

CASE STUDY

Mini Valve Offers Enhanced Mitigation of Contamination Risks in Critical Wafer Processing Equipment

FURON®

Pure Performance

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ASK AN ENGINEER

The Challenge

Choosing a fluid-handling valve used to be easy given each valve type had its own area of utility. Diaphragm valves are used primarily for handling slurries and corrosive fluids. Since diaphragm valves have minimal surface contact and are considered the cleanest valve, they have found widespread use in the semiconductor industry. However minimizing entrapment of dead volumes of fluid is an important consideration when evaluating diaphragm valve cleanliness performance. This dead volume entrapment can be particularly severe and result in loss of process efficiency. And because entrapment and fluid mixing can lead to fluid degradation and contamination problems in dispensing, additional fluid movements through the valve are required to flush out degraded fluid and/or contaminants and result in the waste of expensive chemicals.

Engineers from two different companies representing semiconductor and life science markets reached out to us to inquire about co-developing a manifold solution to help achieve minimal chemical entrapment requirements that seemed out of reach with Saint-Gobain's existing valve (3/16") product offering.



Furon HPV Mini Valve (1/8")

The Saint-Gobain Design Services Solution

Saint-Gobain's High Purity Systems team has introduced a new Furon® HPV Mini Valve (1/8") into its product portfolio. The addition of this new valve size complements Saint-Gobain's existing manifold valve proposition with a differentiated solution that will help customer's meet their growing process cleanliness and manufacturing yield requirements. This new valve design aims at optimizing the geometry of the wetted flow path to avoid possible entrapment area.

The table below presents data that compared design attributes that mitigate process challenges and the performance of the Furon® HPV Mini Valve (1/8") and one of Saint-Gobain's competitor's 1/8" valve. Our design concept confirmed reduction in the total volume from 0.50 to 0.30 without compromising Cv which we believe is an important design achievement. Optimized fluid volume means shorter flush or purge time to stabilize the system hence less equipment downtime.

	Furon® HPV Valve (1/8")	Competitor's 1/8" Valve
Total Volume (CC)	0.30	0.50
Dead leg Volume (CC)	0.06	0.06
Cv	0.06	0.06

Customer Experience

Saint-Gobain's new Furon® HPV Mini Valve (1/8") solution should enable customers to further mitigate any equipment downtime or undesired flush time due to contamination issue.

