



# Red Valve

Mining Industry  
Valve Solutions Guide



# The Best Choice for the Toughest Mining Challenges



## Cost-Effective, Reliable Valve Solutions

Since 1953, Red Valve has been a leading manufacturer of pinch valves for the mining industry. Today, Red Valve products are used in every type of mining operation worldwide. A pioneer and innovator of valves built specifically for the toughest mining applications, Red Valve has enhanced the efficiency of the mining industry with a wide array of cost-effective flow control products and solutions.



*PVM - Series 75  
Manual Pinch Valve*



*PCV - Series 5200  
Control Pinch Valve*

# A Red Valve Product for Every Application

## Precious Metal Mining:

- Acid Leaching
- Ball Mills
- Concentrators
- Flotation Cells
- Concentrate Lines
- Hydrocyclones
- Tailings
- Thickener Underflow
- Circuit Sizing and Reduction

## Iron Ore / Coal / Tar Sands:

- Iron Ore Reduction
- Pelletizing
- Bio Isolation
- Coal Transport
- Coal Washing
- Dilute Coal Dust
- Distribution Tanks
- Filter Tanks
- Lead
- Taconite
- Sand Slurry
- Bitumen
- Potash
- Soda Ash

## Aluminum / Bauxite:

- Aluminum Oxide
- Caustic Soda
- Lime Feed
- Liquors
- Mud Washing
- Sodium Hydroxide

## Phosphate Mine:

- pH Control
- Reausticizers
- Sulfuric Acid
- Phosphoric Acid
- Diammonium Phosphate
- Washing and Blending
- Drying and Filtering
- Sand and Silica Reduction
- Pelletizing



SPS - Pressure  
Sensors



KFD - Series D  
Knife Gate Valve



PAV - Type A Air-Actuated  
Pinch Valve



KDX - Series DX  
Knife Gate Valve

# Slurry Knife Gate Valves



## Dependable Service, Year After Year

Designed for the most rugged mining operations, Red Valve KFD - Series D Flexgate and KDX - Series DX Slurry Knife Gate Valves have excellent abrasion resistance and are ideal for high solid applications. These reliable valves are engineered for operator dependability, low maintenance and low downtime.

When open, Red Valve Knife Gate Valves provide full-port, unobstructed flow and drop-tight, bi-directional shutoff. Flow obstructions are eliminated and turbulence wear is minimized. A heavy-duty stainless steel gate passes through two rugged elastomer slurry seats and the valve

body and seats purge clean, allowing the valve to close on demand.

The seat cartridges control gate-to-seat compression. As a result, common knife gate valve problems, such as uneven seat wear or excess operating torque, are eliminated.

Red Valve Knife Gate Valves are ideal for on/off applications where the valves are not frequently cycled. Problems with valves corroding or binding due to the slurry dewatering in the valve seat and chest area are eliminated.

## Knife Gate Valve Applications

- Tailings
- Hydrocyclone Feed Isolation
- Pump Grinder / Mill Isolation
- Flotation Cells
- Leaching Systems
- Thickener Underflow
- Bin / Tank Isolation Valves
- Recirculation Water
- Lime Systems



## Knife Gate Valve Features

- Handwheel, Bevel Gear, Pneumatic, Hydraulic Operators
- Special Portable Hydraulic Units Available
- Multiple Flush Connections Purge Heavy Percent of Solids
- Seats Cartridges Match Schedule 40 ID
- Special IDs for HDPE Pipe or Rubber-Lined Pipe Available

# Control Valve Products



## Control Pinch Valves

In slurry applications, elastomers can be tougher and more resilient than metal. In the wide-open position, there is virtually no wear or turbulence on Red Valve Pinch Valve Sleeves. The flow pattern of a Red Valve Pinch Valve is streamlined, even when throttled.

## Control Valve Trim

Typically, Red Valve Control Pinch Valves are furnished with a cone sleeve for throttling applications. The unique cone sleeve provides inherent linear flow characteristics which result in flow rates directly proportional to the amount of sleeve travel throughout the stroke of the valve while under constant pressure and pressure-drop conditions. Red Valve Control Pinch Valves with linear flow characteristics are often specified for liquid-level control and applications requiring constant gain.

## Standard Sleeves

For more than half a century, Red Valve's elastomer experience and know-how has become legendary. Acting as an adjustable pipe for flow rate, Red Valve Pinch Valve sleeves are the heart of the valve. Available in a variety of rugged elastomer materials and designs, Red Valve's standard sleeves are unmatched for abrasion resistance, consistently outlasting conventional metal valves.



