



# WEFTEC 2019 Aeration Blower True Cost Guide

# Agenda

- This WEFTEC guide will be continually updated over the next few weeks and available to WEFTEC attendees
- A networking directory is being prepared. It will not only include exhibitor and speaker contacts but also those of personnel at utilities, consultants and suppliers who will be at WEFTEC and want to interface with others having an aeration blower interest
- Attendees will also have access to Municipal Wastewater Blower True Costs which has comprehensive information on the options and can be the basis for discussions.
- Bob Mcilvaine will be facilitating discussions at the show and will also be the contact to submit information and networking contact information
- Bob Mcilvaine cell 847 226 2391 email [rmcilvaine@mcilvainecompany.com](mailto:rmcilvaine@mcilvainecompany.com)



# Speeches

# Aeration Improvements Yield Improved Settleability and Nutrient Optimization at the East End WWTF

Room S505b, 2-2:30 Monday, Sept 23

The aeration improvements project, including conversion to diffused aeration, three new integrally geared blowers, and incorporation of selector zones cost approximately \$12 million. Not only did the project address much-needed replacement of the aging aeration system, it provided the PWD an opportunity to enhance the process performance and reliability through improved settleability. The selector design also gives the PWD a head start in targeting effluent nitrogen reduction. The aeration system upgrades completed at the East End WWTF have helped the Portland Water District meet permit requirements, manage peak wet weather flows in Portland, and to embrace an 'adaptive management' approach to manage effluent nitrogen in a cost effective manner. Portland Water District selected single-stage integrally geared blowers because of lower long term operating costs.

Speakers

[Scott Firmin](#), Portland Water District

[Benjamin Levin](#), Hazen and Sawyer



# Beyond Ammonia-Based Aeration Control: Energy Saving, Performance Improvement, and Infrastructure Evaluation

Monday 4:00 -4:30 Room S503A

The District will start the following infrastructure evaluation: 1) Develop a consultant contract for blower control improvement to examine the turn down of existing blowers and to evaluate if an automatic blower control can provide a smooth air supply based on the air demand from the ABAC system; and 2) Perform an air piping evaluation and aeration tank oxygen transfer efficiency tests to evaluate if the air piping or diffuser plates could limit air supply.

## **Co-Author(s)**

[Joe Ford](#), MWRD GC

[Joseph Kozak](#), MWRD of Greater Chicago At Cicero Stickney WTP

[Scott Owen](#), Metropolitan Water Reclamation District of Chicago

[Heng Zhang](#), MWRD of Greater Chicago At Cicero Stickney WTP

## **Speaker**

[fenghua yang](#), Metropolitan Water Reclamation District of Greater Chicago (MWRD)

# Our Blowers are Too Large! We're Wasting Too Much Energy! Hmmm... Maybe Not

Tuesday Sept 24, 11-11:39 Room s501a

The findings in this study suggest that modifying one or more of the existing single stage gear driven centrifugal blowers will likely be the most cost-effective and preferred alternative for improving the aeration system performance. If process demands are driven down by 30% of the existing process requirements through improved control, modifying the existing Turblex blower would have a payback of approximately two years. Even if the aeration reduction is not improved, blower modification provides a favorable payback period of less than six years

## **Author and Speaker**

[Brock Hodgson](#), AECOM

## **Co-Author(s)**

[Ken Brischke](#), AECOM

[Brendan Cavanaugh](#), Colorado Springs Utilities

[Diego Rosso](#), University of California, Irvine

[Rahul Subramanian](#), Colorado Springs Utilities



# Witnessing Factory Acceptance Tests in Accordance With the New ASME Wire-to-Air Performance Test Code for Blower Systems

Tuesday 11:30-12 Room s501a

ASME chartered a new PTC committee to develop a new code for testing of wire power performance of blowers of the type commonly applied at WRFs. The committee includes representatives from leading equipment manufacturers, specifying engineering consulting companies, and WRF blower buyers. ASME PTC 13 was developed over a 7-year period and is now published with the goal of being the principal code to govern testing of aeration blowers for WRFs in the United States.

