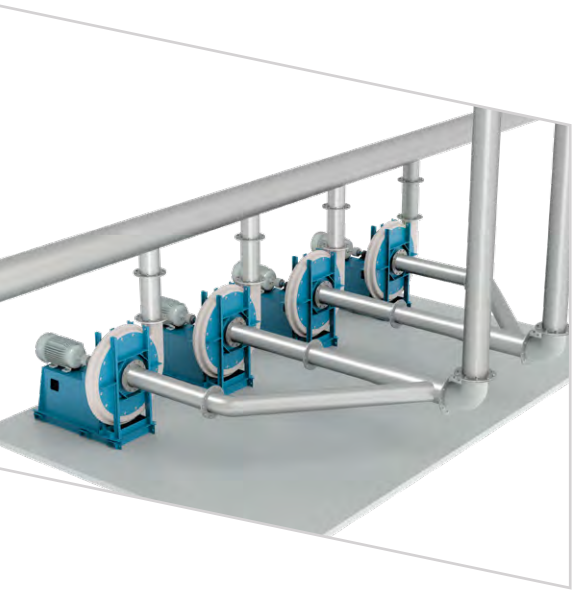
TCF
TWIN CITY FAN



Quick Facts

Industry
Titanium mining and processing

Application
Fans provide corrosive, toxic and volatile gas extraction

Customer
Titanium metal production company

Twin City Fan Representative
Unique Solutions & Sales - Mesa, AZ

Challenge
Provide fans that are environmentally sealed, produce high negative pressure and have titanium construction and fiberglass housings

Solution
Customized, direct drive HRS 245 High Pressure Radial Pressure Blowers with high-speed ball bearings and triple-carbon, nitrogen gas-purged shaft seals

Titanium Metal Production

Overview

A titanium metal production company in the Western U.S. needed to upgrade the fans that extract harmful gases – titanium tetrachloride, carbon monoxide and carbon dioxide – produced by chlorination, which is the process of retrieving titanium metal from ore. These gases must be extracted and disposed of; they must not be released into the atmosphere.

High-performance industrial fans extract the gases. Venturi-type scrubbers eliminate these harmful gases from the process. The original fans were installed in the early 1970s and had exceeded their usable life. The company contacted the Twin City Fan & Blower rep to provide a solution.

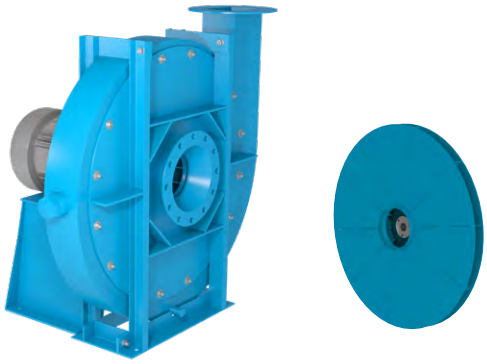
Challenges

The original fans, which were more than 40 years old, were failing frequently. They were located outside, so the composite fiberglass housings were degrading from decades of exposure to direct sunlight. The primary challenge to this upgrade project was translating the titanium company's requirements into a design for cost-effective fans that would meet environmental regulations, satisfy the performance criteria of the process and keep maintenance and operational costs low.

Recent environmental regulations impose stringent requirements for containing these corrosive, toxic, and volatile gases, which the old fans could not meet. In addition to requiring special shaft seals, the titanium production company insisted that the airstream components of the fans – including the shafts – be constructed from titanium. The housings were to be fiberglass.

The titanium facility ran the original fans in series to obtain the 100 inches WC negative pressure required to extract the gases. When fans are operated in series (the output of the first feeds the inlet of the second), the static pressures are additive. The original fans supplied 1,485 CFM at 49 inches WC, which was barely adequate. Replacement fans would have to meet – or exceed – this pressure requirement.

CASE STUDY



Model HRS
High Pressure
Radial Pressure Blower

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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Solution

Twin City Fan & Blower supplied four direct drive HRS 245 High Pressure Radial Pressure Blowers with 32-inch wheels, 75 HP motors and high-speed ball bearings. The HRS wheel features a full back plate and a fully-shrouded front plate. The HRS design develops the most pressure for a given speed and offers the highest efficiency. The wheels, blades, back plate and shafts – any component that could come in contact with the airstream – are constructed of titanium. The housings are fiberglass.

TCF determined that only four fans were needed to replace the eight original fans – only two sets were operated at any given time. Instead of running two fans in series (like the original design) to obtain the negative pressure required to extract the gases, each HRS fan exerts 100 inches WC static pressure, so only one fan per running fan pair was needed. They operate in suction mode to extract the gases from the process. Pressure is of primary importance for this application. As for air flow, the 2,500 CFM air flow supplied by the HRS fans is more than adequate.

To ensure compliance with strict environmental regulations, Twin City Fan engineered the fans to include triple-carbon, nitrogen gas-purged shaft seals to keep the gases inside the fan. The housing is sealed, but the spinning shaft protrudes through the housing. The special shaft seals ensure that the gases are contained.

Results

The titanium metal production company can rely on the new TCF fans to extract harmful gases from the titanium chlorination process and remain confident that there are no fugitive emissions. Because of Twin City Fan's engineering expertise, the metals company purchased only four fans instead of eight, thereby saving maintenance and operational costs. Now, only two fans need to operate at any given time. The other two fans serve as backups or are run when the primary fans are being maintained.

Not only did Twin City Fan meet the titanium company's performance requirements, TCF provided the most cost-effective solution.