Transportation of Dangerous Goods

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What is TDG???

- TDG or the Transportation of Dangerous Goods,

  prohibits anyone from transporting dangerous goods
- unless it is within the requirements of the Act and the TDG Regulations.
- It was implemented to promote public safety during handling and transport.
- It is different from WHMIS which focuses on employee health and safety.

TDG Training Objectives

- TDG or the Transportation of Dangerous Goods, is required training prior to transporting dangerous goods
- Training encourages education and practices that meet the requirements of the Act and the TDG Regulations.
- This training objective intends to promote public safety during handling and transport.
- Completing the test at the end of this power point presentation will adequately evaluate your comprehension of the material and ability to safely transport dangerous goods.

Shipper's Responsibility

- Classification: Look up the classification of the product.
- Container: Select correct container for the product.
- Documents: Complete required shipping documentation
- Labels and Markings: Ensure that containers have appropriate label and markings
- Placards: Correct placards are posted on the transportation vehicle
- The consignor is responsible for classification of dangerous goods before the carrier takes possession and providing shipping documentation.

Driver's Responsibility

- Shipping Documents: Are properly completed and available
- Labels and Markings: Check that the labels andmarking match shipping sheets.
- Containers: Properly labelled, marked prior to transporting. Product secured within container and container secured so no potential leak/spill or accidental release
- Placards: Are correct and posted on truck
- Securing Loads: Loads are properly secured

Classification Overview

- Classification
- Packing Groups
- Shipping Name
- UN Number

Classification

is defined in Part 1 of the TDG Regulations as: “classification means, for dangerous goods, as applicable, the shipping name, the primary class, the compatibility group, the subsidiary class, the UN number, the packing group, and the infectious substance category.”

Shipping Names

In Canada's Transportation of Dangerous Goods (TDG) Regulations, shipping names refer to the official names assigned to dangerous goods for transport. These names are listed in Schedule 1 and Schedule 2 of the TDG Regulations and must be used correctly on shipping documents.

Key Points About Shipping Names:

- Official Designation: Each dangerous good has a specific shipping name that must be used in documentation.
- UN Number: Shipping names are associated with a UN number, which helps identify the substance internationally.
- Primary Class & Packing Group: The shipping name also determines the hazard class and packing group of the material.
- Special Provisions: Some shipping names have additional handling or transport requirements.

For example, "Methane, compressed" is a shipping name with UN1971, classified under Class 2.1 (Flammable Gas)

Use of Shipping Schedules

In Canada's Transportation of Dangerous Goods (TDG) Regulations, Schedules 1, 2, and 3 serve different purposes:

- Schedule 1: Contains a list of dangerous goods, including their classification, UN numbers, packing groups, and special provisions.
- Schedule 2: Provides a detailed list of dangerous goods with additional specifications, such as handling requirements and restrictions.
- Schedule 3: Offers a legend explaining the symbols and abbreviations used in Schedules 1 and 2, helping users interpret the information correctly.

These schedules are essential for ensuring the safe transportation of hazardous materials across Canada

