
























## Applications **NITROSWING<sup>®</sup> Nitrogen Generators** and **OXYSWING<sup>®</sup> Oxygen Generators**

	<b>Nitrogen</b>	<p><b><u>Aircraft Tires Inflation</u></b></p> <p>Nitrogen is non-combustible and dry. This combination requires all airliner tires, that are subject to severe operating conditions, to be filled with nitrogen to eliminate condensation freeze at high altitude and to avoid any accidents.</p>
	<b>Nitrogen</b>	<p><b><u>Air-Driven Tools / Machinery</u></b></p> <p>The lifetime of air driven tools and machinery is in strict relation with the dryness of the compressed air. Since nitrogen has superior dryness (dewpoint &gt;60°C) than compressed air, with the use of nitrogen the lifetime of tools and machinery is significantly improved.</p>
	<b>Nitrogen</b>	<p><b><u>Autoclaves</u></b></p> <p>In composite processing, a dry-air autoclave is pressurized with Nitrogen gas and then internally heated. Specialized materials will bond or "cure" in an autoclave. The process is intended to produce certain properties unfound in raw materials such as light weight with great strength or specific type of rigidity. Materials with great strength and light weight are advantageous to many industries such as aerospace, automotive, and many others.</p>
	<b>Nitrogen</b>	<p><b><u>Bacteria Elimination</u></b></p> <p>The use of nitrogen to replace ambient air, containing oxygen, creates a so-called hypoxia which prevents bacteria to survive. This prevents organics to be contaminated by unwanted bacteria and avoids mold or mildew formation.</p>

	<p><b>Nitrogen</b></p>	<p><b><u>Beverage Storage</u></b></p> <p>Use of Nitrogen has become very common to prevent product oxydation and any enzymatic or microbiological reaction. Nitrogen is a gas that is inert, odourless, it cannot be dissolved, it is non toxic and it reduces the use of additives.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Beer Foaming</u></b></p> <p>When beer is foamed using nitrogen, the hordein-derived polypeptides produce the most stable foams thus giving the beer a mouthfeel and 'creamy' texture.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Bicylce Manufacturing</u></b></p> <p>Bicycle framebuilding is made by assembling pipes through a welding and or brazing process. The most efficient and cost effective method is that of propane/oxygen brazing.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Blanketing for Adhesive Curing</u></b></p> <p>Furnaces where adhesive compounds are applied to various tape materials are purged with nitrogen, thus reducing the incidence of poor adhesive bonds, or hazardous atmospheres due to chemicals used for the bonding process.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Bottling</u></b></p> <p>The turbulence that results from bottling, has the potential to mix a lot of air with the liquid to be bottled, increasing the risk of oxidation. Nitrogen works to displace the oxygen and preserve the liquid during bottling.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Bright Annealing</u></b></p> <p>To obtain maximum brightness during annealing, this application requires addition of nitrogen in the oven. The higher the temperature in the oven, the higher the nitrogen purity shall be.</p>







	<p><b>Nitrogen</b></p>	<p><b><u>Carbon Fiber Curing</u></b></p> <p>Small curing facilities for materials such as metal, Carbon fiber, Kevlar, and other high strength fibers are an ideal application for on-site nitrogen generators.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Chemical Plants</u></b></p> <p>Nitrogen is used to inert the headspace in chemical storage or process tanks. Creating an oxygen-deficient environment defeats hazards or prevents explosive environments.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Coil Tubing</u></b></p> <p>For your safety during maintenance or remedial treatments on an oil or natural gas well, air has to be replaced with inert nitrogen to prevent explosions.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Controlled Atmosphere Fruit Storage</u></b></p> <p>A typical storage system for fruit is controlled-atmosphere (CA) storage. In CA storage the oxygen and carbon dioxide content of the storage environment are controlled in such a way as to retard senescence and further deterioration of the fruit. Oxygen levels are reduced by displacing oxygen with nitrogen.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Copper Mining</u></b></p> <p>The dried copper concentrate is fed into a furnace with oxygen. This melting process separates the slag from the molten copper which is then additionally refined.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Curing</u></b></p> <p>Curing facilities for materials such as metal, Carbon fiber, Kevlar, and other high strength fibers are an ideal application for on-site nitrogen Generators.</p>

