

Cavity-Filled Ball Valve Extends Service Life 12X in Caustic Cleaning Service

APPLICATION

Isolation service for caustic cleaning lines at an alumina refinery in Australia.

In this industry, aggressive caustic media and continuous scale formation make frequent cleaning (1 to 4 weeks) a necessity. Valve reliability becomes a direct driver of maintenance costs and plant uptime.

CHALLENGE

In 2015, the ball valves being used in caustic cleaning services at this alumina refinery were experiencing severe scale buildup inside the ball cavity — leading to stem seizures or failures, causing frequent maintenance interventions and valve replacements. Some of the existing ball valves were lasting only 30 days.

The ongoing operational disruptions and replacement costs prompted the refinery to seek a more reliable valve solution that could withstand the demanding caustic environment.

SOLUTION

Working closely with the customer to determine the root cause of the failures, Bray recommended a Series F15/F30 full-bore, two-piece cavity-filled ball valve. This solution directly addresses the application's failure mode through unique features:

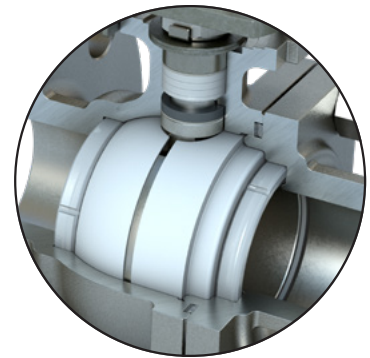
- > Cavity fillers eliminate areas where scale can accumulate around the ball.
- > Lower friction surface allows ball to operate freely with reduced torque requirements.
- > Innovative technology has proven successful for similar applications in other industries.

The customer agreed to run a 12-month field trial on several valves.

RESULTS

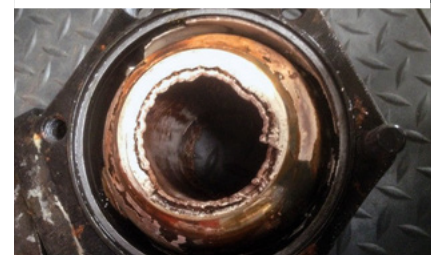
- > **Valve service life increased 12X** — from approximately 30 days to more than 12 months.
- > **Direct material savings of \$6,000+ AUD** per application, based on cost of twelve competitor valves per year versus a single F15/F30 ball valve. (Based on year 2015 values.)
- > **Reduced costs** for associated installation, maintenance, and downtime.
- > **Failure mode was designed out** — cavity-filled seats prevent the scale packing that caused repeat valve replacements.
- > **Enhanced safety for operators** — due to less operator intervention required on seized valves.

Based on the outstanding trial results, the F15/F30 ball valve with cavity filler became the **preferred solution** for hundreds of ball valve applications throughout multiple sites, reaching a quantity of **more than 500 valves**.



PROCESS CONDITIONS

Industry	Alumina mining.
Process	Clarification.
Application	Caustic cleaning line isolation.
Operating Pressure	87 to 145 psi 6 to 10 bar
Operating Temperature	158°F to 221°F 70°C to 105°C
Media	Hot sodium hydroxide.



Upper image shows significant scale buildup in prior valve's ball cavity. Lower image shows significantly less scale buildup after using Bray's cavity filled ball valve.

BRAY PRODUCT DETAILS

Valve	Series F15/F30 flanged two-piece ball valve.
Size	NPS 3 DN 80
Pressure Class	ASME 150 PN 10
Upgrades	Cavity fillers.
Operator	Manual handlever.

To learn more about our full line of innovative flow control solutions, visit Bray.com.