ISC Sales

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PSA NITROGEN GENERATORS

GAS ASSIST INJECTION MOLDING

LASER & PLASMA CUTTING

CHEMICAL PROCESSING

FOOD PROCESSING

PHARMACEUTICAL

LASER CUTTING

HEAT TREATING

BLANKETING

BEER & WINE

Local: 972.964.2700 Fax: 972.964.2755

4421 Tradition Trail • Plano, Texas 75093





Beer & Wine Manufacturing & Storage

Breweries and wineries take great care to prevent oxidation during all processing steps and packaging to enhance product quality. Nitrogen can also provide an inert atmosphere during the mashing and lautering operations. Increasing the nitrogen levels in the finished product to enhance foam characteristics is also common

Chemical Processing

Nitrogen is used to create an oxygen-deficient environment for use with oxygen-sensitive chemicals reducing safety hazards. It is used to propel liquids through pipelines; and in the manufacture of ammonia.

Electronics

Nitrogen prevents oxidation while manufacturing semiconductors and printed circuit processes such as wave soldering. It is also used to enhance solvent recovery systems by eliminating the use of chlorofluorocarbons for cleanup.

Food Processing & Packaging

Nitrogen extends shelf-life in packaged foods by preventing spoilage due to oxidation, mold growth, moisture migration and insect infestation.

Injection Molding

In the gas injection molding process (GIM), nitrogen is injected under high pressure into the melted polymer and displaces the core of the molded part. This creates a void and reduces the amount of material used.

Metal Production

Nitrogen is used to protect metals such as steel, copper and aluminum during annealing, carburizing and sintering operations.

Metal Fabrication

Nitrogen is utilized as a purge gas with stainless steel tube welding. It is also used to support plasma and laser cutting systems. By using high purity (99.9% to 99.99%) nitrogen, it is possible to eliminate oxide edges and the need for additional handling labor.

Petroleum Refining

Nitrogen is used to maintain pressure in oil and gas reservoirs; to blanket storage tanks and product loading/unloading; to purge pipelines; and to strip volatile organic compounds (VOCs) from waste streams. Controlling VOC emissions helps refiners comply with U.S. Clean Air Act requirements.

Pharmaceuticals

Nitrogen is commonly used for blanketing and purging to protect volatile chemicals from oxygen and high purity gases, which are a required component of many analytical instruments.

Rubber Manufacturing

In the vulcanizing process, nitrogen is used to prevent surface deteriorations due to oxidation.

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PSA NITROGEN GENERATORS

75% to 92% Cost Savings

Generating your own nitrogen can substantially reduce the cost of nitrogen consumption, and is the primary reason for the purchase of most PSA systems.

The price of purchasing nitrogen in a gaseous or liquid form can vary from $2.88 to $0.35 per 100 ft3. The price range can be a result of volume consumption, type of product, location, or vendor. This cost is strictly for the gas or liquid delivered and does not factor additional supply costs such as:

- Delivery Costs
- Monthly Cylinder / Tank Rental Fees
- Bulk Evaporative Loss
- Handling and Purchasing Labor Costs
- Additional Site Liability Insurance

A PSA system will produce gaseous nitrogen at costs that ranges from $0.061 to $0.217 per 100 ft^3. The price range is a result of local power costs, compressor efficiencies, and required nitrogen purity.

An average PSA system has an (ROI) return on investment of 6 to 18 months. This rapid return enhances the financially attractive position of a PSA system above and beyond the 75% to 92% base reduction in nitrogen cost.

The Nitrogen generator is a PSA system that separates the oxygen from a compressed air supply generating a continuous source of gaseous nitrogen.

Reliability

PSA systems operate automatically and supply nitrogen on demand 24 hours a day. A missed nitrogen delivery due to bad weather or clerical oversight can dramatically impact production costs.

Nitrogen Purity

PSA systems can produce nitrogen purities from 95.0% to 99.99%. If your application can operate at lower purities the cost of production is reduced and can add to your overall reduction in nitrogen costs.

