

MED GAS SOLUTIONS

PATENTED BRAZE EQUIVALENT Medical Gas Solutions™



PERMANENT
Cold Braze Alternative



ASSEMBLED
Within Minutes



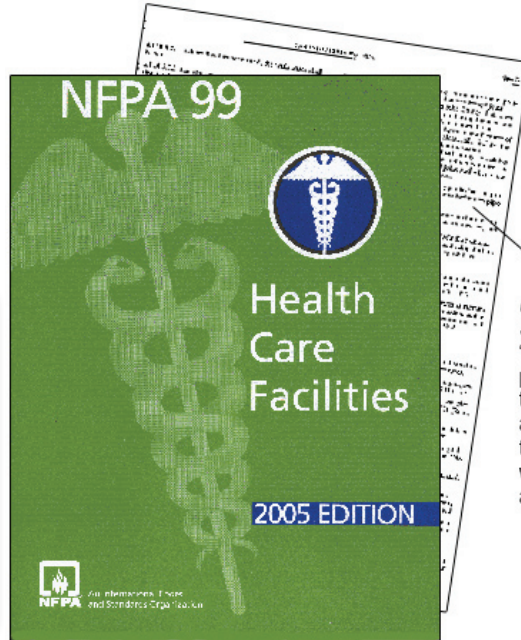
NFPA 99
(National Fire Protection Association)



Medical Gas Solutions from LOKRING

Lokring Technology, LLC offers a patented, permanent, axially swaged tube fitting. This technology for medical gas applications is now approved by NFPA 99-2005 (Paragraph 5.1.10.7 (4)).

Imagine being able to shut down your medical gas system and within minutes being able to install a tie-in, a tee for future expansion or to cap off a line for renovation. Medical gas tie-ins can be installed as fast as you can drain the lines.



**NFPA 99-2005
Section 5.1.10.7(4)**
"Axially swaged, elastic strain preload fittings providing metal to metal seal having pressure and temperature ratings not less than that of a brazed joint and when complete are permanent and non-separable."

Simply bleed the medical gas or vacuum line, cut and clean the tubing, and install a LOKRING fitting. It takes less than five minutes to install a permanent, leak-tight fitting.

Since no brazing is necessary, no expensive nitrogen NF purge is required. Without brazing, no particulate is created during installation. Gas lines go back into service as fast as the credentialed Medical Gas Verifier can document proper concentrations.



Lokring Medical Gas Fittings...

The installation of LOKRING Medical Gas fittings takes minimal time and there is less patient disruption due to noise and brazing. Lokring installation is a cold braze alternative. There is no hot work, no burn permits, and no fire watches necessary. In addition, the speed of the LOKRING installation reduces system down-time and the additional costs associated with contract labor and overtime staffing.



Fittings are cleaned for oxygen service in sizes 1/2" through 2". A simple hand held tool is all that is necessary. The top photo on the right shows an installer attaching a 1 1/2" LOKRING coupling to a pre-fabricated, vacuum line tie-in. The oxygen tie-in installation in the middle & bottom photos uses LOKRING 1 1/2" couplings on Type L copper tubing.



The cost of LOKRING Medical Gas Fittings is considerably less than the overall cost of other special fittings for medical gas tie-ins. A short training course is all that is required for contractors with ANSI/ASSE 6010 installer certification. Lokring Technology has been used by the Marine, Biotech, Automotive, Power Generation, Chemical Processing and Railroad industries worldwide since 1989.

