

Airgas®

an Air Liquide company

Compressed Gas Safety

Guide to safe handling
and transportation



Airgas, an Air Liquide company, is the leading U.S. supplier of industrial, medical and specialty gases, as well as hardgoods and related products; one of the largest U.S. suppliers of safety products; and a leading U.S. supplier of ammonia products and process chemicals.

Dedicated to improving the performance of its more than 1 million customers, Airgas safely and reliably provides products, services and expertise through its more than 18,000 associates, over 1,400 locations, robust e-Business platform, and Airgas Total Access® telesales channel.

As an Air Liquide company, the world leader in gases, technology and services for Industry and Health, Airgas offers customers an unrivaled global footprint and industry-leading technology and innovations.



Things you should know before handling or transporting compressed gas cylinders

Did you know that all compressed gases are labeled hazardous materials simply because they're under pressure? Many gases are also considered hazardous materials because of the properties of the gas contained in the cylinder. Since all compressed gases are classified as a hazardous material, specific training on federal and state regulations covering the safe storage, use and transportation of compressed gases by your manager or employer before you touch a compressed gas cylinder is required. You should also receive training by your manager or employer concerning the nature and properties of any specific gas you are handling, or may be required to handle.

- Free information on specific compressed gases are contained in publications called **Safety Data Sheets (SDS)**. SDS provides safety, technical and regulatory information about a specific compressed gas product. They are available from your point-of-product purchase, or can be **downloaded from Airgas.com**. Please take advantage of Airgas' SDS service and become informed of the potential dangers associated with each compressed gas you purchase from us.
- *The Compressed Gas Association (CGA)* offers publications on handling compressed gases, such as, pamphlet P-1, "Safe Handling of Compressed Gases in Containers." They also sell videos on the subject of compressed gases. Visit CGAnet.com for more information.
- Do not hesitate to ask questions. We want to help and we want you to be safe.

Note: Reading the information in this pamphlet is not a substitute for your training, nor is it to be used as a replacement reference for state and federal laws and regulations. It simply presents brief highlights of some of the more common compressed gas handling procedures that are industry standards.

Handling compressed gases

Compressed gases are capable of creating environments that are explosive, reactive, flammable, oxidizing, oxygen deficient, extremely cold, corrosive or otherwise extremely hazardous to health, depending upon the product contained in the cylinder.

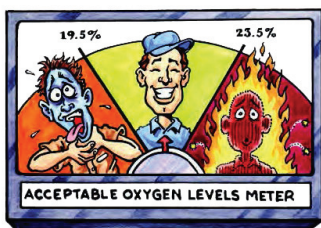


Most compressed gas cylinders are very heavy, and remain so whether they are empty or full, as their contents are in gaseous form and weigh very little. Cylinders containing product in liquid or liquefied form are extremely heavy when full, but less so when empty. Acetylene cylinders are designed with a porous filler material in addition to the gas product itself. The safest way to move any cylinder is with a cylinder cart.

Medical gases or gases that are intended for human consumption must be handled by personnel with specific training on such gases. For example, gases such as breathing air are marked to indicate they are specifically for breathing. However, most gases are not intended for human consumption in any form.

A few facts about oxygen

- Did you know that oxygen is NOT air and air is not oxygen? Air is composed of only 21% oxygen.
- Oxygen has a very narrow acceptable range of safety and studies have determined that it becomes dangerous to all humans if oxygen levels drop below 19.5%. OSHA classifies this as an IDLH (immediately dangerous to life and health).



- Depending on an individual's lung efficiency and other factors, an individual may suffer ill effects even before the critical 19.5% level.
- As the oxygen concentration drops, the more dangerous the environment is to sustain life.
- OSHA has also determined that too much oxygen in the air (over 23.5%) is dangerous because it creates an oxygen-enriched atmosphere and causes rapid burning.

- Fuels become more reactive in an oxygen-rich atmosphere and will cause a fire to burn more rapidly, intensely and often violently. For this reason, you should never allow a gas to be released into an enclosed space or room, as this could change the oxygen concentration of the atmosphere.