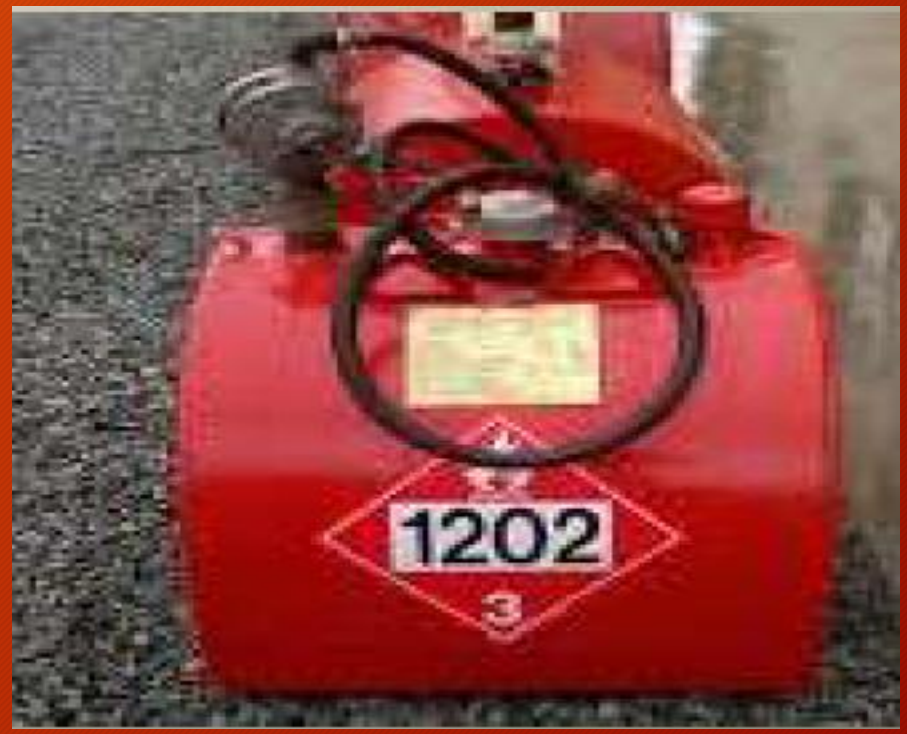
Shipping Documents

- Any document that accompanies dangerous goods being handled, offered for transport or transported
- Describes or contains information relating to the goods Includes a bill of lading, cargo manifest, shipping order, way-bill, and/or switching order.

Location of Documents:

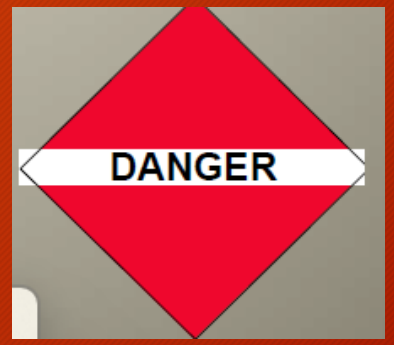
- When in cab must be within arms reach.
- When outside of cab must be on seat, driver's door or in pocket of driver.

Example of Safety Mark



Safety Marks

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.

Packing Groups

Packing Group (PG) is a part of the classification of some dangerous goods and is noted as PG I, II or III.

In some classes, the degree of the hazard is

- indicated by packing groups, always shown in
- Roman numerals

Example

- I Great Danger
- II Moderate Danger
- III Minor Danger

UN Number

- To find the UN number of a particular shipping name, consult the alphabetical list of shipping names in Schedule 3. Once you have found the proper UN number in column 3, return to Schedule 1 to find the information associated to it.

Means of Containment

In Canada's Transportation of Dangerous Goods (TDG) Regulations, a means of containment refers to any container, packaging, or part of a transport system used to safely hold dangerous goods.

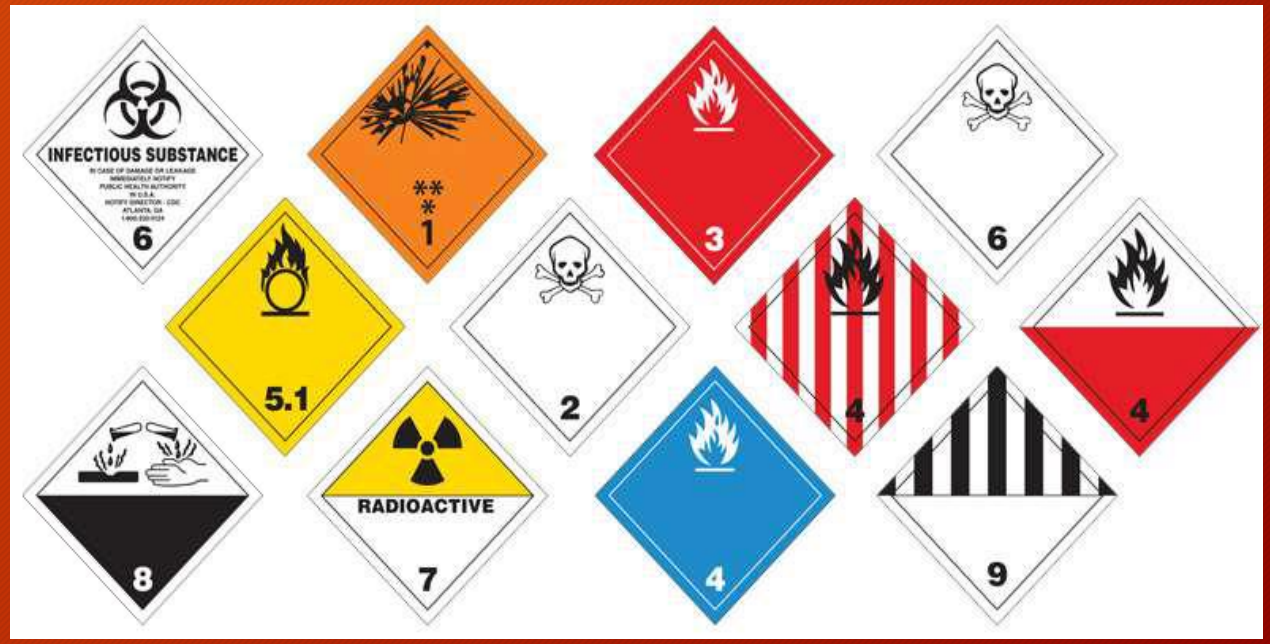
There are two main types:

