



Red Valve

Valve Selection Guide for the Mining Industry

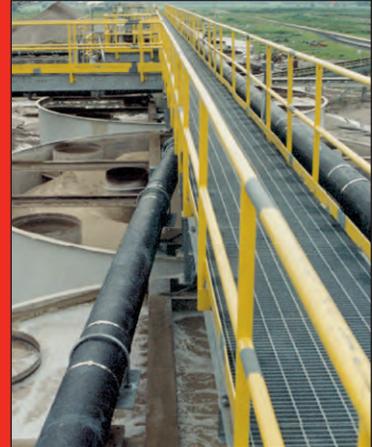


Red Valve

Providing Cost-Effective, Reliable



Since its inception in 1953, Red Valve Company has been the world's leading manufacturer of valves for the mining industry. Today, Red Valve products are used in every type of mining operation worldwide. A pioneer and innovator of valves and equipment to solve the toughest mining applications, Red Valve has enhanced the efficiency of the mining industry by introducing a wide variety of simple, cost-effective flow-control products and solutions.



Designed for slurry, abrasive and corrosive applications, Series 70 and 75 manually operated pinch valves provide reliable, bi-directional shutoff.



Red Valve's Series 9000 Class 300# pinch valve with hydraulic actuator is designed for high-pressure applications.



Valve Solutions

Precious Metal Mining Applications

- 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
- Bin Isolation
- Coal Transport
- Coal Washing
- Dilute Coal Dust
- Distributor Tanks
- Filter Tanks
- Lead
- Taconite
- Sand Slurry
- Bitumen
- Potash
- Soda Ash

Aluminum/Bauxite Applications

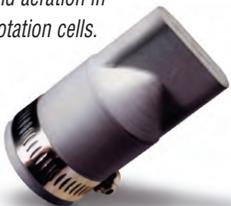
- Aluminum Oxide
- Caustic Soda
- Lime Feed
- Liquors
- Mud Washing
- Sodium Hydroxide

Phosphate Mine Applications

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



The Tideflex® air diffuser nozzle is ideal for achieving optimal sparging and aeration in flotation cells.



Providing a full 360-degree pressure reading, Red Valve pressure sensors are the industry standard for protecting instrumentation and ensuring accurate, non-clogging pressure measurement.



Providing a bi-directional, drop-tight shutoff, Red Valve's Flexgate valve is designed with a stainless steel gate and two heavy-duty elastomer cartridge slurry seats—ideal for difficult abrasive slurry applications.

The Flexgate Slurry Knife Gate Valve

Dependable, Maintenance-Free Service, Year After Year

Designed for rugged applications found in mining operations, the Flexgate valve has excellent abrasion resistance and is ideal for applications with a high percentage of solids. Red Valve's Flexgate valve is engineered for operator dependability, low maintenance and less downtime.

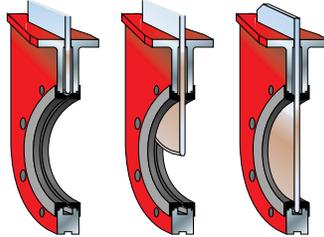


When open, the Flexgate valve provides true full-port, unobstructed flow and absolute drop-tight shutoff, bi-directionally. As the knife blade passes through the seat cartridges, the valve body and seats purge clean, allowing the valve to close on demand.

Flexgate valve on a hydrocyclone.



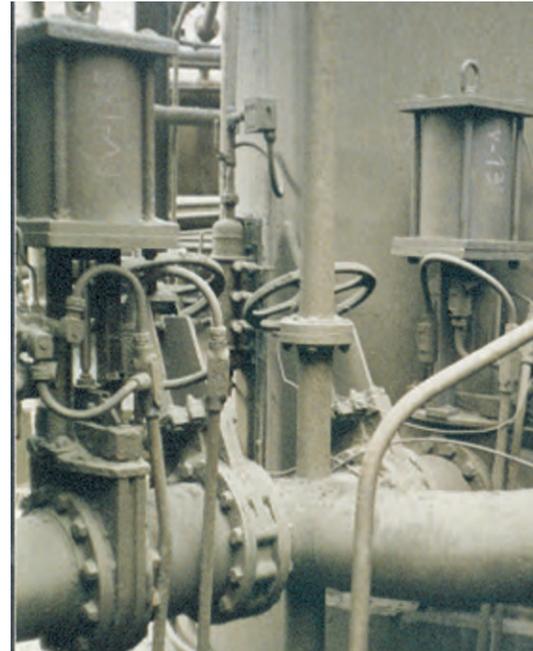
Tank isolation valve at the Andina Mine in Chile.



