HAYS

NON-CLOGGING CASE STUDY MESURFLO®

Evaluating Flow Control Reliability in Contaminated HVAC Systems

OVERVIEW

Automatic flow control valves play a critical role in maintaining balance and efficiency in HVAC systems. But real-world conditions rarely mirror clean lab environments.

In operating systems, even with strainers installed, fine particulates such as iron filings and oxides remain suspended in the water stream. These contaminants can migrate throughout the system and interact with sensitive valve components. To evaluate how automatic flow controllers respond under these realistic conditions, controlled lab testing simulated particulate exposure, pressure variation, and continuous circulation.

CHALLENGE

Fine particulates in HVAC systems threaten flow control reliability, even when strainers are installed to protect sensitive components.

Small Particles Stay Suspended

Even with strainers, fine iron oxides remain suspended and circulate throughout systems.

Precision Creates Vulnerability

Spring-loaded valves rely on tight internal clearances, where particles jam sliding components.

Failure Happens Fast

With contamination, many traditional valves failed within the first few operating cycles, often from a single particle.

Testing showed that even minimal particulate contamination can cause immediate valve failure. In HVAC systems, small debris is not a minor nuisance—it's a critical reliability threat.

ABOUT US

Hays Fluid Controls delivers reliable flow solutions that simplify HVAC system performance. Our Mesurflo™ automatic balancing valves help schools, hospitals, and facilities cut energy costs, reduce maintenance, and improve comfort—paying for themselves in savings.

SOLUTION

A valve design built to resist clogging and maintain reliable flow control.

No Sliding Parts

Mesurflo® eliminates sliding components, removing the tight clearances where particles lodge and cause failure.

Generous Internal Openings

A larger opening between the orifice and diaphragm allows fine debris to pass instead of becoming trapped.

Self-Flushing Operation

During low-pressure cycles, trapped particles are naturally flushed through, preserving flow accuracy.

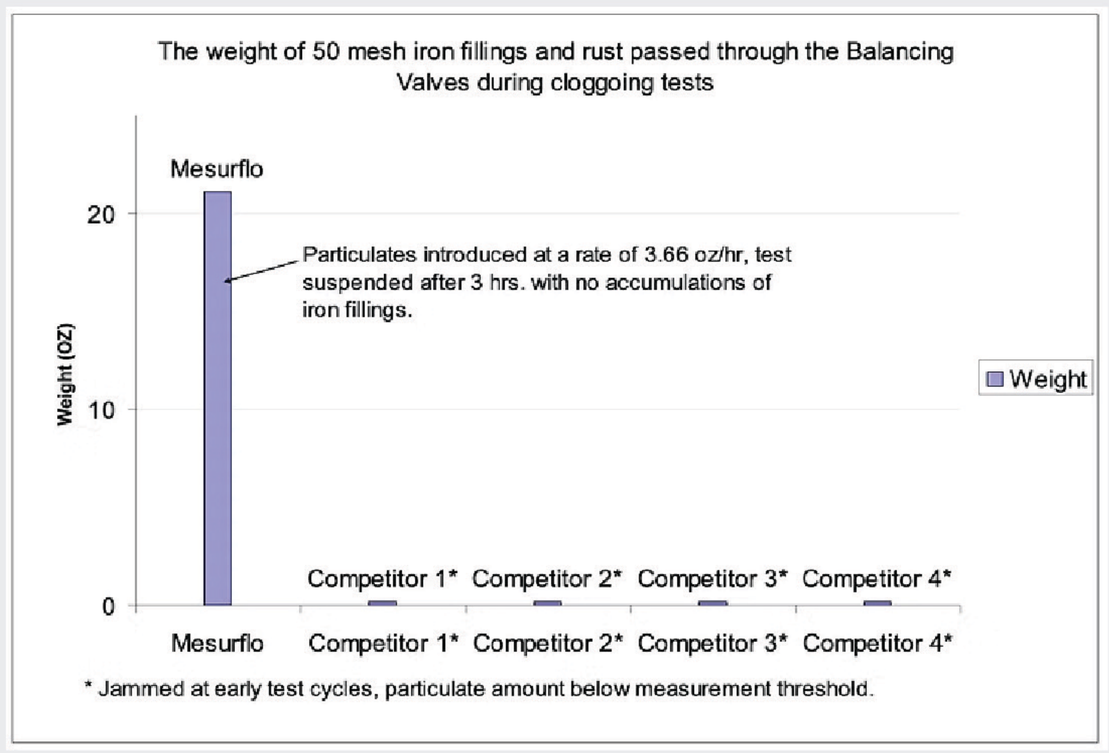
RESULTS

Testing demonstrated that fine particulate contamination can quickly disable traditional automatic flow control valves in real HVAC systems.

In controlled lab conditions simulating real-world HVAC environments, spring-loaded valves consistently failed when exposed to fine iron particulates—even in small amounts. In contrast, the Mesurflo® maintained accurate flow control throughout testing. Its no-sliding-parts design and larger internal openings prevented jamming and allowed debris to pass or flush naturally, ensuring dependable performance under contaminated conditions.

WHEN FLOW CONTROLLERS FAIL What We Found in the Lab

To evaluate how automatic flow controllers perform in contaminated HVAC systems, a controlled lab test simulated real-world conditions. Iron filings and iron oxides were introduced into a 1 GPM open-loop water system at rates of 0.8 and 3.6 oz/hr. The valve under test was installed upstream of a filter, inlet pressure was varied from 5 to 30 PSID, and flow was closely monitored.



The results were clear. Every spring-loaded valve tested failed—many within the first few cycles. Fine iron particulates jammed the sliding components inside the valves, where extremely tight internal clearances left no tolerance for debris. In some cases, a single particle was enough to stop flow regulation. Continued testing showed additional buildup further restricted flow, often reducing it to ineffective levels.

In contrast, the Hays Mesurflo® maintained accurate flow throughout testing. Although minor debris collected in low-velocity areas, its no-sliding-parts design and larger internal opening prevented jamming. During low-pressure cycles, particles flushed through naturally, allowing reliable operation even under sustained particulate exposure.

(800) 354-4297

sales@haysfluidcontrols.com

haysfluidcontrols.com

400 East Fields Street,
Dallas, NC 28034

HAYS