

Raising the bar for sintering quality.

Sintering Atmosphere Control Technology.



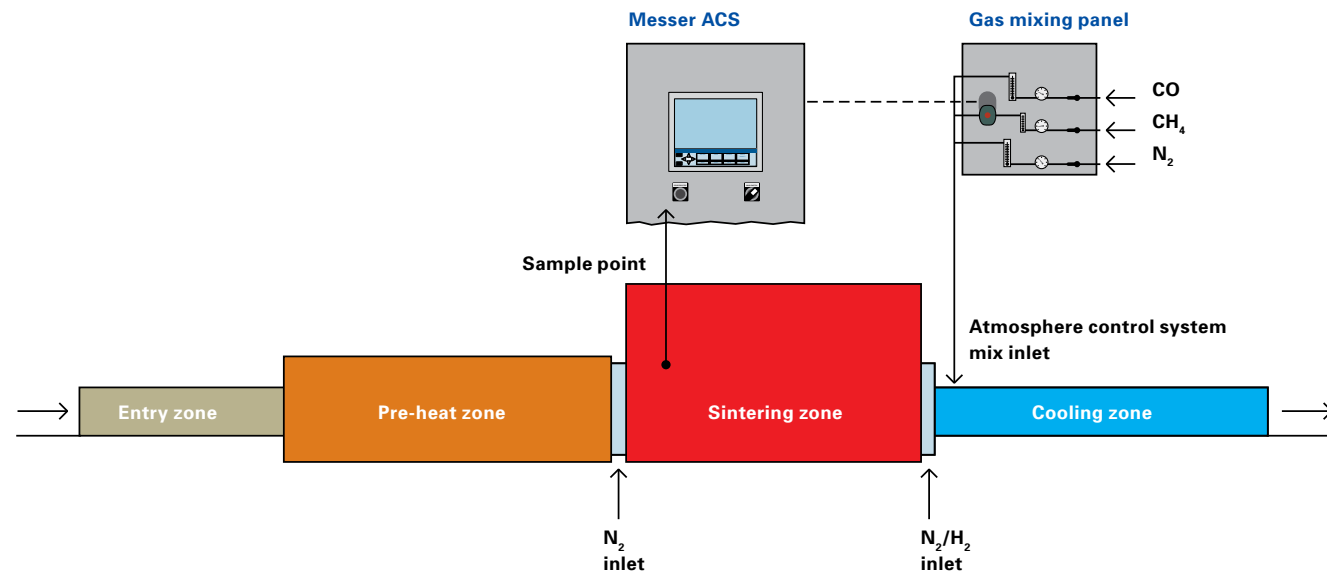
Creating new opportunities for sintered parts.

Through online carbon control.

The powder metallurgy (PM) industry is challenged to increase the quality and consistency of sintered parts in order to open up new market opportunities.

parts. A sophisticated, online carbon control system is at the heart of Messer's offering. It paves the way for exciting new market opportunities for sintered parts.

Messer has developed a technology to control the sintering process and improve the mechanical strength of sintered



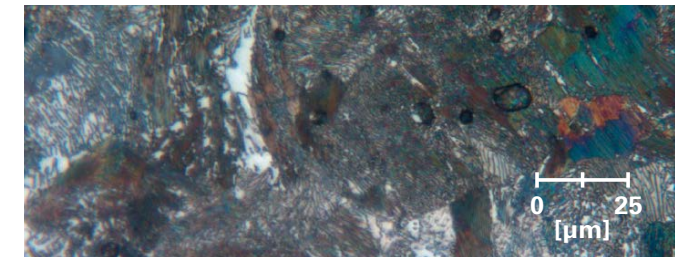
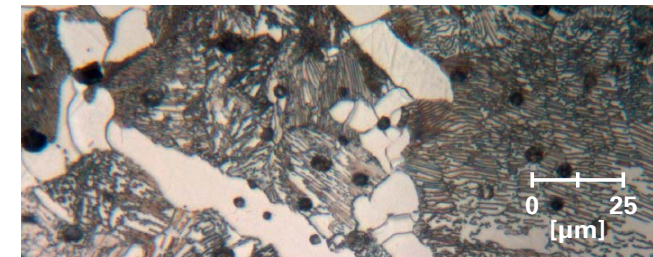
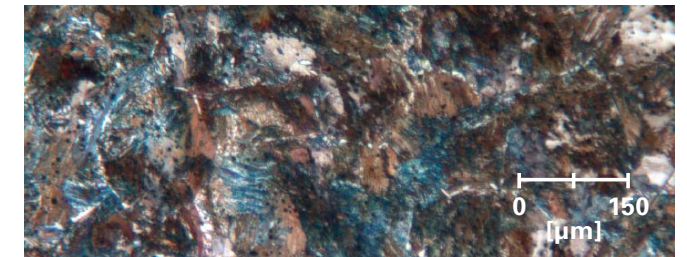
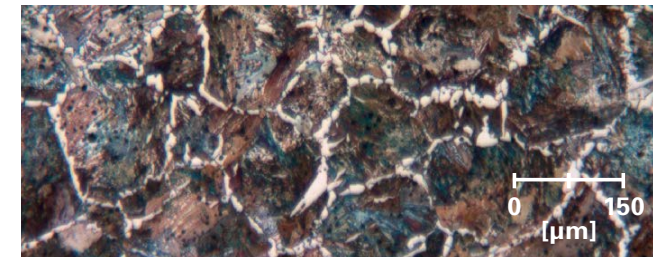
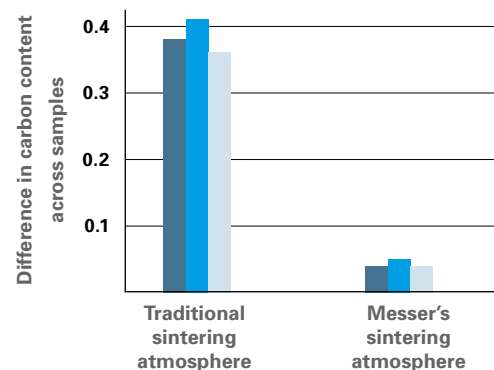
Messer's technology – an integral part of the sintering process

