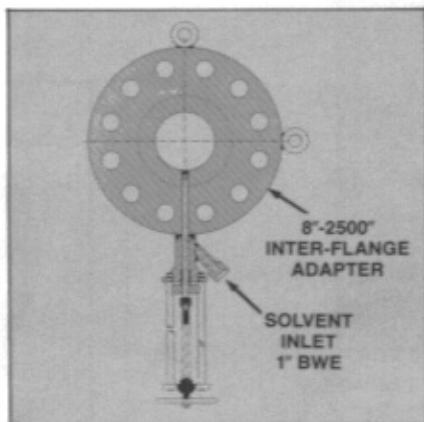
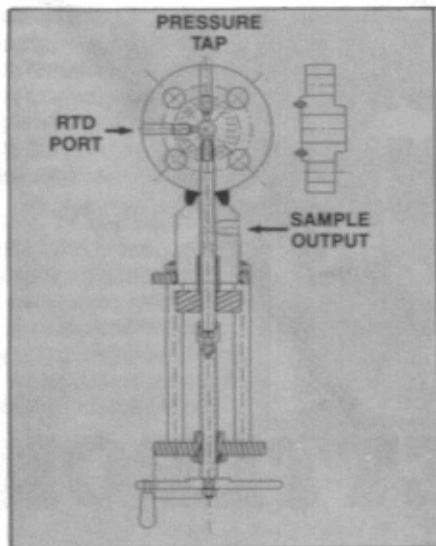


Industry Trends

by Peter P. Van Blarcom

Interflange Adapters

Here is a rather unique solution to a space problem. A Fetterolf customer who fabricates small reactor and autoclave assemblies had a space problem under the reactor. A 1" liquid drain line was to be used to drain the vessel. Pressure and temperature sensor taps were needed as well as a sampling and injection valve. Fetterolf fabricated a special 1" 316ss 2500 ANSI class interflange adapter which includes a 1/2" 9115 Ram Seal Valve, a 1/2" threaded connection for an RTD and a 1/2" threaded connection for a pressure sensor, all contained in the 1" ring-joint interflange section.



In this case the valve outlet is at 90° to the plunger centerline. It could have been at 45° or any other desired angle and could be threaded, flanged, or have a SW or BWE nipple. This approach can be used for lines of any size and any pressure class with the valve being a sampling or injection point, with pressure and/or temperature taps as required.

Another version is shown with a 1" Ram-Seal valve in a 8" 2500 class raised face interflange adapter. In this case the valve is used as a solvent injection valve. One assembly is placed on each side of an 8" 2500 class ball valve. Whenever the ball valve is actuated, solvent is injected to prevent product build-up on the ball and thus prevent damage to the seats. Injection pressure is about 5000 PSI.

Something to think about:

The risk a company runs when it wants to market its product as a specialty rather than a commodity is that it may resort to all sorts of strategies at the expense of quality. The test, in the long run, is a good product.

Robert Davis
Stanford University

The world is full of very competent people who honestly intend to do things tomorrow, or as soon as they can get around to it.

Bits & Pieces

What does it take to get to the top? "The same thing it took to get started — a sense of urgency about getting things done."

Industry Week

"A man wrapped up in himself makes a very small parcel."

Jerre Stead

Draining Process Vessels

How do you drain a tank or reactor? One way is to install a pipe nipple and flange as shown in figure 1 and install a flush bottom tank valve. After all, that is what they are designed for isn't it? The answer is "yes" but there is a great deal more involved if the job is to be completed properly.

First of all, a nipple and flange as shown in figure 1 was not the best choice to begin with. A much better selection would have been a studded pad as shown in figure 2. This method gets the valve closer to the vessel and eliminates, at least partially, a large stagnant area from the inside wall of the tank to the closing point of the valve. For the sake of discussion, let's assume that the nipple and flange as shown in figure 1 is already in place and a drain valve must now be selected.

