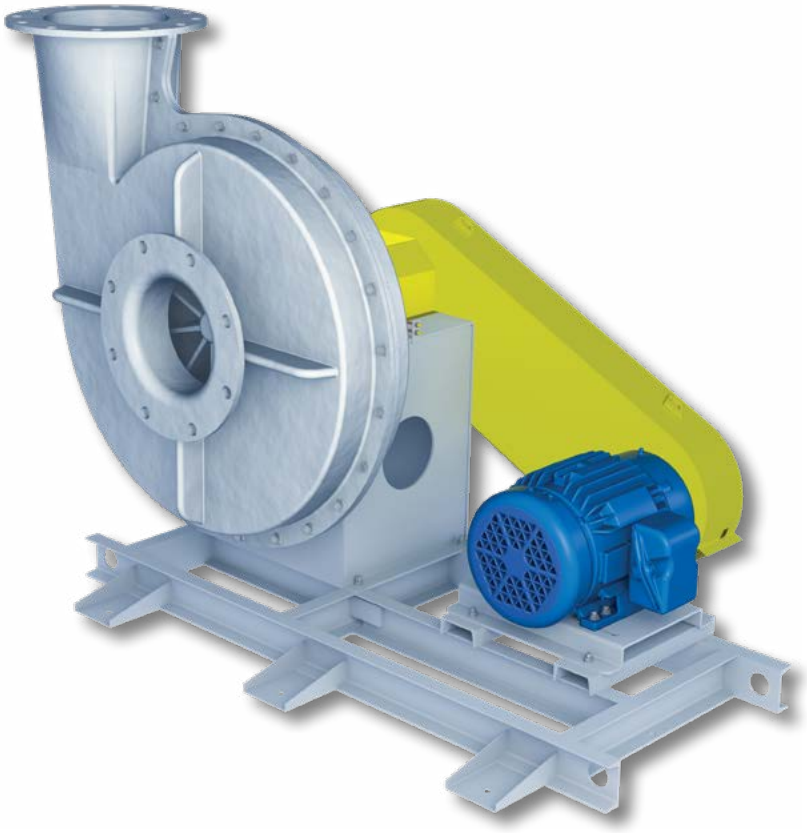
TCF

TWIN CITY FAN

INDUSTRIAL PROCESS AND
COMMERCIAL VENTILATION SYSTEMS

FIBERGLASS FANS FOR CORROSIVE ENVIRONMENTS

BCSF | BAFF | RBOF | HPF | ILCF | TAHF | VAHF | TAMF | PRVF | TCWPF




Paper Machine Exhaust


Air Scrubber


Water Treatment Facility

Corrosive Applications

When dealing with corrosive environments, selecting the right fan is essential for achieving optimal performance and for increasing the longevity of the equipment. Whether you require a fan for a chemical, pulp and paper, or water treatment application, Twin City Fan can provide a wide range of fiberglass fans that are designed to deliver maximum corrosion resistance. We also offer a variety of accessories, multiple types of fiberglass materials and optional features such as Spark Resistant Construction.

Typical Applications

- Fume control / fume exhausting
- Odor control
- Oil mist emissions
- Pollution / emissions control
- Process control, heating or cooling
- Scrubbers

Typical Industries

- Fertilizer
- Metal & mineral processing
- Pulp & paper
- Petrochemical
- Pharmaceutical
- Steel processing
- Water and wastewater treatment

Advantages of Fiberglass Fans

- Superior corrosion resistance to gases and vapors.
- Lower maintenance costs.
- More economical than stainless steel construction.