The seat cartridges control the gate to seat compression. As a result, problems with uneven seat wear or excess operating torque, common with other styles of slurry knife gate valves, are avoided.

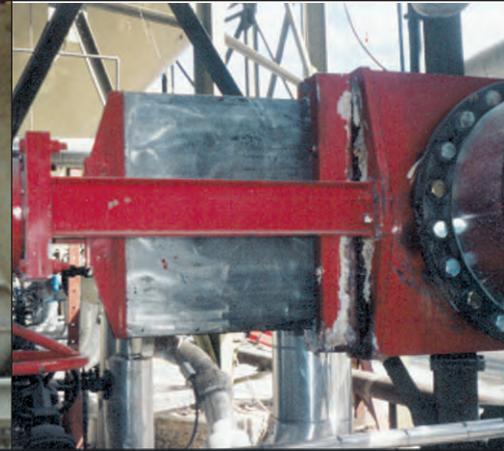
The Flexgate valve's unique design also prevents the process from spraying out of the valve, reducing safety and environmental concerns.

Slurry knife gate valves are often used for on/off applications in which 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 with the Flexgate valve.



Applications:

- Tailings
- Hydrocyclone feed isolation valves
- Pump, grinder and mill isolation valves
- Flotation cells
- Leaching systems
- Thickener underflow
- Bin & tank isolation valves
- Recirculation water
- Lime systems

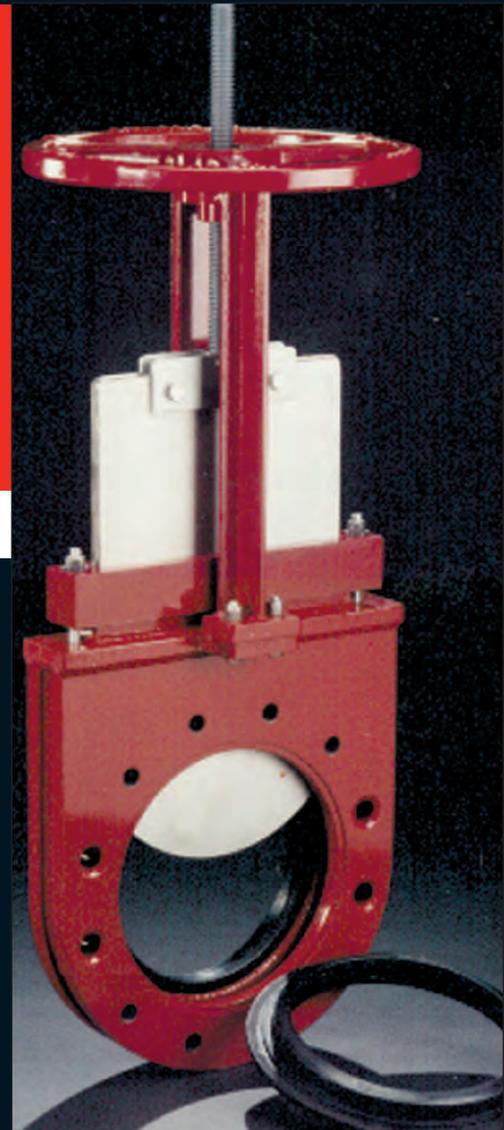


RED VALVE HAS ENGINEERED ITS SLURRY KNIFE GATE VALVE TO COMBINE THE BEST OF WHAT BOTH A PINCH VALVE AND KNIFE GATE VALVE OFFER.

