

Quality Maker

Ventilation Fans Which Last For A Century



CHANGI WATER RECLAMATION PLANT (CWRP)

Process

1) Used water flows from your home's drain lines to the link sewer.



2) It then drops into the Deep Tunnel Sewerage System where water flows to CWRP.



3) Because the tunnel relies on gravity to work, it is built on a gradual slant from a depth of 20m – 50m underground.



4) At CWRP, water is separated from solids.



5) Part of the water is reused at the plant.



6) Treated water is dispersed 5km out at sea.



7) Solids are transformed into biologically stable products.

These can be used as fertilizers for plants.



AZEN MANUFACTURING
A Twin City Fan Company

CWRP: A Milestone Event in the Development of Singapore's Sanitation System

Expected to be the world's largest, covered sewerage treatment plant when it becomes operational in 2008, the CWRP is the Public Utilities Board's latest initiative to ensure long term sustainability of Singapore's water resources. In fact, together with the Deep Tunnel Sewerage System, the CWRP is poised to replace the 6 water reclamation plants and 130 pumping stations that Singapore currently utilizes. Treatment capacity of the CWRP is estimated to be 528 million gallons per day.

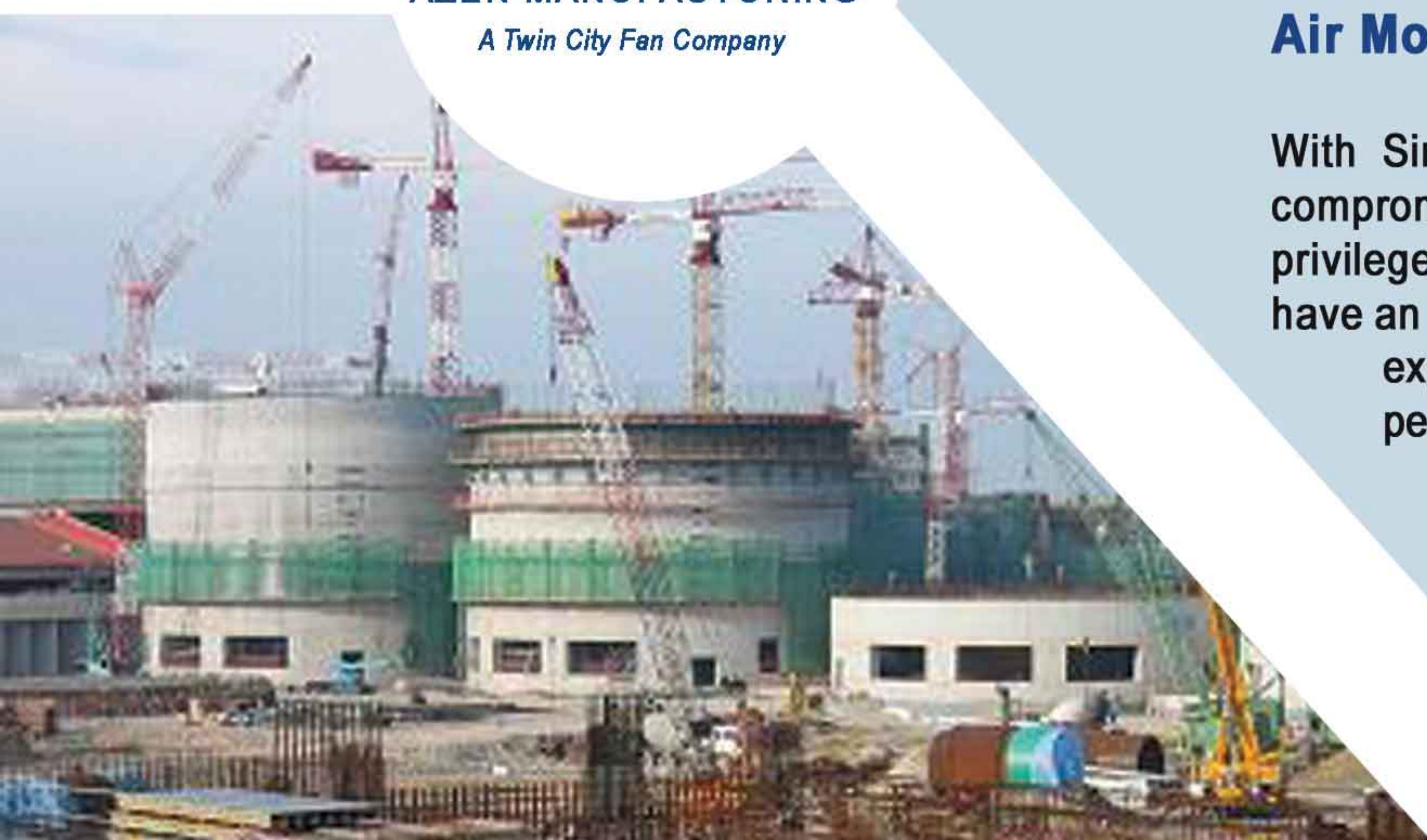
Azen's Quality: Ventilation Fans Designed & Made to Last at Least a 100 Years

