**Oxygen Concentrator FAQ**



**How does PSA work?**

PSA uses a material called molecular sieve for gas separation. This zeolite-based sieve has a preferential adsorption effect on nitrogen gas. Clean， dry air is passed through the sieve bed on the oxygen generator (PSA oxygen machine， oxygen generator) to produce an oxygen-rich gas.

**What is Pressure Swing Adsorption (PSA) technology?**

PSA is one of several technologies currently used to separate oxygen from air.

**Does the equipment have to be air-conditioned?**

PSA oxygen generators perform best at temperatures between 40 degrees Fahrenheit (4 degrees Celsius) and 80 degrees Fahrenheit (27 degrees Celsius).

**Does the equipment room need humidity control?**

PSA oxygen generators perform best when the dew point of the incoming air is 40 degrees Fahrenheit (4 degrees Celsius) or below. Depending on the model selected and the inlet air equipment provided (air compressor， dryer， air booster tank and inlet air filter)， the room may or may not require humidity control. Please consult the equipment for recommendations on specific applications.

**Does the oxygen generator (PSA oxygen machine， oxygen concentrator) have to be in the room?**

The standard XITE oxygen concentrators are designed for use indoors.

**What are the maintenance requirements for PSA oxygen concentrators?**

PSA oxygen concentrators have internal filters and it is recommended that the elements be replaced approximately every 6 months in 24/7 operation. In addition， the valves will need to be modified every few years. Most maintenance will involve service of the air compressor as recommended by the air compressor manufacturer.

**Can the air preparation equipment be located in a separate area from the oxygen generator?**

The air preparation or supply equipment can be located in a separate room from the oxygen concentrator.

Can an oxygen generator (PSA oxygen machine， oxygen concentrator) be operated with a contaminated screen and what are the consequences?

PSA oxygen generators can still be operated after contamination， but a reduction in oxygen purity and flow should be expected. This can be critical in many applications， such as hospitals where oxygen is being inhaled.

**How long does a molecular sieve last?**

The lifetime of a molecular sieve is based on the quality of the inlet gas. If the inlet gas quality always meets the recommended standards， the molecular sieve can be used indefinitely (20 years or more!) . If the molecular sieve is contaminated with oil， dust or water， can it be cleaned or replaced? If the molecular sieve is contaminated with oil， it must be replaced. Water contamination， depending on the degree， does not necessarily mean that the sieve needs to be replaced. Dirt is a rare reason to replace a sieve， but other contaminants such as ammonia can cause the sieve to fail. Consult the equipment for specific air contamination that may be present at the generator site.

**Are molecular sieves easily available， or are they difficult to obtain in many locations?**

There are several suppliers of molecular sieves around the world.

**Is it easy to replace molecular sieves and what is the cost?**

All XITE oxygen generators are designed to allow for sieve replacement in the field. The cost of replacing the sieve depends on the model and size of the generator.

**Can I use a regular compressor， or do I need an oil-free compressor?**

PSA oxygen generation does not require an oil-free compressor as long as the quality of the incoming air is maintained.

**Are all zeolite molecular sieves the same?**

Not all zeolite molecular sieves are the same， and even the brands made in different places can vary.

**Are oil-free compressors more expensive than regular compressors?**

Oil-free air compressors are usually much more expensive than oil-lubricated versions.

**Can any air compressor be used for the XITE PSA O2 generator?**

We only recommend good quality intake equipment (air compressors， dryers and intake filter sets) to meet our air quality requirements ISO 8573.1 class 1.4.1. The details of this specification are shown on the general arrangement drawings for each of our models. We also recommend using good quality intake equipment so that the intake air will be as good in the future as it was on day one.

**Do I need a dryer to prepare the air?**

The intake air quality specification for the XITE PSA oxygen generators requires a dew point value of 40 degrees Fahrenheit (4 degrees Celsius) or less. If the local ambient air conditions are higher than this value， an air dryer is required.

**What happens if an air compressor fails and oil is introduced into the air line?**

Excessive oil from the air compressor can contaminate the molecular sieve and damage the PSA oxygen generator.

**Does air pretreatment require a dryer， or can I use a standard refrigeration dryer?**

Air pretreatment does not require a dryer， in most cases a refrigeration dryer will suffice.

