

Knife Gate Valve Greatly Improves Performance and Safety in Alumina Refining

APPLICATION

Thickener discharge service handling hot caustic liquor within an alumina refining process.

CHALLENGE

The refinery experienced ongoing leakage problems with the existing knife gate valves installed on the thickener discharge service—creating severe safety concerns. Leakage during valve operation was severe enough that a safety exclusion zone of approximately 50 feet | 15 meters (spanning multiple plant levels) had to be maintained around the equipment to protect site personnel.

Although the site had a long history of other successful Bray product installations elsewhere in the facility, the operating team was reluctant to evaluate another valve that was based on a similar sealing concept to the existing equipment. As a result, discussions regarding a trial reportedly continued for approximately three years before approval was granted.

SOLUTION

Bray proposed a trial installation of a Series 762 heavy duty slurry knife gate valve with advanced SlurryShield® technology. Its proprietary elastomer molding process and fully encapsulated J-ring substrate are engineered to improve the elastic return time — thereby minimizing discharge as the gate opens. The valve also included an optional Alumina trim package with high-temperature EPDM sleeves, hardened gate material, and SlurryGuard™ synergistic coatings to enhance abrasion resistance and prevent heavy scale formation.

Following installation, plant personnel were able to compare operating performance directly within the application where leakage concerns had been most severe.

RESULTS

- > Operators expressed confidence in the Series 762 performance within approximately two weeks of operation.
- > The valve reduced leakage significantly compared with the existing equipment, eliminating the need for the large safety exclusion zone around the valves.
- > Overall the valve improved sealing reliability, reduced maintenance requirements, provided longer service life, lowered operating costs, and enhanced operational safety.
- > The customer subsequently ordered three additional Series 762 knife gate valves for the same facility, with potential expansion into other areas of the facility—pending confirmation of long-term operating performance.



Bray Series 762 heavy duty knife gate valve with SlurryShield® technology.

PROCESS CONDITIONS

Industry	Alumina refining.
Application	Thickener discharge service.
Media	Hot caustic liquor.
Operating Pressure	Up to 20 psi 1.4 bar
Operating Temperature	Up to 194°F 90°C

BRAY PRODUCT DETAILS

Valve	Series 762 heavy duty slurry knife gate valve with advanced SlurryShield® technology.
Size	NPS 12 DN300
Modifications or Upgrades	Alumina trim package includes: EPDM-HT sleeve material; Hardened gate material; SlurryGuard™ coatings.

For more information about Bray knife gate valves, contact your local representative or visit [Bray.com](https://www.bray.com).