- Small Means of Containment: Containers with a capacity of 450 liters or less, such as:
  - Drums
  - Jerricans
  - Boxes
  - Pails
  - Bags
  - Cylinders
  - Intermediate Bulk Containers (IBCs)
- Large Means of Containment: Containers with a capacity greater than 450 liters, including:
  - Highway tanks
  - Tank cars (railway)
  - Portable tanks
  - Tubes
  - Large IBCs

The selection of a means of containment depends on factors like the class of dangerous goods, mode of transport, and destination.

Determining Classification

- Look up the list of dangerous goods
- Check previous shipping documents
- Check Safety Data Sheet
- Contact manufacturer



Classes of Hazards

- There are nine classes
- Each of the nine classes represent a different type of hazard
- There are some classes that are separated into divisions to more clearly identify hazards.

- Eg. Class 5 has two divisions
- - 5.1 Oxidizers
- - 5.2 Organic Peroxide

Classes of Hazards

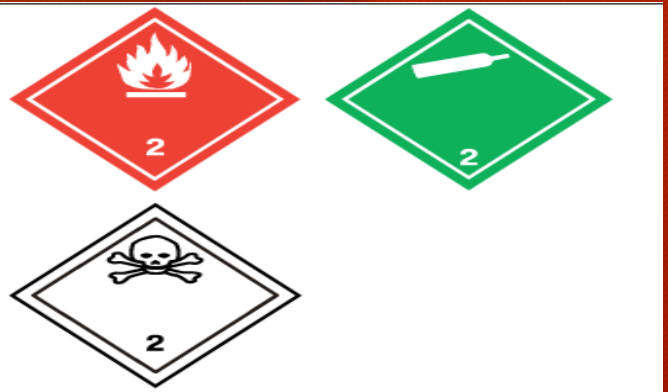
Nine Classes Based on Hazard Type:

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

Classes of Hazards

Class 1 Explosives	 Sample shows: Class 1.1., 1.2 and 1.3

Class 1 Explosives	There are six divisions in this category. To be included, the substance or article has the ability to be a mass explosion, fragment projection, fire hazard (along with a minor blast or projection hazard), may ignite or initiate during transport, be very insensitive with a mass explosion hazard, or extremely insensitive with no mass explosion hazard.	•Ammonium picrate •Cartridges for weapons (with specific characteristics) •White phosphorus •Pyrotechnic substances

Class 2 Gases	 Samples show: Class 2.1 Flammable gases; Class 2.2 Non-flammable and non-toxic gases; Class 3 Toxic gases

Class 2 Gases	There are three divisions: flammable gases, non-flammable and non-toxic gases, and toxic gases. Aerosols under UN 1950, AEROSOLS may be transported as flammable or non-flammable or non-toxic gases, depending on the properties of the aerosol.	•Propane •Nitrogen •Carbon dioxide Oxygen, compressed •Oxygen, refrigerated liquid •Chlorine •Sulphur dioxide

