


# Victaulic® No. 670 (90° Elbow) and No. 671 (45° Elbow) Installation-Ready™ Fittings for Copper Mating Components

**⚠ WARNING**



- Read and understand all instructions before attempting to install any Victaulic piping products.
- Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Wear safety glasses, hardhat, and foot protection during installation.

Failure to follow these instructions could result in death or serious personal injury and property damage.

**⚠ CAUTION**

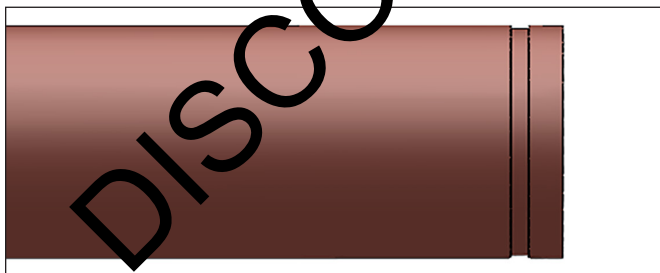
- A thin coat of Victaulic Lubricant or silicone lubricant must be used to prevent gaskets from pinching/tearing during installation. Failure to use a compatible lubricant will cause gasket damage, resulting in joint leakage and property damage.

## INSTALLATION METHOD 1

**DO NOT DISASSEMBLE THE FITTING**

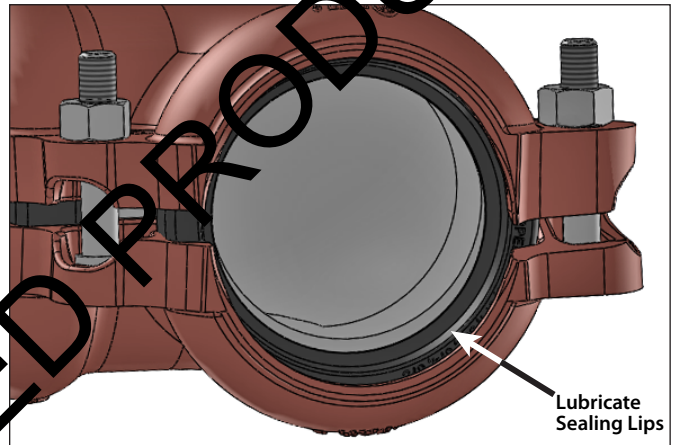


**1. DO NOT DISASSEMBLE THE FITTING:** No. 670 and No. 671 Installation-Ready™ Fittings are designed so that the installer does not need to remove the bolts and nuts for installation. This design facilitates installation by allowing the installer to directly insert the grooved end of copper mating components into the fitting.



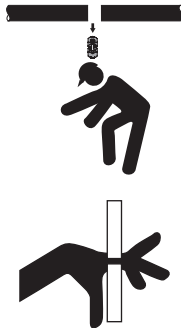
**2. CHECK COPPER MATING COMPONENT ENDS:** The outside surface of the copper mating component, between the groove and the copper mating component end, must be smooth and free from indentations, projections, weld seams, and roll marks to ensure a leak-tight seal. All oil, grease, loose paint, dirt, and cutting particles must be removed. The copper mating component OD, groove dimensions, and maximum allowable flare diameter must be within the tolerances published in current Victaulic grooving specifications, which can be downloaded at victaulic.com. **NOTE:** Maximum allowable copper mating component ovality shall comply with the requirements of ASTM B88.

**3. CHECK GASKET MATERIAL GRADE:** Check the gasket material grade to make sure it is suitable for the intended service. Victaulic gaskets for copper products contain two marks: the copper-colored mark identifies that the gasket is specifically for Victaulic copper products, and the additional mark identifies the gasket grade. Refer to Victaulic publication 05.01 for the color code chart, which can be downloaded at victaulic.com.



