948x10^{-3}$	$6.8947x10^{-2}$	2.0360	51.715	2.3067	27.68	$6.8045x10^{-2}$
*MPa (Mega Pascal)	145.04	1.0	10.0	$2.9350x10^{-2}$	$7.5006x10^{-3}$	334.56	$4.0147x10^{-3}$	9.8692
bar (10^5 pascal)	14.504	0.10	1.0	29.530	$7.5006x10^{-2}$	33.456	$4.0147x10^{-2}$	0.9869
in. Hg (at 0°C)	0.4912	$3.3864x10^{-3}$	$3.3864x10^{-2}$	1.0	25.40	1.133	13.596	$3.342x10^{-2}$
Torr (mm Hg at 0°C)	$1.9337x10^{-2}$	$1.3332x10^{-4}$	$1.3332x10^{-2}$	$3.9370x10^{-2}$	1.0	$4.4605x10^{-2}$	0.5253	$1.3158x10^{-3}$
ft. Water (at 4°C)	0.4335	$2.9890x10^{-3}$	$2.9890x10^{-2}$	0.8826	22.419	1.0	12.0	$2.950x10^{-2}$
in. Water (at 4°C)	$3.6127x10^{-2}$	$2.4908x10^{-4}$	$2.4908x10^{-3}$	$7.3554x10^{-2}$	1.8683	$8.33x10^{-2}$	1.0	$2.4582x10^{-3}$
Atmosphere (A_N)	14.696	0.10133	1.0133	29.921	760.0	33.90	406.79	1.0

*Note: 1 MPa = (Newton/m^2) x 10^{-6}

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Hardness comparison chart

Rockwell B Scale 1/16" Ball 100 kg Load	Rockwell C Scale 120° Cone 150 kg Load	Firth or Vickers 120 kg	Brinell 10mm Ball 3000 kg Load
72	–	130	130
75	–	135	135
77	–	141	140
78	–	142	141
79	–	144	143
79	–	146	145
80	–	147	147
81	–	149	150
82	–	150	152
82	1	152	154
83	2	154	156
84	3	159	160
85	4	162	163
86	5	165	165
87	6	168	167

Rockwell B Scale	Rockwell C Scale	Firth	Brinell
87	7	171	170
88	9	174	175
89	10	177	180
90	11	183	183
91	12	184	185
91	13	196	187
92	14	190	191
92	15	197	196
93	16	199	200
94	17	201	203
94	18	209	206
95	19	213	211
96	20	217	217
97	21	221	224
98	22	226	229
99	23	235	237
99	23	240	240
100	24	246	245
101	25	250	249
102	26	255	255
102	27	258	258
103	28	261	261
104	29	272	269
105	30	278	276
105	31	285	285

Rockwell B Scale	Rockwell C Scale	Firth	Brinell
106	32	291	293
107	33	305	301
108	34	312	311
109	35	320	323
109	36	335	331
110	37	344	341
110	37	352	346
111	38	361	351
111	39	380	362
112	40	385	370
113	41	390	375
114	42	401	388
114	43	423	401
115	44	435	415
115	45	460	427
116	46	474	444
117	47	489	451
117	48	502	461
118	49	534	477
119	51	551	495
119	52	565	502
120	53	587	514
–	54	606	529
–	55	639	545
–	56	649	525

Rockwell B Scale	Rockwell C Scale	Vickers	Brinell
–	57	694	576
–	59	727	590
–	60	746	601
–	61	775	614
–	62	803	626
–	63	867	652
–	64	905	668
–	65	940	682
–	66	1021	712
–	67	1060	725
–	68	1114	745
–	70	1170	760
–	71	1220	780
–	72	–	800
–	–	–	–

Flow rate conversions

from \ to	lit/sec	gal/min	ft^3/sec	ft^3/min	bbl/hr	bbl/day
lit/sec	1	15.85	0.03532	2.119	22.66	543.8
gal/min	0.06309	1	0.00223	0.1337	1.429	34.30
ft^3/sec	28.32	448.8	1	60	641.1	$1.54x10^4$
ft^3/min	0.4719	7.481	0.01667	1	10.69	256.5
bbl/hr	0.04415	0.6997	0.00156	0.09359	1	24
bbl/day	0.00184	0.02917	$6.50x10^5$	0.00390	0.04167	1

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Temperature conversion table

