



CONSTRUCTION SAFETY EDUCATION PROGRAM #25

T.D.G. TRANSPORTATION OF DANGEROUS GOODS



This education program provides general information on TDG. It is intended to give contractors and workers practical information relating to the precautions to be taken when working with dangerous goods.

For specific regulatory requirements concerning TDG, please consult the Transportation Of Dangerous Goods Act and the appropriate regulations.

Additional information on TDG is available from the Construction Safety Association of Manitoba, the Manitoba Department of Conservation, Environmental Programs Division and Transport Canada, Dangerous Goods Directorate.



WHAT ARE DANGEROUS GOODS?

There are nine classes of Dangerous Goods listed in Schedule 1 of the TDG Regulations.

- Class 1 – Explosives
- Class 2 – Gases
- Class 3 – Flammable Liquids
- Class 4 – Flammable Substances
- Class 5 – Oxidizers and Organic Peroxides
- Class 6 – Toxic and Infectious Substances
- Class 7 – Radioactives
- Class 8 – Corrosives
- Class 9 – Miscellaneous

HOW CAN YOU RECOGNIZE DANGEROUS GOODS ?

Each class has hazard symbols, known as a placard or label, that represent the danger of that class. Labels must be attached to small containers (e.g. drums, boxes, bottles, cylinders). Placards must be attached to large containers (e.g. trucks, trailers, tote tanks, rail cars).

Class 1 – Explosives



Products that are designed to explode (e.g. dynamite) or create special effects (e.g. fireworks). There are 6 divisions in Class 1. Classes 1.1, 1.2, and 1.3 have a bursting bomb symbol on an orange background as their logo as they present a greater hazard (e.g. dynamite and black powder). Class 1.4, 1.5, and 1.6 are less sensitive (have less risk) and do not have a symbol on their orange logo (e.g. small caliber rifle ammunition). The number at the bottom of the logo indicates the division.

Class 2 – Gases



Gases are materials that are stored under pressure. They might have one or more of these hazards: might erupt violently; flammable or toxic vapours can spread rapidly; vapours might be super-cold; cylinder could become a rocket if it's over-heated, damaged or punctured. There are 3 divisions in Class 2. Class 2.1 is Flammable Gas (e.g. propane, butane and MAP gas) and its logo has a red background with the symbol of a flame. Class 2.2 is Non-Flammable, Non-Toxic Gas (e.g. nitrogen) and its logo is a white gas cylinder on a green background. Class 2.3 is toxic gas (e.g. chlorine) and uses the skull and crossbones symbol on a white background for its logo.

Class 3 – Flammable Liquids



There is only one logo for class 3 products: a white flame symbol on a red background and the number 3 at the bottom. These products can be very dangerous as a spill can spread quickly over a large area. A tiny spark can ignite vapours causing an explosion or intense fire. There are 3 “packing groups”: Packing Group I indicates a great danger (e.g. ethyl ether), Packing Group II indicates moderate danger (e.g. gasoline) and Packing Group III indicates a minor danger (e.g. diesel fuel).

Class 4 – Flammable Substances



There are three divisions in Class 4. They all use a logo with a flame symbol at the top and the number 4 on the bottom. Class 4.1 Flammable Solids catch fire easily and fires are difficult to extinguish. It has a logo of horizontal red and white stripes. Class 4.2 Spontaneously Combustible can ignite without warning and has a logo with a white top half and red bottom half. Class 4.3 Dangerous When Wet can give off flammable gases or burst into flames if it gets in contact with water. Its logo uses a blue background.

Class 5 – Oxidizers and Organic Peroxides



Class 5 has 2 divisions that both use a yellow background with a flame symbol at the top as their logo. Class 5.1 Oxidizers have readily available oxygen that will feed a fire and has the number 5.1 at the bottom of the logo. Class 5.2 Organic Peroxides are unstable and reactive which means if they are combined with other goods they can burst into flames, create heat and provide oxygen to intensify a fire.

