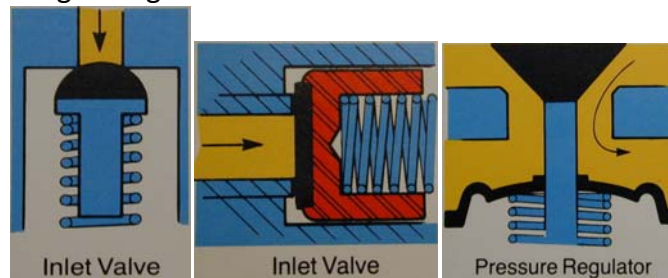


How to Choose a Vernay Poppet Valve

Vernay Laboratories designs and manufactures precision molded elastomeric parts. Our primary area of expertise is in the design and manufacture of elastomeric check valves for fluid control applications. Our standard product lines include a variety of check valve designs both fully elastomeric and elastomer over molded onto metal or plastic inserts. One of these product lines is a family of poppets which can be used to make valves. Both all rubber designs and designs with rubber bonded to metal or plastic substrates are available.

Poppets are typically used as check valves, pressure relief valves, or regulating valves. They can be more expensive to apply than other all rubber valve designs but have several advantages that make them the desired choice as check valves, pressure relief valves and pressure regulating valves.



Typical Poppet Valve Applications

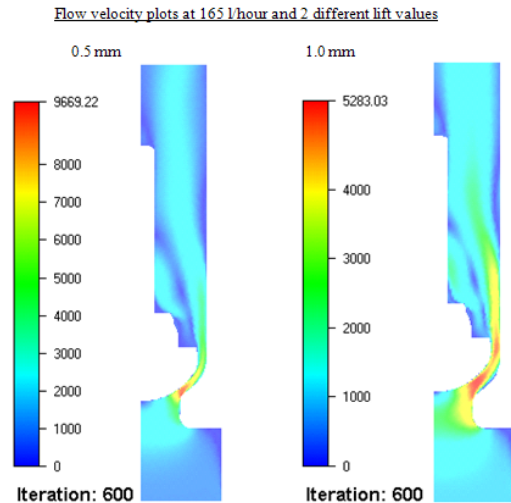
Some of the advantages of the Vernay's all rubber and rubber tipped poppets include:

- Superior sealing and leakage prevention due to the integrally molded, permanently bonded seal and, with guided operation, the sealing point consistently contacts the seat at the same point each time allowing it to conform to the shape of the seat.
- Low noise (as compared to all metal poppet designs)
- Streamlined flow around the ball or cone shaped tip
- Precise opening pressure control as a result of using a metal spring

Factors that should be considered when selecting a poppet valve:

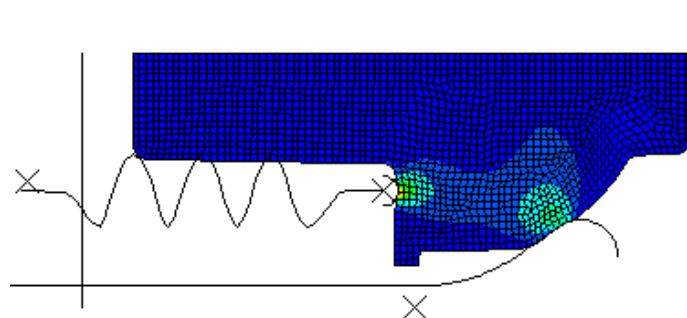
- The environment the poppet will work in (fluid being controlled, operating temperature, etc.)
- Desired flow rate and pressure drop
- Desired opening pressure
- The control required (acceptable variation) of both opening pressure and flow or pressure drop regulation
- Acceptable noise generation

Vernay uses Computational Fluid Dynamics (CFD) and finite element analysis (FEA) simulation software to optimize the design of poppet valves for many applications. Specifically, the CFD software allows the designer to study the forces acting on the poppet valve in the flow field. This insight helps guide the designer in creating geometries that minimizes the aerodynamic effects of the fluid passing around the poppet and to correctly size the spring and preload.



Example of CFD analysis of flow around poppet as it open

FEA software is utilized to evaluate the stresses and strains developed in the poppet to assure designs have optimal sealing characteristics without developing excessive stresses and strains in the selected elastomer.



FEA analysis of stresses in a spring loaded poppet

With our advanced design capabilities coupled with our 60+ years of manufacturing expertise in elastomer molding and bonding Vernay can be a one stop source for poppet valves as well as other elastomeric flow control component needs.

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