Red Valve's Flexgate valve, designed for on/off service, closes like a knife gate valve. A heavy-duty stainless steel gate passes through two rugged elastomer slurry sleeves, which provide a compression interference fit resulting in a bi-directional drop-tight seal. When in the open position, the valve is full-port, eliminating flow obstructions and keeping turbulence and wear to a minimum.

Features:

- Handwheel, bevel gear, pneumatic, hydraulic operators.
- Special portable hydraulic units available.
- Multiple flush connections purge heavy percentage of solids.
- Seat cartridges match schedule 40 ID. Special IDs for HDPE pipe or rubber-lined pipe are also available.



Replacing the seat cartridge is fast and easy, requiring only a few quick steps and little maintenance. Valve disassembly to replace the seat cartridges is not necessary.



CONTROL PRODUCTS

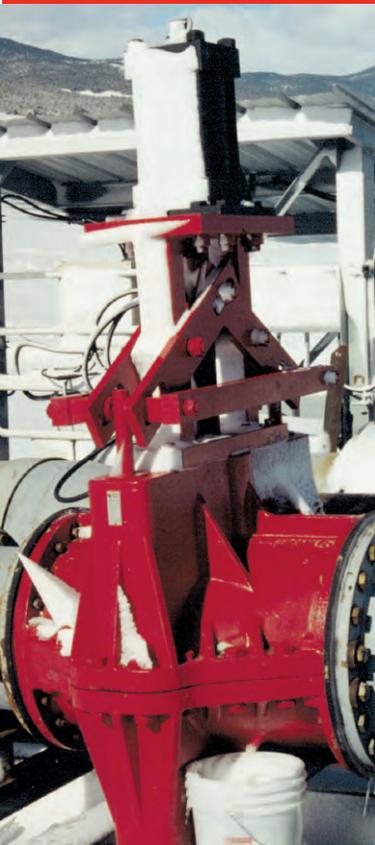
On slurry applications, rubber is tougher than metal. In the wide-open position, there is virtually no wear or turbulence on the Red Valve pinch valve sleeve. Unlike flow patterns of conventional valves, which create a deflection that causes wear, the flow pattern of a Red Valve pinch valve is streamlined—even when throttled.



Level control pinch valve on a column cell.

Applications:

- Flotation cells
- Lime feed
- Concentrators
- Thickener underflow
- Sulfur, phosphoric and cyanide acids
- Leaching

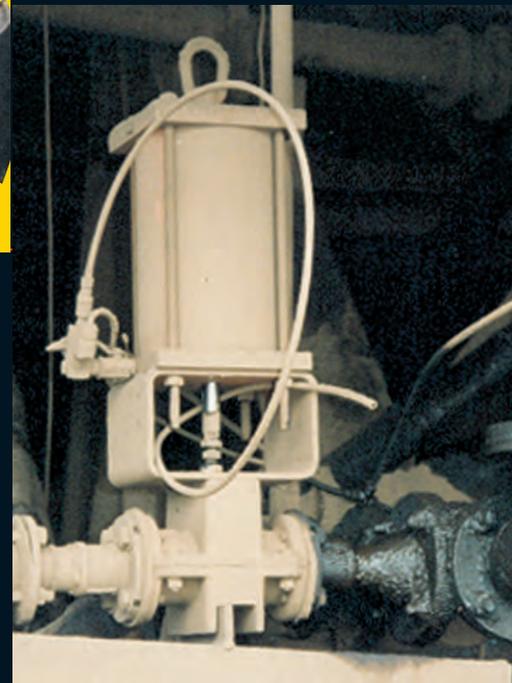


High-pressure center-line closing pinch valve on tailings.

Lacking the resiliency of Red Valve's flexible pinch valve products, ball, plug or butterfly valves (shown here) wear quickly in slurry applications, requiring high maintenance.



Acid feed valve on a heap leaching process.