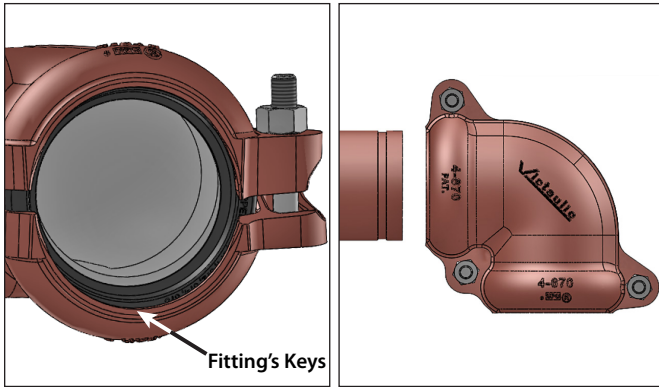
**4. LUBRICATE GASKETS:** Apply a thin coat of Victaulic Lubricant or silicone lubricant only to the sealing lips of each gasket's interior. **NOTE:** The exterior surface of the gaskets is supplied with a factory-applied lubricant, so it is not necessary to remove the gaskets from the fitting to apply additional lubricant to the exterior surface.

**⚠ WARNING**

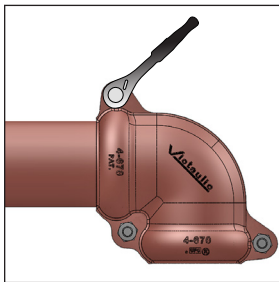


- Never leave a No. 670 or No. 671 Fitting partially installed and unattended on copper mating component ends. A partially-installed fitting poses a drop hazard or a burst hazard during testing.
- Keep hands away from the copper mating component ends and the openings of the fitting when attempting to insert grooved copper mating component ends into the fitting.
- It is important to tighten the nuts in the sequence shown on the following page until metal-to-metal contact occurs at the bolt pads.

Failure to follow these instructions could result in serious personal injury and property damage.



**5. INSERT FIRST COPPER MATING COMPONENT END:** Assemble the joint by inserting a grooved copper mating component end into one opening of the fitting. The grooved copper mating component end must be inserted into the fitting until contact with the center leg of the gasket occurs. A visual check is required to ensure the fitting's keys align with the groove in the copper mating component end.

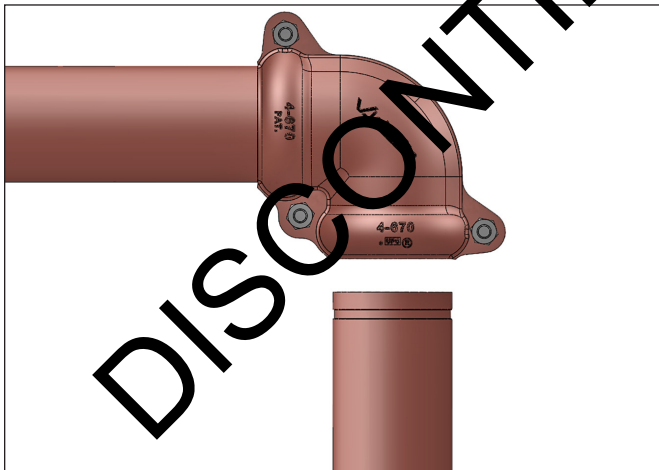


**5a. TIGHTEN NUT AT OUTSIDE LOCATION:** Tighten the outside nut at the corresponding location until metal-to-metal contact occurs at the bolt pad. Make sure the fitting's keys engage the groove completely and that the oval neck of the bolt seats properly in the bolt hole.

