Over the past 30 years, the process of wastewater treatment has seen dramatic changes as world populations continue to increase and concern over the environment grows. Ever more stringent regulations for wastewater quality have been met with high-tech engineering. Red Valve Company has worked closely with the designers and operators of wastewater treatment plants across the globe to provide innovative solutions for the most difficult challenges faced in a treatment plant.

Unlike most valve companies who view water and wastewater as one and the same, Red Valve provides products specifically engineered for the rigors of use on slurries such as sewage, sludge and grit. Red Valve provides a Total System Solution for Wastewater Treatment that encompasses every step of the treatment process, from collection to final discharge. Our commitment is to provide dependable, cost effective products that offer the best possible solution for their particular application.
Red Valve Products Are Ideal for:

- Influent Control
- Grit Removal
- Sludge
- Raw Sewage
- Digester Control
- Sodium Hypochloride
- Scum
- Lime Addition
- Digester Gas
- Backflow Prevention
- Effluent Discharge
- CSO/SSO Systems

The Series 75B buried service valve is the ideal choice for below-grade service because there is no packing to maintain, no seats and no bonnets.

Electrically operated Series 5400E controls digester sludge accurately and requires no maintenance.

The Series 75 and pressure sensors with Hypalon® sleeves are the ideal choice for sodium hypochloride and other corrosive chemical additives as the sleeve is the only wetted part providing long-term corrosion-resistant service life.

The Series G Knife Gate is an economical solution for isolation applications throughout a plant. With stainless-steel wetted parts and a heavy-duty gate, the Series G is designed for use on clean water or slurries. Available in sizes 2’ - 144”, manual or automated.

The Series 39 InLine Check Valve is ideal for lift stations and backflow prevention throughout a plant. The Tideflex® Check Sleeve eliminates levers, springs, and flappers that require maintenance and become clogged.

The Series 5200E Electric Valve provides accurate, repeatable control on slurries. An elastomer sleeve is the only wetted part, for long-term throttling, even on abrasive or corrosive material.
Red Valve’s revolutionary Tideflex® Check Valves are often used in combined sewer overflow (CSO) systems to protect collection pumps from backflow during times of high tide and heavy rainfall. The all-rubber construction is resistant to rust and corrosion, unlike flap gates with hinge-pins and seats that can misalign. The Tideflex® provides long-term and maintenance-free service life in any municipal environment.

All Tideflex® Check Valves operate on the same principle – forward hydraulic pressure opens the valve’s bill to allow flow, and reverse pressure seals the bill, preventing backflow.

For in line installations, Red Valve offers a variety of products. The Series 39 is made up of a fabricated steel or cast-iron body with an integral rubber check sleeve, which handles flow with low head loss. The valve’s operation is passive, requiring no outside energy source, levers or counter weights.

The Tideflex® Series 37G In Line Check Valve is manufactured to be installed inside the pipe. The valve is often used to prevent odors, rodents and raw sewage from entering residences and businesses.

For ground-level installation in existing structures such as interceptors, manholes and vaults, the Tideflex® Series TF-1 features a flat bottom that allows easy installation without modification to the structure. The TF-1 offers low cracking pressure to eliminate standing water and very low headloss that is not affected by rust, corrosion or lack of lubrication. Like all Tideflex®, the TF-1 features a long, dependable service life, reducing overall costs and eliminating inconvenient maintenance requirements.
Wherever pumps are being used to move or lift water, Red Valve products can be found providing solutions for a range of applications. Backflow prevention is critical to keep the drainage lines empty, and prevent potential flooding. Red Valve’s Tideflex® Check Valve can be used at the discharge point to prevent floodwaters or tidal surges from entering the pipeline.

Wastewater is most often collected by gravity sewers, and then lifted by pumps to allow it to flow through the treatment process. Raw sewage is, by its very nature, a difficult material to control. Red Valve products are designed to handle slurries such as raw sewage by using full-port designs and abrasion resistant materials. Red Valve Pinch Valves feature no changes in the direction of the flow, and no cavities or dead spaces where material can build up. Red Valve Knife Gates with their thin profile also feature a rugged design that is ideal for pump isolation or bypass lines.

Redflex® Expansion Joints on pumps will absorb vibration, compensate for pipe misalignment and movement. Red Valve offers Redflex expansion joints in sizes from 1 to 108 to meet any application requirement. Red Valve pressure sensors are used to protect pumps from running dry or overpressuring the line by providing accurate, dependable pressure movement. Red Valve sensors are the only sensors that will stay operational on difficult process fluids such as sewage, sludge, and scum.