Safety

PSA systems operate with no more liability than a standard compressed air system. With a PSA system you yield the liability of handling 2,200 PSI cylinders or storing -320°F (-196°C) liquid nitrogen.

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System Operation

The earth's atmosphere is comprised of approximately 78% nitrogen and 21% oxygen. Once atmospheric air is compressed, its pressure is increased while proportions of nitrogen and oxygen remain unchanged. Once the air is compressed it must be filtered and dried prior to its introduction to the PSA system.

Step 1.

Inlet valves direct the compressed air flow into one of the two adsorption chambers (Right) where the CMS (Carbon Molecular Sieve) adsorbs the oxygen content while allowing the nitrogen to pass creating a high purity nitrogen stream that then exits the adsorption chamber and is stored in the nitrogen storage/buffer tank. The other adsorption chamber (Left) is depressurized to atmosphere through the exhaust valve enabling the CMS to release and expel any previously adsorbed oxygen to atmosphere.

Step 2.

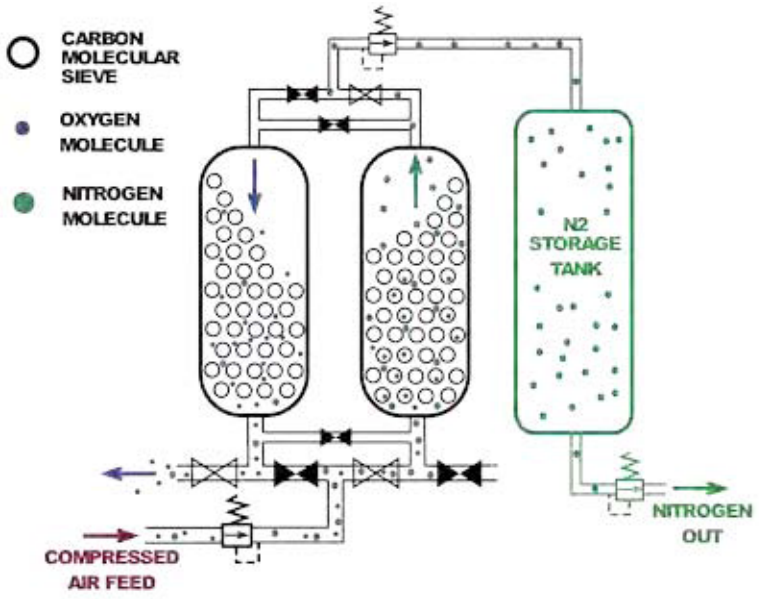
Just prior to the end of the (Right) absorption cycle the exhaust valve on (Left) is closed and balance valves are opened to equalize pressure in the two adsorption tanks.

Step 3

The inlet valves are then inverted bringing the regenerated (Left) tower online to adsorb oxygen leaving a high purity nitrogen gas stream. The other adsorption chamber (Right) which was previously online adsorbing oxygen is depressurized so the CMS will release and exhaust any previously adsorbed oxygen to atmosphere.

Step 4

This cyclic action continues allowing the PSA to produce a steady stream of high purity nitrogen gas. This process is commonly known as Pressure Swing Adsorption (PSA).



