

THE MIXED FLOW GAZETTE

Volume 1
Number 2

A periodic newsletter with ideas, information, and solutions to roof exhaust problems involving pollution abatement, exhaust re-entrainment, odor control, and energy savings

Where to see us...

As part of our aggressive marketing program we participate in a variety of industry trade shows and symposia throughout the year. Our goal is not only to meet current and future users of Tri-Stack systems but also to help support our representatives and distributors with current technical and applications information.

Hopefully we'll see you at one or more of these events:

January 14-16	National Sales Meeting Brunch—Atlantic City, NJ
March 18-21	Pittcon 2002—New Orleans, LA
March 25-26	PDC 2002, Opryland Florida Hotel—Orlando, FL
March 18-19	Tradeline's Research Buildings—Hilton Head, SC
May 7	In-House Training Session
June 1-6	AIHCE Expo, San Diego, CA
July 16-17	ASHE 2002—Tampa, FL
October 8	In-House Training Session
October 3-4	Tradeline's Animal Research Facilities—San Antonio, TX
November 4-5	Tradeline's College & University Facilities—San Diego, CA

Eliminating odors at wastewater treatment facilities –

Exhaust dilution can be an effective solution

Odoriferous exhaust gases generated by wastewater treatment facilities can create major problems. Among these facilities are chemical, petrochemical, pharmaceutical, wastewater/sewerage treatment plants, and others. While odors are considered either toxic or non-toxic, regardless of their actual or perceived dangers, they must be eliminated. To this end, many municipalities are passing ever more stringent regulations with regard to odoriferous exhaust generated by these facilities.

Among the more popular methods in use today to manage wastewater treatment exhaust odors are chemical additives such as potassium permanganate, sodium hypochlorite, chlorine, and others, depending upon severity and type of odor or its perception. Precipitators, scrubbers, thermal oxidizers, charcoal filters, and other expensive hardware may also be

used to treat process exhaust prior to discharge.

Tri-Stack™ roof exhaust systems – with their unique mixed flow technology operation – provide a highly efficient method of odor control, particularly when compared against these other methods.

Mixed flow technology is both practical and cost-effective. Its theory of operation is simple: to eliminate odor by dilution, fresh air is mixed in with the wastewater process exhaust gases until a suitable concentration (ppm) is reached and the odor is no longer perceptible or objectionable. Dilution is achieved two ways, either directly by diluting the exhaust stream (plume) before it leaves the exhaust fan; or, indirectly, where the exhaust stream from the fan is diluted by

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Educational seminars and technical presentations

Let us present a technical symposium at your facility



Our technical staff routinely hosts technical sessions at customer facilities throughout the country. These presentations are usually one-day events and have proven to be useful to engineers, architects, facility managers, building owners, and others concerned with pollution abatement, exhaust re-entrainment, and odor control. Seminars are designed for people at all technical levels within an organization, and generally consist of a short presentation followed by lively question/answer sessions as well as roundtable discussions. Seminar participation will most likely provide you and your guests with new insight for handling difficult problems with regard to exhaust control and management. If you'd like to arrange for a technical seminar, please contact a Strobic Air Regional Manager or the factory direct. We'd be pleased to work with you and your staff.

Where to read about us...

In addition to application bulletins and article reprints, other editorial features on Tri-Stack systems are now scheduled for PHARMACEUTICAL ENGINEERING Magazine (heat recovery case histories), R & D LABORATORY DESIGN (also on heat recovery), LABORATORY EQUIPMENT (heat recovery), and POLLUTION EQUIPMENT NEWS (odor management at wastewater treatment facilities); this subject is also scheduled for an article in CHEMICAL PROCESSING Magazine. A case history/tutorial article on managing odor at hospitals using emergency diesel generators is tentatively scheduled for FACILITY CARE Magazine; and three major articles on mixed flow impeller technology and its many advantages (including heat recovery, odor management, and pollution abatement) are scheduled for ENGINEERED SYSTEMS and PLANT ENGINEERING magazines.

Most of these articles – as well as previously published articles shown here – contain valuable technical data as well as useful case history solutions that might be beneficial to your application.