TCF
TWIN CITY FAN

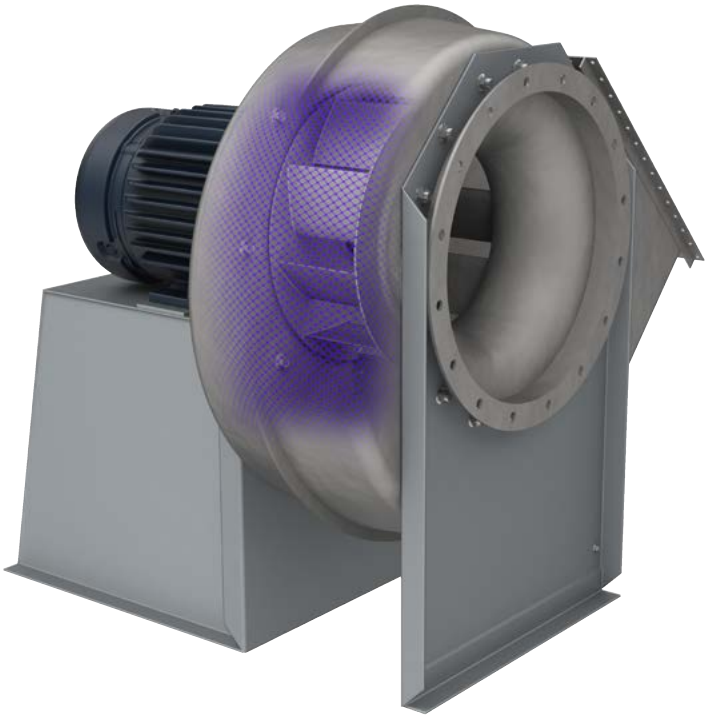
Safety Containment Housings

Many of today's processes incorporate chemical components that are not compatible with ferrous metal with quality coatings or high-nickel, white metals, like stainless steel and Monel. Over time these chemical will break down even the toughest composite (FRP) materials. Many chemicals contain fluorine. Acids such as Hydrofluosilicic or Hydrofluoric are two such examples. In addition, depending on concentration, temperature and state (gas or liquid), some relatively innocuous chemicals can break down metals and over time even FRP.

For applications with highly corrosive chemicals and where safety of the operating personnel and the surrounding equipment is the highest concern, Twin City Fan has developed FRP housings for the BCSF fan designed to contain the impeller in the event of a catastrophic failure. With some of the fans operating with tip-speeds over 25,000 feet per minute, impeller components can become missiles destroying standard FRP and metallic housings. The design is not meant to be indestructible, but to contain any parts from penetrating the housing wall.

The proprietary design incorporates many strategic laminate structure as well as reinforcement changes from our standard housing. Twin City Fan's containment housing is designed to contain an impeller up to 1.22 times the max catalog speed of the fan.

For more questions, please contact your local Twin City Fan sales representative. To find your local representative, visit www.tcf.com.



TCF
TWIN CITY FAN

Carbon Fiber Impellers

Twin City Fan's BCSF fan is available with carbon fiber impeller in lieu of traditional fiberglass. Designated by the fan class (CF = carbon fiber; FG = fiberglass), the material change allows the BCSF to reach RPM limits well beyond the limits of the traditional fiberglass. This higher limit translates into a fan able to reach pressures up to 34" w.g.

In addition to the higher pressure capability, the lighter carbon fiber impeller allows for lower weight and moment of inertia (WR^2). This allows for less stress on the motor and drive package (belt driven). See page 4 for more information about Twin City Fan's BCSF fiberglass fans.

Arrangement 1
Belt Driven

Model BCSF

Backward Curved High Pressure Centrifugal Composite Fans, SWSI

The BCSF Centrifugal Composite Fan is a backward curved industrial fan designed for handling particulate-free, corrosive or caustic air in high pressure applications where conventional steel and stainless steel fans would corrode. Typical industries that utilize this style of fan include pulp-and-paper, steel processing, petrochemical plants and wastewater treatment facilities. All of the parts that are exposed to the airstream are constructed of high-quality corrosion resistant materials to avoid material breakdown from most chemicals. The BCSF also features a wide impeller and housing, producing a high volume of air at a lower velocity.

Impeller Design

The Model BCSF features a non-overloading impeller design suitable for applications requiring large volumes of air at moderate to high pressures. The high efficiency impeller features backward curved blades of single thickness affixed to the rim.

