



F-1960 Cold Expansion

Recommended Installation Guidelines



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Installation Guidelines:

CB Supplies VIPERT[®] tubing with ASTM F-1960 Cold Expansion Fittings using DeWALT or Milwaukee cordless power tools



Read this Manual BEFORE using this equipment.
Failure to read and follow and use information can result in serious personal injury, property damage, or damage to the equipment.
Keep this Manual for future reference.



When using Cold Expansion Tools other than the cordless power tools by DeWALT or Milwaukee, follow the tools manufacturer's instructions.



The expansion of VIPERT[®] tubing differs slightly from the expansion of PEX-a due to different physical properties of the materials and failure to follow Installation Guidelines will result in installation defects and leaky joints.

Installation Guidelines:

1. Cut tubing using a tubing cutter designed for use with PEX / PE-RT tubing, the tubing should be cut perpendicular to the length of the tubing. End of the tubing should be square and free of burrs or other material which could affect the connection between the fitting and the tubing.



Figure 1



Don't use a hack saw, pocket knife, copper tubing cutter, and hatchet or razor knife

Installation Guidelines:



Figure 2

- Slide the PEX reinforcement ring over the VIPERT® Tubing according to fitting manufacturer's instructions; some makes of PEX reinforcement rings have built in stops which should position the end of the tubing $1/16^{\text{th}}$ of an inch (1.6 mm) before being flush with the end of the PEX reinforcement ring. When using PEX reinforcement rings without built in stops, the end of the VIPERT tubing should be $1/16^{\text{th}}$ of an inch (1.6 mm) to $1/8^{\text{th}}$ of an inch (3.2 mm) from being flush with the end of the PEX reinforcement ring. Rule of Thumb, push the PEX Reinforcement Ring onto the VIPERT® tubing until you feel the VIPERT® Tubing with your thumb.



Don't push the PEX reinforcement ring past the end of the tubing

3. Using a DeWALT or Milwaukee cordless tubing expander tool:

- Insert the expander head into the end of the tubing with the properly positioned PEX cold expansion ring and expand the VIPERT® tubing; **there should be a gap of $1/32^{\text{nd}}$ of an inch between the wall of the tubing and the expander head.**
- Hold the tubing in place;
- Press and hold the trigger on the expander tool to expand the VIPERT® tubing while holding the VIPERT® tubing in place. The expander tool will continue to cycle until the trigger is released, the expander head should rotate with each expansion cycle;
- After each expansion cycle **insert the expander head further into the VIPERT® tubing approximately $1/8^{\text{th}}$ of an inch each expander head cycle** until the VIPERT® tubing is snug against the shoulder of the expander head on the expander tool and do one more expansion cycle, refer to Table 1 for the recommended number of expansions for each size of tubing; Figure 3 and Figure 4.
- Release the trigger on the expander tool and remove VIPERT® tubing.
- Inspect the expanded end of the VIPERT® tubing for even expansion of the wall around the circumference of the tubing end.
- Inspect the inside of the expanded end of the tubing to ensure expander head rotated and left an even impression pattern on the interior surface of the tubing. If gaps are found in the impression pattern on the interior surface, the expanded end of the tubing must be cut off and the expansion redone.

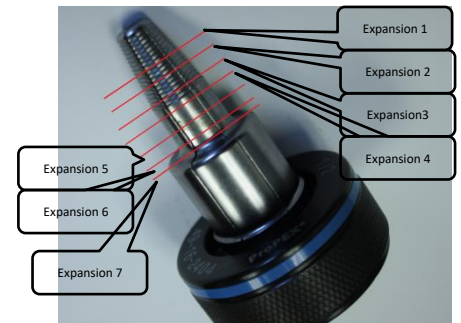


Figure 3: Example of insertion distance for $1/2^{\text{''}}$ VIPERT® tubing between expansion head cycles. Larger Expander Heads will require adjustment to the insertion distances for the different expansion cycles required for the proper expansion of the VIPERT® tubing.



Figure 4



Don't over expand the tubing and ring

Don't force the VIPERT® tubing onto the expander head between expansions

Don't advance the expander head into the tubing further than $1/8$ of an inch each expansion cycle as leak paths may result

Don't make connections in ambient temperatures below 5°F (-15°C) (See Cold Weather Installation Section)

Don't hold the last expansion

Installation Guidelines:

Table 1: Number of Expansions of 1/8th of inch advances into the VIPERT® tubing for 3/8” to 2” Nominal Tubing Size at 73.4° F (23° C) Using cordless PEX expansion power tools

Nominal Tubing Size (in.)	DeWALT Power Tool	Milwaukee Power Tools	
		M12	M18
3/8	6 – 7	6 – 7	5
1/2	7 – 8	7 – 8	9
5/8	9 – 10	9 – 10	9
3/4	11 – 12	11 – 12	10
1	17 – 18	17 – 18	19
1 1/4	--	--	9
1 1/2	--	--	10
2	--	--	10

Note: The number of expansions is to be used as a guide only as the actual number of expansions required to properly expand the tubing will vary due to factors such as: technique; temperature or cordless PEX expansion power tool used.

