

A technical publication from Alberta EDGE (Environmental and Dangerous Goods Emergencies)

# Transportation of Nitrogen by Road

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Transportation of Nitrogen by Road  
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This material is meant as a guide to certain parts of the Transportation of Dangerous Goods Regulations and is not meant to be a substitute for them. It is the responsibility of handlers, offerers and transporters of dangerous goods to consult the Regulations for the exact requirements. Alberta EDGE (Environmental and Dangerous Goods Emergencies) of Alberta Transportation and Economic Corridors can provide accurate information regarding the Regulations 24 hours a day.

These telephone lines are recorded to assist in responding to the emergency (natural /manmade) and/or inquiry regarding Dangerous Goods and to ensure that the information is accurate. Direct any questions regarding the recording to the Regulatory Compliance Office responding to your call or contact the manager of Alberta EDGE at 780-427-8660. Legal Authority: Dangerous Goods Transportation and Handling Act, Section 13(1).

*For more information regarding this bulletin visit:*

<https://www.alberta.ca/safety-bulletins-and-notices-transportation-of-dangerous-goods.aspx>

## General

Liquid nitrogen and compressed nitrogen are regulated for transportation by the Transportation of Dangerous Goods (TDG) Regulations. Nitrogen is often transported at low pressures in a small means of containment (capacity of 450 litres or less) or a large means of containment (capacity greater than 450 litres).

To determine the complete requirements for transporting this product you must consult the TDG Regulations. Assistance can be obtained by calling Alberta EDGE (Environmental and Dangerous Goods Emergencies) of Alberta Transportation and Economic Corridors at 780-422-9600 (in Edmonton) or 1-800-272-9600 (in Alberta).

## Classification

According to Section 2.14 of the TDG Regulations, Class 2.2, Non-flammable and Non-toxic Gases, consists of gases that are transported at an absolute pressure greater than or equal to 280 kPa at 20 °C, or as refrigerated liquids, and that are not included in Class 2.1, Flammable Gases, or Class 2.3, Toxic Gases. Nitrogen has a boiling point of -196 °C.

Liquid nitrogen is often used as a coolant for other regulated and non-regulated products.

UN number	UN1977
Shipping Name	NITROGEN, REFRIGERATED LIQUID
Class	2.2
Packing Group	None

Compressed nitrogen is commonly used as a welding gas.

UN number	UN1066
Shipping Name	NITROGEN, COMPRESSED
Class	2.2
Packing Group	None

## Exemptions

The transportation of nitrogen in a small means of containment (a cylinder that has a capacity of 450 litres or less) may be exempt under the following sections of the TDG Regulations.

### 150 kg Gross Mass Exemption

The nitrogen is exempt from documentation, dangerous goods safety marks, dangerous goods training, and the reporting requirements if it is transported in one or more small means of containment on a road vehicle, a railway vehicle or a ship on a domestic voyage if (Section 1.15):

- the means of containment is in compliance with the requirements for transporting gases in Part 5 of the TDG Regulations;

- the gross mass of all dangerous goods transported on the road vehicle or the railway vehicle, or a ship on a domestic voyage, is less than or equal to 150 kg; and
- the dangerous goods are in a quantity or concentration available to the general public and are transported by a user or purchaser of the dangerous goods or by a retailer to or from a user or purchaser of the dangerous goods.

## Class 2, Gases, in Small Means of Containment Exemption

Compressed nitrogen is exempt from documentation and dangerous goods training requirements if it is transported in one or more small means of containment on a road vehicle solely on land if (Section 1.32.3):

- the dangerous goods are UN 1066, NITROGEN, COMPRESSED;
- the dangerous goods are contained in no more than five small means of containment;
- the gross mass of the dangerous goods is less than or equal to 500 kg; and
- the labels displayed on the small means of containment can be seen from outside the road vehicle.

## 500 kg Gross Mass Exemption

Part 3 (Documentation), Part 4 (Dangerous Goods Safety Marks) and Part 5 (Means of Containment) do not apply to the handling, offering for transport or transporting of dangerous goods on a road vehicle, a railway vehicle or a ship on a domestic voyage (Section 1.16):

- if the dangerous goods included in Class 2, Gases, they are in one or more small means of containment in compliance with the requirements for transporting gases in Part 5, Means of Containment;
- the gross mass of all dangerous goods is less than or equal to 500 kg;
- each means of containment (or cylinder) has displayed on one side, other than a side on which it is intended to rest or to be stacked during transport, the dangerous goods safety marks required by Part 4, Dangerous Goods Safety Marks;
- the dangerous goods are accompanied by a shipping document or document in accordance with the requirements for location of a shipping document in sections 3.7 to 3.9 of Part 3; and
- the shipping document, includes the following information in the following order:
  - the primary class of the dangerous goods, following the word "Class", and
  - the total number of means of containment, on which a dangerous goods safety mark is required to be displayed, for each primary class, following the words "number of means of containment".