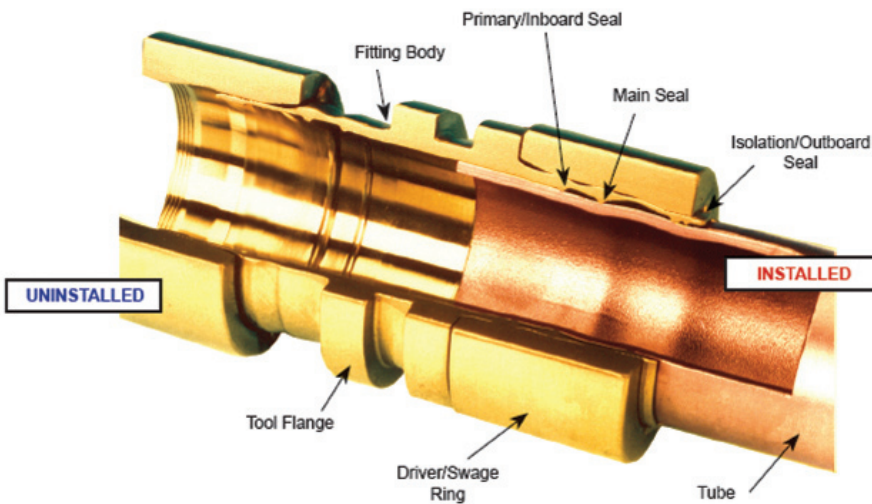
Advantages of LOKRING Fittings

- No brazing necessary
- No nitrogen NF purge required
- No danger of particulate formation
- No danger of melting or burning of ambient materials in the area (such as adjacent wiring and pneumatic lines)
- No burn permits needed
- No fire brigade standby necessary
- No shutdown of smoke or fire sensors in the area
- No cooling of brazed joints -- immediate usage following leak test
- Minimal patient disruption
- Special configurations



This outside installation used LOKRING couplings to connect existing medical gas lines to new lines for hospital expansion. The completed installation included 3/4" size for nitrogen and nitrous oxide. The oxygen line was 1 1/2" size on Type L copper. The total installation time for the three fittings was 20 minutes.

LOKRING's ESP® (Elastic Strain Preload) Technology



The leak-free seal is the result of LOKRING's ESP installation where the axial movement of the LOKRING driver over the body swages the body onto the tube's surface. This compresses the tube wall first elastically and then plastically.

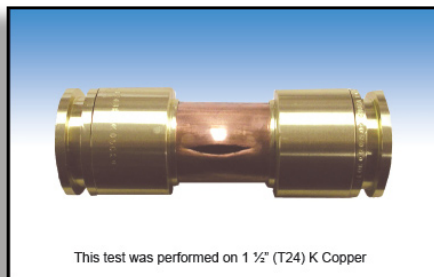
The tube wall resists this swaging action, generating high unit compressive loads at the contact points between narrow sealing lands inside the fitting body and the tube surface.

These contact stresses are sufficiently high to plastically yield the tube surface under the sealing lands, forming a 360° circumferential, permanent, metal-to-metal seal between the tube and fitting body.

The driver, which experiences a small increase in diameter (elastic strain) during installation, exerts an elastic, radial pre-load on the metallic seals for the life of the connection.

Pressure Testing

This test was performed on 1 1/2" Type K copper tubing. As shown, the copper tubing burst at 3200 psi while the fitting remained intact.



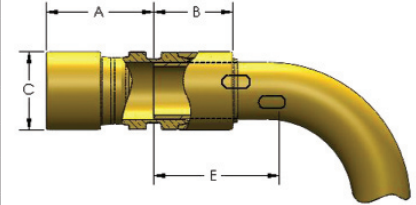
This test was performed on 1 1/2" (T24) K Copper

Nominal Fitting Size (TXX)	Tube OD	Qualified Wall Thickness K		Qualified Wall Thickness L	
		Wall	Pressure Rating (PSI)	Wall	Pressure Rating (PSI)
1/2" (T08)	0.625	0.049	1500	0.040	1200
5/8" (T10)	0.750	0.049	1200	0.042	1000
3/4" (T12)	0.875	0.065	1400	0.045	1000
1" (T16)	1.125	0.065	1100	0.050	800
1 1/4" (T20)	1.375	0.065	900	0.055	700
1 1/2" (T24)	1.625	0.072	800	0.060	700
2" (T32)	2.125	0.083	700	0.070	600

LOKRING Medical Gas Fittings Exceed Required Temperature of 1000°F. Pressure rating should be derated at elevated temperature. Fittings meet 1000°F integrity test. See specification FS-BR for details.

