

## Steel-hardened advantages

### Vario-Nitro-Carb Plus – for optimal surface treatment

Material surfaces must be tough. Wear and corrosion resistance are important quality criteria, depending on the application. Consideration must also be given to the connection layers that are built up during the nitriding process and whose composition and layer structure provide the requisite properties for the subsequent application. The Vario-Nitro-Carb Plus process from Messer has been specifically tailored to the needs of modern gas nitriding technology and meets the highest expectations. It effectively expands the range of applications for reproducible gas atmospheres when adjusting component properties, and makes it easier to create tough, wear-resistant surface layers with better corrosion resistance.

#### **Variable, reliable and convincing**

A characteristic feature of the Vario-Nitro-Carb Plus process is the purely synthetic furnace atmosphere, which can have a high level of carbon activity if required, thereby allowing high carbon concentrations to be set in the connection layer; the  $\epsilon/\gamma$  ratio is therefore adjustable across a wide spectrum.

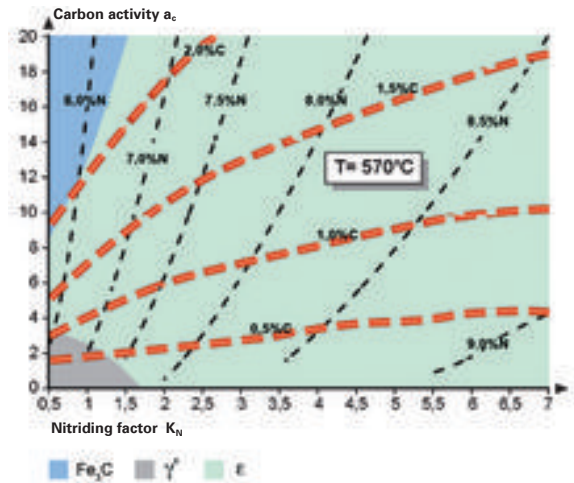
To use Vario-Nitro-Carb Plus from Messer, there is no need for a new furnace installation as it can easily be used with existing furnaces. With an unregulated furnace atmosphere, the process is controlled via the fixed gas quantities that are added. If the furnace is equipped with an atmosphere control system, the nitriding process can also be optimised with the aid of special flow meters and programme controllers. Multi-stage nitriding processes are possible, if required.



*Vario-Nitro-Carb Plus ensures that everything runs smoothly.*



Modern nitriding furnaces at IVA



Stability ranges of iron nitrides and iron carbide

### Your benefits at a glance

The Vario-Nitro-Carb Plus process from Messer

- guarantees you rapid and targeted build-up of the surface layer.
- permits variable and flexible configuration of the  $\epsilon/\gamma$  nitride ratio.
- produces surface layers with high corrosion and wear resistance.
- can be specifically tailored to your individual requirements and used with existing furnace installations.
- delivers optimal results along with good reproducibility and a high level of operational safety.

### What the experts think

When it comes to the nitriding of steels, the Vario-Nitro-Carb Plus process from Messer offers an extremely user-friendly and efficient solution. The mix of synthetic gases delivers workpieces with an even hardness distribution and layer structure, which is achieved by adding pure or modified carbon dioxide ( $\text{CO}_2$ ). The Vario-Nitro-Carb Plus process is extremely flexible in its use and can easily be adapted to suit individual requirements.

Please do not hesitate to contact us if you have any questions regarding the Vario-Nitro-Carb Plus process 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](http://www.messergroup.com/de/Standorte)

This and many other brochures can also be downloaded from the Internet in PDF format:  
[www.messergroup.com](http://www.messergroup.com)



Targeted wear protection for long service life

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