	<p><b>Oxygen</b></p>	<p><b><u>Disaster Management</u></b></p> <p>In case of infrastructure breakdown oxygen can no longer be delivered. Under these circumstances an on-site medical oxygen generator is the only reliable source.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Enhanced Oil Recovery</u></b></p> <p>For pressurization of oil wells, nitrogen is an ideal gas choice. It increases productivity, and has no corrosive effect on borehole piping (unlike carbon dioxide).</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Ethanol Production / Bio-fuels</u></b></p> <p>Nitrogen is used to eliminate moisture while pressurizing, blanketing, and inerting storage and holding tanks.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Explosive Atmospheres</u></b></p> <p>Controlling gas/vapor explosion hazards is often a necessity of chemical process safety. The safest way to prevent explosions is to displace oxygen by inert nitrogen.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Field Hospitals</u></b></p> <p>Oxygen supply in remote locations and in lacking or total absence of any infrastructure is automatically related to on-site Oxygen generation. Containerized Medical Oxygen Generators are the ideal solution.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Fire Extinguishers</u></b></p> <p>Dry chemical extinguishers come in a variety of types and are suitable for a combination of class A, B and C fires. These are filled with foam or powder and pressurized with nitrogen.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Fire Prevention/Suppression</u></b></p> <p>Nitrogen is an excellent fire prevention and fire suppression tool, reducing the oxygen concentration in a most cost effective manner on-site.</p>

	<p><b>Oxygen</b></p>	<p><b><u>Fish Farms / Aquaculture</u></b></p> <p>Fish hatcheries are well aware of the benefits of oxygen on fish health, fish growth and fish density maximizing. For remotely located fish farms, oxygen on-site production is an indispensable oxygen source.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Food Industry</u></b></p> <p>Nitrogen is an efficient, cost-effective way, without the use of additives to stop bacterial growth, reduce oxidation, preserve product taste and texture, extend product shelf life and to improve the visual appeal of freshness.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Fuel Tank Inerting</u></b></p> <p>For the replacement of potentially explosive fumes in fuel tanks, nitrogen is used to blanket the headspace of the tanks.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Gas Assisted Injection Molding</u></b></p> <p>The principle of this process is that nitrogen gas is injected during moulding, either through the sprue or directly into the mould tool. At a controlled high pressure this has the benefit of overcoming sink marks or introducing a cavity without the need of any core.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Glass Blowing</u></b></p> <p>Glassblowers produce from medical and labor glass, to Christmas ornaments, to glass jewelry and light bulbs. Oxygen is used as comburent gas on the glass blowing torches.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Gold Leaching</u></b></p> <p>Intensive cyanidation leaching has been used commercially for the treatment of gravity concentrates containing coarse gold. The leaching kinetics are increased by increasing cyanide and oxygen concentrations.</p>





