Installation: Manual Coning and Threading Procedure

Manual Kit Procedure

1. Cut tubing to length (see Table 2, Dwg. 1 below) and square off the end using hacksaw with at least 32 teeth per inch or abrasive cut-off wheel. (Fig.1)


Fig. 1

Allow extra length for proper engagement into the connection as listed in Table 2.

Additional 1/16" should be added to each end to compensate for coning/end facing.
Note: When cutting tubing with abrasive cut off wheel, tubing should not be over heated effecting material properties.

TABLE 2: Engagement Allowance

	Connection Tubing Size	Type OD x ID	Engagement Allowance in (mm)
Medium Pressure (to 20,000 psi)	SF250CX	1/4 x .109	.55 (14.0)
	SF375CX	3/8 X .203	.69 (17.6)
	SF562CX10	9/16 x .359	.81 (21)
	SF562CX20	9/16 x .312	.84 (21.3)
	SF750CX10	3/4 x .516	1.00 (25.4)
	SF750CX20	3/4 x .438	1.00 (25.4)
	SF1000CX10	1 x .688	1.38 (35)
	SF1000CX20	1 x .562	1.46 (37)
	SF1500CX	1-1/2 x .937	1.88 (47.6)
High Pressure (to 60,000 psi)	F250C	1/4 x .083	.50 (12.7)
	F375C	3/8 x .125	.69 (17.5)
	F562C	9/16 x .188	.87 (22)
	F562C40	9/16 X .250	.84 (21)
	F1000C43	1 x .438	1.62 (41.1)
Ultra-High Pressure (to 150,000 psi)	F250C100	1/4 x .083	1.18 (30.0)
	F375C100	3/8 x .125	1.10 (28.0)
	F562C100	9/16 x .188	.84 (21.3)
	F312C150	5/16 x .062	1.18 (30.0)

Manual coning and threading tools are not available for any tubing sizes over 9/16" OD, see Coning and Threading Machine section.
All dimensions for reference only and subject to change.

Drawing 1:

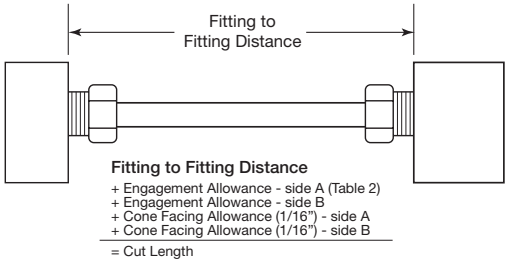
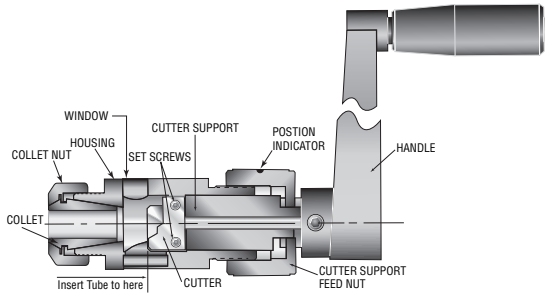


TABLE 3: Tubing Coning



	Tubing O.D. Inches	Cone Length inches (mm)	Number of Turns
Medium Pressure (to 20,000 psi)	1/4"	.11 (2.79)	2
	3/8"	.13 (3.30)	3-1/2
	9/16" (CX-10)	.13 (3.30)	2-1/2
	9/16" (CX-20)	.16 (4.06)	3
High Pressure (to 60,000 psi)	1/4"	.13 (3.30)	3
	3/8"	.16 (4.06)	3
	9/16" (C40)	.28 (7.11)	5-1/2
	9/16"	.21(5.33)	4-1/2
Ultra-High Pressure (to 150,000 psi)	1/4" (C100)	.13 (3.30)	3
	3/8" (C100)	.16 (4.06)	3
	9/16" (C100)	.21 (5.33)	5 1/2
	5/16"	.19 (4.83)	3-1/2

Manual coning and threading tools are not available any tubing sizes over 9/16" OD, see Coning and Threading Machine section.
All dimensions for reference only and subject to change.

2. Install the collet and collet nut into the bottom of the coning tool housing. Remove the cutter support feed nut from the coning tool housing and install the cutters. This can be done by backing out the four set screws in the cutter support.

Note: When installing new blades, be sure the blades are flat against the holder. There should be no space between the blades and the holder.

3. Place the coning tool housing (or optional support arm), without the feed nut/ cutter support assembly, in a vise. The vise should be equipped with soft jaws, and the housing should be placed in the vise to allow lubricant to flow to the cutters and cone.


