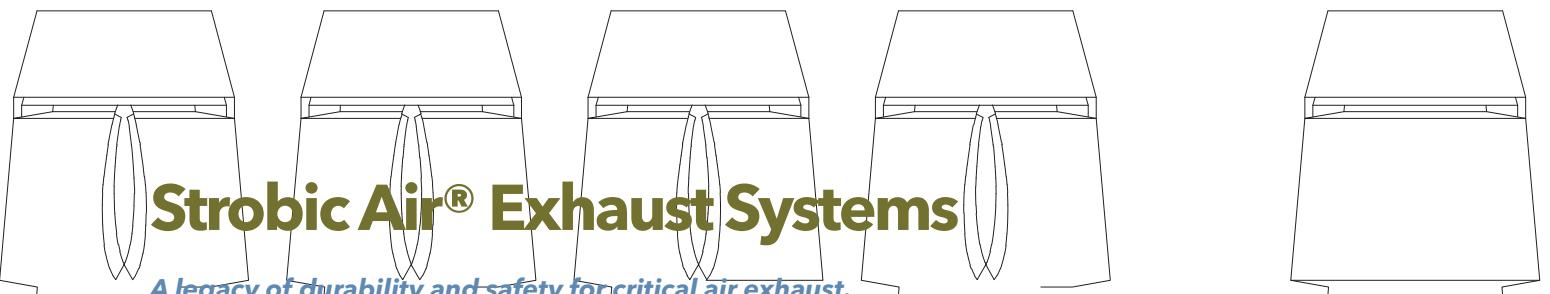


Strobic Air Technologies



Strobic Air®
Exhaust
Systems



Strobic Air® Exhaust Systems

A legacy of durability and safety for critical air exhaust.

Strobic Air Technologies has been in business since 1966 and invented the first critical air exhaust systems in the early 1980's. We designed the Strobic Tri-Stack® System with one goal in mind: to design and build the safest most durable critical air exhaust systems in the world. History says we succeeded.

The Tri-Stack® System is your solution for exhaust fume and odor control.

Time-Tested Superior Design:

The Proven Product for Your Building Exhaust

Strobic Air's Tri-Stack® exhaust systems are practical, cost-effective, and energy efficient solutions for all of your exhaust needs.

Whether your concern is pollution abatement, re-entrainment, or odor control, Tri-Stack® systems offer an effective solution for you. Operating at thousands of facilities as direct replacements for tall, unsightly conventional centrifugal exhaust fans, Tri-Stack® is the industry leader for many reasons, which include:

- Modular construction allows for easy installation and low system pressures to provide a fast payback when compared

to traditional centrifugal stack exhaust designs.

- Attractive, low profile, architect friendly design
- Verifiable industry low vibration levels
- Virtually maintenance free
- Direct drive reliability
- Superior materials and coatings
- L-10 rating of 150,000 hours or greater on all motor bearings

Tri-Stack® systems are ideal for use in hospitals, biomedical facilities, and research laboratories at universities as well as private pharmaceutical, chemical, and petrochemical organizations.

Specialty applications from diesel generator exhaust to emergency ammonia fume extraction are also common and can be custom designed for your needs. Tri-Stack® systems are the industry leader wherever issues of exhaust pollution, odor control, re-entrainment, aesthetics, or energy savings are a priority.

Tri-Stack® Systems Roof Exhaust Fans: Configurations for Any Project Size or Application

Tri-Stack® systems can be designed for retrofit and new construction. They can be configured to meet your design requirements, as well as optimize efficiency to ensure you have the best possible design. Strobic Air's experienced staff will be pleased to work with you to determine the best possible Tri-Stack® configuration for your application.



Consider these outstanding advantages of Tri-Stack® fans and systems

Prevent Re-entrainment

Tri-Stack™ is designed to prevent re-entrainment of contaminated air back into the laboratory building or neighboring buildings fresh air intakes. This makes the environment safer for you and your neighbors.

