

Bray Provides Rapid Delivery for High Cycle Valves in Hydrogen Production



CUSTOMER

A leading global industrial gas supplier for hydrogen pressure swing adsorption (PSA) and oxygen vacuum swing adsorption (VSA) processes.

CHALLENGE

PSA and VSA processes require equipment that ensures safe operation, reliable performance, and continuous availability. The demanding processes call for valves that must maintain zero leakage, endure high cycle counts, and provide an extended service life to optimize return on investment. Valves for these demanding applications are often subjected to extensive endurance tests to validate their performance in specific operating conditions.

Recently, a Bray customer presented requirements for switch valves in their hydrogen pressure swing adsorption application. These requirements included:

- > Service life of at least 1 million cycles (cycle = open + close)
- > Design pressure well above typical PSA requirements (750 psi vs 450 psi)
- > Rapid cycling (<3 seconds per stroke)

In addition, an accelerated product delivery schedule was required, reduced approximately 40 percent from typical leadtimes.

SOLUTION

To meet the performance and endurance requirements, Bray’s engineering team proposed our ASME Class 600 high performance butterfly valve (Series 44) with spring return scotch yoke pneumatic actuator (Series 98). The trim was upgraded based on the success of our ASME Class 300 package (Series 42 + Series 98), which was previously qualified to 1 million cycles. Finite Element Analysis (FEA) was used to verify internal component integrity, providing the customer with detailed information needed to move forward without additional testing.

RESULTS

Bray provided a total of 32 automated valve assemblies (see product details sidebar) to meet the upgraded requirements, and all units were shipped within the required timeframe.

As the customer continues to push the hydrogen production limits within PSA, Bray has been selected as the primary switch valve supplier for all ASME Class 600 skids moving forward, based on our record of success for product qualification and rapid delivery.

PROCESS CONDITIONS

Process	Hydrogen production
Application	Pressure swing adsorption
Media	Gaseous hydrogen
Operating Temperature	-29°C to 65°C -20°F to 150°F
Operating Pressure	52 bar 750 psi
Leakage Rate	EN 12266 Rate A

BRAY PRODUCT DETAILS

Valve	Series 4X High Performance Butterfly Valve
Upgrades	High-cycle trim
Size	NPS 8 DN 200 NPS 16 DN 400 NPS 20 DN 500
Seat	RPTFE (Energized)
Actuation	Series 98 Spring Return Scotch Yoke Pneumatic
Accessories	Filter Regulator, Switch Box, Solenoid, Positioner (by others)

To learn more about our complete portfolio of flow control solutions, contact your local representative or visit Bray.com.