Optional Accessories

- Access Door
- Shaft Seal
- Flanged Inlet and Outlet
- Housing Drain
- Vibration Isolation Bases
- Inlet Box
- Outlet Damper
- Fan Guards

Optional Construction

- Static Grounding
- ASTM D4167 Construction

Optional Materials

- Vinyl Ester
- Surface Veil

Sizes (Impeller Diameters)
- 16.5" to 60" (14 sizes)

Performance
- Airflow to 151,000 CFM
- Static pressure to 34" w.g.
- Airstream temperature to 200° F

Arrangements
- Available in Arrangements 1, 8, 9, 9F, 10

Model BAFF

Airfoil Fiberglass Centrifugal Fans, SWSI

The BAFF fiberglass fan is constructed for durability and resistance to most chemicals. All airstream parts are constructed of fiberglass reinforced plastic and mounted on an all-welded, heavy-gauge steel base. All fiberglass parts are coated inside and outside with resin (with UV inhibitor), approximately 10 mils in thickness, to seal and provide protection from ultraviolet light. This results in a smooth, high gloss finish. All steel parts are finished with an air dry epoxy paint. The aluminum hub and carbon steel shaft assembly are bolted to the fiberglass impeller and completely coated with fiberglass laminate for maximum corrosion protection.

Impeller Design

Features Twin City Fan & Blower's FA9 impeller with backward inclined airfoil blades offering a power limiting characteristic, high operating efficiency and low noise levels.

Optional Accessories

- Raised Bolted Cleanout Door
- Weather Cover (Arr. 10)
- OSHA Type Belt Guard (Arr. 1 & 9)
- Shaft & Bearing Guard (Arr. 1 & 9)
- Flanged Inlet
- Unitary Base (Arr. 1 & 9)
- Vibration Isolators (Rubber-in-shear or Spring)
- Housing Drain
- Shaft Seal

Optional Construction

- Static Grounding
- ASTM D4167 Construction

Optional Materials

- Vinyl Ester
- Surface Veil
- Fire Retardant Resin

Arrangement 9
Belt Driven

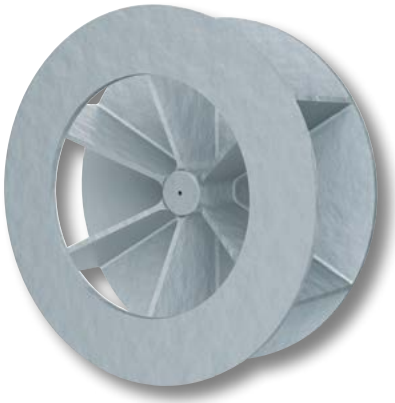
Backward Inclined Airfoil
Fiberglass Impeller

Sizes (Impeller Diameters)
- 12" to 25" (four sizes)

Performance
- Airflow to 17,000 CFM
- Static pressure to 13.5" w.g.
- Airstream temperature to 200° F

Arrangements
- Available in Arrangements 1, 9, 10

Arrangement 9
Belt Driven



Radial Bladed Fiberglass Impeller

Sizes (Impeller Diameters)
- 10" to 57" (14 sizes)

Performance
- Airflow to 38,300 CFM
- Static pressure to 18" w.g.
- Airstream temperature to 200° F

Arrangements
- Available in Arrangements 1, 9, 10

Model RBOF

Fiberglass Radial Bladed Centrifugal Fans

The RBOF fiberglass fan offers superior corrosion resistance to gases, fumes and vapors. The RBOF's fan housings feature one piece, fabric-reinforced construction utilizing corrosion-grade resins. A glass veil is standard for airstream surfaces providing a resin rich liner to maximize chemical resistance.

The standard resin used for the RBOF is resistant to a large variety of alkalis and other chemical agents. When a corrosion resistant fan is required to withstand chemicals that attack glass or polyester resin, special plastic and reinforcing material can be supplied.

Impeller Design

The RBOF impeller features a radial blade design. All impellers are constructed of solid FRP with a steel hub embedded and encapsulated into the back plate.

Optional Accessories

- Bolted Inspection Door
- Weather Cover (Arr. 10)
- OSHA Type Belt Guard (Arr. 1 & 9)
- Flanged Inlet
- Unitary Base (Arr. 1)
- Vibration Isolators (Rubber-in-shear or Spring)
- Housing Drain
- Shaft Seal

Optional Construction

- Static Grounding (Hazardous Fumes)

Optional Materials

- 304 SS or 316 SS (bearing pedestals and inlet supports)
- Synthetic surfacing veil
- Special resins to suit specific applications
- Fire Retardant Resin reduces the resin's tendency to burn. Antimony trioxide is included to attain a flame spread rating of 25 or less.