°C		°F	°C		°F	°C		°F	°C		°F	°C		°F	°C		°F
–51	–60	–76	–10.0	14	57.2	1.1	34	93.2	12.2	54	129.2	23.3	74	165.2	34.4	94	201.2
–46	–50	–58	–9.4	15	59.9	1.7	35	95.0	12.8	55	131.0	23.9	75	167.0	35.0	95	203.0
–40	–40	–40	–8.9	16	60.8	2.2	36	96.8	13.3	56	132.8	24.4	76	168.8	35.6	96	204.8
–34	–30	–22	–8.3	17	62.6	2.8	37	98.6	13.9	57	134.6	25.0	77	170.6	36.1	97	206.6
–29	–20	–4	–7.8	18	64.4	3.8	38	100.4	13.4	58	136.4	25.6	78	172.4	36.7	98	208.4
–23	–10	14	–7.2	19	66.2	3.9	39	102.2	15.0	59	138.2	25.1	79	174.3	37.2	99	210.2
–17.8	0	32	–6.7	20	68.0	4.4	40	104.0	15.6	60	140.0	26.7	80	176.0	37.8	100	212.0
–17.2	1	33.8	–6.1	21	69.8	5.0	41	105.8	16.1	61	141.8	27.2	81	177.8	38	100	212
–16.7	2	35.6	–5.6	22	71.6	5.6	42	107.6	16.7	62	143.6	27.8	82	179.6	43	110	230
–16.1	3	37.4	–5.0	23	73.4	6.1	43	109.4	17.2	63	145.5	28.3	83	181.4	49	120	248
–15.6	4	39.2	–4.4	24	75.2	6.7	44	111.2	17.8	64	147.2	28.9	84	183.2	54	130	266
–15.0	5	41.0	–3.9	25	77.0	7.2	45	113.0	18.3	65	149.0	28.4	85	185.0	60	140	284
–14.4	6	42.8	–3.3	26	78.8	7.8	46	114.3	18.9	66	150.8	30.0	86	186.8	66	150	302
–13.9	7	44.6	–2.8	27	80.6	8.3	47	116.5	19.4	67	152.6	30.6	87	188.6	71	160	320
–13.3	8	46.4	–2.3	28	82.4	8.9	48	118.4	20.0	68	154.4	31.1	88	190.4	77	170	338
–12.8	9	48.2	–1.7	29	84.2	9.4	49	120.2	20.6	69	156.2	31.7	89	192.2	82	180	356
–12.2	10	50.0	–1.1	30	86.0	10.0	50	122.0	21.1	70	158.0	32.2	90	194.0	88	190	374
–11.7	11	51.8	–0.6	31	87.8	10.5	51	123.8	21.7	71	159.8	32.8	91	195.8	93	200	392
–11.1	12	53.6	0.0	32	89.6	11.1	52	125.6	22.2	72	161.6	33.3	92	197.6	99	210	410
–10.6	13	55.4	0.6	33	91.4	11.7	53	127.4	22.8	73	163.4	33.9	93	199.4	100	212	413.6

°C		°F	°C		°F
104	220	428	216	420	788
110	230	446	221	430	806
116	240	464	227	440	824
121	250	482	232	450	842
127	260	500	238	460	860
132	270	518	243	470	878
138	280	536	249	480	896
143	290	554	254	490	914
149	300	572	260	500*	932
154	310	590	266	510	950
160	320	608			
166	330	626			
171	340	644			
177	350	662			
182	360	680			
188	370	698			
193	380	716			
199	390	734			
204	400	752			
210	410	770			

Look up known temperature in middle column

Find °C at left or °F at right

$T_F = \frac{9}{5} Tc + 32$

$Tc = (T_F - 32) \times \frac{5}{9}$

Weights and measures

Metric measures and equivalents

Length

1 millimetre (mm)		= 0.0394 in
1 centimetre (cm)	= 10 mm	= 0.3937 in
1 metre	= 100 cm	= 1.0936 yd
1 kilometre (km)	= 1,000 m	= 0.6214 mile

Area

1 sq cm (cm^2)	= 100 mm^2	= 0.1550 in^2
1 sq m (m^2)	= 10,000 cm^2	= 1.1960 yd^2
1 sq km (km^2)	= 100 hectares	= 0.3861 $mile^2$

