



Protection with added value

Endolin gas mixtures – for the highest metallurgical standards, even on tight budgets

Even the strongest need protection. In order to protect steel and non-ferrous alloy components against oxidation and surface decarburisation, the heat treatment that determines their properties is carried out under protective or reactive gas. Successful protection depends, not least, on the type of gas that is used: today's customary high standards of quality can now barely be met with conventional exogas. With the Endolin gas mixtures from Messer, however, you will always be on the safe side.

The mixture is what matters

The Endolin process is based on concentrated endogas, which is produced catalytically from natural gas or propane and air in a generator. The endogas is then diluted with nitrogen (N₂), leading to the formation of low-dew-point mixtures with a carbon monoxide (CO) content of one to five per cent and a hydrogen (H₂) content of two to ten per cent. The Endolin mixture is fed into the furnace via a special metering device, with both components, endogas and nitrogen, being mixed as required. Alternatively, partially diluted endogas and nitrogen can be introduced

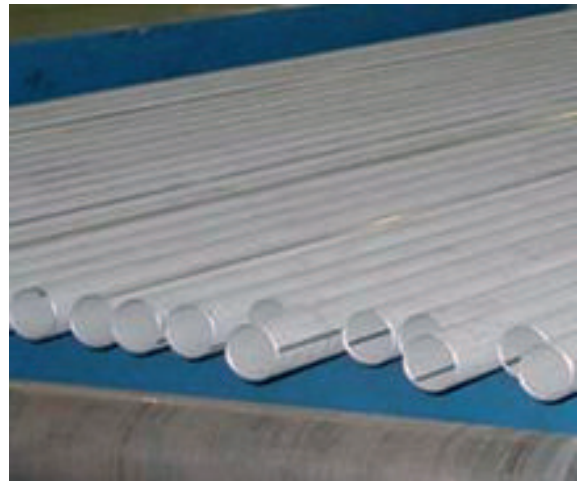
separately at different points of the heat treatment facility, leading to different hydrogen and carbon monoxide contents in the heating chamber and cooling tunnel. A special nitrogen injection system in the cooling zone also allows a flow to be generated which markedly reduces unwanted dust deposits.



Dazzling results with optimised Endolin



Endolin field-test : before annealing and ...



... after annealing

Your benefits at a glance

Endolin mixtures

- are extremely effective protective and reactive gases.
- are comparatively dry due to their low dew point: no additional dryer required.
- are stable and even retain their approximate chemical composition in the heating chamber.
- protect against decarburisation and facilitate carburisation. Probes measure the furnace atmosphere and indicate the propane requirement.
- have a reduction potential up to 15 times greater than exogases.
- completely remove adherent oxide layers.

Last, but not least: Endolin mixtures not only have a positive effect on the recrystallisation annealing of steel; they also reduce the costs, improve the quality and increase the safety of sintering, soldering and tempering processes.

What the experts think

Endolin mixtures are an economically and technically attractive option for when a pure hydrogen supply is too expensive and self-produced exogas or monogas do not meet quality requirements. The cryogenic nitrogen required for dilution is available commercially, but can also be produced on-site at the user's premises.

Please do not hesitate to contact us if you have any questions regarding Endolin mixtures or would like to arrange a personal consultation with our application experts.

Contacts in your country can be found at:

www.messergroup.com/de/Standorte

This and many other brochures can also be downloaded from the Internet in PDF format:
www.messergroup.com



The Endolin process: tried and tested in pipe production.

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