



Benchmark
International

Advantages of VPSSA Technology for Your Application

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Oxygen is not only essential for survival but also plays a crucial role in highly diverse industries. Many applications, from agriculture to water treatment plants, require a reliable source of concentrated, high-purity oxygen, and there are several types of systems designed to meet these needs. Pressure swing adsorption (PSA) is a system that compresses air first and then extracts oxygen. Since air is roughly 78% nitrogen, it takes a significant amount of energy for these units to compress all the chemical elements in the air.

A far more efficient alternative is to use vacuum pressure swing adsorption (VPSA) technology. These systems extract oxygen from the air first and then compress the oxygen only.

Oxygen Solutions delivers on the most technologically advanced oxygen concentration equipment with vacuum swing adsorption technology, which is industry-recognized as the most efficient in the market and provides numerous advantages over PSA processes.

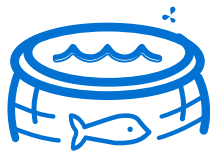
VPSA technology uses different equipment than PSA and requires significantly less energy, resulting in an average cost savings of one-third to one-half in comparison to PSA systems.



Applications for VPSA Technology

Before going into detail about the more general benefits of VPSA units, we will examine the advantages that industries gain from using this technology. Concentrated oxygen is essential to many industries, and being able to produce sufficient oxygen on location at a specific purity and at a reasonable cost is important.

VPSA technology from Oxygen Solutions meets even the most highly demanding oxygen needs with reliable, self-sustaining systems. Some of the industry sectors in which our unique technology has applications are:



Aquaculture

Oxygen Solutions is one of only a handful of companies producing smaller VPSA units suitable for recirculating aquaculture system (RAS) applications.

Our technology facilitates consistent water aeration, which helps to increase fish yields and decrease the likelihood of disease and algae blooms.



Mining

VPSA technology increases the safety of mining operations by enabling on-site oxygen generation. It also decreases operational expenses and increases profit, particularly in gold and mineral mining applications where it boosts recovery yield rate. VPSA systems reduce the use of cyanide in both the leaching process and wastewater discharge.



Water Treatment

In water treatment applications, VPSA technology significantly lowers operating costs and offers long-term system functionality along with the best water taste possible. Reliable oxygen generation delivers reduced air pollution contamination risks, as well as a reduction in treatment process odor. VPSA systems work efficiently and ensure the prevention of CO₂, VOC, and THM levels in the water.



Wastewater Treatment

As in the pulp and paper industry, wastewater treatment plants greatly benefit from the stimulated aerobic bacteria growth VPSA technology enables. Oxygen concentrators from Oxygen Solutions in these applications are highly portable and adaptable to the needs of each location. Our technology's dependability enables wastewater treatment facilities to consistently meet production demands in ridding the water of impurities, regardless of the extent of their oxygen needs.



Medical

On-site oxygen concentrators from Oxygen Solutions are safer to use than tanks and cylinders and eliminate the expense of purchasing oxygen. Our technology's large-scale capabilities meet any level of oxygen demand, and there is no need to worry about diminished supply with the use of remote monitoring.



Agriculture

In aeroponic and hydroponic growing systems, VPSA technology decreases overall oxygen costs, improves plant root systems, and reduces bacterial and fungal growth.



Pulp and Paper

The consumption of expensive bleaching chemicals is greatly reduced by using VPSA technology in pulp and paper production processes. The delignification of pulp, sodium sulfide oxidation, and alkali extraction speeds are increased.

The wastewater organic material degradation process also benefits from reliable, high-quality oxygen as it stimulates aerobic bacteria growth.

Unique Benefits of VPSA Systems

When it comes to oxygen concentration technology, VPSA units offer many impressive advantages over other systems. VPSA systems are the most powerful option available for large-scale oxygen requirements and feature several additional noteworthy benefits, including:

- High-efficiency capabilities
- Simple architecture
- Low energy requirements
- Low operating costs
- Purity of up to 95%
- Customizable solutions to meet the unique needs of each application

In comparison to PSA systems, VPSA solutions provide a greater number of beneficial capabilities.

Suitable for Challenging Environments

Oxygen Solutions provides VPSA technology that is portable and easily installed even in difficult locations. Our modular units provide dependable onsite oxygen supplies that are self-replenishing so that the most critical applications are never without oxygen. In potentially dangerous environments, such as throughout the mining industry, VPSA systems increase safety.



