Less oxygen, more safety and quality

Targeted protection during production, storage and transportation, through inerting

Increased safety via reduced oxygen content

Inerting offers safety in many areas where the risk of fire or explosion due to inflammable chemicals, bulk materials and dusts exists. Furthermore, inerting also offers protection from unwanted auto-oxidation or biological processes.
During inertion, air and the oxygen it contains, is replaced by an unreactive gas such as nitrogen, carbon dioxide or a noble gas.
As one of the leading international industrial gas companies, Messer has many years of know-how in the field of inertisation and is able to supply the necessary gases.

No chance of explosions

To eliminate the risk of explosion through inflammable dusts, gases or vapours, the atmospheric oxygen level is kept below the limiting oxygen content (LOC). This prevents the creation of explosive mixtures. As the LOC varies from material to material, each inerting process has to be individually designed.

Letting the air out of quality problems

Many oils and fats, particularly those from a vegetable source are prone to losses in quality through auto-oxidation, polymerisation and fat decomposition following contact with oxygen and moisture. Storage of these products under an inert gas protects against losses in quality, increases the stability to oxidation and improves product lifetime.

The first biodiesel plant in Central and Eastern Europe is in Trzebinia, Poland. Since August 2005, nitrogen from Messer has been maintaining the inert gas atmosphere required for production and storage of the fuel.

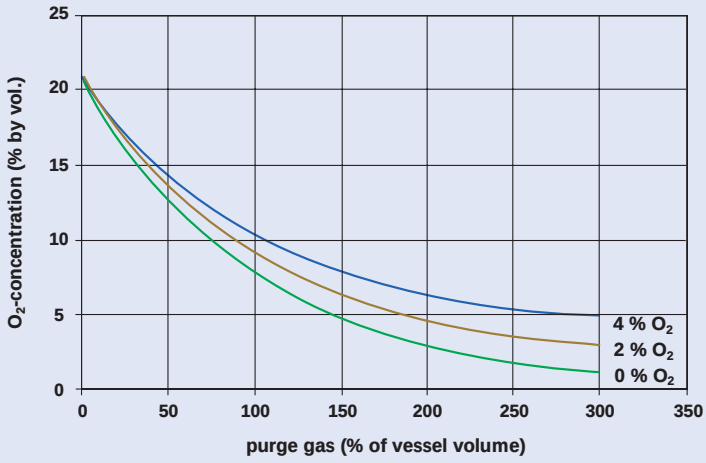
In one of the largest European bioethanol production plants in Pischelsdorf, Austria, nitrogen from Messer protects against explosions.

Photo: AGRANA Bioethanol GmbH

Which is the right inerting process for you?

In order to find the optimal individual inerting process for you, the experts from Messer will carry out an extensive system analysis, taking into account plant and material specifications.
With initial or occasional inertisations, the appropriate plant components are purged with an inert gas until the LOC is reached. Favourable plant layout, such as wide apart entry and exit points, leads to lower inert gas requirements.
To achieve a desired oxygen concentration, the nature and purity of the inert gas must be taken into consideration. In most cases, nitrogen is used for inerting.

Theoretical amount of purge gas to reach required oxygen concentrations.



Permanent inerting

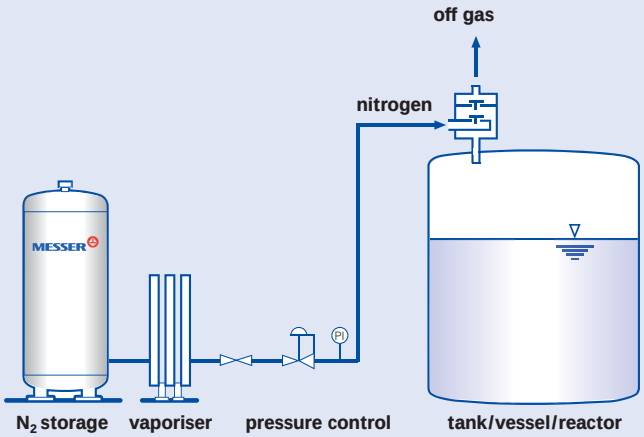
Closed systems such as tanks or reactors are often permanently inerted. In this case special blanketing valves create a slight permanent overpressure with inert gas in the tanks. When designing the valves, pressure resistance, volume, location and existing insulation of the tanks has to be taken into account. In addition, the performance of the corresponding pumps for filling and emptying of the tanks must also be observed. In extreme situations, for example large temperature variations during tank emptying, a peak in inert gas demand can occur. For such cases Messer provides sufficient volumes and a reliable gas supply.
The permanent existence of a slight overpressure prevents the entry of air and removes the need for oxygen level monitoring.