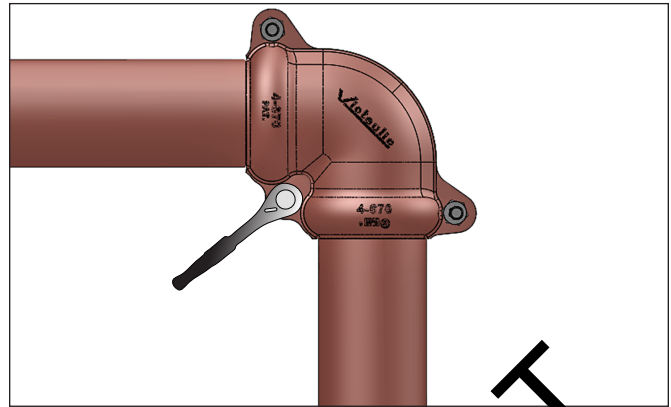
**⚠ WARNING**

- At this point, the fitting is only partially installed.
- The fitting shall be treated as a potential drop hazard and must not be left unattended.

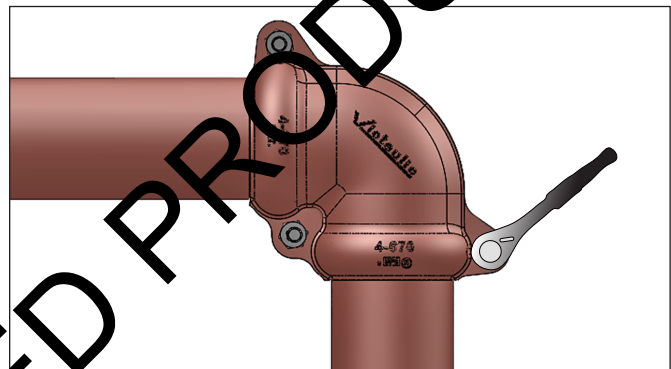
Failure to follow these instructions could result in serious personal injury or property damage.



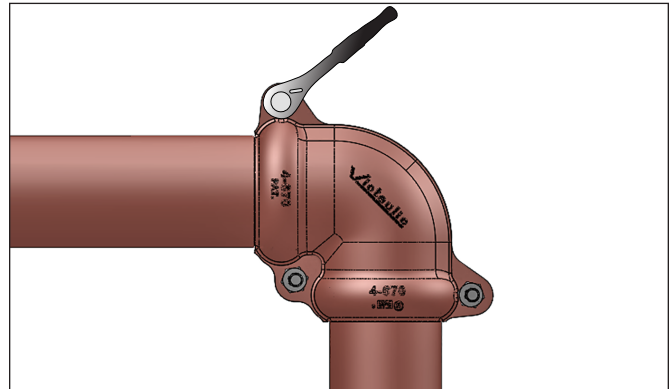
**6. INSERT SECOND COPPER MATING COMPONENT END:** Insert the second grooved copper mating component end into the other opening of the fitting. The grooved copper mating component end must be inserted into the fitting until contact with the center leg of the gasket occurs. A visual check is required to ensure the fitting's keys align with the groove in the copper mating component end. **NOTE:** If the copper mating component cannot be inserted into the fitting, incrementally loosen the nut that was tightened in step 5a just until the copper mating component is inserted (refer to the warning above).



**6a. COMPLETELY TIGHTEN NUT AT INSIDE LOCATION:** Completely tighten the nut at the inside location until metal-to-metal contact occurs at the bolt pad. Make sure the fitting's keys engage the groove completely and that the oval neck of the bolt seats properly in the bolt hole.



**7. COMPLETELY TIGHTEN NUT AT SECOND OUTSIDE LOCATION:** Completely tighten the nut at the second outside location until metal-to-metal contact occurs at the bolt pad. Make sure the fitting's keys engage the groove completely and that the oval neck of the bolt seats properly in the bolt hole.



**8. COMPLETELY TIGHTEN NUT AT FIRST OUTSIDE LOCATION:** Completely tighten the nut at the first outside location, ensuring metal-to-metal contact at the bolt pads. Make sure the fitting's keys engage the groove completely and that the oval neck of the bolt seats properly in the bolt hole.

**⚠ WARNING**

- Make sure all nuts are tightened completely until metal-to-metal contact occurs at the bolt pads, as described in the above tightening sequence.

