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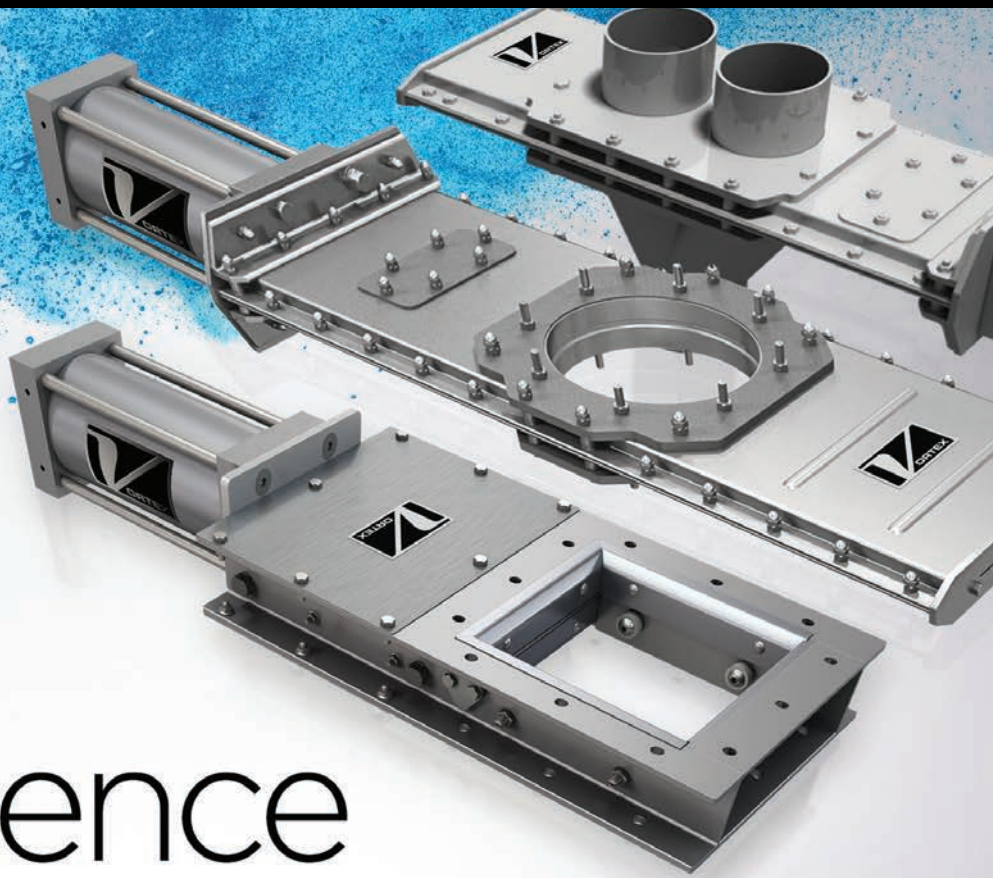
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With Experience Comes Innovation.

Transporting and conveying dry bulk solids is never a straightforward task. Many in the industry would go as far as saying success takes a mix of "black magic", science, and engineering. Indeed it can be difficult, but the reality is that it takes many years of experience to have some reasonable guarantee you'll get it right.

Learn about one company that has been innovating in the dry bulk handling industry for 40 years. 

Pellets into powder

Cal-Chlor is the world's largest distributor of CaCl_2 powder, which is shipped in 23 kg plastic valve bags

Munson helps Cal-Chlor reduce calcium chloride with screen classifying cutters.

The surge in production of North American oil and natural gas has been good for petroleum producers and the businesses that supply them with material for drilling.

One important product in this category is calcium chloride (CaCl_2), a two-part chloride salt that provides benefits in such applications as drilling shale formations, flushing mud from oilfield holes, and filling casings when drilling ends.

Demand for CaCl_2 is so high among oil producers that supplier Cal-Chlor Corp. of Lafayette, Louisiana, has solidified its standing as the largest distributor of CaCl_2 in the world on the strength of oilfield use, says Brett Davis, operations director of the company's Opelousas, LA, plant.