Volume/Capacity

1 cu cm (cm^3)		= 0.0610 in^3
1 cu decimetre (dm^3)	= 1,000 cm^3	= 0.0353 ft^3
1 cu metre (m^3)	= 1,000 dm^3	= 1.3080 yd^3
1 litre (l)	= 1 dm^3	= 1.76 pt
		= 2.113 US l pt
1 hectolitre (hl)	= 100 l	= 21.997 gal
		= 26.417 US gal

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Weights and measures

Metric measures and equivalents (cont)

Mass (Weight)		
1 milligram (mg)		= 0.0154 grain
1 gram (g)	= 1,000 mg	= 0.0353 oz
1 metric carat	= 0.2 g	= 3.0865 grains
1 Kilogram (kg)	= 1,000 g	= 2.2046 lb
1 Tonne (t)	= 1,000 kg	= 0.9842 ton

Imperial measures and equivalents

Length		
1 inch (in)		= 2.54 cm
1 foot (ft)	= 12 in	= 0.3048 m
1 yard (yd)	= 3 ft	= 0.9144 m
1 mile	= 1,760 yd	= 1.6093 km
1 int nautical mile	= 2,025.4 yd	= 1.852 km

Area		
1 sq inch (in^2)		= 6.4516 cm^2
1 sq foot (ft^2)	= 144 in^2	= 0.0929 m^2
1 sq yard (yd^2)	= 9 ft^2	= 0.8361 m^2
1 acre	= 4,840 yd^2	= 4046.9 m^2
1 sq mile ($mile^2$)	= 640 acres	= 2.590 km^2

Volume/Capacity		
1 cu inch (in^3)		= 16.387 cm^3
1 cu foot (ft^3)	= 1,728 in^3	= 0.0283 m^3
1 cu yard (yd^3)	= 27 ft^3	= 0.7646 m^3
1 fluid ounce (fl oz)		= 28.413 ml
1 pint (pt)	= 20 fl oz	= 0.5683 l
1 gallon (gal)	= 8 pt	= 4.546 l

Mass (Weight)		
1 ounce (oz)	= 437.5 grains	= 28.35 g
1 pound (lb)	= 16 oz	= 0.4536 kg
1 stone	= 14 lb	= 6.3503 kg
1 hundred weight (cwt)	= 112 lb	= 50.802 kg
1 ton	= 20 cwt	= 1.016 t

Inches to millimetres

in	mm	in	mm	in	mm
.0001	.00254	.01	.25400	1	25.40000
.0002	.00508	.02	.50800	2	50.80000
.0003	.00762	.03	.76200	3	76.20000
.0004	.01016	.04	1.01600	4	101.60000
.0005	.01270	.05	1.27000	5	127.00000
.0006	.01524	.06	1.52400	6	152.40000
.0007	.01778	.07	1.77800	7	177.80000
.0008	.02032	.08	2.03200	8	203.20000
.0009	.02286	.09	2.28600	9	228.60000
.0010	.02540	.10	2.54000	10	254.00000
.002	.05080	.2	5.08000	20	508.00000
.003	.07620	.3	7.62000	30	762.00000
.004	.10160	.4	10.16000	40	1,016.00000
.005	.12700	.5	12.70000	50	1,270.00000
.006	.15240	.6	15.24000	60	1,524.00000
.007	.17780	.7	17.78000	70	1,778.00000
.008	.20320	.8	20.32000	80	2,032.00000
.009	.22860	.9	22.86000	90	2,286.00000

Millimetres to inches

in	mm	in	mm	in	mm
.001	.00004	.1	.00394	10	.39370
.002	.00008	.2	.00787	20	.78740
.003	.00012	.3	.01181	30	1.18110
.004	.00016	.4	.01575	40	1.57480
.005	.00020	.5	.01969	50	1.96850
.006	.00024	.6	.02362	60	2.36220
.007	.00028	.7	.02756	70	2.75591
.008	.00031	.8	.03150	80	3.14961
.009	.00035	.9	.03543	90	3.54331
.010	.00039	1.0	.03937	100	3.9370
.02	.00079	2	.07874	200	7.87402
.03	.00118	3	.11811	300	11.81102
.04	.00157	4	.15748	400	15.74803
.05	.00197	5	.19685	500	19.68504
.06	.00236	6	.23622	600	23.62205
.07	.00276	7	.27559	700	27.55906
.08	.00315	8	.31496	800	31.49606
.09	.00354	9	.35433	900	35.43307

Based on 1 Inch = 25.4 millimetres, exactly

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Fraction to decimal to metric conversion chart

