

ENGINEERING COMMUNIQUÉ

JAY R. SMITH MFG. CO.® ♦ MARCH 2014 ♦ VOLUME 4-ISSUE 2



From: THE SMITH ENGINEERING GROUP

Subject: Mifab 'MI-GARD' Floor Drain Trap Seal

Mifab now has a trap seal device titled 'Mi-Gard.' It is their answer to the Quad Close Seal. It is available in 2, 3, 3½ and 4 inch sizes. Please refer to the attached Data Sheet for specific information. Mifab has obtained IAPMO/UPC and ASSE listing for the Mi-Gard.

The Quad Close Seal has some distinct features versus our competitors. When water flows through the Quad Close Seal, it opens fully allowing full flow with no cross bars and so forth to restrict flow, catch debris, and is a one piece design easily installed & removed. The specially formulated material used in the Quad Close Seal is superior to the Mifab silicone material in this type of application.

The proof is visual comparison. Suggest to the specifier and installer to obtain samples of the competition and compare against one another. For those who have seen the demonstration of placing the Quad Close Seal and the competitor units in clear pipes, inverting them, filling them with water and timing how quickly the water starts leaking or pouring through all the units except the Quad Close Seal, provides obvious confirmation whose product is superior.

The Quad Close Seal is substantial and when installed the valve closes between 0.004 and 0.007 pounds per square inch and remains close to over 10.00 inches of head pressure. When holding the Quad Close Seal by hand and looking into it, some light may be seen. This is of no concern and has no bearing on whether or not the seal will prevent sewer gas omission and evaporation. Both of these issues are discussed in the attached three page document titled "The Myths and Facts of Sewer Gases and Drains".

ASSE test reports are available for these four sizes upon request. The Quad Close Seal passed all requirements/sections of the ASSE 1072 National Standard titled "Performance Requirements for Barrier Type Floor Drain Trap Seal Protection Devices" and was independently tested by the IAPMO R&T certified test laboratory.



Bariatric Water Laboratory & Sink Supports

To our knowledge, there is no fixture standard requiring a 1,000 lb. static load rating for lavatories or sinks. While the idea may be considered favorable by some, it is not practical compared to the water closet where the person will apply direct full static weight loading on the fixture. Lavatories and sinks are not intended to receive the full static impact of a person but a partial loading since most will be leaning on or bracing against the fixture. It is doubtful a person will be able to apply 1,000 lbs. of static weight to a lavatory or sink.

Some manufacturers have noted the capability of some of their lavatories or sinks to handle a 1,000 lb. load. You should be observant as these fixtures will have to be mounted to the floor structure in order for the weight to be transferred to the floor structure. In most cases, Smith can provide a support to attach to the back of the fixture to assist in preventing the fixture from deflecting forward.

It would require a massive assembly to support an off-the-floor lavatory or sink without utilizing the floor for support.

STOP THE STINK WITH JAY R. SMITH'S QUAD CLOSE TRAP SEAL/STINK STOPPER

MIFAB MI-GARD DATA SHEET

Mifab is now offering their answer to the QUAD CLOSE SEAL (Stink Stopper)! Mifab MI-GARD (-2, -3, -3½ & -4 inch sizes).

Patent: Mifab's submittal sheet indicates a patent number 7900288. This patent is titled: DRAIN CARTRIDGE HAVING REMOVABLE VALVED SYSTEM. This patent is assigned to Liquidbreaker, LLC, Carlsbad, CA., inventor is Giovanni Fima, Oceanside, CA. This was originally filed as a drainage cartridge for waterless urinals but later added a continuation-in-part to include references to urinals, tubs, floor drains and other drainage devices. Although the patent was first filed in 2007, it was not issued until March 8, 2011. It is still an active patent. This patent is not assigned to Mifab but they are allowed to use the patent reference. The illustrations in the patent do not look exactly like the Mifab unit but this is not uncommon for the illustrations to differ somewhat from the actual product.

Liquidbreaker:

There are four basic parts; an ABS frame, flexible rubber sealing ribs, an ABS fastener/bolt to hold the sealing diaphragm (flapper) and two silicone sealing diaphragms. It is inserted/removed like the Quad, Sure Seal and Pro Set. This configuration differs some from the patent but within acceptable limits.

Mifab:

Mifab's unit differs from Liquidbreaker by one item. They only are providing one silicone diaphragm and the vacant indentation can be seen when visually observing the unit. As mentioned, other than the one seal, it is the same as the Liquidbreaker.

