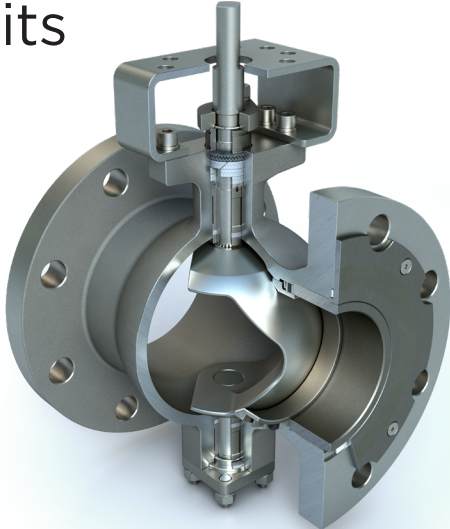


# Segmented Control Valve Improves Performance and Profits in Milk of lime

**KEY RESULTS**

- > Reduced impacts of abrasive Milk of lime.
- > Improved overall flow, controllability, and rangeability.
- > Valve service life was increased 5X, eliminating shutdowns and improving profitability.
- > Estimated savings of \$32,000 USD per valve over 3 seasons.



**APPLICATION**

**Milk of lime control for a large sugar mill.**

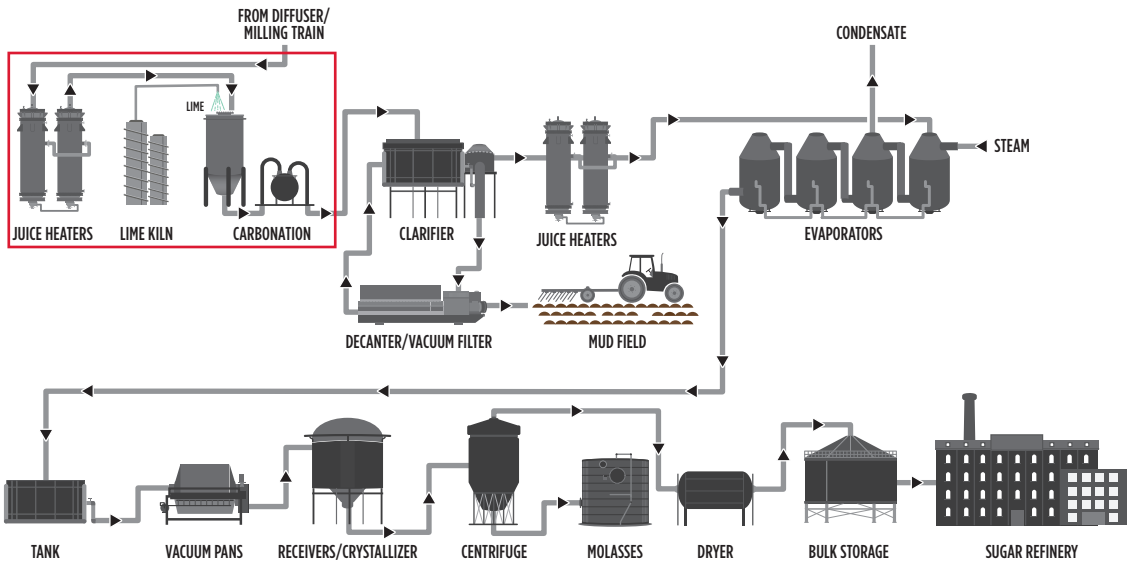
Within a sugar plant, raw juice is sent to be clarified through a carbonation process. Milk of lime is added to the raw juice, to remove non-sugar impurities, before the juice is sent to heaters and clarifiers.

Milk of lime has high degree of suspended and dissolved solids which cause valve abrasion, scaling and poor flow control. Ineffective flow control leads to inconsistent juice pH levels, poor clarification, and excessive use of lime.

**PROCESS CONDITIONS**

<b>Process</b>	Carbonation
<b>Application</b>	Dosing
<b>Media</b>	Milk of lime
<b>Operating Pressure</b>	60 to 80 psi 4 to 5.5 bar
<b>Operating Temperature</b>	176°F to 194°F 80°C to 90°C
<b>Flow Rate</b>	80 to 300 gpm 303 to 1356 l/min

**TYPICAL SUGAR PROCESSING APPLICATION**





*Bray Series 19L control valve package in Milk of lime service.*

**CHALLENGE**

To maximize productivity and profitability, sugar producers require uninterrupted service for up to 365 days per year — relying on high performance valves that are critical to their operation. In this milk of lime application, a competitor’s ball and butterfly valves were experiencing multiple effects from the aggressive media.

- > Severe erosion causing leaks at the upstream and downstream flanges.
- > Erosion and leaks at the valve disc, ball & body.
- > Ball/Disc-to-stem failures, due to jamming from the milk of lime scale.

With valve maintenance and repairs required every 3 - 4 months, the shutdowns and service interruptions were severely affecting plant operations and profits.

**SOLUTION**

Bray engineers evaluated the milk of lime process conditions at the sugar plant by performing a physical inspection, plus a CFD analysis, on the failed valves.

A Series 19L Segmented Control Valve was recommended as the best solution for this application, with features that included:

- > Solid tungsten carbide seat and downstream bore liner to provide superior abrasion/erosion protection.
- > Tungsten carbide coated body internals and segment to withstand erosion.
- > Scraper seat designed to wipe away lime deposits from the valves internal components.
- > Stem bearing protectors to reduce ingress of milk of lime into the stem area to minimize scaling and valve jamming.

The proposed high performance materials, coatings, and valve design would protect the valve and piping from severe process conditions.

**RESULTS**

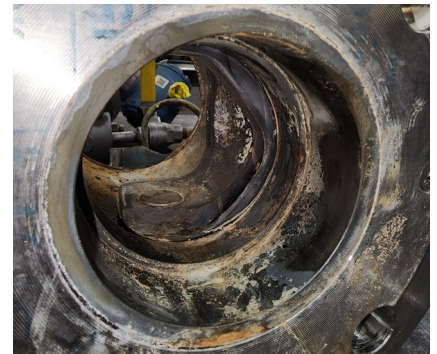
After installing the S19L control valve package, the sugar plant saw many process improvements, including:

- > Minimized effects of abrasion, erosion and scaling.
- > Improved flow, controllability, and rangeability.
- > Consistent juice pH level and high quality and color of sugar crystals.

The S19L control valve package has performed continuously for 3 full sugar campaigns, with no leaks or downtime — saving the customer **\$32,000 USD** in material costs alone over that period.



*The existing ball and butterfly valves were experiencing severe erosion and leaks and jamming issues from seized valves*



*After 3 years in service, inspection of the S19L showed no signs of erosion on the ball segment, seat, body walls, or liner.*