Fig. 2

4. Slide the tubing through the collet until the end of the tube appears in the coning tool housing window (see Drawing in Table 3 above). Line the end of the tube with the edge of the window as marked above and tighten the collet nut firmly in place using the collet nut wrench (Fig. 2).

Installation: Manual Coning and Threading Procedure

5. Install the feed nut/cutter support assembly into the coning tool housing. Rotate the feed nut clockwise until the top of the cutters just contact the top of the tube. **Do not** rotate the feed nut any further at this point.


Fig. 3

6. Apply cutting oil through the lubricant opening in the end of the cutter holder or directly through the housing window (Fig. 3). A medium weight high sulphur content cutting fluid is recommended. Use the cutting oil freely during the coning operation.

7a. The distance the feed nut travels from it's start position can be used to gauge the amount of travel to properly cone the tube. The amount of travel is shown in Table 3, pg 6 and is labeled “Cone Length”.

7b. Another method to determine proper cone length is to count the number of turns of the feed nut. The number of turns required is listed in Table 3 under the heading “Number of Turns”. This includes enough advancement of the feed nut to face-off the tube and square the edge that forms the seal surface. The feed nut is supplied with a position indicator (drilled hole) to help determine the number of turns.

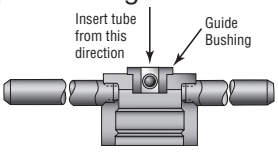
8. Rotate the handle in a clockwise direction while simultaneously **slowly turning** the feed nut in a clockwise direction. Rotate the feed nut slowly and evenly to smoothly cone the tube. Loosen collet nut, remove tubing and visually inspect the cone. Use deburring tool to remove any burr on inside edge of tube after coning.


Fig. 4

Manual Threading

9. Using the Coning Tool Body to hold the tubing for threading, clamp in vise, and slide the threading tool over the tube through the guide bushing (Fig. 4).

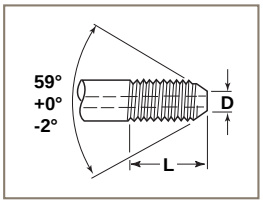
10. Apply a medium weight, high sulphur cutting oil to threading area (Exception: Hydrogen service -
Sulphur not recommended)



11. Apply pressure to the top of the threading tool to start the cutting action. The threads are left handed, so turn the threader **counterclockwise** to thread the tube. The threading tool may need to be periodically rotated clockwise to break and discharge metal chips. Apply lubricant freely during the threading process.
Note: The lead in chamfer (larger chamfer) on the die flutes toward guide bushing.

12. Continue to rotate die holder counterclockwise while applying cutting oil generously throughout the process until threads of the following lengths have been cut. See number of turns required in Table 5 (page 8), or length in Table 4 below.

13. After tube is coned, threaded and de burred, check for proper thread fit and length with a new collar of the proper size.



Note: Remember to flush all tubing prior to installation with a fluid that is compatible with the process fluid being used.

TABLE 4 - Inches (mm)

