

# PRO·CESS

## WORLDWIDE

5

SEPTEMBER 2016 Volume 18

www.process-worldwide.com

# DATA PROVIDER FOR INCREASING DIGITIZATION

The trend toward linking up the production and control levels in a network is now making itself felt in low-voltage switchboards in the process industry.

Raw Materials

**CHEMICALS FROM THE SMOKESTACK**

Major Plant Construction

**HOW TO PUT CONTRACTS INTO FORCE**

Valve Technology

**ARRIVAL OF AN INTELLIGENT SYSTEM**



**Patrick Thomas**  
CEO of Covestro:

"We have to change the way we look at CO<sub>2</sub> – using it as an alternative source of raw materials is a solution to some of the biggest challenges of our time."



# RELIABLE POWDER PRODUCTION



Sources: Munson

Each SCC 30 Screen Classifying Cutter reduces calcium chloride pellets into powder comprised of uniformly sized particles at rates to 11,793 kg per hour.

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 ( $\text{CaCl}_2$ ), a two-part chlo-

ride salt that provides benefits in such applications as drilling shale formations, flushing mud from oilfield holes, and filling casings when drilling ends.

Demand for  $\text{CaCl}_2$  is so high among oil producers that supplier Cal-Chlor of Lafayette, Louisiana, has solidified its standing as the largest distributor of  $\text{CaCl}_2$  in the world on the strength of oilfield

Screen classifying cutters master challenging product

— Calcium chloride is really difficult to process. This very hygroscopic salt dissolves exothermic in water and its abrasive properties require robust process equipment. An American calcium chloride supplier has found a save and reliable process solution.

use, says Brett Davis, operations director of the company's Opelousas, LA, plant.

The plant downsizes  $\text{CaCl}_2$  pellets into a powder comprised of uniformly sized particles using five Screen Classifying Cutters (SCC) from Munson Machinery. 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  $\text{CaCl}_2$  powder production ranges from 181 to 363 tonnes.

Process is automated from railcars to packaging line

Cal-Chlor sources its  $\text{CaCl}_2$  in Michigan. The salt is refined from natural brines found in underground sandstone formations, and then manufactured and shipped as pellets (about 4.5 mm in diameter)

\* Contact Munson: Phone +1-315-797-0090

to Cal-Chlor's Opelousas, LA, and Ludington, MI, plants for processing.

At the Opelousas plant, loading, conveying and feeding of  $\text{CaCl}_2$  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  $\text{CaCl}_2$  empties into the loader through the bottom of the railcar, and is conveyed to a surge hopper in the plant. The hopper meters  $\text{CaCl}_2$  pellets to the four of the plants 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  $\text{CaCl}_2$  into each cutter, Cal-Chlor installed a mechanical flow control valve with a variable frequency drive above each cutter.

### Cutters resist "nasty" $\text{CaCl}_2$ effects

Davis points out that the cutters are "near bulletproof" when it comes to processing  $\text{CaCl}_2$ . This toughness is needed due to the nature of  $\text{CaCl}_2$ , 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 84-112g of  $\text{CaCl}_2$  in a cup with water will become too hot to hold in minutes. In fact  $\text{CaCl}_2$ '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 continuous-



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

ly 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  $\text{CaCl}_2$  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  $\text{CaCl}_2$  powder in the Rockies, New York and Pennsylvania.

### Powdered $\text{CaCl}_2$ bagged and palletized

Powdered  $\text{CaCl}_2$  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  $\text{CaCl}_2$  powder into 23 kg plastic valve bags, palletise them and load them on trucks for shipping. Davis says valve bags are used because  $\text{CaCl}_2$  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 sixth in Ludington. WÜH

# IKA®

Your Application  
Your Standard  
Our Competence

CMX  
Solid-Liquid Mixing System



Excellent  
powder wetting  
in batch process

[www.ikaprocess.com](http://www.ikaprocess.com)



IKA® German technology