



**Brieser**  
CONSTRUCTION

**Section 46**  
**Safety Health**  
**and**  
**Environmental**  
**Manual**

**2024**

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**Toxic & Hazardous Substances**

<b>BRIESER CONSTRUCTION GENERAL CONTRACTORS</b>		Developed:	3/13/2017
		Revised:	3/13/2017
<b>CORPORATE SAFETY, HEALTH &amp; ENVIRONMENTAL MANUAL</b>		Revision:	01
		Reviewed:	11/2023 JH
STANDARD OPERATING PROCEDURE:		<b>Toxic &amp; Hazardous Substances</b>	
CROSS REFERENCE:	<b>OSHA 29 CFR 1910 Subparts Z &amp; H ACGIH, TLV TWAs and BEIs</b>		

## Toxic & Hazardous Substances

### PURPOSE

The purpose of this policy is to set out our approach to protecting workers from harmful exposure to in-plant hazards such as process chemicals or other toxic or hazardous substances.

### SCOPE

This policy is not a comprehensive plan to provide Brieser employees with safe work procedures. It is merely an awareness level program designed to inform our employees on the physical & health characteristics of a substance that they may come into contact or work around while on some of our customer's sites.

In all cases where employees may be potentially exposed to harmful chemicals the site competent person for Brieser, which is the site supervisor or superintendent, will conduct a full job hazard analysis utilizing the entire Brieser SH&E Manual to eliminate or reduce the hazard to acceptable levels before any task has been started.

### PURPOSE

**Competent person** -means an individual who can identify existing and foreseeable respirable crystalline silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them. The competent person must have the knowledge and ability necessary to fulfill the responsibilities set forth in this policy.

**Health Hazard** - means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees.

**Physical Hazard** - means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive), or water reactive.

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## RESPONSIBILITIES

*The Program Administrator: Brieser Safety Director*

- Issuing and administering this program and making sure that it satisfies all applicable federal, state, and local requirements.
- Ensuring all necessary inspections are maintained by conducting field audits.
- Conducting a periodic review of this program.

*Project Managers, Superintendents and Foremen*

These people are responsible for:

- Ensuring that employees are trained in this policy before working in the host facility where process operations contain chemicals listed within this policy.
- Conducting a job hazard analysis such as the Brieser TSTI before work starts to identify all site hazards.
- Selecting the appropriate PPE for chemicals listed in this policy.

*Human Resources*

These people are responsible for:

- Maintaining training records for all employees included in the training sessions.

*Employees*

- Knowing the physical characteristics & health hazards of the chemicals presented within this policy.
- Know where plant chemicals listed in this policy are used.
- Know & understand host facility contingency/emergency plans before working around chemicals listed in this policy.
- Using the appropriate control methods outlined within the Silica Control Permit
- Ensure you are trained on any equipment used including Personal Protective Equipment
- Following established work procedures as directed by the supervisor.
- Reporting any unsafe conditions or acts to the supervisor.
- Knowing how and when to report exposure incidents.

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## **Anhydrous Ammonia**

### ***General***

Anhydrous ammonia is widely used as a refrigerant in many industrial facilities, including:

- Meat, poultry, and fish processing facilities
- Dairy and ice cream plants
- Wineries and breweries
- Fruit juice, vegetable juice, and soft drink processing facilities
- Cold storage warehouses
- Other food processing facilities
- Petrochemical facilities

Other uses are.

- Metal heat treating, annealing, and hardening.
- Production of Nitric Acid
- Acid neutralization in water treatment facilities
- Petroleum & Mining industries to extract chemicals and ores.
- Power plant stack emissions reduction
- Diesel Engine pollution reduction
- Beverage industry to supply nitrogen for yeast and other organisms.
- Leather industry to cure hides.
- Heat recovery air conditioning

If your task is working on or nearby.

- Industrial Refrigeration machinery rooms, equipment and/or piping
- Petroleum refineries
- With or near agricultural fertilizer

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All Brieser employees must obtain a permit from the host facility and understand the types of chemicals they may be working on/near and take the necessary precautions to eliminate or reduce the hazard.

