RDP Diamond Gate Bins





Oakland, CA 450 tons (1998)

RDP Diamond Gate Bins

Since 1992, Diamond Gate Bins have been storing and loading difficult and sticky municipal wastewater treatment plant dewatered solids.

Wide ranging solids concentration and material pressures, resulting from the large storage silos, are reliably, cleanly and rapidly loaded with Diamond Gate Bins. Truck loading is accomplished in 1 to 5 minutes. The system consists of one or more storage hoppers which are mounted on load cells. Each hopper bottom is fitted with a patented Diamond Metering Gate, which accurately controls the flow of solids during the load-out process. A typical system has two or more hoppers configured to allow trucks to be loaded, without having to move the truck The Diamond Metering Gate is equipped with the patented Tightseal[™] system, providing a watertight storage system.

There are no internal moving parts. This eliminates shaft seals and bearings all of which require maintenance and allow leakage of sludge.



Features & Benefits



Rapid, clean loading without moving trucks

Imagine storing over 10 truckloads of dewatered cake in a storage bin and loading trucks with 45,000 pounds in under 45 seconds.

Most people picture (based on actual events) a storage bin dripping sludge from shaft seals, on to bearings and gears, ending up on the ground causing odors and attracting flies. During truck load-out, the pressure, caused by the head of material above the discharge, creates an uncontrollable discharge rate. Sludge goes splashing and splattering out of the truck. Tires explode as the truck is buried by uncontrolled discharge of sludge.

For owners of Diamond Gate Bins, the picture is a clean leak free system and controlled load-out of trucks.



Watertight gate seal prevents leaks and odors

The metering gate is used to provide a 3 step load-out.

Step 1: At the start of the load-out process the initial discharge rate is set low, in order to establish a cushion of solids in the truck bed. This eliminates splashing and splattering caused from solids impacting on the solid truck bottom.
Step 2: Once the cushion is established, the discharge rate is increased to provide rapid loading of the truck. Often the load-out rate is in excess of 3,000 ponds per second during step 2.
Step 3: As the desired total load-out weight is approached, the rate of discharge is decreased until the set point total weight is obtained.

The result is a smooth, splash and splatter free loading of trucks to within +/- 200 pounds.



Load cells provide accurate control of truck load-out

Load cells are installed on each hopper to control both the filling and load-out operation. At loading rates of over 3,000 pounds per second, RDP's proprietary weighing and control system provides a highly accurate measurement and rapid control of the loading process.



Graphic control of load-out and data logging

Systems are usually furnished with a graphic operator interface. Systems are also available to print weight tickets and provide complete data logging interface.

Installations From 30 to Over 8,000 tons of Storage



San Francisco Airport 30 tons (2004)



Salt Lake City, UT 400 tons (2001)



San Francisco, CA 8,500 tons (1990)



Eugene, OR 280 tons (2000)



RDP Technologies, Inc.®

Roseville, CA 110 tons (2001)

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The equipment and systems described are protected by one or more U.S. or foreign patents 6,698,766; 6,508,387 and 6,447,674. Additional patent may be pending

RDP Tightseal[™]System

The patented Tightseal[™] is in use on hundreds of slide gates. The seal is not only used on the Diamond Metering Gate, but is also used on conventional (non metering) square or rectangular gates. The seal is installed on screw conveyors, grit/screenings hoppers, sludge pump inlets, anywhere a leak proof slide gate is required, the Tightseal system can be utilized.

The Tightseal uses a special single molded piece ball type sealing system that forms an O-ring seal around the opening. There are no joints or cracks in the rubber ball seal which would allow leakage. The ball seal is a heavy duty large diameter seal (1-1/2" to 2" diameter) formulated from a proprietary blend of materials to provide the proper hardness, flexibility, oil and chemical resistance, and a built in lubricant. The result is a rubber seal with long life and no leakage. As the level of solids increase, increasing pressure on the seal, the Tightseal becomes tighter and provides an optimum seal. The seal is mounted to a heavy duty support frame and held in place with a seal retainer. The retainer directs the deformation of the ball seal, under pressure, against the gate blade, creating a seal that gets tighter as more pressure is exerted on the slide gate.

Certain applications include a ramping system, which pressurizes the seal as the gate reaches the fully closed position. This preloads the seal against the gate blade.

The Tightseal system is in use on gates from 12" to 72" wide.







RDP Diamond Metering Gate



48 inch gate open area



When storing dewatered sewage sludge in storage bins, variations in the solids content, the polymer content and the height of sludge in the bin, cause the flow rate of the sludge to vary greatly. The patented Diamond Metering Gate is able to adjust to the flow changes and accurately control the rate of discharge.

The unique diamond shaped orifice provides a gradual increase in open area when compared to conventional square or rectangular gates. This allows the gate to open gradually, for a smooth and controlled flow of sludge. Once the sludge is flowing, the gate will accurately change to keep the rate of discharge within the required range. This prevents splashing and over filling during the load-out process.

Diamond Metering Gates are furnished with the patented Tightseal[™] system which prevents leaking, even when loaded with over 2,000 tons of sludge.

Diamond Metering gates are in operation on fully automatic multiple hopper storage bins and systems to small single hopper bins using only manual control of the gate.

The diamond orifice provides two advantages compared to conventional slide gates.

First the orifice provides a gradual change in open area. Second, the orifice allows for a longer travel distance for changing the open area. This allows the gate to better control the flow through the orifice and modulate the flow with greater accuracy.