



Completely Enclosed Screw  
Conveyor Eliminated  
Housekeeping Issues

**Plant Location**  
**Elementis Chromium**  
Castle Hayne, NC

## Screw Conveyor Solves Housekeeping Issues for Chromium Production Facility in Castle Hayne, NC

### General Description of the Application

Chromium chemical products are used in a variety of applications ranging from pigments for paints, chrome coatings for appliances and automobiles to additives used in the tanning process to produce leather. The most common use of chromium is as an additive to iron, producing steel that is corrosion-resistant. Elementis is a leader in the chromium industry with manufacturing facilities located in North Carolina and Texas.

At the facility in Castle Hayne, NC one of the processes involves conveying chromium paste from a pair of filter presses to a dryer. Historically, this was accomplished using a belt conveyor, but it was a highly inefficient process. Chromium paste would constantly fall off the belt, leading to significant man hours spent cleaning the surrounding area. After careful consideration, Elementis chose to partner with KWS because of their proven track record of resolving the most difficult bulk material handling applications.

### Design Parameters of Application

**Product Type:** Chromium Paste  
**Material Density:** 70 to 90 Lbs per Cubic Foot  
**Moisture Content:** 18 Percent by Volume  
**Capacity:** 1,535 Cubic Feet per Hour  
**Duty:** 24 Hours per Day, 7 Days per Week

### Advantages Provided by KWS

Since the new KWS screw conveyor was replacing an existing belt conveyor, there was minimal clearance between the belt filter presses and the down-stream equipment. KWS assigned a veteran Project Manager with over 35 years in the industry to the task. Every obstacle was carefully dimensioned and modeled using three-dimensional software to ensure a problem-free installation. Bolted covers created a dust-tight enclosure and kept the chromium paste completely contained within the trough housing throughout the conveying process. Reducing clean up and housekeeping issues allows Elementis employees to focus on preventative maintenance and improving the process rather than daily clean up.

### Special Features of KWS Design

Chromium paste is very abrasive and the new KWS screw conveyor was designed for the application. Heavy-duty U-troughs with 3/8-inch thick abrasion-resistant AR400 wear liners form a long-lasting housing that will hold up to the abrasive chromium paste. Possible buildup of chromium paste on the screw flights and center pipe was a concern of Elementis. To prevent buildup, a system of spray nozzles was installed along the length of the trough to continuously coat the screw with a small amount of water to encourage the paste to release and convey to the discharge point.



**Design  
Engineering  
Manufacturing**

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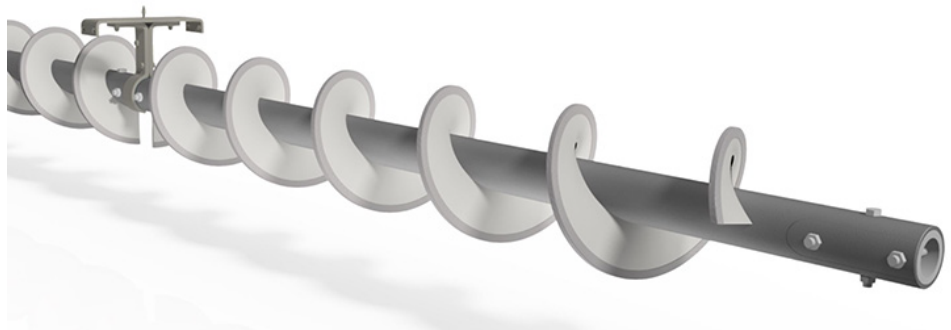
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The screws were designed for long life while conveying the chromium paste efficiently. Close-clearance between the outside diameter of the screws and inside diameter of the U-troughs allows for maximum cleanout of material, leaving very little in the troughs. Typical clearance between a screw and housing is 1/2-inch, but KWS reduced the clearance to 1/4-inch for this application. Hardsurfacing is commonly used to extend the wear life of a screw by welding on a highly abrasion-resistant coating along the carrying face of the flights. KWS also applied the hardsurfacing to around the periphery and non-carrying face of the flights, which completely encapsulates the screw flights with an ultra-hard and abrasion-resistant protective layer.

### Testimonial

"There is no spillage of chromium paste with the new KWS screw conveyor.  
We don't have to spend any time cleaning up the area at the end of a shift."

- Maintenance Manager – Elementis Chromium



Close Tolerance Screw Flights are Hardsurfaced to Reduce Wear



Spray Nozzle System Lightly Coats Screw Flights  
with Water to Reduce Chromium Paste from Sticking



Chromium Paste is Used in  
Many Different Applications



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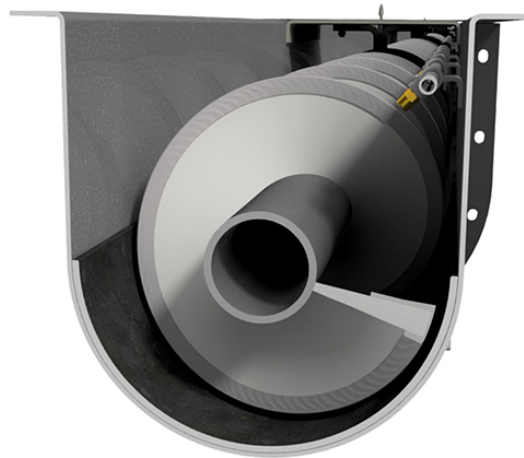
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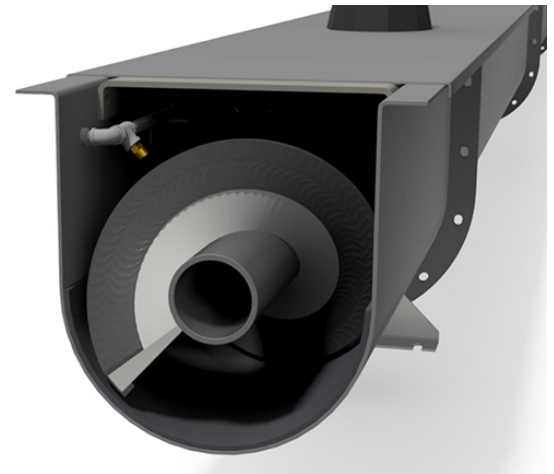
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Abrasion Resistant AR-400 Trough Liners  
Reduce Gap Between Screw OD and Trough  
ID for Improved Clean Out of Chromium Paste



KWS Screw Conveyor Completely  
Contains Chromium Paste and  
Eliminates Spillage



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