Safe, Low Maintenance Operation

The unique design of the Tri-Stack™ system only requires once every 18 months greasing schedule, or approximate 7 times in 10 years. This is compared to an industry average of every 3-6 weeks.

Low Vibration, Quieter Operation

The Tri-Stack™ combines mixed flow impeller technology and a true direct design to offer the industry leading low vibration levels. With less vibration comes quieter operation. If attenuation is needed the Strobic Air Technologies patented silencer nozzle is the only option in the industry that allows a fan to be attenuated by 10 db or better without adding height to the fan system.

Attractive, Low-Profile Design

While safety is, and always will be our #1 priority, the Tri-Stack™ system was designed with aesthetics and architecture in mind. In almost every case our application engineering team can help you create a design that is safe, effective and meets local architecture and sound ordinances.

Durability and Low Cost of Ownership

The Tri-Stack™ system was designed with superior materials and coatings so that we can offer you a product that can last 18-25 years in most environments with minimal maintenance. Because of this we offer a 7 year warranty, the longest warranty in the industry. *Ask your rep how you can upgrade your warranty to 10 years!

Ability to Retrofit on Almost Any Footprint

When it comes to replacing older systems, or application engineering team can help you find solution to fit just about any footprint.



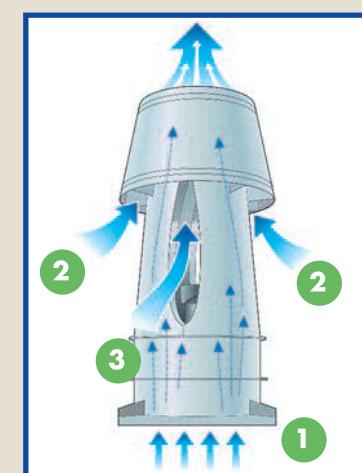
Strobic Air's Tri-Stack®: Three stacks in one fan

There exists a common misconception that "TRI" in Tri-Stack® equates to three fans. However, in truth, "TRI" refers to the unique ability of each individual fan in the Tri-Stack® series to incorporate three stacks (or streams) of air into a single plume, which is composed of the following:

- The first stack comes from the building source itself.
- The second stack is induced through the wind band.

This stack allows the nozzle plume to develop fully before exiting the top of the wind band and helps shield it from cross-winds.

- The third stack is entrained through the teardrop shaped motor cut-outs of the unique nozzle design. The nozzle design allows the motor to remain outside of the hazardous exhaust stream, therefore allowing for easier maintenance and long life cycle. This stack adds air volume to the center of the stack as well as allows ambient air for cooling of the motor.



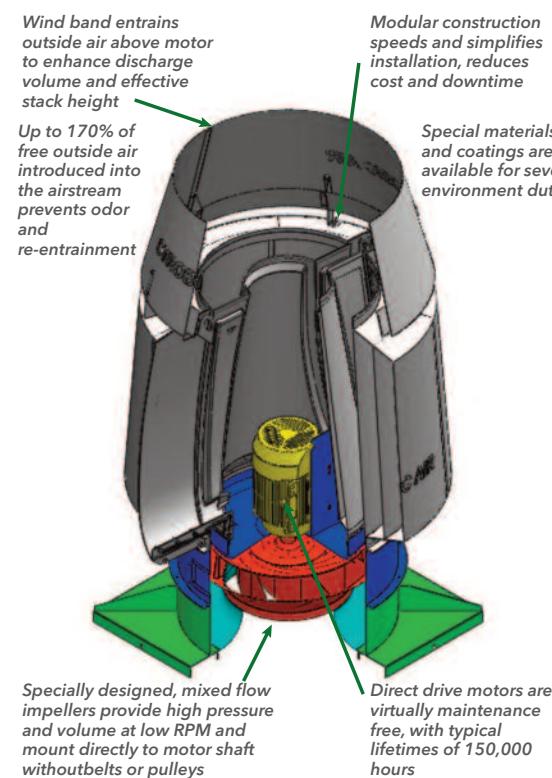
Strobic Air's Tri-Stack® fan is the industry's most efficient, best cost of ownership, and reliable fan.

