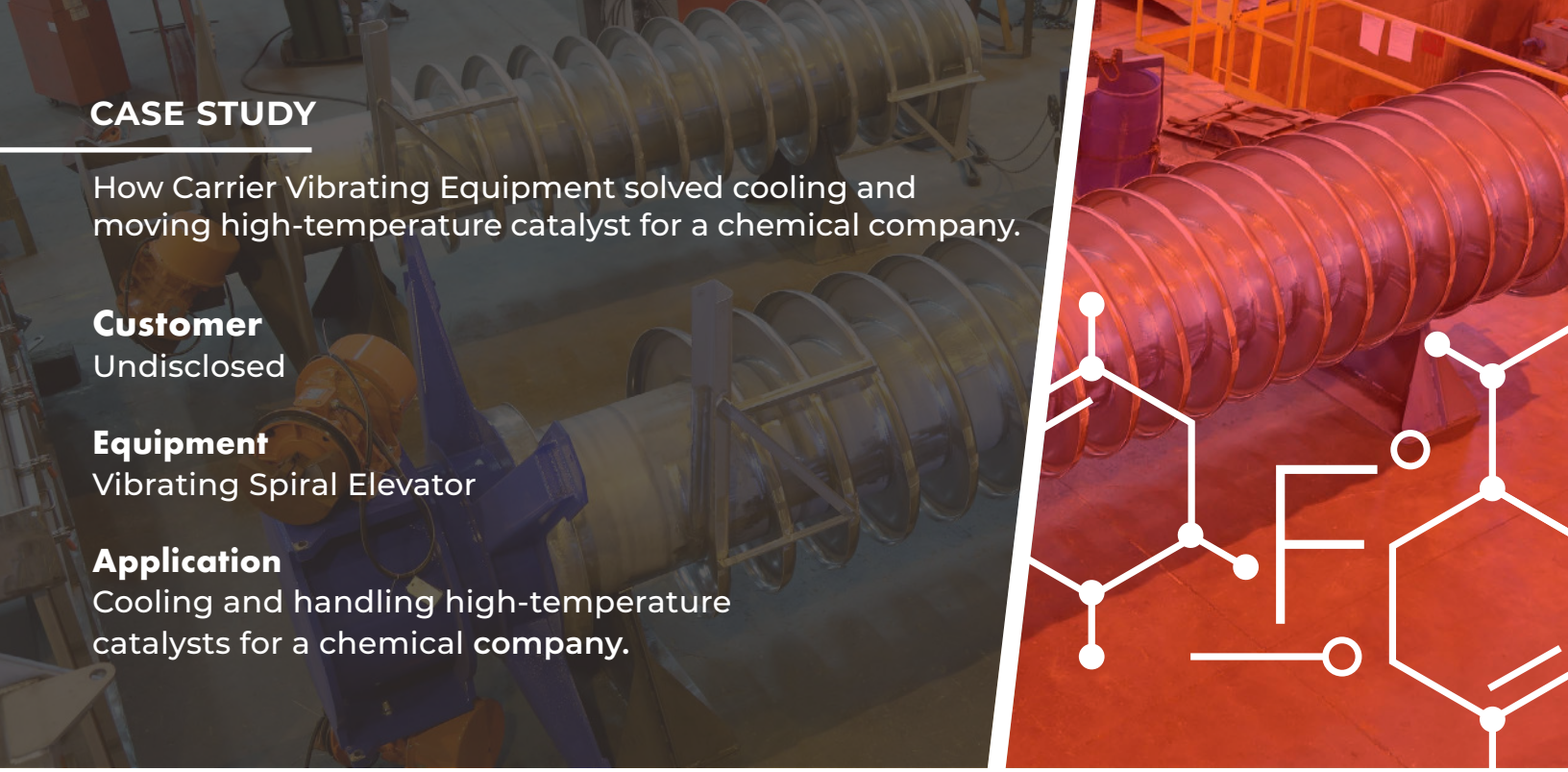

CASE STUDY

How Carrier Vibrating Equipment solved cooling and moving high-temperature catalyst for a chemical company.