These large diameter Knife Gate Valves have been installed in the City of Houston, Southwest Pumping Station since 1987.
Specify Red Valve for Reliable Influent Flow Control.

A typical inflow line is full of twigs, rags and other debris that can clog traditional valves. This calls for a large valve that can remain open for long periods of time and still close drop-tight when actuated, even on entrapped solids.

One of the most difficult applications in wastewater treatment is influent flow control. In these large diameter systems, long-term reliability is essential. It is crucial that the valve be able to handle anything that can flow into the sewer lines, including tree branches, plastic bags, bottles, sand and grit, chemical spills and aluminum cans.

Red Valve’s large-diameter pinch valves have a full-port opening with no obstructions and no change in the direction of flow. There are no crevices or dead spots where debris can collect, and the soft walls of the elastomer sleeve not only prevent buildup, they can actually seal around entrapped solids for a drop-tight shutoff.

Even if the influent flow control valve is installed after initial screening, it must still deal with concentrated sewage and abrasive grit, which often moves at a considerable velocity as it enters the treatment process.
During the pretreatment stage, wastewater is passed through a bar screen to remove large debris. It then moves on to a de-grit chamber, where small solids, such as stones, gravel and metal particles, are removed. This grit is extremely abrasive and will wear metal-seated valves quickly. The Series 75 Manual Pinch Valve uses an elastomer sleeve that absorbs the impact of the particles. The sleeve lasts longer than even expensive metal alloys and is easy and inexpensive to replace.

Caustic and chemical solutions, such as carbon, ferric chloride and lime, are used to equalize wastewater in the first stage of treatment. These materials present tough problems for metal valves, but Red Valve’s Control Pinch Valves are equipped with hand-selected elastomer sleeves that resist abrasion and corrosion. The flexing action of the sleeve breaks apart devatered solids each time the valve is actuated, even after long periods of inactivity.
Pinch Valves Resist Plugging, Abrasion and Corrosion on Chemicals.

Pinch Valves Are Ideal for:
- Lime Addition
- Lime Elevated Temp.
- Carbon Slurry
- Sodium Hypochloride
- Ferric Chloride
- Polymers

Sleeve Trim Selection:
- Pure Gum Rubber-180°F
- Viton®-400°F
- Neoprene-230°F
- Hypalon®-230°F
- Hypalon®-230°F
- EPDM-300°F

What sets Red Valve products apart from traditional metal valves is their elastomer technology. In addition to giving the valves a superior flow pattern, the rubber sleeve of a pinch valve provides unsurpassed abrasion and corrosion resistance. As the only wetted part of the valve, the synthetic elastomer sleeve completely isolates the process fluid from the metal body and operating mechanism. Since chemicals are never in contact with any metal surfaces, there is no need to resort to expensive alloys such as stainless steel.

Lime is a popular chemical used in wastewater treatment for pH control, but it can be difficult to control. Lime can also scale along the walls of a valve, eventually building up and reducing flow capacity or hindering valve operation. Red Valve pinch sleeves are constantly flexing, preventing lime buildup. The closing and opening action of a pinch valve breaks up dewatered lime by changing the physical shape of the valve.

Right: Series 75 valve on this hot lime recirculation system provide dependable pH control.
Wastewater treatment plants handle digester gases comprised of methane, water and other compounds that create sulfurous and sulfuric acids that can quickly corrode metal plug valves. Corrosion occurs not only in the valve’s interior but also in the closing mechanisms, affecting the valve’s ability to achieve positive shutoff and causing additional maintenance problems. Plug valve manufacturers have tried to provide various solutions, such as aluminum, stainless steel and rubber-lined valves, but have had only minimal success.

Red Valve’s rugged pinch sleeves are constructed of hand-selected, non-permeable and corrosion-resistant elastomers. The sleeve isolates the valve body by keeping the process medium completely enclosed. For isolation applications, the Red Valve Manual Pinch Valve features bidirectional, drop-tight shutoff that yields reliable service time after time, year after year.

Red Valve Performance on Sludge with Egg Digesters.

The newest trend in wastewater treatment, egg-shaped digesters provide more efficient mixing of waste-activated sludge. Unlike conventional digesters, egg digesters contain much smaller spots for solids to collect. The reduced surface area creates a smaller scum blanket so that a higher percentage of the waste is continuously mixed. To match this performance excellence with the most efficient and reliable process equipment available, designers of egg digesters have standardized on Red Valve Manual and Control Pinch Valves.

700 manual and control pinch valves operating at a 200 mgd Seletar wastewater treatment plant in Singapore.

