

TRANSPORTS DANGEROUS GOODS (TDG)

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Warning to readers

The transport of dangerous goods may be subject to regulations of the international maritime Organization (IMO), of the Organization of international civil aviation (ICAO) with U.S. regulations on the transport of dangerous goods, more specifically the Code of Federal Regulation (CFR), title 49, the Organization of United Nations (UN) and Transport Canada.

Training Policy

This program follows the Directive "B" additional training for whoever does the handling of dangerous goods in the Canada.(1)

(1) Transport Canada.



Transportation of Dangerous Goods - TDG

Les Transports de Matières Dangereuses – TMD

- Overview of TDG Regulations
- Classification of Dangerous Goods
- Safety Marks & Placards
- Empty Containers & Vehicles
- Emergency Response
- Documentation
- Test

What are “Dangerous Goods”?

Definition Under the Law

- “Dangerous goods” means any product, substance, or organism included by its nature or by the regulations in any of the classes listed in the schedule.”
- “The Schedule” referred to above is Schedule II of the Transportation of Dangerous Goods Regulations.



TDG Act, 1992

Objectives

- To promote public safety during handling and transport
 - Different from WHMIS/GHS which focuses on employee health & safety
- Prohibits anyone from transporting dangerous goods unless it is with the requirements of the Act and TDG Regulations.



Training is a Requirement

TDG Regulations, Section 9.7

- No person shall handle, offer for transport, or transport dangerous goods unless they are:
 - Trained in aspects of the TDG Regulations, and issued a Certificate of Training, or
 - Under the direct supervision of a trained person.
- Training Certificate is valid for 3 years

TDG Key Definitions

Handling

means loading, packing or placing, unloading, unpacking or removing, or reloading, repackaging or replacing dangerous goods in or from any container, packaging, or means of transport or at any facility .

Safety Mark

includes any design, symbol, device, sign, label, placard, letter, word, number, abbreviation or any combination thereof that is to be displayed on dangerous goods or containers and packaging.

Shipping Document

means any document that accompanies dangerous goods being handling, offered for transport or transported and that describes or contains information relating to the goods

Packing Group

indicates the degree of danger within a given classification of dangerous goods. Group I, great danger; Group II moderate danger; Group III, minor danger

Dangerous Goods Classifications

Nine Classes Based on Hazard Type

- Class 1: Explosives
- Class 2: Gases
- Class 3: Flammable Liquids
- Class 4: Flammable Solids
- Class 5: Oxidizers
- Class 6: Poisons
- Class 7: Radioactive Materials
- Class 8: Corrosives
- Class 9: Miscellaneous

Classify Dangerous Goods

Step 1: Determine if material is exempt

- Refer to Part II (Section 2.3) of TDG Regulations to determine if exempt. If so, classification is not required.

Step 2: Determine Classification

- Refer to Schedule II of TDG Regulations.
 - List I consists of explosive materials.
 - List II consists of more than 3000 dangerous goods, other than explosives.

Transportation Requirements

Transportation of specific dangerous goods may require the following:

- Commercial insurance
- Licensing
- Signage
- Safety gear (PPE's, spill kit, fire extinguisher, first aid kit, Orange manual,
- TDG documentation
- Employer documentation
- Travel plan
- Emergency plan

Exemptions

Gasoline & Diesel Fuel

- **TDGR Section 2.31 makes partial exemptions for transportation by road if:**
 - Containers are transported in open vehicle so label or placard is visible from outside the vehicle;
 - Each container is secured to the vehicle during transport; and
 - Total capacity of containers in/on vehicle is not more than **2,000 liters**.

Exemptions

Propane

- TDGR Section 2.31 makes partial exemptions for transportation by road if:
 - Containers are transported in open vehicle so label or placard is visible from outside the vehicle;
 - Each cylinder is secured to the vehicle during transport; and
 - Total quantity being transported is not greater than **500 kg**.

Exemptions

Herbicides & Pesticides

- **TDGR Section 2.31 makes partial exemptions for transportation by road if:**
 - The product or solution is transported in a tank having a volume of **5000 L or less.**;
 - Tank is being used for mixing or holding of product prior to or during application procedures;
 - Tank is properly placarded

Exemptions

Gasoline, Diesel Fuel, & Propane

- **Exempt from:**

- Using TDG shipping document
- Using placards on vehicles (except herbicides/pesticides)
- Training, registration, reporting

- **Not exempt from:**

- Immediately notifying authorities if dangerous goods are lost or released.
 - Filing written report for spills/releases.
 - Labeling containers.
- 

Exemptions

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- 

Class 1 - Explosion

1.1



Materials or objects with a mass explosion hazard.

