



fanTR

TECHNOLOGY RESOURCES


IN THE AIR,
BY YOUR SIDE,
WE ALWAYS
INNOVATE

**VENTILATION
FOR COOLING
SYSTEMS**



INSTITUCIONAL ABOUT FANTR

The company Composite was created in 1989, inspired by the heightened entrepreneurial spirit and vision of its founders, young engineers from the best schools in the country, widely renowned around the world. Combining a wide range of skills in electronics, infrastructure, aerodynamics, composite materials and innovative industrial processes, this groups of young and talented professionals quickly became a strategic partner for industries that require solutions with high technological content in their products. Such skills were crucial for the company's success in the aviation, aerospace and petrochemical industries, as well as the growing segment of renewable energies – specifically wind energy.



“The amalgamation between extensive knowledge and key relationships ultimately lead to the development of groundbreaking products for these industries.”


The amalgamation between extensive knowledge and key relationships ultimately lead to the development of groundbreaking products for these industries. Among the many products developed at the time, some of the most relevant include wind turbine blades, cooling tower fans, aircraft fuselage elements, rocket engines for satellite launches, storage tanks for acid fluids, and toll traffic control system software. That was also when the company consolidated one of its inherent traits: fostering relationships with companies overseas, multinational corporations and institutes of international relevance. Despite being a Brazilian company, Composite's operations, knowledge and relationships expand across the globe.

In 1995, due to the extensive variety of expertise, industries serviced, and the skyrocketing growth of some industrial activities, the original Founders decided to compartmentalize their fields of knowledge, creating different companies to focus on their best attributes for each new opportunity that arose. Among the new companies built is Tecsis – Technology in Advanced Systems, focused on developing blades and other parts for wind power turbines and industrial ventilation systems.

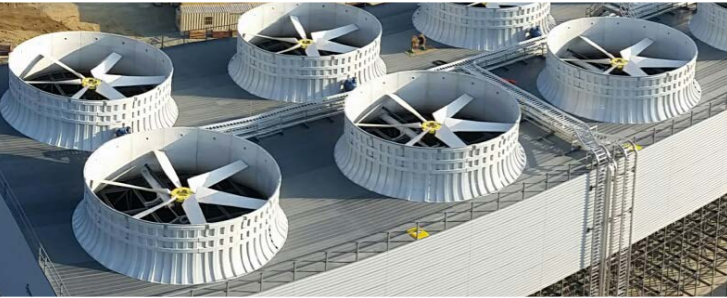
Initially, one of the two newly created Business Units of Tecsis, DVI (Industrial Ventilation Division) focuses on servicing cooling system users and manufacturers, more commonly known as cooling towers – a technological inheritance of the former Composite. That was when the current managing partners, as well as the main technical and commercial directors and officers, joined the company. Inspired by constantly innovative and high-tech solutions, this new and very welcome group is focused on identifying new opportunities. Tecsis-DVI started working with major companies, such as Petrobras, Grupo Votorantim, Vale do Rio Doce and Ferbasa, no longer requiring imported so-

lutions. New products were created for new industrial segments, including ventilation systems for mining tunnels, highways, subways, hydroelectric power plants, wind tunnel systems, elements for applications with special technical requirements, made of Kevlar and carbon fiber, fans for aggressive, corrosive and acid environments, as well as the expansion and full coverage of all technical requirements of ventilators for cooling systems, either regarding energy efficiency or low noise emission requirements.

In 2013, amidst the growth and success of both Business Units, the leaders of both Units decided to pursue different paths due to the impossibility of sharing management platforms that allowed maintaining the required focus for each business, in addition to assigning material and human resources due to the inherent characteristics of each activity. That is when FanTR was created – an independent company conceived to carry on developing high-tech products on a global scale. All intellectual, material and human assets are transferred to FanTR, supported by new and state-of-the-art facilities, in June of the same year.



In 2013 FanTR was created – an independent company conceived to carry on developing high-tech products on a global scale.