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Primary and secondary clarifiers remove heavy metals, dense sludge, oils and grease from the wastewater. The solids sink to the bottom of the clarifiers where they are collected and added to the oils and grease that are skimmed from the top. This very thick combination is sent to solids processing tanks for further treatment.

Pumping costs are usually increased in order to move this sludge through restrictive valve designs. The smooth, laminar flow pattern of a Red Valve Control Valve allows the thick material to pass freely, and the precise pinching design provides accurate, long-term throttling.

The viscous nature of wastewater creates problems with accurate pressure measurement. Traditional gauges and diaphragm seals clog quickly and do not signal the pump to stop when a blockage is encountered, often damaging the pumps and other process equipment. To solve this problem, Red Valve pressure sensors feature a full-port opening and a 360-degree sensing element to ensure an accurate pressure reading, regardless of conditions.

The Red Valve Tank Level Sensors are not affected by foaming, ice and other conditions that can cause errors in Ultrasonic and capacitance Level Sensors. The Red Valve Tank Level Sensor uses a high-sensitivity, solid-state pressure transmitter that is completely isolated from the process fluid by an elastomer sleeve that transmits pressure through a fluid fill and is accurate to ±2.

The pressure transmitter is available to sense gauge pressure for vented tanks and differential pressure for pressurized tanks. It can easily be calibrated for process fluid density or specific gravity in any height of tank. The output signal is 4–20 mA. An integral LED display is available and can be calibrated in virtually any units, e.g. percentages, inches H₂O, etc.

The elastomer diaphragm provides maximum surface area with minimum diameter allowing installation close to the bottom of the tank. The sensor can also be “rodded” from the outside of the tank to the inside of the tank, if necessary, in the event of severe blockage.

The Series 427L sensor provides accurate level measurement on a variety of applications such as equalization basins, sludge tanks and chemical systems.
Add Flexibility to Your Plant with Redflex® Expansion Joints.

Redflex® Expansion Joints and rubber fittings are designed to alleviate piping stress, compensate for movement, reduce noise and isolate vibration. Made in the U.S.A. by Red Valve Company, Redflex® Expansion Joints can be custom-built in a variety of styles and configurations to accommodate pipe size reduction, misalignments and offsets. Red Valve offers flanged and slip-on connections, single or multiple arches and a range of elastomers to meet process conditions, including Teflon®-lined joints for severely corrosive applications.

Redflex® Expansion Joints Are Ideal for:
- Aeration Systems
- Pump Vibration Elimination
- Grit Pumps
- Chemical Feed Pumps
- Odor Control Systems
- Blower Vibration Elimination

Redflex® Elastomer Selection:
- Pure Gum Rubber-180˚F
- Viton-400˚F
- Neoprene-230˚F
- Hypalon-230˚F
- EPDM-300˚F
- Butyl-250˚F
- Teflon® Lined-250˚F

Redflex® Products:
- Expansion Joints
- Rubber Fittings
- Vibration Pipe
- Flanged or Slip-On
- Rubber Elbows
- Ducting Joints
- Teflon® Lined
- Sizes 1 -108

Above: Large diameter square and round ducting joints on an air handling system.

Right: Filled arch J-1 Redflex Expansion Joint on lime pumping system.
Red Valve Is the Better Solution for Aeration and Mixing.

For optimum performance in aeration and mixing, Red Valve's Coarse and Fine Bubble Air Diffusers incorporate Tideflex® technology to increase jet velocity of the diffusing air and to eliminate damage caused by backflow and clogging.

The Tideflex® Coarse Bubble Air Diffuser completely eliminates settling by offering the best possible mixing technology. With Red Valve's signature “T” configuration, the diffusers can be installed very low in the tank to prevent any collection of solids at the bottom of the tank. The all-rubber construction lowers maintenance costs, and the patented Duckbill® design prevents backflow of sludge during a power failure or routine shutdown.

Red Valve's Domeflex® and Tubeflex® Fine Bubble Air Diffusers offer the same backflow prevention and maintenance-free service and are designed to provide maximum oxygen transfer. This efficient aeration keeps microorganisms alive in the tank and ultimately yields a higher quality of effluent.

Combined Aeration

Combining coarse bubbles for mixing with fine bubbles for oxygen transfer increases efficiency, enhances scouring and improves performance.

Engineered Tideflex® duckbill has memory; forward pressure opens the valve; reverse pressure seals the valve and prevents backflow into the header pipe.

Tideflex coarse bubble diffuser easily replaces stainless steel diffusers by incorporating the same end connection in its design.
Historically, there have been two options in air diffuser systems. Fine bubble diffusers could provide the biological system requirements at a low airflow rate, but generally the airflow had to be increased to provide sufficient mixing. Coarse bubble diffusers provided high mixing power, but needed twice the airflow to meet oxygen requirements.