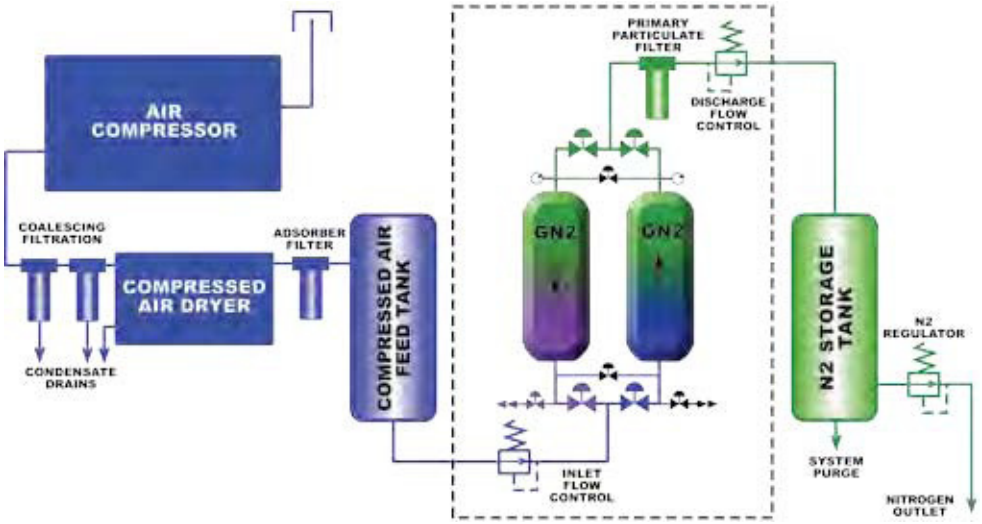
(CMS) Carbon Molecular Sieve

The adsorption component CMS is a non-polarity based adsorbent that uses a unique pore structure to preferentially adsorb oxygen molecules over nitrogen molecules. By adsorbing the oxygen from the process stream (Compressed Air) what remains can be virtually pure nitrogen.

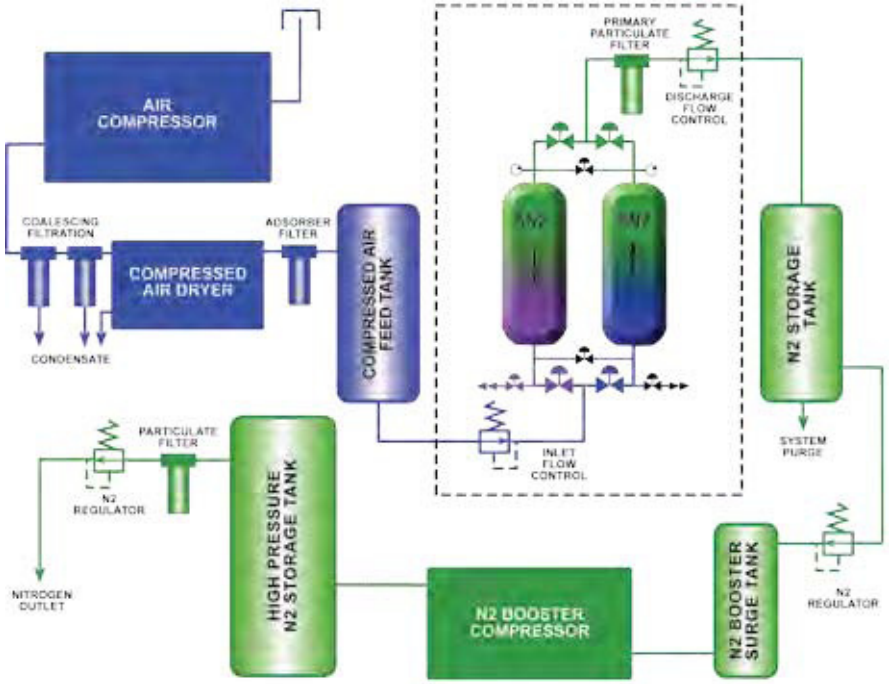
Because the product is a nonpolarity based adsorbent, it's hypothetical life is indefinite but realistically it has an industrial service life in excess of 10 years with proper maintenance.

Carbon molecular sieve is also widely applied in petrochemical industry, heat treatment industry, and electronic manufacturing as well as the food preservation.