Class 6 – Toxic and Infectious Substances



Class 6 has 2 divisions that both use a white background and have the number 6 at the bottom of their logo. Class 6.1 Toxic (poison) can cause injury or death if swallowed, vapours are inhaled, or if it is absorbed through the skin. Some poisons are corrosive and can burn skin, eyes or lungs. The symbol at the top of a logo is a skull and crossbones. Class 6.2 Infectious are known or suspected to cause disease. They could be hazardous to animals and/or humans. They have the biomedical hazard symbol (three outward facing semi-circles) at the top of their logo.

Class 7 – Radioactives



Radioactives are dangerous because the energy they give off can break down atoms and molecules. Skin tissue and bone can be damaged by radiation exposure. It can also cause cancer and genetic mutation. The logo for radioactives has a “trefoil” symbol (center dot with 3 fan blades radiating outwards) at the top and the number 7 at the bottom. The top half of the logo is yellow and the bottom half is white.

Class 8 – Corrosives



Corrosives can damage (“burn” or “eat”) skin, metal and other objects. Even the vapour given off by corrosive liquids is dangerous. The logo for corrosives is a white top half with a symbol of a vial dripping onto a metal bar and a symbol of a vial dripping onto a hand on the top half with a white background. The bottom half is black and displays the number 8. Be VERY careful when mixing corrosives – they can react with each other or with other goods and cause an explosive reaction and/or release poisonous vapours.

Class 9 – Miscellaneous



Miscellaneous dangerous goods do not meet the definition of any of the other 8 classes, but can still be dangerous to human health and/or to the environment if they spill or leak. There are 2 logos for Class 9. The new one is a black and white horizontal stripe top half and a white bottom half. The old logo was a white background with a red exclamation mark in the center. Both versions display the number 9 at the bottom.

Mixed Load Placard



Whenever the “DANGER” logo is used, it indicates that there is more than one class of dangerous goods in the same vehicle, trailer or rail car. This logo is used whenever there is more than 500 kilograms of dangerous goods in a shipment. For goods that require you to display the class logo and UN number for them, you must do so instead of displaying the “DANGER” logo if they are part of a mixed load.

* The term “logo” as used above refers to a label if it is on a small container and to a placard if it is on a large container.

WHAT DOES THIS MEAN TO YOU ?

If you **HANDLE** (load/unload/package/receive at a loading dock), **TRANSPORT** (carry in your vehicle or trailer), or **OFFER FOR TRANSPORT** (prepare waybills) any of the above listed dangerous goods you need to be trained and carry a certificate of training issued by your employer.

THE LAW!

The TDG Act and Regulations allow for fines of \$50,000 per person (employer/supervisor/ worker) per day for a first offence and \$100,000 for each subsequent offence.

UNDERSTANDING DANGEROUS GOODS

Each class of dangerous good has its own unique hazards. The class that a product belongs to depends on what makes it dangerous.

Each product on the market that has been tested and is known to be dangerous has a UN (United Nations) number assigned to it. This number is unique to each product and the UN number for that product is the same all over the world.

Some dangerous goods have the hazards of 2 different classes. These products have both a primary and a subsidiary classification. On a shipping document (e.g. invoice, waybill) these types of goods display the primary classification (hazard) first, followed by the subsidiary class in brackets.

For example, methanol is a flammable liquid, but it is also toxic (poisonous). If you look at a waybill from a shipment of methanol, it would state "Methanol, UN1230, 3 (6.1)".

PROPER CONTAINMENT OF DANGEROUS GOODS

The hazards associated with dangerous goods can be reduced by using the proper container. The term specified means of containment, or "spec package" refers to containers (cardboard boxes, wooden crates, plastic bottles, aluminium or steel cylinders, steel or plastic drums, etc.) that have been tested and approved for storing and transporting dangerous goods.

"Spec packages" have the letters "UN" (United Nations), "TC" (Transport Canada), "CTC" (Canadian Transport Commission) or "DOT" (U.S. Department of Transport) followed by a series of letters and numbers stenciled or stamped on them.

For example, a box that has “**UN 4G/Y75/S/02/CAN/ACME/2-183**” printed on the box would be: built to an **international** standard/ made of **cardboard**/ could hold **75 kilograms**/ of **solid** goods/ made in **2002**/ manufactured in **Canada**/ by the **Acme** Company/ has a registration number of **2-183**, and has been tested and approved for storing and transporting dangerous goods.