## Documentation

The consignor (shipper) must provide the initial shipping document and the carrier must ensure that it is correct (Section 3.1 and 3.2).

The carrier must provide the consignee with a copy of the document [Section 3.2(6)].

The consignor and carrier must retain a copy of the shipping document for two years (Section 3.11). There is no requirement for the consignee to retain a copy of the document.

## Dangerous Goods Shipping Document

A sample dangerous goods shipping document is provided at the end of this document. This document may be used for any shipment of nitrogen. According to Section 1.4 of the TDG Regulations, the definition of the shipping document must be in paper format; electronic format is not acceptable.

## Multiple Collections and Deliveries

If the quantity of dangerous goods or the number of small means of containment changes during transport, the carrier must show on the shipping document or on a document attached to the shipping document the change in the quantity of dangerous goods or the number of small means of containment [Section 3.5(5)].

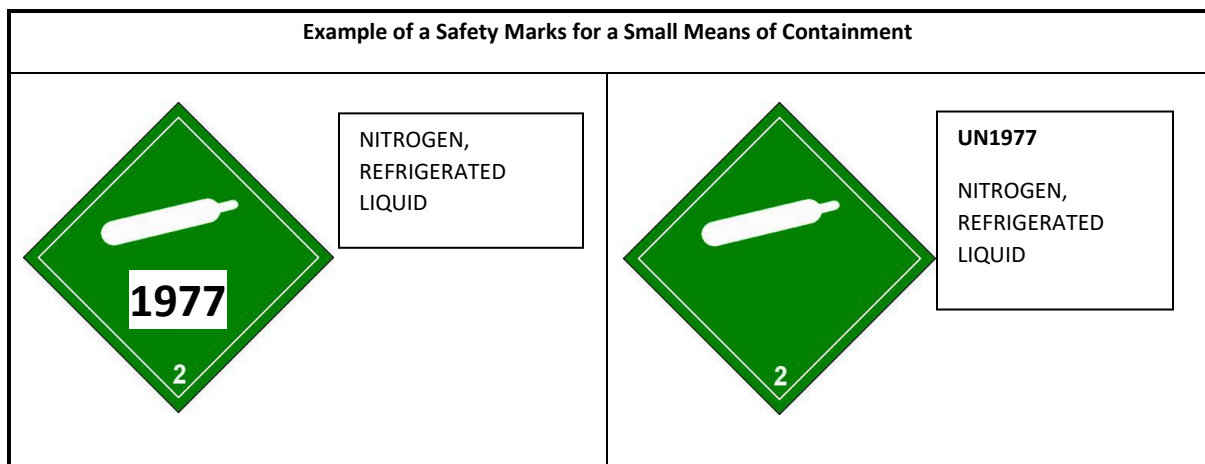
How the carrier shows the change in quantity is the carrier's choice. The carrier can change the number used to express quantity or may mark on the shipping document, or on a document attached to the shipping document, the additions to or the subtractions from the number used to express quantity.

## Safety Marks

The consignor (shipper) is responsible for providing all safety marks to the carrier (Section 4.4). The carrier must ensure that they are correct (Section 4.5).

