



## HOW TO SELECT SIZE AND INSTALL ELECTRICAL METAL TUBING

E.M.T. is used in both concealed and exposed work in commercial and residential applications where, during or after installation, exposed conductors would be subject to physical harm or would be rendered inaccessible inside of walls or ceilings. Individual wires that are not contained within a jacketed cable must also be run in conduit. Some wiring jobs that require the use of conduit cannot be done with E.M.T. but necessitate the use of rigid galvanized steel conduit. Where an explosion-proof system is required or where the conduit is subject to a permanent moisture condition, rigid conduit must be used. Around the home, E.M.T. is usually only used for surface circuit extensions such as patio lighting or for surface-mounted basement and work shop wiring. It is also used to provide physical protection for cables where they pass through an open area. An example of this use would be an underground cable from the exterior wall until it gets to the correct burial depth in the ground and, perhaps, to even beyond the flower bed area.

All cut ends of E.M.T. should be reamed to remove any burrs from the inside. E.M.T. should be supported with approved straps at least every 10 feet and within 3 feet of each point of termination. E.M.T. fittings for coupling or connecting to boxes should be made up tight

and where installed in wet locations or in concrete must be the compression type. Short turn "elbows and offset connectors are available to aid in making neat entry into boxes.

Bends in any conduit run (between two points where permanent access is assured) can total no more than 360 degrees, the equivalent of four 1/4 bends. This is the maximum and is very difficult to pull wires through so it is best to hold the number of bends you use to a minimum. Bends must be made so as not to injure the tubing or effectively reduce its internal diameter. E.M.T. benders are the practical tools for making bends BUT DO NOT use them to bend rigid galvanized conduit. See other side of sheet for instruction for making some popular bends. ALSO SEE ARTICLE 358 OF NFPA NATIONAL ELECTRICAL CODE for additional information on E.M.T. uses and applications.

The number of wires that can be run in conduit are governed by the tables in chapter 9 of the NFPA National Electrical Code (NEC). The chart below lists the more popular wire types and sizes and is based on Article 358.22 and the Chapter 9 tables of the NEC.

**CONDUIT WIRE CAPACITY CHART**

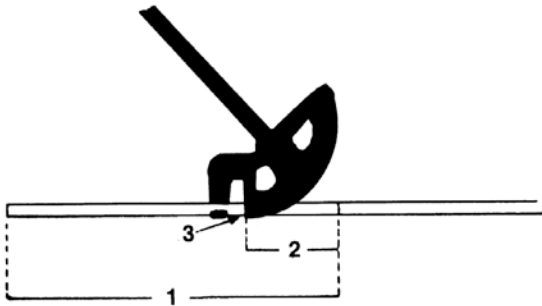
TYPE OF WIRE	CONDUCTOR SIZE AWG	Trade Size Conduit							
		1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3
T H H N or T H W N	#14	12	22	35					
	#12	9	16	26	45				
	#10	5	10	16	28	38			
	#8	3	6	9	16	22	36		
T H W	#6	1	3	4	8	11	18	32	
	#4	1	1	3	6	8	13	24	36
	#2	1	1	2	4	6	10	17	26
	#1	1	1	1	3	4	7	12	18
	1/0		1	1	2	3	6	10	16
	2/0		1	1	1	3	5	9	13
	3/0		1	1	1	2	4	7	11
	4/0			1	1	1	3	6	9



## HOW TO MAKE POPULAR E.M.T. CONDUIT BENDS

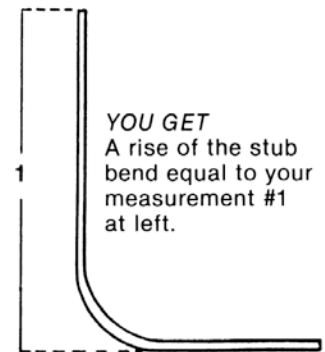
Most conduit benders are very similar in appearance and dimension, but may not be exactly alike. The directions below were designed to be used with a typical hand bender. You may need to modify the dimensions given to get correct results. For sizes over 1" in diameter, we recommend using a factory-made bend and coupling it in where needed.

### MEASURE AND BEND

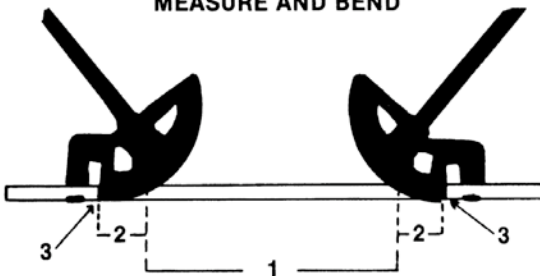


1. Measure from end and mark lightly the length of the stub needed.
2. Measure back toward end 5" for 1/2" E.M.T., 7" for 3/4" E.M.T., or 9" for 1" E.M.T. and mark point boldly.
3. Position the toe of the bender cradle on the bold mark and bend by stepping firmly on the heel of the bender and pulling on the handle.

### 90 DEGREE STUB BEND

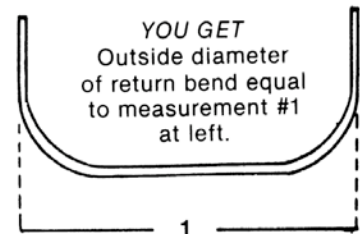


### MEASURE AND BEND

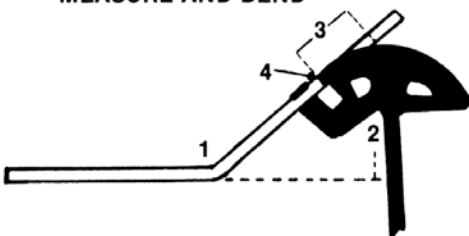


1. Measure and mark lightly the outside diameter of the return bend desired.
2. Measure back towards ends 2-1/2" for 1/2" E.M.T., 3-1/2" for 3/4" E.M.T., or 4-1/2" for 1" E.M.T. and mark these points boldly.
3. Position toe of bender cradle on the bold marks and bend but make sure the first bent stub is held exactly vertical while the second bend is being made.

### RETURN BEND



### MEASURE AND BEND



1. Make the first 45 degree bend at desired point.
2. Measure from base line at 90 degree angle to desired amount of offset and mark lightly.
3. Measure back down from this mark 2-1/2" for 1/2" E.M.T., 3-1/2" for 3/4" E.M.T., or 4-1/2" for 1" E.M.T. and mark boldly.
4. Position toe of bender cradle on bold mark and bend until the stub is parallel to the first part of the run.

### OFFSET BEND

