

# Industrial N2 Nitrogen Generator Compressed Air Psa Nitrogen Gas Plants

# **Basic Information**

. Place of Origin: SUZHOU, CHINA Brand Name: **SUMAIRUI GAS** 

· Certification: ISO9001, CE, BV, SGS, TUV, ASME,

GOST,NB,NR ETC

Model Number: OSP Minimum Order Quantity: 1 set Negotiable

• Packaging Details: Exporting wooden case /Film packing

Delivery Time: 30-45 days

Payment Terms: L/C, T/T, Western Union, MoneyGram

100 sets/months Supply Ability:



# **Product Specification**

• Design Code: Marine Certificates

· Capacity: 300SCFM

• Purity: 99.99%-99.999% 80-105 Psig Pressure: Material: Mild Steel

Certificates: CE, ISO, ASME, GOST, KGS, NB Etc

• PLC: Siemens S7-1200/1500 • HMI: 7inches/12 Inches • Flow Meter: Vortex Type/ Metal Rota

Oxygen Analyzer: Yes Monometer: 1 Lot

· Working Mode: **Fully Automatic** • Type Of N2 Generator: PSA Modular CMS

· Working Life: >10 Years

Used For Tungsten Molybdenum Industry Application:

### **Product Description**

# N2 generator for Marine industry with capacity 100 scfm purity 95% 110 psig by CCS, ABS, BV, DNV,GL Certificates

Nitrogen production that is carried out using pressure swing adsorption (PSA) technology over a carbon molecular sieve (CMS) is considered to be a mature, cost-effective and highly efficient method to produce nitrogen to meet a wide range of purity and flow requirements. Ongoing increases in efficiency in PSA-based nitrogen-generation facilities are being driven by enhanced CMS materials (Figure 1) and process improvements. This article provides an overview of the fundamentals of PSA-based nitrogen generation, while focusing specifically on innovative practices and improved CMS materials. Together, these advances contribute to continuous improvement in PSA system performance, giving chemical process industries (CPI) plant operators a proven way to produce a reliable and low-cost supply of high-purity dry nitrogen onsite.



FIGURE 1. Carbon molecular sieve (CMS) pellets, typically manufactured from coconut shells, provide the surface area and pore structure needed to separate oxygen and nitrogen from a compressed air inlet stream

Nitrogen — in both the gaseous and liquid state — is used in a wide range of applications in many industrial sectors. These include the production of foods and beverages, chemicals and pharmaceuticals; petroleum processing; the thermal treatment of metals; the manufacture of flat glass, semiconductors and electronics; and many more. Industrial facilities that require large volumes of nitrogen always look for efficient methods of onsite nitrogen production to meet all of the specifications related to purity, flow requirements, power consumption, footprint and portability

Nitrogen gas is produced by separating air into its primary component molecules (nitrogen and oxygen), using one of two methods: 1. Traditional cryogenic fractionation of air that has been liquefied; or 2. Separation of gaseous air using pressure swing adsorption (PSA) or membrane-based separation systems. If large volumes of nitrogen with extremely high purity (99.998%) are required, cryogenic fractionation of air remains the most efficient and economical technology option [2]. This is the oldest method of nitrogen production, and it has the ability to produce both gaseous and liquid nitrogen (for daily use and as a backup supply). Cryogenic fractionation of air is typically carried out in large-scale commercial plants that then deliver the produced nitrogen to users.

However, at many CPI facilities, enriched nitrogen is produced onsite using smaller-scale PSA separation or membrane-based separation systems. PSA systems operate on the principle of physical adsorption of the oxygen in air by carbon molecular sieve materials (such as those shown in Figure 1), leaving an enriched nitrogen stream as the product; the process is illustrated in Figure 2. Today's PSA systems can economically produce nitrogen from compressed air at a variety of volumes. For instance, today's systems can handle an inlet air stream of less than 5,000 to more than 60,000 std. ft3/h, reliably producing N2 that meets purity requirements from 95 to 99.9995%

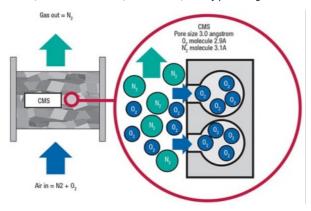


FIGURE 2. Within the CMS pellets, oxygen is preferentially adsorbed, allowing a nitrogen-rich product stream to be captured for use onsite

However, the capital and operating costs of a PSA system are directly correlated with the purity of the nitrogen produced, and these costs climb rapidly once nitrogen with purity greater than 99.5% is required. In some cases, it can be cost-effective to produce higher-purity nitrogen by first producing 99.5%-purity nitrogen using a PSA system, and then using a palladium or copper unit to remove residual levels of oxygen in the nitrogen product. Such systems can bring down residual oxygen to 1–3 ppm.

