

V500 Valves with Ceramic Trim Resist Erosion in Bitumen Furnace Application

RESULTS

- Valve replacements improve process control and up-time.
- Valve replacements extend time between unit turnarounds from 3 to 12 months.



APPLICATION

Diluted bitumen furnace feed valves.

CUSTOMER

Oil sand producer in Alberta, Canada.

CHALLENGE

Beneath the windswept soil of Alberta lies a thick, viscous mixture of bitumen, sand, clay, and water called oil sand. One of those components—bitumen—is a tar-like substance too thick and sticky to flow unless it is heated (melted). Extracting bitumen from the sand is a challenge for Canadian oil producers. Applying valves to control the extraction or separation process is also a challenge because bitumen can be very erosive.

One oil sand processor was experiencing excessive trim erosion problems with 24 Diluted Bitumen Furnace Charge valves. Diluted bitumen leaving the extraction plant enters a recovery unit where it is heated in a furnace to 110°C. Approximately 60 percent of the water and naphtha flashes off as vapor and leaves the drum through an overhead line. Bitumen, on the other hand, exits the drum through the bottom, into a second flash drum, where it is heated again—this time to ~300°C. (The second heating removes all the remaining water and naphtha.)

The temperature, pressure, and viscosity of this process was causing frequent, unplanned maintenance on the control valves. Every three to four months, they were shutting down and requiring trim replacements. The producer asked engineers at Spartan Controls (the Emerson Impact Partner) for a solution that would increase the valves' trim life, improve process up-time, and extend the life between turnarounds.

The V500 eccentric plug rotary valve controls erosive and hard-to-handle fluids, providing either throttling or on-off operation. The valve's design features include streamlined flow passages, rugged metal trim components, and a patented, self-centering seat ring.



Fisher™ V500 eccentric plug rotary valve.

SOLUTION

Spartan engineers recommended Fisher valves designed for highly-erosive applications --V500s with hardened trim. The specified valve design incorporates ceramic trim materials with Alloy 6 seat ledge inserts, carbide body overlays, Alloy 6 slotless seat ring retainers, and FIELDVUE™ digital valve controllers. The end-user ordered two dozen.

These severe service valves have improved process control and reduced the cost and frequency of maintenance. They are inspected during scheduled furnace outages, which occur every 12 to 14 months. The customer is saving money by avoiding trim replacements and downtime.

The plant achieves a 90% recovery rate and produces 240,000 barrels/day of oil. Bitumen is ultimately upgraded to light crude oils used to make fuels, petrochemicals, and lubricants.

RESOURCES

View Fisher V500 product page:

<https://www.emerson.com/en-us/catalog/fisher-v500>



<http://www.Facebook.com/FisherValves>



<http://www.YouTube.com/user/FisherControlValve>



<http://www.Twitter.com/FisherValves>



<http://www.Linkedin.com/groups/Fisher-3941826>

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