



Atmospheres for Powder Metal Producers



The proper atmosphere is critical to the quality and final composition of powder metal production

In order to ensure that your powder metals meet specifications and are free of defects, special attention to the furnace atmosphere is recommended during the atomization process.

The proper control of the variables that contribute to your atmosphere system are critical to the final composition of powder metal production. Beginning with the initial furnace installation, selecting the source of the atmosphere gases and considering the factors involved in the production of the parts, can all affect the quality and integrity of the powder. Linde can provide the gases needed for your gas applications in the powder metal industry — such as argon, nitrogen, and hydrogen— and the technical knowledge required to help you remain competitive and maximize your resources.

Highlights

- Customized supply system options for hydrogen, argon and nitrogen-based atmospheres
- Gas control equipment and technologies from ongoing R&D and industry experience
- Engineering support and expertise located regionally
- Products and patented applications to improve quality and reliability



Our engineers are available to help you select the most cost-effective atmosphere composition for your product lines and assist in balancing the atmosphere flows for consistent product results.

When making specialty metal powders, argon is used in the atomization process to provide the most inert atmosphere possible. At high temperatures, necessary for many processes, oxygen and nitrogen may react with advanced materials, such as titanium, nickel and cobalt alloys. This reaction forms detrimental metallic oxides and nitrides that lead to inclusions and other defects in the final products.

Nitrogen can be used in gas atomization processes where the metals are less refractory in nature or do not react to form nitrides. In addition, liquid nitrogen can also be used as part of a recycle loop for the recovery of more expensive gases such as argon and helium.



Experience Counts

Customer service and support is a cornerstone of Linde's philosophy. When you choose a Linde protective atmosphere system, you get much more than gas and equipment. You have access to a full range of customer services at your fingertips.

Linde can assist in the design, installation and maintenance of a cost-effective protective atmosphere supply system, including hydrocarbon additives.

For total capabilities from a single source, dedicated to helping you increase your output and improve your bottom line, call Linde.

Gas Applications in Powder Metal Industry

Application	Argon	Nitrogen (N ₂)	Hydrogen (H ₂)
Powder Metal Production	●	●	●
Inert Gas Atomization	●	●	
Bright Annealing		●	●
Hot-Isostatic Pressing (HIP)	●		●
Sintering Atmosphere	●	●	●
Melting & Casting	●	●	
Furnace Inerting	●	●	●
Post Sintering Heat Treating	●	●	●
Replace Dissociated Ammonia		●	●
Additive Manufacturing (3D Printing)	●	●	

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