

Nested Wells? Why.

4 discreet zones, one
well.....

Introducing.....



Current nested well design

- We all know that a nested well involves placing a series of smaller diameter PVC casing and screen into a common larger diameter well. Then, we use each of those smaller isolated wells to either inject or sample from.
- What if, we were able to install (3) packers in a string and each packer had (3) separate isolated pass thru tubes throughout the string to perform all of the injection or sampling.....
- Sounds to good to be true? Maybe not!

Injection



- The packer shown on the previous screen has (3) 3/8" OD pass thru tubes made from 304 stainless steel. Each one is staggered from the other to provide clearance for fittings.
- If your well has multiple screens at different levels we are now able to provide an isolated zone using multiple packers and pass thru's for discreet zone injection. The packer shown in the previous slide is 1.66" in diameter. After adjusting our manufacturing processes, we have been able to include (3) 3/8" pass thru tubes in this diameter. Previously it had been limited to just (2) pass thru's.
- Using 3 packers in a single string, you are now able to have a total of 4 isolated zones, including above the upper most packer.

Zone 1



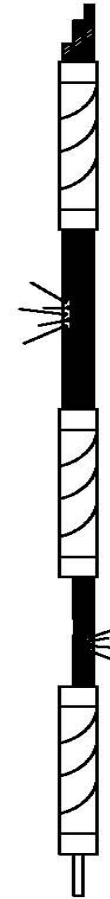
Zone 2



Zone 3



Zone 4



Made for Injection ..

- For injection of remedial solutions, this style of packer is perfectly suited. We offer up to 4 zones in one well.
- For sampling, we would need to discuss due to the extra need for 1/4" tubes for the sample pumps (usually airlift). This limits the amount of discharge tubes available in the 1.66" diameter platform.



Construction / Materials

- Typically, we find that most of our clients are working in water wells that have concentrations of TCE's, petroleum based chemicals, oxidants and other contaminants that not only pose threats to humans but also the tooling that we are using to clean them up with.
- Aardvark uses Viton® whenever possible for the rubber bladder/element. One of Viton's best characteristics is that it is impervious to most of the chemicals we are seeing in monitoring wells.
- A note for you as the buyer.....

Materials continued.....

- **Viton® does not like to stretch or expand.**
- We try to size the at rest diameter of the packer to the largest reasonable size to accommodate the ID of the well. Thankfully, most monitoring wells are cased in either PVC or stainless steel allowing for a reliable and concentric ID.
- The 1.66" diameter of our 2" packers are a good example. In 2" PVC the packer element only needs to expand .170" per side to create contact with the ID of the casing. In a 4" cased well, we may suggest a 3-1/2" OD of the packer for an expansion of .250" per side.

Materials continued

- In addition to Viton, we may suggest the use of EPDM, Nitrile, or even natural rubber. All of these can be “blended” by our rubber specialists with more or less polymers to make the rubber softer or harder depending on use.
- The bodies or skeleton of the packer should almost always be made from 304 or 316 stainless steel. We try to use 304 whenever possible due to the ease of welding as compared to 316 grades.

Delivery times

- As with everything, delivery times can vary depending on things like diameter, configuration, quantity etc. Generally, we have found that it has been averaging between 2 weeks and 3 weeks. The longest part of the build is the rubber glands. These are generally custom made where the rubber is hand laid on a mandrel, then cured in an autoclave layer by layer..
- Some of the 1.66" packers for the 2" wells can be made slightly faster as we have long sleeves of Viton pre-made and then cut them to length when needed.

All your needs.

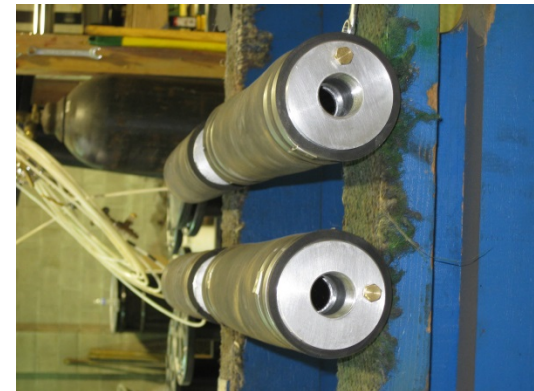
- From the **GW Monitoring** wells we have discussed today to **mechanical packers**, pressure **grout packers**, wireline style and simple **isolation**, Aardvark Packers will make it our priority to work with you for your next project.
- We want you to be successful and have a great experience using our products. We have been in business since 1968. I have been with Aardvark since 1986.

- Thank you,

Dave Baca

dave.baca@aardvarkpackers.com

Photo's



450 California ST
Grants Pass, Or 97526
855-546-6488 ph.
866-868-6665 fax
sales@aardvarkpackers.com
www.aardvarkpackers.com