

# Technical Article Series

Abrasive salt not too tough for stainless screens in rock salt plant.

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# Abrasive salt not too tough for stainless screens

Non-blinding major advantage

## NEW SOLUTIONS TO PLANT PROBLEMS

A machine that screens crushed, fused salt for 24 hours a day has yet to need replacement of its two, bottom stainless steel screen cloths. The top screen, which takes the most severe beating from the 4 tons an hour of incoming hot salt, has needed occasional replacement.

The 72" separator is operating at the Lindbergh Rock Salt plant of the Canadian Salt Co., Ltd. in Elk Point, Alberta, Canada. Assistant Plant Manager Ken Palamarek is pleased with the machine's service record and daily performance, especially the non-blinding operation of the screens. Screen blinding is a common problem with some kinds of separators used in salt and other dry chemical processing.

The multiple deck construction of the vibrating separator conserves operating space and makes maximum use of available screen area for overall efficiency. In addition, there is no flexing of wire in the screen cloth, and screen life is greatly prolonged.

The Lindbergh plant is located over salt beds that are suitable for solution mining only. The product obtained by this technique of solution, followed by evaporation and crystallization, is highly pure and is generally used to make table salt and other high grades rather than lower grade rock salt.

In western Canada the demand for road salt is high, but unfortunately salt beds that could be mined by conventional tunneling and drilling for cheap supplies of road salt are not available. Because freight costs for rock salt from the east are prohibitively high, evaporator salt is converted into the coarser rock salt by melting the crystallized product, casting it into briquettes, then crushing to a top size of 7/8" and screening the resultant material to obtain the primary cut at 1/4" - 3/8".

The crushing process yields a mixture of particle sizes, which must be separated into various size ranges to become marketable products.

This is where the vibrating screener comes in. Material from the crusher is fed at the rate of 4 tons per hour at 300-400°F into a primary screen with the coarser cut being fed into the 8-inch diameter intake port at the top of the separator. From there it is carried by the three-dimensional vibrations of the machine across or through various mesh screens. The separator at Canadian Salt has three decks, which means that four different particle size ranges are classified by the machine. The screen sizes in use are 1/2", 3/8" and 1/4".

Rock salt is specified as that particle size range which passes through a 3/8" mesh screen and does not pass through a 1/4" mesh screen. Other products are water conditioner salt used in regenerating water softeners (7/8" to 1/4"); coarse crushed salt used in ice control; range salting and hide curing (pack method) (3/8" to 1/4") and fine crushed salt used for ice control, hay salting, meat curing and range salt (minus 1/4").

In addition to the non-blinding characteristic, two other features of the separator that are especially appealing to Canadian Salt are the high tonnage throughput of the screener and its relatively low power requirement. Crushed salt moves through the separator at the rate of four tons per hour. Power consumption is only two horsepower.

Crushed salt is fed into the center of the top of the machine. Oversize particles are moved by the multi-plane motion to the screen periphery, where they are discharged. Undersize particles pass rapidly through the screen.

As the process continues through the other decks, each screen is equipped with a feed tray to redirect the undersize particles to the center of the screen beneath. This greatly increases screening efficiency by exposing the material to a maximum amount of screen surface,

Because the machine is in a closed system, there is no dusting during operation, and the noise level is lower than that experienced with open screens. The integral design of the machine further contributes to its low

noise level.

General maintenance consists of routine lubrication, inspection of parts, and replacement of any connections to external systems as might be necessary.