Silicone vs. Quad Close Material:

The Quad Close is molded from a material specially formulated for this application versus the ordinary silicone diaphragm found in the Liquidbreaker/Mifab device. We experimented with various materials including silicone when developing the Quad Close. Silicone did not hold up to several of the tests. The material itself is very soft. Deformation at the edges can be a problem, creating an open gap between the seal's edges and the sealing surface on the rigid body. Silicone is not good at providing a dynamic seal, has poor abrasion resistance and will tear easy, all of which are essential qualities for a seal used in the floor drain environment

Listings:

Mifab has obtained IAPMO/UPC and ASSE listings. Presently the Quad Close Seal, Sure Seal and Mifab have these listings. Pro Set's Trap Gard has neither.

Our Opinion:

The cross bar will definitely create an appurtenance restricting flow and catching debris such as mop strings, hair and similar debris, fouling the seal. Due to the softness of the silicone material, it will fatigue in a short period of time and has a tendency to roll up on the edges voiding the seal. Remember, the Quad Close Seal is a one piece design with an impregnated stainless steel ring for rigidity and will not fatigue over a period of time.

Quad Close Material

Advantages:

1. Exceptionally good weather aging and ozone resistance
2. Excellent water & chemical resistance
3. Excellent resistance to gas permeability and aging due to exposure to steam
4. Good in ketones and alcohols
5. Good heat resistance
6. Good low temperature flexibility

Disadvantages:

1. Poor petroleum oil & solvent resistance
2. Not recommended for exposure to aromatic hydrocarbons

Temperature Range:

Low	High
40°F	300°F

Primary Applications:

Standard and special sealing applications such as hydraulic or rotary seal, o-rings, seals & gaskets, hot & cold water system seals, faucets, steam, etc. brake systems, ozone exposure applications, automotive cooling systems & general industrial use.

Silicone

Advantages:

1. Excellent extreme temperature properties.
2. Excellent compression set resistance
3. Moderate solvent resistance
4. Very clean, low odor & taste

Disadvantages:

1. Typically not good for dynamic seals due to friction properties & poor abrasion resistance
2. Not recommended for most concentrated solvents, oils, concentrated acids and dilute sodium hydroxide.

Temperature Range:

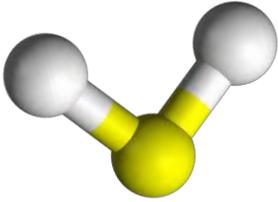
Low	High
75°F	400°F

Primary Applications:

O-rings, rubber seals and custom rubber components for: static seals, for extreme temperature applications, medical devices, & FDA applications.



THE MYTHS AND FACTS OF SEWER GASES AND DRAINS

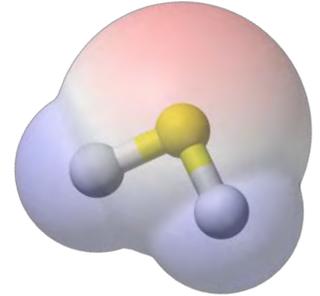


Fact: The main odorous component of sewer gas is **Hydrogen Sulfide**.

Fact: Hydrogen Sulfide Gas is **heavier** than air.

Fact: **Air** at sea level weights 0.0749136 lb. per cubic foot.

Fact: **Hydrogen Sulfide** weights 0.0850893 lb. per cubic foot.



Myth No. 1: Sewer gases rise up out of the drain pipes, much like steam, thru small openings of a drain trap seal device.

Fact No. 1: Hydrogen Sulfide gas will collect under a layer of air the same as water will collect underneath a layer of oil. An outer force is needed to move or agitate the lower layer (Hydrogen Sulfide Gas) thus mixing it with the upper layer (Air).

Fact No. 2: The only way sewer gas can be expelled out of a drain would be if it were pushed out by atmospheric pressure differential and/or turbulence.

Example 1: Wind blowing into a vent stack pipe, creating a higher pressure in the drain pipe than inside the room the drain is connected to, will push the heavier hydrogen sulfide gas out of the drain, agitating and mixing the gas with the air inside a room.

Example 2: An air conditioner or ceiling exhaust fan can pull air from a room, reducing the air pressure in the room thus allowing sewer gases to be pulled from a drain.

Example 3: Sewer gases forming inside a septic tank increasing the gas pressure inside the tank will push the sewer gases up and out of the floor drain.

