domnick hunter

MAXIGAS Nitrogen Supply

for modified atmosphere packaging

www.domnickhunter.com

Modified Atmosphere Packaging

improving product quality and extending shelf-life

Product spoilage can occur from the moment a food item has been produced. Increased consumer demand for fresh, high quality preservative-free foods has led to the development of modified atmosphere packaging (MAP).

MAP or 'gas flushing' as it is also known, is an increasingly popular technique used to easily and economically improve product quality and extend shelf-life.

Flushing packaged foods with inert high purity nitrogen retards aerobic spoilage and oxidative deterioration by typically reducing the oxygen level in packaged foods to below 1% so that food tastes as good as the day it was made.

Nitrogen is primarily used to reduce the oxygen content within food packaging and to avoid product deterioration. A secondary reason for using nitrogen is as a filler gas to provide a pressurized atmosphere that prevents package collapse, this is an important consideration for consumer brands.

MAP is used in numerous products

- Potato chips, corn and extruded snacks
- Nuts
- Edible oils - refining of palm and coconut oils
- Coffee and tea
- Powdered milk
- Spices, pasta and other dried products
- Grated cheese and other dairy products
- Fruit juices and wine

Benefits of using MAP

- Preservation of product flavor, aroma, texture and nutritional value
- Increased sales through high product quality
- Fewer product returns
- Increased production efficiency with longer production runs
- Better product color and texture at point of sale
- Extended shelf-life
- Increased export opportunities to new geographic markets

Typical MAP shelf-life extension

Product Type	MAP Gas Required	Normal Product Life	Extended Life Factor
Liquid Food & Beverages	N_2	3 – 7 days	1 – 3 weeks
Dried Food Products	N_2	6 months	1 – 2 years
Grated & Soft Cheese	N_2 / CO_2	2 – 3 weeks	2 – 3 months
Fresh Fruit & Vegetables	N_2*	3 – 6 days	1 – 5 weeks
Fresh Pasta	N_2 / CO_2	1 – 2 weeks	3 – 4 weeks
Chilled & Ready Meals	N_2 / CO_2	1 – 4 days	1 – 2 weeks
Cooked & Chilled Meats	N_2 / CO_2	1 – 2 weeks	1 – 2 months

* minimal amounts of CO_2/O_2

In Vertical Form Fill Seal machines, the foodstuff and nitrogen are fed down the hopper, into a former, where the packaging takes place.

Image courtesy of Wright Machinery UK Ltd www.wright.co.uk

Why MAXIGAS?

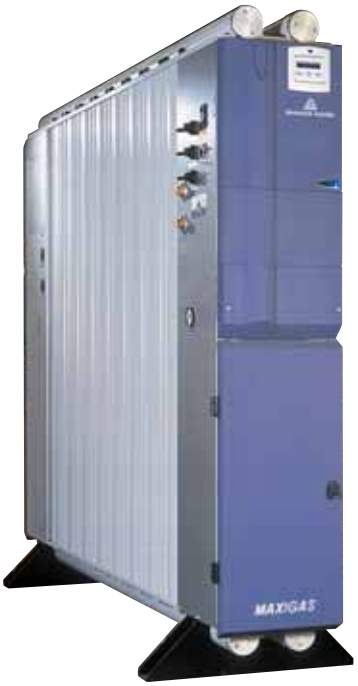
MAXIGAS is a cost effective alternative to other nitrogen sources with no on-going costs such as refills, order processing or delivery charges. It is also a safer alternative to the manhandling of high-pressure nitrogen gas cylinders.

Production downtime is minimized due to the permanent availability of an on-demand nitrogen supply, giving manufacturers increased control. MAXIGAS requires minimal maintenance and can also bring valuable space saving advantages.

The development of food packaging machines with integrated gas flushing capabilities and the supply of 'food grade' nitrogen by domnick hunter allows food manufacturers to enhance the quality and integrity of their products.