FM DATA MONTHLY/WEB EXTRA

Technical/tutorial article on heat recovery applications for Tri-Stack systems

FACILITIES MANAGER

Tutorial article on mixed flow technology/Tri-Stack system applications for pollution abatement, re-entrainment prevention, and odor control

LAW ENFORCEMENT NEWS

Case history article on Nebraska State Crime Patrol Laboratory on fume hood exhaust systems to help prevent DNA contamination for criminal investigations

PHARMACEUTICAL ENGINEERING/ISPEAK

Tutorial/case history article on Tri-Stack systems at Albany Molecular Research, Inc. for prevention of laboratory fume hood exhaust re-entrainment

BUILDING DESIGN & CONSTRUCTION

Tutorial article on Tri-Stack systems/heat recovery at Dartmouth College

CHEMICAL PROCESSING

Tutorial article on Tri-Stack systems for odor prevention at industrial wastewater treatment facilities

HYDROCARBON PROCESSING

Case history article on Tri-Stack systems for exhaust re-entrainment prevention at Ashland Chemical Corp.

PLANT ENGINEERING

Technical/tutorial article on Tri-Stack systems/mixed flow impeller technology

HPAC ENGINEERING

Tutorial/case history article on Tri-Stack systems for heat recovery at Neurogen Corp./Dartmouth College

PHARMACEUTICAL ENGINEERING

Case history/tutorial article on heat recovery for Tri-Stack systems at Neurogen Corp.

MODERN HEALTHCARE

Case history article on Tri-Stack systems for diesel generator exhaust at Meridian Health Systems' Brick Hospital

POLLUTION EQUIPMENT NEWS

Tutorial article on Tri-Stack systems for odor control applications at wastewater treatment/chemical processing facilities

ENGINEERED SYSTEMS

Tutorial article on heat recovery with Tri-Stack systems for 100% makeup air facilities

PHARMACEUTICAL ENGINEERING

Technical article on eliminating laboratory fume hood exhaust re-entrainment – how wind studies helped assure a successful project

CONSULTING ENGINEER

Case history article on laboratory workstation exhaust fume management at University of Quebec at Montreal (UQAM)

CHEMICAL ENGINEERING PROGRESS

Tutorial article on Tri-Stack Systems as an alternate method for managing odor through exhaust dilution

ENGINEERED SYSTEMS

Tutorial article on mixed flow impeller technology for eliminating noise, odors, and re-entrainment from laboratory workstation fume hoods

HPAC ENGINEERING

Tutorial article on laboratory renovation incorporating Tri-Stack Systems to improve ventilation and reduce noise

Please contact us directly or a Strobic Air representative for additional information and/or reprints of any of these articles.



In addition to our extensive editorial program, you will find our advertising in the following publications:

WATER ENGINEERING &
MANAGEMENT
FACILITIES MANAGER
BUILDING OPERATING
MANAGEMENT
TODAY'S FACILITY MANAGER
ASHRAE JOURNAL
ENGINEERED SYSTEMS

CANADIAN ENVIRONMENTAL
PROTECTION
PHARMACEUTICAL ENGINEERING
HPAC ENGINEERING
POLLUTION EQUIPMENT NEWS
HEALTH FACILITIES MANAGER
CHEMICAL EQUIPMENT
CHEMICAL PROCESSING

INDUSTRIAL HYGIENE NEWS
LAB EQUIPMENT
AMERICAN LABORATORY NEWS
R & D Magazine/LAB DESIGN
NEWSLETTER

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Eliminating odors at wastewater treatment facilities—

the atmosphere before it reaches the property line, nearby air intakes, or sidewalks.

Indirect dilution is completely influenced by atmospheric conditions with regard to wind speed, direction, and even humidity. Direct dilution – the most efficient and cost-effective method – is accomplished with mixed flow impeller technology. The mixed flow impeller fan draws odor-laden exhaust into a ductwork system and carries it to the highest point of the building's roof. At the roof, fresh air is drawn into the exhaust fan to mix with and dilute the odoriferous exhaust gases generated by the wastewater treatment process. This technique is most effective when the resulting mixture of process exhaust and outside air is ejected from the fan upwards at a high velocity which is precisely how mixed flow impeller technology works.

