

Sanitary Hose Assemblies for Pharmaceutical Applications PTFE vs Silicone. Which is better?

Most pharmaceutical process applications have **sanitary hose assemblies** somewhere in their systems. Be it load cell isolators, portable tank hook ups, CIP jumpers or any one of a dozen other applications, sanitary hose assemblies are everywhere. Some specifications that are common to most pharmaceutical sanitary hose assemblies. They need to be steam sterilisable or autoclavable. They need to have product contact materials that have been tested to meet USP Class VI requirements. Most hose materials that we deal in meet FDA guidelines, but there are really only two that meet the pharmaceutical requirements: Platinum cured silicone and smooth bore PTFE (Teflon). Which one is better? It really depends on your application and what you are trying to accomplish.

Platinum Cured Silicone Properties

- Light in weight
- Very flexible
- Cannot take what is normally considered high pressure
- Sizes from ¼" to 4"
- ¼" -1" is generally extruded material with a braid reinforcement
- Mandrel wrapped, cloth reinforced 4 ply hose is available from ½"-4", normally with a wire helix
- Silicones have very little tensile strength on its own. The braided material can stretch a little.
- Silicones can be somewhat gas permeable.
- Good but not great chemical resistance. Silicone does not do well with many solvents

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PTFE Hose Properties

- The premier PTFE hoses, such as Aflex Bioflex and Pharmaline have a smooth inner bore and a convoluted outer bore. They normally have a stainless steel braid reinforcement then a cover material such as EPDM or Silicone. This renders them heavier than silicone.
- Very flexible but great force to bend normally than silicone
- Higher pressure ratings than silicone
- Sizes ½” -3” (there are 4” smooth ID PTFE hoses available but they really don’t bend).
- Normally not gas permeable
- Excellent chemical resistance

So Which is the Better Hose Choice?

It is really a function of your application. The cost differential between the two is not particularly significant. If you get into applications above 100 PSI, the PTFE hoses are probably preferred. If you need something light and flexible (short load cell jumpers are a good example) silicone works great. For constant steam applications we normally recommend conductive PTFE hoses. For a hose assembly that it being handled (connected/ disconnected) constantly, PTFE is probable going to hold up better, but will be heavier. For hoses that are in a constant dynamic state (filling machines come to mind), wire reinforced silicone won’t work. The wire work hardens and eventually snaps.



Silicone Hoses Used as Jumpers on a Biological Skid

The point of this is that each application is unique. You need to consider several things before specifying the proper hose. Here are the questions we normally ask our clients.

- What is the product?
- What is the process temperature?
- Give us an overview of the application. Tell us how the hose is going to be used.
- What is the process pressure?
- How are you going to clean the hose?
- What is the cleaning temperature and pressure?

If you go through all of this, look at hose specifications and still are unsure of what hose to specify, please contact your Sales Representative at Tri-Canada by calling **(905) 677-9000** or send an email to **sales@tricanada.com**.