Behind the scenes

Messer's sintering technology, works on the simple principle of gas sampling. A gas sample passes through an external, heated probe designed specifically for the sintering process and then through the carbon monoxide gas analyser. The results are used to calculate the carbon potential of the furnace atmosphere. The system uses a closed loop method, constantly comparing gas measurements against the C-potential to identify deviations. Operators can then easily and dynamically adjust the gas mixture to maintain constant, optimum carbon control over the furnace atmosphere.

Range of carbon content in parts treated during a production day

■ PM component 1 ■ PM component 2 ■ PM component 3



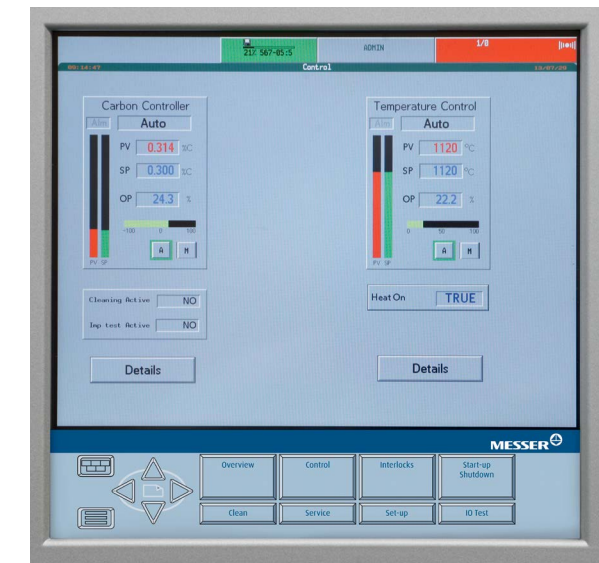
Traditional sintering atmosphere

Messer's sintering atmosphere

Benefits at a glance

- Delivers real-time monitoring and dynamic adjustment capabilities over furnace atmospheres
- Allows faster start-up and reduced switching times between different alloys
- Reduces post-treatment costs for salvaging carbon content of components

- Enables operators to sinter highly alloyed powders (Cr)
- Enables controlled carburisation (up to 150 µm) for greater resistance to fatigue
- Enables consistently high quality of the sintering furnace atmosphere through closed loop control



User-friendly customer interface for real-time monitoring and dynamic adjustment of furnace atmosphere

Creating a lean sintering atmosphere

Today, most furnace atmospheres in the PM industry are fed a mixture containing nitrogen (as the base gas) and various active gases such as hydrogen, carbon monoxide and hydrocarbons. The aim of these active gases is to control the carbon content and the oxidation process.

carburising process can be tightly controlled. The challenge lies in ensuring advanced monitoring and control functionality that allows operators to ensure carbon potential uniformity throughout the furnace.

These gases can be finely adjusted to create a leaner atmosphere which delivers the desired carbon potential. In other words, keeping all active gases to a minimum so the

Messer has resolved this challenge with its unique sintering technology. This innovative, automated and user-friendly solution gives operators real-time monitoring and dynamic adjustment capabilities over furnace atmospheres.



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