**Can I use a desiccant dryer if I want， and are there any advantages or disadvantages?**

A desiccant dryer can be used instead of a freeze dryer， and slightly better performance can be expected from oxygen generators (PSA oxygenators， oxygen generators). However， this improved performance may not offset the loss of energy and cost.

**What happens if the air dryer fails or stops working?**

If the required air dryer fails， damage to the PSA oxygen generator can occur due to moisture contamination of the screen.

**Do you have different system sizes for different altitudes?**

The sizing of the air compressors for PSA oxygen generators must take into account the altitude of the site. Higher altitudes require larger air compressors.

**What is the purity of the oxygen produced by PSA?**

The purity of the oxygen produced by the Seagate generator can range from 93% to 95%， with 99% being optional (certain criteria must be present).

**What is the dew point of the oxygen produced by the PSA?**

The dew point of oxygen produced from a PSA oxygen generator will be -60 degrees F (-51 degrees C) to -100 degrees F (-73 degrees C)， depending on the size of the oxygen generator.

**What is the standard pressure of oxygen produced by a PSA?**

Most XITE oxygen (OG-25 models and above) generators have an output pressure of 45psig (3 bar gage) to 60psig (4 bar gage)， with the option of higher pressures via oxygen booster.

**Do different models of oxygen generators produce oxygen at different pressure levels?**

The OG-15 and OG-20 models produce oxygen at 9 psig (.62 bar gage) and 15 psig (1.03 bar gage)， respectively.

**Can you increase the pressure to a higher level?**

Oxygen delivery pressures for PSA oxygen generators can usually be increased to the high end by reducing the flow rate of the unit. Higher pressures would require an oxygen booster or compressor.

**Can you deliver pressures of 7 or 8?**

With an oxygen booster， pressures of 8 and higher are possible.

**The purity of liquid oxygen is 99% . ... Is this better than 93% oxygen?**

Liquid oxygen at 99% purity (LOX) may have some advantages in metal cutting， but not necessarily in medical applications.

**If the standard purity of PSA oxygen is 93% +-3%， can I use a stake to produce a higher purity of oxygen， say 95%?**

If a PSA oxygen generator is operated at its 80% or lower rated output， continuous oxygen purity of 95.3% can be achieved.

**Are there different pharmacopeial standards for 99% and 93% oxygen?**

The U.S. Pharmacopeia standard is used by the FDA and many other medical facilities with oxygen specifications of 93% and 99%.

**Why are some countries specifying 99%?**

Due to old rules and regulations， some local authorities require 99% pure oxygen. However， with the acceptance of international specifications from CSA (Canada) and ISO 10083 (Europe)， these older specifications are being revised to 93%.

**What is the difference between an oxygen concentrator and an oxygen concentrator?**

These terms have been used interchangeably， with oxygen concentrator being the most technically accurate. In general， oxygen concentrators describe smaller home healthcare systems， while oxygen concentrators describe all other sizes of equipment.

**If millions of people around the world are using oxygen concentrators that produce 93% oxygen every day， why do some countries still mandate 99% oxygen hospital supply systems?**

There have been powerful competing interests lobbying local authorities to maintain the 99% medical oxygen purity standard to prevent the introduction of cheaper alternatives such as PSA oxygen concentrators.

**Liquid oxygen has losses， a certain amount of which is evaporated. does PSA gaseous oxygen have the same problem?**

Normally， the LOX tank will bleed off 1-4% of the tank volume to prevent pressure buildup. For PSA oxygen generators， this is not a factor and all oxygen generated can be used without bleeding off.

**Are there recommendations for typical hospital oxygen systems?**

There are CSA and ISO specifications that contain information on hospital oxygen systems.

**Can I monitor my oxygen generator system from a remote location?**

Seagate offers a telemetry communication option for remote monitoring of OG-250 and above models of oxygen generators.

**How do I size a hospital PSA oxygen system?**

Ideally， the hospital will design specifications or historical data to determine the required equipment size. If this information is not available， a formula can be used to estimate the peak oxygen required. Please refer to the XITE Hospital Application Note for more information.

**What are the benefits of a PSA oxygen system compared to using cylinders or liquid oxygen?**

With a PSA oxygen system， you eliminate all costs and problems associated with oxygen delivery (higher prices， delivery costs， supply issues， etc.).

