1. PURPOSE 2
2. DEFINITIONS 2
3. SCOPE 2
4. PROCEDURE 2
   - 4.1. General Requirements 2
   - 4.2. Handling 3
   - 4.3. Storage 3
   - 4.4. Acetylene, Fuel Gas and Oxygen Cylinders 4
5. RESPONSIBILITIES 5
6. RELATED DOCUMENTS 5

CONTROLLED DOCUMENT- 24 HRS FROM 2/21/2025 2:22 PM
-- UNCONTROLLED THEREAFTER –
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1. PURPOSE

To provide a procedure for the safe handling, transporting, storage, inspection and use of compressed gas cylinders.

2. DEFINITIONS

2.1. Compressed Gas

Any gas or mixture of gases exerting in a container, a pressure exceeding 40.6 psia at 68 °F; or any flammable liquid having an absolute vapor pressure exceeding 40.6 psia at 100 °F as determined by ANSI/ASTM D 323.

2.2. Cryogenic Liquids

Liquid having a boiling point below -130 °F (-90 °C) at 14.7 psia.

2.3. Cylinder

A gas cylinder is a pressure vessel for storage and containment of gases at above atmospheric pressure. Inside the cylinder the stored contents may be in a state of compressed gas, vapor over liquid, supercritical fluid, or dissolved in a substrate material, depending on the physical characteristics of the contents.

2.4. Flammable Gas

A flammable gas is a gas having a flammable range with air at 20°C (68°F) and a standard pressure of 101.3 kPa (14.7 psi), and:

(a) are ignitable when in a mixture of 13% or less by volume in air; or

(b) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit.

2.5. Valve Protection Cap

A rigid removable cover provided for container valve protection during handling, transportation, and storage.

3. SCOPE

3.1. This procedure applies to BASF Corporation's Beaumont, Texas plant site.

4. PROCEDURE

4.1. General Requirements

4.1.1. Markings

Labels and stamped markings on compressed gas cylinders shall not be altered or removed. Cylinders that do not bear legible indication of content will not be accepted.

4.1.2. Cylinder Modifications

No part of the cylinder, including the pressure relief device, container valve, or valve protection device, shall be modified, removed, or repaired.

4.1.3. Use of Cylinders as Rollers or Supports

Cylinders shall not be used as rollers or supports.

4.1.4. Contact with Flames/Heat/Electrical Arcs

Never apply a flame or heat directly to any part of the compressed gas container or allow it to come into contact with an electrically energized system.

When compressed gas containers are used in conjunction with electric welding, they shall not be grounded or used for grounding.

4.1.5. Empty Gas Cylinders

Empty gas cylinders shall be capped and marked “Empty” or “MT”.

4.1.6. Refilling or Mixing of Cylinder Contents

Gas cylinders shall not be refilled, or cylinder contents mixed by plant personnel.

4.1.7. Separation from Spark Producing Activity

No spark-producing activity is allowed within 35 feet of stored flammable cylinders.

4.2. Handling

4.2.1. Electromagnets

Electromagnets are not acceptable devices for lifting cylinders.

4.2.2. Cylinder Lifting

- Slings, chains, or cables can only be used for lifting cylinders if the cylinders are equipped with lifting lugs.
- Cylinders shall not be lifted by their protective caps.

4.2.3. Transporting Compressed Gas Cylinders

- Never transport cylinders in closed body vehicles.
- Cylinders shall be transported in approved cylinder carts, cradles or material handling devices with cylinder valves closed, regulators removed and protective caps in place.
- Hand trucks must be used for transportation of individual high-pressure containers. Six-packs, 12-packs, etc., must be moved according to supplier’s recommendations, using proper lifting devices.
- The cylinders must be properly secured to prevent shifting/movement.

4.3. Storage

4.3.1. Sign Posting in Storage Areas

Storage areas shall be prominently posted with the hazard class or the name of the gases to be stored. "NO SMOKING" signs shall be posted where flammable gases are stored.

4.3.2. Segregation of Full and Empty Cylinders

Empty and full gas cylinders are to be capped and stored in separate racks.

4.3.3. Storage Temperatures

Cylinders shall not be subjected to temperatures greater than 125º F.

4.3.4. Security of Cylinders

- Cylinders must be chained or secured by a non-combustible (metal) chain to prevent shifting or falling.
- There are some large cylinders (i.e., argon) which cannot be knocked over without excessive force; as long as such cylinders are stored in areas where heavy moving objects cannot strike them, additional securement is not necessary.
- Cylinders not in use must also have valve protection caps in place. Cylinders must be secured before caps are removed.

4.3.5. Storage Position of Liquefied Gas Cylinders

Liquefied gas cylinders shall be stored and used valve end up.