Customer
Undisclosed

Equipment
Vibrating Spiral Elevator

Application
Cooling and handling high-temperature catalysts for a chemical **company.**

Overview / Challenge

A chemical company contacted Carrier Vibrating Equipment with a need to transport an extremely high temperature chemical catalyst immediately after it had been processed in a rotary calciner. With the extremely high-temperature product, the customer needed a solution that would safely and efficiently move the catalyst. Cleanability and space were also at the forefront of the conversation.

Customer Requirements:

- Transport 1,500°F high-temperature chemical catalyst
- Eliminate product cross-contamination during transport
- Meet safety guidelines to protect employees from the high temperature
- Must use or inhabit limited floorspace
- Must be easily cleaned

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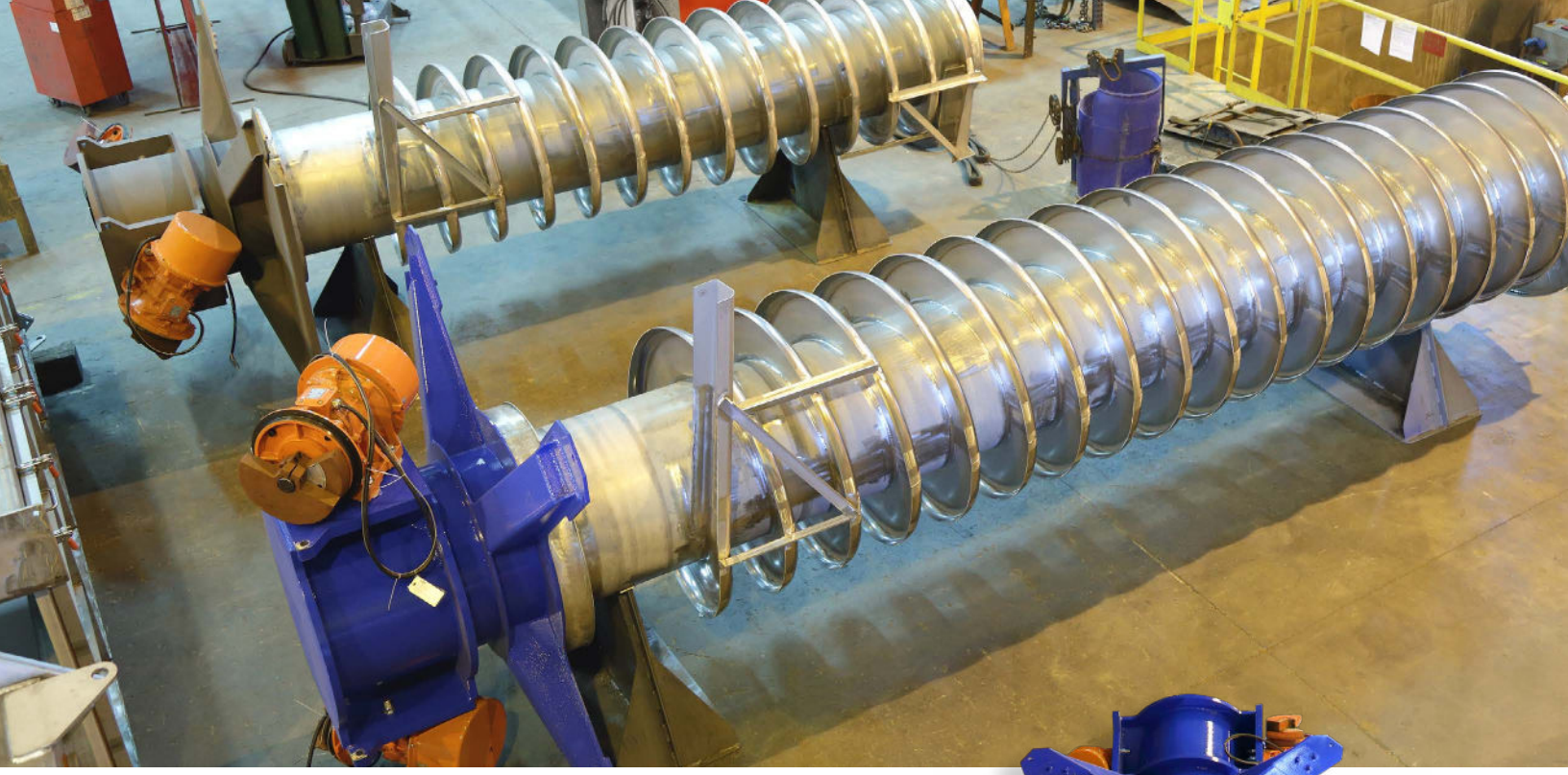
Our recommendation is on the next page.