**Are there concerns about carbon monoxide and carbon dioxide when using PSA technology to produce gaseous oxygen?**

Most specifications for medical or respiratory oxygen have maximum levels of carbon monoxide and carbon dioxide. It is important that the oxygen system has clean fresh air and that carbon monoxide and carbon dioxide monitors are used in medical or respiratory oxygen.

**Is there equipment available to allow XITE's plant equipment to diagnose problems with oxygen generators without having to go to the job site?**

Seagate offers a telemetry communication option for remote monitoring of OG-250 and above models of oxygen generators.

**Can the system be set to automatically shut down if a problem occurs?**

Depending on the sensors used (dew point， oxygen purity， carbon monoxide and carbon dioxide levels， flow rate， etc.)， the unit can be configured to shut down based on any number of parameters.

**Can oxygen cylinders be contaminated?**

It is possible for oxygen cylinders (or any other type of gas cylinder) to become contaminated through improper use. For this reason， XITE provides vacuum pumps on most CFP models to evacuate the cylinders before filling.

**How long does an oxygen cylinder last and does it have to be recertified periodically?**

Oxygen in a cylinder can last indefinitely.

**Do I need to use a vacuum pump to empty the cylinder before refilling?**

It is never a bad idea to use a vacuum pump to empty a cylinder before refilling， especially if the cylinder is not under the control of the filler. If the cylinder is always under the control of the filler， this vacuum procedure can be omitted.

**Why use carbon filters to produce medical grade oxygen?**

Carbon filters provide an additional filtration measure for medical or breathing oxygen systems， in addition to eliminating odors from the system.

**What is the most cost effective oxygen cylinder filling equipment?**

Due to the optimal size of the oxygen compressor， the Hitt CFP-500 and CFP-1000 models offer our two best values.

**Why do several models of cylinder equipment cost almost the same， but produce very different amounts of oxygen?**

On the smaller CFPs， the price does not vary with the size of the equipment because standard equipment and instrumentation is available on each skid. Also， there are only three standard sizes of oxygen compressors.

**Can I reduce the cost of the system and use only oxygen monitors?**

If the application is not for medical or respiratory use， costs can be reduced by eliminating the carbon monoxide and carbon dioxide monitors.

**How do the carbon monoxide， carbon dioxide and oxygen monitors work? Do they wear out?**

There are different types of sensor technology available for gas monitoring. XITE uses chemically depleted sensors， and these sensors must be replaced over time.

**If I sell or rent oxygen cylinders， how many cylinders do I need?**

It is generally accepted that a 10 to 1 ratio of cylinders is required， depending on the output of the equipment. For example， if a CFP-500 produces (50) cylinders per day， it may require (500) cylinders to serve the market. This ratio may change if the customer provides cylinders.

**Are there different valves on the cylinders?**

For steel oxygen cylinders， there are (2) main types of valves available worldwide， CGA type 540 in the US and BS # 3 in the UK. DIN type valves are also in use.

**What equipment do I need to transfer from a large cylinder to a small cylinder?**

A high pressure flexible hose with an on/off valve and corresponding cylinder valve connections at both ends is required. For safety reasons， it is also recommended to have a sealed container or sealing chamber for the cylinder being filled.

**What is the cost of filling an oxygen cylinder with a PSA oxygen concentrator?**

For PSA oxygen generators， the cost of oxygen production or cylinder filling is usually expressed in kilowatt hours (KWH). The reason for this is that air is free， but there is a cost of electricity to operate the air compressor. At sea level altitude， it takes approximately 10 KWH to fill a 6 cubic meter sized oxygen cylinder， or 1.5 KWH per cubic meter.

**How much energy does it take to operate just one PSA oxygen generator?**

The energy required to run just a PSA oxygen generator is negligible， about 50 watts for the control circuit.

**How large is a PSA Oxygen Concentrator system?**

Most XITE oxygen systems can fit into a 20 or 40 foot shipping container.

**Does Seagate test each oxygen generator before it is shipped to the job site?**

Every XITE oxygen system is tested at the facility.

**Can I mount a PSA oxygen generator system on a skid?**

Yes， you can mount a PSA oxygen generator on a skid， but it must be in a vertical position for proper operation.