Standard System Installation



High Pressure System Installation



Description	Standard	Optional
Inlet Flow Controller	X	
Outlet Flow Controller	X	
Automatic Operation & PLC Control	X	
NEMA 12 Electrical	X	
NEMA 4 Electrical		X
Touch Screen Operator Interface		X
Tower Pressure Gauges	X	
Non-Lubricated High Cycle Valves	X	

Description	Standard	Optional
Removable Stainless Steel Screens	X	
ASME/CRN (GN2-75 and larger)	X	
Manifold Type Solenoid Valves	X	
Skid Mounted Component Packages		X
Booster Compressor Packages		X
Process Oxygen Sensor with Alarms		X
Energy Saving Sleep Mode	X	
Automatic Purity Proof System		X

Custom designed, larger capacity or non standard purity systems are available upon request

Model Number	(A) 99.99% Purity		(B) 99.9% Purity		(C) 99.5% Purity		(D) 99.0% Purity		(E) 98.0% Purity		(F) 95.0% Purity	
	Feed	Output	Feed	Output	Feed	Output	Feed	Output	Feed	Output	Feed	Output
	SCFM @ 90 PSIG	SCFH @ 70 PSIG	SCFM @ 90 PSIG	SCFH @ 70 PSIG	SCFM @ 90 PSIG	SCFH @ 69 PSIG	SCFM @ 90 PSIG	SCFH @ 68 PSIG	SCFM @ 90 PSIG	SCFH @ 65 PSIG	SCFM @ 90 PSIG	SCFH @ 57 PSIG
25XX-XXX	3	26	3	42	3	50	3	63	4	78	4	101
35XX-XXX	5	40	5	64	5	76	5	95	6	117	6	151
50XX-XXX	7	59	7	95	7	113	8	142	8	175	9	227
75XX-XXX	11	86	10	138	10	164	11	205	12	253	14	328
100XX-XXX	14	112	14	180	13	214	15	268	16	331	18	429
125XX-XXX	17	139	17	223	16	265	18	331	20	409	22	530
175XX-XXX	22	178	22	286	20	340	23	426	25	526	28	681
250XX-XXX	37	297	36	477	34	567	39	709	42	877	47	1135
350XX-XXX	51	416	50	668	48	794	55	993	59	1228	66	1589
500XX-XXX	66	535	65	859	61	1021	70	1277	76	1578	85	2043
650XX-XXX	88	713	86	1145	82	1362	94	1702	102	2104	113	2724
800XX-XXX	110	891	108	1431	102	1702	117	2123	127	2630	142	3404
1000XX-XXX	132	1069	129	1717	123	2043	140	2553	153	3157	170	4085
1250XX-XXX	168	1366	165	2194	157	2610	179	3263	195	4033	218	5220
1400XX-XXX	190	1544	186	2480	177	2951	203	3668	220	4559	246	5901
1600XX-XXX	219	1782	215	2862	204	3404	234	4255	254	5261	284	6809
1800XX-XXX	241	1960	237	3148	225	3745	257	4681	280	5787	312	7490
2000XX-XXX	270	2198	265	3530	252	4199	289	5248	314	6489	350	8398
2250XX-XXX	307	2495	301	4007	286	4766	328	5958	356	7365	397	9532

Please Note: Feed Air Pressure is measured in SCFM while Nitrogen output is measured in SCFH