Solution

Carrier recommended developing two vibratory spiral elevators to meet the customer's objectives. One spiral elevator was built using 309 stainless steel to convey the high-temperature chemical catalyst while the other was fabricated from 304L stainless steel. Carrier's flexibility with construction materials is just one of many areas that sets the company apart from competitors. They were both designed with 4" sidewalls for additional safety and were flighted with a 12" pitch.

Each spiral elevator was housed inside a stationary metal shroud constructed of stainless steel. This protects personnel, prevents cross contamination, and simplifies the duct control needed. The shrouds not only encased the spirals, but provide additional support to the vibrating load.

Vibrating Spiral Elevator

Stainless Steel Shrouds on Each Elevator

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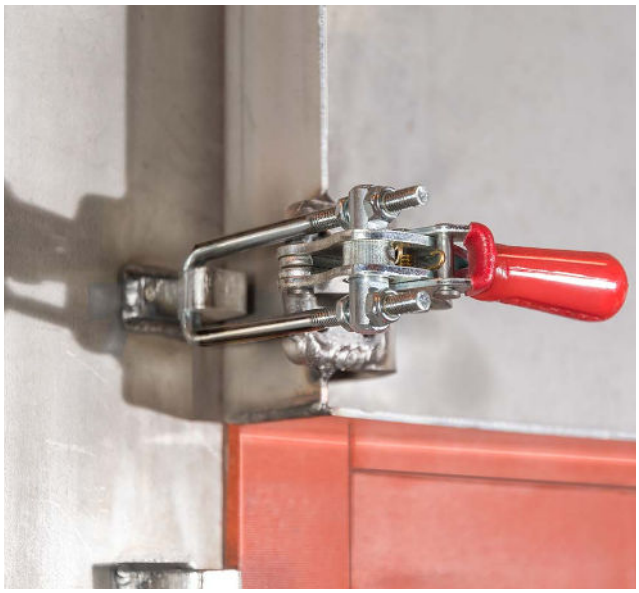
The first shrouded spiral elevator was positioned immediately after the calciner at the beginning of the process line. Its job was to safely handle the 1,500° F catalyst while conveying to a catalyst cooler.

To protect the motor from the high temperature, this spiral was designed with a steel heat shield, prolonging the equipment's life and reducing downtime and maintenance.

Steel Heat Shield Protects the Spiral Motors

Both spiral elevators were designed to be able to be easily opened with quick access handles, allowing safe, quick access for maintenance and cleaning of the entire system. Each spiral elevator is powered with a drive that consists of two 7.9 HP, heavy duty vibrating type motors, TENV, arranged for 460 volt, 3 phase, 60 cycle service, complete with adjustable rotating eccentric weights for stroke variation. The motors were bolted to structural flanges on the side of the units positioned in the proper angle of attack for ideal conveying conditions.



Quick Access Handles Used on Each Shroud

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Results

Carrier was able to develop a set of vibrating spiral elevators that utilized top mounted motors to transport the catalyst while cooling to 200 degrees. The motors featured adjustable rotating eccentric weights for stroke/ amplitude adjustment.

Cross-contamination of the chemical catalyst was avoided with the use of easy to clean spiral elevators.

Employees were kept safe from the high-temperature catalyst with the addition of stainless steel protective shrouds.

Finally, the customer began transferring the catalyst directly from the calciner, safely and efficiently utilizing limited floorspace with the help of Carrier's recommendation. The customer secured approximately 243 feet of efficient conveying length that is easily cleaned.

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Learn more about:
Vibratory Spiral Elevators

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