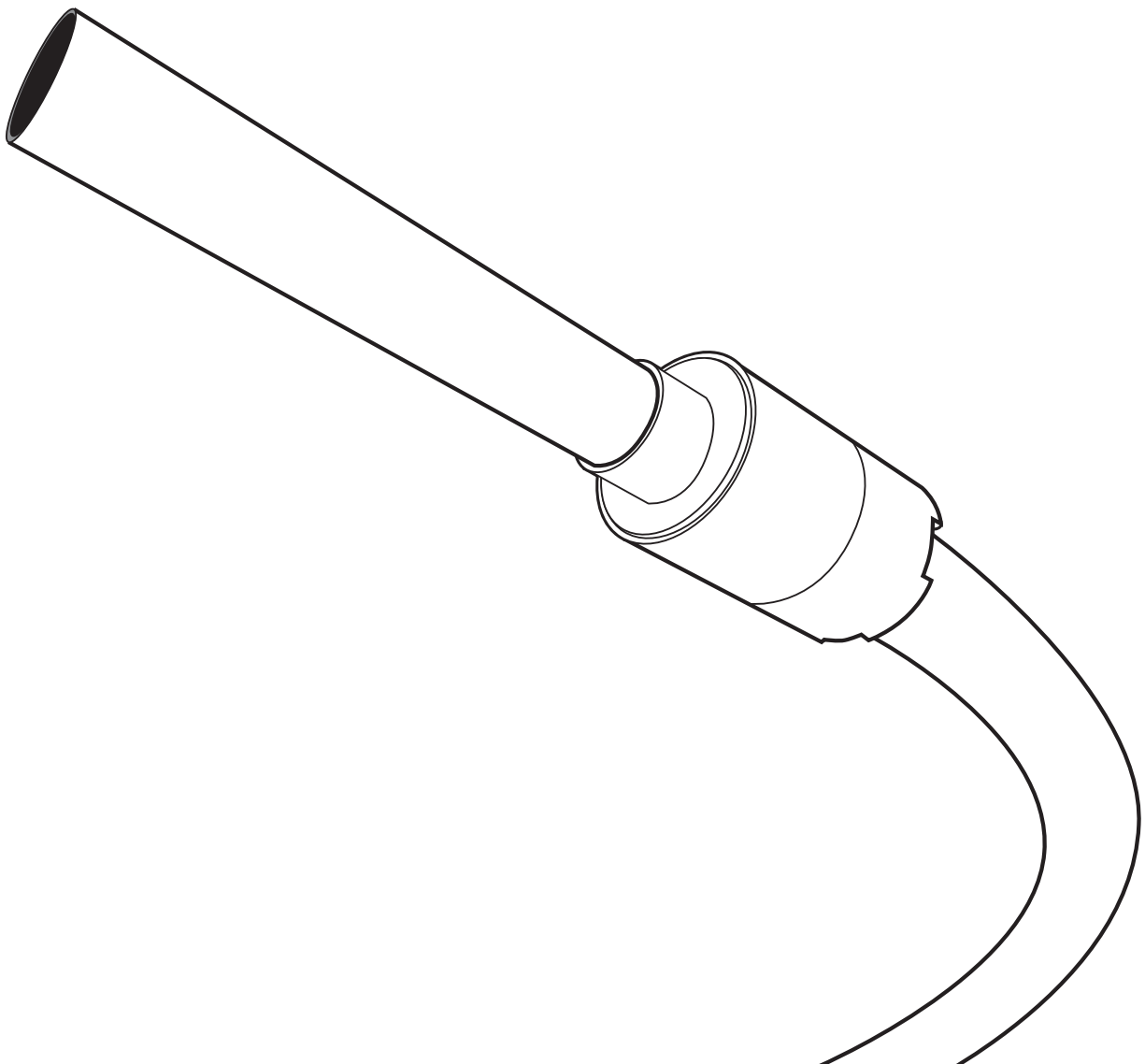




DESIGN & INSTALLATION INSTRUCTIONS

MediTrac[®] Flexible Medical Gas Piping



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1.0 User Warnings

Each installer must meet applicable qualifications in accordance with state and/or local requirements as established by the administrative authority that enforces the health care facilities codes where medical gas piping is installed. The MediTrac® Corrugated Medical Tubing (CMT) must only be installed by an ASSE 6010 certified installer who has been successfully trained through the MediTrac® CMT installation program.