TNT - dynamite

1.2



Materials or objects with a risk of projection, without mass explosion hazard. **Military shells**

1.3



Materials or objects with a risk of fire with risk light blast or projection or both, without risk mass explosion. **Fireworks.**

Class 2: Gases

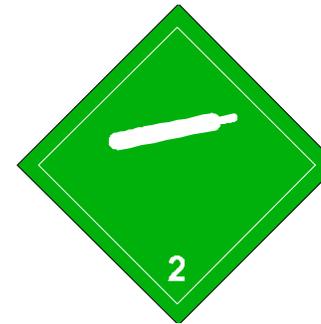
Division 2.1 - Flammable Gases

- Propane, acetylene



Division 2.2 - Non-Flammable Gases

- Refrigerant, nitrogen, oxygen



Division 2.3 - Poisonous Gas

- Carbon dioxide, sulfur dioxide



Class 2: Gases

Hazards

- Explosion or fire
 - Container rupture
 - Container rocketing
 - Frostbite
 - Asphyxiation
 - Toxicity
 - Irritation
- 

Class 3: Flammable Liquids

Liquids with a flash point $< 61^{\circ}\text{C}$

Commonly used as fuels

- Gasoline, fuel oil, diesel



Flash Point

- Minimum temperature at which a liquid gives off sufficient vapour to form an ignitable mixture with air at the surface of the liquid

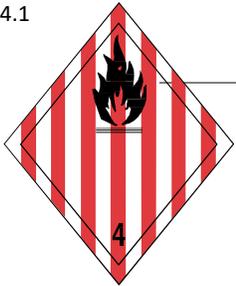
Class 3: Flammable Liquids

Hazards

- Fire
- Explosions
- Toxic fumes
- Corrosivity
- Water contamination

Class 4 – Flammable solids, subject materials to spontaneous inflammation and hydroreactives material

4.1



Flammable solids. **The safety match**

4.2



Material prone to spontaneous ignition. **active coal**

4.3



Hydroreactives materials. **sodium**

CLASS 5

Oxidizing substances and organic peroxides



Oxidizing materials. **ammonium nitrate**

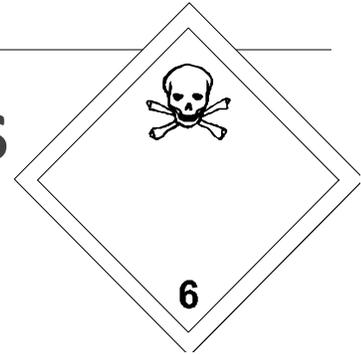


Organic peroxides. **of benzoyl peroxide**

Class 6: Poisonous (Toxic)

Poisonous or Infectious Materials

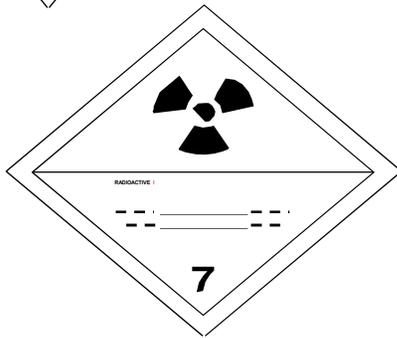
- A solid or liquid that is poisonous by inhalation of vapours, by skin contact or by ingestion.
- Examples: pesticides, lead compounds, disinfectants, some solvents, hospital wastes



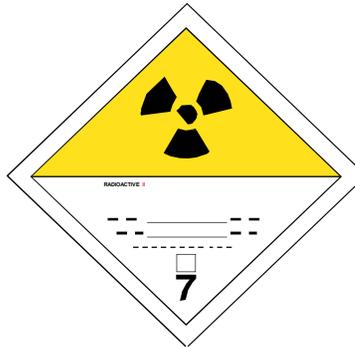
CLASS 7 radioactifs



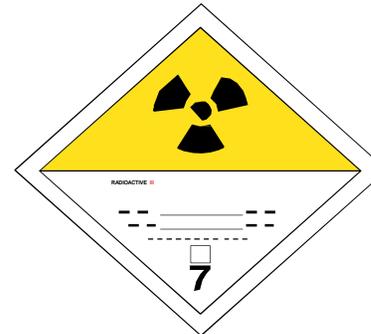
Radioactive material defined in the packaging and transport of nuclear substances regulations. **uranium hexafluoride**