Fraction	Inch	mm	Fraction	Inch	mm	Fraction	Inch	mm
1/64	0.01562	.0397	11/32	0.34375	8.731	43/64	0.67187	17.066
1/32	0.0312	0.794	23/64	0.35937	9.128	11/16	0.6875	17.462
3/64	0.04687	1.191	3/8	0.375	9.525	45/64	0.70312	17.859
1/16	0.0625	1.588	25/64	0.39062	9.922	23/32	0.71875	18.256
5/64	0.07812	1.984	13/32	0.40625	10.319	47/64	0.73437	18.653
3/32	0.0937	2.381	27/64	0.42187	10.716	3/4	0.75	19.050
7/64	0.10937	2.788	7/16	0.4375	11.112	49/64	0.76562	19.447
1/8	0.125	3.175	29/64	0.45312	11.509	25/32	0.78125	19.844
9/64	0.14062	3.572	15/32	0.46875	11.906	51/64	0.79687	20.241
5/32	0.1562	3.969	31/64	0.48437	12.303	13/16	0.8125	20.637
11/64	0.17187	4.366	1/2	0.5	12.700	53/64	0.82812	21.034
3/16	0.1875	4.763	33/64	0.51562	13.097	27/32	0.84375	21.431
13/64	0.20312	5.159	17/32	0.53125	13.494	55/64	0.85937	21.828
7/32	0.21875	5.556	35/64	0.54687	13.891	7/8	0.875	22.225
15/64	0.23437	5.953	9/16	0.5625	14.287	57/64	0.89062	22.622
1/4	0.25	6.350	37/64	0.57812	14.684	29/32	0.90625	23.019
17/64	0.26562	6.747	19/32	0.59375	15.081	59/64	0.92187	23.416
9/32	0.28125	7.144	39/64	0.60937	15.478	15/16	0.9375	23.812
19/64	0.29687	7.541	5/8	0.625	15.875	61/64	0.95312	24.209
5/16	0.3125	7.937	41/64	0.64062	16.272	31/32	0.96875	24.606
21/64	0.32812	8.334	21/32	0.65625	16.669	63/64	0.98437	25.003

Based on 1 Inch = 25.4 millimetres, exactly

Exotic materials

Material selection is proving increasingly critical in many of today's Instrumentation applications. There are many factors which metallurgists take into consideration before selecting the correct material to suit the media, or even the environment, products are being used with. This could simply be to work at higher temperatures or pressures than the industry standard 316 Stainless Steel will allow. Some applications call for a high strength versus weight ratio which allows a much thinner section of tubing to be used to achieve the pressure required but at a much reduced weight. The most common reason for selecting an Exotic material would be to combat media or environmental corrosion. There are many types of corrosion we find in our market place and if a product fails in service due to corrosion it can prove extremely expensive, and more importantly, very dangerous. The common types of corrosion Parker see include Pitting, Crevice, Stress, Microbially Influenced (MIC) and Galvanic.

The selection of material has to be cost effective for the user. For example, if the rate of corrosion is likely to be slow, it could be more cost effective to select a lower cost item and change it out when it has deteriorated, compared to paying a high initial product cost and not having to change out.
A number of criteria have to be taken into consideration by the user before the decision can be made on which material, or indeed which manufacturer should be used, such as:

- Critical nature of the system
- Media contained within the system
- Environmental influences
- Rate of corrosion
- Frequency of change out
- Cost of product
- Installation costs
- Downtime costs when changing out product (i.e. loss of production)
- Inventory costs
- Product quality

In this booklet there are listed a range of alloys from which Parker manufactures a variety of Fitting and Valve products for Instrumentation and associated applications.

6MO

UNS S31254

6MO is an austenitic stainless steel which because of its relatively high molybdenum content possesses a very good resistance to pitting and crevice corrosion.

This grade of steel was developed for use in halide containing environments where crevice, pitting and stress corrosion attacks are prone.

6MO is especially suited to handle high-chloride environments such as brackish water, seawater, caustic chlorides and pulp bleach systems.

Microbially Influenced Corrosion (MIC) can occur in brackish and waste water systems especially where equipment has been idle for extended periods. 6MO is extremely resistant to MIC and for this reason is also being used where bacteria and algae form "biofilms" on metal surfaces in warm seawater in areas such as the Middle East, Irish Sea and the Gulf of Mexico.