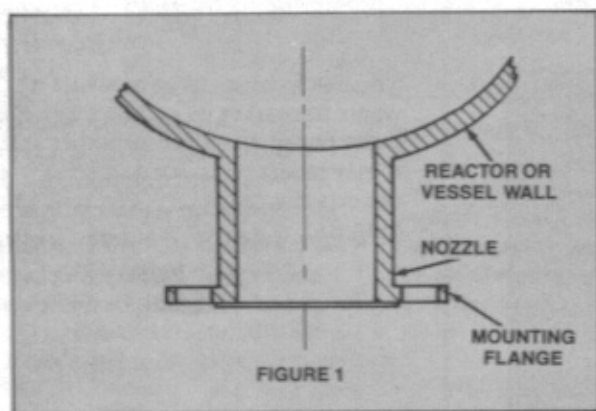


FIGURE 1

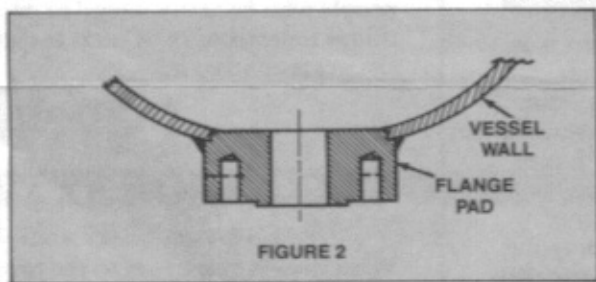


FIGURE 2

One choice might be as shown in figure 3. A flanged valve bolts up to the nipple flange on the bottom of the vessel. When the plunger is withdrawn, the fluid in the vessel drains out the 45° outlet branch. When the valve is closed (as shown), the seal ring expands under compression to prevent leakage past the valve.

But what about the material in the nipple (dotted area)? It just sits there — is not agitated or mixed in the process — heavy particles will settle into this area and stagnate — it could contaminate the next batch or cause process/product upset downstream when the valve is opened to drain the vessel.

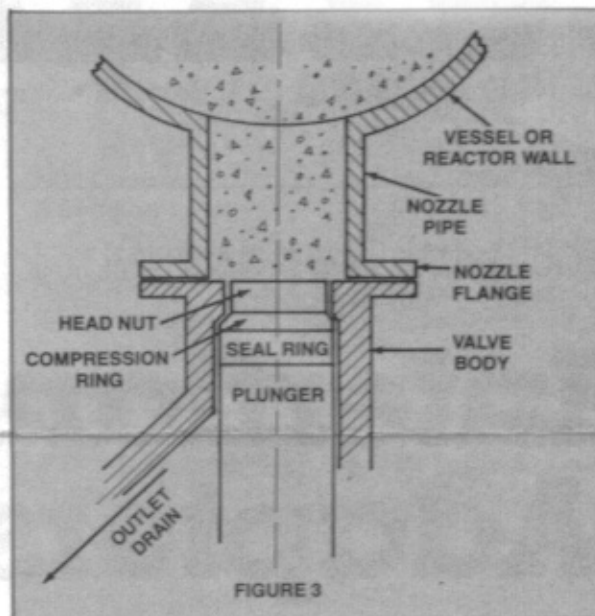


FIGURE 3

A possible solution would be as shown in figure 4. An extended plunger is utilized to partially fill the void space of the nozzle. The stagnant area is greatly reduced as shown but is still of considerable magnitude, varying in size depending on the difference between the I.D. of the nozzle and the O.D. of the plunger. The same problems, as with figure 3, still exist but are greatly reduced.

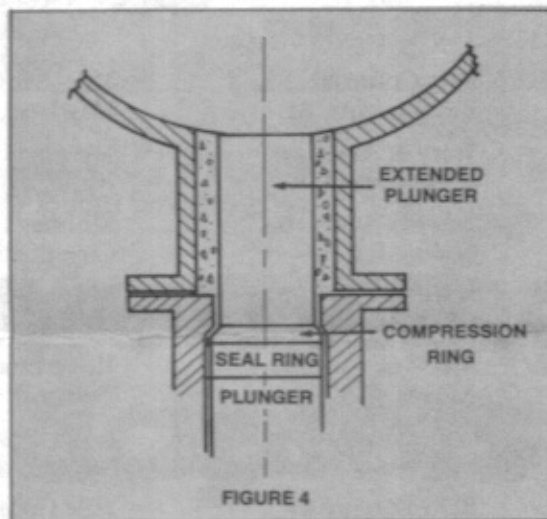
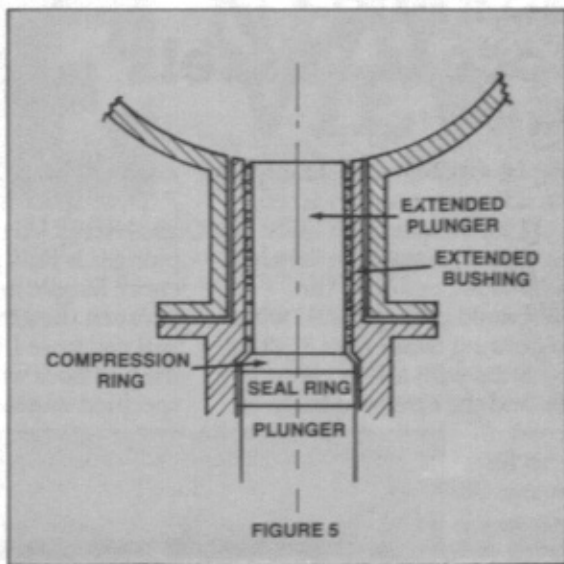