Nitrous oxide, helium and sulfur hexafluoride

are gas products that are of particular concern to the compressed gas industry. Unfortunately, state coroner offices report many cases of the abuse of these gases, as none of them are capable of supporting life. Inhalation of helium and sulfur hexafluoride has been depicted in TV shows and movies to cause the inhaller's voice to temporarily change in pitch. *This is an extremely dangerous act and should never be done.* The human body carries little or no oxygen reserve in the bloodstream, and it can take very little of an asphyxiant gas to be overcome. Further, you can't physiologically tell when you are being asphyxiated (important with nitrous oxide) except for CO₂. Persons who breathe non-life supporting gases can be overcome and die even if they're given mouth-to-mouth resuscitation. A study conducted by the European Industrial Gas Association (eiga.org) indicates that some people can become overcome with a single breath of inert gas.



Some do's and don'ts for handling compressed gases

ALWAYS familiarize yourself when storing flammable gases as to whether or not the product is heavier or lighter than air.

ALWAYS wear safety glasses with side shields when handling or working around compressed gases.

ALWAYS return cylinders to your supplier with approximately 25 pounds per square inch (psi) of pressure. By following this rule you will help prevent cylinder contamination. If you believe a cylinder has become contaminated, tell your gas supplier.



ALWAYS use a properly designed cart when necessary for compressed gas cylinder movement.

ALWAYS ensure cylinders are properly restrained with appropriate bracket or stand.

ALWAYS wear the proper personal protective equipment (PPE) for the job (i.e. protective clothing, helmet, face shield, welding lenses, safety shoes and leather gloves when cutting or welding).



ALWAYS apply protective valve caps securely on cylinders when idle or in transport. Many cylinders contain pressures in excess of 2000 pounds per square inch or more. A broken valve resulting from a falling cylinder is all it takes for the cylinder to become an unguided missile. Also, an uncontrolled release of gas under pressure can be dangerous.



ALWAYS keep a fire extinguisher available where compressed gases are stored. Have one nearby when using flammable compressed gases. Know your emergency and evacuation plan.



ALWAYS store full and empty cylinders separately.

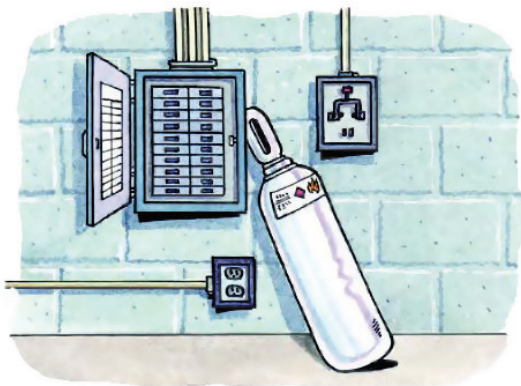
ALWAYS ensure you have properly verified the contents of each compressed gas cylinder by reading its label prior to placing it in service. Read the label, know the gas properties, and review the SDS before beginning your work.

ALWAYS perform a check of your equipment to look for possible leaks. Immediately remove any equipment from service that's leaking. Remember, even small leaks can cause big problems.

NEVER store cylinders where they can come in contact with objects at extreme temperatures, such as a furnace or cryogenic (extremely cold) liquid. Extreme temperatures can weaken containers or cause a gas release.

NEVER store cylinders where they can come in contact with corrosive materials.

NEVER store cylinders where they can become part of an electrical circuit. Store cylinders away from electrical switches, outlets and extension cords.



NEVER store cylinders where water is freestanding or may collect.

NEVER store cylinders containing a flammable or oxidizing gas near an ignition source, such as open flames, furnace, water heater or sparking device.

NEVER store a flammable liquefied compressed gas, such as propane, on its side unless the cylinder is designed to be used on its side.

NEVER transfer gas from one cylinder to another. Gas transfer activities require special training and qualifications.



NEVER attempt to adapt or modify valve connections on cylinders or gas apparatus. Fittings are assigned to specific gases to help prevent misuse of the gas.

NEVER conceal damage, contamination, arc burns, or attempted repairs to a cylinder.



NEVER use cylinders as a support, doorstop or a coat rack.

NEVER lift cylinders by the protective valve cap or by use of a magnet.

NEVER attempt to repair cylinders, their valves or valve components. Repairs require special training and equipment, and should only be performed by authorized service personnel.

NEVER move cylinders by rolling them on their side.