Example 4: Water backing up from flooding or from a clogged drain pipe will push the sewer gas thru a drain, into a room.

Fact No. 3: The Quad Close check valve will close between 0.004 and 0.007 pounds per sq. inch and remain closed to well over 10.00" of head pressure until a reverse pressure occurs, opening the valve and allowing air and/or water to enter the drain. This will prevent sewer gases from escaping or being expelled from a floor drain pipe. The pressure needed to close the Quad Close valve is a fraction of the weight of (1) cubic foot of air.

(Approximately 0.07788 to 0.0807 lbs. Per Cubic Foot)

Fact No. 4: The Quad Close check valve is a pressure amplifier or intensifier much like a diaphragm type valve. Designed after the human heart valve, the large surface area beneath the Quad Close is a "diaphragm" that sums up the ultra-low drain pressure, closing the valve and concentrating this pressure evenly along the valves sealing surfaces. **See Fig. No. 1:**

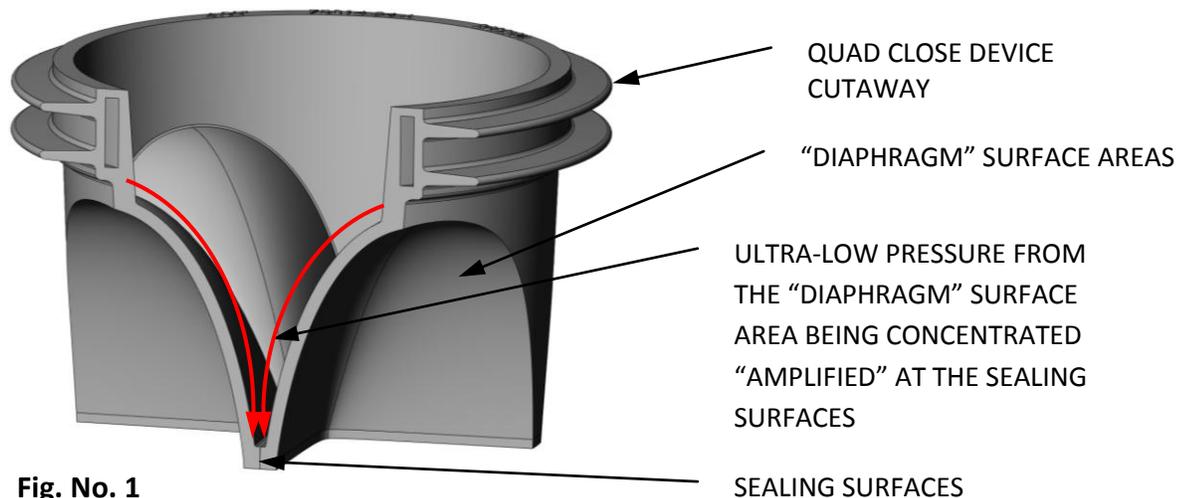


Fig. No. 1

Myth No. 2: If you can see light thru a trap sealing device then sewer gases can get thru.

Fact No. 1: The fact that light can or cannot be seen thru a trap seal device has nothing to do with whether or not the device will stop sewer gases. Light requires a straight line path of travel thru the device to be seen. Gas will travel thru openings between curved surfaces even if the device appears closed. This can be demonstrated by placing the trap seal device onto a surface of water. Producing an ultra-small pressure differential, the device will close and float. Any opening thru the valve that does not close, will allow water to come thru thus sinking the valve. Consequently gas will make it thru the device easier since it has considerably less overall pressure on the device than water, for closing the device. **See Fig. No. 2:**