Having secured majority of the HVAC packages, Azen Manufacturing Pte Ltd participated actively in meeting the air ventilation demands of this massive CWRP construction job. Close to a 1,000 units of Twin City ventilation fans of an array of types and capacities (from as low as 180 CMH to as high as 300,000 CMH) were supplied by Azen. Because the fans are to have a lifespan of 100 years, it was of utmost importance that they were constructed to the highest quality possible to ensure durability and reliability.

Adhering to the most stringent guidelines set out by US consultants CH2M Hill and Singapore's CPG, every type of fan had to go through a performance test which was carried out in Azen's in-house testing facility and witnessed by the consultants. These tests were an added assurance, over and beyond what was certified by AMCA (Air Movement & Control Association International) with regards to the performance of Twin City's fans. Staying true to all our published claims, 100% of our fans tested performed at a level beyond what was required by the AMCA Check Test Tolerance Curve (AMCA Publication 211-94).

Azen's Performance: Top – Quality Manufacturer of Air Moving Equipment

With Singapore's entire sewerage system at stake, no room for compromises can be tolerated. Without a doubt, Azen was given the privilege to play a major role in this prestigious project because we have an extensive range of high quality air moving products. The high expectations of our clients coupled with the rigorous performance testing exercise not only served to further add to the high levels of confidence we already have in our own products, most importantly, it further solidified our claims that Azen is indeed a Top Quality Manufacturer of Air Moving Equipment in the eyes of all customers.



TESTING HIGHLIGHTS:

PIEZOMETER RING: Build – In Airflow Measuring System that Provides Accuracy of +/- 5%

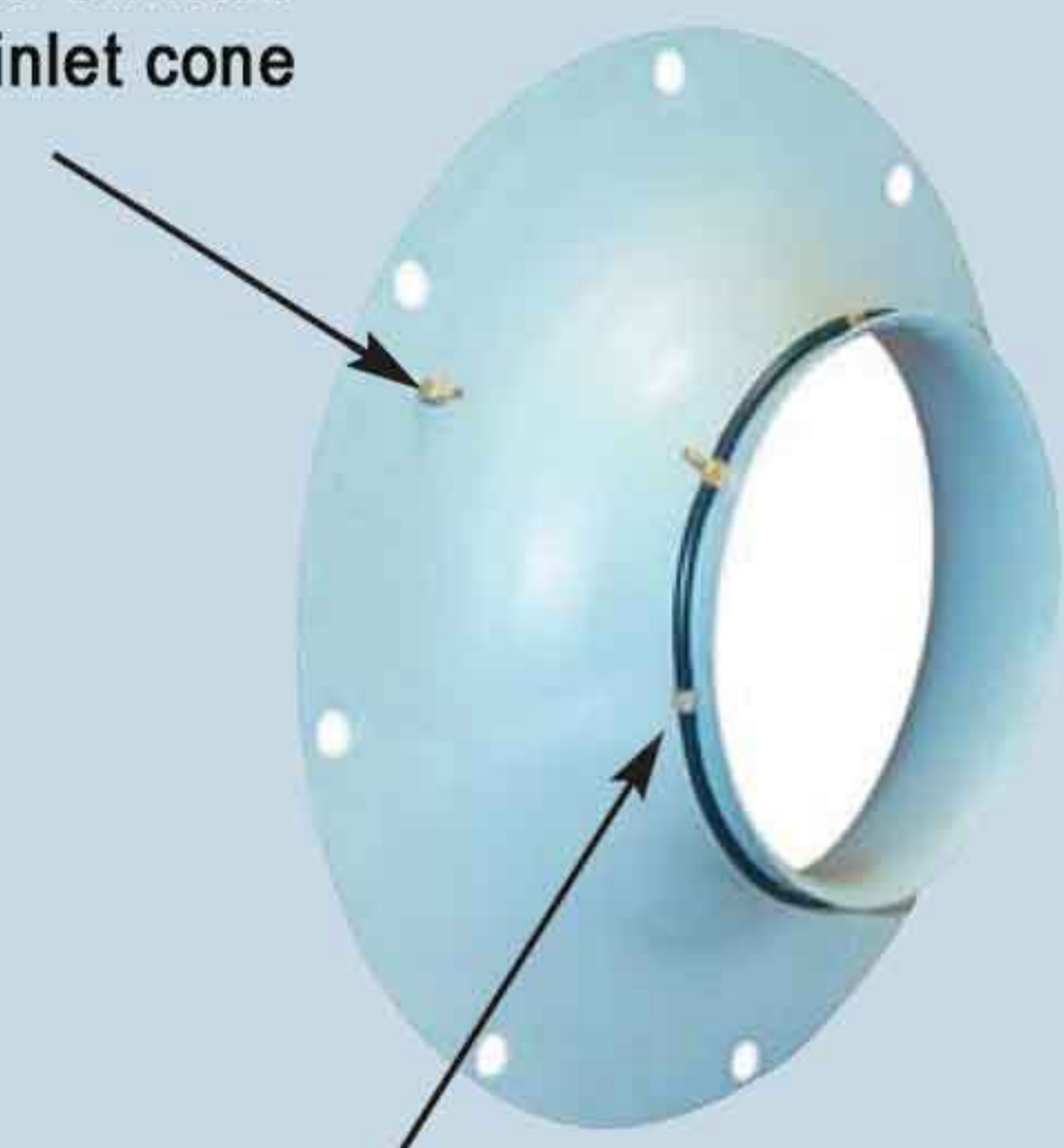
The Piezometer Ring Airflow Measuring System offers significant improvement of accuracy over the use of Pito-tubes (which has a 20% margin error) by ensuring that the inlet is unobstructed. New to most of Asia and certainly among the firsts in Singapore, this highly accurate built-in measuring system in our fans was used to verify the airflow produced by those ventilation units that were to operate in a highly controlled environment and where airflow monitoring was absolutely necessary at all times.