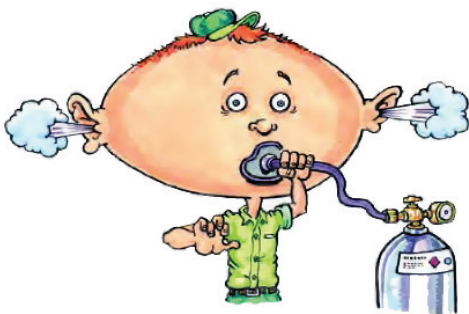
NEVER remove, alter or cover cylinder labeling or markings.

NEVER lubricate or use pipe dope on cylinder valves or fittings. Valves and fittings are designed to operate without lubrication. If the valve is hard to operate, it needs to be repaired and should be returned to your supplier with clear information regarding the problem.

NEVER handle any part of a cylinder (including valve, valve component or gas apparatus) with oily hands or oily gloves. Contamination of cylinder surfaces with oil, grease or any type of hydrocarbon material is dangerous.

NEVER allow cylinders to be stored or transported where contamination may get in or on the surface of the cylinders.

NEVER breathe gas from a cylinder unless it has been authorized and provided for that reason. Gases should only be provided by authorized and trained personnel. Gases should only be breathed from a cylinder by the use of a proper pressure reducing device, such as a gas regulator with associated gas delivery equipment.



Transportation

Transporting compressed gas cylinders is hazardous, and you should become familiar with their hazards before transporting them.

NEVER transport cylinders in confined areas in vehicles, such as the passenger compartment or trunk. Such a practice is extremely dangerous. Gases can cause explosive, reactive, flammable, oxidizing, oxygen deficient, extremely cold, corrosive or health-hazardous environments. Every year incidents occur where people disregard this warning and the results are tragic. Cylinders should only be delivered in vehicles properly designed for transport and with adequate ventilation.

Most accidents involving the handling and transportation of compressed gases are caused by not following proper safety precautions.



Because compressed gases are considered hazardous materials, the Department of Transportation (D.O.T.) in the United States, and Transport Canada (TC) in Canada, regulate their transportation. Transportation of compressed gases triggers many regulatory requirements, some of which are covered here:

- Hazardous Material Manifests or shipping papers are required for each shipment of hazardous materials. In many cases, the delivery order you receive for the cylinder transaction is designed to comply with these requirements.
- Compressed gas cylinders must be properly labeled before they can be transported. The labels should never be removed or defaced.
- Compressed gas cylinders must be secured from movement during transportation, otherwise, they can open accidentally or roll off the vehicle into the path of oncoming traffic.



Note: Even cylinders that one might consider empty are still hazardous and are regulated because of the small amount of residual gas they contain.

Remember...

Do not hesitate to ask questions. Your safety is our number one concern. Your Airgas associate will assist you as much as possible.

If an emergency occurs during the transportation of compressed gases, guidance can be obtained by calling the number printed on the back cover of this booklet.

In addition, the following are selected pages from the Emergency Response Guidebook (NAERG guide).

The guides for various gases are broken down into three major categories and eight sub categories, as follows:

POTENTIAL HAZARDS

- Fire or explosion
- Health

PUBLIC SAFETY

- Isolation information
- Protective clothing
- Evacuation

EMERGENCY RESPONSE

- Fire
- Spill or leak
- First aid

Finally

The information in this guide is general information and should not be used as specific information for a particular gas, or in lieu of an SDS for a specific gas product. Emergency response activities must only be undertaken by certified Hazmat Technicians, in accordance with OSHA 29 CFR §1910.120(q).



For Airgas SDS
information,
go to:

Airgas.com

To find the Airgas location
nearest you, call:
866.924.7427

D.O.T. emergency response guides

When you are TRANSPORTING THIS GAS PRODUCT	Refer to this D.O.T. EMERGENCY RESPONSE GUIDE
Acetylene, dissolved	116
Air, compressed	122
Argon, compressed	121
Argon, refrigerated liquid	120
Carbon dioxide	120
Compressed gas flammable, N.O.S.	115
Compressed gas, N.O.S.	126
Fire extinguisher	126
Helium, compressed	121
Hydrogen, compressed	115
Liquefied petroleum gas (LPG)	115
MAPP (methylacetylene 116 (p) propadiene mixture)	116
Methane, compressed	115
Nitrogen, compressed	121
Nitrogen, refrigerated liquid	120
Nitrous oxide, compressed	122
Oxygen, compressed	122
Oxygen, refrigerated liquid	122
Propane	115
Propylene	115