This guide must be used in conjunction with state and local health care facilities codes. Local codes will take precedence in the event of a conflict between these instructions and the local code. In the absence of local codes, installation must be in accordance with the current edition of Health Care Facilities Code, NFPA 99.

In addition to compliance with local codes, sound engineering principles and practices must be exercised for the proper design of medical gas piping systems. The installation instructions and procedures contained in this Design & Installation Instructions must be strictly followed. All installations must pass inspections by the local authority having jurisdiction prior to occupancy of the serviced areas of the health care facility.

▲ DANGER

IF THIS SYSTEM IS USED OR INSTALLED IMPROPERLY, LIFE SUSTAINING / LIFE SUPPORT EQUIPMENT MAY BE IMPAIRED, LEADING TO POSSIBLE SEVERE MEDICAL COMPLICATIONS AND DEATH. APPLICABLE LOCAL CODES AND THESE INSTALLATION INSTRUCTIONS MUST BE STRICTLY FOLLOWED.

2.0 Material Description

The OmegaFlex® MediTrac® flexible (CMT) system consisting of a corrugated copper alloy tubing and non-removable mechanically axially swaged brass fittings. Fittings are supplied in a variety of transition connections for easy attachment to traditional copper tube systems and direct connection to piping system components.

Tubing is jacketed with fire-retardant plenum-rated polyethylene which enhances the mechanical properties of the copper alloy tubing and provides protection for the tubing when routing through building components. The jacket is marked at two-foot intervals with the manufacturer's trademark, part number, maximum operating pressure and the length measurements.

3.0 Material Use and Limitations

These installation instructions are intended to aid the medical gas pipeline installer in the design, installation, and testing of corrugated medical tubing systems for hospitals and healthcare buildings. All medical gas piping systems must be installed per NFPA 99—this guide provides additional information for clarification. OmegaFlex® MediTrac® system must be installed in accordance with the installation practices and procedures included in the MediTrac® Design and Installation Guide by an ASSE 6010 certified installer who has completed the MediTrac® installer training. Manufacturer’s training on the proper installation of MediTrac® CMT does not qualify the installer as a ASSE 6010 certified installer—it only demonstrates that the installer has been trained on the proper installation procedure for MediTrac® Corrugated Medical Tubing.

Some of the special features of the MediTrac® corrugated medical tubing system are outlined below:

1. MediTrac® corrugated medical tubing is used to provide safe, efficient, and timely installation in buildings such as hospitals, urgent care facilities, laboratories, or other facilities requiring medical grade piping.
2. MediTrac® corrugated medical tubing can be routed in the same locations that traditional copper gas piping materials are installed (i.e., plenum areas, within conduit, along or through floor joists, or in ceiling spaces).
3. For retrofit installations, MediTrac® corrugated medical tubing can be installed anywhere copper pipe has traditionally been installed. It has the benefit of reducing installation time and reducing or eliminating hot work (permitting, etc.), because MediTrac® can be supplied in long continuous lengths, reducing the risk of possible leak paths due to the reduction in number of intermediate joints.

4.0 Description of System and Components

1. Material for corrugated medical tubing conforms to ASTM B103, copper alloy UNS No. C51000.
2. Jacket is, plenum rated, fire retardant polyethylene tested in accordance to ASTM E-84 with a maximum 25 Flame Spread/50 Smoke Density rating.
3. Fittings are brass metallic copper alloy No. CA 360, cleaned to CGA G4.1, and compliant with NFPA 99 requirements.