How It Works:

The System is based on the principle of a flow nozzle. The inlet cone of the fan is used as the flow nozzle, and the flow can be calculated by measuring the static pressure drop through the inlet cone.

The pressure drop is measured from the tap located on the face of the inlet cone to the piezometer ring in the throat. The inlet tap is connected to the high-pressure side of the transducer and the piezometer ring is connected to the low-pressure side.

Inlet Tap
mounted on face
of inlet cone

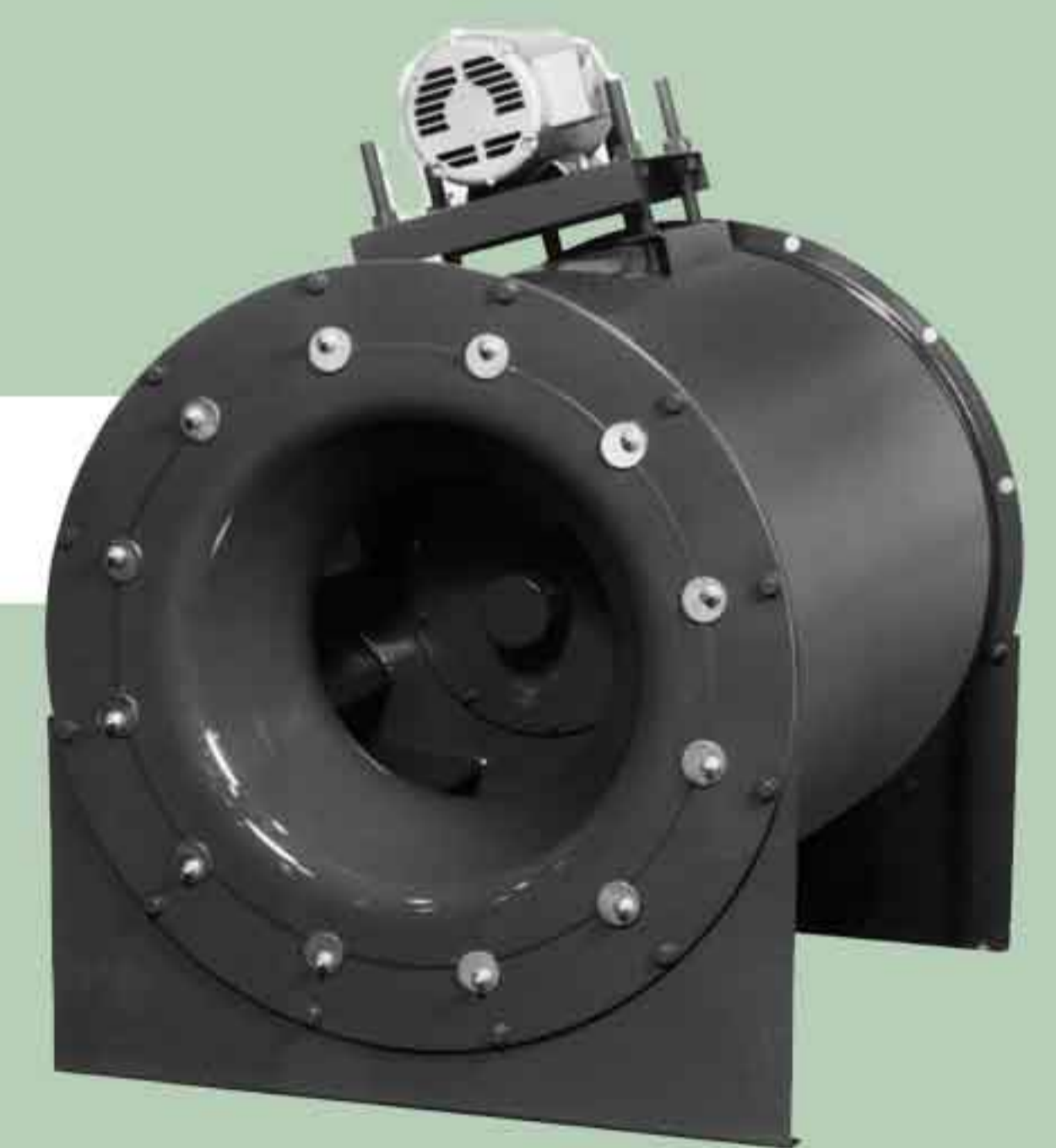


Piezometer Ring
mounted on throat
of inlet cone

PRODUCT FEATURES:

1. TWIN CITY Airfoil Fans (BAF)

Standing at 14ft tall and 12ft wide, the largest centrifugal fan that was used in the CWRP project was the 890 BAF Double Width Double Inlet Airfoil Fan. A popular choice for efficiently handling large volumes of clean air, features of TCF Airfoil Fans include:



- Capacities of 2,000 to 600,000 CMH
- Airfoil blades which provide higher efficiency and less noise than Backward Curve Blades
- Volume control devices like Outlet Dampers and Variable Inlet Vanes as accessories
- The use of conical spun shrouds (rims) that make BAF fans less susceptible to performance losses associated with poor inlet conditions
- Continuously welded fan housings to provide strength and durability for extended service life

2. TWIN CITY Tubular Centrifugal Inline Fans (TSL)

The TSL is a straight line centrifugal flow fan featuring the reliable performance of a centrifugal fan with the space saving advantages of an axial type fan. Another fan type used in the CWRP project, its features consist of:

- Capacities of 1,300 to 380,000 CMH