General Information

Nominal Fitting Size (TXX)	Tube O.D.	Qualified Wall Thickness K and L	Insertion Depth Pre-Install, A	Insertion Depth Post-Install, B	Outside Diameter, C	Minimum Straight Run Before Obstruction, E
1/2" (T08)	0.625	.049/ .040	1.14	0.89	0.91	1.68
5/8" (T10)	0.750	.049/ .042	1.33	1.02	1.02	1.95
3/4" (T12)	0.875	.065/ .045	1.48	1.12	1.19	2.04
1" (T16)	1.125	.065/ .050	1.94	1.46	1.53	2.63
1 1/4" (T20)	1.375	.065/ .055	2.20	1.66	1.86	2.82
1 1/2" (T24)	1.625	.072/ .060	2.51	1.90	2.21	3.20
2" (T32)	2.125	.083/ .070	3.27	2.47	2.88	4.01

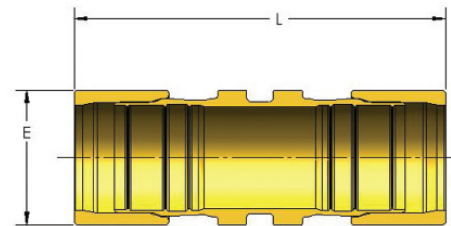


- All dimensions are in inches.
- Dimensions A, B, C & E are applicable to all fittings of the same size within this catalog.
- For use on copper tube per ASTM B819, type K and L wall, and drawn for copper tube per ASTM B88 type K and L wall.
- For tooling dimensions refer to proper catalog or www.lokring.com
- Coupling 'thru-bore' design permits tube to pass completely through.
- Fitting material 360 Brass as per ASTM B16.
- Fittings are cleaned to CGA G-4.1 standard. (OC = Oxygen Clean)
- Fittings are approved by NFPA 99-2005 and meet or exceed the design requirements of brazed fittings.
- CAD files in .DWG file format are available for most configurations.
- All dimensions are reference only and subject to change.
- Due to variation in head affected zones (HAZ), Lokring fittings should be installed at least 6" from a brazed joint.

Couplings

Tubing Size TXX	Ordering Information			Dimensions			LOKTOOL™ Standard Installation Tool
	Fitting Material	Shape	Fitting Size TXX	Part Length (Uninstalled) L	E	Take-Out, A	
1/2	BR	- CPL -	T08	2.47	0.91	N/A	IT20
5/8	BR	- CPL -	T10	2.82	1.02	N/A	IT20
3/4	BR	- CPL -	T12	3.11	1.19	N/A	IT20
1	BR	- CPL -	T16	4.07	1.53	N/A	IT50
1 - 1/4	BR	- CPL -	T20	4.62	1.86	N/A	IT50
1 - 1/2	BR	- CPL -	T24	5.28	2.21	N/A	IT50
2	BR	- CPL -	T32	6.88	2.88	N/A	IT50

BR-CPL-TXX

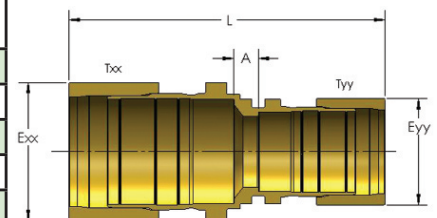


NOTE: Gage port couplings (-GCPL-) are available upon request. Thread size is 1/8"-27. Consult your authorized Lokring distributor for details and other available options. All dimensions are for reference only and subject to change.