#### **HEALTH EFFECTS**

- Exposure to Anhydrous Ammonia has been shown to be corrosive to the skin, eyes, and lungs.
- High concentrations of ammonia gas, liquid ammonia and solutions of ammonia can cause harm if inhaled or if they come into contact with eyes or skin.
- Exposure of the eyes to ammonia may cause burning, tearing, temporary blindness and severe eye damage. Exposure of the skin to ammonia may cause severe burns and blistering. Exposure of the respiratory tract (mouth, nose, and throat) to ammonia may cause runny nose, coughing, chest pain, severe breathing difficulties, severe burns, and death.

#### **PHYSICAL CHARACTERISTICS**

- Pungent Odor, detectable at 3-5 ppm
- Colorless gas under normal ambient conditions, liquid when under pressure
- Hydrophilic, meaning it likes water. Creates a strong base, pH 14.
- Likes water mean it likes living things.
- Flammable at 12,000 to 16,000 ppm
- Liquid will cause freeze burns.
- Never add heat (water) to liquid ammonia
- Very corrosive in concentrated ammonia solutions
- Lighter than air when dry, heavier in moist air or around water

#### **EXPOSURE LIMITS**

- TLV TWA: 25 ppm
- IDLH: 300 ppm for ½ hr.

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## **METHODS OF COMPLIANCE**

Employees should be provided with and required to use impervious clothing, gloves, face shields and other appropriate protective clothing necessary to prevent any possibility of skin contact with liquid anhydrous ammonia or aqueous solutions of ammonia containing more than 10% by weight of ammonia. Similar precautions should be taken to prevent the skin from becoming frozen from contact with vessels containing liquid anhydrous ammonia.

### ***Recordkeeping & Training***

- A copy of this policy is located on Brieser's Website
- Brieser will ensure that each affected employee with respect to training can demonstrate knowledge and understanding of.
  - Health hazards associated with Anhydrous Ammonia exposure.
  - The tasks in their workplace that could result in exposure to Anhydrous Ammonia
  - Proper use, storage, and maintenance PPE
  - The contents of this policy
  - Who the competent person is on their site?

## **NITROGEN**

### ***GENERAL***

Nitrogen is widely used to purge equipment, tanks, and pipelines of vapors and gases in many industrial facilities, including:

- Chemical plants
- Petroleum Refineries
- Other Industrial Facilities

Nitrogen is also used to maintain an inert and protective atmosphere in tanks, vessels and storage tanks containing flammable liquids or air-sensitive materials.

If your task is working with on or nearby.

- Industrial machinery rooms, equipment and/or piping
- Petroleum refineries
- Compressed cylinders

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All Brieser employees must obtain a permit from the host facility and understand the types of chemicals they may be working on/near and take the necessary precautions to eliminate or reduce the hazard. Documented planning will be conducted for those operations involving potential nitrogen exposure on the Brieser TSTI and/or customer permit. This includes anytime an active purge is being applied to a system in or around equipment associated with work.

If working with Nitrogen Cylinders Section 35 Compressed Gas Safety shall be referenced for a complete guide to working with compressed gasses including Nitrogen. This policy will reference some specific precautions but is not comprehensive, therefore Section 35 of our Safety Manual be utilized.

### **HEALTH EFFECTS**

- Nitrogen is a simple asphyxiant by displacing the oxygen in the air.
- Inhalation of excessive amounts of nitrogen can cause dizziness, nausea, vomiting, loss of consciousness, and death.

### **PHYSICAL CHARACTERISTICS**

- Odorless, colorless, tasteless, and nonirritating, nitrogen has no properties that can warn people of its presence.
- Liquid Nitrogen is a cryogenic liquid, has an extremely low boiling point of -320 degrees F.
- Produces large volumes of nitrogen gas when it vaporizes.
- Colorless gas under normal ambient conditions, liquid when under pressure
- Nitrogen gas is only slightly lighter than air and readily mixes with air at room temperature. Cold vapors are denser and will settle.