MAXIGAS deliverables

- Nitrogen purity up to 10 ppm oxygen content
- On-demand food grade nitrogen
- Compatibility with most packaging machines
- Increased control
- In remote or congested areas, no reliance on deliveries of gas
- Modular space saving design
- Ability to add extra banks of generators
- Simplicity
- Innovative regeneration feature requires minimal maintenance
- domnick hunter global service and support
- Easily retrofitted



MAXIGAS model N2MAX116

Reliable supply for fast paced production lines

How it works

MAXIGAS is constructed from pairs of extruded aluminum columns filled with carbon molecular sieve (CMS) and operates on the Pressure Swing Adsorption (PSA) principle to produce a continuous stream of nitrogen gas from compressed air. Oxygen and other trace gases are preferentially adsorbed by the CMS, allowing nitrogen to pass through.

Carbon molecular sieve differs from ordinary activated carbons in that it has a much narrower range of pore openings. This allows small molecules such as oxygen to penetrate the pores and be separated from the air stream. The larger molecules of nitrogen by-pass the CMS and emerge as the product gas.

After a pre-set time when the on-line bed is almost saturated with adsorbed gases, the system automatically switches to regenerative mode, venting the contaminants from the CMS. The second CMS bed then comes on-line and takes over the separation process. The pair of CMS beds switch between separation and regeneration modes to ensure continuous and uninterrupted nitrogen production.

Carbon molecular sieve

Performance data

	Model	Nitrogen Outlet Flowrate - Cubic Feet Per Hour (scfh) v Oxygen Content						
		10 ppm	100 ppm	0.1%	0.5%	1%	2%	3%
MAXIGAS MIDI	N2MID350	21	35	56	91	109	141	N/a
	N2MID600	31	52	91	137	162	215	N/a
SINGLE BANK MAXIGAS	N2MAX104	45	77	158	268	317	416	487
	N2MAX106	67	113	236	402	476	625	731
	N2MAX108	91	155	317	540	635	833	974
	N2MAX110	113	187	399	674	798	1041	1218
	N2MAX112	183	296	649	1087	1285	1454	1688
	N2MAX116	243	395	865	1451	1712	1868	2168

Performance data based on 87 psi g (6 bar g)) air inlet pressure, 68°-77°F (20°-25°C) ambient temperature.
Consult domnick hunter for performance under other specific conditions.

MAXIGAS installation

Technical specifications

Ambient temp. range	41-113°F (5°-45°C)
Nitrogen outlet pressure	72.5 psig (5 barg)
Min. air inlet pressure	87 psig (6 barg)
Max. air inlet pressure	138 psig (9.5 barg)
Inlet air quality	Dewpoint: -40°F (-40°C) Particulate: <0.1 micron Oil: <0.01 ppm
Electrical supply	110V/1ph/60Hz or 220V/1ph/50Hz
Inlet/outlet connections	½" NPT

Weights and dimensions

Model	Height ins (mm)	Width ins (mm)	Depth ins (mm)	Weight lbs (Kg)
N2MID350	43 (1100)	23 (590)	24 (600)	320 (145)
N2MID600	43 (1100)	23 (590)	24 (600)	397 (180)
N2MAX104	65 (1650)	20 (500)	32 (810)	551 (250)
N2MAX106	65 (1650)	20 (500)	39 (980)	728 (330)
N2MAX108	65 (1650)	20 (500)	45 (1150)	904 (410)
N2MAX110	65 (1650)	20 (500)	52 (1320)	1080 (490)
N2MAX112	69 (1760)	24 (600)	68 (1717)	1485 (674)
N2MAX116	69 (1760)	24 (600)	81 (2055)	1845 (837)

Standard accessories

Oxygen analyzer for continuous monitoring of nitrogen purity.

Flow verification kit.

Analog outputs for remote monitoring alarm connections.

Other dh products

- Compressed air filters
- Sterile air filters
- Compressed air dryers
- Laboratory gas generators
- Oil/water separators

MAXIGAS MIDI

The MAXIGAS MIDI range is designed to offer the most compact solution for smaller scale nitrogen requirements.

MAXIGAS modular concept

For higher flow rate applications, MAXIGAS can be multibanked to offer the most cost effective solution.
The modular design of the MAXIGAS system means you can simply add extra banks as your business grows and your gas requirements increase.

ISO 9001:2000
Q 05240

domnick hunter
5900-B Northwood Pkwy.
Charlotte, NC 28269 USA
Tel: (800) 345-8462
Telefax: (704) 921-1960
indgassystems@domnickhunter.com
http://www.domnickhunter.com

Publication Reference: 790 04/05 Rev 002 USA 08/06
Stock No: 17 400 4790