## Cone Sleeves

Ideal for throttling control, Red Valve's cone sleeves create a pressure drop designed to match the flow rate of the application. With additional wear rubber on the downstream side, Red Valve cone sleeves provide optimal service life with minimized recovery inside the sleeve.

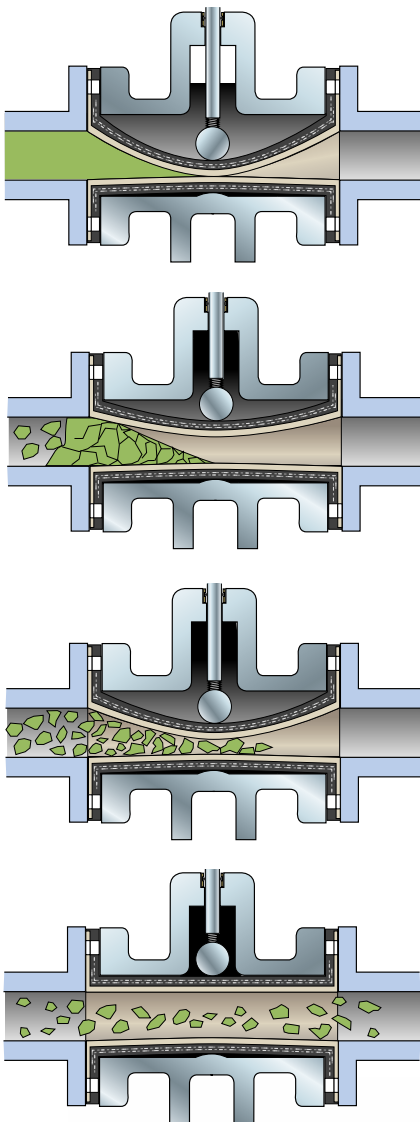


## Control Valve Applications

- Flotation Cells
- Thickener Underflow
- Lime Feed
- Sulfur / Phosphoric / Cyanide Acids
- Concentrators
- Leaching

## Control Valves Have a Self-Cleaning Action

Every Red Valve Control Valve sleeve has a flexing action that breaks away solid or dewatered slurry build-up. The full round port sleeve has no pockets for slurry to plug in or erode. This design even breaks up dewatered lime.

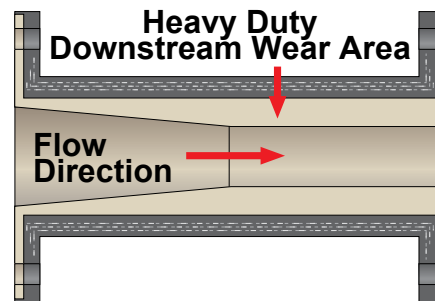


As shown in the 4" PCV - Series 5200 illustrations above, when the control valve opens and closes, the flexing action of the elastomer sleeve cleans the valve by breaking away any build-up or deposits.

## Cone Sleeve Advantages

Cone Sleeve Trim provides tighter control with a 20:1 turn down ratio and 0.89 recovery factor. Pressure recovery occurs downstream of the sleeve, so cone sleeves can handle a higher pressure drop than other sleeve designs.

The configuration of the cone sleeve reduces erosion and provides a smooth venturi flow pattern for throttling service.



## Series TFO Flow Restrictor

Designed to help eliminate cavitation on control valves, the TFO Flow Restrictor is an elastomer variable orifice that induces backpressure. As the flow rate increases, the pressure drop in the TFO increases in a near-linear pattern rather than exponentially, as with orifice plates. This distinguishing feature of the TFO provides variable flow characteristics and performance superior to the orifice plate restrictor, making the TFO the restrictor of choice to eliminate cavitation in high-pressure-drop and discharge-to-atmosphere applications.



# Mine Tailings



## Solutions for Every Tailing Application

Red Valve offers solutions for every valve application challenge within a tailings disposal system. When open, Red Valve Pinch Valves are like a 100% full-port piece of wear-resistant pipe, with no restrictions in the line to impede flow. When closed, the valves provide Class VI Shutoff.

Red Valve's PVM - Series 70 and PVM - Series 75 Manual Pinch Valves are the industry's first choice for isolation valves in mine tailing systems. The valves are ruggedly designed and engineered to last. Since the operating mechanism is isolated from the flow, a manual pinch valve can be left in the open or closed position for years without affecting the operating torques, which remain constant.