Model HPF

Fiberglass Radial Bladed High Pressure Blowers

HPF Fiberglass Pressure Blowers are recommended for relatively small, but constant, volumes of air at high static pressure. All airstream parts are constructed of fiberglass reinforced plastic, with excellent corrosion resistance to most chemicals. The radial type impeller is resin transfer molded (RTM) from a resin-glass mixture providing optimal strength and corrosion resistance. All impellers are dynamically and statically balanced after testing.

Belt driven Arrangement 1 or direct drive Arrangement 8 are available and are supplied with heavy-gauge steel bases, finished with two coats of light gray epoxy paint. Arrangement 1 can be furnished with a slide rail base for ease in adjusting belt tension.

Impeller Design

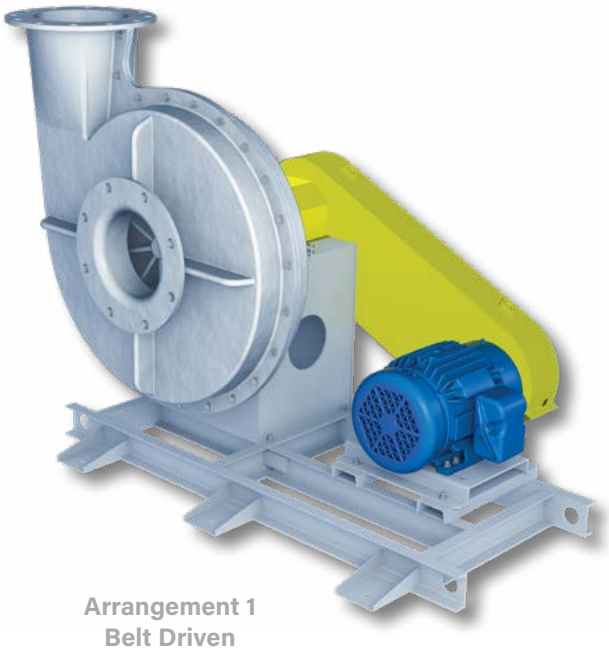
The HPF's impeller is cast from a resin-glass mixture providing optimal strength and corrosion resistance.

Optional Accessories

- OSHA Type Belt Guard (Arr. 1 & 9)
- Coupling Guard (Arr. 8)
- Shaft and Bearing Guard (Arr. 1 & 8)
- Housing Drain
- Flanged Inlet and Outlet
- Shaft Seal
- Vibration Isolators (Rubber-in-shear or Spring)
- Unitary Base
- Graphite Impregnation

Optional Materials

- 316 Stainless Steel Fan Shaft
- Dow Vinyl Ester
- Nexus Veil
- Fire Retardant Resin



Arrangement 1
Belt Driven

Radial Bladed Fiberglass Impeller

Sizes (Impeller Diameters)
- 18" to 28" (three sizes)

Performance
- Airflow to 4,700 CFM
- Static pressure to 36" w.g.
- Airstream temperature to 225° F

Arrangements
- Available in Arrangements 1, 8, 9, 10

Arrangement 9
Belt Driven

Backward Inclined Airfoil
Fiberglass Impeller

Sizes (Impeller Diameters)
- 12" to 25" (four sizes)

Performance
- Airflow to 15,200 CFM
- Static pressure to 7" w.g.
- Airstream temperature to 200° F

Arrangements
- Arrangement 9 (belt driven)

Model ILCF

Fiberglass Inline Centrifugal Fan

The ILCF Fiberglass Inline Centrifugal Fan is designed to provide straight-through airflow. This combines the compact advantage of an axial flow fan with the performance characteristics of a centrifugal fan. The ILCF is constructed with straightening vanes to improve the efficiency and the pressure characteristics by minimizing turbulence downstream from the fan and converting rotational energy at the impeller discharge into useful work. The fan is also incorporates bearing lubrication lines that extend to the outside of the fan housing for ease of maintenance.

Constructed of fiberglass (FRP), the ILCF is primarily used for exhausting gases, fumes and vapors from chemical processes. Airstream parts are constructed of fiberglass reinforced plastic for resistance to a wide variety of acids, alkalies and other chemical agents.

Impeller Design

Features Twin City Fan & Blower's FA9 impeller with backward inclined airfoil blades offering a power limiting characteristic, high operating efficiency and low noise levels.