FIGURE 1

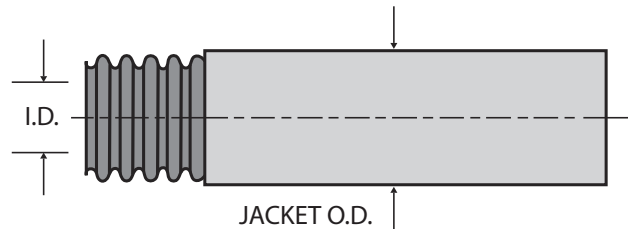


TABLE 1 - TUBING DIMENSIONS

MediTrac® Size	1/2"	3/4"	1"
Corrugated Tubing ID (nom) (inches)	0.599	0.820	1.060
Jacket OD (nom) (inches)	0.875	1.125	1.375

5.0 Installation Practices

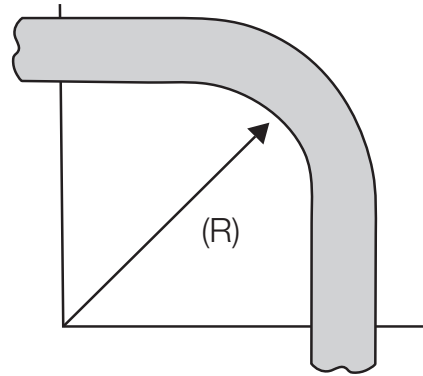
Precautions must be taken to ensure that any exposed CMT is not damaged or abused during building construction. All system hardware should be stored in a secure, dry location prior to installation.

1. When MediTrac® is installed underground or in a concrete slab, piping will be encased in a nonmetallic sleeve
2. MediTrac® CMT piping system is for use with flammable medical gases up to a max operating pressure of 185 psi. Both the MediTrac® tubing and fittings have been tested to be leak-free at pressure 3.5x greater than the maximum operating pressure of the system (647.5 psi).
3. MediTrac® CMT gas piping system shall only use components provided by OmegaFlex® for use with the MediTrac® CMT system.
4. Ends of the piping are to be temporarily capped, plugged, or taped closed prior to installation and routing to prevent the entrance of dirt and/or other debris.
5. **BENDING:** Undue stress or strain on the tubing or fittings is to be avoided. Tight bends can restrict the gas flow and increase pressure drop. The tightest bend allowed for each size of MediTrac® CMT is shown in Table 2.

TABLE 2 - RECOMMENDED BEND RADIUS (R)

Tubing Size	1/2"	3/4"	1"
Recommended Bend Radius (inches)	6	8	10

FIGURE 1



6. MediTrac® corrugated medical tubing shall be supported from the building structure in a manner acceptable by local code. Hangers and supports shall comply with MSS SP-58, Pipe Hangers and Supports—Materials, Design, Manufacture, Selection, Application, and Installation. Supports for MediTrac® corrugated medical tubing shall be sized for copper tubing. MediTrac® CMT will use the next size up copper pipe hanger to accommodate MediTrac®'s outside diameter (1/2" MediTrac® uses 3/4" copper pipe hanger). Maximum support spacing is defined in Table 3.

TABLE 3 - SUPPORT INTERVALS

MediTrac® Size	1/2"	3/4"	1"
Copper Tube Size for Hanger	3/4"	1"	1-1/4"
Maximum Spacing (ft)	6	7	8

6.0 Fitting Assembly

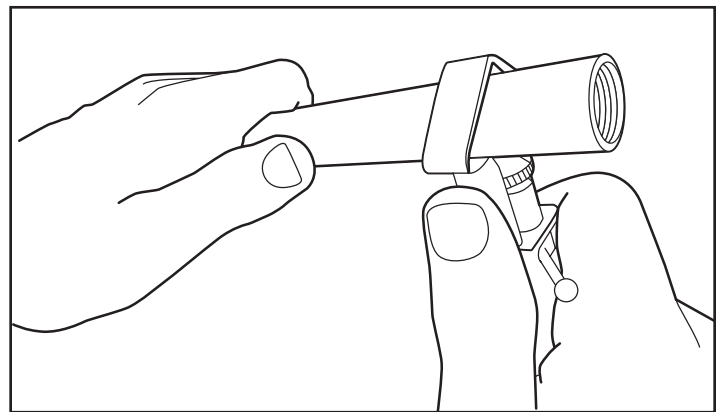
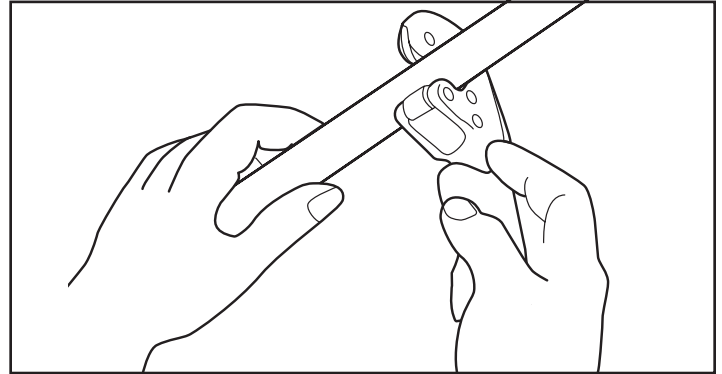
1. CUT-TO-LENGTH:

Determine the proper length of MediTrac®. Cut through the exterior jacket and copper corrugated tubing using a tubing cutter with a sharp wheel. Cut must be centered between two corrugations. Use full circular strokes in one direction and tighten roller pressure roughly ¼ turn per revolution.

DO NOT OVERTIGHTEN CUTTER:
OVERTIGHTENING CUTTER MAY CAUSE DEFORMATION TO THE COPPER ALLOY TUBING AND CAUSE ISSUES DURING FITTING ASSEMBLY.

▲ NOTICE

DUE TO THE LARGE DIAMETER AND DEPTH OF CORRUGATION, TUBING MUST BE CUT WITH A STANDARD TUBING CUTTER RIDGID™ 151 OR EQUAL USING A MEDITRAC® CUTTING WHEEL NO. MT-E-5272.

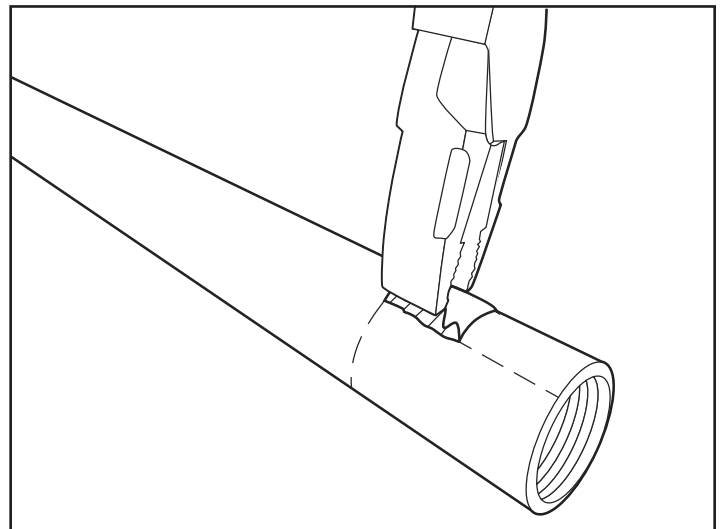


2. STRIP JACKET:

Using a MediTrac® jacket stripper (MT-JST) or utility knife, score the jacket approximately 3" back from the end. Using lineman pliers or similar tool, pinch the jacketing material on either side of the score mark to remove. Care must be taken when scoring the jacket to prevent damage to the copper alloy core.

▲ CAUTION

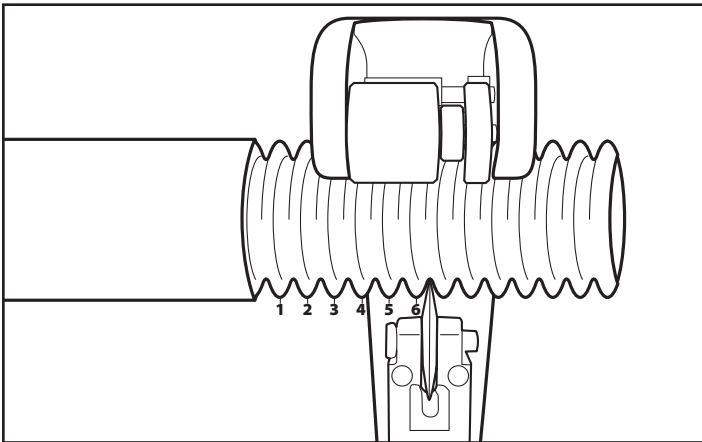
FOR YOUR PERSONAL SAFETY—KNIFE BLADE AND CUT TUBE ENDS ARE BOTH SHARP. USE CARE WHEN CUTTING THE JACKET AND HANDLING THE TUBE.