Control Valve Trims

Typically, Red Valve control pinch valves are furnished with cone sleeve trims for throttling applications. The cone sleeve trims are designed to have inherent linear flow characteristics, which result in flow rates that are 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 valves with linear flow characteristics are often specified for liquid-level control and for flow-control applications requiring constant gain.



Standard Sleeve

Acting as an adjustable pipe for flow rate, the pinch valve sleeve is the heart of every control valve. Red Valve's standard pinch valve sleeves are manufactured to meet high technical standards and reinforced with strong, durable fabric. Available in a variety of rugged elastomer designs, Red Valve's standard sleeves are unmatched in abrasion resistance, consistently outlasting conventional metal valves.



Cone Sleeve

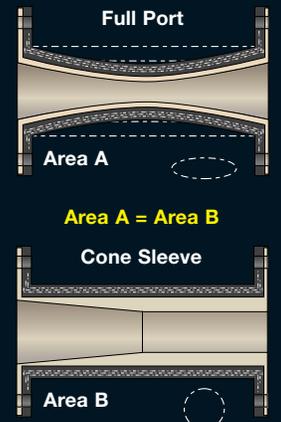
Ideal for throttling control, Red Valve's cone sleeve trim creates a pressure drop designed to match the flow rate of the application. With additional wear rubber on the downstream side, Red Valve's cone sleeve provides optimal service life with minimized recovery inside the sleeve.

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.



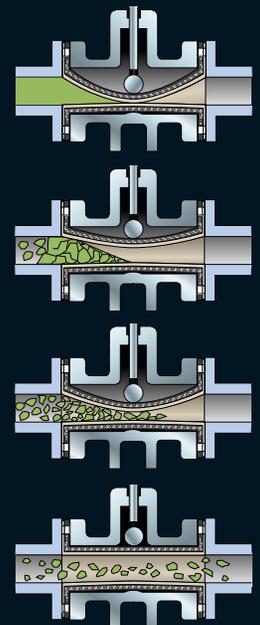
THROTTLING SERVICE

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



RED VALVE PRODUCTS SELF-CLEAN:

The pinch valve sleeve's flexing action breaks away any solid or dewatered slurry buildup. The full round port sleeve has no pockets for slurry to plug in or erode.



Self-cleaning design breaks up even dewatered lime.

Series TFO Flow Restrictor

Designed to help eliminate cavitation on control valves, the TFO Flow Restrictor is an elastomer variable orifice that induces back pressure. 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

Red Valve Company offers solutions to every valve application found within a tailings disposal system. Red Valve's pinch valves—the industry's first choice for isolation valves in mine tailing systems—are designed to last.

When open, pinch valves are like a 100 percent full-port piece of wear-resistant pipe, with no restrictions in the line to impede the flow. When closed, the valves provide Class 6 shutoff.

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.



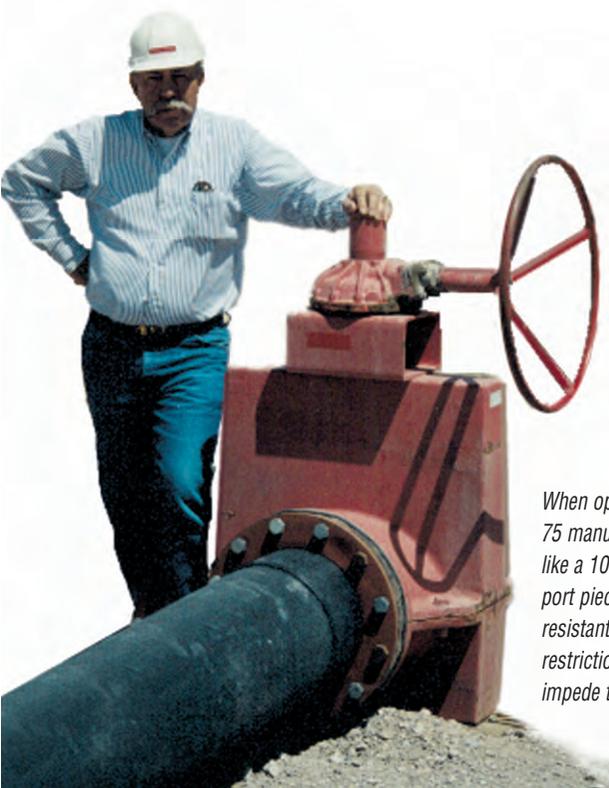
Red Valve's Series 9000 high-pressure control pinch valve, ANSI Class 300#, is another proven solution. Available with various actuators, including bevel gear actuators for manual operation and hydraulic and electric actuators for automatic operation, the Series 9000 is equipped with a heavy-duty solid steel stroke adjustment unit that affords flexibility in control and stroke for abrasion sleeve wear, eliminating downtime.