#### SELECTING THE RIGHT SYSTEM

When selecting the most appropriate nitrogen-production process, several parameters should be considered. Purity and capacity are the most important factors that can affect the choice of production methodology, and hence, have a direct impact on the unit cost of the nitrogen produced. The use of a PSA nitrogen-generation system, which can be designed to meet all types and patterns of nitrogen flow — steady, periodic and erratic — has grown in popularity during the last several decades, thanks to the simplicity, performance, flexibility, reliability and relatively low capital and operating costs of this production route. However, the optimal nitrogen-production rate using a PSA system based on CMS pellets is around 3,000 Nm3/h of N2 produced (>95% purity). Within that range, PSA is a more economical option than O2/N2-separation by air liquefaction and cryogenic separation, or by membrane-based separation. The principles of PSA-based nitrogen-generation technology using

CMS and several important aspects of process engineering knowhow are discussed below.

#### CARBON MOLECULAR SIEVES

CMS is part of a special class of activated carbons that have non-crystalline (amorphous) structure with a relatively narrow pore-size distribution. This material provides molecular separations based on the rate of adsorption of nitrogen, rather than the differences in adsorption capacity between oxygen and nitrogen. Figure 2 shows the inner structure of a CMS material that is appropriate for the separation (removal) of O2 molecules from N2 molecules in the compressed-air inlet, to yield an enriched nitrogen stream (Note: Carbon molecular sieves are selective for oxygen, while zeolite molecular sieves are selective for nitrogen).

#### Features and Benefits

Unlimited flexibility: production capacity can be easily adjusted directly on site by simple module additions without any skilled

Compact dimensions for installations even in small or low ceiling spaces of your production facility

Easy fleet management: all OSP models feature the same components, allowing a limited spare parts management and easy

Non-corrosive materials such as aluminum and stainless steel, for all process components

	Nitrogen purity (Nm3/hr)							Dimensions	Weight
	95%	99%	99.5%	99.9%	99.99%	99.995%	99.999%	(L*W*H) mm	KG
OSP5	21	13	11	8	5	4.2	3	1100*600*1700	300
OSP10	38	29	25	15	10	7.5	6.1	1200*650*1800	350
OSP20	80	56	52	32	20	16	14	1600*1000*220 0	ı
OSP40	160	116	105.2	67.2	40	34	28	1800*1000*220 0	l
OSP60	252	174	157.8	100.8	60	51	45	1900*1200*220 0	l
OSP80	339.2	232	211	132	80	70		2000*1200*240 0	l
OSP100	420	290	263	168	100	90		2100*1600*250 0	l
OSP150	630	435	394.5	252	150	135		2500*1800*260 0	
OSP200	848	580	526	336	200	180		2800*1900*285 0	l
OSP250	1060	725	657.5	420	250	225		3100*2000*320 0	l
OSP300	1270	870	780	500	300	260		3900*2600*340 0	ı
OSP400	1696	1160	1052	672	400	360	1	4500*3250*360 0	ı
OSP500	2120	1450	1300	840	500	450	400	4900*3600*380 0	l
OSP600	2540	1740	1578	1000	600	540	480	5300*3600*390 0	1
OSP800	3390	2320	2100	1340	800	720		5600*3900*410 0	ı
OSP1000	4240	2900	2630	1680	1000	900	800	5800*4000*450 0	11800

### Design reference:

Compressed air inlet pressure 7.5 bar(g)/108 psi(g) Air quality 1.4.1 according to ISO 8573-1:2010 Nitrogen outlet pressure 6 bar(g)/87psi(g) Nitrogen quality 1.2.1 according to ISO 8573-1:2010. Designed working temperature max 50 °C Dew point at Nitrogen outlet - 40 °C

# Notes:

OSP nitrogen generator max working pressure 10 bar(g)/145psi(g) Following request of PSA on-site nitrogen generator will be customized: Working pressure >10 bar(g)/145 psi(g) Dew point < - 50 °C Plug and play Movable/containerized Other special requirements as per site conditions





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