Category I – white



Category II – yellow



Category III – yellow

CLASS 8

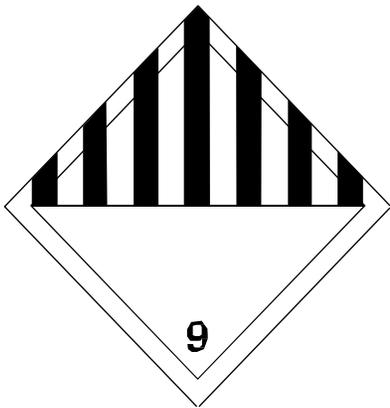
Corrosives



Corrosive materials. **Sulfuric acid**



Class 9: Miscellaneous products



Products, materials or organizations.

biphenyl PCB - PCB and asbestos



PLACARDS – SIGNS - TDG



explosion



Gas/liquid flammable



Flammable solids



**flammables gas with
water contact**



PLACARDS – SIGNS - TDG



Oxidizer materials



Toxic materials



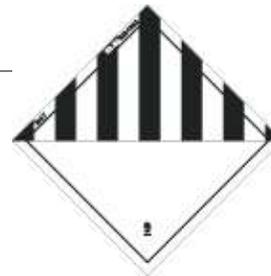
Infectious materials



radioactiv



corrosif



Dangerous products



Hot transport products



Safety Labels & Placards



➤ Safety Labels,

➤ Special Placards,

➤ Safety Marks,



Symbol

Color

Class number

- Labels: used for packages, cylinders, small containers
- Placards: used for large containers, trucks, other transport units
- Signs: special placards such as “Danger”
- Other Marks: additional information (e.g., shipping name, PIN, container orientation, etc. on smaller containers).

Safety Marks & Placards



Mandatory Use

- Safety marks used to indicate:
 - Presence of dangerous goods
 - Type and degree of associated risk
- Safety marks must be used on all containers, packages, tanks, cylinders and transport units used for transporting dangerous goods

Special Placards

- If the quantities of individual classes do not exceed the small quantity limit, but the total quantity of dangerous goods exceeds 454 kg, the a “danger” placard must be displayed on the vehicle.

Activities related to transport of dangerous goods

Manufacturer



off-loading

Transporter



Storage

Loading



Inspection



Action on the storage site

Ensure that the storage site is:

- Control the entry and exit of hazardous materials using a registry.
- Check if site security measures are still adequate.
- Verify the identity and integrity of shippers and known carriers.
- Follow the directions of the National Fire Code.
- Follow the instructions of the regulations on health and safety at work
- Follow the internal instruction of the employer.

Battery Safety



Battery Safety



DANGER

LEAD ACID BATTERIES
CORROSIVE LIQUIDS (ELECTROLYTE)
ENERGIZED ELECTRICAL CIRCUITS
NO SMOKING

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Sulfuric Acid

Colorless to dark-brown, oil, odorless liquid. Corrosive, causes severe burns to eyes/skin/respiratory tract. May cause blindness. Chronic: tooth erosion, GI disturbances, and dermatitis. Reaction with water produces excessive heat.



