

Pressure Swing Adsorption (PSA) Technology

Many oxygen applications use cylinders, or bulk oxygen in the form of liquid oxygen (LOX) which must be delivered to the place of use. However, a savings can be made by using an on-site generated oxygen system. Oxygen made on-site may be even more critical for remote applications, far away from the source of supply.

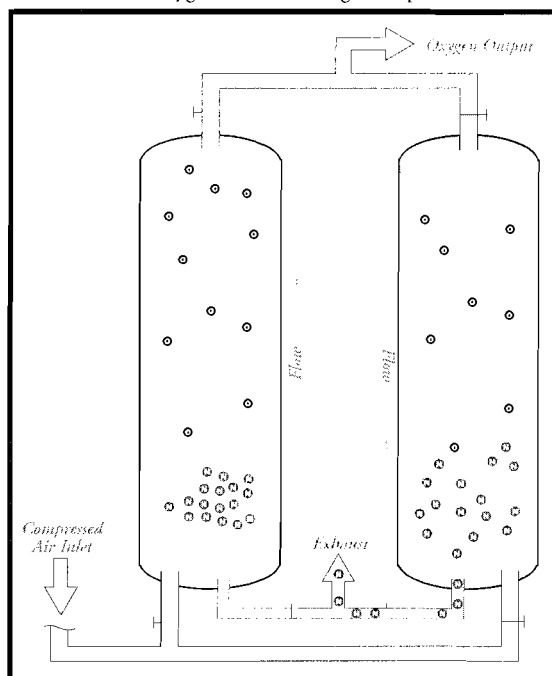
Enriched oxygen can be generated on-site by several methods such as chemical, electrolytic and cryogenic, to name a few. A cost effective and simple technology, used since the 1950's is Pressure Swing Adsorption (PSA). By connecting an **OGSI** oxygen generator to an existing air supply, or a feed air system supplied by **OGSI**, you can produce oxygen on demand at considerable savings using PSA Technology.

The air we breathe contains roughly 78% nitrogen, 21% oxygen, .9% argon and the balance is other gases. The oxygen is separated from the air using PSA Technology. The process centers around a molecular sieve known as Zeolite.

At high pressures the sieve adsorbs or attracts nitrogen, and at low pressures it desorbs or releases nitrogen. The OGSI generator consists of two tanks filled with sieve. As high pressure air (about 72 psi) is introduced into the first tank, it passes through the sieve and nitrogen is adsorbed. The remaining oxygen and trace gases are piped to a buffer or surge tank.

Just before the first tank becomes completely saturated with nitrogen, feed air is redirected to the second

▲ Oxygen Pressure Swing Adsorption



tank which then repeats the above process. An equalization step is incorporated to optimize performance. The first tank is then vented to atmosphere which allows the nitrogen to desorb or release from the sieve. To complete the regeneration of the first tank, a small amount of the oxygen is used to purge it. This process is completed over and over again until the demand for oxygen is met. Under normal operating conditions, which includes the use of clean dry air for separation, the sieve will last indefinitely.

Productivity of a PSA generator is dependent on the oxygen purity required. A generator can produce significantly more oxygen at 90% purity as it can at 95.4%, with a relatively small increase in feed air. By means of a PLC or some other micro processor based controller, it is practical on larger generators for the user to change the swing cycles. Purity and flow levels can be selected and optimized based on changing demand variables.