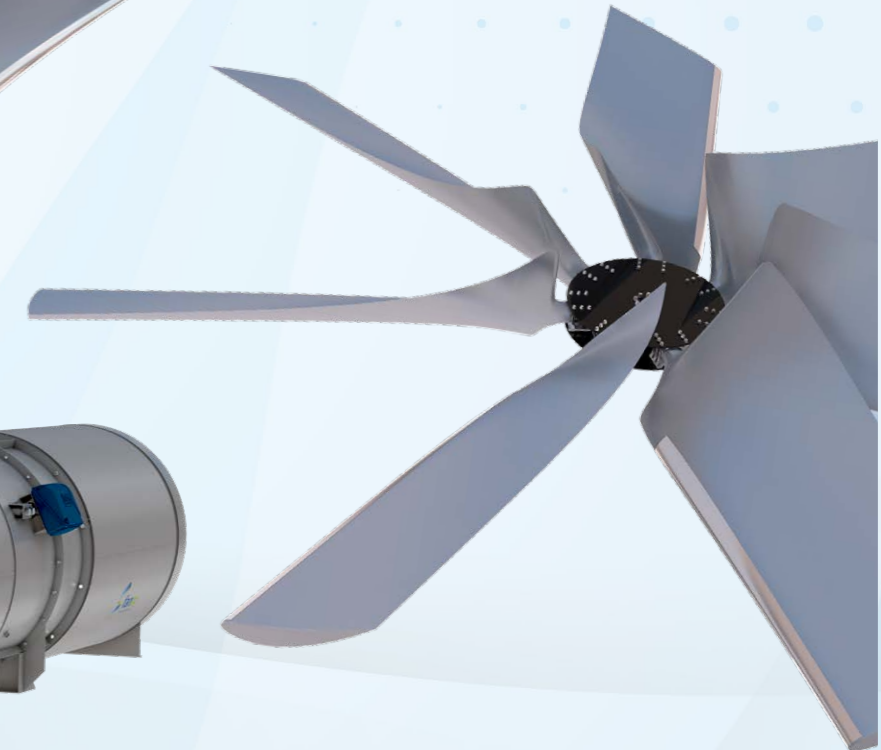
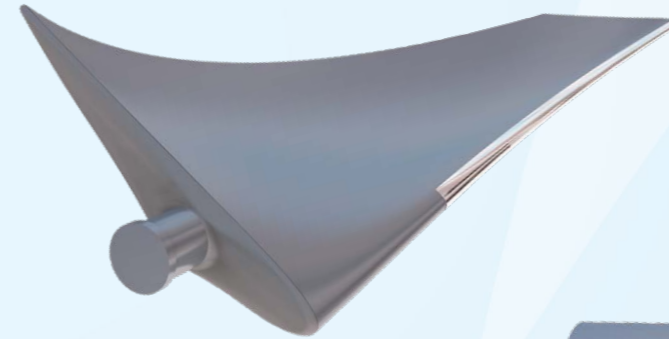


WHAT WE DO

We develop and manufacture axial fans for underground ventilation systems, cooling towers, air coolers, and air cooled condensers. We offer a complete line of products covering the following markets: mining, construction, road tunnels, subway, refineries, pulp and paper, petrochemical plants, thermoelectric plants, etc.

In addition, we have a specialized team of engineers able to develop products tailored to any ventilation application, in addition to designing complete ventilation systems.

All of our products are designed and built with 100% Brazilian and proprietary technology, in line with the strictest international quality and development standards.





DIFFERENTIALS DNA

Complete customer service;



Mastery of vibration and noise control technology;



Extensive knowledge of aerodynamics;



Mastery of the manufacturing process of composite materials;



With more than 30 years of experience, our professionals are references in their respective areas of expertise;



TEST STATION

We have available multiple test stations for the development of our product lines, including an up to 36ft diameter station for cooling application fan real scale tests. With these stations, we can certify the efficiency and noise levels of our equipment and validate the structural and fatigue life cycle of the Fans, based on the most important international standards.



SOFTWARE FOR DESIGNING

We use the most relevant software available in the market for fan design, like ANSYS FEA and CFD (Computational fluid dynamics)

VENTILATION FOR COOLING SYSTEMS DISTRIBUTED WORLDWIDE



We are recognized as one of the leading companies in the world when it comes to technological relevance and reliability, according to the top OEMs in the cooling ventilation market.



Global Coverage: more than 80% of our products are exported to all regions of the world.



Complete customer service. We closely monitor our products and clients across all sales and after-sales stages.

UNDERGROUND VENTILATION WITH OUR EQUIPMENT



No. 1 in the Brazilian underground ventilation market in the mining segment.




Responsible for ventilation systems across major hydroelectric plant projects in South America.



Customized service, working closely together with our clients.

GLOBAL REGIONS WITH EQUIPMENT IN OPERATION





VENTILATION FOR COOLING SYSTEMS

Our axial fans were designed and developed by FanTR's technical staff, employing aerospace know-how and specific software to analyze the aerodynamics and operation of each fan model.

