# BIOGON® food grade gases.
## BIOGON® N liquid (E 941). Liquid nitrogen, $N_2$.

### Application

Liquid nitrogen is used within the food industry for cooling, freezing, MAPAX® packaging of food in a modified atmosphere and inerting. In cooling and freezing processes the cold liquid nitrogen's high vaporisation temperature is used to quickly cool/freeze food. Nitrogen is primarily used to eliminate the oxygen in the atmosphere, thus minimising the growth of microorganisms and the oxidation of fat products. During the storing and bottling of wines and oils, nitrogen is used as an inert gas in order to extend the shelf-life of the products and avoid oxidation of the flavourings.

### Product specification

**BIOGON® N liquid (E 941). Liquid nitrogen, $N_2$**

| Product name | Purity vol % | Impurities unit ppm | | | | | Odour, taste | Material number* |
|---|---|---|---|---|---|---|---|---|
| | $N_2$ | $O_2$ | $H_2O$ | CO | CnHm** | $NO/NO_2$ | | |
| BIOGON® N liquid | ≥ 99,95 | ≤20 | ≤20 | ≤10 | ≤100 | ≤10 | none | |

*Differs between countries, see local language version.

**Calculated as methane.

All BIOGON® products comply with the requirements in European food legislation. This includes, among others, the European regulation (EC) no. 852/2004, regulation (EC) no. 178/2002, regulation (EC) no. 1333/2008 and regulation (EC) 231/2012. The gases in in the BIOGON® product group do not contain any allergens. No genetically modified organisms (GMO) are used in the manufacturing process for BIOGON® gases.

### Characteristics and origin

Liquid nitrogen is a colourless, tasteless and odourless liquid. Nitrogen is not flammable, nor does it support combustion. Atmospheric air contains 78,09 vol. % nitrogen, and nitrogen gas is somewhat lighter than air. Nitrogen as a little water wolubility and is dissolved in the water phase in food. Nitrogen is inert and does not react with the products. Liquid nitrogen is extracted from air via distillation in an air separation system.

## Physical data

| | | | |
|---|---|---|---|
| Type of gas and symbol | Nitrogen, $N_2$ | | |
| Boiling point | –196 °C | | |
| Heat of vaporisation, 1 bar | 199 kJ/kg | | |
| Heat capacity (15 °C) | 1.04 kJ/kg K | | |
| Conversion factors | 1 $Nm^3$ | = 1,419 l | = 1,148 kg |
| | 1 l | = 0,705 $Nm^3$ | = 0,808 kg |
| | 1 kg | = 0,872 $Nm^3$ | = 1,237 l |
| Critical values | Critical temperature | | –147,1 °C |
| | Critical pressure | | 33,9 bar |
| | Critical density | | 0,311 kg/l |

1 $Nm^3$ = 1 $m^3$ at 15 °C, 1 atm (technical atmosphere). The litre designation is used for gas in the liquid phase.

## Safety

Our goal is to maintain a high level of safety and protection, both for employees and the environment. Please read our safety data sheets (available at our web sites) before you use the product.

## Delivery form

Cooled liquid.



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