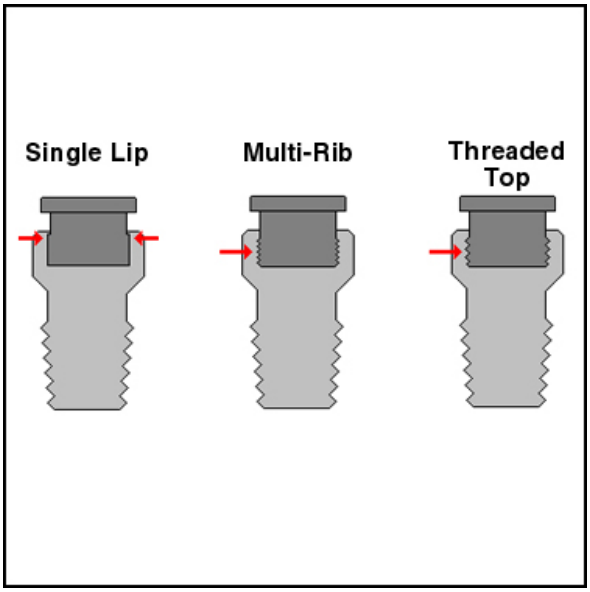
Chapter 7

Sealant Injection Fittings, Adapters and Special Tools

Identifying Dangerous Two-Piece Fittings

There are several different styles of two-piece buttonhead fittings. The illustration below describes the differences between the most common styles. The drawing in the center illustrates the multi-rib style of pressed on top. This is the style which failed at a nearby compressor station at relatively low injection pressure (estimated 3,000 to 5,000 PSI). With this design, the ribs form a friction fit with the body section; there are no threads or additional ribs in the body portion. As there are no identifying marks on the samples we have in our failed fitting collection, we are unable to positively identify the manufacturer of this style of fitting.



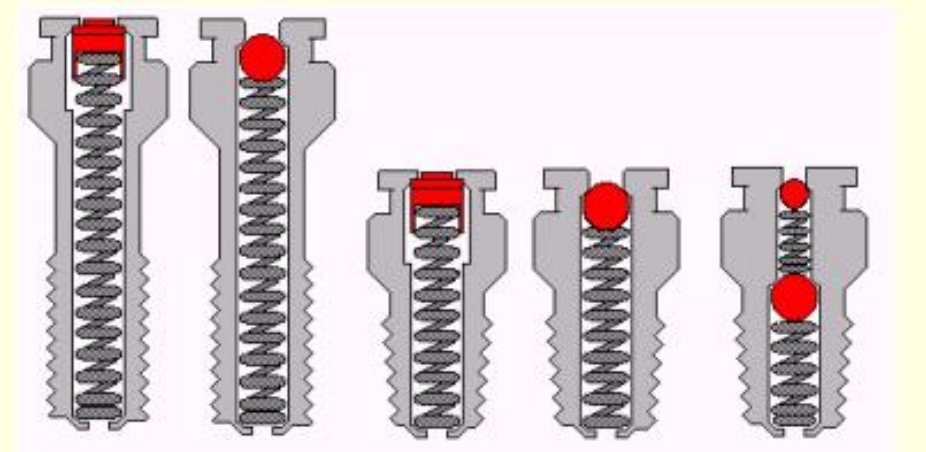
Dangerous Two-Piece Fitting Designs

Two-piece fitting manufacturers distribute through a wide variety of industrial supply firms. It is possible that these types of fittings were introduced to the pipeline system many years ago and have been in service or in inventory since then. They could have also been purchased recently as old inventory from any number of sources, the supplier not realizing the potential danger of this style fitting when placed in high-pressure service.

The illustration on the left, is the other type of two-piece buttonhead fitting. The manufacturer's catalogue describes the fitting as being designed for heavy duty use, on industrial construction and earth moving machinery. Notice the single lip which secures the hardened buttonhead.

We encountered a failure of this style of buttonhead fitting several years ago. The top section separated at only 3,000 PSI while injecting sealant at approximately eighty 80° degrees Fahrenheit. This was on a twenty 20" inch ball valve manufactured in Scotland. The fitting had been provided as original equipment from the manufacturer. Upon further discussion with the manufacturer, they advised that they quit installing the two-piece buttonhead fitting in 1988 and now only utilize the one-piece design. Fortunately no one was injured when the fitting came apart because the buried inner check valve held back the 1000 PSI gas pressure.