Red Valve's PCV - Series 9000 High Pressure Control Pinch Valve is a proven solution for tailing applications. Available with various actuators (including bevel gear

actuators for manual operation and hydraulic and electric actuators for automatic operation) the PCV - Series 9000 is equipped with a heavy-duty solid steel stroke adjustment unit that affords flexibility in control and stroke for abrasion sleeve wear, reducing chances of downtime.

Red Valve Slurry Knife Gate Valves are another ideal choice for use on tailings systems, especially where large-diameter sizes are required. A knife blade passes through two full-port elastomer seats, opening or closing the valve.

The world's largest manufacturer of pinch valves, Red Valve has an international reputation for quality engineered products. Every Red Valve Control Pinch Valve and Slurry Knife Gate Valve is backed by our experience and dedication to innovative design, high engineering standards and skilled manufacturing. Versatile and durable, Red Valve products provide solutions to control your toughest tailing applications.



## Tailings System Applications



*High-Pressure PCV - Series 5400 Pinch Valves on tailings.*



*When open, PVM - Series 75 Valves are like a 100% full-port piece of wear-resistant pipe, with no restrictions in the line to impede flow.*



*PCV - Series 9000 Hydraulic-Actuated Tailings Isolation Valve for 720 psi service at a mine.*

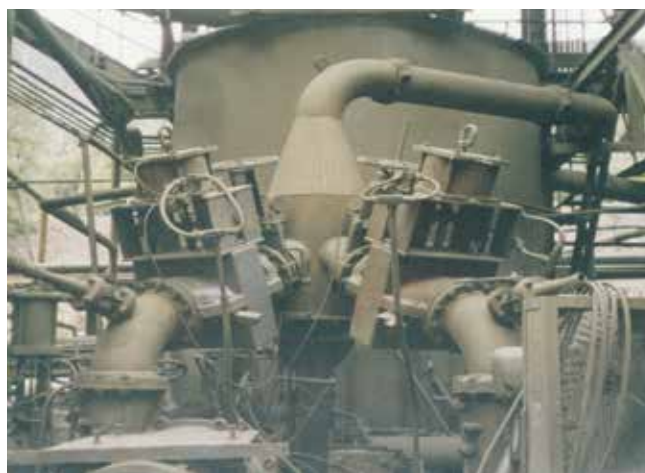
# Flotation Cells and Thickener Underflow



## Precise, Repeatable Control

Flotation cells and thickener underflow lines are an area where Red Valve Pinch Valves play a vital role in increasing production and decreasing maintenance and downtime. Crushed ore entering flotation cells or spent ore discharging from a thickener retain high solids content that can quickly destroy valves. Red Valve Pinch Valves, which are full-port when open, minimize erosion and optimize valve life.

Red Valve Pinch Valves are also ideal for pressure and level control applications. With a patented cone sleeve trim sized to match any application's exact control requirements, Red Valve Pinch Valves provide precise, repeatable control across a wide range of pressure and flow conditions.



*Flow Control Pinch Valves on a Dewatering System at a filter plant.*

# Biological Wastewater Treatment



## Diffused Aeration & Mixing Systems for Mining Applications

Mining facilities typically generate a large volume of process wash water containing mining solids and other constituents. Many facilities capture this process water so that it can be analyzed for treatment. This fluid is contained in large storage tanks (similar to equalization tanks in wastewater treatment) and requires sufficient energy to mix the fluid and particles. Diffused aeration is the most cost effective means of providing mixing of this type of fluid. This method also provides dissolved oxygen to the fluid which prevents any anoxic or anaerobic conditions from occurring (reducing the potential for odors release).

The Tideflex® Coarse Bubble Mixing & O<sub>2</sub> Systems are designed specially for these types of high solids applications. The individual diffusers use check valve technology to prevent any fluids or solids from entering the piping which can rapidly

result in a clogged system. The piping and supports can be provided in 304L SS or 316L SS. The systems are anchored to concrete floors using the supplied seismic rated epoxy adhesive. These systems are the strongest available in the industry and provide years of maintenance free operation.





*Red Valve offers a worldwide, world-class custom service network. With corporate offices in Pittsburgh, PA, manufacturing facilities in Gastonia, NC, and a network of sales representatives around the globe, Red Valve has the sales engineering team to help you select the best choice of valves and related products for your applications.*



**Red Valve**<sup>®</sup>  
The World Leader in Pinch and Check Valve Technology™

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