### **EXPOSURE LIMITS**

- IDLH: Any Oxygen level below 19.5% to by oxygen-deficient

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#### **METHODS OF COMPLIANCE**

- Appropriate signage will include adequate warning by stating Danger, Inert Gas Present, Possible Oxygen Deficient Environment.
- As determined by the hazard assessment (TSTI), nitrogen vent / purge points will be labeled and barricaded.
- As determined by the hazard assessment (TSTI), nitrogen vent / purge points will be labeled and barricaded with a 3' diameter or as determined by oxygen monitoring (must be > 19.5 outside of the barrier.)
- Nitrogen cylinders should contain an identifying label UN1066.
- Nitrogen cylinders should be upright, properly supported, and stored outdoors or in a well-ventilated area. The protective cap must be in place when not in use.
- Nitrogen must not be used to power pneumatic tools or blowers except when they are used in an inert atmosphere.

#### **RECORD KEEPING & TRAINING**

- A copy of this policy is located on Brieser's Website
- Brieser will ensure that each affected employee with respect to training can demonstrate knowledge and understanding of.
  - Health hazards associated with Nitrogen exposure.
  - The tasks in their workplace that could result in exposure to Nitrogen.
  - Proper use, storage, and maintenance PPE
  - The contents of this policy
  - Who the competent person is on their site.



# Toxic and Hazardous Substances Learning Exercise

Score:

%

Employees Name:

Date:

Answer each of the following questions by circling the appropriate letter.

1. The purpose of this policy is to set out our approach to protecting workers from harmful exposure to in-plant hazards such as process chemicals or other toxic or hazardous substances.
  - a. True
  - b. False
2. Some uses for Anhydrous Ammonia are the following (circle all that apply)
  - a. Wineries and breweries
  - b. Cold storage warehouses
  - c. Petrochemical facilities
  - d. Leather industry to cure hides.
3. Exposure to Anhydrous Ammonia is not shown to be corrosive to the skin, eyes, and lungs.
  - a. True
  - b. False
4. \_\_\_\_\_ is widely used to purge equipment, tanks, and pipelines of vapors and gases in many industrial facilities, including:
  - a. Anhydrous Ammonia (NH<sub>3</sub>)
  - b. Nitrogen (N<sub>2</sub>)
  - c. Compressed Air
  - d. Water (H<sub>2</sub>O)
5. All Brieser employees must obtain a \_\_\_\_\_ from the host facility and understand the types of chemicals they may be working on/near and take the necessary precautions to eliminate or reduce the hazard. Documented planning will be conducted for those operations on the \_\_\_\_\_. This includes anytime an active purge is being applied to a system in or around equipment associated with work.
  - a. Parking Pass / Big Truck
  - b. Permit / Brieser TSTI
  - c. Radio / Correct Frequency
  - d. Nitrogen / Anhydrous Ammonia

## Toxic and Hazardous Substances Learning Exercise

### Answer Sheet

1. The purpose of this policy is to set out our approach to protecting workers from harmful exposure to in-plant hazards such as process chemicals or other toxic or hazardous substances.
  - a. **True**
  - b. False
2. Some uses for Anhydrous Ammonia are the following (circle all that apply)
  - a. **Wineries and breweries**
  - b. **Cold storage warehouses**
  - c. **Petrochemical facilities**
  - d. **Leather industry to cure hides.**
3. Exposure to Anhydrous Ammonia is not shown to be corrosive to the skin, eyes, and lungs.
  - a. True
  - b. **False**
4. \_\_\_\_\_ is widely used to purge equipment, tanks, and pipelines of vapors and gases in many industrial facilities, including:
  - a. Anhydrous Ammonia (NH<sub>3</sub>)
  - b. **Nitrogen (N<sub>2</sub>)**
  - c. Compressed Air
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5. All Brieser employees must obtain a \_\_\_\_\_ from the host facility and understand the types of chemicals they may be working on/near and take the necessary precautions to eliminate or reduce the hazard. Documented planning will be conducted for those operations on the \_\_\_\_\_. This includes anytime an active purge is being applied to a system in or around equipment associated with work.
  - a. Parking Pass / Big Truck
  - b. **Permit / Brieser TSTI**
  - c. Radio / Correct Frequency
  - d. Nitrogen / Anhydrous Ammonia