Identifying One-Piece Fittings



One-Piece Sealant Injection Fittings

There is no doubt that the one-piece body is less likely to come apart under pressure. The weak point of the one-piece design is the use of a light crimp on the bottom of the fitting which holds the ball and spring in place. It is not difficult to collapse the spring inside the fitting when injecting cold or heavy sealing compounds (see Page 2 of the FLOW WOLF® brochure). This restricts sealant flow and can eventually plug off the fitting. Continued injection with high-pressure guns or pumps can straighten the crimp and the ball check mechanism is then blown into the valve body. This often results in the seat sealant system becoming completely plugged off. It can also result in gas or product escaping out through the fitting, which can be difficult to stop and may trigger an emergency shut-down if inside a compressor station.

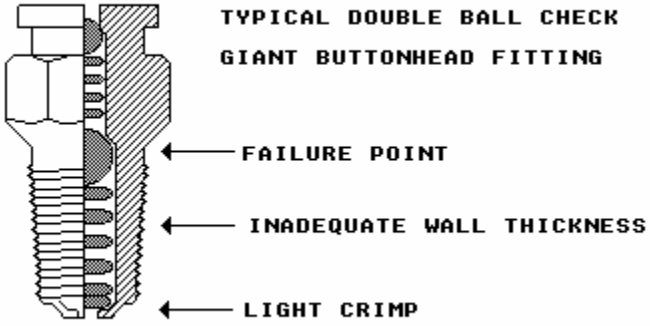
Should this occur, the Sealweld® FLOW WOLF® Leak-Lock # 1 adapter can be attached to the leaking giant buttonhead fitting and the top section tightened to make a seal. Once the leak is stopped, cleaner and / or sealant can still be injected into the valve. During the next scheduled shut-down, the pipeline can be de-pressurized and the damaged fitting can be safely replaced.

Dangerous 1/4" One-Piece Fittings

Another weak point of most one-piece styles is the risk of the fitting snapping in two as a result of inadequate wall thickness on 1/8" NPT and 1/4" NPT sizes. The failure usually occurs at the transition zone between the threaded portion and the body shoulder. It can be caused by dropping a wrench on the fitting or by standing on the fitting while climbing to examine the actuator. Occasionally the buttonhead coupler can become locked onto the buttonhead fitting if the pressure is not relieved from the sealant hose assembly. Inexperienced maintenance people have been known to use a hammer to remove the coupler from the fitting and the striking blow has been known to cause these smaller sized fittings to break in two.

With the one-piece design there must be sufficient clearance through the bottom of the fitting to insert a ball check and spring mechanism. Many of the 1/4" and larger one-piece giant buttonhead fittings feature a

double ball check system. These types require an even larger internal passage which further reduces the wall thickness in the threaded area. This lowers the burst rating of the fitting and offers little if any safety margin.



Unfortunately most valve manufacturers have cut only a 1/4" NPT thread into the body of the valve for sealant fittings. We strongly recommend that you urge the valve manufacturers to use a 3/8" NPT or 1/2" NPT thread to reduce the risk of this type of fitting failure on all new valves. For valves that must use a 1/4" NPT fitting, standardize with a .316 stainless steel material for increased mechanical strength.

Special Uses and Safety Advantages of the FLOW WOLF® Fitting

Many of the valves currently in service have only a 1/4" NPT thread for sealant fittings. To safely re-fit these valves, we suggest the use of a 1/4" FLOW WOLF® sealant injection fitting made from .316 stainless steel or a 1/4" NPT male x 3/8" or 1/2" NPT female stainless steel adapter. The .316 stainless material is readily available from Parker or Cajon or similar sources and offers burst rating of 18,000 PSI to 24,000 PSI which provides a comfortable safety margin. Because these adapters **do not** have check valve mechanisms, there is adequate wall thickness in the threaded area and increased material strength. Install a 3/8" or 1/2" NPT FLOW WOLF® style sealant injection fitting into the adapter. Remember to advise maintenance staff to completely de-pressurize the pipeline leading up to the valve as well as the valve body before attempting to remove a sealant injection fitting. **Do not** rely on the buried inner check valve to hold back line pressure, they are notoriously unreliable.

The special single ball check feature in the FLOW WOLF® fitting allows the valve technician to attach the SO-BV Tool to the fitting which can un-seat the ball check. The technician can then test if the buried internal check valve is in place and working or if it has been damaged or removed. If the seat sealant system is plugged or if solid contaminants become trapped behind the valves seat rings, proper use of the SO-BV Tool enables the technician to back flush these contaminants out through the tool.