4.3.6. Storage of Flammable Gas Cylinders

CONTROLLED DOCUMENT- 24 HRS FROM 2/21/2025 2:22 PM
-- UNCONTROLLED THEREAFTER –
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Flammable gas cylinders must be stored a minimum of twenty (20) feet apart from oxygen cylinders or be separated by an approved non-combustible partition with a one-hour fire resistance rating. Flammables should be stored at least 20 feet from oxidizers or separated by a 1-hour fire wall.

4.3.7. Ground/Surface Contact While in Storage

Cylinders should be stored on surfaces which do not allow water accumulation to prevent bottom corrosion.

4.3.8. Exposure to Corrosives

Cylinders should not be stored under corrosive product process areas without adequate overhead protection for the cylinders.

4.4. Acetylene, Fuel Gas and Oxygen Cylinders

4.4.1. Position of Acetylene Cylinders

Acetylene cylinders shall be stored and used only in the upright position. Never lay an acetylene cylinder on its side.

4.4.2. Heat Sources

Keep acetylene cylinders away from all heat sources. Steam, condensate or other heat sources greater than 212 °F will melt fusible safety plugs on acetylene cylinders.

4.4.3. Opening of Acetylene Cylinder Valves

Acetylene cylinder valves must not be opened more than 1½ turns. The recommended valve opening is ¾ of a full turn.



NOTE:

The valve assembly on acetylene cylinders is a single-seat unit, and this valve is only opened a minimal amount in case of an emergency. Any time the valve is open, the valve wrench shall be left on the cylinder valve handle to facilitate rapid closure.

4.4.4. Opening of Oxygen Cylinder Valves

Oxygen cylinder valves are to be fully opened.



NOTE:

This valve is a double-seated valve; thus, it needs to be fully opened. At full open, the top seat seals and protects against packing leaks.

4.4.5. Maximum Downstream Pressure for Acetylene

Maximum acetylene pressure downstream of the pressure regulator shall not exceed 15 psig. Acetylene is unstable above this pressure.

4.4.6. Use of Hydrocarbon Products

Oil, grease or other hydrocarbon products must not be used on cylinders, regulators or other oxy-acetylene equipment.

4.4.7. Hose Identification Colors

Oxygen supply hoses will be green; acetylene or fuel gas hoses shall be red; and inert gas hoses shall be black.

4.4.8. Connection Threads for Oxygen and Acetylene Cylinders

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All connection threads are right hand (clockwise) for oxygen, and left hand (counterclockwise) for acetylene.

4.4.9. Cutting Rigs Not in Use

Cutting rigs not in use are to be broken down for storage. The cylinder valves shall be closed, regulators removed, and valve protection caps put in place.

4.4.10. Check Valve/Flashback Arrestors

Oxygen/acetylene hoses must be equipped with check valve/flashback arrestors at the regulators, NOT the torch head.
If not in use, valves for both cylinders must be closed a the bottle.
This is to prevent backflow into the hoses, where an explosive mixture could form.

5. RESPONSIBILITIES

5.1. Unit/Department Manager

- Implement requirements of this procedure.
- Ensure monthly inspections are completed

5.2. Users

- Comply with the requirements of this procedure.

6. RELATED DOCUMENTS

- OSHA 29 CFR 1910 Subpart H – Hazardous Materials.
- OSHA 29 CFR 1910 Subpart M – Compressed Gas and Compressed Air Equipment.
- OSHA 29 CFR 1910 Subpart Q – Welding, Cutting and Brazing.
- OSHA 29 CFR 1910.101: Compressed Gases (general requirements).
- OSHA 29 CFR 1910.253 Oxygen –Fuel gas welding and cutting.
- CGA Pamphlet C-6 2019: Standards for Visual Inspection of Steel Compressed Gas Cylinders.
- CGA Pamphlet C-8 2017: Standard for Requalification of DOT-3HT, CTC-3HT and TC-3HTM Seamless Steel Cylinders.
- CGA Pamphlet P-1, 2015 Safe Handling of Compressed Gases.
- 49 CFR 171-179 DOT Hazardous Materials Regulations.
- Breathing Air Guideline attachment to the Confined Space procedure BMEHS 002.003. Also saved in the EHS Forms section of the Beaumont web page.
- NFPA 55 Standard for the Storage, Use, and Handling of Compressed and Liquified Gases in Portable Cylinders.
- ASME B16.34 2017 Valves - Flanged, Threaded, and Welding End.
- API 598 2020 Valve Inspection and Testing.
- API RP 574 2016 Inspection of Piping, Tubing, Valves and Fittings.

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Revision Number	Revision Description	Revised By	Revision Date
New	?	?	?
001	Reviewed	G. Dawson	03/2017
002	Revised format, added TOC, hyperlinks, review	R.J. Sumrall	11/2020
003	Reviewed, added clarifications previously in general safety rules. No changes to application of procedure.	C. Wilding	02/16/2023

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