Model Number	(A) 99.99% Purity		(B) 99.9% Purity		(C) 99.5% Purity		(D) 99.0% Purity		(E) 98.0% Purity		(F) 95.0% Purity	
	Feed	Output	Feed	Output	Feed	Output	Feed	Output	Feed	Output	Feed	Output
	SCFM @ 110 PSIG	SCFH @ 90 PSIG	SCFM @ 110 PSIG	SCFH @ 90 PSIG	SCFM @ 110 PSIG	SCFH @ 88 PSIG	SCFM @ 110 PSIG	SCFH @ 86 PSIG	SCFM @ 110 PSIG	SCFH @ 80 PSIG	SCFM @ 110 PSIG	SCFH @ 75 PSIG
25XX-XXX	4	30	4	48	4	57	4	72	4	89	5	115
35XX-XXX	6	45	5	72	5	86	6	107	6	133	7	172
50XX-XXX	8	68	8	108	8	129	9	161	10	199	11	258
75XX-XXX	12	98	11	157	11	186	13	233	14	288	16	373
100XX-XXX	16	128	15	205	15	244	17	304	18	376	20	487
125XX-XXX	19	158	19	253	18	301	21	376	22	465	25	602
175XX-XXX	25	203	24	325	23	387	27	484	29	598	32	774
250XX-XXX	42	338	40	542	39	645	44	806	48	996	54	1289
350XX-XXX	58	473	56	759	54	903	62	1128	67	1395	75	1805
500XX-XXX	75	608	72	976	70	1161	80	1451	87	1794	97	2321
650XX-XXX	100	819	95	1301	93	1547	106	1934	116	2392	129	3095
800XX-XXX	125	1013	119	1627	116	1934	133	2418	144	2989	161	3868
1000XX-XXX	149	1215	143	1952	139	2321	160	2902	173	3587	193	4642
1250XX-XXX	191	1553	183	2494	178	2966	204	3708	222	4584	247	5932
1400XX-XXX	216	1755	207	2820	201	3353	231	4191	250	5182	279	6705
1600XX-XXX	249	2025	239	3254	232	3869	266	4836	289	5979	322	7737
1800XX-XXX	274	2228	262	3579	255	4256	293	5320	318	6577	355	8511
2000XX-XXX	307	2498	294	4013	286	4771	328	5965	356	7374	398	9542
2250XX-XXX	349	2835	334	4555	325	5416	372	6771	405	8370	451	10832

Specifications & Dimensions

Model Number	Minimum Storage Capacity / Gallons		Voltage	Inlet Ports	Outlet Ports		Dimensions Inches			
	Air	N^2					H	W	D	
25XX-XXX	10	10	100-1-50	1/2″	1/2″	150 PSIG	40	31	13	220
35XX-XXX	15	15		1/2″	1/2″		40	31	15	226
50XX-XXX	15	15		1/2″	1/2″		49	41	15	353
75XX-XXX	20	20		3/4″	1/2″		65	48	24	510
100XX-XXX	20	20		3/4″	1/2″		65	48	24	540
125XX-XXX	20	20		3/4″	1/2″		65	48	24	565
175XX-XXX	30	30		3/4″	1/2″		69	52	28	675
250XX-XXX	60	60		1″	1/2″		69	52	28	730
350XX-XXX	60	60		1″	1/2″		75	52	33	1200
500XX-XXX	80	80		1-1/2″	3/4″		80	68	33	1286
650XX-XXX	120	120	115/120-1-60	1-1/2″	3/4″		85	68	33	1500
800XX-XXX	120	120		1-1/2″	3/4″		90	77	33	2425
1000XX-XXX	200	200		1-1/2″	3/4″		90	86	45	2590
1250XX-XXX	240	240		2"	1"		90	86	45	2975
1400XX-XXX	240	240		2"	1"		90	90	45	3375
1600XX-XXX	240	240		2"	1"		90	99	45	3975
1800XX-XXX	300	300		2"	1"		90	104	45	4635
2000XX-XXX	400	400		2"	1"		104	110	45	4950
2250XX-XXX	400	400		2"	1"		104	112	62	5620

Notes:
1. Capacity reflects a maximum 90°F inlet temperature and 90°F ambient
2. Feed compressed air pressure dewpoint must not exceed 39°F.
3. Inlet/Outlet connections are NPT unless otherwise specified
4. Dimensions are in inches. Complete drawing packages available upon request
5. Shipping weight is in pounds
6. Dimensions and specifications are subject to change without notice

Model	Purity %	
XXX	X	
25	A	99.99
35	B	99.90
...	C	99.50
2000	D	99.00
2250	E	98.00
	F	95.00

Feed Pressure	
X	
7	70 PSIG
9	90 PSIG
11	110 PSIG
14	145 PSIG

Voltage/Package	
-XXX	
116	120-1-60
SP1	Package #1
SP2	Package #2

Note: Feed voltages for packages match air dryer feed voltages.

Example Model # 500B9-116
This is a 500 setup for specified nitrogen output at 99.9% purity and a 90 PSIG compressed air feed.