A 1/2" 3000 PSI stabbing valve should always be screwed into the SO-BV Tool before the stinger un-seats the ball check in the fitting. Hydrates or contaminants may prevent the ball check from re-seating when the stinger is retracted after the back flushing or venting is complete. With the ball valve attached to the SO-BV Tool, simply close the valve to contain the leakage. The leaking ball check can usually be properly seated by injecting a small amount of Sealweld® # 5050 ball valve sealant back through the 1/2" ball valve, SO-BV tool and fitting.

Suggested Actions

There are such a wide variety of designs and styles of sealant fittings it is difficult to recommend that any particular fitting be withdrawn from a pipeline system without close examination. The best way to judge if it is one-piece or two-piece construction is to examine the bottom of the fitting. If the fitting is installed into a pressurized valve, it would be extremely dangerous to remove it to examine the bottom in an attempt to determine whether or not it is of one-piece construction. DO NOT rely on the buried inner check valve to hold back line pressure. ALWAYS blow down the pipeline both upstream and downstream before removing any sealant injection fittings on ball and gate valves. As this is impractical in most situations our best advice would be to NOT service the valve if the technician has any doubts if the fitting is safe or not.

*Call Sealweld® for **on-site valve maintenance training seminars**, available worldwide.*

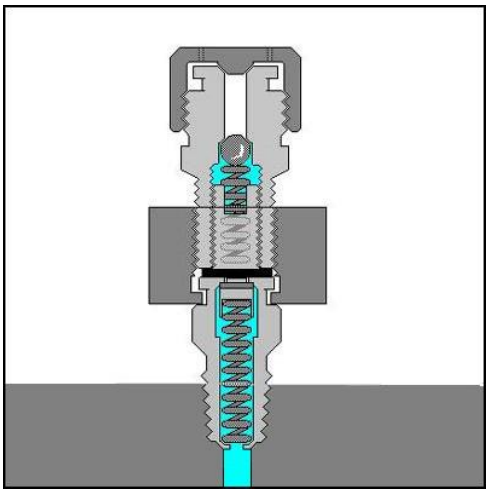
When examining sealant fittings; if a crimp is obvious then you can be almost certain that it is of one-piece construction. If the bottom is flat and no crimp is present, then it is probably a two-piece fitting and should be discarded. The FLOW WOLF® design is obvious by its threaded cage (with Allen head) screwed into the bottom of the fitting and FLOW WOLF stencil on the wrench flats. Sealweld® valve maintenance technicians tour the many miles of pipeline on a regular basis. We would be glad to stop in at any location and examine any fittings in question to make a determination. By spending a little time with your valve technicians, we can show them some of our many failed fitting samples and teach them how to make their own determinations regarding the integrity of fittings.

Sealweld® FLOW WOLF® Valve Maintenance Adapter Kit

A collection of the most commonly used adapters for servicing all makes of valves.

FLOW WOLF® Leak-Lock # 1

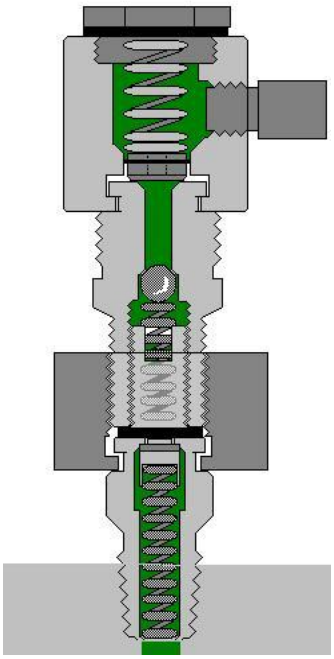
FLOW WOLF® Leak-Lock # 1 Adapter for leaking or damaged giant buttonhead fittings Stops leakage to atmosphere and allows for the safe injection of valve cleaners and sealant.