The plant downsizes CaCl_2 pellets into a powder comprised of uniformly sized particles using five Screen Classifying Cutters (SCC) from Munson Machinery Co., Utica, New York. Each cutter processes up to 11,793 kg of product per hour, says Davis. They are so important to meeting oilfield on-time demand that Cal-Chlor runs four of them and keeps the fifth for emergency use if one goes offline. The plant's daily CaCl_2 powder production ranges from 181 to 363 tonnes.

AUTOMATED PROCESS

Cal-Chlor sources its CaCl_2 in Michigan. The salt is refined from natural brines found in underground sandstone formations, and then manufactured and shipped as pellets (about 4.5mm in diameter) to Cal-Chlor's Opelousas, LA, and Ludington, MI, plants for processing.



The surge hopper (top) meters CaCl_2 pellets, which flow through two intake chutes to the cutters.

At the Opelousas plant, loading, conveying and feeding of CaCl_2 is automated; no worker handles the calcium chloride prior to bagging, loading and shipping. The railcars are diverted to a spur where they park over a pit that contains a loader and conveying mechanism. The raw CaCl_2 empties into the loader through the bottom of the railcar, and is conveyed to a surge hopper in the plant. The hopper meters CaCl_2 pellets to the four of the plant's five SCC-30 cutters through an intake

chute at the top of each unit.

Davis says it is important to maintain a constant feed rate. If material backs up it will strain the cutter bearings, causing them to overheat and possibly fail. To assure an even flow of CaCl_2 into each cutter, Cal-Chlor installed a mechanical flow control valve with a variable frequency drive above each cutter.

CLEAN CUT

Davis points out that the cutters are "near bulletproof" when it comes to processing >>>

CaCl₂. This toughness is needed due to the nature of CaCl₂, which is abrasive, generates heat when collected in large volume, attracts moisture, and generally is a "nasty product" that "does strange things to whatever equipment it comes in contact with."

He notes that as little as 84-112 gm of CaCl₂ in a cup with water will become too hot to hold in minutes.

In fact, CaCl₂'s heat-generating and hygroscopic properties become an asset in snow melt and deicing treatments for sidewalks and driveways.

The Opelousas plant operates SCC-30 models, which have 76 cm long feed throats that, like all SCC units, are 28 cm wide. The power range is 15 to 30 kw. Cal-Chlor operates them at between 1,200 to 1,800 rpm.

The units feature a helical rotor design with dozens of cutter tips attached to a helical array of staggered holders called "interconnected parallelograms" to continuously shear oversize materials against twin, stationary bed knives. The cutter tips are aligned along the entire shaft, making total contact with the product. The helical pattern of cutter tips eliminates

dead spots and hot spots by moving material throughout the length of the rotor, taking full advantage of the screen area for maximum throughput with minimal fines and little to no heat generation, while ensuring uniform wear.

The cutters are typically made of stainless steel, which in Cal-Chlor's case is vital to resist abrasion, corrosion and other problems that CaCl₂ presents.

Cal-Chlor also operates a sixth SCC-48 model (122 X 28 cm feed throat) at its plant in Ludington, Michigan, to fill oilfield demand for CaCl₂ powder in the Rockies, New York and Pennsylvania.

Powdered CaCl₂ exiting the cutters is gravity discharged onto a conveyor and automatically transported to another surge hopper that feeds a bagging station. At this point workers fill the CaCl₂ powder into 23 kg plastic valve bags, palletise them and load them on trucks for shipping. Davis says valve bags are used because CaCl₂ is too oily to effectively seal with conventional plastic bags.

When Davis joined the company in 2006, Cal-Chlor had two SCC cutters which proved successful, prompting the addition of three additional units in Opelousas and the

The SCC Cutter's helical rotor design provides maximum throughput with minimal fines and little to no heat generation, while ensuring uniform wear.



sixth in Ludington. ■

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