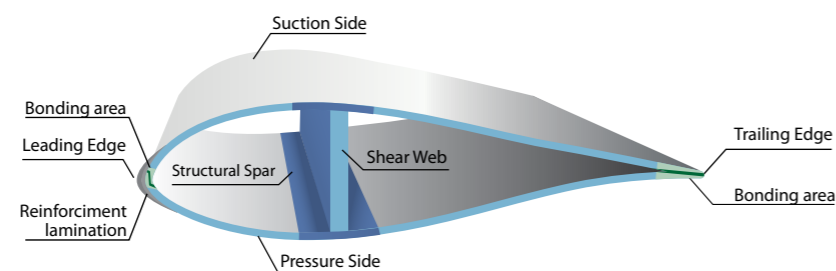
Products are validated in our exclusive test hub, which has several test benches. This allows us to gauge and refine results to ensure our fans deliver unmatched performance in the market.



COMPOSITE

Fans made of fiber glass, aramid or carbon fiber offer superior efficiency and a unique design in the market. Composite material offers excellent mechanical properties with the lightest weight possible, freely moldable with no geometric restriction. This allows us to manufacture aerodynamic profiles with large blade cords and torsions, as per specific simulation programs, which ultimately ensures the outstanding efficiency and performance of fans.

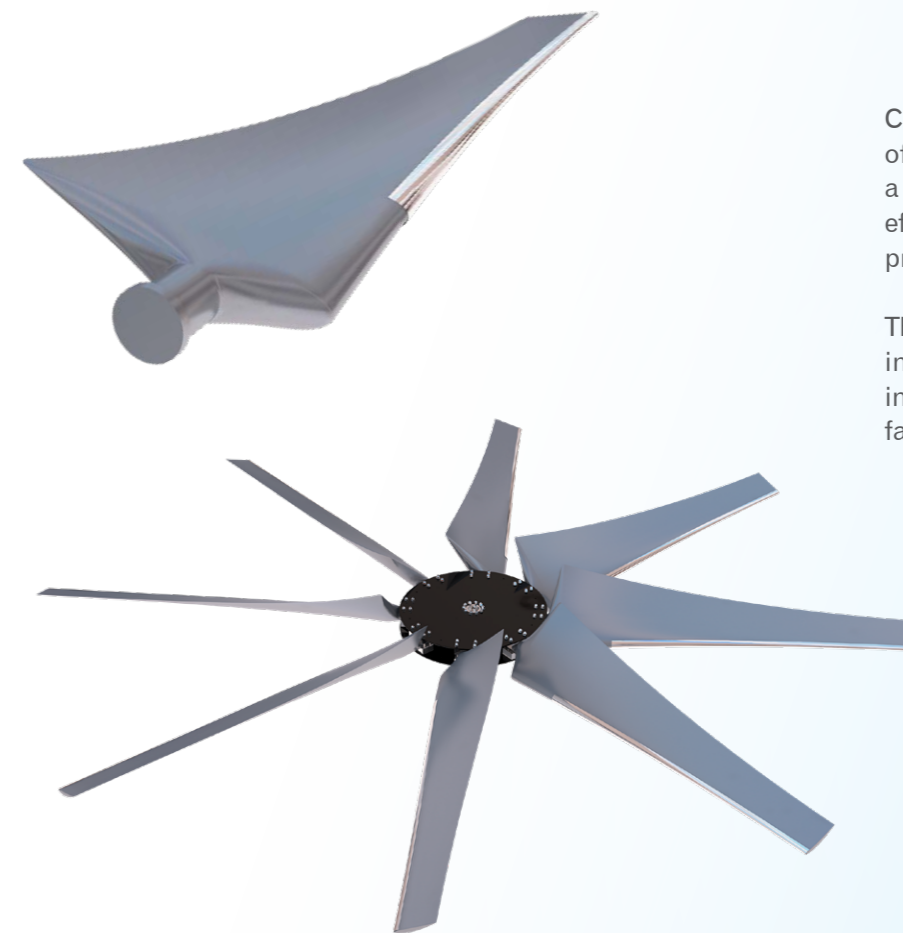
At our full-scale test station, we can compare the efficiency and noise emission of all available models, including comparing them to competing models. This allows us to validate our design and reinforce the superior nature of our equipment.



CR FAN Composite Rotor

CR fans meet the requirements of most points of operation with a great cost-to-benefit ratio, more efficient than competing aluminum products.

This vastly versatile fan can be used in cooling towers or air coolers, including small towers (minimum fan diameter of 6 feet).



DIAMETER	NUMBER OF BLADES	FLEXIBILITY	FLOW RATE	MARKET	LEADING EDGE PROTECTION
6ft. (1.829 mm) - 36ft. (10.979 mm)	from 4 to 12	Flexibility	9 m ³ /s - 1.400 m ³ /s	Aircooler, Cooling Tower & Air Cooled Condenser	Polyurethane (PU), 316 Stainless Steel

NCR FAN New Composite Rotor

The NCR fan is the perfect combination between efficiency, resistance and weight.

With competitive prices in the market, the NCR fan is our sales flagship. It is the ideal solution for applications without noise restrictions.

