

Victaulic® Grooved Piping System for Vacuum Services

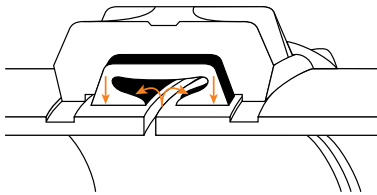
VACUUM SERVICES

The grooved piping system is the most versatile, economical and reliable piping system available. It is up to three times faster to install than welding, and easier and more reliable than threading or flanging, resulting in lower total installed cost.

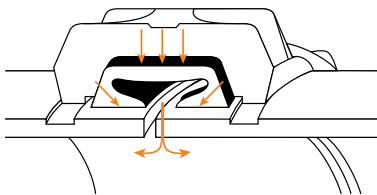
The system is designed for roll grooved or cut grooved standard pipe or roll grooved light wall pipe. Pipe end preparation is fast and easy either in the shop or on the job site with the variety of Victaulic grooving tools available.

The unique, C-shaped, pressure responsive gasket design has been the heart of the grooved system since its inception. Relying on compound compression set (resiliency) and the initially flared design, the gasket seals on the "A" dimension of the pipe O.D. This design accommodates pipe movement under both pressure and vacuum.

During assembly, the gasket is slightly stretched over the pipe ends, applying the natural compression of the angled lips as well as the resiliency of the entire gasket body. Assembly of the coupling housing over the gasket mates it closely to the gasket back, fully encasing the gasket with a backbone of ductile iron. With the bolt pad fully tightened this adds additional compressive force without full compression, leaving the natural resiliency as an active sealing force within the joint.



The Victaulic gasket design seals equally well under a vacuum as with pressure. Vacuum creates a pressure differential between the inside and outside of the piping system. The resulting increased force from the external pressure has the same seal enhancement effect as internal pressure.



For small diameter piping, Victaulic offers the Pressfit System which offers economy, speed and reliability in joining plain end pipe. The system incorporates Schedule 5 carbon steel or approved 316/316L or 304/304L stainless steel pipe from 1/2" - 2" (15 - 50 mm) including couplings, elbows, tees, reducers, adapters and valves. A portable, handheld tool assembles the fitting on the pipe to form a permanent mechanical, rigid engagement of the fitting into the pipe.

COUPLING TYPE

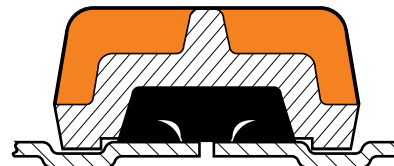
The Victaulic piping method may be used for joining a variety of piping systems for vacuum services. It may be utilized for varied pipe sizes, pipe materials and wall thickness. Products are available to provide rigid or flexible systems.

As with any piping method, the nature of the joining method should be considered in designing the piping system. This design data applies primarily to grooved end pipe, however much of the information applies to other Victaulic mechanical piping products, such as fittings, valves, hole cut products, plain end systems and the Pressfit System unless noted under the specific product information.

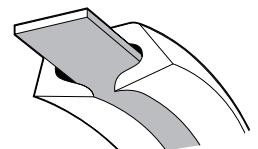
GASKET TYPE

For vacuum services under 10" (254.0 mm) of mercury, a standard gasket or FlushSeal® is satisfactory.

Due to the pulling action on the center of the gasket under continuous vacuum service in greater than 10" (254 mm) of mercury up to full vacuum (29.9" Hg/760 mm Hg), use of molded FlushSeal gaskets is required. FlushSeal gaskets provide added stiffness which will not collapse under continuous vacuum service greater than 10" (254 mm) of mercury. Victaulic also has available metal liners which may be inserted in the standard gasket cavity for vacuum service, when FlushSeal gaskets are unavailable.



FlushSeal Gasket



Metal Liner

Pressfit® products are designed for rigid, permanent, uniform engagement of the fitting onto the pipe and contain o-rings that are suitable for full vacuum service to 29.9" (760 mm) of mercury.

VACUUM TEST RESULTS

Testing was performed on both rigid and flexible Victaulic couplings on various pipe materials including galvanized steel, stainless steel and copper tubing. Also tested was the Victaulic Pressfit system.

The test procedure was done in accordance with National Fire Protection Association (NFPA) 99 "Standard for Health Care Facilities," Chapter 4 - Gas and Vacuum Systems, paragraph 4-3.2.2.2. Testing was witnessed by SGS U.S. Testing Company of Fairfield, NJ. The vacuum gauges used for the testing were manufactured by Helicoid Instruments, a division of Bristol Babcock from Watertown, CT. The temperature was 69°F (21°C) and the relative humidity was at 19%.

The test program involved imparting a vacuum into the test specimen and isolating the specimen and gauge from the vacuum pump source. Following are the results of that testing:

26.09-1A

Piping	Coupling Style	Vacuum at Start (In./mm of Hg)	Vacuum After 1 Hour (In./mm of Hg)
4" Galv. Steel 100 mm Galv. Steel	S/07 & 75 with FlushSeal® Gasket	29.1 739	29.1 739
2" Galv. Steel 50 mm Galv. Steel	S/07 & 75 with FlushSeal Gasket	29.2 742	29.2 742
4" Type 316 S.S. 100 mm Type 316 S.S.	S/07 & 75 with FlushSeal Gasket	29.0 737	29.0 737
2" Type 316 S.S. 50 mm Type 316 S.S.	S/07 & 75 with FlushSeal Gasket	29.3 744	29.3 744
4" Copper 100 mm Copper	S/606 with FlushSeal Gasket	28.9 734	28.9 734
2" Copper 50 mm Copper	S/606 with FlushSeal Gasket	29.1 739	29.1 739
2" Type 316 S.S. Pressfit® 50 mm Type 316 S.S. Pressfit	S/597	28.8 732	28.8 732
1" Type 316 S.S. Pressfit 25 mm Type 316 S.S. Pressfit	S/597	28.8 732	28.8 732

The results of this testing substantiate the use of Victaulic couplings for vacuum services. The design and subsequent performance capabilities of Victaulic couplings allows them to be utilized on vacuum piping systems which provides the designer with the options to use rigid or flexible couplings.

Victaulic is the originator of the Grooved Piping System, with over 70 years of experience in mechanical piping components. This experience has resulted in the technology incorporated into the proprietary design of Victaulic products. The results of the described tests performed apply only to Victaulic couplings and cannot be applied to other coupling manufacturers.

The material presented is intended solely for piping design reference in utilization of Victaulic products for their intended application. It is not intended as a replacement for competent, professional assistance which is an obvious requisite to any specific application. Good piping practice should always prevail. Specific vacuums, pressures, temperatures, external or internal loads, performance standards and tolerances must never be exceeded.