Classes of Hazards

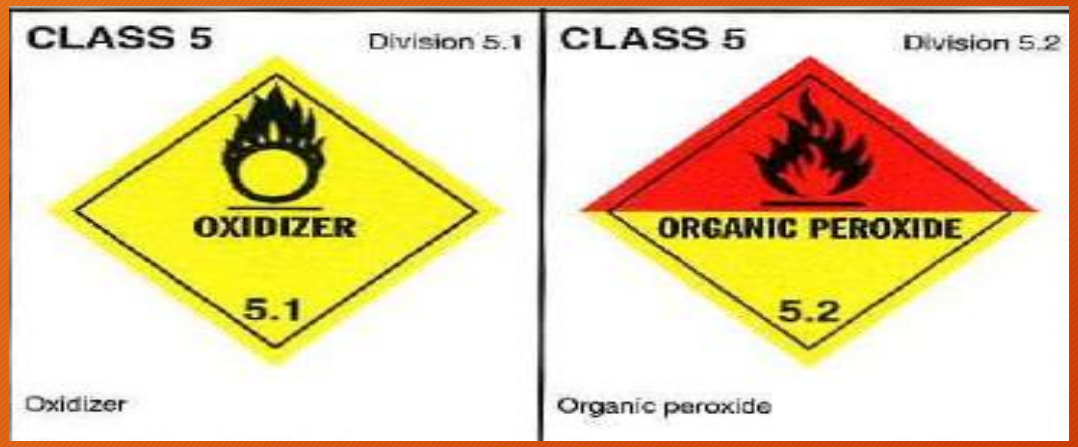
Class 3 Flammable Liquids	 Sample shows: Class 3 Flammable liquids

Class 3 Flammable Liquids	Based on a liquid's flash point and other properties, substances are included in this class if they are expected to be able to catch fire at common temperatures.	•Gasoline •Diesel •Methanol

Class 4 Substances/Products include: Flammable Solids; Substances Liable to Spontaneous Combustion; Substances That on Contact with Water Emit Flammable Gases (Water-reactive Substances)	 Sample shows: Class 4.1 Flammable solids

Class 4 Substances/Products include: Flammable Solids; Substances Liable to Spontaneous Combustion; Substances That on Contact with Water Emit Flammable Gases (Water-reactive Substances)	Class 4 has three divisions: flammable solids, substances liable to spontaneous combustion, and water reactive substances. These substances may cause fire (through friction), become explosive when in contact with water, become explosive even with contact with oxygen (air), or undergo a reaction that will result in a stronger exothermic reaction (a reaction that releases heat). For example, Class 4.2 Substances liable to spontaneous combustion includes substances that will ignite within 5 minutes of coming in to contact with air.	•Sulphur •Safety matches •Naphthalene •Carbon, activated •Calcium carbide

Classes of Hazards



Class 5 Oxidizing Substances, including Organic Peroxides	The two divisions are oxidizing substances and organic peroxides. These substances may explosively decompose, burn rapidly, be sensitive to impact or friction, react dangerously with other substances, or cause damage to the eyes.	•Ammonium nitrate based fertilizer •Hydrogen peroxide •Dibenzoyl peroxide

Class 6 Toxic and Infectious Substances	 Samples show: Class 6.1 Toxic substances; Class 6.1 Infectious substances

Class 6 Toxic and Infectious Substances	The two divisions are toxic substances and infections substances. Substances are included in class 6 if they can cause death or serious injury or harm to human health if swallowed, inhaled, or in contact with skin. Medical or clinical waste may also be classified as an infectious substance if they contain regulated properties.	•Strychnine •Arsenic •Chloroform •Phenol •Bacteria •Viruses

Classes of Hazards

Class 7 Radioactive Materials	 Sample shows Class 7 Radioactive materials, Category I White

Class 8 Corrosive Substances	 Sample shows Class 8 Corrosives

Class 7 Radioactive Materials	Radioactive materials include those substances included in the Packaging and Transport of Nuclear Substances Regulations.	•Items with tritium concentrations

Class 8 Corrosive Substances	There are no divisions in this class. Substances are included in Class 8 if they are known to cause injury to the skin such as burns, destruction (thickness), or lesions.	•Acetic acid •Sulphuric acid

Classes of Hazards

Class 9 Miscellaneous Products, Substances or Organisms	  Samples show: Class 9 Miscellaneous Products, Substances or Organisms; Class 9 Lithium Batteries

Class 9 Miscellaneous Products, Substances or Organisms	Substances are considered Class 9 when they are listed in column 3 of Schedule 1 in the TDG Regulation, or by other inclusions and exclusions as defined in the regulations. Substances include those that present a danger sufficient to be included in the TDG regulations, but which cannot be assigned to any other class.	•Carbon dioxide, solid (Dry Ice) •Lithium cells and batteries

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.