ASME PTC 13 was developed to make the process of blower testing more accessible for specifiers and purchasers of WRF blowers.

- The primary goal is to determine an accurate estimate of the overall electric (wire) power required for an aeration blower to supply a specified volume of air, with a specified pressure rise, at a specified set of anticipated site inlet conditions.
- Application of thermodynamic theory for testing is simplified by limiting scope to conveying humid air mixtures at pressure ratios (discharge pressure divided by inlet pressure) of 3 or less.

## **Author**

[Lloyd Slezak](#), Brown and Caldwell

## **Co-Author(s)**

[Mark Addison](#), Aerzen USA

[Andrew Balberg](#), Lone Star Blower

[Jacque Shultz](#), Howden

# 429 Mobile Session: Aeration Blowers

Tuesday 3:30-5 Room 4807 Hall A

- This mobile session will consist of visits to several blower manufacturers with a range of technologies including positive displacement, multi-stage centrifugal, and geared and gearless single-stage centrifugal blowers. Each manufacturer will be expected to provide a short presentation of their various products followed by a short question and answer period.

Technical Presentations by the following exhibitors:

APG-Nueros

Gardner Denver, Inc.

Next Turbo Americas, LLC

Sulzer Pumps Solutions Inc.

- Ken Brischke—AECOM
- Joe Rohrbacher-Hazen & Sawyer



# New Aeration Controls for Improved BNR Performance and Cost Savings

Monday, Sept 23, 4:30-5pm Room S 503A

The master blower controls provided at Upper Blackstone were programmed with four modes: (1) manual pressure, (2) manual flow, (3) auto pressure MOV, and (4) auto flow MOV. The two manual modes are included as a backup for maintenance purposes. The two auto modes are non-PID methods. Commissioning results from November 2018 suggest both Auto MOV modes are successfully achieving target DO set points with minimal hunting. Upper Blackstone will be testing both Auto MOV modes to evaluate whether the Auto Flow MOV mode truly provides a more stable operation and lower pressure compared to Auto Pressure MOV. The paper will also present lessons learned based on one year of operation after startup.

## **Speaker**

[Maureen Neville](#), CDM Smith

## **Author**

[Alexandra Doody](#), CDM Smith Inc

## **Co-Author(s)**

[Jeremiah Brown](#), Howden Roots

[Tim Hilgart](#), GE ROOTS

[Saed Hussain](#), CDM Smith

[Karla Sangrey](#), Upper Blackstone Clean Water



# Blower Exhibitors



# Aerzen - Stand 862

<http://www.aerzenusa.com>

Aerzen provides positive displacement blowers, hybrid blowers and turbo blowers for aeration in wastewater treatment.

McIlvaine Municipal Wastewater Blower System and Component True Costs has the following Aerzen slides

- Aerzen Rotary Lobe vs Screw Compressor
- Aerzen - Defining the Field of Operation
- Three different blower types provide lowest true cost at CMA
- Several slides relative to components such as filters

**Address:** 108 Independence Way , Coatesville, PA 19320-1653, USA



# APG Neuros - Stand 4408

<http://www.apg-neuros.com>

- APG-Neuros offers efficient and affordable high efficiency turbo blowers and aeration systems for municipal and industrial customers. With over 800 units installed and 140 on order, APG-Neuros offers the most proven product supported by a strong engineering and a well-established service network throughout North America and Europe.
- Our high speed turbo blower is considered as the industry leader for high efficiency and high quality. APG-Neuros product superiority is attributed to the application of the most technologically advanced and proven components from the aerospace industry such as the air bearing, permanent magnet synchronous motor and programmable logic controller (PLC) based aeration control system.
- Customer benefits include energy savings up to 35% elimination of heat rejection, vibration-free operation, noise reduction, smaller footprint, and lower installation costs compared to conventional products
- **Address:** 1270 Michele-Bohec, Blainville, QC J7C 5S4, CAN