Typical applications include:

- Service water streams for nuclear power plants
- Offshore platform equipment
- Petrochemical and Seawater cooling systems
- Salt plant evaporators
- Bleach lines in pulp and paper mills
- Desalination plant equipment
- Fire fighting systems
- Tube heat exchangers
- Instrument measuring lines

Typical chemical composition: - %

C	0.02 max
Cr	20
Ni	18
Mo	6.25
N	0.2
Cu	0.75
Mn	1.0 max
P	0.03 max
S	0.01 max
Si	0.8 max
Fe	Remainder

Alloy 400

UNS N04400

Alloy 400 was the first nickel alloy invented, back in 1905 and remains one of the most extensively used nickel alloys due to its excellent corrosion resistance to a wide range of media. Alloy 400 has outstanding resistance to neutral and alkaline salts. It has been a

standard material for salt plants for many years.

This alloy is one of the few metallic materials, which can be used in contact with fluorine, hydrofluoric acid, hydrogen fluoride or their derivatives. Alloy 400 shows very high resistance to caustic alkalis. Its behaviour in seawater is excellent, with improved resistance to cavitation corrosion compared with other copper based alloys. It can be used in contact with dilute solutions of mineral acids such as sulphuric and hydrochloric acids. However, it is important to note that, as the alloy contains no chromium, corrosion rates may be increased in oxidising conditions.

Whilst Alloy 400 can be considered immune to chloride-ion stress cracking, it can stress crack in the presence of mercury or in most aerated hydrogen/fluoride vapours.

Typical applications include:

- Service water streams for nuclear power plants
- Uranium refining and isotopes separation used in the production of nuclear fuel
- Offshore platform equipment
- Petrochemical and seawater cooling systems
- Salt plant evaporators
- Desalination plant equipment
- Fire fighting systems carrying seawater
- Tube heat exchangers
- Instrument measuring lines
- Feed-water and steam generator systems in power plants
- Equipment used in the manufacture of chlorinated hydrocarbons
- Sulphuric and hydrofluoric acid plants

Typical chemical composition: - %

C	0.3 max
Ni	63.0 min
Cu	31
Mn	3.0 max
S	0.024 max
Si	0.50 max
Fe	2.5 max

Alloy 825

UNS N08825

Alloy 825 is a titanium-stabilised fully austenitic nickel-iron-chromium alloy with additions of copper and molybdenum.

This alloy is characterised by its good resistance to stress corrosion cracking and to oxidising and non-oxidising hot acids alike. It also has a very satisfactory resistance to pitting and crevice corrosion. Alloy 825 is a versatile general engineering alloy with good

resistance to corrosion in a wide range of media such as sulphuric, sulphurous, phosphoric, nitric and organic acids, alkalis such as sodium or potassium hydroxide, and aqueous chloride solutions. Its high nickel content gives this alloy almost complete immunity to stress corrosion cracking.

Typical applications include:

- Heat exchangers, evaporators and other equipment in phosphoric acid plants
- Fuel element dissolvers
- Sulphuric acid pickling plants
- Seawater cooled heat exchangers
- Chemical plants
- Food processing
- Sour gas applications
- Down hole control lines for oil and gas production

Typical chemical composition: - %

Ni	42.0
C	0.05 max
Cr	21.5
Mo	3.0
Mn	1.0 max
S	0.03 max
Si	0.5 max
Al	0.2 max
Ti	0.9
Cu	2.25
Fe	22 Min

Alloy 625

UNS N06625

Alloy 625 is a low–carbon, nickel-chromium-molybdenum-niobium alloy which shows excellent resistance to a variety of corrosive media.

This alloy has outstanding resistance to pitting & crevice corrosion as well as good resistance to intergranular attack. It also has almost total resistance from chloride-induced stress corrosion cracking. With these properties of the alloy, it has extremely high resistance to attack by a wide range of media and environments including nitric, phosphoric, sulphuric and hydrochloric acids, as well as alkalis and organic acids in both oxidising and reducing conditions. Alloy 625 has virtually no corrosive attack in marine and industrial atmospheres with extremely good resistance to seawater, even at elevated temperatures.

Typical applications include:

- Flue gas scrubbers
- Phosphoric and other acid producing facilities
- Nuclear waste reprocessing equipment
- Sour gas applications
- Offshore industry particularly in warm environments
- Marine equipment applications
- Turbines
- Aerospace industry, particularly fuel and hydraulic lines

Typical chemical composition: - %

Fe	5.0 max
C	0.1 max
Cr	21.0 - 23.0
Mo	21.5
Mn	0.5 max
P	0.015 max
S	0.015 max
Si	0.5 max
Al	0.40 max
Ti	0.40 max
Nb	3.65
Ni	58.0 min

Alloy C-276

UNS N10276

Alloy C276 is a nickel-molybdenum-chromium wrought alloy, which is generally considered to be the most versatile corrosion resistant alloy currently available.

