

Safety & Code Compliance for Flammable Furnace Atmospheres.

At Messer, we do more than simply produce and distribute industrial gases. For over 40 years, Messer's industry leading application team has provided custom industrial gas supply solutions for a wide range of heat treatment and manufacturing applications. We understand our customers, their processes, and the important role our gases play in their operations. We also recognize the hazards that accompany the use of inert gases such as argon and nitrogen, flammable gases such as hydrogen, and their usage and storage as cryogenic liquids. Messer remains deeply committed to providing resources, plant audits and trainings that help our customers use our products safely and effectively.

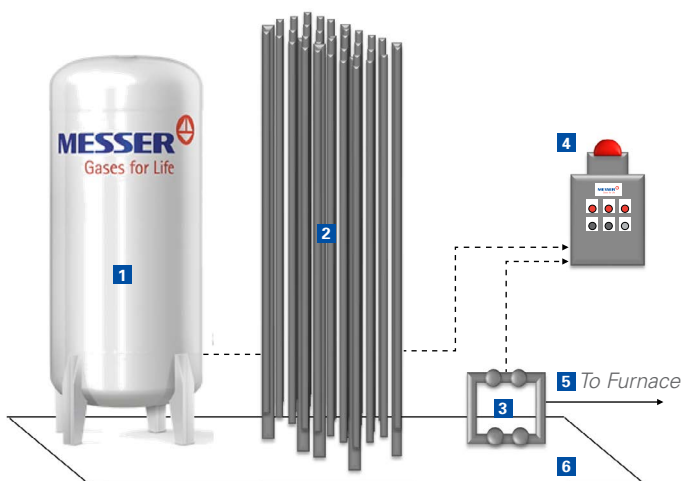
Standards for Flammable Furnace Atmospheres

The National Fire Protection Association (NFPA), American Society of Mechanical Engineers (ASME), and Compressed Gas Association (CGA) provide codes, standards, and guidelines for industrial processes. Understanding and complying with these codes is essential to maintaining a safe workplace for all. When designing industrial gas supply systems for flammable atmospheres, Messer's team helps customers choose the optimal flow control system and delivery that satisfy the following codes:

- NFPA 86 Standard for Ovens and Furnaces
- NFPA 55 Compressed Gases and Cryogenics Fluids Code
- ASME B31.3 Process Piping

When dealing with these furnace atmospheres, these codes address several key considerations for safe furnace operation. For example, the furnace must have the appropriate atmosphere flow controls, safety shutoff valves, safety interlocks, and means for safe introduction and removal of the flammable atmospheres. In addition, there are specific requirements of bulk gas supply systems detailed below:

Basic Requirements of a Nitrogen Bulk System



1. Nitrogen Tank

NFPA 55 details the requirements for minimum safety distances

2. Vaporizers

Nitrogen system designed for the flow of furnace atmosphere when a flow interruption creates an explosion hazard. (NFPA 86:13.5.5.1.5)

3. Low Temperature Shut off and Pressure Regulator Manifold

- Low temperature shut off device cannot interrupt flow of safety purge gas (NFPA 86:13.5.9.2.1)
- Consult industrial gas supplier for selection of low temperature shutoff device (NFPA 86:13.5.9.2.3)

4. Alarm Panel

NFPA 86:13.5.5.2 requires:

1. Low-Level Alarm Panel is placed in the area occupied by furnace operators
2. Low level alarm allows for safe shutdown of affected furnaces and sufficient nitrogen gas for 5 volume changes of all connected atmosphere furnaces (NFPA 89:13.5.5.1.4(1))

5. Piping and Pressure Vessels

- Piping complies with ASME B31.3 Process Piping (NFPA 86:13.5.5.1.1)
- Material of construction of pressure vessels and receivers need to be compatible with the lowest possible temperature of furnace atmospheres or have a control system to shut off gas flow when that minimum temperature is reached (NFPA 86:13.5.9.2.3)

6. Main Bulk Pad

Fenced, locked with a second means of egress per NFPA 55 with bollards for equipment protection

Messer Safety Purge Alarm Solutions

Messer offers end-to-end atmosphere control solutions compliant with current codes and standards, from atmosphere flow control panels to safety equipment such as the Safety Purge Alarm Panel. In the event a low gas temperature, low pressure, or low tank level condition arises for safety purge gas, a visual and audible alarm will sound.



Concerned about your furnace atmosphere supply system?

Messer's experienced team is available to perform furnace audits, provide safety training, help furnace operators understand and comply with the relevant codes and standards, and make recommendations based on industry best practices.

Contact Messer today to learn more.

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