Optional Accessories

- Fiberglass Motor Cover
- Fiberglass Curb Cap
- Fiberglass Stack Cap
- Exterior Stainless Steel Hardware
- Housing Drain
- Horizontal Support Legs
- Bolted Inspection Door
- Stack Cap Bird Screen
- Ceiling Suspension Brackets

Optional Construction

- Static Grounding (Hazardous Fumes)

Optional Materials

- Vinyl Ester
- Surface Veil
- Fire Retardant Resin

Model TAHF & VAHF

High Pressure Axial Fans

Model TAHF (Tubeaxial)

The Model TAHF is the belt driven tubeaxial fiberglass axial flow fan utilizing a 7-bladed impeller. It fulfills the need for a corrosion resistant fan with more performance capability and lower noise level. The impeller, housing, bearing base and inner support structures are constructed of glass reinforced plastic.

Model VAHF (Vaneaxial)

Adding a vane section to the Model TAHF tubeaxial fiberglass axial flow fan converts it to a Model VAHF vaneaxial fan for improved performance.

Impeller Design

The TAHF and VAHF impellers are constructed using a resin transfer method (RTM). Glass cloth is cut to various template sizes to form laminations, which are fitted into a mold. Glass is impregnated with “vinyl ester” in a low-pressure injection process. The fan' impeller is cured under pressure in the mold, forming a monolithic structure.

Optional Accessories

- Fiberglass Curb Cap
- Fiberglass Stack Cap
- Companion Flanges
- Stack Cap Bird Screen
- OSHA Type Inlet/Outlet Guard
- Bolted Inspection Door
- Horizontal Support Legs
- Exterior Stainless Steel Hardware

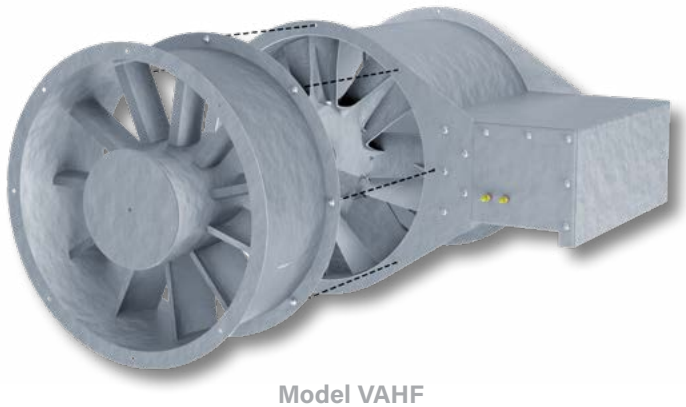
Optional Construction

- Static Grounding (Hazardous Fumes)

Optional Materials

- Vinyl Ester
- Surface Veil
- Fire Retardant Resin

Model TAHF
Tubeaxial Fan

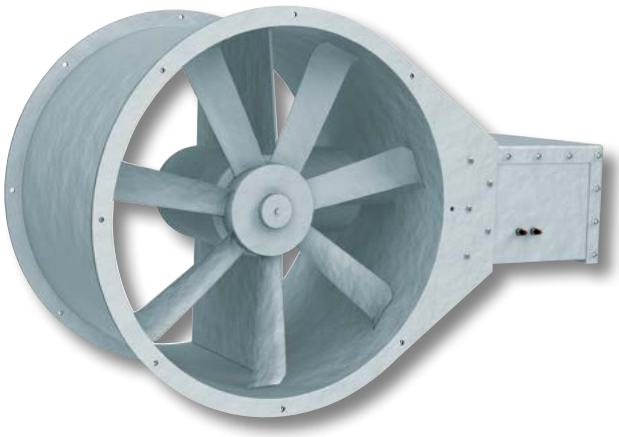


Model VAHF
Vaneaxial Fan

Sizes (Impeller Diameters)
- 12" to 60" (16 sizes)

Performance
- Airflow to 83,200 CFM
- Static pressure to 4" w.g. (VAHF)
- Static pressure to 2.5" w.g. (TAHF)
- Airstream temperature to 200° F

Arrangements
- Arrangement 9 (belt driven)



Arrangement 9
Belt Driven

Fiberglass impeller constructed with glass cloth impregnated with vinyl ester resin

Sizes (Impeller Diameters)
- 14" to 60" (ten sizes)

Performance
- Airflow to 51,900 CFM
- Static pressure to 1.5" w.g.
- Airstream temperature to 200° F

Arrangements
- Arrangement 9 (belt driven)

Model TAMF

Fiberglass Tubeaxial Fans

The model TAMF belt driven tubeaxial fan is constructed from corrosion-resistant FRP and utilizes fiberglass impeller for medium performance range requirements. The standard resin used for the TAMF is resistant to a large variety of alkalis and other chemical agents. All fiberglass parts are coated inside and outside with resin (with UV inhibitor), approximately 10 mils in thickness, to seal the surface and provide a smooth finish.