This fan can be used in all applications: cooling towers, air coolers and air cooled condensers.

Note: for air cooled condensers, the hub design is reinforced to support the atypical loads of this particular application.



DIAMETER

14ft. (4.267 m) -
42ft. (12.802 m)



NUMBER OF BLADES

from 5 to 11



HIGH EFFICIENCY

High
Efficiency



FLOW RATE

50 m³/s -
1.900 m³/s



MARKET

Aircooler, Cooling
Tower & Air Cooled
Condenser



LEADING EDGE
PROTECTION

Polyurethane (PU),
316 Stainless Steel

TEP FAN Technical Extended Performance

The TEP fan has a slightly longer cord than the NCR, reducing the number of blades used under the same operating conditions. This also means that TEP can be used in some operating points where NCR is not feasible, in addition to being used in lower rotations.

It can be used in all applications, but it is more commonly used in cooling towers and air cooled condensers.

Note: Similarly to the NCR, the hub design for air cooled condensers is reinforced to support the atypical loads of this particular application.



DIAMETER

12ft. (3.658 m) -
36ft. (10.973 m)



NUMBER OF BLADES

from 5 to 11



HIGH EFFICIENCY

High
Efficiency



FLOW RATE

35 m³/s -
1.400 m³/s



MARKET

Cooling Tower &
Air Cooled
Condenser



LEADING EDGE
PROTECTION

Polyurethane (PU),
316 Stainless Steel

STEP FAN

Sound and Technological Extended Performance

The STEP Fan has the longest cord in our fan line, enabling its use across a variety of operating points at low rotations and with extremely low noise levels.

This fan can only be applied in cooling towers, air coolers and air cooled condensers.



DIAMETER

24ft. (7.315 mm) -
38ft. (11.582 mm)



NUMBER OF BLADES

from 5 to 10



LOW SOUND

Low Sound



FLOW RATE

140 m³/s -
1.600 m³/s



MARKET

Cooling Tower &
Air Cooled Conden-
ser



LEADING EDGE
PROTECTION

Polyurethane (PU),
316 Stainless Steel

SLSF FAN

Super Low Sound Fan

The SLSF Fan offers a unique design, enabling its use across a variety of operating points at low rotations and with extremely low noise levels. It is used primarily in cooling towers.



DIAMETER

63in. (1.600 mm) -
156in. (3.962 mm)