- 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 Cont.

- Propane
- TDGR Section 2.31makes 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.

Primary and Subsidiary Classes

- If the product has more than one type of
- hazard the primary class is shown first, with
- the subsidiary class in brackets

Emergency Response Assistance Plans

An Emergency Response Assistance Plan (ERAP) is a specialized plan required for transporting certain high-risk dangerous goods in Canada. It outlines the procedures and resources needed to respond to a release or anticipated release of these goods while in transit.

Key Features of ERAPs:

- Specific to Certain Goods: ERAPs apply to dangerous goods that exceed the quantity limits set by the Transportation of Dangerous Goods (TDG) Regulations.
- Emergency Response Resources: Lists specialized personnel and equipment needed for incident response.
- Coordination with Other Plans: Works alongside emergency response plans from carriers, local authorities, and other organizations.
- ERAP Telephone Number: Every ERAP must have a designated emergency contact number on shipping documents.

Who Needs an ERAP?

- Typically, producers, manufacturers, and distributors of dangerous goods require an ERAP. In some cases, others may voluntarily have an approved plan

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.
- 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.

Proper Equipment Use for Transporting

Transporting dangerous goods isn't just about getting from point A to point B—it's about safety, precision, and strict regulatory compliance.

- **Choosing the Right Equipment:** The type of containment system used must be **Transport Canada-approved** and compatible with the goods. Certain materials require **UN-certified packaging** to ensure safe transport.
- **Inspection & Maintenance:** Before transport, containers should be checked for **leaks, corrosion, and damage**. Proper labeling and fastening prevent movement that could cause spills or accidents.
- **Handling & Loading:** Loading hazardous materials isn't just about stacking—it's about **preventing contamination and ensuring stability**. Specialized lifting equipment can help manage heavy or volatile substances safely.
- **Compliance & Documentation:** Whether moving goods by **road, rail, air, or marine**, operators must follow **TDG regulations**, maintain proper **shipping documents**, and ensure **trained personnel** handle transportation.

Transporting dangerous goods safely keeps businesses compliant, communities protected, and the environment secure.

Emergency Measures

Transporting dangerous goods comes with risks, and knowing how to respond to emergencies is critical for safety.
An emergency can involve **spills, leaks, fires, explosions, or exposure risks**. Quick action is essential to minimize harm.

Immediate Response Actions:

- **Call 911** and report the incident.
- Contact **CANUTEC** (Canada's Transport Emergency Centre) for expert guidance.
- Use the **Emergency Response Guidebook (ERG)** to assess risks and determine safe distances.

Containment & Mitigation:

- If safe, **stop the spread** of hazardous materials using absorbents or barriers.
- Follow **Emergency Response Assistance Plan (ERAP)** protocols for high-risk goods.
- Ensure **proper protective equipment** is used by responders.

Reporting & Documentation:

- Maintain **accurate incident reports** as required by TDG regulations.
- Follow **remedial measures** to prevent future incidents.
- Cooperate with authorities for **investigation and compliance checks**.

Being prepared for emergencies ensures **public safety, environmental protection, and regulatory compliance**.

Does the training certificate expire?

- Yes, it does. The expiration date differs for different modes of transport. The certificate is valid for:
  - 36 months (3 years) after its date of issuance

When being Inspected

- Training certificate is available
- Documents for product are correct and available
- Labels and markings are on product and corrected
- Containers are appropriate for product
- Placards are correct and posted
- Loads are safely secured

Conclusion

Transporting dangerous goods is more than just compliance—it's a commitment to **safety, responsibility, and preparedness**. Every step, from selecting the right equipment to responding effectively in emergencies, plays a role in **protecting people, communities, and the environment**.

By following TDG regulations and adopting **best practices**, we ensure that hazardous materials are handled with the **care and expertise** they demand. Whether you are a transporter, handler, or responder, your knowledge and actions **make a difference** in maintaining a **safe and efficient transport system**.

Safety isn't just a requirement—it's a responsibility we all share.