Mixed flow impeller technology: The key to superior performance

Tri-Stack® Systems Provide Significant Performance, Reliability, and Cost Advantages Over Conventional Centrifugal Exhaust Fans

Strobic Air has refined mixed flow technology fans for almost three decades, and has pioneered many aerodynamic concepts with the technology. Mixed flow fans provide optimum performance in virtually all configurations of low pressure/high flow and high pressure/low flow. They offer substantial advantages over centrifugal-type fans such as higher efficiency performance for lower horsepower requirements for comparable pressures and flows. The constant acceleration ratio of mixed flow fan blades permits both the leading and trailing edges to perform equal work, maximizing efficiency and providing a stable performance curve without stall or un-stall sections.

Because Tri-Stack® systems require so little maintenance, building maintenance workers are freed up to spend their time on productive work. In addition, the need for rooftop penthouses to protect maintenance workers is also eliminated, reducing costs and weight on the roof structure.



On a direct operating cost basis, use of Tri-Stack® mixed flow fan technology reduces energy consumption. With the combination of both energy recovery and Smart System™, the Tri-Stack® solution dramatically lowers overall energy cost.



Smart System™

The Smart System™ maintains safe ventilation levels while minimizing facility energy costs and carbon footprint. Controlling to a static pressure set point in your ductwork, the Smart System™ dynamically measures fan performance, allowing it to safely control fan speed while never dropping below a minimum outlet velocity and stack height. Once fan speed is reduced to reach a minimum outlet velocity, bypass dampers are adjusted to meet lower building demand.

Features and Benefits

- ↑ Reduces sound levels at off-peak loading
- ↑ Can contribute to Leadership in Energy & Environmental Design (LEED) certification
- ↑ Logs performance data for more than 5 years
- ↑ Controls fan speed to meet building demand while maintaining a minimum outlet velocity and effective stack height
- ↑ Stages fan operation and rotates redundant fan
- ↑ Can be retro-fit onto existing systems
- ↑ Easy to use touch screen controls
- ↑ Easy tie-in to Building Automation System for monitoring purposes over BACnet, LonWorks, Modbus, and more
- ↑ Detects failures and activates backup fan
- ↑ Controls isolation and bypass damper positions
- ↑ Additional system options include: flow stations, anemometer, temperature monitoring, concentration, motor vibration and more
- ↑ Cloud connectivity

System Response

The Smart System™ is designed to quickly respond to fan failures and other adverse system conditions. In the event of a fan failure, a backup fan will immediately engage and ramp up to speed, restoring system pressure quickly. In addition, an alarm will be sent via email or text message to one or several people simultaneously to notify them of the failure.

Fan Functions

The Smart System™ will control all of the following:

- ↑ Maintains duct static pressure set point
- ↑ Adjusts fan operating frequency
- ↑ Cycles fans on/off every 30 days
- ↑ Controls isolation damper position
- ↑ Adjusts bypass damper position
- ↑ Automatically rotates backup fan
- ↑ Detects failures and activates redundant fan
- ↑ Measures and records system performance
- ↑ Communicates with building system



Tri-Stack systems meet AMCA 210/260/300 and all applicable ventilation standards

Tri-Stack® systems conform to all applicable ventilation standards such as:

- ↑ AMCA (Air Movement Control Association)210/260/300 for the majority of our fans
- ↑ ANSI/AIHA (American National Standards Institutes/ American Institute of Hygienic Association) Z9.5 for laboratory workstations and their exhaust systems
- ↑ ASHRAE (American Society of Heating, Refrigerating, and Air-conditioning Engineers, Inc.) 45
- ↑ NFPA (National Fire Prevention Association) 45

These organizations provide guidelines with regard to building air intake and exhaust design, indoor air quality and re-entrainment issues of contaminated exhaust entering doors, windows and outside air intakes.