Mixed flow impeller fans draw in nearly twice the amount of fresh air (through base-mounted bypass dampers) as exhaust air into the fans' exhaust and send it in a vertical "jet plume" up to 7000 ft./min. exit velocity. The jet velocity induces large amounts of outside air (up to 170%) to be drawn into the plume. This injection of fresh air causes **immediate relief of odor perception by odor dilution**, and sends the odor laden gas/air

mixture high into the atmosphere. In most cases this system eliminates odor problems in the neighborhood; however, when it does not combining dilution with one or more of the other available odor control methods should be considered.

Another major consideration with regard to mixed flow technology is the aesthetics associated with tall exhaust stacks on the roof. Mixed flow fans are substantially shorter than tall stacks typically used with conventional centrifugal fans. Elimination of tall, unsightly stacks which are either prohibited by code or undesirable is an added benefit. In addition, low profile mixed flow impeller fans don't require rooftop penthouses for regular maintenance, structural reinforcements on the roof, or complex, expensive mounting/stabilizing hardware such as elbows, flex connectors, guy wires, or spring vibration isolators, substantially reducing time and costs for installation.

Mixed flow impeller fans also typically consume about 25% less energy than conventional centrifugal fans, with resultant faster pay back periods as well. Lower noise levels may also be advantageous in some locations. When noise is an issue, however, there are accessories available to deal with it including acoustical fences and acoustical silencer nozzles which are highly effective.



The Ocean County Utilities Authority, Southern Division in Manahawken, NJ uses Tri-Stack systems extensively at its wastewater treatment facilities and pumping stations. Many of the pumping stations are located in residential/resort neighborhoods; obviously residents will not tolerate odor problems. Nor have there been any according to Brad Hazley, director of the Southern Division.



The Strobic Air/Safety Design Response Team:

At your service...



Our Safety Design Response Team is also available to help analyze your existing pollution abatement and/or odor control system, without obligation. Chances are we can offer a number of alternative design plans to enhance performance, add efficiency, lower costs, reduce stack heights, add redundancy, and provide for future growth.

How to get more information...

Please send me full details about Strobic Air's Tri-Stack™ systems and accessories for the following application(s):

My requirement is: Immediate Future Reference Only

Name _____

Title _____

Company _____

Address _____

City _____ State/ZIP _____

Telephone (_____) _____

Fax (_____) _____

Email _____

- Please send additional technical literature
- Please call to arrange a demonstration
- Please send CD-ROM on Acoustical Silencer Nozzles™
- Please send CD-ROM on Tri-Stack™ systems/accessories
- Please send feature article reprints
- Please send information on CAD files and Selection Programs
- Please send an Engineering Guide
- Please delete my name from your mailing list

If you're ready for extra quiet performance from your Tri-Stack system...

Hear it now!

If your Tri-Stack fans are operating in particularly noise-sensitive areas, you may want to consider retrofitting our recently introduced acoustical silencer nozzles™ which provide high attenuation values to help reduce fan noise at the property line. Their low profile design is also aesthetically pleasing, minimizing the perception of tall stacks on the building's roofline; in fact, adding the new acoustical silencer nozzles to your existing Tri-Stack fans actually decreases overall fan height, along with fan noise.

Dynamic insertion losses for the acoustical silencer nozzles range from -6 dB at 8 KHz to -15 dB at 1 KHz. This exceeds – or matches – attenuation values for typical in-line silencers across the tested frequency range of 63 Hz to 8 KHz. Dynamic insertion losses were determined using AMCA 300 sound testing specifications on our TS Series Tri-Stack systems.



Use of the acoustical silencer nozzle has virtually no effect on fan performance, with typical pressure drop of 0.1" w.g. static pressure exhibited. The fiberglass acoustical media in the silencers is protected from the air stream and weather elements, and retrofitting of the silencer nozzle onto your Tri-Stack fan is simple and straightforward, without requiring electrical disconnections.

Because the acoustical silencer nozzles (constructed of fiberglass) weigh about 60% less than comparable methods of fan attenuation, the need for structural



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www.met-pro.com/strobic.html
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reinforcement on the roof or complex mounting/stabilizing hardware is also eliminated. Lower weight combined with low profile design also keeps wind loading to a minimum. Acoustical silencer nozzle design allows fan motors to be easily accessible for convenient routine maintenance procedures, also minimized by the fan motors' direct drive configurations.