Nitrogen Applications

GENERON INNOVATIVE GAS SYSTEMS

Use Of Nitrogen For Inerting Applications

Blanketing, Purging, Pressure Transfer

Nitrogen gas is colorless, odorless, tasteless, non-toxic and a poor conductor of heat and electricity. It comprises about 78% of normal air and is slightly lighter than air at standard atmospheric pressure and temperature.

Liquid nitrogen is produced commercially from fractional distillation of liquefied air. Gaseous Nitrogen is produced by vaporizing liquid nitrogen or through separation of air utilizing either PSA (Pressure Swing Adsorption) or membrane technologies.

The inert characteristic, availability, and relatively low cost of gaseous nitrogen have made it a versatile tool for the handling and storage of flammable or chemically active materials. The inert properties of Nitrogen make it an ideal gas for use in product blanketing and inerting, purging, equipment and product storage, and many other applications where a clean, dry, inert gas is required. Nitrogen can be generated on-site at high pressures and low oxygen levels to safely prevent ignition of flammable gases, and to protect vital equipment and instruments as well as applications where oxygen and water can create process problems and potential hazards. It can also be used to prevent degradation of products sensitive to oxygen, moisture or combustion by-products and is ideal as non-freezing, non-corrosive instrument gas.

Nitrogen Conversion Data

	Weight		Gas		Liquid	
Pounds (LB)	Kilograms (Kg)	Cubic Feet (SCF)	Cubic Meters (Nm^3)	Gallons (Gal)	Liters (L)	Pounds (LB)
1 Pound	1.0	0.4536	13.8030	0.3627	0.1481	0.5606
1 Kilogram	2.205	1.0	30.42	7996	0.3252	1.2349
1 SCF Gas	0.07245	0.03286	1.0	0.02628	0.01074	0.04065
1 Nm^3 Gas	2.757	1.2506	38.04	1.0	0.4080	1.5443
1 Gal Liquid	6.745	3.06	93.11	2.447	1.0	3.785
1 L Liquid	1.782	0.8083	24.60	0.6464	0.2642	1.0
1 Pound	1.0	0.4536	13.8030	0.3627	0.1481	0.5606

SCF (Standard Cubic Feet) gas measured at 1 atmosphere and 70° F.
Liquid measured at 1 atmosphere and boiling temperature
Nm3 (Normal Cubic Meters) measured at 1 atmosphere and 0° C.

Which On-site Technology To Use?

- Membranes are normally recommended for purities below 99% while PSA's are normally recommend for purities above.
- For operating temperatures above 104°F (40°C) membrane systems are normally recommend. PSA's are most efficient at converting air at 99% and greater purities but this advantage is based on an operating temperature of 68°F (20°C). As temperatures increase PSA's become less efficient. At temperatures above 113°F (45°C) they are not even rated.
- Low operating pressure systems have unique characteristics and need to be looked at individually.

Considerations For Using Nitrogen

An inert gas is any gas that is non-flammable, chemically inactive, non-contaminating for the use intended, and oxygen deficient to the extent required. When selecting an inert gas to be used for inerting, several characteristics should be considered.

- The gas must not react chemically with the material with which it comes into contact.
- It must be non-toxic and moisture free.
- It must be free of contaminants.
- It should be available in sufficient quantity at reasonable cost.

Generon IGS Nitrogen Generators

Generon IGS is in the unique position to be able to supply competing air separation processes utilizing either hollow fiber membrane or PSA (Pressure Swing Adsorption) technologies to provide our customers with the best technical solution for their application.

NITROSWING® Modular PSA Generators

- 8 Models to choose from ranging in size from 84 SCFH (2.2 Nm^3H) to 4,300 SCFH (112.8 Nm^3H) depending on desired purity and pressure.
- Nitrogen purities to 99.9995%.
- Product Dew Point to -70°F (-57°C).
- Delivery pressures to 120 psig (8.3 barG).

NITROSWING® Twin-Tower PSA Generators

- Generon IGS manufactures more than 30 models ranging in size from 324 SCFH to 262,300 SCFH (9.0 Nm^3H to 7,400 Nm^3H) depending on desired purity and pressure.
- Nitrogen purities to 99.999%.
- Product Dew Point to -70°F (-57°C).
- Delivery pressures to 130 psig (9 barG).

Nitrogen Membrane Generators

- Nitrogen purities adjustable from 95% to 99.9%.
- Product Dew Point to -70°F (-57°C).
- Extensive product range from the smallest module producing 25 scfh (.7 Nm^3/h) to large integrated systems producing 187,000 scfh (4,915 Nm^3/h).
- Modular design allows for various combinations with the flexibility and customization from a single membrane module to multiple Integrated Systems resulting in easy installation and fast start-up times.
- Product pressures available in two standards: 200 psig (14 barG) and 330 psig (23 barG)

A full installation is typically comprised of an air compressor, air dryer, filtration package, air receiver tank, nitrogen generator, and a nitrogen buffer tank.

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With a Generon IGS Nitrogen Generator you can:

- Eliminate high cost purchased gases.
- Eliminate delivery & fuel sur-charges.
- Eliminate rental and handling charges.
- Eliminate evaporation losses.
- Eliminate long term contacts.
- Eliminate truck and forklift traffic in your plant.
- Eliminate run outs.
- Lower your operating cost with a **Generon IGS** nitrogen generating system.