3. PRECISION CUT:

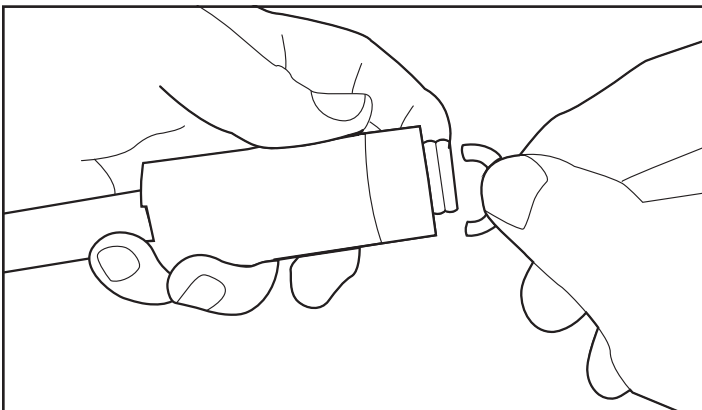
Using a tubing cutter with MediTrac® cutting wheel, make final cut exposing six full corrugations. Cut must be aligned in the root between two corrugations. Use full circular strokes in one direction and tighten roller pressure slightly after each revolution.

DO NOT OVERTIGHTEN ROLLER. BE SURE TO WIPE CLEAR ANY RESIDUAL COPPER PARTICLES FROM CUTTING.



4. MECHANICALLY AXIALLY SWAGE FITTING INSTALLATION:

Remove fitting from packaging and remove the threaded axial swaging tool from the fitting assembly. Take care not to drop the two split-rings—an oxygen compatible grease has been applied to the split-rings to help prevent them from falling during disassembly. Slide the axial swaging tool assembly over the tubing and place the split-ring into the first corrugation closest the cut end of the tubing, then slide the swaging assembly over the split-ring to hold them in place. At this time the adapter should be joined to the traditional piping system or outlet using approved methods.



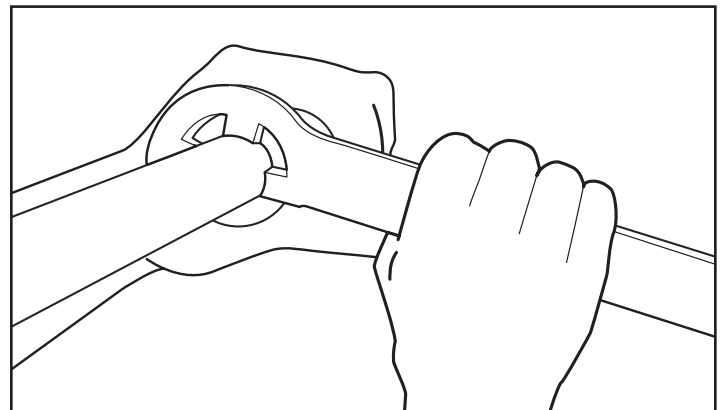
5. Once the adapter is installed, thread the axial swaging assembly onto the adapter and tighten using the appropriate wrenches on the wrench flats located on the brass swaging tool. Tighten the swaging tool until the tightening torque increases greatly. See table 4 for minimum assembly torque requirements.
6. At this point a leak-free seal is established for properly assembled fittings. It is recommended that system pressure testing is completed at this time prior to engaging the anti-tamper sleeve. Maximum test pressure shall not exceed 1.5x rated max operating pressure (277.5 psi). The fitting cannot be tightened additionally or removed for reuse once the anti-tamper sleeve is engaged.

TABLE 4 - FITTING TORQUE

CMT Trade Size	CMT Designator	Torque Value
1/2"	MT-0500-CMT	42 ft-lbs
3/4"	MT-0750-CMT	45 ft-lbs
1"	MT-1000-CMT	75 ft-lbs

7. AXIALLY SWAGED JACKET LOCK AND ANTI-TAMPER SLEEVE INSTALLATION:

Turn the MediTrac® threaded driver down by hand until resistance is met, using the special MediTrac® driver wrench continue engaging the anti-tamper sleeve until it has covered the adapter wrench flats.