Order Part Number - D-FW-LL1-SS

FLOW WOLF® Leak-Lock # 2

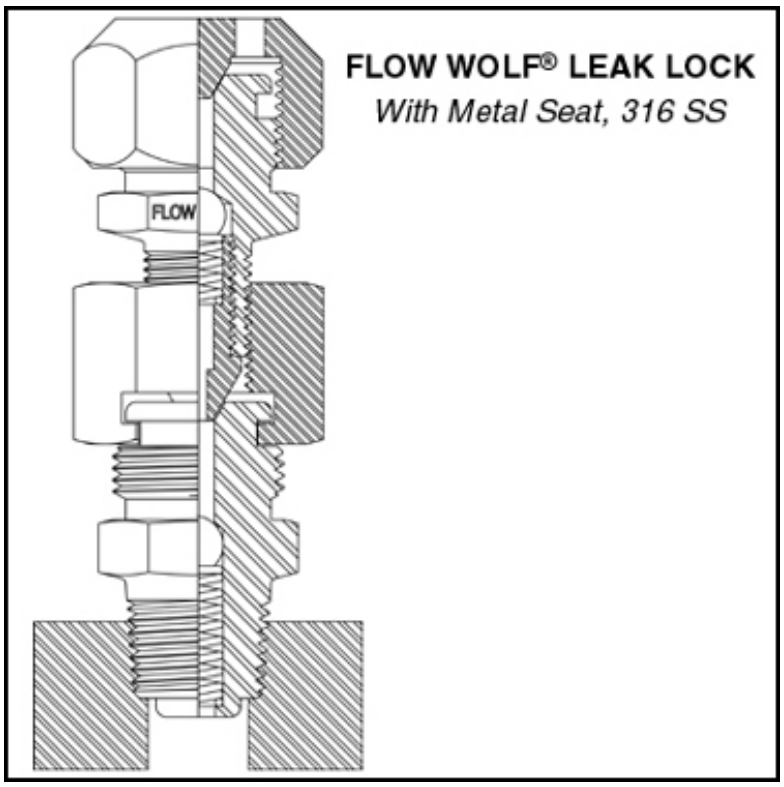
FLOW WOLF® Leak-Lock # 2 Adapter for leaking or damaged small buttonhead fittings. Converts a small buttonhead fitting to a giant buttonhead fitting for easy servicing.



Order Part Number - D-FW-LL2-SS

FLOW WOLF® Leak-Lock with Metal Seat

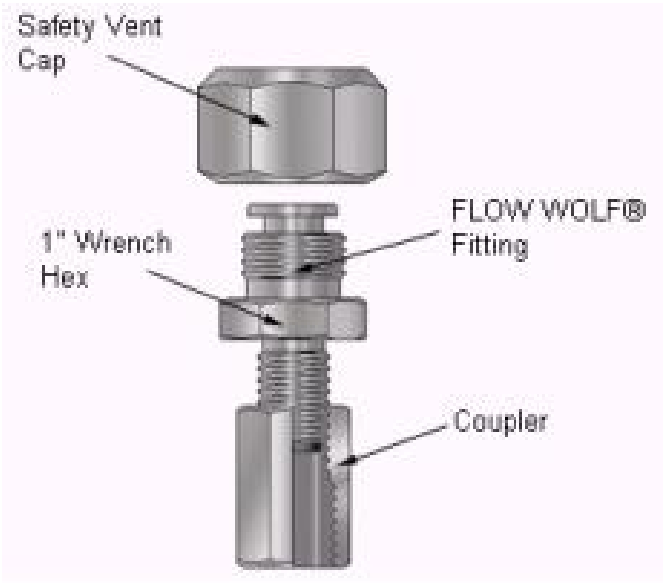
FLOW WOLF® Leak-Lock with Metal Seat designed for all types of giant buttonhead fittings with a metal cap. Converts non-standard buttonhead connections to North American standards for connecting guns and pumps.



Order Part Number - D-FW-LL1-MS-SS

FLOW WOLF® - Cameron® Adapter

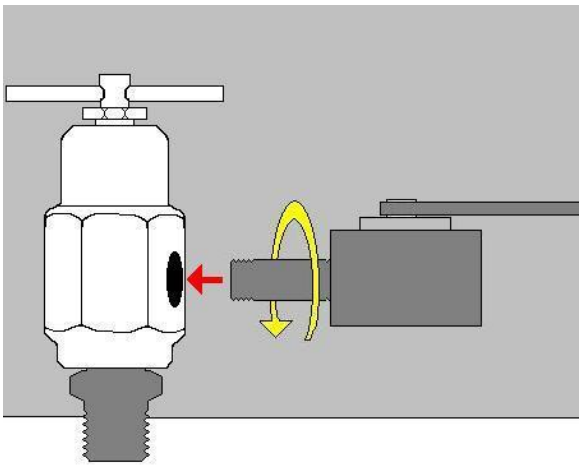
FLOW WOLF® - Cameron® Adapter - Use in Cameron® Ball Valves that are equipped with a small capped fitting. Threads onto cap thread connection.



Order Part Number – D-FW-CAM-SO

Screw-On Body Vent Tool

The SO-BV Tool - Screw-On Body Vent Tool threads onto fittings with a metal cap and sends a stinger down to un-seat the ball check. Ideal for preventing pressure lock in W-K-M® gate valves.

