Segmented Ball Valve Increases Reliability for Potato Peeling Process

Series 19L Segmented Ball Valve

KEY RESULTS

- Eliminated impacts of abrasive media through optimized design and materials.
- Significantly reduced downtime and costs associated with valve repairs and replacements.
- Greatly improved process productivity and reliability.

CUSTOMER

One of the world's largest producers of potato products, located in the United Kingdom.

CHALLENGE

For many potato products, processing begins with peeling. Steam and high pressure are used to peel the potatoes quickly, leaving behind an abrasive mixture — steam, potato peels, sand, and grit — that is very tough on valves. In addition, this application requires the valve to cycle more than 26,000 times per year.

This customer had previously tried two types of valves — a plug valve and a floating ball valve, both with continuous failures. The plug valve failed at the stem, allowing steam to escape — creating a dangerous safety hazard. With failures ocurring at intervals less than 3 months, the valves were replaced 6 times, for a total cost of $25,000+ USD — not including downtime and lost revenue.

The customer then tried a floating ball valve, but within 4 months, the severe operating conditions destroyed the ball, seat, stem, and body. A better solution was clearly needed that could withstand the abrasive media and demanding operating conditions.

PROCESS CONDITIONS

Process	Steam Exhaust
Application	Potato Peeler
Media	Mix of steam, potato peels, sand, grit, etc.
Operating Temperature	215°C 419°F
Operating Pressure	20 bar 290 psi
Cycles	26,000+ per year

Competitor ball valve showed signs of severe damage to ball (left) and seat (right) caused by abrasive media.

SOLUTION

Bray met with the customer onsite to assess the damaged valves and operating conditions. After evaluating the situation, Bray's application specialists recommended the Series 19L segmented ball valve with a Series 92 double-acting pneumatic actuator. The technical team shared CFD analysis of the failed valves compared against the Series 19L, and explained multiple design features targeting abrasive media and high-cycle applications. After demonstrating the product's global success in similar conditions, the customer was supplied 3D models, along with sizing and selection datasheets.

The Series 19L segmented ball valve design features included:

> **Application-specific materials** and **trim** for abrasion resistance and high cycles.
> Upper and lower **stem bearing protection** against ingress of peels, sand, and grit.
> **Sharp leading edge** of segment to cut through any solids.
> **Split-stem design** to provide an uninterrupted flow path.

BRAY PRODUCT DETAILS

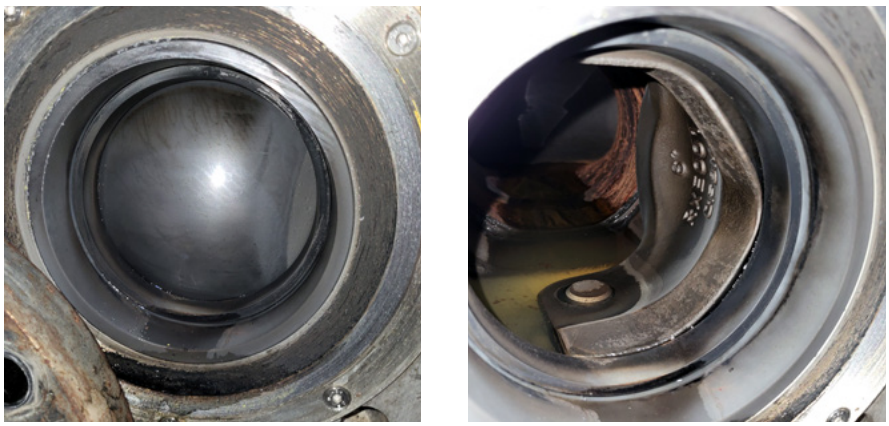
Valve	Series 19L Segmented Ball Valve
Size	NPS 6 | DN 150
Pressure Class	ASME 300
Actuation	Series 92 Double Acting Pneumatic Actuator
Upgrades	Stainless Steel Body CF8M + HVOF (Tungsten Carbide) Segment Solid Tungsten Carbide Seat and Seat Retainer

RESULTS

The customer was very impressed with Bray's quick response and technical strength, and agreed to install the recommended package for evaluation. After **6 months** of continuous service, the valve package was removed for inspection — showing no signs of wear or damage to valve components. After returning to service, it has performed trouble-free for **18 continuous months** total — compared to less than 3 months from previous valves.

Bray's control valve package has performed up to **6 times longer** than competitors, providing many benefits which include:

> Optimized design & materials eliminated impacts of abrasive media.
> Reduced downtime and associated repair costs for inoperable valves.
> Productivity and reliability were greatly increased.



After 18 months of service, Bray's Series 19L segmented ball valve showed no signs of wear or damage.

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