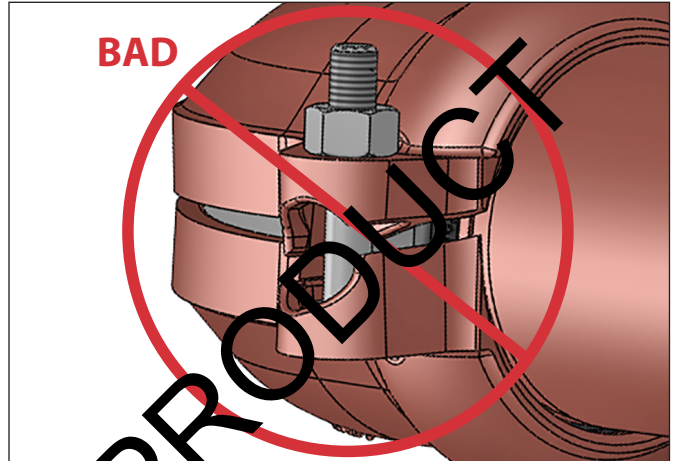
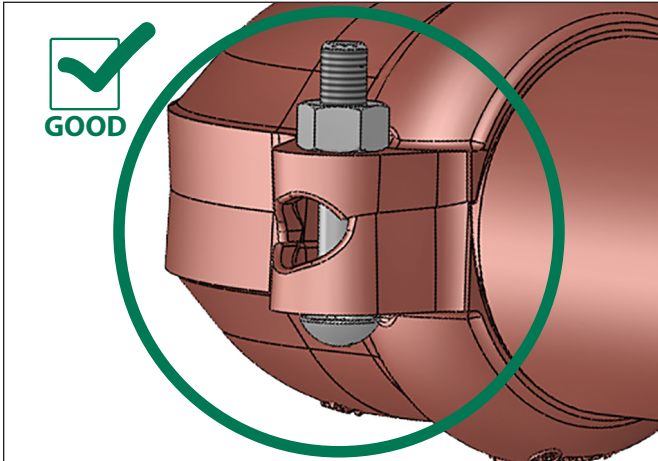
Failure to tighten all nuts completely may cause joint failure, resulting in serious personal injury and property damage.

**NOTICE**

- It is important to tighten all nuts until metal-to-metal contact occurs at all bolt pads, as instructed in the tightening sequence on the previous page.
- An impact wrench or standard socket wrench with a deep-well socket can be used to bring the bolt pads into metal-to-metal contact.
- Refer to the “Helpful Information” and “Impact Wrench Usage Guidelines” sections.

**HELPFUL INFORMATION**

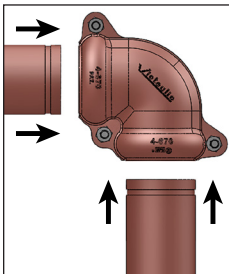
Nominal Size inches	Deep-Well Socket Size inches/mm
2 – 2½	1¼ 17
3 – 4	7⁄8 22



**9. VERIFY ALL NUTS ARE TIGHTENED COMPLETELY TO ENSURE METAL-TO-METAL CONTACT IS ACHIEVED AT ALL BOLT PADS:** Visually inspect all bolt pads at each joint to confirm metal-to-metal contact with neutral or positive offset at the angled bolt pads. If the bolt pads do not reach metal-to-metal contact, loosen the nuts then retighten all nuts evenly by alternating sides. If the bolt pads still do not reach metal-to-metal contact, remove the fitting from the copper mating component ends, and verify that the OD, groove dimensions, and maximum allowable flare diameter are within the tolerances published in current Victaulic grooving Specifications.

**NOTE:** Before pressurizing the system, the nuts can be loosened to permit repositioning of the fitting. After repositioning the fitting, the hardware must be retightened until the installation requirements listed in these instructions are achieved.

**INSTALLATION METHOD 2**



1. When practical, all grooved copper mating component ends may be inserted into the fitting prior to tightening. In this case, the hardware must be tightened evenly by alternating sides until the installation requirements listed in these instructions are achieved.
2. Before pressurizing the system, the fitting may be adjusted by loosening the appropriate hardware.