NUMBER OF BLADES

from 3 to 5



LOW SOUND

Super Low Sound



FLOW RATE

7 m³/s -
180 m³/s



MARKET

Aircooler & Cooling
Tower



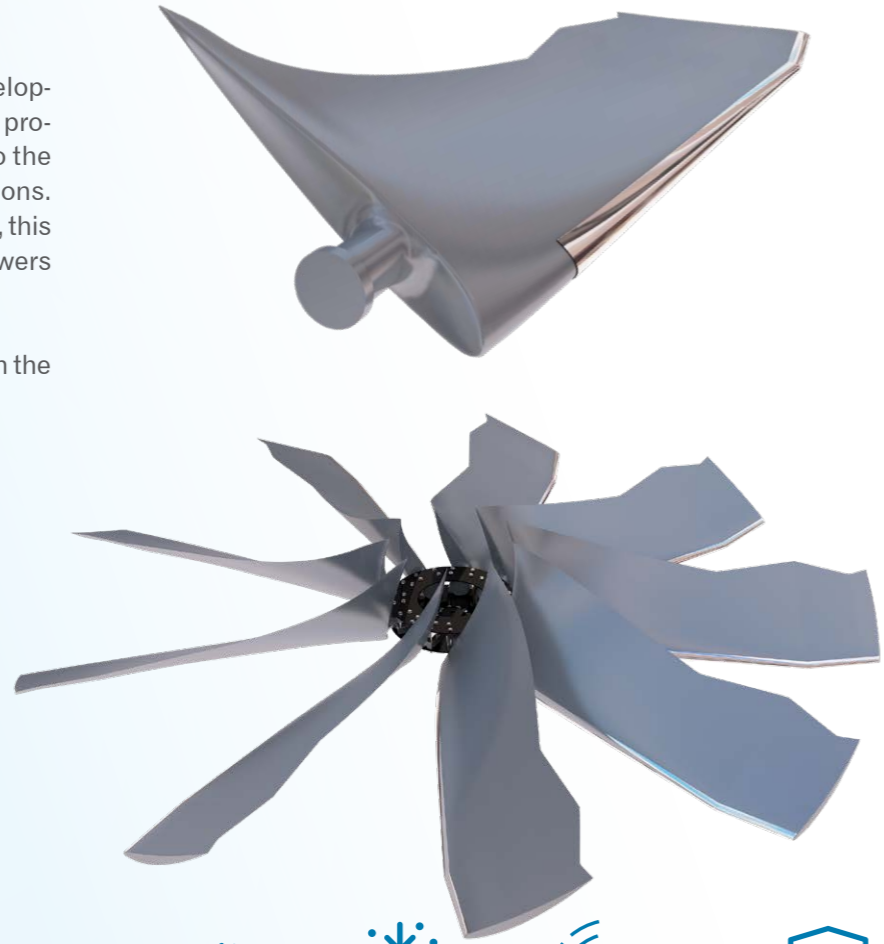
LEADING EDGE
PROTECTION

Polyurethane (PU),
316 Stainless Steel

FLN FAN Fantr Low Noise

Despite still being under development, the FLN Fan has already proven to be a great alternative to the CR Fan in low-noise applications. With a unique, patented design, this fan can be used in cooling towers and air coolers.

The same FLN design is used in the blades of our mining fans.



DIAMETER

up to 20ft.
(6.096 mm)



NUMBER OF BLADES

from 5 to 11



LOW SOUND

Low Sound



FLOW RATE

tbd



MARKET

Aircooler, Cooling
Tower & Air Cooled
Condenser



LEADING EDGE
PROTECTION

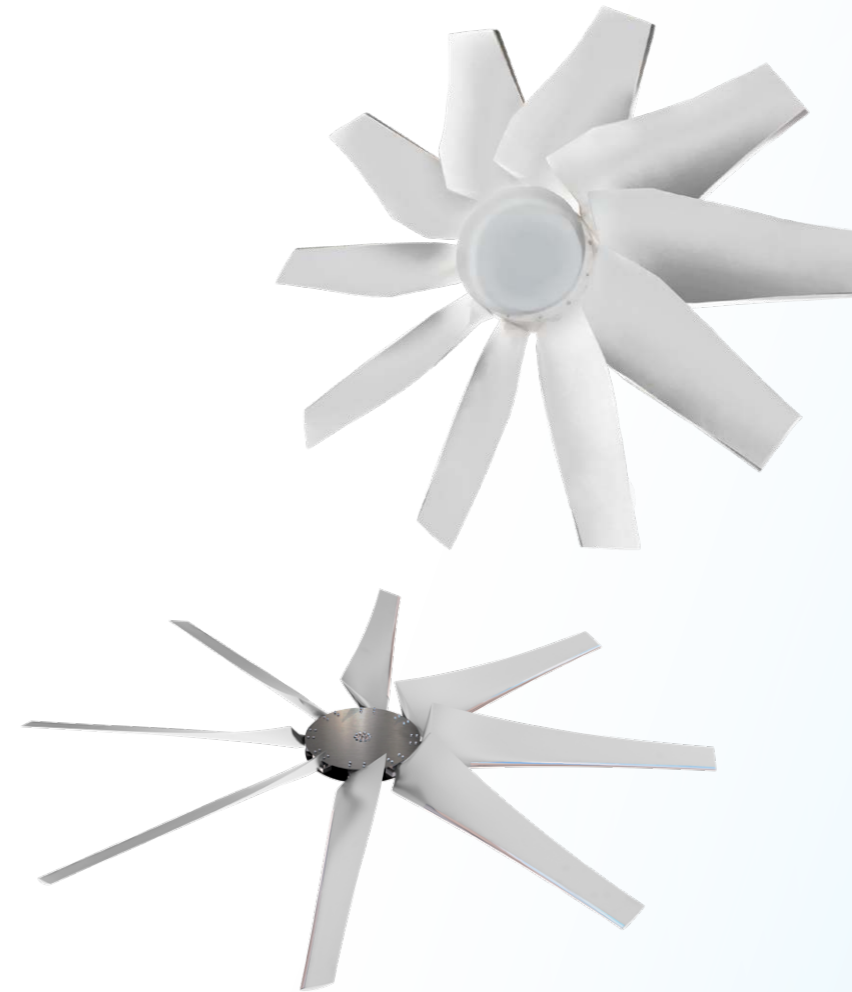
Polyurethane (PU),
316 Stainless Steel

HA FAN Corrosion Resistant

We developed the HA (High Acid Content) version to cover applications in cooling towers with water containing high chloride and fluoride content. This is a highly corrosive condition.

To endure such an aggressive environment, our HA fans are 100% coated with proprietary composite material. The constructive basis designed for these equipment is also one of our patented solutions. Other materials can also be applied (teflon, 316L, duplex, 904L and monel), depending on the composition of the water.

Applicable to the CR and TEP models, with a diameter of up to 18 feet.