- Static pressures to 2,300 Pa
- Sizes 18 1/4" to 89" diameter with patented open back plate airfoil wheel
- Unique wheel design that allows air to flow with a minimum of turbulence and losses
- Higher and broader efficiency range compared to competitive tubular fans and square inline fans
- Higher efficiency leads to quieter operation

AZEN Manufacturing Pte Ltd – TOP QUALITY DESIGNER & MANUFACTURER OF AIR MOVING EQUIPMENT

As a quality designer and manufacturer of Air Moving Equipment in Singapore and the Asia Pacific Region for over a decade, Azen has been involved in a range of reputable projects across different industries. What differentiates us from our competitors is our ability to provide an **extensive product line** which allows for **customization**. Thus, customers are given the flexibility in fan design and construction and just as importantly, at a **reasonable cost**. As all our fans are manufactured in Singapore, assurance of quality is guaranteed.

Azen Manufacturing is extremely privileged to be part of the Twin City Fan Companies group, one of the largest and most recognized fan manufacturers in the United States. With more than 100 years of experience in the air moving industry, Twin City has accumulated a wealth of technical and manufacturing knowledge when it comes to designing and manufacturing of ventilation fans. By drawing from Twin City's expertise and combining them with our own, Twin City Azen is poised to meet every need that customers may have in the air movement industry.

For more information on our extensive range of high quality Twin City industrial ventilation products, please contact us at:
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