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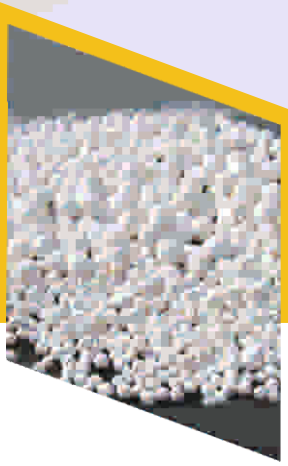
WITH
SERVICES

NITROAIR
ENGINEERS PVT. LTD.

Nitrogen, Oxygen, Ozone and Compressed Air Systems

OUR PRODUCTS:

- CMS (Carbon Molecular sieves)
- Oxygen Analyzers
- IOT Module
- Controllers
- Water Meters
- Ozone Analyzers
- PLC Panels
- MCC panels



OUR ESTEEMED CLIENTS

IndianOil | Lubrizol | NMDC Limited | Zydus Cadila

Finolex Cables Limited | HETERO | | | embio | HETERO

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Industries We Serve

- Pharmaceuticals Industries
- Chemicals Processing Plants & Petrochemicals Industry
- Metallurgical & Heat Treatment
- Oil & Gas
- Food Industries

PSA Nitrogen Plant

Pressure Swing Adsorption (PSA) is a nitrogen gas generation method with a specially designed adsorbent. This adsorbent is called a Carbon Molecular Sieve (CMS) having micro pores in its surface to adsorb O2, CO2, and H2O molecules when under a certain pressure. After the adsorption process, the adsorbent is regenerated by depressurizing the vessel containing the adsorbent. PSA can produce nitrogen gas continuously by repeating the above adsorption and regeneration. The use of the PSA process has seen immense growth during the last few decades, mainly due to its simplicity and low operating costs. Major applications outside of nitrogen have been the recovery of high-purity hydrogen,methane and carbon dioxide & oxygen. The number and size of the CMS will dictate the purity of the nitrogen produced and the flow rates possible. PSA has been successfully used to produce nitrogen from a rate of 5,000 CFH to 60,000 CFH with purities ranging from 95% - 99.999%.

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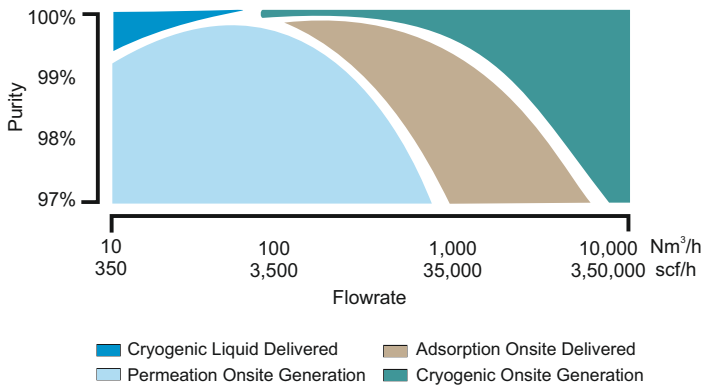
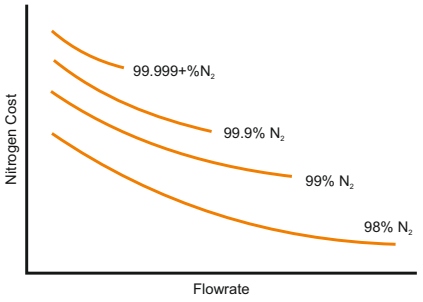
When to Use PSA

There are different options for nitrogen production, such as permeation membrane systems and cryogenic distillation. This means it is important to first establish if PSA is the most efficient and economic method for your application. In order to do this, you will need to determine the day-to-day use of nitrogen that is anticipated and the purity of the nitrogen that is required. Figure 1 shows the areas where PSA is likely to be a good option (Adsorption onsite generation).



PSA can produce nitrogen in a range of purities as shown in figure 1. However, figure 1 does not take into account the financial aspect (i.e. the cost of production). Figure 2 can give an idea of the general trend of how costs change with increasing levels of purity and increasing flow rates. It is not always necessary to produce highly pure nitrogen. For example, blanketing vegetable oils can be done with purities of around 99.5%.

The purity of nitrogen required to blanket a flammable material is determined by the material's Limiting Oxygen Concentration (LOC) or Lower Flammability Limit (LFL). These values can be obtained from the National Fire Protection Association's (NFPA) NFPA 69: Standard on Explosion Prevention Systems. In this guideline it can be seen that sometimes the purity required can be below 95%.



Benefits of producing own N2

- You save money – N2 from the Generator costs 30% to 50% of N2 from a cylinder. Payback periods are generally less than ONE year, which can reduce further if you have compressed air already available in your manufacturing facility.
- It gives N2 of better and more consistent purity than that available from cylinders where O2 content can vary from 0.5% to 4% (based on actual measurements taken by us). In our Generator, continuous online O2 measurement is available.
- Elimination of risk of accidents which may take place due to handling of N2 cylinders as well as due to excess O2 in cylinders.

Services we offer

- Onsite performance testing & status assessment of any make of PSA Nitrogen Generators, PSA/VPSA Oxygen Generators, and Heatless Air Dryers using our own calibrated Oxygen Analysers & Dew Point Meters.
- Revamping of above equipment which is non-functional or underperforming and to bring them to rated output & purity/dryness, with a performance guarantee
- Replacement adsorbents (Activated Alumina, CMS, Zeolite Molecular Sieves,
- Deoxo Catalyst, Activated Carbon, etc. for the above equipment.
- Replacement Tube Bundles for any make of Intercoolers, Oil Coolers, Aftercoolers & other Heat Exchangers used for compressed air/gas service.
- Air compressor (IR, ATLAS, KAESER, ELGi etc.)

Maintenance

- Performing maintenance on this system can be very dangerous. The tanks containing the adsorbent are usually stored in cabinets. This means the creation of a nitrogen or oxygen-enriched atmosphere is likely in these areas. Also, it means that work may have to be carried out in confined areas.
- If repairs are necessary and require piping or vessel to be opened or have hot repairs done, the pipe work or vessels concerned should be purged with clean air until an oxygen concentration of 19.5% - 23.5% is achieved and can be maintained. After new equipment has been installed, before restarting the PSA a good cleaning process to remove any contaminants should be performed.
- For further guidance see EIGA Doc 149/10 section 10.

Spare Parts Supply

Filters

Valves

M/S. NITROAIR ENGINEERS PVT. LTD.

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