Technical/Field Support

Strobic Air technical and sales engineers can also provide valuable support services for you and your clients. Performance and cost comparisons of Tri-Stack® systems vs. alternative methods of pollution abatement, as well as informative presentations on system design, construction, operation, and advantages. These support services have proved useful for building owners and/or managers who are considering new or retrofit systems. We can also provide computer-generated sound calculations to the property line or into the facility. A comprehensive resource library of technical/tutorial/applications articles as well as case studies can be found at www.choosetristack.com.

How to get more information...

Tell us about your application. We will work with you and others associated with your project to recommend the best solution for your pollution abatement or odor control problem.

Value added accessories for enhanced system performance

Maximize HVAC system performance and minimize noise at the property line

Strobic Air offers a number of useful accessories for Tri-Stack® systems to reduce energy consumption, provide even quieter operation through higher sound attenuation, as well as special construction materials and/or coatings to accommodate unusual applications such as operation in acidic, caustic and high temperature environments. Many of these accessories are described below.

Energy recovery systems

Unique glycol/water heat exchanger coil modules for Tri-Stack® systems extract exhaust heat for heating or cooling conditioned makeup air. A 1°F rise in makeup air temperature permits a corresponding 3% reduction in heating costs, drastically lowering energy costs for savings of thousands, or hundreds of thousands, of dollars per year.

Smart System™

Automatically maintains safe fume hood ventilation levels and minimum exhaust stack height while minimizing facility energy cost and carbon footprint.

Acoustical Silencer Nozzles™

Acoustical silencer nozzles for Tri-Stack® systems attenuate up to 12 dBA for quieter operation in particularly noise sensitive areas. Low profile design is unobtrusive, enhancing roofline aesthetics without affecting fan performance. Acoustical silencer nozzles may be retrofitted onto existing Tri-Stack® fans quickly and conveniently.



cal processing, plating and wastewater treatment facilities) where they may be exposed to nitric acid, fluorides, sulfuric acids and other high concentrations of caustic exhaust components.

HEPA filtration system

Tri-Stack® HEPA filtration systems are available for special medical/pharmaceutical applications such as isolation room and quarantine room exhaust, Level 4 safety laboratories, or similar applications, bag in/bag out.



Fans for harsh environments

Tri-Stack® fans may be constructed with highly specialized materials and/or coatings for use in caustic, corrosive and other severe environments (such as chemi-



Fans for high temperature environments

Tri-Stack® fans are also available in rigid steel construction for high temperature applications such as emergency diesel generator, furnace or boiler room exhaust. High temperature systems can withstand up to 1000° F continuously and incorporate a chemically resistant high temperature coating.



Retrofit applications

Replacing outmoded centrifugal fans with Tri-Stack® fans is sensible, convenient, and cost-effective. One manifolded Tri-Stack® fan can typically replace up to 20 individually dedicated stacks enhancing building aesthetics and eliminating negative implications associated with roof stacks. In addition to performance and operating cost advantages, retrofitting Tri-Stack® systems reduces engineering costs and eliminates extensive coordination of production/processing schedules to prevent unnecessary and expensive downtime.



Mono-Stack™

For less mission critical applications Strobic Air offers a series of centrifugal fans. These Mono-stack™ fans can be fitted with many of our standard Tri-Stack® options, such as, Smart System™, energy recovery systems, and more. The Mono-Stack™ comes standard with:

- ↑ Powder coating
- ↑ Variety of wheel diameters
- ↑ AMCA B or C construction
- ↑ BV3 or BV4 vibration ratings
- ↑ Ability be used in conjunction with Variable Frequency Drives (VFDs)

↑ Modular plenum construction allowing for future expansion