# Atlas Copco Compressors - Stand 2816

<http://www.atlascopco.us>

Atlas Copco Compressors is an industry-leading global manufacturer and service provider of compressed air technology and quality air accessories with 24/7 service support. This year at WEFTEC we will be showcasing a wide range of energy efficient low-pressure air solutions ideal for the wastewater industry. Including our ZS blowers, with superior screw technology, that are on average 30% more energy efficient than traditional rotary lobe blowers. In each of the past five years, we have invested in opening new U.S. facilities to further support manufacturing, distribution and training for customers nationwide. Our sales and service representatives are right where our customers do business. The people of Atlas Copco are committed to your sustainable productivity

**Booth Contact:** Mr. Paul Humphreys

**Phone Number:** (803) 817-7479

**Address:** 1800 Overview Drive , Rock Hill, SC 29730, USA



# Becker Pumps Corp. - Stand 8515

<http://www.beckerpumps.com>

Becker manufactures the world's most widely used vacuum pumps, compressors and regenerative blowers in the Environmental Industry. Becker blowers and compressors deliver 100% oil free air with ZERO contamination from dirt and oil induced into your water or solution. With our new line of SV regenerative blowers, our single stage and double stage SV's offer excellent flows for either pressure or vacuum. Our oil-free rotary vane compressors provide low pressure air for many environmental tasks. Whether it's for water treatment, aeration and agitation, dewatering, air analysis or remediation, Becker offers perfect environmentally oriented solutions for you, including a "no noise" alternative with our new submersible blower. Whether you need an individual pump, compressor, application specific system or fully centralized pneumatic system, our technically trained Sales Team is ready to help.

**Booth Contact:** Darin Ladd

**Phone Number:** (513) 332-7338

**Address:** 100 East Ascot Lane, Cuyahoga Falls, OH 44223, USA



# Continental Blower, LLC - Stand 1253

<http://www.continentalblower.com>

- Continental Blower, LLC is a leading manufacturer of vertically split, cast iron and cast aluminum, multistage, centrifugal blowers and exhausters for air and gas handling applications.
- **Address:** 23 Corporate Circle, East Syracuse, NY 13057-1077, USA

# Gardner Denver, Inc. - Stand 2048

<http://www.gardnerdenverproducts.com>

- Gardner Denver offers a complete source of positive displacement blowers; Sutorbilt, DuroFlow, CycloBlower and HeliFlow. Our products provide proven results in numerous wastewater applications.
- **Address:** 1800 Gardner Expressway, Quincy, IL 62305-9364, USA



# GL-TURBO Houston - Stand 5255

<http://www.lonestarblower.com>

With the most efficient and reliable technologies in the market and more than 3,000 installations, our experience staff can uniquely offer the best technology to fit your application. Our products include: Geared Turbos: Integrally geared single stage turbo with variable inlet and discharge guide vanes 100 to 6,000 hp. Gearless Turbos: High speed blowers with permanent magnet motors 20 to 1,000 hp. Multistage Turbos: Vertically split cast iron multistage turbos 20 to 3,500 hp. Process Control

Lone Star can offer a more efficient and cost effective turn-key solution to the entire aeration or other process control. Our manufacturing facility in Houston, Texas USA can build and performance test blowers to comply with all published performance test codes including the soon to be released ASME PTC13 code. For the first time in the industry we can show true power consumption across all blower technologies. Service Matters! If you want immediate 24/7 response where no phone call goes unanswered, Lone Star is your company. We offer a high service alternative not available elsewhere in the industry and have local service centers throughout North and South America. Our aftermarket group provides repair services on most other major brand blowers besides our own. Lone Star is also part of the global GL-Turbo network to assist our customers no matter where they are. Industries served include Water and Wastewater, Power, Petro-Chemical, Oil and Gas, Food and Beverage, Mining, and other industries using low pressure compressed air or gas in pressure or vacuum applications. to try our products?