C276 has outstanding resistance to localised corrosion and to both oxidising and reducing media. It has very good resistance to a wide range of chemical process environments, including strong oxidisers such as ferric and cupric chlorides, hot contaminated media, chlorine, a variety of acids and seawater and brine solutions. It is one of the few materials that withstand the corrosive effects of wet chlorine gas, hypochlorite and chlorine dioxide.

This alloy is a favourite with chemical plants because of its excellent mechanical properties giving it good durability in addition to its resistance to aggressive process fluids.

Typical applications include:

- Heat exchangers
- Flue gas desulphurisation systems
- Production of hydrofluoric acid
- Transfer piping lines
- Reaction vessels
- Pollution control/stack gas equipment containing chlorides, sulphur oxides, nitrogen oxides, carbon dioxides and carbon monoxide.

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- Waste treatment equipment
- Instrument measuring lines
- Pulp washing equipment
- Sulphuric acid applications such as pickling baths and detergent manufacture
- Chlorine dryers and other wet chlorine applications

Typical chemical composition: - %

C	0.02 max
Cr	15.5
Co	2.5 max
Mo	16
W	3.75
Fe	5.5
Mn	1.0 max
P	0.04 max
S	0.03 max
Si	0.08 max
V	0.35 max
Ni	Remainder

Titanium

UNS R50400

The titanium material used for Instrumentation products is what is known as commercially pure or unalloyed. It has proven to be technically superior and a very reliable and cost effective material in a wide range of chemical, industrial, marine and aerospace applications.

Titanium exhibits superior resistance to chlorides and many forms of corrosion. The material is immune to chloride pitting and intergranular attack and is highly resistant to crevice and stress corrosion. Titanium and its alloys have a number of unique properties, which make them a good choice even when strength or corrosion resistance may not be critical. These properties include important equipment design factors, such as low density, high melting point, non-magnetic, an extremely short radioactive half life, very low modulus of elasticity and co-efficient of expansion. These factors allow the material to be very flexible whilst giving extremely high strength properties against a very much reduced weight ratio.

Typical applications include:

- Gas turbines
- Heat exchangers
- Chemical plants for the production of chlorine, hypochlorites, acids and other aggressive compounds
- Desalination plants
- Cooling and piping systems in marine applications
- Hydrocarbon processing

- Pulp and Paper plants
- Condensers
- Nuclear waste re-processing systems
- Flue gas desulphurisation systems

Typical chemical composition: - %

C	0.10 max
Fe	0.40 max
H	0.01 max
N	0.05 max
O	0.02 max
Al	6.0
V	4.0
Ti	Remainder

Instrumentation product directory

Parker Instrumentation group together with Sandvik has the ability to provide a full process to Instrumentation hook up package for all our customers' needs.

The following sets out a comprehensive list of available products and their relevant catalogues.

Valves

Needle valves

V Series (Catalog 4110-V)
SN6 Series (Catalog 4110-SN)
VQ Series (Catalog 4110-VQ)
NP6 Series (Catalog 4110-NP)
PV Series (Catalog 4110-PV)
U Series (Catalog 4110-U)
HNV Series (Catalog 4190-HV)
RPV Series (Catalog 4190-HV)
HGV Series (Catalog 4190-HV)

Manifold valves

CCIMS© (Catalog 4190-CCIMS)
Monoflange (Catalog 4190-FP)
Pro-Bloc© (Catalog 4190-FP)
Monoflange(FE)& Pro-Bloc©(FE) (Catalog 4190-FP)
H-Series (Catalog 4190-PM/4190-FM)
Hi-Pro Series (Catalog 4190-HBM)

Ball/Plug valves

MB Series (Catalog 4121-MB)
B Series (Catalog 4121-B)
SWB Series (Catalog 4125-SWB)
HB Series (Catalog 4121-HB)
MPB Series Ball valve (Catalog 4234)
PR Series (Catalog 4126-PR)
Pneumatic/Electric Actuators (Catalog 4123)
Hi-Pro Series (Catalog 4190-HBV)