Impeller Design

The TAMF's impeller is constructed with glass cloth impregnated with vinyl ester resin and secured to a 316 stainless steel fan shaft by a stainless steel retainer bold and washer. Impellers shall be statically and dynamically balanced to ensure quiet operation.

Optional Accessories

- Fiberglass Curb Cap
- Fiberglass Stack Cap
- Stack Cap Bird Screen
- Exterior Stainless Steel Hardware
- OSHA Type Inlet/Outlet Guard
- Horizontal Support Legs
- Bolted Inspection Door

Optional Construction

- Static Grounding (Hazardous Fumes)

Optional Materials

- Vinyl Ester
- Surface Veil
- Fire Retardant Resin

TCF
TWIN CITY FAN

Model PRVF
Fiberglass Tubeaxial Roof Ventilators

The model PRVF is designed for roof mounted exhaust applications where corrosion resistance is a primary consideration.

Impeller Design
The PRVF's impeller is constructed with glass cloth impregnated with vinyl ester resin and secured to a 316 stainless steel fan shaft by a stainless steel retainer bold and washer.

Optional Accessories/Construction
- Stack Cap Bird Screen
- Exterior Stainless Steel Hardware
- Bolted Inspection Door
- Static Grounding (Hazardous Fumes)

Optional Materials
- Vinyl Ester
- Surface Veil
- Fire Retardant Resin

Sizes (Impeller Diameters)
- 14" to 60" (ten sizes)

Performance
- Airflow to 50,800 CFM
- Static pressure to 1.5" w.g.
- Airstream temperature to 200° F

Arrangements
- Arrangement 9 (belt driven)

Model TCWPF
Fiberglass Wall Panel Fans

Design to withstand corrosive environments, the TCWPF's standard housing is fabricated with an integral inlet side mounting flange. It incorporates a solid FRP motor base that is reinforced with solid FRP support struts.

Impeller Design
The TCWPF's impeller is constructed with glass cloth impregnated with vinyl ester resin.

Optional Accessories
- Stainless Steel Hardware
- Inlet/Outlet Guard
- Automatic Stainless Steel or Fiberglass Shutter
- Stainless Steel Mounting Adapter
- Fiberglass Extension Sleeve
- Option Fiberglass Mounting Flange
- Inlet/Outlet Guard

Optional Materials
- Vinyl Ester
- Surface Veil
- Fire Retardant Resin

Sizes (Impeller Diameters)
- 12" to 48" (nine sizes)

Performance
- Airflow to 41,900 CFM
- Static pressure to 1" w.g.
- Airstream temperature to 200° F

Arrangements
- Direct Drive

The corrosion resistance guide below provides general data to guide the application of Twin City Fan & Blower's standard fiberglass fans based on the corrosive agent within the gas stream. This data is based on a maximum gas stream temperature of 200°F at relatively low concentrations.

Legend of Symbols

S - Satisfactory Application L - Limited Life or Life Tests Incomplete U - Unsatisfactory