7.0 Capacity Tables

MediTrac® Flow Capacities in CFM

Supplied Gas: **Medical Air**
 Supply Pressure (PSIG): **55**
 Pressure Drop (PSIG): **1**

Length (ft)

	10	20	30	40	50	60	75	100	150	200	250	300	400	500
1/2	10.2	7.0	5.7	4.9	4.3	3.9	3.5	3.0	2.4	2.1	1.8	1.7	1.4	1.3
3/4	21.3	15.2	12.5	10.9	9.8	9.0	8.1	7.0	5.8	5.0	4.5	4.1	3.6	3.2
1	39.7	28.2	23.1	20.1	18.0	16.4	14.7	12.8	10.5	9.1	8.2	7.5	6.5	5.8

Supplied Gas: **Medical Air**
 Supply Pressure (PSIG): **55**
 Pressure Drop (PSIG): **2**

Length (ft)

	10	20	30	40	50	60	75	100	150	200	250	300	400	500
1/2	14.7	10.2	8.2	7.0	6.2	5.7	5.0	4.3	3.5	3.0	2.7	2.4	2.1	1.8
3/4	29.7	21.3	17.5	15.2	13.7	12.5	11.2	9.8	8.1	7.0	6.3	5.8	5.0	4.5
1	55.8	39.7	32.5	28.2	25.3	23.1	20.7	18.0	14.7	12.8	11.5	10.5	9.1	8.2

Supplied Gas: **Medical Air**
 Supply Pressure (PSIG): **55**
 Pressure Drop (PSIG): **3**

Length (ft)

	10	20	30	40	50	60	75	100	150	200	250	300	400	500
1/2	18.2	12.6	10.2	8.7	7.7	7.0	6.2	5.4	4.3	3.7	3.3	3.0	2.6	2.3
3/4	36.1	25.9	21.3	18.5	16.6	15.2	13.7	11.9	9.8	8.5	7.7	7.0	6.1	5.5
1	68.1	48.4	39.7	34.4	30.9	28.2	25.3	21.9	18.0	15.6	14.0	12.8	11.1	9.9

Supplied Gas: **Medical Air**
 Supply Pressure (PSIG): **55**
 Pressure Drop (PSIG): **4**

Length (ft)

	10	20	30	40	50	60	75	100	150	200	250	300	400	500
1/2	21.2	14.7	11.8	10.2	9.0	8.2	7.3	6.2	5.0	4.3	3.8	3.5	3.0	2.7
3/4	41.5	29.7	24.4	21.3	19.1	17.5	15.7	13.7	11.2	9.8	8.8	8.1	7.0	6.3
1	78.4	55.8	45.7	39.7	35.6	32.5	29.1	25.3	20.7	18.0	16.1	14.7	12.8	11.5

Supplied Gas: **Medical Air**
 Supply Pressure (PSIG): **55**
 Pressure Drop (PSIG): **5**

Length (ft)

	10	20	30	40	50	60	75	100	150	200	250	300	400	500
1/2	23.9	16.5	13.3	11.4	10.2	9.2	8.2	7.0	5.7	4.9	4.3	3.9	3.4	3.0
3/4	46.2	33.1	27.2	23.7	21.3	19.5	17.5	15.2	12.5	10.9	9.8	9.0	7.8	7.0
1	87.5	62.2	51.0	44.3	39.7	36.3	32.5	28.2	23.1	20.1	18.0	16.4	14.3	12.8

Conversion Factors:

	SG	Multiplier
Medical Air	1.0000	1.0000
Oxygen (O2)	1.1044	0.9535
Nitrogen (N2)	0.9669	1.0153
Carbon Dioxide (CO2)	1.5189	0.8110
Nitrous Oxide (N2O)	1.5300	0.8085

NOTE: Multiply the value given in the flow capacity tables by the multiplier shown for the gas being used to correct flow capacity.



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