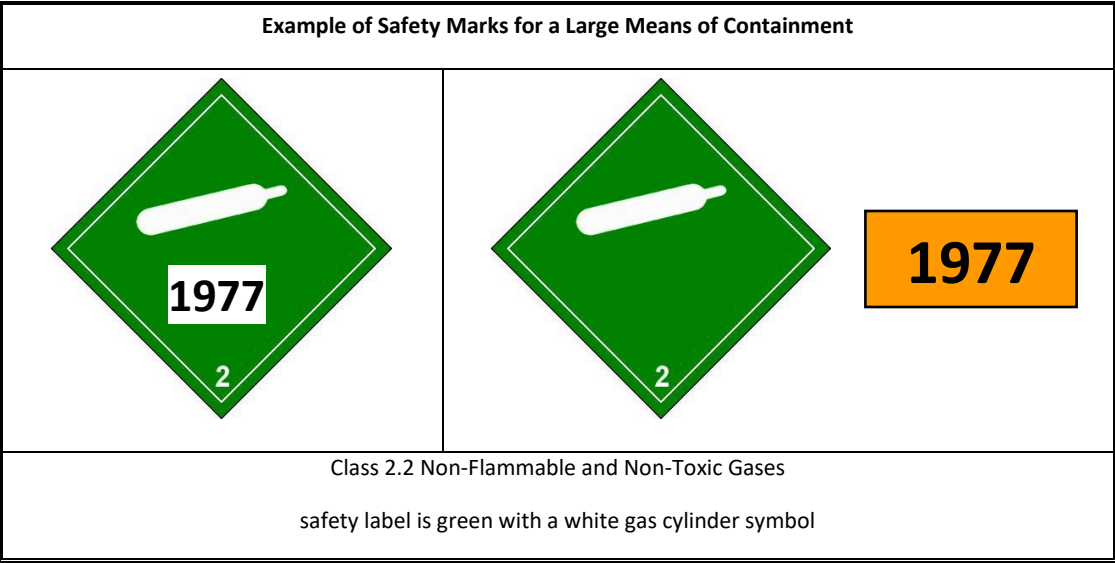
All small means of containment of liquid nitrogen (UN1977) or compressed nitrogen (UN1066) must have at least the following information on each container:

- the Class 2.2 label (Section 4.10);
- the shipping name (Section 4.11); and
- the UN number (the UN number can also be on the label) (Section 4.12).



Class 2.2 Non-Flammable and Non-Toxic Gases  
safety label is green with a white gas cylinder symbol

All large means of containment, including a truck from or supporting frame as a large means of containment, must be clearly marked with four Class 2.2 placards, one on each of the four sides of the large means of containment or vehicle (Section 4.15). The UN number must be shown inside each placard or on an adjacent orange panel (Section 4.8).



### Training

Anyone who handles, offers for transport or transports nitrogen must be trained or work under the direct supervision of a trained person unless an exemption applies. An employer issues a dangerous goods training certificate when the employer is satisfied that the training is adequate. The training certificate may be in paper or electronic format.

Section 6.3 of the TDG Regulations lists the information required on the certificate. The certificate is valid for a maximum of three years from the date of issuance [Section 6.5(b)].

The employer must retain a copy of the certificate for at least two years after the certificate has expired (Section 6.6).

## Reporting Requirements

In the event of a release or anticipated release of NITROGEN, Class 2.2, dangerous goods (herein referred to as an event), the person in possession of the dangerous goods at the time of the event must make an Emergency Report to the local authorities as soon as possible. An Emergency Report is required when any quantity of dangerous goods that was released or for any potential release. For more information on reporting requirements, request Alberta EDGE information bulletin entitled [Reporting Requirements](#).

A local authority is any organization, which may be responsible for emergency response at the location of the release or anticipated release. In Alberta, these include:

- the local police or RCMP, and
- Alberta EDGE (Environmental and Dangerous Goods Emergencies), 24/7 at 1-800-272-9600 or in Edmonton area, 780-422-9600.

The Emergency Report provided to the local authority referred to in Section 8.3 must include the following information (Section 8.3):

- the name and contact information of the person making the report;
- the date, time and geographic location of the release; or
- the date, time and geographic location of the incident that led to the anticipated release;
- the mode of transport used;
- the shipping name or UN number of the dangerous goods;
- the quantity of dangerous goods that was in the means of containment before the release or anticipated release;
- the quantity of dangerous goods estimated to have been released; and
- if applicable, the type of incident leading to the release, including a collision, roll-over, derailment, overfill, fire, explosion or load-shift.

The Release or Anticipated Release Report will be required in the following situations (Section 8.4):

- the death of a person;
- a person sustaining injuries that required immediate medical treatment by a health care provider;
- an evacuation of people or their shelter in place;
- the closure of a facility used in the loading and unloading of dangerous goods, or a road, a main railway line or a main waterway;
- a means of containment has been damaged to the extent that its integrity is compromised; and

- the centre sill or stub sill of a tank car is broken or there is a crack in the metal equal to or greater than 15 cm (6 in.).