**.Phone Number:** (617)-204-3474



**Address:** 8883 West Monroe Road, Houston, TX 77061, USA

# Green Power Engineering Corporation - Stand 7351

<http://www.gpe.com.t>

- Green Power Engineering Corporation (GPE) has been engaged and served in development of turbine-related rotating machinery industry for more than 10 years. We have extensive experience and great ability in engineering integrates. Our four cores are a professional team, high specification analysis software, efficiency equipment and the best quality to provide the best technical services and products. We never stop to pursue innovation and development, with professional knowledge and experience. Our brand: Kavas Turbo Blower, which is one single stage centrifugal impeller and gear box design, with 85-90% performance. It can easily operate and maintain. The specs are 300~600KW with flow rate 3~9kg/s, and the pressure range is 1.4~2.0barA. The design is based on environmental and long-term saving
- **Booth Contact:** William Chen
- 
- **Phone Number:** +86-676955216
- 
- **Address:** No. 6, Luke 3rd Rd., Kaohsiung City, 82151, TWN

# Hardy Pro-Air Systems & Service - Stand 5512

<http://www.hardyproair.com>

Manufacturer of Blower Systems and Sound Enclosures for Wastewater Aeration.

**Booth Contact:** Scott Stevenson

**Phone Number:** (800) 658-0198

**Address:** 351 Main St, Antioch, IL 60002, USA



# Howden - Stand 4423

<http://www.howden.com/turblex>

- Howden's range of fans, blowers, compressors and steam turbines, together with premier brands Roots and Turblex, are highly reliable and efficient solutions for the environmental markets. Our rotary blowers and turbo compressor technology has been reliably serving wastewater applications for many decades, and with the added benefit of our Data Driven solutions we can recommend the most appropriate operational changes to optimize the performance of your rotating equipment. Howden's range of wastewater solutions are enhanced with a Data Driven Advantage, offering a unique and innovative digital solution; increasing the availability and reliability of critical assets, enabling plant optimization and delivering cost-effective aeration solutions and energy savings. With our range of steam turbines, we can offer solutions for all customer demands from the simple CORE for packages, up to extensively customised/engineered systems within the range up to 12MW. From our smallest turbo generator through to our single stage turbine and right up to our multi-casing steam turbine, we have the ideal industrial solution for your turbo needs.
- **Booth Contact:** Tim Hilgart
- 
- **Phone Number:** (417) 864-5599
- 
- **Address:** 4654 W Junction St, Springfield, MO 65802-1012, USA

# Inovair Blowers - Stand 5415

<http://inovair.com>

- Inovair is a U.S. manufacturer of modern high-efficiency compact, integrally-g geared turbo blowers and blower packages engineered for wastewater, pneumatic conveying, aircraft ground support equipment and other industrial applications. Inovair blower packages feature quiet operation, are the most affordable turbo blower design, and utilize industry standard, easily maintained micro controllers, VFD's and electric motors. Accessible Technologies is the parent company of both Inovair and ProCharger supercharger systems, and has been designing and producing industry leading turbomachinery for over 20 years.
- Glen Roderique (Glen.Roderique@Inovair.com) or Nate Neufeld (Nate.Neufeld@Inovair.com), Ph. 855-466-8247.
- **Booth Contact:** Nate Neufeld
- 
- **Phone Number:** (913) 469-7259
- 
- **Address:** 14801 W. 114th Terrace, Lenexa, KS 66215, USA

# Kaeser Compressors, Inc. - Stand 3625

<http://www.us.kaeser.com>

- Kaeser Compressors is a global leader in air system engineering, offering a wide range of rotary lobe and screw blower packages, industrial air compressors, and advanced system controls
- **Address:** PO Box 946, Fredericksburg, VA 22404-0946, USA