Reducers

Tubing Size TXX	Ordering Information			Dimensions			LOKTOOL™ Standard Installation Tool	
	Fitting Material	Shape	Fitting Size TXX-TYY	Part Length (Uninstalled) L	Take-Out, A	E _{xx}		E _{yy}
5/8 - 1/2	BR	- RED -	T10 - T08	2.84	0.19	1.02	0.91	IT20
3/4 - 1/2	BR	- RED -	T12 - T08	3.17	0.38	1.19	0.91	IT20
3/4 - 5/8	BR	- RED -	T12 - T10	3.15	0.19	1.19	1.02	IT20
1 - 3/4	BR	- RED -	T16 - T12	3.95	0.36	1.53	1.19	IT50
1-1/4 - 1	BR	- RED -	T20 - T16	4.61	0.27	1.86	1.53	IT50
1-1/2 - 1-1/4	BR	- RED -	T24 - T20	5.27	0.32	2.21	1.86	IT50

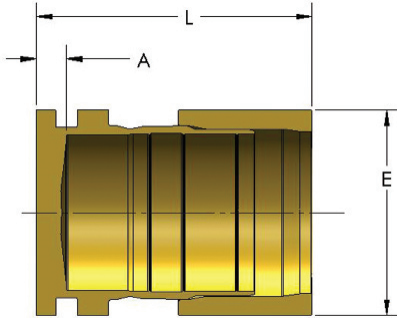
BR-RED-TXX-TYY



Consult your authorized Lokring distributor for details and other available options. All dimensions are for reference only and subject to change.

Caps

BR-CAP-TXX

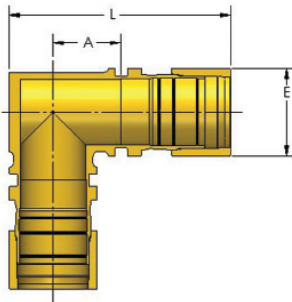


Tubing Size TXX	Ordering Information			Dimensions			LOKTOOL™	
	Fitting Material	Shape	Fitting Size TXX	Part Length (Uninstalled) L	E	Take-Out, A	Standard Installation Tool	
1/2	BR	- CAP -	T08	1.47	0.91	0.24	IT20	
5/8	BR	- CAP -	T10	1.65	1.02	0.24	IT20	
3/4	BR	- CAP -	T12	1.76	1.19	0.21	IT20	
1	BR	- CAP -	T16	2.33	1.53	0.29	IT50	
1-1/4	BR	- CAP -	T20	2.62	1.86	0.31	IT50	
1 - 1/2	BR	- CAP -	T24	2.98	2.21	0.34	IT50	
2	BR	- CAP -	T32	3.86	2.88	0.42	IT50	

NOTE: Gage port caps (-GCAP-) are available upon request. Thread size is 1/8"-27. Consult your authorized Lokring distributor for details and other available options. All dimensions are for reference only and subject to change. Insertion depth= L-A

90° Elbows

BR-EL90-TXX

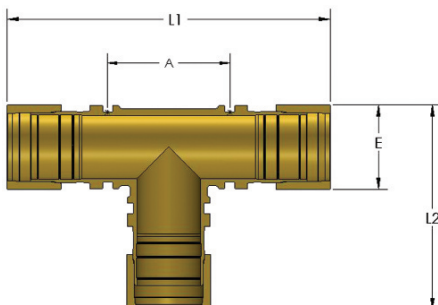


Tubing Size TXX	Ordering Information			Dimensions			LOKTOOL™	
	Fitting Material	Shape	Fitting Size TXX	Part Length (Uninstalled) L	E	Take-Out, A	Standard Installation Tool	
1/2	BR	- EL 90 -	T08	2.49	0.91	0.75	IT20	
5/8	BR	- EL 90 -	T10	2.80	1.02	0.83	IT20	
3/4	BR	- EL 90 -	T12	3.16	1.19	0.98	IT20	
1	BR	- EL 90 -	T16	3.94	1.53	1.09	IT50	

Consult your authorized Lokring distributor for details and other available options. All dimensions are for reference only and subject to change. Insertion depth= L-A-1/2 E