After repositioning the fitting, the hardware must be retightened until the installation requirements listed in these instructions are achieved.

**IMPACT WRENCH USAGE GUIDELINES**

**⚠ WARNING**

- It is important to tighten the nuts completely until metal-to-metal contact occurs at the bolt pads.
- **DO NOT over-torque the hardware by continuing to tighten the nuts after the visual installation guidelines for the fitting, described in Step 9 above, are achieved.**

Failure to follow these instructions could cause gasket pinching and fitting damage, resulting in joint failure, serious personal injury, and property damage.

Due to the speed of assembly when using an impact wrench, the installer should take extra care to ensure nuts are tightened until proper assembly is complete. Always refer to the specific product installation instructions for complete installation requirements.

**IMPACT WRENCH USAGE GUIDELINES (CONTINUED)**

Impact wrenches do not provide the installer with direct “wrench feel” or torque to judge nut tightness. Since some impact wrenches are capable of high output, it is important to develop a familiarity with the impact wrench to avoid damaging or fracturing the bolts or the fitting’s bolt pads during installation. **DO NOT over-torque the hardware by continuing to tighten the nuts after the visual installation guidelines for the fitting, described in Step 9 above, are achieved.**

If the battery is drained or if the impact wrench is under-powered, a new impact wrench or a new battery pack must be used to ensure the visual installation guidelines for the fitting, described in Step 8 above, are achieved.

Perform trial assemblies with the impact wrench and check the assemblies with socket or torque wrenches to help determine the capability of the impact wrench. Using the same method, periodically check additional nuts throughout the system installation.

For safe and proper use of impact wrenches, always refer to the impact wrench manufacturer’s operating instructions. In addition, verify that proper impact grade sockets are being used for fitting installation.

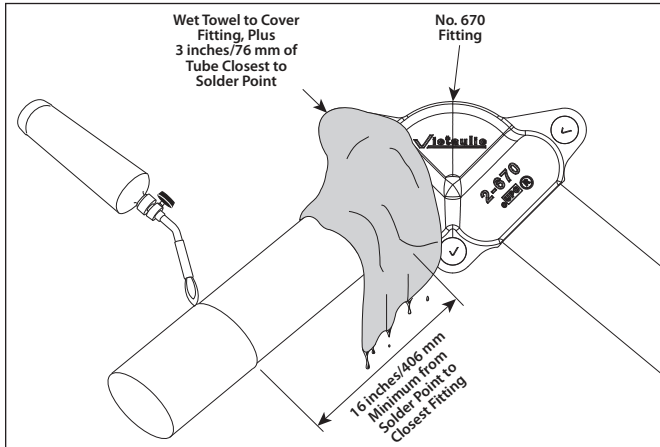
**⚠ WARNING**

Failure to follow instructions for tightening fitting hardware could result in:

- Personal injury or death
- Bolt shear or bolt fractures
- Damaged or broken bolt pads or fitting fractures
- Joint leakage

# Victaulic® No. 670 (90° Elbow) and No. 671 (45° Elbow) Installation-Ready™ Fittings for Copper Mating Components

## REQUIREMENTS FOR SOLDERING NEAR NO. 670 AND NO. 671 FITTINGS



## REMOVAL OF A FITTING FROM THE SYSTEM

**WARNING**

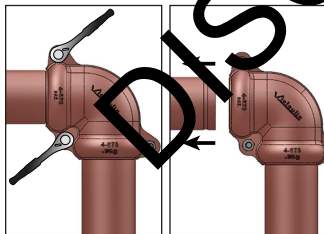
- Make sure the system is depressurized and drained completely before attempting to remove any fittings.
- The fitting and copper mating components must be supported during loosening of the nuts.

Failure to follow these instructions could result in death or serious personal injury and property damage.

