

Agricultural - Sugar Beets

Despite the natural deep-freeze provided by the frigid Upper Midwest winters, outdoor storage of harvested sugar beets still experience large spoilage rates.



More than half of the sugar produced in the U.S. comes from sugar beets. Annually, more than 25 million tons of sugar beets are produced on 1.5 million acres yielding 4 million tons of refined sugar. In the Upper Midwest, sugar beets have a growing season about five months long. Harvested beets are stored outdoors where the cold winter months act as a freezer until the beets can be processed. But heat can still build up inside the piles and cause excessive spoilage. Looking to reduce their spoilage rates, a major beet processing plant turned to Aerovent for a customized ventilation system that could help it maximize production, profitability and customer satisfaction.



Outdoor Sugar Beet Storage Piles

THE CHALLENGE

Beets are harvested in autumn and early winter then transported to a processing plant. They are stored in outdoor piles where the cold winter air helps preserve them. In the Upper Midwest, sugar beets are processed around the clock between October and April. However, even when stored outdoors in frigid temperatures, the beets can start to ferment and generate heat within the piles, which can quickly rot entire mounds. To reduce spoilage rates, the core of the beet piles need to be cooled down—or ventilated.

THE AEROVENT SOLUTION

To extend the storage life of its sugar beets, the processing plant invested in an extensive cold-air ventilation system. Aerovent engineered the solution using 128 VP Vaneaxial fans. The fans were custom-fit with elbows that connected to a series of ductwork that ran through the beet piles. The ductwork, provided by the customer, was set up around the pile site with holes drilled into it to capture the cold air blown into the interior of each pile. By directing naturally refrigerated air throughout the beet piles, the processing plant was able to keep its sugar beets at a consistent temperature longer, letting it process almost the entire harvest and keeping spoilage to a minimum.

Aerovent VP Vaneaxial Fans with Aluminum Propeller

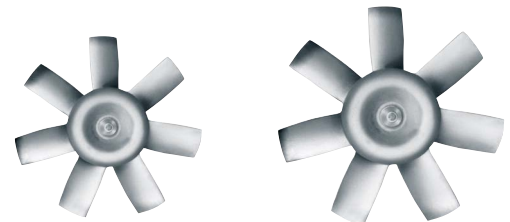


Performance

Airflow from 800 to 102,500 CFM
Static pressure to 5" w.g.

Manufactured Sizes

12" to 60" wheel diameters



VP Aluminum Propellers

THE CHALLENGE

Aerovent's VP Vaneaxial fan is designed for high-capacity applications requiring straight-line air discharge. The fan is installed vertically while the chilled air must be blown horizontally into the centers of the beet piles. In addition, the piles, fans and ductwork are constantly exposed to outdoor elements. The vertical fan needed to fit with the horizontal ductwork distributing the air, and the fan--and especially its propeller--needed to drain properly if exposed to rain and snow.

THE AEROVENT SOLUTION

To fit the vertical fan to the horizontal air-distribution ductwork, Aerovent created an easily attached 45-degree elbow that allowed air to be blown throughout the horizontal ductwork on the ground. Aerovent also drilled holes into the hub of the fan propeller to allow for drainage of rain and snow that could cause alignment or other problems (a common modification made in vertical installations). A final customization included the creation of a metal lid that closes up the fan unit during the off-season to help keep moisture out.

THE CHALLENGE

Each type of fan is designed to accommodate a certain amount of air pressure. In most applications, the exact pressure that will be generated can be easily predicted. But with an outdoor application, unpredictable factors can make it hard to know exactly how much energy is being generated inside the beet pile and can affect the static pressure of this application.

THE AEROVENT SOLUTION

Aerovent's VP Vaneaxial fan was ideal for this application with many unpredictable factors. Performance features of this type of fan include airflow from 800 to 102,500 CFM and static pressure to 5" w.g. This gives the fan a high tolerance for pressure variations so it can accommodate the unpredictability inherent in such an application. Specifically, the VP's propeller better accommodates pressure buildup, making it easier to handle the pressure and air performance requirements.

Features Overview

- ▶ Aerovent created an easily attached 45-degree elbow to connect the vertically installed fans to the horizontal air-distribution ductwork on the ground.
- ▶ Holes were drilled into the hub of fan propellers for the drainage of rain and snow that can cause alignment or other problems.
- ▶ A custom-designed metal lid closed up the fans during the off-season to keep moisture out.
- ▶ VP Vaneaxial fans have airflow from 500 to 120,500 CFM and static pressures to 5" w.g., giving them high tolerance for pressure variations in unpredictable outdoor applications.
- ▶ VP Vaneaxial fans feature aluminum propellers and fan housings constructed of galvanized metal for corrosion resistance, longevity and aesthetic integrity.



THE INDUSTRIAL CHOICE



Aerovent's engineering and manufacturing capabilities and quality industrial products have enabled them to provide the best solution for the most demanding ventilation problems presented by outdoor deep-freeze applications such as sugar beet processing. Aerovent's knowledge and expertise in selecting the right fan and making the appropriate modifications to accommodate each customer's unique situation has made it a leader in its field and has produced an impressive 85-year track record.

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