APPLICATION	SATURATED VAPOR	DRY VAPOR	EXCESS DRY AIR	APPLICATION	SATURATED VAPOR	DRY VAPOR	EXCESS DRY AIR
ACIDS				**ALKALINE SALTS**			
Acetic	L	S	S	Sodium Bicarbonate	L	S	S
Aqua Regia	U	U	L	Sodium Carbonate	L	S	S
Boric	S	S	S	Sodium Chloride	L	S	S
Butyric	S	S	S	Sodium Cyanide	L	S	S
Carbonic	S	S	S	Trisodium, Phosphate	L	L	S
Chromic	S	S	S	**ALKALIS**			
Citric	S	S	S	Ammonium Hydroxide	U	L	S
Formic	L	S	S	Calcium Hydroxide	U	L	S
Hydrochloric	S	S	S	Potassium Hydroxide	U	L	S
Hydrocyanic	L	S	S	Sodium Hydroxide	U	L	S
*Hydrofluoric	L	S	S	Sodium Hypochlorite	U	L	S
Hypochlorous	L	S	S	Ketones			
Lactic	S	S	S	Acetone	U	L	S
Maleic	S	S	S	Methyl Ethyl Ketone	U	U	L
Nitric	L	S	S	Methyl Isobutyl Ketone	U	U	L
Oleic	S	S	S	**ESTERS**			
Oxalic	S	S	S	Butyl Acetate	U	L	S
Perchloric	U	U	U	Ethyl Acetate	U	U	S
Phosphoric	S	S	S	Zinc Acetate	S	S	S
Picric	L	S	S	**GASES**			
Stearic	S	S	S	Ammonia	L	S	S
Sulfuric	S	S	S	Bromine	U	U	U
Sulfurous	S	S	S	Carbon Dioxide	S	S	S
Tannic	S	S	S	Carbon Disulfide	L	L	S
Tartaric	S	S	S	Chlorine	L	S	S
SALTS, ACID & NEUTRAL				*Fluorine	L	S	S
Alum	S	S	S	*Hydrogen Fluoride	L	S	S
Aluminum Chloride	S	S	S	Hydrogen Sulfide	S	S	S
Aluminum Sulphate	S	S	S	Sulfur Dioxide	S	S	S
Ammonium Chloride	S	S	S	**HYDROCARBONS**			
Ammonium Nitrate	S	S	S	Benzene	U	U	U
Ammonium Sulphate	S	S	S	Fuel Oil	S	S	S
Calcium Chloride	S	S	S	Gasoline	S	S	S
Calcium Sulphate	S	S	S	Kerosene	S	S	S
Copper Chloride	S	S	S	Lubricating Oil	S	S	S
Copper Sulphate	S	S	S	Mineral Oil	S	S	S
Ferric Chloride	S	S	S	Toluene	U	U	U
Ferric Nitrate	S	S	S	Vegetable Oil	S	S	S
Ferric Sulphate	S	S	S	Naphtha	S	S	S
Magnesium Salts	S	S	S	Methane	S	S	S
Nickel Salts	S	S	S	Butane	S	S	S
Potassium Chloride	S	S	S	Propane	S	S	S
Potassium Nitrate	S	S	S	Xylol	S	S	S
Potassium Sulphate	S	S	S	**CHLORINATED SOLVENTS**			
Sodium Chloride	S	S	S	Carbon Tetrachloride	L	S	S
Sodium Sulphate	S	S	S	Chlorobenzene	U	U	U
Sodium Sulphite	S	S	S	Chloroform	U	U	U
Stannous Chloride	S	S	S	Perchlorethylene	U	U	L
Zinc Chloride	S	S	S	Trichlorethylene	U	U	L
Zinc Sulphate	S	S	S				
ALCOHOLS	S	S	S	**GLYCOLS**	S	S	S

***Consult Twin City Fan & Blower for applications where the corrosive agent concentration and gas temperature is known.

INDUSTRIAL PROCESS AND COMMERCIAL VENTILATION SYSTEMS

CENTRIFUGAL FANS | UTILITY SETS | PLENUM & PLUG FANS | INLINE CENTRIFUGAL FANS
MIXED FLOW FANS | TUBEAXIAL & VANEAXIAL FANS | WALL MOUNTED FANS | ROOF VENTILATORS
CENTRIFUGAL ROOF & WALL EXHAUSTERS | CEILING VENTILATORS | GRAVITY VENTILATORS | DUCT BLOWERS
RADIAL BLADED FANS | RADIAL TIP FANS | HIGH EFFICIENCY INDUSTRIAL FANS | PRESSURE BLOWERS
LABORATORY EXHAUST FANS | FILTERED SUPPLY FANS | MANCOOLERS | FIBERGLASS FANS | CUSTOM FANS

TCF
TWIN CITY FAN

TWIN CITY FAN & BLOWER

WWW.TCF.COM

5959 TRENTON LANE N. | MINNEAPOLIS, MN 55442 | PHONE: 763-551-7600 | FAX: 763-551-7601