DIAMETER

10ft (3.048 mm) -
18ft. (5.486 mm)



NUMBER OF BLADES

from 4 to 11



HIGH CORROSION
RESISTANCE

High
Corrosion
Resistance



FLOW RATE

26 m³/s -
350 m³/s



MARKET

Cooling Tower



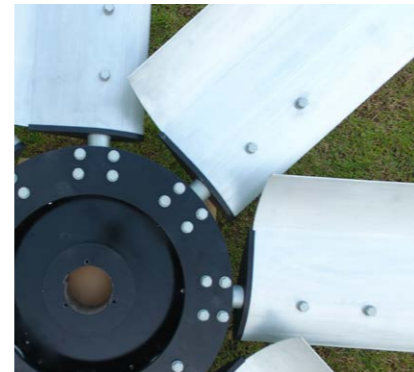
LEADING EDGE
PROTECTION

316L Stainless Steel,
904L Stainless Steel,



ALUMINUM

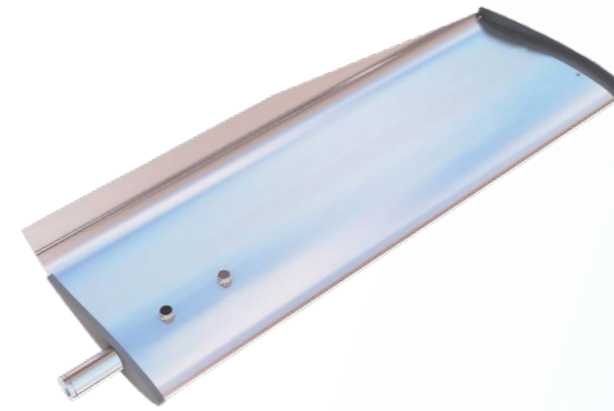
The use of aluminum in cooling tower fans makes this model very attractive, especially due to its low cost and adequate performance.



ALUMINIUM FAN *Fantr Aluminum Standard*

It is a lightweight fan with excellent strength and durability. It supports different application environments and is manufactured on a large scale, making them available with short delivery times.

Strength, local inventory available, speedy delivery and after-sales are the unique features that allow this model to stand out in the Brazilian market.



DIAMETER



NUMBER OF BLADES



LOW COST



FLOW RATE



MARKET



LEADING EDGE PROTECTION

FAS360	60in. (1.524,0mm) - 140in. (3.556,0mm)	from 3 to 8	Low cost	6 m ³ /s - 150 m ³ /s	Aircooler & Cooling Tower	Not applicable
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FAS490 Fantr Aluminum Low Sound

Using the same development philosophy as the TEP composite fan, the FAS490 has a longer chord than the standard aluminum version, which allows the fan to work at lower speeds, providing less noise.



DIAMETER



NUMBER OF BLADES



LOW COST



FLOW RATE



MARKET



LEADING EDGE PROTECTION

FAS490	132in. (3.352,8mm) - 156in. (3.962,4mm)	from 3 to 8	Low cost	30 m ³ /s - 180 m ³ /s	Aircooler & Cooling Tower	Not applicable
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TECHNICAL SPECIFICATIONS COMPARATIVE TABLE BETWEEN MODELS

	Diameter	Number of blades	Main features	Flow rate	Market	Leading edge protection
COMPOSITE MATERIAL						
SLSF	63in. (1.600 mm) - 156in. (3.962 mm)	from 3 to 5	Super Low Sound	7 m ³ /s - 180 m ³ /s	Aircooler & Cooling Tower	Polyurethane (PU), 316 Stainless Steel
CR	6ft. (1.829 mm) - 36ft. (10.979 mm)	from 4 to 12	Flexibility	9 m ³ /s - 1.400 m ³ /s	Aircooler, Cooling Tower & Air Cooled Condenser	Polyurethane (PU), 316 Stainless Steel
NCR	14ft. (4.267 mm) - 42ft. (12.802 mm)	from 5 to 11	High Efficiency	50 m ³ /s - 1.900 m ³ /s	Aircooler, Cooling Tower & Air Cooled Condenser	Polyurethane (PU), 316 Stainless Steel
TEP	12ft. (3.658 mm) - 36ft. (10.973 mm)	from 5 to 11	High Efficiency	35 m ³ /s - 1.400 m ³ /s	Cooling Tower & Air Cooled Condenser	Polyurethane (PU), 316 Stainless Steel
STEP	24ft. (7.315 mm) - 38ft. (11.582 mm)	from 5 to 10	Low Sound	140 m ³ /s - 1.600 m ³ /s	Cooling Tower & Air Cooled Condenser	Polyurethane (PU), 316 Stainless Steel
FLN	up to 20ft. (6.096 mm)	from 5 to 11	Low Sound	tbd	Aircooler, Cooling Tower & Air Cooled Condenser	Polyurethane (PU), 316 Stainless Steel
Line HA	10ft (3.048 mm) - 18ft. (5.486 mm)	from 4 to 11	High Corrosion Resistance	26 m ³ /s - 350 m ³ /s	Cooling Tower	316L Stainless Steel, 904L Stainless Steel,
ALUMINUM						
FAS360	60in. (1.524,0mm) - 140in. (3.556,0mm)	from 3 to 8	Low cost	6 m ³ /s - 150 m ³ /s	Aircooler & Cooling Tower	Not applicable
FAS490	132in. (3.352,8mm) - 156in. (3.962,4mm)	from 3 to 8	Low cost	30 m ³ /s - 180 m ³ /s	Aircooler & Cooling Tower	Not applicable

