



PRESSURE SWING ADSORPTION TECHNOLOGY

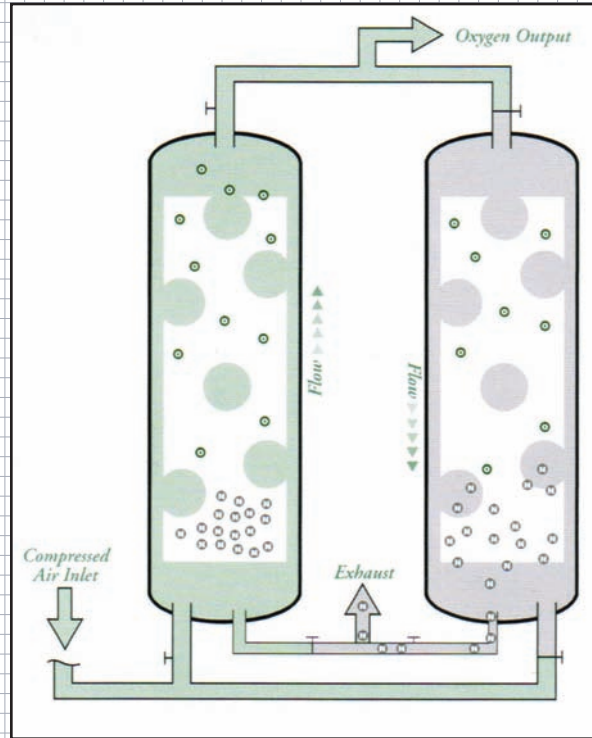
Many oxygen applications use cylinders, or bulk oxygen in the form of liquid oxygen (LOX) which must be delivered to the place of use. However, savings can be achieved by using an on-site oxygen generating system. Oxygen made on-site may even be more critical for remote applications, far away from the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

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 that has been 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 about 78% nitrogen, 21% oxygen, .9% argon with the balance being other gases. The oxygen is separated from the air using PSA Technology. The process centers around molecular sieve called Zeolite. Zeolite will adsorb nitrogen preferentially.

At high pressure, the sieve adsorbs or attracts nitrogen and at low pressures it desorbs or releases nitrogen. The *OGSI* generator consists of two tanks or beds filled with sieve. As pressured air (72 psi nominal) is introduced into the first bed, 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 bed becomes completely saturated with nitrogen, feed air is redirected to the second bed which then repeats the above process. An equalization step is incorporated to optimize performance. The first bed is then vented to atmosphere which allows the nitrogen to desorb or release from the sieve. To complete the regeneration of the



first bed, a small amount of the oxygen is used to purge it. This process is repeated 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 can last indefinitely.

Productivity of a PSA generator is dependent on the oxygen purity required. A generator can produce significantly more oxygen at 90% purity than it can at 95%, with a relatively small increase in feed air. By means of a PLC, it is practical to change the swing cycles based on the customers' needs. Purity and flow levels can be selected and optimized based on changing demand variables.

TECHNICAL NOTE
Oxygen Generating Systems Intl.

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