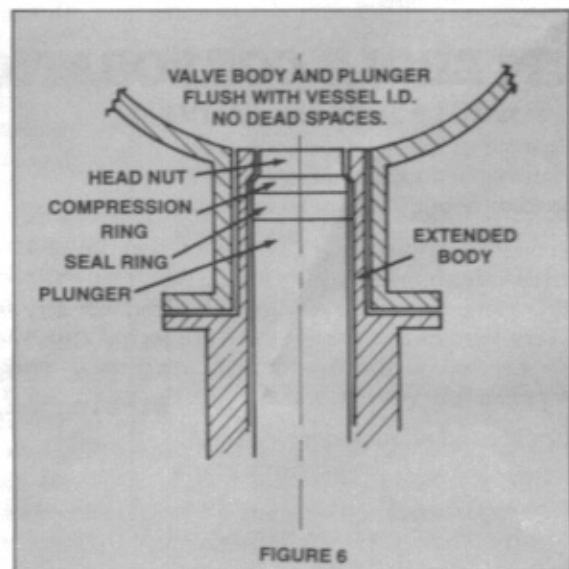
FIGURE 4



Still a better choice would be the use of an extended bushing surrounding the plunger as shown in figure 5. Now we have further reduced (but not eliminated) the stagnant zone within the nozzle by partially filling it with the extended bushing. A dead space still exists between the plunger O.D. and the bushing I.D. where material may collect (and solidify?). The material which may settle into the area between the nozzle I.D. and extended bushing O.D. is trapped and will remain there until the valve is removed. It will not contaminate future batches. The bushing also serves to guide the plunger to assure no plunger contact with the nozzle I.D. in the case of nozzle/flange misalignment or shrinkage in welding.

The ideal solution is shown in figure 6. The use of an extended body places the seal ring at the I.D. of the vessel, totally eliminating dead spaces and stagnant areas within the process stream, at the same time guiding the plunger through its entire stroke and reducing the overall length of the valve.

When considering the use of an extended body

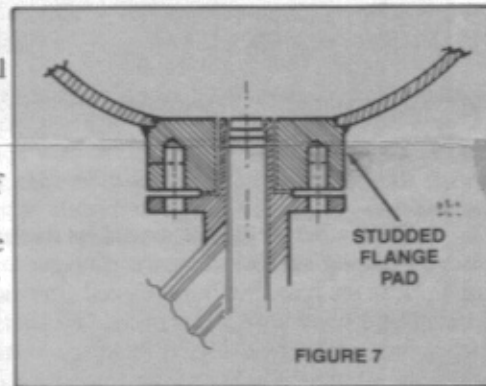


design, be sure that the I.D. of the nozzle is large enough to accept the O.D. of the extended body. If the use of a 3" drain valve is being considered for example, the nozzle should perhaps be 4" with a 4" mounting flange. The 3" valve can be fitted with a 4" body flange, and the extended body of

sufficient O.D. to fill the nozzle. All clearance problems are eliminated and boring of the nozzle and flange are not necessary. An extended body should always be considered when long nozzle lengths are used. Valve stroke and overall length are thereby reduced.

Truly the most desirable design takes us back to figure 2 with the use of a studded flange pad, of minimum required thickness, welded to the vessel, and the use of a Ram-type drain valve with an

extended body as shown in figure 7. Dead space is eliminated, stroke and overall length is reduced, the plunger is fully guided over its entire length, and the clearance between the extended body O.D. and pad bore I.D. is minimized as the pad bore will be bored to a specified dimension. Pads may be



used with jacketed vessels and jacketed valves without difficulty.

It is always best to consult with the valve manufacturer early in the project to be certain that all

sizing and dimensioning is agreed to prior to manufacturing and thus avoid fit-up problems and possible delays. Call the local Fetterolf agent listed to the right for assistance in laying out a vessel drainage system.