

Working Principle of Membrane Nitrogen Producer

For years, industry has used gas cylinders to meet the nitrogen needs of their industrial processes. However, as technology has evolved, industry is now turning to installing on-site generators rather than using cylinders. Why? The reason is simple, because on-site generators offer more advantages than cylinders.

How many types of nitrogen generators are there? Nitrogen generators are based on two technologies.

1. variable pressure adsorption (VPS)
2. Membrane technology

How does a membrane nitrogen generator work?

Nitrogen generators do not create nitrogen; instead, they use the nitrogen present in the air and concentrate it by removing the excess molecules.

Ambient air is composed of 78% nitrogen, 21% oxygen and carbon dioxide, argon and water. The membrane separation process uses the principle of diffusion to separate the faster transporting gas from the slower transporting gas. As a result, nitrogen is transported as the product gas.

XITE uses Air Liquide's membrane technology, whose asymmetric hollow fibers consist of a core optimized for mechanical strength and, for gas separation, a sheath. A 12-inch module stretching approximately 750 miles contains 500,000 to 1 million fibers.

Membrane modules may contain more than one million individual hollow fibers, creating cross-flow and counter-flow designs that allow flexibility in designing to meet all pressure drop and performance constraints. The bundled design uses high performance fibers to allow operation at high temperatures and extreme pressures. This increases membrane productivity, reduces the number of membranes, and lowers system CAPEX.

Optimal nitrogen production from a membrane is a complex calculation that depends on a variety of factors including inlet gas temperature, pressure drop across the membrane, volumetric flow rate of the inlet gas, and desired purity at the outlet. XITE's engineered solutions do this study for our customers and propose an efficient and optimized system for on-site nitrogen production.

Why choose a membrane nitrogen generator?

Some of the basic factors in choosing a membrane nitrogen generator are.

The membrane generator works on a relatively simple principle.

It is less costly to maintain.

The footprint of the installation is smaller.

Membrane nitrogen generators start up faster and are quieter