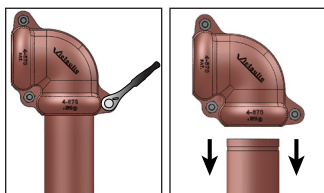
**NOTICE**

- No. 670 and No. 671 Fittings DO NOT need to be fully disassembled for removal.

1. Make sure the system is depressurized and drained completely before attempting to remove any fittings for maintenance. Provide support for the fitting and copper mating components during loosening of the nuts.



2. Loosen the nuts only on the outside and inside locations of the fitting end where the first copper mating component is to be removed. Remove the copper mating component from the loosened side. Verify that the fitting is secured to the other copper mating component to prevent the fitting from falling.



3. While supporting the fitting, loosen the nut at the other outside location. Carefully remove the fitting from the copper mating component.

4. Follow all steps of the "Installation Method 1" section on pages 1 – 3 to reinstall the joint.

## REASSEMBLY OF A FITTING THAT WAS FULLY DISASSEMBLED DURING REMOVAL FROM THE SYSTEM

**NOTICE**

- No. 670 and No. 671 Fittings DO NOT need to be fully disassembled for removal. However, if a fitting is fully disassembled during maintenance or for any other reason, the following steps must be completed.
- The fitting must be reassembled, as shown in the following steps, before attempting to reinstall the product. DO NOT attempt to assemble the gaskets and liner to the copper mating components individually.

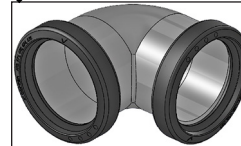
1. Inspect the gaskets, liner, and hardware for any damage or wear. If any damage or wear is present, the affected components must be replaced with new, Victaulic-supplied components of the same grade and/or material to ensure joint performance.

**CAUTION**

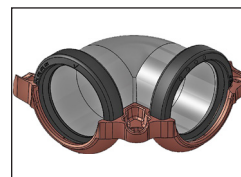
- A thin coat of Victaulic Lubricant or silicone lubricant must be used to prevent the gaskets from pinching/tearing during reassembly.

Failure to use a compatible lubricant will cause gasket damage, resulting in joint leakage and property damage.

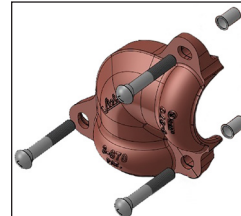
2. **LUBRICATE GASKETS:** Apply a thin coat of Victaulic Lubricant or silicone lubricant to the gasket sealing lips and exterior. It is normal for the gaskets to have a hazy white appearance after they have been in service.



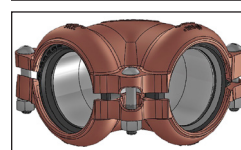
3. **ASSEMBLE GASKETS ONTO LINER:** Insert one end of the liner into the gasket until contact with the center leg of the gasket occurs. Repeat for the other end.



4. **INSTALL LINER/GASKET ASSEMBLY INTO ONE FITTING HOUSING:** Install the liner/gasket assembly into one of the fitting's housings. Verify that the gaskets are seated in the gasket pockets and that the liner remains fully engaged with the center leg of each gasket.



5. **INSTALL BOLTS AND BOLT RETAINERS:** Install a bolt into each hole of the other housing, then apply a bolt retainer onto the end of each bolt.



6. **JOIN FITTING HOUSINGS:** Join the two housings by inserting the bolts with bolt retainers into the housing with the liner/gasket assembly. Verify that the gaskets are seated in the gasket pockets of each housing and that the liner remains fully engaged with the center leg of each gasket.

Thread a nut onto the end of each bolt. **NOTE:** Make sure the oval neck of each bolt seats properly in the bolt hole.

DO NOT tighten the nuts completely. The bolt pads need to be set at a gap for reinstallation of the fitting. Two to three full bolt threads, exposed above each nut, shall provide the proper gap.

7. Follow all steps of the "Installation Method 1" section on pages 1 – 3 to reinstall the joint.

For complete contact information, visit [victaulic.com](http://victaulic.com)

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