

A guidebook intended for use by first responders during the initial phase of a **transportation incident involving dangerous goods/hazardous materials**

2016

EMERGENCY RESPONSE GUIDEBOOK



U.S. Department
of Transportation
**Pipeline and
Hazardous Materials
Safety Administration**



Transport
Canada

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Canada

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Y TRANSPORTES



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.

CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Methane (UN1971) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

- Vapors may travel to source of ignition and flash back.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Containers may explode when heated.
- 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 not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).

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 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.
- In fires involving Liquefied Petroleum Gases (LPG) (UN1075); Butane, (UN1011); Butylene, (UN1012); Isobutylene, (UN1055); Propylene, (UN1077); Isobutane, (UN1969); and Propane, (UN1978), also refer to BLEVE – SAFETY PRECAUTIONS (Page 368)



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

EMERGENCY RESPONSE

FIRE

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

CAUTION: Hydrogen (UN1049), Deuterium (UN1957) and Hydrogen, refrigerated liquid (UN1966) burn with an invisible flame. Hydrogen and Methane mixture, compressed (UN2034) may burn with an invisible flame.

Small Fire

- Dry chemical or CO₂.

Large Fire

- 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 that gas escapes rather than liquid.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing 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

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give 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 calm and warm.

GUIDE 115
GASES - FLAMMABLE
(Including Refrigerated Liquids)

ID NO.	NAME OF MATERIAL	ID NO.	NAME OF MATERIAL
1011	Butane	1954	Dispersant gases, n.o.s. (flammable)
1012	Butylene	1954	Refrigerant gases, n.o.s. (flammable)
1027	Cyclopropane	1957	Deuterium
1030	1,1 - Difluoroethane	1957	Deuterium, compressed
1030	Refrigerant gas R - 152a	1961	Ethane, refrigerated liquid
1033	Dimethylether	1961	Ethane-Propane mixture, refrigerated liquid
1035	Ethane	1951	Propane-Ethane mixture, refrigerated liquid
1035	Ethane, compressed	1964	Hydrocarbon gas mixture, compressed, n.o.s.
1037	Ethyl chloride	1965	Hydrocarbon gas mixture, liquefied, n.o.s.
1038	Ethylene, refrigerated liquid (cryogenic liquid)		Hydrogen, refrigerated liquid (cryogenic liquid)
1039	Ethyl methyl ether	1966	
1039	Methyl ethyl ether	1969	Isobutane
1041	Carbon dioxide and Ethylene oxide mixture, with more than 9% but not more than 87% Ethylene oxide	1971	Methane
1041	Ethylene oxide and Carbon dioxide mixture, with more than 9% but not more than 87% Ethylene oxide		Methane, compressed
1049	Hydrogen	1971	Natural gas, compressed
1049	Hydrogen, compressed	1972	Liquefied natural gas (cryogenic liquid)
1055	Isobutylene	1972	LNG (cryogenic liquid)
1057	Lighter refills (cigarettes) (flammable gas)	1972	Methane, refrigerated liquid (cryogenic liquid)
1057	Lighters (cigarettes) (flammable gas)	1972	Natural gas, refrigerated liquid (cryogenic liquid)
1063	Methyl chloride	1978	Propane
1063	Refrigerant gas R-40	2034	Hydrogen and Methane mixture, compressed
1075	Butane	2034	Methane and Hydrogen mixture, compressed
1075	Butylene	2035	Refrigerant gas R-143a
1075	Isobutane	2035	1,1,1-Trifluoroethane
1075	Isobutylene	2037	Gas cartridges
1075	Liquefied petroleum gas	2037	Receptacles, small, containing gas
1075	LPG	2044	2,2-Dimethylpropane
1075	Petroleum gases, liquefied	2453	Ethyl fluoride
1075	Propane	2453	Refrigerant gas R-161
1075	Propylene	2454	Methyl fluoride
1077	Propylene	2454	Refrigerant gas R-41
1912	Methyl chloride and Methylene chloride mixture	2517	1-Chloro-1, 1-difluoroethane
1912	Methylene chloride and Methyl chloride mixture	2517	Difluorochloroethanes
1954	Compressed gas, flammable, n.o.s.	2517	Refrigerant gas R-142b
		2601	Cyclobutane