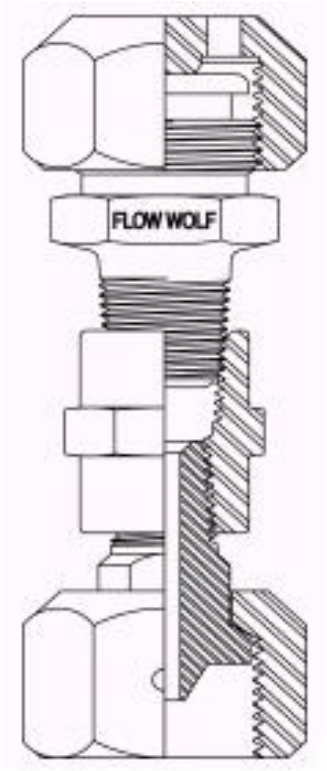


Order Part Number - D-SO-BV

FLOW WOLF® - Screw-On to Buttonhead Adapter

FLOW WOLF® - Screw-On to Buttonhead Adapter

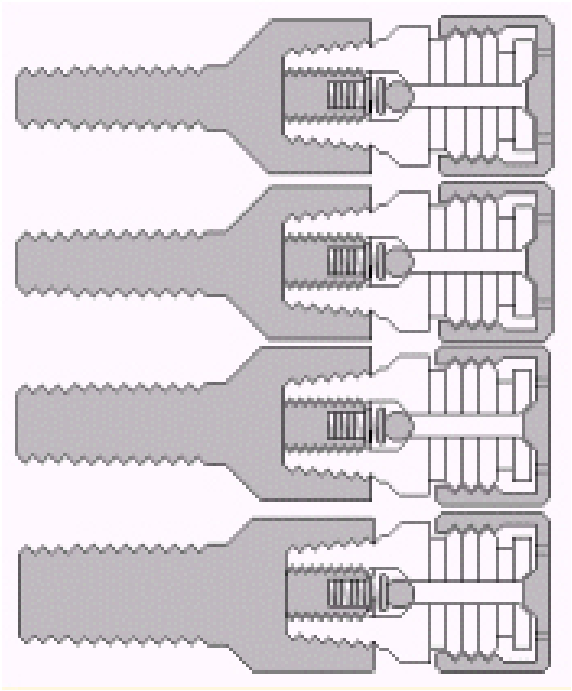
Converts W-K-M® fittings without a buttonhead flange to accept a standard slip-on giant buttonhead coupler.



Order Part Number - D-FWSO-BH

FLOW WOLF® - Packing Injector Adapters

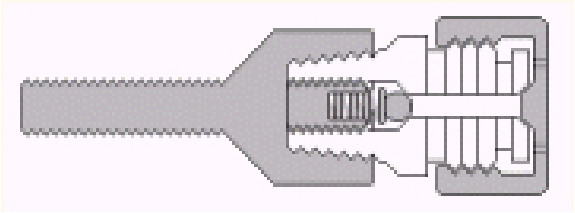
FLOW WOLF® - Packing Injector Adapters for threaded stem plug valves. Remove Allen head screw and install a buttonhead adapter to inject valve cleaner and loosen the old hardened packing.



Order Part Number - D-PIT-KIT

FLOW WOLF® - Orifice Fitting Adapter

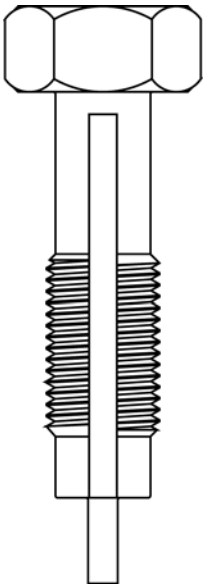
FLOW WOLF® - Orifice Fitting Adapter - Inject valve cleaner to soften old stick grease follow-up by injecting a soft sealant such as Sealweld® Total-Lube # 911 will fit most types of standard packing injectors.



Order Part Number - D-FWOA1/4 T

FLOW WOLF® - Packing Injector Relief Stinger

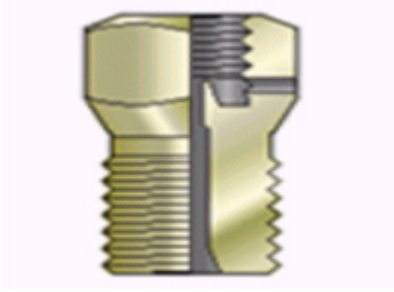
The Packing Injector Relief Stinger features a special tip on stinger and groove along threads for relieving excess packing pressure that may be causing increased torque in gate valves.



Order Part Number - D-PI-RLF

FLOW WOLF® - Small Screw-On Connection

Small Screw-On to Standard Screw-On Connection - Use in W-K-M® / IKS ball valves with small capped fitting. Connect to the D-FWS0-BH adapter.



Order Part Number - D-SSO-SO

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