Flexgate valves are commonly found on tailings systems, especially in larger diameter sizes. The Flexgate valve provides the best features of a pinch valve and a knife gate valve. A knife blade passes through two full-port elastomer seats, opening or closing the valve.

Series 9000 hydraulic actuated tailings isolation valve for 720 psi service at Homestake Mine in South Dakota.



Typical application of Flexgate valve on tailings. (right)



When open, the Series 75 manual pinch valve is like a 100 percent full-port piece of wear-resistant pipe, with no restrictions in the line to impede the flow.





RELIABLE VALVE SOLUTIONS FOR EVERY TAILINGS APPLICATION

The world's largest manufacturer of pinch valves, Red Valve Company has an international reputation for quality engineered valves. Every Red Valve pinch valve and Flexgate valve is backed by our experience and dedication to innovative design, high engineering standards and skillful manufacturing.

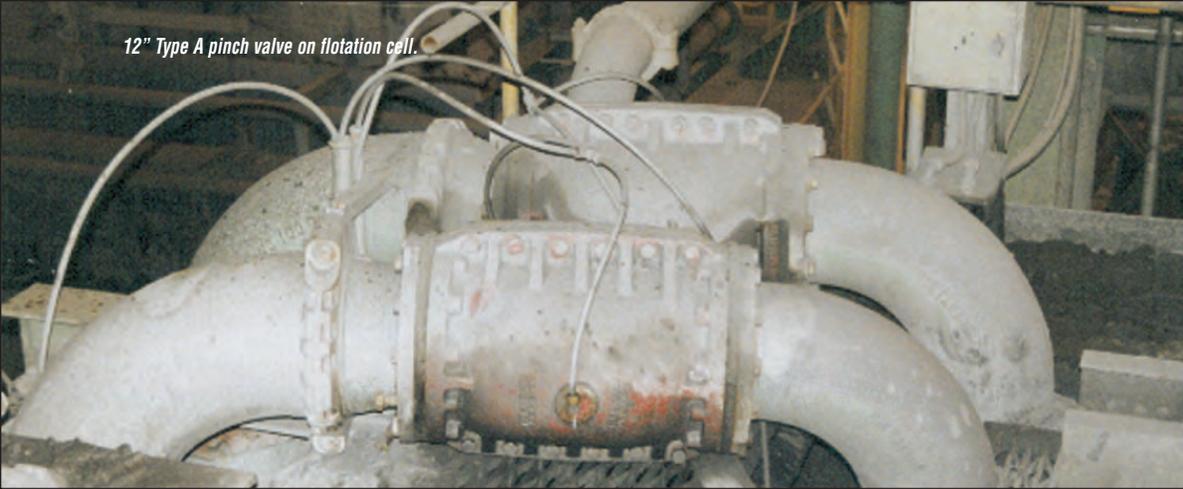
Versatile and durable, Red Valve products provide solutions to control your

toughest mining applications.

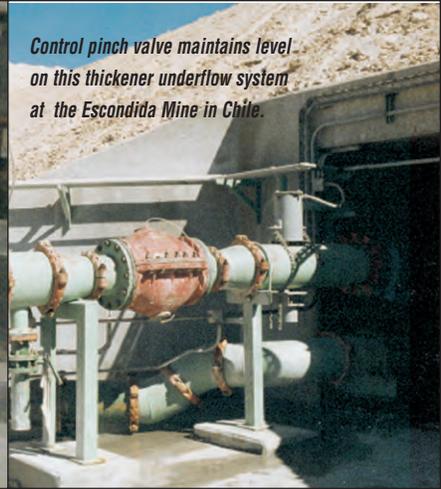


Red Valve's Series 5400 (above) and Series 75 pinch valves (left), offer maximum durability, heavy-duty performance and center-line closure.