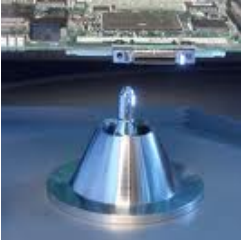


	<p><b>Nitrogen</b></p>	<p><b><u>Grain Silos Explosion Prevention</u></b></p> <p>Grain dust in oxygen-rich grain silos and grain elevators is very hazardous. Nitrogen is used to inert, eliminating explosions.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Health &amp; Beauty Aids</u></b></p> <p>Oxydation by ambient air would compromise raw materials and various ingredients. By using nitrogen for inerting, the risk of any oxydation is totally eliminated.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Heat Treating</u></b></p> <p>Heat Treatment is the controlled heating and cooling of metals to alter their physical and mechanical properties without changing the product shape. To avoid any unwanted oxydation during this process kilns, ovens and furnaces are blanketed with nitrogen.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Inerting</u></b></p> <p>Displacing oxygen with nitrogen prevents explosions and retards oxidation so ensuring safety and quality at the same time.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Jewelry Manufacturing</u></b></p> <p>If gold melting furnaces contain oxygen, the risk is to discolour or weaken the product. Therefore ambient air in furnaces has to be displaced with nitrogen.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Kiln/Grain Drying</u></b></p> <p>The extremely low dew point of nitrogen makes it an ideal choice for drying of grain and kiln, so efficiently inhibiting microbial growth.</p>







	<p><b>Nitrogen</b></p>	<p><b><u>Laser Cutting</u></b></p>
	<p><b>Nitrogen</b></p>	<p><b><u>Laser Welding</u></b></p>
	<p><b>Nitrogen</b></p>	<p><b><u>Lead-Free Soldering</u></b></p>
	<p><b>Nitrogen</b></p>	<p><b><u>Leak Check</u></b></p>
	<p><b>Oxygen</b></p>	<p><b><u>Medical Oxygen</u></b></p>
	<p><b>Oxygen</b></p>	<p><b><u>Metal Furnitures Manufacturing</u></b></p>

	<p><b>Nitrogen</b></p>	<p><b><u>Milk Powder Packaging</u></b></p> <p>Packaging of milk powder with MAP system, increases its shelf life and avoid product rancidity.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Mine Fires</u></b></p> <p>By reducing the oxygen concentration by means of nitrogen there is inhibition of primary and secondary combustion, gas explosions are prevented and fire zones can be sealed.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Mine Trucks Tire Inflation</u></b></p> <p>Compressed air contains oxygen and therefore water vapor that causes higher tire temperatures, pressure variation, and corrosion of the tire components. This results in increased tire wear. Due to the lack of moisture, nitrogen inflated tires do not oxidize and run cooler, leading to longer tire life.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Mobile Medical Unit</u></b></p> <p>Mobile Medical Device certified PSA O<sub>2</sub> generators provide life-saving, medical grade breathing O<sub>2</sub> for hospitals and shelters.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Modified Atmosphere Packaging</u></b></p> <p>Nitrogen is an efficient, cost-effective way, without the use of additives to stop bacterial growth, reduce oxidation, preserve product taste and texture, extend product shelf life and to improve the visual appeal of freshness.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Neon Light Manufacturing</u></b></p> <p>To bend the neon light tubes to the desired shape, they have to be heated by means of a flame from an oxygen fed torch.</p>



	<p><b>Oxygen</b></p>	<p><b><u>Ozone Generating</u></b></p> <p>Most Ozone (O<sub>3</sub>) generators produce this gas out of compressed air. By using oxygen (O<sub>2</sub>) as feedgas instead of air, the ozone generator efficiency is significantly increased.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Oxy-acetylene Brazing</u></b></p> <p>Brazing is a process that is well matched for PSA generated oxygen thus avoiding the use of oxygen in cylinders and relevant dangerous cylinder handling. The ratio of oxygen to acetylene should always be two to one.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Oxygen Lancing</u></b></p> <p>During oxygen lancing process, a pipe pumping oxygen is used to clear slag near the outlet of the smelter vessel, so that liquid iron can flow freely.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Off Shore Platforms</u></b></p> <p>On off shore applications air is replaced with inert nitrogen so to displace oxygen to retard oxidation and inhibit any explosion or fire.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Oil Extraction</u></b></p> <p>Nitrogen is used to repressurize depleted oil wells. Along with the benefit of increased productivity, inert nitrogen has no corrosive effect on borehole piping.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Pharmaceuticals</u></b></p> <p>Most pharmaceutical applications are blanketing, inerting and sparging, preventing oxidation processes and/or reduce flammability.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Pipeline Drying</u></b></p> <p>The extremely low dew point of nitrogen makes it an ideal choice for drying of pipelines. As a value-added feature, nitrogen is totally inert thus retarding oxidation and preventing explosions.</p>