GUIDE 115

POTENTIAL HAZARDS

FIRE OR EXPLOSION

• EXTREMELY FLAMMABLE

- Will be easily ignited by heat, sparks or flames
- Will form explosive mixtures with air
- Vapors from liquefied gas are initially heavier than air and spread along ground
- Vapors may travel to source of ignition and flash back
- Containers may explode when heated
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices
- Ruptured cylinders may rocket

HEALTH

- Vapors may cause dizziness or asphyxiation without warning
- Some may be irritating if inhaled at high concentrations
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite
- Fire may produce irritating and/or toxic gases

PUBLIC SAFETY

- **CALL emergency response telephone number on shipping paper first. If shipping paper is not available or there's no answer, contact one of the following:**

United States – CHEMTREC 800.424.9300

Canada – CANUTEC 613.996.6666

Mexico – SETIQ 01.800.00.214.00

- Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions
- Keep unauthorized personnel away
- Stay upwind
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks)
- Keep out of low areas

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA)
- Structural firefighters' protective clothing will only provide limited protection
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 800 meters (1/2 mile)

Fire

- If a tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions

EMERGENCY RESPONSE

FIRE

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED**

Small Fires

- Dry chemical or CO₂

Large Fires

- Water spray or fog
- Move containers from fire area if you can do it without risk

Fire Involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles
- Cool containers with flooding quantities of water until well after fire is out
- Do not direct water at source of leak or safety devices; icing may occur
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank
- ALWAYS stay away from tanks engulfed in fire
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area)
- All equipment used when handling the product must be grounded
- Do not touch or walk through spilled material
- Stop leak if you can do it without risk
- If possible, turn leaking containers so gas escapes rather than liquid
- Use water spray to reduce vapors or divert vapor cloud drift. Do not allow water runoff to contact spilled material
- Do not direct water at spill or source of leak
- Prevent spreading of vapors through sewers, ventilation systems and confined areas
- Isolate area until gas has dispersed

CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

FIRST AID

- Move victim to fresh air
- Call 911 or emergency medical services
- Apply artificial respiration if victim is not breathing
- Administer oxygen if breathing is difficult
- Remove and isolate contaminated clothing and shoes
- Clothing frozen to the skin should be thawed before being removed
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin
- Keep victim warm and quiet
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves

GUIDE 116

POTENTIAL HAZARDS

FIRE OR EXPLOSION

• **EXTREMELY FLAMMABLE**

- Will be easily ignited by heat, sparks or flames
- Will form explosive mixtures with air
- Silane will ignite spontaneously in air
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire
- Vapors from liquefied gas are initially heavier than air and spread along ground
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices
- Vapors may travel to source of ignition and flash back
- Containers may explode when heated
- Ruptured cylinders may rocket

HEALTH

- Vapors may cause dizziness or asphyxiation without warning
- Some may be toxic if inhaled at high concentrations
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite
- Fire may produce irritating and/or toxic gases

PUBLIC SAFETY

- **CALL emergency response telephone number on shipping paper first. If shipping paper is not available or there's no answer, contact one of the following:**

United States – CHEMTREC 800.424.9300

Canada – CANUTEC 613.996.6666

Mexico – SETIQ 01.800.00.214.00

- Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions
- Keep unauthorized personnel away
- Stay upwind
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks)
- Keep out of low areas

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA)
- Structural firefighters' protective clothing will only provide limited protection

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 800 meters (1/2 mile)

Fire

- If a tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also consider initial evacuation for 1600 meters (1 mile) in all directions

EMERGENCY RESPONSE

FIRE

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED**

Small Fires

- Dry chemical or CO₂

Large Fires

- Water spray or fog
- Move containers from fire area if you can do it without risk

Fire Involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles
- Cool containers with flooding quantities of water until well after fire is out
- Do not direct water at source of leak or safety devices; icing may occur
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank
- ALWAYS stay away from tanks engulfed in fire
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area)
- All equipment used when handling the product must be grounded
- Stop leak if you can do it without risk
- Do not touch or walk through spilled material
- Do not direct water at spill or source of leak
- Use water spray to reduce vapors or divert vapor cloud drift. Do not allow water runoff to contact spilled material
- If possible, turn leaking containers so that gas escapes rather than liquid
- Prevent entry into waterways, sewers, basements or confined areas
- Isolate area until gas has dispersed

