



Venturi injectors provide highly efficient transfer of ozone for water treatment in a wide range of industrial applications.

Ozone Industry Sets Its Sights on Industrial Applications

By Jim Lauria

Ozone has proven its efficacy, efficiency and value in drinking water treatment for years. Now ozone proponents are turning their sights on industrial applications, where the same benefits that have made ozonation so attractive in municipal water treatment can be applied across a much wider range of water quality challenges.

The International Ozone Association (IOA) Pan American Group has drawn together scientists, engineers and marketers from across the ozone industry to help suppliers from every corner of the business benefit from the growing interest in the power of the aggressive oxidant. The IOA's Industrial Committee is actively advocating for the use of ozone, promoting research, educating the water industry about the use of ozone in an array of industrial applications and seeking case studies to help illustrate how ozone improves our lives daily.

Key benefits

Water treatment professionals have long recognized how effective ozone is in clean-in-place (CIP) systems, laundry, pulp and paper, mining and other industries. As ozone gains traction in industry after industry, certain key benefits float to the top. Of course, efficacy is first and foremost. Ozone works, and it works fast—even faster than peroxide. In just a few seconds, an ozone molecule will blast most organic contaminants, rendering them harmless. And because ozone

dissolves readily in cold water, ozone treatment is extremely energy-efficient in processes like laundry and sanitation.

The powerful bleaching action of ozone has driven its extensive use in pulp and paper manufacturing, and the beneficiation of minerals like kaolin clay, where bright, white color is an indicator of quality. Other mining applications of ozone include the detoxification of compounds like cyanide into cyanate or the oxidation of selenium. As pressure increases to reuse water in mining—or any other industry—fast, efficient treatment will be a key part of the picture and ozone is proving itself to be a great fit. Another great strength of ozone systems is that they are largely self-contained, making them well adapted to remote applications. Generated on-site from oxygen or air, ozone does not require the storage or handling of dangerous chemicals.

In ozonation reactions or degassing processes, ozone is quickly converted to atmospheric oxygen. In terms of its chemical activity, ozone is like the perfect assassin. In its molecular ozone form, it is a specific oxidant that targets aromatic and aliphatic compounds—including pathogens and phenolic compounds that produce off-tastes and odors—kills quickly and effectively, then disappears into thin air. Converted into a hydroxyl radical, it storms a much wider range of contaminants in a flurry of oxidation before becoming neutralized.



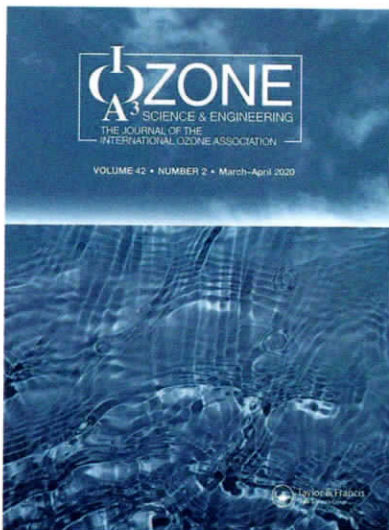
The International Ozone Association (IOA) unites scientists, engineers and marketers to advance the ozone industry. Visit Pan American Group website at <https://www.ioa-pag.org/>

Science emphasis

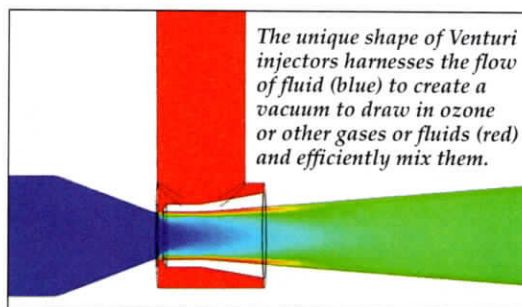
Members of IOA range from manufacturers of ozone generators and other ozone-specific machinery to the consulting engineers who design ozonation systems for their clients. The organization has a firm grounding in science and a mission to dig deep into the technology, so the emphasis is on rigorous testing, data sharing and detailed analysis.

Venturi injectors are widely used in efficiently injecting and mixing ozone into anything from pool water to winery CIP systems to massive treatment units at remote mining sites. Because IOA has drawn players from upstream and downstream in the market, their activities have proven to be fertile ground for collaboration, innovation, networking and letting ideas germinate and grow among colleagues involved in every aspect of ozonation.

In many marketing case studies, it is enough to know that ozone in a CIP system doesn't require hot water and high pressure like conventional detergent CIP systems. In contrast, IOA's online case study on CIP explains how analysis of a large ozone CIP system in a bottling plant saved \$72,000 (USD) in energy costs and \$300,000 in chemicals annually, while improving bacterial control. IOA's page on ozone in pulp and paper applications links to dozens of peer-reviewed articles in *Ozone: Science and Engineering* on the topic.



Ozone Science & Engineering, published by the International Ozone Association, provides data-driven, peer-reviewed insight into the use of ozone in an ever-growing range of applications.



The unique shape of Venturi injectors harnesses the flow of fluid (blue) to create a vacuum to draw in ozone or other gases or fluids (red) and efficiently mix them.

Constant flow

IOA is continually sharing new information with members. As COVID-19 continued its spread in early summer, Barry Loeb, Editor-in-Chief of *Ozone: Science and Engineering*, alerted readers to promising trials of an ozone treatment for scarce N95 masks and studies of ozone-based decontamination systems for rooms in hospitals and hotels. Of course, the pandemic has put several IOA meetings on hold, including the Pan America Group conference scheduled for August in Las Vegas, NV. The organization is responding, however, by bringing members together online for conferences, such as a recent session on CFD or the upcoming presentation on ozone in mining applications. As IOA's website notes: "We're only beginning to discover ozone's potential." This is the time to get involved with the organization at the forefront of those discoveries.

About the organization

◆ The International Ozone Association is a non-profit educational and scientific organization dedicated to the collection and dissemination of information on, and to promote research in, any and all aspects of ozone and related oxygen species technologies. Through the organization, members gain access to the most cutting-edge information on ozone technology. For more information, please visit the website <https://ioa-org.org/>

About the author

◆ Jim Lauria is Vice President of Sales & Marketing for Mazzei Injector Company, LLC. Since graduating with a Bachelor of Chemical Engineering degree from Manhattan College, he has traveled the world benchmarking the best global water management practices. Lauria is a member of the IOA-PAG Executive Operating Committee and co-Chair of their industrial committee. He can be contacted at jlauria@mazzei.net.



About the company

◆ Mazzei Injector is a fluid design company that manufactures mixing and contacting systems for ozone injection and other municipal and industrial water treatment applications. The company, built by an engineer and driven by data-rich pursuits such as its in-house computational fluid dynamics (CFD) lab, is a perfect match for the International Ozone Association's passion for science-based industry development. The company is a proud silver year-round sponsor of the IOA.



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