*Orientative information. For specific cases, please contact our Commercial Team.

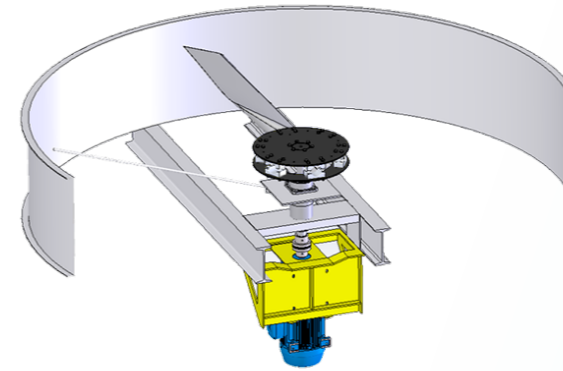
** Flow rates presented for the typical static pressure range up to 35mmWG



VENTILATION SYSTEMS

In addition to fans, we also offer complete ventilation systems, including engines, reducers, couplings, support base, protective screen and inlet nozzle.

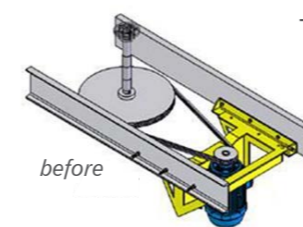
We carry out structural calculations with finite elements and guarantee not only performance, but also durability and fatigue lifespan of all system elements. This analysis also includes verifying the fluid passing through the equipment (contaminated air) and local temperature variations (systems installed below $-45\text{ }^{\circ}\text{C}$).



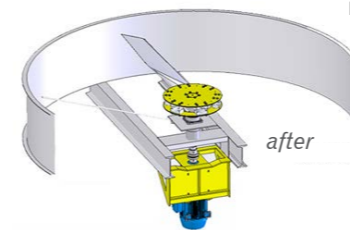
DIRECT DRIVE SYSTEM FOR AIR COOLERS

The Direct Drive system offers the most efficient alternative to the belt and pulley system commonly used in air coolers. Despite being cheaper, the belt and pulley system carries a high maintenance index, ultimately leading to constant equipment downtime.

Our engineers developed a solution to replace this system with a direct drive system, in which the belt and pulley are removed and the engine is coupled directly to the rotor. This enhances the system's performance and reduces maintenance.



- Elastic coupling
- Modification of the structure and support of the air cooler
- Motor reducer or variable-frequency drive



CR is the most commonly used fan model for this application.

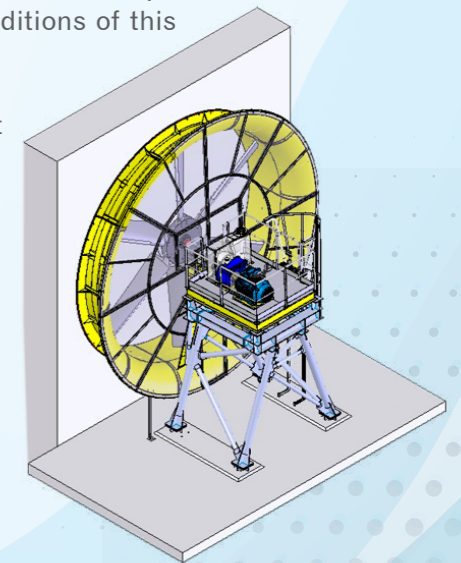
SYSTEMS FOR HIGHLY CORROSIVE ENVIRONMENTS

Our engineering and development teams can conceive, calculate and design not only fans, but complete ventilation systems, including:

- Sealing rings
- Support base
- Inlet nozzle
- Protective fairing
- Coupling shaft
- Mechanical emergency brake
- Frequency inverter
- Elastic gasket
- Engine
- Reducer
- External lubrication system
- Protective screen
- Vibra-switch

These systems use HA fans and all other components are also designed for the specific high-corrosion conditions of this application.

Contact us to get your project started.