	<p><b>Nitrogen</b></p>	<p><b><u>Pipeline Inerting</u></b></p> <p>Nitrogen is the gas of choice to displace oxygen, retard oxidation, break the “burning triangle,” and prevent explosions.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Pipeline Pigging</u></b></p> <p>Using nitrogen as an inert propellant for moving “pigs” through pipelines during performing major maintenance or remedial treatments is the ideal solution.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Printing</u></b></p> <p>High-speed printers require nitrogen for drying and to prevent oxygen contamination during film production and separation.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Refineries</u></b></p> <p>Nitrogen is used to inert storage or process tanks as well as move product through pipelines at refineries. Nitrogen prevents hazardous or explosive environments.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Selective Soldering</u></b></p> <p>The benefit of using nitrogen in many solder applications is reduced dross on solder pots and reduced surface tension, which allows solder to cleanly break away.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Semi-Conductors</u></b></p> <p>High purity nitrogen for inertion is used by component level manufacturers and semi-conductor producers.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Sewage Treatment</u></b></p> <p>Injecting oxygen into treatment basins increases highly bacteriological survival and regeneration. The aerobics are well protected by using supplemental O<sub>2</sub> to keep PPM at high level.</p>

	<p><b>Nitrogen</b></p>	<p><b><u>Sintering</u></b></p> <p>To form a coherent bonded mass by heating metal powders, without melting, the sintering process is used. Oxygen, which oxydises the metal, is replaced by nitrogen so to create an inert atmomphere during the sintering process.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>SMT (Surface Mount Technologies)</u></b></p> <p>Adding nitrogen to an SMT line offers benefits like higher quality by eliminating causes of voids, with an economical cost and continuous operation.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Solvents blanketing</u></b></p> <p>Solvents are blanketed with nitrogen and stored in double walled underground tanks with automatic management of leaks and levels.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Underbalanced Drilling</u></b></p> <p>Nitrogen is used as the circulating fluid medium on underbalanced drill rigs, to drill oil and gas wells where the pressure in the wellbore is kept lower than the fluid pressure.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>UV Curing</u></b></p> <p>UV Curing of very thin coatings such as some silicones can only be achieved if the oxygen is excluded. Benefits are: process a wide variety of substrates, better chemical resistance and adhesion, faster cure speeds, thinner coating weights, lower photoinitiator levels, increased production speeds, reduced energy consumption and more consistent curing.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Vessels blanketing</u></b></p> <p>A cover of nitrogen over the surface of a stored commodity will prevent it from harming personnel, equipment, or the environment. It may prevent liquid from vaporizing into the atmosphere. It can reduce the ignition of flammable or combustible liquid. In addition it can simply prevent oxidation of the commodity.</p>

	<p><b>Oxygen</b></p>	<p><b><u>Veterinarians</u></b></p> <p>Medical Oxygen with a purity of 95% is used either during and after surgical procedures.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Waste Water Treatment</u></b></p> <p>Oxygen is injected into water treatment ponds for aerobic biological treatment, for hydrogen sulphide control and for ferrous &amp; manganese precipitation.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Wave Soldering</u></b></p> <p>To eliminate the silvery sludge (called dross) that covers the surface of the solder pot, nitrogen is used in solder applications. In addition it reduces the surface tension.</p>
	<p><b>Oxygen</b></p>	<p><b><u>Wellness</u></b></p> <p>Beauty Farms and Wellness Centers nowadays use oxygen for a number of different applications/treatments with the aim to increase people's wellness.</p>
	<p><b>Nitrogen</b></p>	<p><b><u>Winemakers</u></b></p> <p>Nitrogen gas is commonly used in wineries during different production stages such as sparging, blanketing and flushing. This to reduce enzymatic oxidation, bacterial growth and preserve the wine from oxidation.</p>