12" Type A pinch valve on flotation cell.



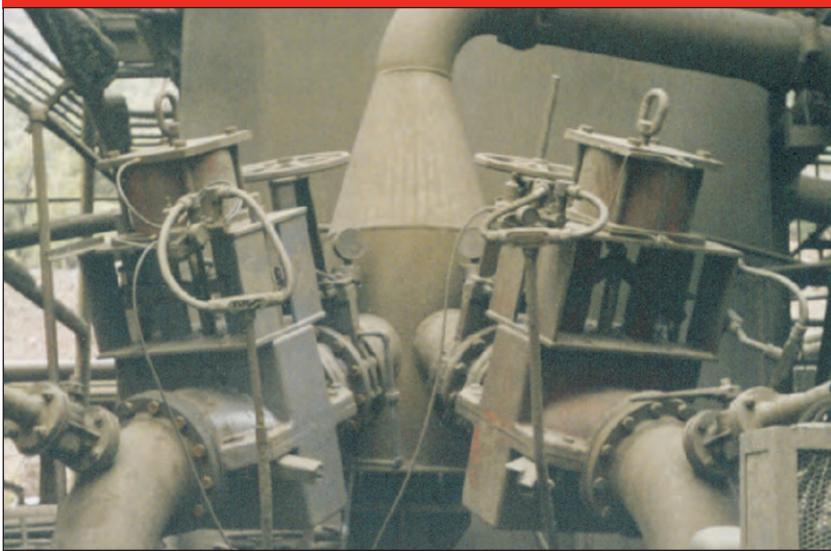
Control pinch valve maintains level on this thickener underflow system at the Escondida Mine in Chile.



FLOTATION CELLS/THICKENER UNDERFLOW

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 the flotation cells or "spent" ore discharging from a thickener retains a high solids content that quickly destroys ball, butterfly and plug 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, pinch valves provide precise repeatable control across a wide range of pressure and flow conditions.



Flow control pinch valves on a dewatering system at this Codelco Mine's filter plant.

Level control pinch valve with cone sleeve on a flotation cell.



Mixing, Agitation and Sparging

Red Valve Tideflex® Air Diffusers eliminate maintenance costs associated with clogged or fouled diffusers. All-elastomer and maintenance-free, Tideflex® Air Diffusers are ideal for use on air diffuser manifolds in mining flotation cells, providing optimal aeration and mixing while preventing clogging.

The Red Valve Tideflex® Diffuser is also ideal for sparging, which keeps slurries in

suspension, preventing separation, bridging and dewatering. Tideflex® Check Valves also prevent nozzles from clogging.

The principle of operation for Tideflex® is simple: Positive differential pressure opens the valve, allowing flow. Reverse differential pressure seals the bill, preventing the backflow of solids and liquids. The elastomer duckbill will even seal around entrapped solids. Tideflex® Air Diffusers eliminate the concern of clogging air manifold and piping

systems when blowers or compressors are stopped during routine shutdown or power failure.

