



domnick hunter



# MAXIGAS Nitrogen Supply

for the chemical industry

[www.domnickhunter.com](http://www.domnickhunter.com)

# Safe chemical manufacture

## *protecting employees and equipment*

Nitrogen gas is a clean, dry and inert element that is non-flammable and does not support combustion; these properties mean it is widely used in the chemical industry to help decrease the risk of fire even at high temperatures.

Nitrogen also disperses oxygen, making its use advantageous when handling oxygen sensitive substances. It is used at various manufacturing stages, some of which are described here.



### Blanketing

Tank blanketing is used for several reasons including to:

- Prevent or reduce oxidation that may damage stored products
- Shield chemicals from airborne contaminants such as moisture and particulate
- Protect the atmosphere we breathe from vapour emissions
- Reduce the combustion risk of highly flammable substances

The space above the substance is filled with a protective layer of nitrogen gas, while a gas delivery system maintains constant pressure even as the temperature and level inside the tank fluctuate. The blanket will protect the stored substance from oxidation and humidity, both of which can cause chemical alteration and degradation. It will ensure powders do not agglomerate and also provide protection against explosion.

Selection of a suitable blanketing gas depends on the liquid or substance being stored. An appropriate tank and other equipment will allow for expansion and overflow.



### Transfer

The use of high-pressure nitrogen gas to assist safe transfer of substances from one vessel to another is highly effective as it speeds up the process without causing any dissolution or build-up of substances.

### Manufacture

Conditioning treatments, spin drying and mixing processes that provoke oxidative reactions can be controlled in a nitrogen atmosphere. Nitrogen can also be used to dilute gas mixtures and increase yields.

### Protective cleaning

Purging reactors, silos, pipelines and other equipment with nitrogen before they are used or prior to a change over from one substance to another is an effective method of removing oxygen and microbiological contaminants that could cause dangerous or undesired reactions that might pollute the end product.

### Cooling

Reactors can also be quickly cooled with nitrogen gas to control reactions and ensure product quality.

### Safeguard

Nitrogen is an effective safety measure to protect life and property from combustion of volatile liquids and avoid vapour emissions that may be harmful to people and the environment.

# Why MAXIGAS?

MAXIGAS is a cost effective alternative to other nitrogen gas sources, with no on-going costs such as refills, order processing or delivery charges. It is an effective gas delivery system for applications that require high flow rates and pressure levels. It is also a safer alternative that eliminates manhandling of high-pressure cylinders or cryogenic gas tanks.

Production downtime is minimised due to the permanent availability of an on-demand nitrogen supply.

Maxigas gives manufacturers increased control over flow rates and requires minimal maintenance. It can also bring valuable space saving advantages.

## MAXIGAS deliverables

- Nitrogen purity of up to 10ppm oxygen content
- On-demand nitrogen
- Increased control
- No reliance on gas deliveries in remote or congested areas
- 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



Dependable nitrogen supply for improved occupational safety

## How it works

MAXIGAS is constructed from pairs of extruded aluminium 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 online 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 online 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