



## STEAM-DRIVEN COMBUSTION FAN

### Overview

In addition to processing more than 25% of California's bulk tomato products, Morning Star Packing Co. supplies 40% of the tomato paste and diced tomato ingredients in the U.S. market. Built in 1995, the company's Williams, Calif. facility processes approximately 765 tons of tomatoes per hour, making it one of the largest tomato processing plants in the world.

Morning Star recently expanded the Williams facility's processing capacity to 1,245 tons per hour, which required adding two boilers because steam is used for nearly every production process in the plant. In addition, steam drives the facility's water and process circulation pumps – and even the fans that provide combustion air to the boilers' burners. This expansion will make the Williams facility the largest tomato processing plant in the state.

Adding the boilers required adding fans to provide combustion air for their burners. Morning Star Packing Co. turned to Twin City Fan & Blower to supply the fans because of their ability to integrate with the rest of the combustion system.

### Challenges

The engineering firm that designed the boilers and their combustion system also established the specification criteria for the combustion fans. To provide sufficient air to support combustion at high load demands, each fan needed to supply 121,000 CFM at 31 inches of static pressure. In addition, they had to be steam-driven.

Morning Star needed to be able to remove and replace bearings, drive components, and even the fan rotor without having to disturb the turbine. The company also needed the fans and their associated components (steam turbines to drive the fans, gearboxes, couplings, etc.) to be delivered in a timely and coordinated manner.

### Solution

To meet the fan performance criteria and satisfy the configuration requirements, TCF supplied two 60-inch steam-driven, single inlet BCS fans. The high efficiency, backward curved impeller of the BCS fan delivers high efficiency over the broad range of its non-overloading power curve.

## Quick Facts

### Industry

Food Packaging

### Application

Combustion air for natural gas-fired steam boiler

### Customer

Morning Star Packing Co.

### Location

Williams, California

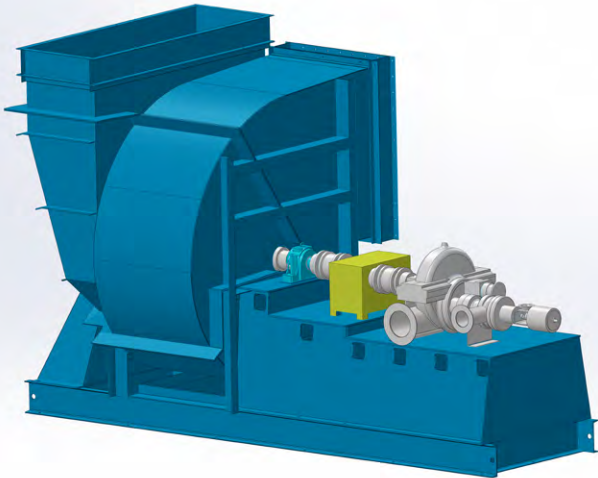
### Challenge

Timely delivery of a fan system that supplies sufficient air to support combustion at high load demands and can be accessed for maintenance

### Solution

Customized steam-turbine-driven BCS backward curved fan

# CASE STUDY



Twin City Fan & Blower has the engineering and manufacturing capabilities to accommodate virtually every conceivable application. We have completed thousands of successful installations worldwide and have a proven track record for tackling the most technically complex and unique applications.

We separate ourselves from the competition by offering a greater breadth of products and quickly adapting to the needs of our customers. This is truly a testament to our company philosophy – respond to the needs of the customer, the first time, every time.



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TCF also supplied the spacer couplings while a third party supplied the steam turbine and gear box for Morning Star's new fan systems. Although coordinating deliveries from other companies presented challenges, TCF made production schedule adjustments that allowed the systems to be delivered in a timely manner.

Because steam turbines typically are more fragile and harder to deal with than electric motors, eliminating the need to move the turbine simplifies maintenance and repair. Because spacer couplings were used, rotor removal and bearing changes can be performed without disturbing the drive.

## Results

This BCS fan is not the first steam-driven fan from TCF at Morning Star Packing Co. The first unit was installed in 1998 to supply a fan that could provide enough air to meet load demand at high fire and comply with emission regulations. New emission regulations required the use of low NOX burners with flue gas recirculation, which raised the inlet air temperature from ambient to more than 200°F. Because the density of hot air is lower than ambient air, the fan curve changed based on the elevated inlet air temperature. To be able to provide enough steam energy from the natural-gas-fired boiler, the combustion fans had to be more robust.

Morning Star's experience with its first TCF fan in 1998 kept the company coming back for more. In 2013, TCF supplied two more fans to replace older underperforming units. Now with its recent expansion, Morning Star knew that Twin City Fan & Blower could not only supply steam-driven fans that satisfy the performance requirements, but could also coordinate deliveries from third-party suppliers as well.



**Model BCS**  
**Backward Curved**  
**Centrifugal Fan**