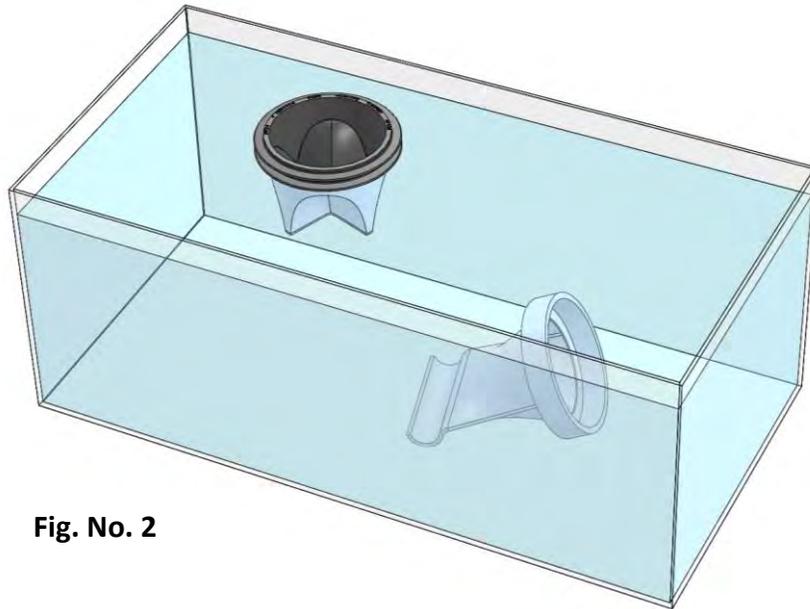


Fig. No. 2

Fact No. 2: Check valves, with ultra-low closing pressures need this “even gas pressure” differential to close them. Uneven mechanical spring type forces on a check valve can leave some sealing areas warped and open. This will allow sewer gases to get thru even the smallest openings around the valves sealing surfaces that are not sealed by the gas pressure, but instead, held open by uneven mechanical forces.

Fact No. 3: Gas pressure is spread evenly over the surface underneath the Quad Close valve producing smooth even pressure along the positive sealing surfaces. This closing action can be seen thru the top of the Quad Close valve. This takes the guess work out of trying to “see” if a trap seal device is operating properly by watching the Quad Close valve “Sealing Surfaces” open or close due to changing pressures within a drainage system.

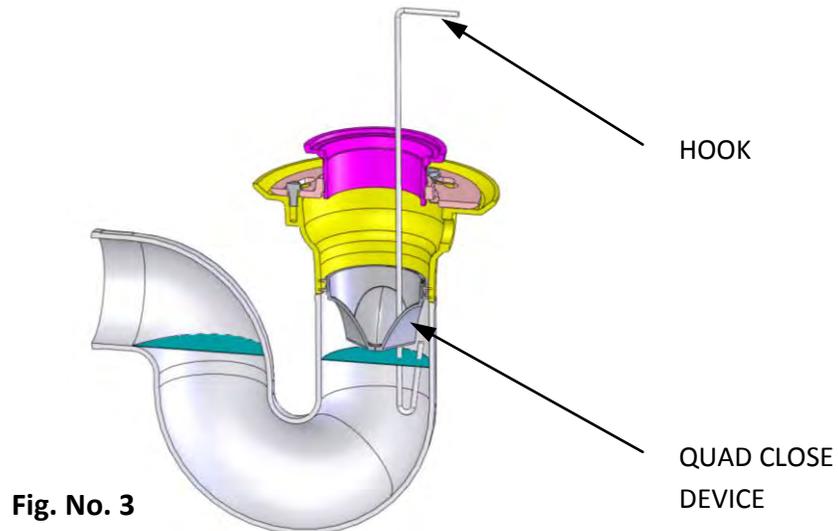
Myth No. 3: A metal drain snake can be used thru a rubber drain trap seal device without eventually destroying the rubber parts of the device.

Fact No. 1: A metal drain snake used thru a rubber drain trap seal device will eventually destroy the rubber parts of the device. A plastic pipe inserted into a trap seal device, to allow a metal drain snake thru, will stretch the valve seal to a point where it will not close. Removal of the trap seal would be best.

Fact No. 2: The Quad Close can be easily removed with a hook or by hand to allow cleaning of the drain.

See Fig. No. 3:

Fact No. 3: The Quad Close can be easily removed for cleaning of the trap seal device itself as well.



Myth No. 4: A trap seal device can be used in place of a trap primer.

Fact No. 1: A trap seal device does not provide water to a drain. Eventually the water in a P-Trap will evaporate out of the outlet side of the pipe and water will need to be placed into the drain, manually or with a trap primer, filling the P-Trap.

Fact No. 2: The use of the Quad Close will enhance the use of a trap primer by greatly reducing the amount of water used to replace the evaporated water in the P-Trap, due to reduction of evaporation.

Fact No. 3: Using a trap seal device in a drain with a P-trap that has no water in it is the same as replacing the P-trap with a trap seal device. A P-Trap with no water in it is just a curved piece of pipe that will allow sewer gases to pass under differential pressure. Using a trap seal device in place of a P-Trap will probably never be allowed by code and should not be.