The Release or Anticipated Release Report must be made to:

- CANUTEC at 1-888-CANUTEC (1-888-226-8832) or 613-996-6666;
- The consignor;
- In the case of dangerous goods included in Class 7, Radioactive Materials, the Canadian Nuclear Safety Commission; and
- In the case of a ship, a Vessel Traffic Services Centre or a Canadian Coast Guard radio station.

Information required on the Release or Anticipated Release are (Section 8.5):

- the name and contact information of the person making the report;
- in the case of a release of dangerous goods, the date, time and geographic location of the release;
- in the case of an anticipated release of dangerous goods, the date, time and geographic location of the incident that led to the anticipated release;
- the mode of transport used;
- the shipping name or UN number of the dangerous goods;
- the quantity of dangerous goods that was in the means of containment before the release or anticipated release;
- in the case of a release of dangerous goods, the quantity of dangerous goods estimated to have been released;
- if applicable, the type of incident leading to the release or anticipated release, including a collision, rollover, derailment, overfill, fire, explosion or load-shift;
- if applicable, the name and geographic location of any road, main railway line or main waterway that was closed;
- a description of the means of containment containing the dangerous goods;
- if applicable, an estimate of the number of people evacuated or sheltered in place; and
- if applicable, the number of deaths and the number of persons who sustained injuries that required immediate medical treatment by a health care provider.

After submitting the Release or Anticipated Release Report, the person or the person's employer, must make a follow-up report in writing to the Minister within 30 days after the day on which the report was made (Section 8.6). The 30-Day Report must include the following information (Section 8.7):

- the name and contact information of the person making the report;
- the names and contact information of the consignor, consignee and carrier;
- in the case of a release of dangerous goods, the date, time and geographic location of the release;
- in the case of an anticipated release of dangerous goods, the date, time and geographic location of the incident that led to the anticipated release;



- the mode of transport used;
- the classification of the dangerous goods;
- the quantity of dangerous goods that was in the means of containment before the release or anticipated release;
- in the case of a release of dangerous goods, the quantity of dangerous goods estimated to have been released;
- a description of the means of containment containing the dangerous goods;
- if applicable, a description of any failure of or damage to the means of containment;
- information about the events leading to the release or anticipated release of dangerous goods;
- information as to whether there was an explosion or fire;
- the name and geographic location of any facility used in the loading or unloading of the dangerous goods that was closed, and the duration of the closure;
- the name and geographic location of any road, main railway line or main waterway that was closed, and the duration of the closure;
- if applicable, an estimate of the number of people evacuated or sheltered in place and the duration of the evacuation or shelter in place;
- if applicable, the number of deaths and the number of persons who sustained injuries that required immediate medical treatment by a health care provider;
- if applicable, the ERAP reference number; the name of the person who was required to have the ERAP; and the date and time that the ERAP incident report was made;
- the date on which the report referred to in section 8.4 was made; and
- an estimate of any financial loss incurred as a result of the release or anticipated release, and any emergency response cost or remediation costs related to it.

For detailed information on reporting requirements, please consult Part 8 of the TDG Regulations.

A 30-Day Report must be kept for two years after the day it was made. The person must make the report available to an inspector within 15 days after the day on which the person receives a written request from the inspector (Section 8.8).

**DANGEROUS GOODS SHIPPING DOCUMENT FOR ROAD TRANSPORT ON CANADIAN SHIPMENTS**

<b>CONSIGNOR</b>			<b>DESTINATION (City-Town)</b>			
Name:			Name:			
Address:			Address:			
Name of Carrier		Prepaid <input type="checkbox"/>	Collect <input type="checkbox"/>	Transport Unit Number		
Point of Origin			Shipping Date		Shipper's No.	
<b>DANGEROUS GOODS</b>						
UN Number	Shipping Name	Primary Class	Subsidiary Class	Packing Group	Quantity	Packages Requiring Labels
24-Hour Number: _____						
ERAP Reference _____ and Telephone Number _____						
<b>Consignor's Certification</b>						
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, are properly classified and packaged, have dangerous goods safety marks properly affixed or displayed on them, and are in all respects in proper condition for transport according to the Transportation of Dangerous Goods Regulations.						
Name of Consignor: _____						
<b>Special Instructions</b>						
<b>NON-REGULATED GOODS</b>						
Packages	Description of Articles			Weight		
Received in apparent good order				Consignee's Signature _____		Shipper's Signature
Received in Apparent Good Order		Driver's Signature		Driver's No.		

Please note that this sample shipping document contains some information that is not required in the TDG Regulations. The additional information reflects current industry practices.