# Mapro International SpA - Stand 1458

<http://www.maproint.com>

- With over 60 years of experience, Mapro International is a global leading manufacturer of blowers and compressors for air, gas and biogas handling for waste water and sludge treatment plants. Custom and standard products include, high quality tri-lobe PD blowers, compact positive displacement blower packages, regenerative blowers, centrifugal fans, multistage centrifugal blowers and rotary vane compressors. Since 1959, from our Milan, Italy headquarter and production facilities, we export our products in more than 40 countries through our subsidiaries and distributors network. If you want something different for your WWT areation, try Mapro.
- **Booth Contact:** Mr. Moreno Sudani
- **Phone Number:** +39 0362366356
- **Address:** Via Vesuvio 2, Nova Milanese, 20834, Italy

# ShinMaywa America Ltd - Stand 623

<http://www.shinmaywaamerica.com>

- ShinMaywa, a worldwide manufacturer of submersible wastewater pumps, mixers and blowers. At our booth you can find live performance of our CNWX non-clog pumps
- **Address:** 6135 Park South Dr Ste 510, Charlotte, NC 28210-0100, USA





# Sulzer Pumps Solutions Inc. - Stand 2012

<http://www.sulzer.com>

- As one of the world's leading pump manufacturers Sulzer offers the most advanced equipment for water production, transportation, wastewater collection and treatment for municipalities and industries. These products include submersible pumps, mixers, flow boosters, aeration systems and turbocompressors, along with easy-to-use systems for monitoring and control. Our solutions provide many ways to boost reliability and cut your energy costs. With extensive knowledge and experience, we can identify the networks and systems where they will benefit you most. And we secure those benefits not only through our equipment, but also through our extensive service and support network
- **Address:** 140 Pond View Dr, Meriden, CT 06450-7142, USA



# The Spencer Turbine Company - Stand 851

<http://www.spencerturbine.com>

Spencer designs, engineers and manufactures air and gas handling equipment solutions including energy-efficient AyrJet<sup>®</sup> high-speed turbo blowers and Power Mizer<sup>®</sup> multistage cast centrifugal blowers for water and wastewater aeration applications and custom fabricated gas pressure-booster blowers and skid packages for biogas, landfill, and digester applications.

**Booth Contact:** Paul Burdick

**Phone Number:** (860) 748-7117

**Address:** 600 Day Hill Rd, Windsor, CT 06095, USA



# Tomorrow Water - Stand 7539

<http://www.bkt21.com>

- Over a twenty-year history, BKT has developed and commercialized its BioFiltration (BBF) system as a versatile solution capable of combining both physical filtration and biological treatment in a single reactor. Now with over 40 references worldwide, BBF is a proven technology specialized in the treatment of municipal wastewater, groundwater, and high-strength industrial wastewater. Certified for compliance with CA Title 22, BBF is not only suitable for the upgrading and retrofitting of existing wastewater treatment plants but also for integration into new wastewater reuse facilities. Recognized by WERF's LIFT Program as a substitute for the primary clarifier, BBF can also remove solids and soluble organics for carbon diversion and to control wet weather flow. In the treatment of groundwater, BBF minimizes operating expense by achieving simultaneous reduction of contaminants such as nitrate, perchlorate, and selenium without generating concentrated brine streams. Furthermore, BBF's robust DUAL MEDIA functionality facilitates broad capability for the removal of nitrates from high-strength industrial wastewater streams, i.e. livestock and acid mining drainage wastewater. Initially designed to deliver the highest performance for conventional functions, the BBF system has been upgraded over decades of R&D to resolve emerging challenges and address tightening future regulations. Today, BBF continues active development in combination with innovations including Anammox, algae, and granule technologies. In pursuing the ultimate goal of converting wastewater from cost stream to profit stream, BKT has extended its commitment to innovation to energy efficiency solutions, such as Thermal Hydrolysis, Turbo Blower, and Activated Anaerobic Digestion technology. Delivering creative solutions to long-standing issues associated with the use of conventional technology, BKT seeks to transform wastewater itself into a resource through "Innovation beyond waste."
- **Booth Contact:** Mr. James Kim
- **Phone Number:** (310) 658-4494



**Address:** 1225 N Patt St, Anaheim, CA 92801, USA