CAS No. 7664-93-9

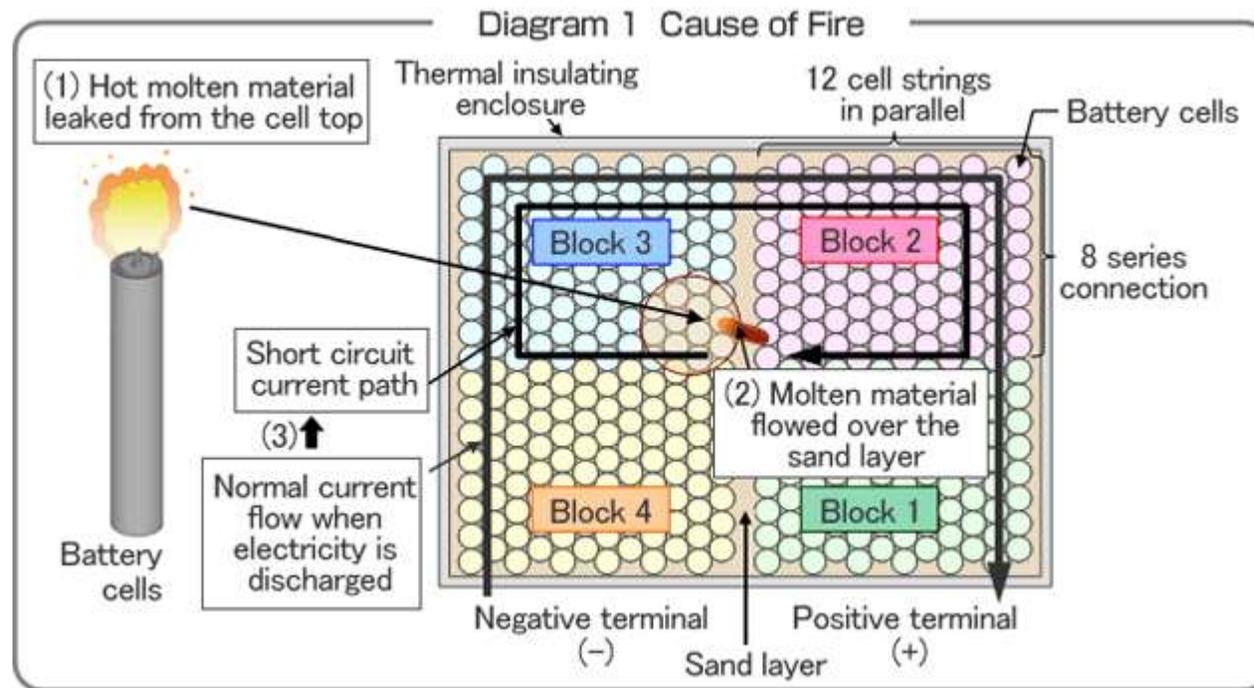
Battery Safety



Battery Safety



Battery Safety



What's wrong with the pictures ?



What's wrong with the pictures ?



What's wrong with the pictures ?



What's wrong with the pictures ?



What's wrong with the pictures ?



Preservation of information related to the transport of dangerous goods

The sender and the carrier must keep a copy of the dangerous goods transport document and information and additional documentation as stated in the law of the TDG.

- **Maintain document for a minimum period of two years.**
- **Follow the internal instructions of the employer.**
- "When documents are stored by electronic means or in a computer system, the sender and the carrier must be able to reproduce them in print form."



Preservation of information related to the transport of dangerous goods

The labelling elements are :

- ❑ Name, address and telephone number of the supplier
- ❑ Nominal amount contained (if made available to the general public)
- ❑ Identification of the product (chemical name, case number,...)
- ❑ If necessary, mentions of danger, caution, warning, and additional, and pictograms associated with the classification.



Information list on dangerous goods

- ❑ the primary, class
- ❑ the Group compatibility of explosives,
- ❑ the subsidiary class (if there is one),
- ❑ the identification number of the product in accordance with the standards established by the United Nations (number one), packing, the Group
- ❑ applicable transport requirements
- ❑ the provisions specific to take.



Small & large containers

Small containers have a capacity less than or equal to 450 litres. It may be cylinders, jerrycans, buckets, barrels, kegs or bottles.

The large containers were more than 450 litres capacity. It can be for Highway tankers, large containers for the bulk or removable tanks