On-demand inerting

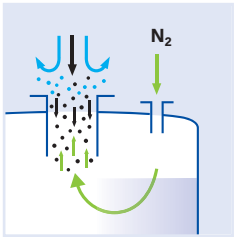
In some open systems, such as dryers, inerting is only required on demand. When the system reaches an unsafe operating stage, for example Start Up or Shut Down, the oxygen level will be kept under the LOC through permanent purging with inert gas. With open systems, either permanent monitoring of oxygen concentrations or maintenance of the required minimum inert gas flow is important to guarantee safe operation.

Inert gas lock

To prevent entry of atmospheric oxygen when filling vessels, special feeding devices are necessary. This is where inert gas locks are put into use. For example, the counter current purging of the feed with inert gas will avoid the entrainment of atmospheric oxygen. The inert atmosphere will remain in the system.



Tank blanketing with N_2 provides permanent safety.



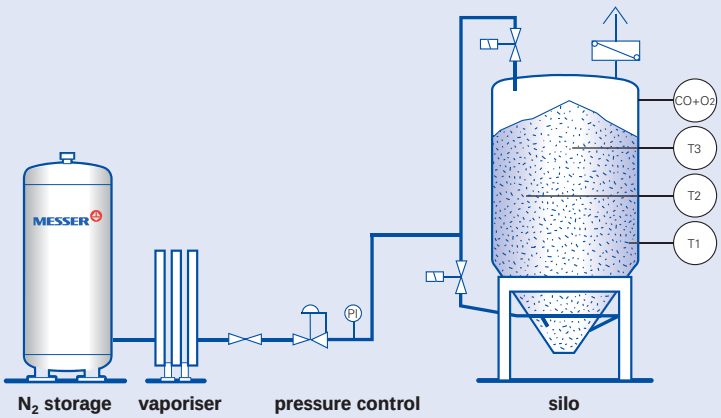
Inert gas locks prevent entrainment of O_2 during feeding.

Inerting as fire-fighting

Silos containing flammable bulk materials such as coal, wood chips, cereals or dried sewage sludge are often fitted with rapid inerting devices. For this reason the silos are equipped with CO- and temperature-monitoring devices and an inert gas supply. If a smouldering spot is detected through an increase in temperature or CO level, the silo headspace is immediately inerted in order to avoid a dust explosion. At the same time, the material will also be inerted until the smouldering fire is completely extinguished. Inertisation with N_2 or CO_2 prevents further damage to the product or silo, as would result through conventional fire extinguishing methods.

In Lublin, Poland, dried sewage sludge is stored safely in silos.

Possible fire or explosion risks can be minimised using rapid inerting.



Ideal explosion prevention and product protection at a glance

- Increased occupational health and safety
- Protection of installations and products
- Compliance with safety regulations
- Lower insurance premiums
- Maintenance of quality standards
- Increased product availability




Messer delivers the correct gases in the correct way with the correct purity.

Finding the best solution together

Our application engineers will be glad to advise you in choosing the right inerting method and in integrating it into your process. For the safe supply of gases, whether as cylinders, cryogenic tanks or on-site production, Messer is your competent partner.

If you have any questions or require assistance from one of our applications experts, please do not hesitate to contact us.

Contact persons in your country can be found at:
www.messergroup.com/de/Standorte/index.html

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