**Fine Bubble Systems**
- High O₂ transfer efficiency
- Low mixing energy
- High maintenance cost
- High capital cost
- Low operating cost

**Coarse Bubble Systems**
- Low O₂ transfer efficiency
- High mixing energy
- Low maintenance cost
- Low capital cost
- High operating cost

Red Valve has developed a unique approach to aeration-system design by combining the aeration benefits of our fine bubble product line with the mixing benefits of our coarse bubble product line. A combined system can meet the biological system requirements for oxygen and still provide sufficient mixing at a lower total airflow.

**Combined System Benefits:**
- Median O₂ Transfer Efficiency
- Excellent Mixing Energy
- Reduced Maintenance Cost
- Reduced Capital Cost
- Median Operating Cost
Red Valve also provides complete effluent diffuser systems to improve the quality of discharge and help protect the environment. Tideflex® Effluent Diffuser Valves increase jet velocity of discharging effluent to enhance mixing while preventing backflow into the header pipe. Red Valve's effluent diffuser systems are custom built to customer specifications and can come equipped with Redflex® Rubber Elbows and Risers, which increase flexibility and reduce the possibility of breakage.

Each diffuser system is unique. Red Valve Company has conducted extensive tests in Tideflex® Diffuser Valves from 2 (50mm) to 48 (1200mm) and has developed an exclusive computer program to assist engineers in designing multiport diffusers. The program includes data analysis of headloss, total headloss, jet velocity and effective open area. This data can be compared to conventional fixed-orifice diffuser designs to illustrate the hydraulic advantages of Tideflex® Valves. For a diffuser nozzle analysis, please contact our engineering department.

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Tideflex® Diffuser Valves:

▸ Prevent Intrusion of Debris, Sediment, Saltwater and Aquatic Life
▸ Provide Proven Long-Term, Maintenance-Free Service Life
▸ Enhance Jet Velocity
▸ Improve Initial Dilution
▸ Provide a More Uniform Flow Distribution Across Ports
▸ Promote Significant Improvement in Saltwater Purging

Proven Performance On:

▸ Marine Outfalls
▸ Inland Outfalls
▸ Retrofit Outfall Pipelines

Far left: (12) 1.050mm Tideflex® Diffuser Valves installed on emergency outfall in Hong Kong.

(12) 6 Tideflex® diffuser valves with integral 3-ft.-long risers discharging to a shallow river.

(20) 250mm Tideflex® diffuser valves on a 1.5km outfall in Viña del Mar, Chile.
Red Valve Provides the Total System Solution for Wastewater Treatment Plants

- **Screening Equalization Basin**
- **Pumps Neutralization**
- **Primary Clarifier**
- **Blowers**
- **Odor Control**
- **Lime Addition**
- **Grit Removal**
- **Digester**
- **Blowers Aeration Basins**
- **Incinerator**
- **Secondary Clarifier**
- **Filtration Disinfection**
- **Sludge Thickening**
- **Settling Tanks**
- **Dewatering**
- **Flocculation**

1. **Tideflex® Check Valves**
2. **Redflex® Expansion Joints**
3. **Tideflex® Air Diffusers**
4. **Manual Pinch Valves**
5. **Control Pinch Valves**
6. **Air Operated Pinch Valves**
7. **Megaflex Valves**
8. **Knife Gates**
9. **Pressure Sensors**
10. **Effluent Diffuser Systems**
11. **Butterfly Valves**
12. **Tideflex® Mixing Systems**
A Complete Line Of Quality Products . . .
Built To Beat Slurries

The revolutionary Tidelex® Check Valve stands alone as the product of choice for backflow prevention, replacing high-maintenance flap gates.

The Series 5200 Control Pinch Valve provides accurate, repeatable control on slurries. An elastomer sleeve is the only wetted part, for long-term throttling even on abrasive or corrosive material.

Providing a full 360° pressure reading, Red Valve pressure sensors are the industry standard for protecting instrumentation and ensuring accurate, dependable pressure measurement.

First introduced by Red Valve, the Type A Miniflex and Megaflex Pinch Valves are the most economical large- and small-diameter automatic valves on the market today.

No actuator needed; add air or water pressure to close.

Red Valve’s 5200E electrically actuated Control Pinch Valve provides economical, reliable and precise control.

Redflex® expansion joints, reducers, rubber pipe, vibration pipe and rubber fittings are the industry standard and are manufactured to 96 inches in diameter.