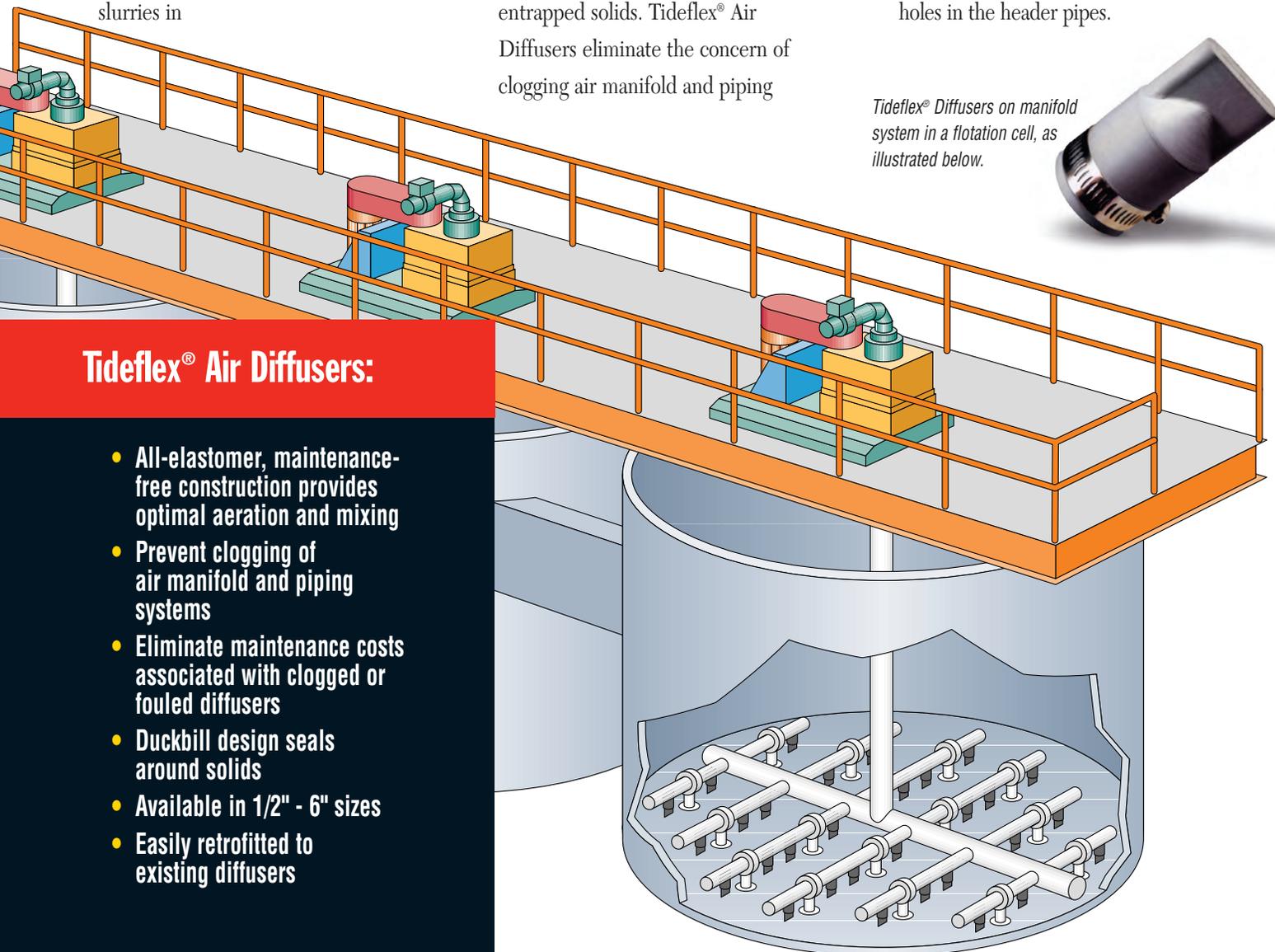
Available in 1/2" to 6" sizes, Tideflex® Air Diffusers are easily retrofitted to existing diffusers. The valves are slipped onto the outside of a pipe stub and fastened with a stainless-steel hose clamp. The valves are also available with NPT male adapters for air diffuser manifolds that have tapped holes in the header pipes.

Tideflex® Diffusers on manifold system in a flotation cell, as illustrated below.



Tideflex® Air Diffusers:

- All-elastomer, maintenance-free construction provides optimal aeration and mixing
- Prevent clogging of air manifold and piping systems
- Eliminate maintenance costs associated with clogged or fouled diffusers
- Duckbill design seals around solids
- Available in 1/2" - 6" sizes
- Easily retrofitted to existing diffusers





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