Tees

BR-TEE-TXX



Tubing Size TXX	Ordering Information			Dimensions				LOKTOOL™	
	Fitting Material	Shape	Fitting Size TXX	Part Length L1	Part Length L2	E	Take-Out, A	Standard Installation Tool	
1/2	BR	- TEE -	T08	3.97	2.49	0.91	1.50	IT20	
5/8	BR	- TEE -	T10	4.48	2.80	1.02	1.66	IT20	
3/4	BR	- TEE -	T12	5.06	3.16	1.19	1.95	IT20	
1	BR	- TEE -	T16	6.26	3.94	1.53	2.23	IT50	

Consult your authorized Lokring distributor for details and other available options. All dimensions are for reference only and subject to change. Insertion depth= (L1-A) /2

Installation Tooling

Installation Tooling consists of two kit sizes supplied with gauges and adjustable inserts.

MTK20-BR is used for 1/2", 5/8" and 3/4" tubing.

MTK50-BR works with 1", 1 1/4", 1 1/2" and 2"

To install a LOKRING fitting, a LOKTOOL™ tool head with inserts, multipurpose gage, hydraulic pump, and hydraulic hose are needed.



Tools, inserts, and gages come packaged either as:

- Individual tool kits designed for installing one size of fittings only, (ITK Series)
- Multiple tool kits designed for installing multiple size fittings with one tool (MTK Series)

Note: Special halocarbon tool kits are available for extra clean requirements. Contact your authorized LOKRING distributor for ordering details

How to Select Tooling

Tool Selection for Brass Tube Fitting Sizes							
Tool	1/2	5/8	3/4	1	1 - 1/4	1 - 1/2	2
IT20							
IT50							

The shaded cells show which size tool can install which size fitting.

MEDICAL GAS TRAINING CLASSES AND CERTIFICATION ARE REQUIRED TO INSTALL LOKRING FITTINGS. TRAINING IS AVAILABLE THROUGH YOUR LOCAL LOKRING® DISTRIBUTOR

NOTE: Tool rentals are available through your local Lokring Distributor

www.lokring.com

LOKRING TECHNOLOGY STANDARD PRODUCT WARRANTY

Lokring warrants that goods delivered hereunder shall be free from defects in material and workmanship under normal use and service for a period of one (1) year from shipment. If during such one (1) year period,

1. Lokring is notified promptly upon discovery of any defect in the goods, including a detailed description of such defect.
2. Lokring is afforded the opportunity to inspect such goods at the installation site prior to any attempt to repair or retrofit.
3. If requested by Lokring, Customer returns such goods to Lokring for further examination (FOB destination); and upon examination of such, Lokring determines that such goods were defective and such defects were not caused by accident, abuse, misuse, neglect, alteration, improper installation, repair or alteration (other than at the specific direction of Lokring), improper testing or use contrary to instruction of Lokring, then within a reasonable time. Lokring shall at its sole option credit the customer for such goods.

Any goods replaced under this warranty shall be returned to the customer, transportation charges prepaid, and Lokring will reimburse the customer for any transportation charges incurred. The performance of this warranty does not extend the warranty period of any goods beyond the period applicable to the goods originally delivered.

In no event shall Lokring be liable for claims for any other damages whatsoever (whether direct, immediate, foreseeable, consequential or special) suffered by Buyer or anyone else arising out of any breach by Lokring. This express warranty is in lieu of and excludes all other warranties, guarantees, and/or representations, expressed or implied.

System design and system safety are the ultimate responsibilities of the end-user. Consideration to system function, compatibility, product ratings, as well as other factors, must be given to ensure proper product selection and function. All information in this catalog has been compiled with regard to accuracy; however, the most up to date information should be verified before use of the product. Lokring reserves the right to change product dimensions, ratings, or other information.



Medical Gas Solutions™



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A FITTING END TO YOUR TUBING CONCERNS™



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