Find out more about other markets in which we operate:

UNDERGROUND VENTILATION

FanTR offers ventilation systems and equipment for air renewal in underground or confined environments. The most common applications include large underground mines and road and subway tunnel construction works.

As the Brazilian leader in this segment, we spearhead the ventilation projects of all major works and mines in Brazil and across Latin America.

TUNNELS



Permanent axial jet fans for high temperature

Commonly known as jet fans, they are permanently installed in road tunnels, subways and underground areas where there is circulation of people.

Fans and systems for tunnel drilling and opening operations

Following the same line of mining fan designs, this equipment is much stronger and designed for extreme operating conditions, which are very common in construction sites.



MINING



Secondary fans

Designed based on actual mine conditions, our fans are much stronger and durable, even in the most adverse conditions.



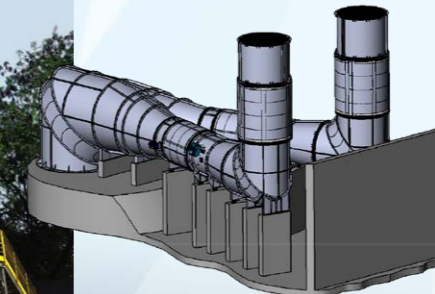
Primary fans

The primary fans provide a constant air flow into the main galleries of the mines, bringing in fresh air. Primary fans can be provided separately or as part of a system.



Ventilation system designs

Fans can be provided separately or as part of a system, along with recovery cones, vibration isolators, elastic gaskets and forks for parallel fan operation (based on aerodynamic efficiency rules).

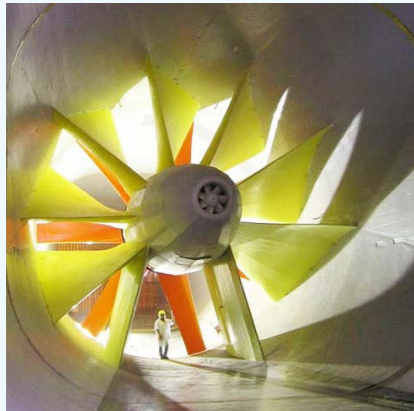


Find out more about other markets in which we operate:

SPECIAL PROJECTS

From wind turbine nacelles to Helibras's helicopter ventilation duct system, our engineering has focused on developing high-performance and high-resistance ventilation solutions, or even manufacturing structural composite parts.

Contact our team if you need to develop any composite product or develop specific ventilation products.



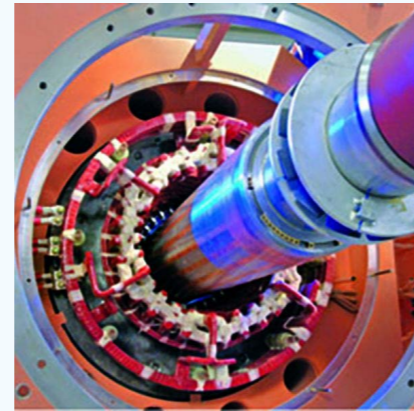
Wind tunnel

We have already delivered wind tunnels to the Instituto Tecnológico de Aeronáutica (Aeronautical Institute of Technology – ITA); modernization of the wind tunnel of the Instituto de Aeronáutica e Espaço (Institute of Aeronautics and Space – IAE), and, more recently, the wind tunnel to calibrate anemometers of the Senai Innovation Institute, in Natal, Rio Grande do Norte.



Air exchange fans for industrial areas

Com experiência no fornecimento de ventiladores para a indústria têxtil e de processamento de alumínio, os ventiladores típicos de torre de resfriamento também podem ser utilizados para a ventilação industrial. Bons ganhos de eficiência e diminuição de consumo de energia são alcançados com a utilização dos nossos equipamentos para esse tipo de aplicação.



Large electric motors

We have an exclusivity agreement with Siemens to supply special blade designs also made of aramid and carbon fiber. We are the only manufacturer certified to meet the loads covered in this application, using this type of material.

SERVICES

FanTR, in addition to developing and manufacturing axial fans for various types of ventilation systems, also performs services related to ventilation, always valuing the quality of service to its customers.



FANTR SERVICES

Performance measurements on cooling towers and axial ventilation system

Support in ventilation system design for mining companies

Tunnel ventilation system design



Installation and assembly supervision

Equipment Refurbishment and repower

Static and dynamic balancing and vibration analysis

Monitoring of ventilation system preventive maintenance



FANTR • TECHNOLOGY RESOURCES

Rodovia Waldomiro Corrêa de Camargo, km 53,7
Bairro Cruz das Almas - Itu/SP - Brazil

+55 (11) 4025-1670
fantr@fantr.com
www.fantr.com