The number of expansions at room temperature should be close to the recommended number of expansion, if the number of expansions performed is less than the recommended number of expansion there is a risk the expansion of the tubing wall and PEX Reinforcement Ring will be uneven and the joint will leak. If the number of expansions at room temperature is higher than the recommended number of the expansions, then the tubing and PEX Reinforcement Ring have been over expanded and will take longer to contract and form a good joint seal.

4. Push the insert of the fitting into the tubing; there should be a slight resistance as the fitting is pushed into the expanded VIPERT® tubing. If the fitting is loose and must be held in place until the expanded VIPERT® tubing contracts enough to hold the fitting in position, the VIPERT® tubing is being over expanded and number of expansion cycles should be reduced. Figure 5.



Figure 5



If the fitting does not insert easily, remove the fitting and make one more expansion

Installation Guidelines:

5. The successful connection should have the PEX reinforcement ring with the VIPERT® tubing stopped against the shoulder of the fitting, **if the PEX reinforcement ring is more than 1/8th of an inch (3.2 mm) away from the shoulder, the fitting needs to be cut out and replaced** (see 5a for instructions to replace unacceptable connection).



Figure 6

- 5a. Cut 2 inches (5.1 cm) behind the fitting, slide a new PEX reinforcement ring on the VIPERT® tubing and follow installation guide

6. F1960 style Cold Expansion Fittings require a minimum spacing distance between fittings for proper installation and the minimum spacing distances are found in Table 2.

Table 2: Minimum Distance between ASTM F1960 style Cold Expansion Fittings

Nominal Fitting Size (inches)	Cut Length of Tubing (inches)	Cut Length of Tubing (cm)
1/2	3	7.62
3/4	4	10.16
1	5	12.70
1 1/4	6	15.24
1 1/2	7	17.78
2	8	20.32

7. Refer to local Plumbing Codes for testing the installed system for leaks.

Cold Weather Installation Guidelines:

1. Ensure ambient temperature is above 5° F (-15° C)
2. Cut tubing using a tubing cutter designed for use with PEX / PE-RT tubing, the tubing should be cut perpendicular to the length of the tubing. End of the tubing should be square and free of burrs or other material which could affect the connection between the fitting and the tubing.
3. Keep PEX reinforcement rings in a warm pocket or warm PEX reinforcement ring with your hands before Sliding the PEX reinforcement ring over the VIPERT® Tubing according to fitting manufacturer's instructions; some makes of PEX reinforcement rings have built in stops which position the end of the tubing 1/6 of an inch before being flush with the end of the PEX reinforcement ring. When using PEX reinforcement rings without built in stops, the end of the VIPERT® tubing should be a minimum of 1/16 of an inch from being flush with the end of the PEX reinforcement ring.
4. **Follow expansion instructions in Installation Guidelines point 3.**



Remember: VIPERT® tubing will contract slower at low temperatures

5. Refer to local Plumbing Codes for testing the installed system for leaks when ambient temperature is at or below the freezing point for water.

Servicing the expansion tool:

Do follow the manufacturer's suggestions for lubrication of expander cone

Do keep your expander heads in their designed holders

Don't use a damaged expander head

Don't use the expander tool for any other purpose (it's not a hammer)



Troubleshooting F-1960 Connections:

If the connections are not sealing, check the following:

1. Follow the Expander Tool Manufacturer's installation guide for installing or changing the expander heads.
2. Check the expander head for damage; such as bent segments or gouges. Replace the expander head if damaged.
3. If the segments of the expander head remain open (flowered), check to make sure segments are clean.
4. Is the cone of the expander head bent? If so, the tool needs to be serviced. DO NOT USE
5. Are the fitting's sealing barbs on the insert segment damaged? If so, replace fitting
6. F1960 style Cold Expansion Fitting insert not fully inserted into the expanded tubing until PEX Reinforcement Ring is against stops on the fitting.
7. Uneven expansion of the PEX Reinforcement Ring and the VIPERT® tubing
8. Is there too much grease on the expander cone?
A-Use a clean cloth to clean expander cone, reapply light coating of grease to lubricate cone.
9. Ambient temperature is below the recommended limit for installation of ASTM F1960 style Cold Expansion Fittings with PEX Reinforcement Rings with VIPERT® tubing.



All unacceptable joints must be cut out and redone to ensure a leak free system!