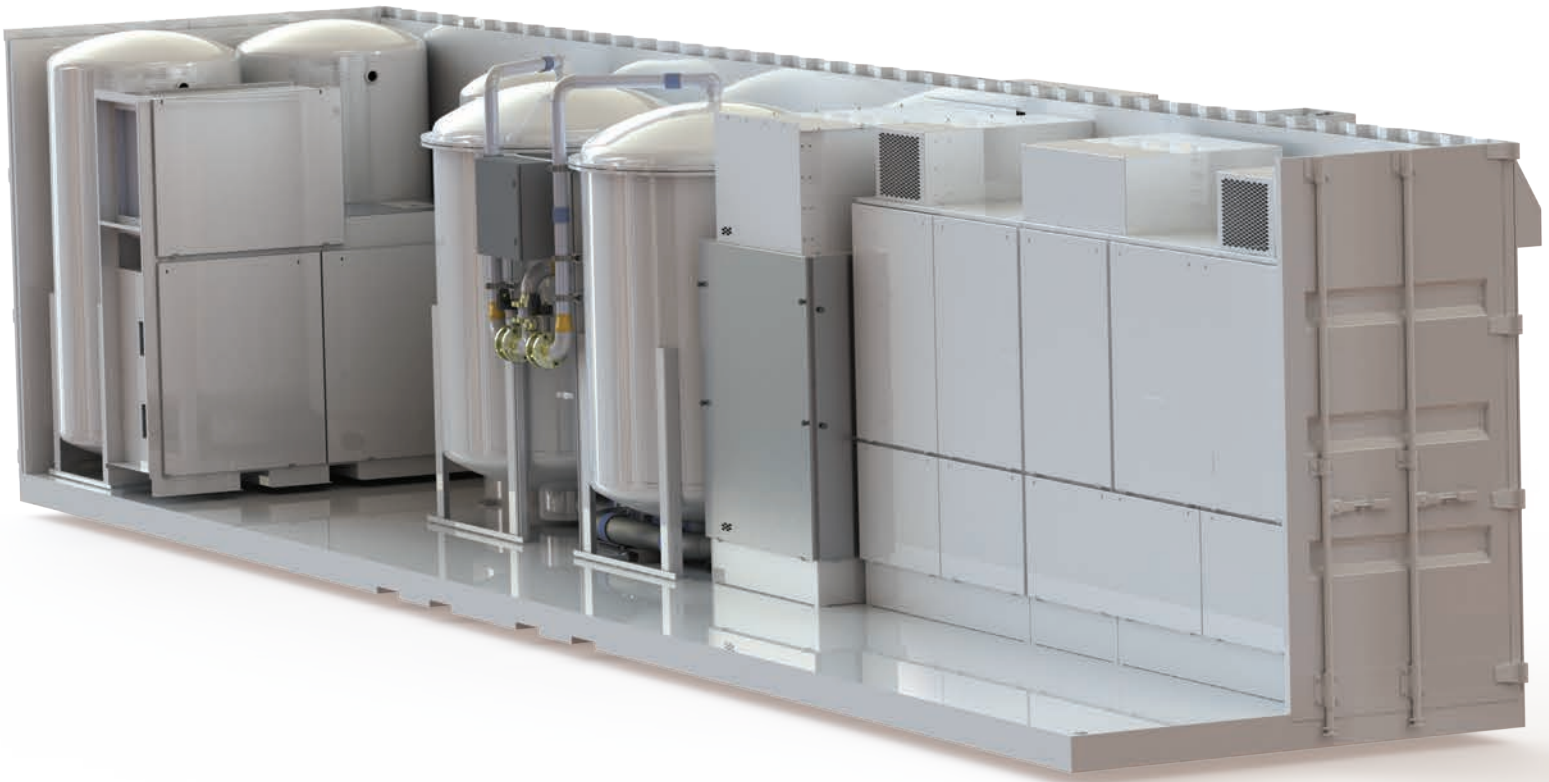
In demanding industries like the military, our technology takes up minimal space and is movable and quickly installable. Additionally, in comparison to PSA systems, VPSA technology performs better in humid environments. Its lower operating pressure minimizes the potential for water condensation. At high altitudes, where PSA technology can perform less optimally, there is virtually no degradation of VPSA technology performance.

Increased System Lifespan

The design of VPSA technology delivers a long performance lifespan. Whereas PSA systems typically require sieve material repacking every 3-5 years, VSA absorber beds last throughout the lifespan of the unit, which can be greater than 10 years. Oxygen Solutions' concentrators ensure low maintenance costs through systems that operate reliably year after year.

Fewer Required Components

In comparison to PSA systems, VPSA technology is simplified and does not require a high-pressure air compressor or dryer system. This cuts down on the need for extensive maintenance. VPSA units feature an oil-free blower that eliminates oil carryover problems. VPSA systems utilize lower operating pressure that eliminates molecular sieve breakdown when the sieve bed removes nitrogen from the air. In fact, sieve never needs adding to the sieve bed because VPSA systems function at only about 10% of PSA system operating pressure.



VPSA Solutions From Oxygen Solutions

VPSA technology from [Oxygen Solutions](#) is highly adaptable to the needs of each application and delivers a buildable, efficient supply of oxygen to nearly any environment. These units overall provide ease of maintenance and act as a reliable, self-sustaining source of quality compressed oxygen.

Our team of experts has the background to help with your company's individual oxygen needs. If you are wondering how much money you could save by switching to a VPSA system from Oxygen Solutions, try our [oxygen calculator](#) to find out. For technical questions or to receive more general information from our representatives about our ozone generators or our single and dual bed concentrators, please [contact us](#) today.

Contact Us



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5304 36 Street NW, Edmonton, Alberta T6B 3P3, CA

www.osioxygen.com | info@osioxygen.com | 1.866.416.0516