Myth No. 5: The ASSE-1072 Standard was written for the back flow prevention of water and sewer gases thru a trap seal type device.

Fact No. 1: The ASSE-1072 Standard was written for the reduction of evaporation of water from a P-Trap.

Fact No. 2: The Smith Quad Close far exceeds the requirement of the ASSE-1072 Standard adding smoke testing, over 10.00" of head backflow prevention and greatly exceeds the ASSE-1072 requirement for evaporation reduction.

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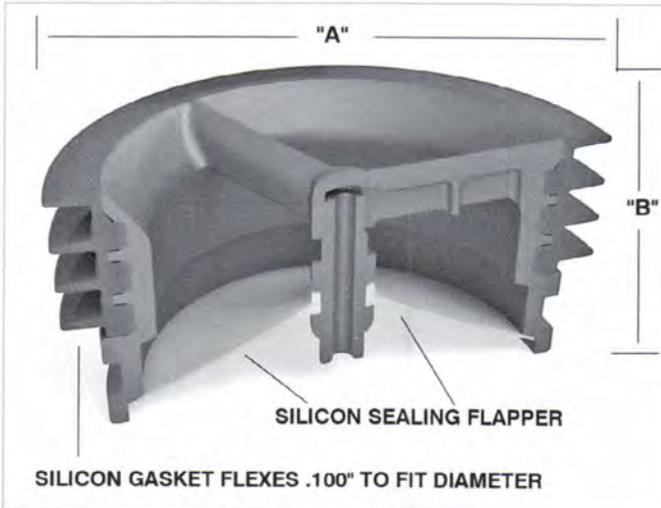


MI-GARD®

FLOOR DRAIN TRAP SEAL

Specification: MIFAB MI-GARD® Series inline floor drain trap seal with UV resistant ABS plastic frame, silicon rubber sealing flapper and four flexible sealing ribs. Tested and certified to the ASSE 1072 Standard and listed with IAPMO. Specify connection size (2", 3", 3 1/2" or 4")

Function: Used in the outlet connections of floor drain bodies, or the inside of floor drain strainers to seal the opening to prevent odors, sewer gases, flood waters and insects from entering up through the floor drain grate. The MI-GARD®'s four flexible silicone sealing ribs ensure easy installation into openings that have variations in size. The MI-GARD® will open to allow drainage and close when there is no water flow. The MI-GARD® can be used in either new construction or retro-fit applications where trap primers were never installed.

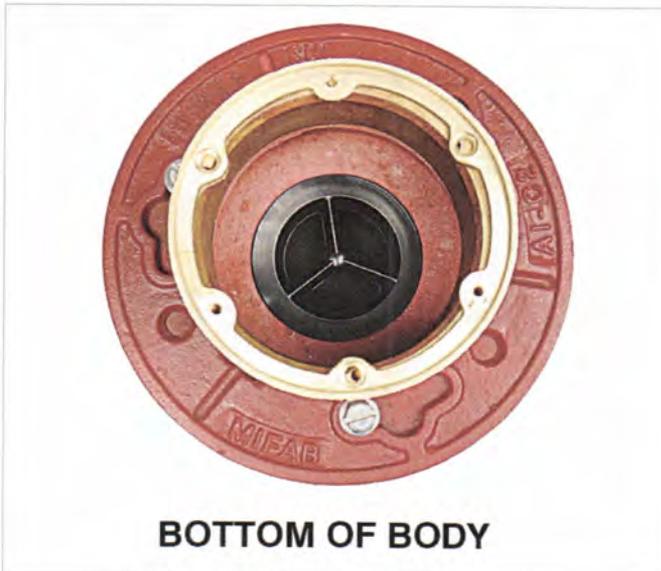


MODEL NUMBER	"A" (PIPE SIZE)	"B" (HEIGHT)
O MI-GARD-2	2" (51)	2" (51)
O MI-GARD-3	3" (76)	2" (51)
O MI-GARD-35	3 1/2" (89)	2" (51)
O MI-GARD-4	4" (102)	2" (51)

U.S. Patent #7,900,288

MI-GARD® prevents the following from entering through the top of floor drains:

- Odors and sewer gases
- Insects



Job Name:

Section No:

Schedule No:

Page No:

Contract:

Purchase Order No:

MIFAB reserves the right to make changes in material and design without formal notice or obligation.

USA: 1-800-465-2736 www.mifab.com CAN: 1-800-387-3880