FIRST AID

- Move victim to fresh air
- Call 911 or emergency medical services
- Apply artificial respiration if victim is not breathing
- Administer oxygen if breathing is difficult
- Remove and isolate contaminated clothing and shoes
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin
- Keep victim warm and quiet
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves

GUIDE 120

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Non-flammable gases
- Containers may explode when heated
- Ruptured cylinders may rocket

HEALTH

- Vapors may cause dizziness or asphyxiation without warning
- Vapors from liquefied gas are initially heavier than air and spread along ground
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite

PUBLIC SAFETY

- **CALL emergency response telephone number on shipping paper first. If shipping paper is not available or there's no answer, contact one of the following:**

United States – CHEMTREC 800.424.9300

Canada – CANUTEC 613.996.6666

Mexico – SETIQ 01.800.00.214.00

- Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions
- Keep unauthorized personnel away
- Stay upwind
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks)
- Keep out of low areas
- Ventilate closed spaces before entering

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA)
- Structural firefighters' protective clothing will only provide limited protection
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids or solids

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet)

Fire

- If a tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions

EMERGENCY RESPONSE

FIRE

- Use extinguishing agent suitable for type of surrounding fire
- Move containers from fire area if without risk
- Damaged cylinders should be handled only by specialists

Fire Involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles
- Cool containers with flooding quantities of water until well after fire is out
- Do not direct water at source of leak or safety devices; icing may occur
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank
- ALWAYS stay away from tanks engulfed in fire

SPILL OR LEAK

- Do not touch or walk through spilled material
- Stop leak if you can do it without risk
- Use water spray to reduce vapors or divert vapor cloud drift. Do not allow water runoff to contact spilled material
- Do not direct water at spill or source of leak
- If possible, turn leaking containers so that gas escapes rather than liquid
- Prevent entry into waterways, sewers, basements or confined areas
- Allow substance to evaporate
- Ventilate the area

CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

FIRST AID

- Move victim to fresh air
- Call 911 or emergency medical services
- Apply artificial respiration if victim is not breathing
- Administer oxygen if breathing is difficult
- Remove and isolate contaminated clothing and shoes
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water
- Keep victim warm and quiet
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves

GUIDE 121

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Non-flammable gases
- Containers may explode when heated
- Ruptured cylinders may rocket

HEALTH

- Vapors may cause dizziness or asphyxiation without warning
- Vapors from liquefied gas are initially heavier than air and spread along ground

PUBLIC SAFETY

- **CALL emergency response telephone number on shipping paper first. If shipping paper is not available or there's no answer, contact one of the following:**

United States – CHEMTREC 800.424.9300

Canada – CANUTEC 613.996.6666

Mexico – SETIQ 01.800.00.214.00

- Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions
- Keep unauthorized personnel away
- Stay upwind
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks)
- Keep out of low areas
- Ventilate closed spaces before entering

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA)
- Structural firefighters' protective clothing will only provide limited protection

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet)

Fire

- If a tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions

EMERGENCY RESPONSE

FIRE

- Use extinguishing agent suitable for type of surrounding fire
- Move containers from fire area if you can do it without risk
- Damaged cylinders should be handled only by specialists

Fire Involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles
- Cool containers with flooding quantities of water until well after fire is out
- Do not direct water at source of leak or safety devices; icing may occur
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank
- ALWAYS stay away from tanks engulfed in fire

SPILL OR LEAK

- Do not touch or walk through spilled material
- Stop leak if you can do it without risk
- Use water spray to reduce vapors or divert vapor cloud drift. Do not allow water runoff to contact spilled material
- Do not direct water at spill or source of leak
- If possible, turn leaking containers so that gas escapes rather than liquid

- Prevent entry into waterways, sewers, basements or confined areas
- Allow substance to evaporate
- Ventilate the area

FIRST AID

- Move victim to fresh air
- Call 911 or emergency medical services
- Apply artificial respiration if victim is not breathing
- Administer oxygen if breathing is difficult
- Keep victim warm and quiet
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves

GUIDE 122

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Substance does not burn but will support combustion
- Some may react explosively with fuels
- May ignite combustibles (wood, paper, oil, clothing, etc.)
- Vapors from liquefied gas are initially heavier than air and spread along ground
- Runoff may create fire or explosion hazard
- Containers may explode when heated
- Ruptured cylinders may rocket