Large containers

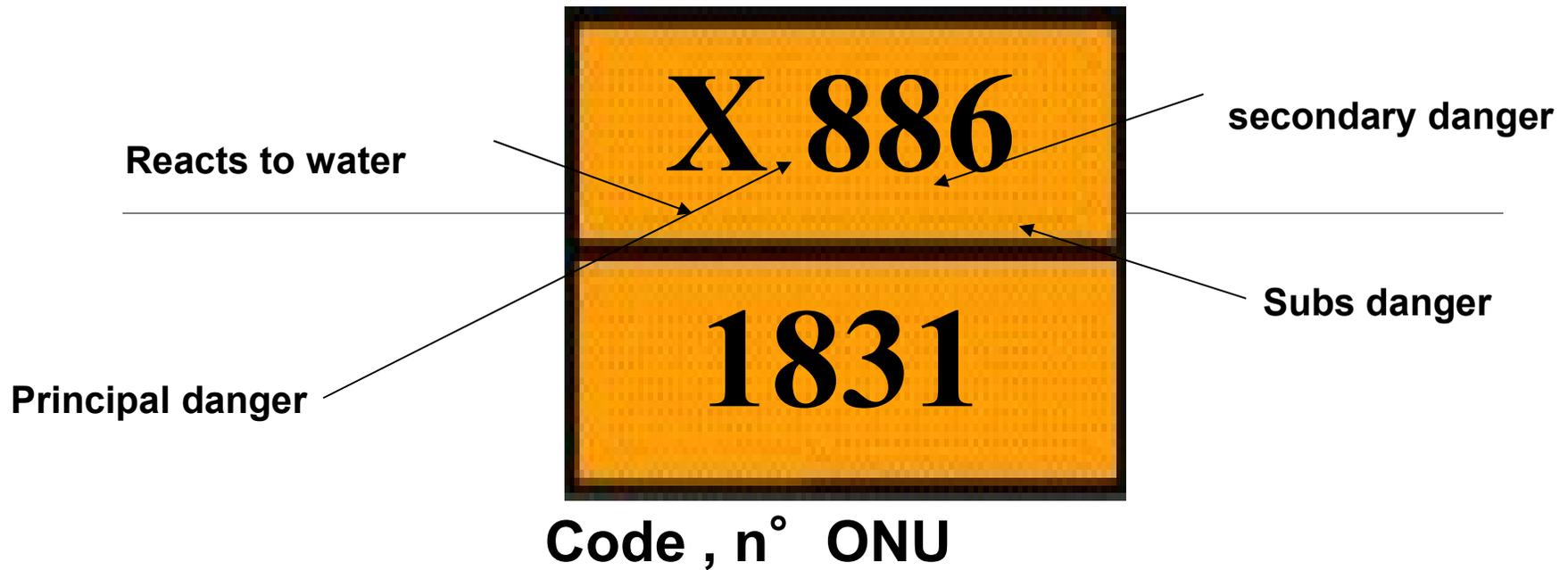
The large containers for the transport in bulk must be manufactured according to the standard CGSB - 43.146, whose capacity is greater than 450 litres but less than 3 000 litres.



TDG : SIGNS

PLATE

Code danger



TDG: SIGNAGE ON TRUCK

SIGNAGE FOR A PRODUCT TRANSPORTED MUST BE VISIBLE FROM THE OUTSIDE.

Plates et signages for each products



Plate

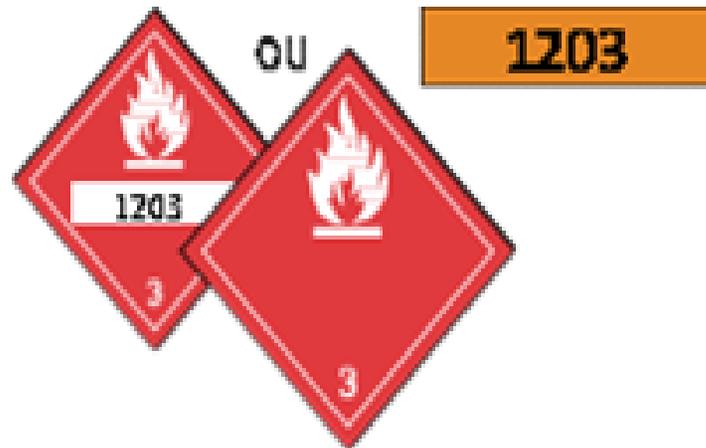
**dangers signs
back/side**



The **UN number** can be placed in two ways:

1. inside of a white rectangle on the plate;
2. on a panel orange, right next to the plate

The 'DANGER' plate can be used in certain situations, to identify a shipment of hazardous materials.

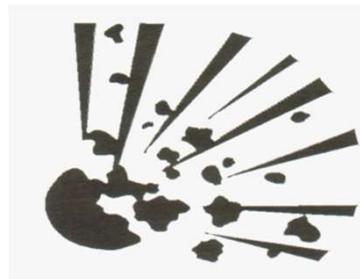


Domestic chemical products

POISON



EXPLOSIVE



INFLAMMABLE



CORROSIVE



WHMIS - office - industrial

NAME OF PRODUCT:									
	Compressed gases	<input type="checkbox"/>			Materials causing other toxic effects	<input type="checkbox"/>			
	Flammable and combustible materials	<input type="checkbox"/>			Biohazardous infectious materials	<input type="checkbox"/>			
	Oxidizing materials	<input type="checkbox"/>			Corrosive materials	<input type="checkbox"/>			
	Materials causing immediate and serious toxic effects	<input type="checkbox"/>			Dangerously reactive materials	<input type="checkbox"/>			
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
REF:									



GHS -symbols

February 2015



WHAT TO DO ?



LET THE FIREFIGHTERS HAZMAT TEAM DEAL WITH THIS...