Check valves

C Series (Catalog 4130-C)
CO Series (Catalog 4130-CO)
CB Series (Catalog 4130-CB)
MPC Series (Catalog 4234)
MPCB Series (Catalog 4234)
LC Series (Catalog 4130-LC)
Hi-Check Series (Catalog 4190-CV)

Filters

F Series (Catalog 4130-F)
FT Series (Catalog 4130-FT)
MPF Series (Catalog 4234)

Relief valves

RL4 Series (Catalog 4131-RL)
RH4 Series (Catalog 4131-RH)

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Bleed and purge valves

BV Series (Catalog 4133-BP)
PG Series (Catalog 4133-BP)

Metering valves

N Series (Catalog 4170-N)
HR Series (Catalog 4170-HR)

Diaphragm valves

Nova Series (Catalog 4515)
NOVAAOP (Catalog 4515)
NV55 (Catalog 4515)
944AOPHPNCSP (Catalog 4515)
16 Series (Catalog 4515)

Analytical systems

Vent recovery panel (Bulletin 4141-VR)
Vent Master™ (Catalog 4142-VM)
IntraFlow™ (Catalog 4250)
R-max™ (Catalog 4140-R)
ChangeOver system (Catalog 4511)

Regulators

Pressure regulators

NPR4100 (Catalog 4511)
IR4000 Series (Catalog 4511)
IR5000 Series (Catalog 4511)
HFR900 Series (Catalog 4511)
IR6000 Series (Catalog 4511)
APR66 (Catalog 4511)
Quantum 959 (Catalog 4511)
DM3000 (Catalog 4518)

Back pressure regulators

ABP1 (Catalog 4510)
ABP3 (Catalog 4510)
BPR50 (Catalog 4510)

Vaporising regulators

AVR3 (Catalog 4512)
AVR4 (Catalog 4512)

Fittings

CPI™ fittings (Catalog 4230/4233)
A-LOK® fittings (Catalog 4230/4233)
MPI™ fittings (Catalog 4234)
PHastite® (Catalog 4235-PH)
Instrumentation pipe fittings (Catalog 4260)
10k Pipe fittings (Catalog 4260-HP)
Welded fittings (Catalog 4280)

Hose/tubing/ Quick couplings

Push-Lok® hose (Bulletin 4281-B1-US)
Quick couplings (Catalog 4220)
Stainless steel metal hose (Catalog 4690-MH)
Multitube® instrument and heat trace tubing (Catalog 4235-PH)

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Flow controllers

Porter

Gas mass flow controllers
(Catalog FM-441)

Digital liquid mass flow controllers
(Bulletin FM-998)

Flowmeters (Catalog FM-1058)

Instrument pressure regulators
(Catalog FM-1057)

PFA/PTFE products

Fluoropolymer components
(Catalog PSM Partek)

Sanitary and BioPharmaceutical

Sanitary fittings (Catalog 4270)

Valves and flow components
(Catalog 4270-VFC)

Tools and accessories

Tube fabrication equipment
(Catalog 4290)

Sample cylinders (Catalog 4160-SC)

Brass push-to-connect fittings
(Bulletin 3531-QRG/USA)

Complementary products

PED Relief valves
(Catalog 4190-HPRV)

High pressure Ball and Needle valves
(Catalog 4190-HH/20K)

Fugitive Emission
(Catalog 4190-FP)

Large Bore Needle valves
(Catalog 4190-HH/LBV)

Distribution Manifolds
(Catalog 4190-DM/HPDM)

Manifold Accessories
(Catalog 4190-FP-ACC)

Enclosures
(Catalog 4190-ENC)

Parker's product selection guide CD contains electronic versions of all catalogs referenced in the product selection guide document as well as additional Parker Instrumentation product lines

Small Bore Expert Training

This is an upgrade and replacement to our industry leading Safety at Work Programme, it provides material that is relevant to your sales professionals and will enable them to conduct their own training sessions with their customer base.

Some of the advantages over our existing programme are:

- Greater knowledge of small bore tubing systems
- Increased product familiarity
- Improved selling and presentation ability
- Increased skills and confidence in dealing with small bore systems
- Ability to deliver chargeable training

Utilising our new range of Tube Fabricating Equipment, you will undertake tube bending and fittings make-up exercises.

For more information about the content and for course dates please contact +44 (0) 1271 313131 and ask to speak to the Marketing Department, alternatively please email your enquiry to: ipd@parker.com

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