HEALTH

- Vapors may cause dizziness or asphyxiation without warning
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite
- Fire may produce irritating and/or toxic gases

PUBLIC SAFETY

- **CALL emergency response telephone number on shipping paper first. If shipping paper is not available or there's no answer, contact one of the following:**

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Canada – CANUTEC 613.996.6666

Mexico – SETIQ 01.800.00.214.00

- Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions
- Keep unauthorized personnel away
- Stay upwind
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks)
- Keep out of low areas
- Ventilate closed spaces before entering

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA)
- Wear chemical protective clothing which is specifically recommended by the manufacturer. It may provide little or no thermal protection
- Structural firefighters' protective clothing is recommended for fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 500 meters (1/3 mile)

Fire

- If a tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions

EMERGENCY RESPONSE

FIRE

- Use extinguishing agent suitable for type of surrounding fire

Small Fires

- Dry chemical or CO₂

Large Fires

- Water spray, fog or regular foam
- Move containers from fire area if you can do it without risk
- Damaged cylinders should be handled only by specialists

Fire Involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles
- Cool containers with flooding quantities of water until well after fire is out
- Do not direct water at source of leak or safety devices; icing may occur
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank
- ALWAYS stay away from tanks engulfed in fire
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn

SPILL OR LEAK

- Keep combustibles (wood, paper, oil, etc.) away from spilled material
- Do not touch or walk through spilled material
- Stop leak if you can do it without risk
- If possible, turn leaking containers so that gas escapes rather than liquid
- Do not direct water at spill or source of leak
- Use water spray to reduce vapors or divert vapor cloud drift. Do not allow water runoff to contact spilled material
- Prevent entry into waterways, sewers, basements or confined areas
- Allow substance to evaporate
- Isolate area until gas has dispersed

CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

FIRST AID

- Move victim to fresh air
- Call 911 or emergency medical services
- Apply artificial respiration if victim is not breathing
- Administer oxygen if breathing is difficult
- Remove and isolate contaminated clothing and shoes
- Clothing frozen to the skin should be thawed before being removed
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water
- Keep victim warm and quiet
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves

GUIDE 126

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Some may burn, but none ignite readily
- Containers may explode when heated
- Ruptured cylinders may rocket

HEALTH

- Vapors may cause dizziness or asphyxiation without warning
- Vapors from liquefied gas are initially heavier than air and spread along ground
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite
- Fire may produce irritating, corrosive and/or toxic gases

PUBLIC SAFETY

- **CALL emergency response telephone number on shipping paper first. If shipping paper is not available or there's no answer, contact one of the following:**

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Canada – CANUTEC 613.996.6666

Mexico – SETIQ 01.800.00.214.00

- Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions
- Keep unauthorized personnel away
- Stay upwind
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks)
- Keep out of low areas
- Ventilate closed spaces before entering

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA)
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection
- Structural firefighters' protective clothing will only provide limited protection

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 500 meters (1/3 mile)

Fire

- If a tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions

EMERGENCY RESPONSE

FIRE

- Use extinguishing agent suitable for type of surrounding fire

Small Fires

- Dry chemical or CO₂

Large Fires

- Water spray, fog or regular foam
- Move containers from fire area if you can do it without risk
- Damaged cylinders should be handled only by specialists

Fire Involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles
- Cool containers with flooding quantities of water until well after fire is out
- Do not direct water at source of leak or safety devices; icing may occur
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank
- ALWAYS stay away from tanks engulfed in fire
- Some of these materials, if spilled, may evaporate leaving a flammable residue

SPILL OR LEAK

- Do not touch or walk through spilled material
- Stop leak if you can do it without risk
- Do not direct water at spill or source of leak
- Use water spray to reduce vapors or divert vapor cloud drift. Do not allow water runoff to contact spilled material
- If possible, turn leaking containers so that gas escapes rather than liquid
- Prevent entry into waterways, sewers, basements or confined areas
- Allow substance to evaporate
- Ventilate the area

FIRST AID

- Move victim to fresh air
- Call 911 or emergency medical services
- Apply artificial respiration if victim is not breathing
- Administer oxygen if breathing is difficult
- Remove and isolate contaminated clothing and shoes
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water
- Keep victim warm and quiet
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves

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