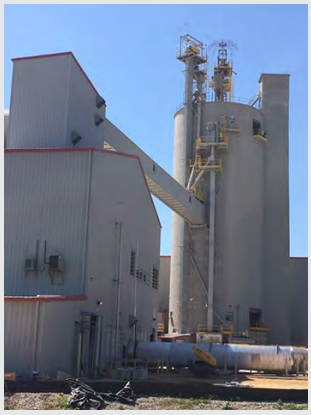
Bucket Elevator for Conveying Glass Cullet and Sand at Cardinal FG in Durant, OK



Plant Name and Location
Cardinal FG
Durant, OK

General Description of the Application

Cardinal Glass Industries designs and manufactures glass products for residential and commercial markets. Cardinal FG is a subsidiary of Cardinal Glass Industries and is a flat glass manufacturer. The glass produced by Cardinal FG is used primarily in window glass which is supplied to other Cardinal divisions, as well as commercial and residential window manufacturers who incorporate the glass into their windows.

In the flat glass (float glass) making process, a mixture of cullet (waste glass), sand and other ingredients is used. Bulk material silos are used to store this mixture. Screw feeders meter the mixture to various bucket elevators which then lift the bulk materials over 100 feet vertically to a gas fired furnace where it is heated to over 1,600-degrees C to begin the glass making process.

Cardinal FG was having problems with an existing bucket elevator at the flat glass making plant in Durant, OK. The existing bucket elevator was rated for 150 tons per hour, but could only produce 60 tons per hour. Additionally, they were getting less than 18 months' life on the elevator belt. Cardinal turned to KWS for a long-term solution.

Design Parameters of Application

Bulk Material: Glass Cullet and Sand
Material Density: 80 to 120 Lbs. per Cubic Foot
Conveyor Capacity: 3,750 Cubic Feet per Hour
Moisture Content: 20 to 25-Percent
Duty: 16 Hours per Day, 6 Days per Week

Advantages Provided by KWS

A team of engineers from KWS visited the Cardinal facility and met with the mechanical engineer to determine the capacity required and the exact needs of the plant. While onsite, the KWS team gathered dimensional information on the existing equipment to determine solutions and recommended a bucket elevator which would handle current requirements while providing additional life. KWS tested multiple material samples of the cullet and sand to determine accurate bulk densities and flow characteristics. Based on all the information gathered, KWS performed calculations and provided a new design for the bucket elevator.

Special Features of KWS Design

KWS designed the new bucket elevator with the ability to handle an additional capacity of 20-percent above and beyond the design capacity of 150 tons per hour. Based on extensive experience in handling extremely abrasive bulk materials such as glass cullet and sand, KWS designed the boot section using abrasion resistant steel (AR235). Replaceable wear liners were added to the inlet chute so they could be replaced as required. Both the head and tail shafts on the new bucket elevator were increased in size to eliminate any failures during operation.

Design Engineering Manufacturing

KWS Manufacturing
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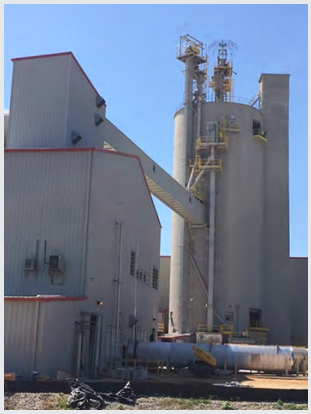
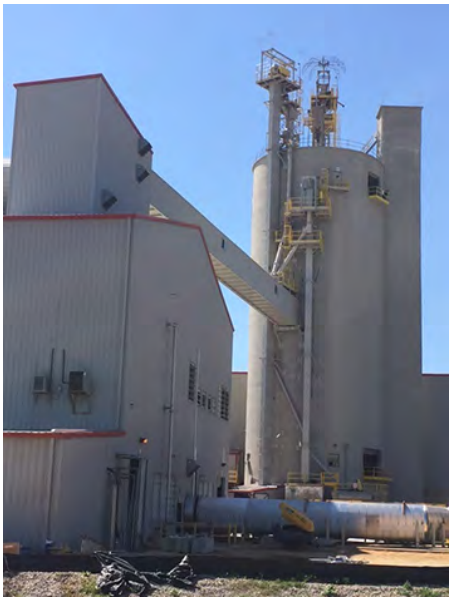


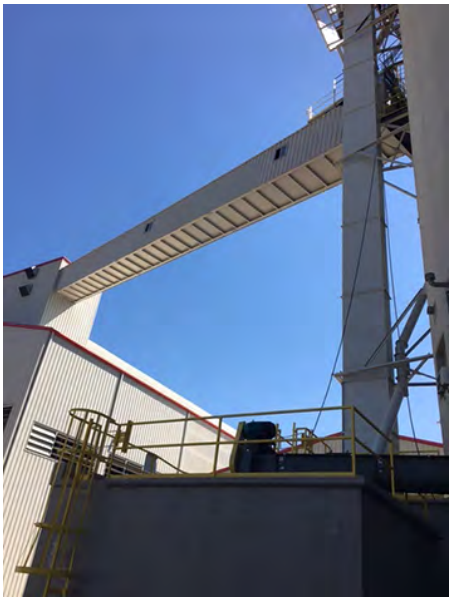
Plant Name and Location
Cardinal FG
Durant, OK

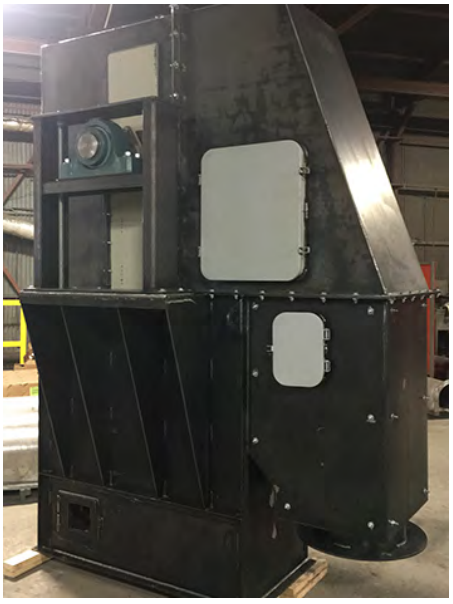
Testimonial

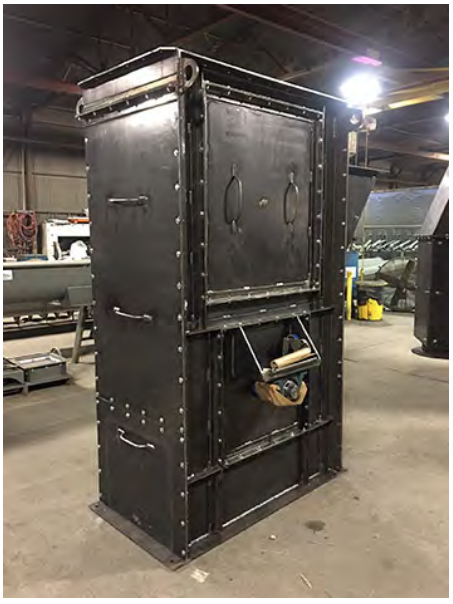
"Since KWS assembled the head and boot sections prior to shipping, the installation went smoothly. The new bucket elevator is working great!"

- Adam Schettler, Mechanical Engineer - Cardinal FG, Durant, OK









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