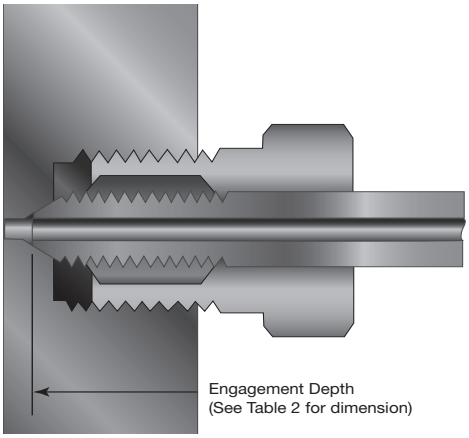
Male Connection	Tube Size O.D. x I.D.	Dimensions D	Dimensions L (max)	Thread Size and Type *
SM250CX	1/4" x .109 (6.35 x 2.77)	.141 (3.58)	.40 (10.2)	1/4" - 28
SM375CX	3/8" x .203 (9.53 x 5.16)	.25 (6.35)	.46 (11.7)	3/8" - 24
SM562CX20	9/16" x .312 (14.29 x 7.92)	.406 (10.31)	.59 (15.0)	9/16" - 18
SM562CX10	9/16" x .359 (14.29 x 9.12)	.438 (11.13)	.56 (14.2)	9/16" - 18
SM750CX20	3/4" x .438 (19.05 x 11.13)	.562 (14.27)	.69 (17.5)	3/4" - 16
SM750CX10	3/4" x .516 (19.05 x 13.11)	.578 (14.68)	.68 (17.2)	3/4" - 16
SM1000CX20	1" x .562 (25.4 x 14.27)	.719 (18.26)	.92 (23.3)	1" - 14
SM1000CX10	1" x .688 (25.4 x 17.48)	.812 (20.62)	.84 (21.3)	1" - 14
SM1500CX	1-1/2" x .937 (38.10 x 23.78)	1.062 (26.97)	1.09 (27.7)	1-1/2" - 12
M250C	1/4" x .083 (6.35 x 2.10)	.125 (3.18)	.57 (14.5)	1/4" - 28
M375C	3/8" x .125 (9.53 x 3.18)	.219 (5.56)	.77 (19.6)	3/8" - 24
M562C	9/16" x .187 (14.29 x 4.78)	.281 (7.14)	1.01 (25.7)	9/16" - 18
M562C40	9/16" x .250 (14.29 x 6.35)	.312 (7.92)	.98 (24.97)	9/16" - 18
M1000C43	1" x .438 (25.4 x 11.13)	.562 (14.27)	1.06 (26.9)	1" - 14
M250C100	1/4" x .083 (6.35 x 2.10)	.125 (3.18)	.64 (16.3)	1/4" - 28
M375C100	3/8" x .125 (9.53 x 3.18)	.219 (5.56)	.68 (17.38)	3/8" - 24
M562C100	9/16" x .187 (14.29 x 4.78)	.281 (7.14)	1.01 (25.7)	9/16" - 18
M312C150	5/16" x .062 (7.94 x 1.57)	.125 (3.18)	.71 (18.0)	5/16" - 24

*Thread is left-hand national fine (Class 2). All dimensions for reference only and subject to change.

Installation: Cone & Thread Make-up Procedure

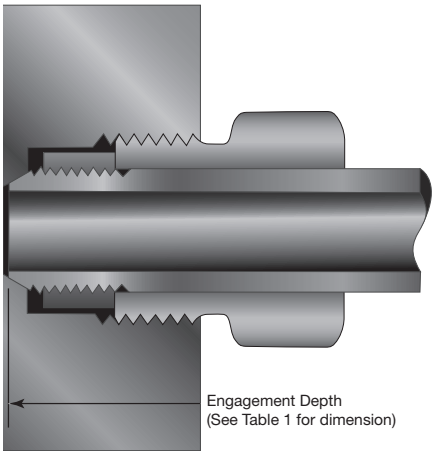
Approximate Number of Turns to Thread Tubing

TABLE 5 (Manual Threading)		
Male Connection	Number of Turns	Shortest Nipple w/Manual Tool = Length
SM250CX	9	3.5"
SM375CX	9	3.5"
SM562CX10/20	8-1/2	3.7"
M250C	13-1/2	3.75"
M375C	15-3/4	4.25"
M562C	14-1/4	4.5"
M562C40	14-1/4	4.5"
M250C100	15-1/4	4.0"
M375C100	13-1/2	4.0"
M562C100	14-1/4	4.5"
M312C150	13-1/2	4.0"

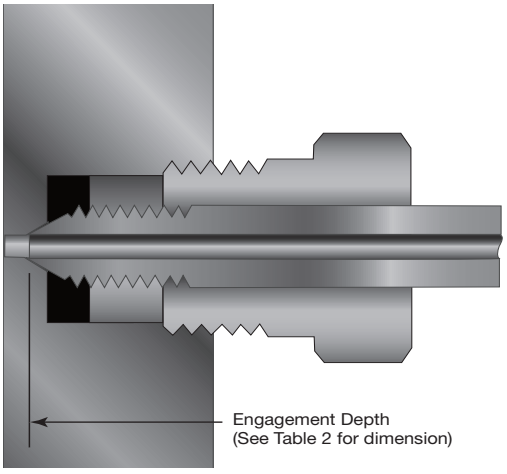


Completed Parker Autoclave Engineers
High Pressure & 9/16" F562C100 Ultra High Pressure Connections

Engagement Depth Illustrations



Completed Parker Autoclave Engineers
Medium Pressure & 1" F1000C43 Connection



Completed Parker Autoclave Engineers
Ultra High Pressure Connections
1/4", 3/8" and 5/16"

Installation: Cone & Thread Make-up Procedure

Assembly and Makeup of Connection

1. Inspect seat cone and tube cone to verify free of all lines and surface imperfections with tube face and cone edge completely smooth. Lubricate male threads of gland nut and collar/gland contact surface with a metal flake based thread lubricant. (see recommended lubricants on page 25-26 of this catalog)

Slip gland nut on tubing as shown (Fig. 5) and thread collar on tubing (turning counter-clockwise) until 1-1/2 to 2 full threads are exposed between collar and cone (Fig. 6).