Emergency Reporting

A discharge, emission or escape from any container must be reported if:

- Greater than “quantity for immediate reporting”
 - Class 2.1 (Propane): 100L
 - Class 3 (Gasoline, Diesel): 200L
 - Class 6: (Herbicide, Pesticides): 5kg / 5L

All fires and explosions involving dangerous goods must be reported.



Emergency Reporting

Immediate Notification

- A person who has charge of dangerous goods and discovers or is advised of a spill, release or fire shall immediately notify:
 - Local police
 - His/her employer
 - Owner, lessee of vehicle
 - Owner or consignor or shipment

Written Report

- Employer must complete Form 2 within 30 days and forward it to Transport Canada.

Who to contact in case of emergency

(1) in case of accidental HAZMAT container release, any person who is in possession of the dangerous goods at that time indeed immediately report to those listed in paragraph (5)

*(5) the person referred to in subsections (1), (2), or (3) shall immediately report:
to the competent provincial authority listed in the table following this paragraph;*

b) to his employer;

c) to the sender of the goods;

d) in the case of a vehicle, the owner, the tenant or the charterer of the vehicle;

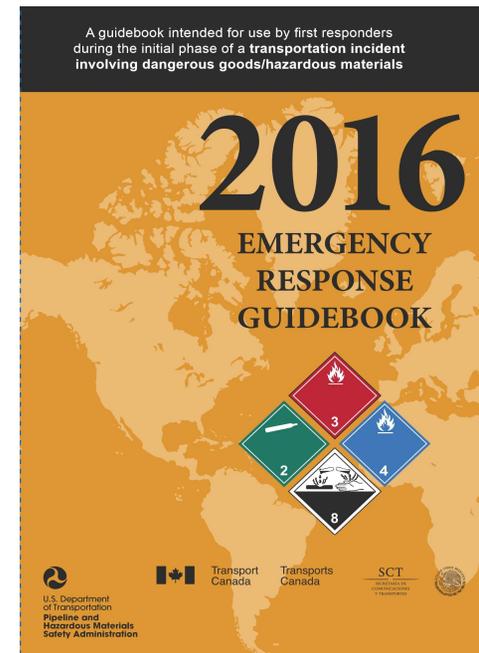
To contact CANUTEC

- In case of emergency, 24hrs/7 days :
 - **(613) 996-6666**, or
 - ***666** cell phone in Canada only.
- **Non urgent questions (613) 992-4624.**
- email: CANUTEC@tc.gc.ca
- Internet: <http://www.canutec.gc.ca>

EMERGENCY RESPONSE GUIDE (ERG2016)

- **CANUTEC** provides a national bilingual (French and English) advisory service and is staffed by professional scientists experienced and trained in interpreting technical information and providing emergency response advice.

- The ERG2016 is available:
 - Paper Version
 - PDF Version



Evaluation



How many different products are considered as dangerous goods?

- A. 200
- B. 1400
- C. 2000
- D. 3500

Answer: 3500 substances are currently classified by the United Nations.



Evaluation

What are dangerous goods among the following substances?

- A. cotton and chlorine
- B. cotton and crushed stone
- C. gas and crushed stone
- D. chlorine, fuel and pesticide

Answer: chlorine, fuel and pesticide are dangerous goods we transport.

Evaluation

What is the hazardous material of the following products in common use?

- A. water
- B. water bleach
- C. mineral water
- D. water source

Answer: bleach is a solution composed of hypochlorite and sodium. It is a corrosive solution.

Evaluation

From the following list, what business use dangerous materials?

- A. Bank
- B. Training Centre
- C. medical centre
- D. the corner store

Answer: Medical centre uses dangerous materials.

Evaluation

How many are there of companies using hazardous materials in Ontario?

- A. 500
- B. 1000
- C. 750
- D. 2000

Answer: According to Environment Canada, there are 750 companies in Ontario who use dangerous materials.

Evaluation

What is the source of the industrial risks associated with hazardous materials?

- A. transport activities
- B. warehousing activities
- C. production activities
- D. all the above

Answer: D - all of the above causes a risk to people and the environment.



Evaluation

Activities involving dangerous materials are monitored very closely. Could you tell what does this sign mean?



- A. a fire took place on this street.
- B. This barracks fire has a team specializing in hazardous materials.
- C. beauty product
- D. Ce truck transports dangerous goods.

Answer: D - the truck carrying flammable liquids (class 3

references



<http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/gmu/reagissant.aspx>

<http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/gmu/indexid.aspx>

<http://www.tc.gc.ca/fra/tmd/clair-partie2-339.htm#art28>