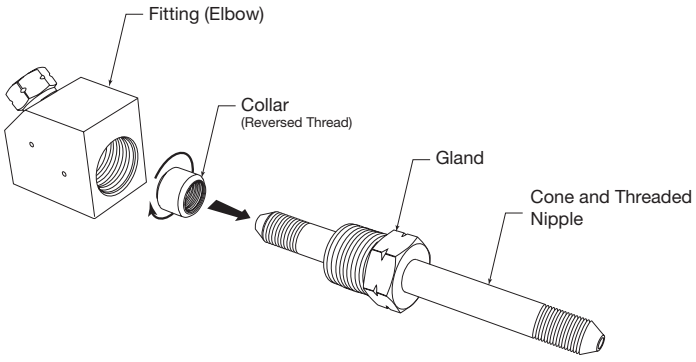


Figure 5

Note: A small amount of process tolerable lubricant, such as silicone grease or any lubricating oil, on the cone tip will help with the sealing process.

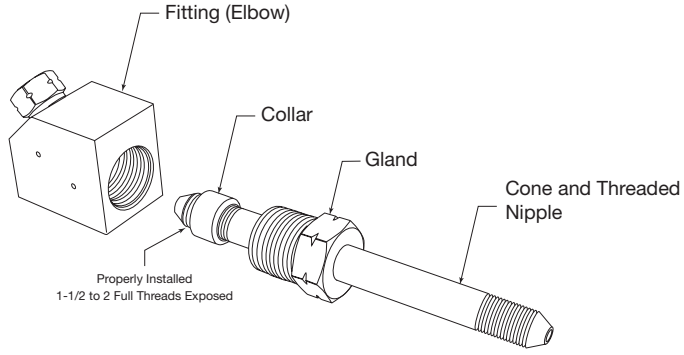


Figure 6

2. Insert tubing in connection, engage gland nut and tighten "finger-tight" at least 4 complete turns (Medium Pressure) and 5-6 Turns (High Pressure) - angular misalignment will not allow rotation with fingers and could cause leakage or gland nut gall - remove and determine cause of misalignment and correct.

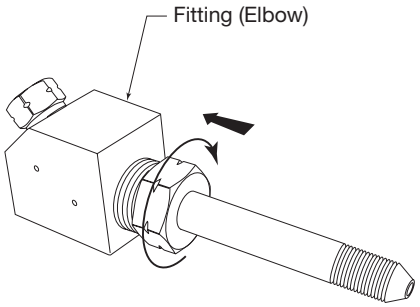


Figure 7

3. Tighten gland nut with torque wrench (REQUIRED) to specified values on page 16 or 17. When tightening, the use of an additional wrench is recommended to hold the fitting or valve body if not otherwise anchored.

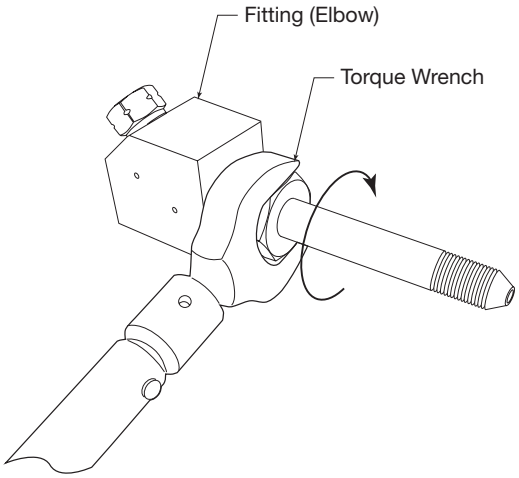


Figure 8

Cautionary Note: The torque used to seal Cone and Thread Connections is typically much less than used on compression fittings (1/8 to 1/4 turn of gland nut from finger-tight)

Recommended Thread Anti-Seize (Not for use on coned surfaces)

Copper Anti-Seize Lubricant:
P-3580 (16 oz. can)
P-3580-8 (8 oz. can)

Moly Paste (50-70%) Anti-Seize Lubricant:
P-9766 (16 oz. can)
(See recommended lubrication sites on pages 23-24)