Certain containers such as cylinders for compressed gases or tanks for flammable liquids have to be re-tested and approved on a periodic basis. Depending on what the cylinder or tank is made of (steel or aluminium) and depending on what it is used for (inert, flammable or corrosive gases or liquids) will dictate how often it has to be tested. Some cylinders and tanks have to be inspected and re-tested annually, others only need it done every 5 or 10 years.

Transport Canada can provide you with a list of companies that are approved to inspect, test and re-qualify cylinders and tanks. They can also tell you how often the containers that you use have to be re-tested.

WHAT YOU CAN DO TO PROTECT YOURSELF!

GET TRAINED!

Persons handling, transporting, or offering for transport dangerous goods must be trained and carry a certificate of training issued by their employer. It must be signed by both you and your employer. Your certificate of training is only valid for 3 years and must be renewed before you continue working unsupervised with dangerous goods.

ASK QUESTIONS!

Ask your supervisor and your supplier for information regarding the specific hazards of the products you work with. The Material Safety Data Sheets (MSDS) for the products you handle must be readily available on the job site. They are an excellent source of information.

REFUSE SUSPICIOUS SHIPMENTS!

If you think that a shipping document is not properly filled out or that a container is not approved for the product that is in it, refuse to accept the load. Advise your supervisor of the problem and await further instructions.

REMEMBER: **YOU** can be fined \$50,000 for illegally handling or transporting dangerous goods.

The Winnipeg office of Transport Canada, Dangerous Goods can be reached at (204) 983-5969 or 1-888-463-0521 or on the web: www.tc.gc.ca/tdg/. They can provide information on where to buy labels or placards, where to get cylinders re-tested, how to properly fill out a shipping document or what type of packaging is required to ship a specific product. You must be trained before shipping, handling or transporting dangerous goods.

DOCUMENTATION

All shipments of dangerous goods must be accompanied by a shipping document (e.g. invoice, waybill).

The proper shipping name of the dangerous goods, the UN number, the class (and the subsidiary class in brackets if applicable), the date the document was prepared, the number of containers, the quantity in metric (e.g. kilograms or litres) the shipper's name and address and a 24-hour phone number for the shipper in case of emergency, are all items that **MUST** be on a TDG shipping document.

ARE THERE ANY EXCEPTIONS ?

Yes. There are exemptions from some of the requirements.

If you are hauling 5 or fewer cylinders of propane, MAP gas, acetylene, argon, oxygen, or compressed air with a gross mass of less than 500 kg, you do not need to be trained or have a shipping document. The cylinders must be transported in an open vehicle (ie. pickup truck) and the dangerous goods labels on the collar must be visible from outside the vehicle. The cylinders however must be appropriate for the products they are holding and must be in-date (not past their re-test date).

There is also an exemption that allows you to haul up to 500kg of dangerous goods without placards and with a modified shipping document if you are trained. Certain products, such as explosives, flammable and toxic gases, infectious substances and radioactives, do **NOT** qualify for this exemption.

WHAT DO YOU DO IN CASE OF A SPILL OR LEAK ?

Get upwind and call 911 (if 911 service is available) or call the local fire and police.

Do **NOT** attempt to clean up or stop a spill unless you have the proper personal protective equipment (PPE) and are familiar with the precautions to take with that product.

The TDG Regulations specify a "reportable quantity". If you have a spill that exceeds the quantity specified, you must call local police or fire and Manitoba Conservation at 945-4888.

Transport Canada operates a 24-hour call center known as CANUTEC.

In case of a dangerous goods emergency, they can be reached at *666 from a cellular phone or at (613) 996-6666. They will accept collect calls.

They can provide information on how to handle spills or leaks as well as technical information about the chemical properties of dangerous goods.

For non-emergency information call them at (613) 992-4624.

There is no charge to use CANUTEC's services.

QUIZ

NAME: _____

DATE: _____

T / F – True or False M.C. – Multiple Choice

1. T / F - If a shipping clerk provides you with a waybill it is automatically considered a valid TDG shipping document and does not have to be looked over for compliance with the TDG Regulations.

2. M.C. - Where is the safest place to be in the event of a dangerous goods leak or spill?
 - a) upwind
 - b) downwind

3. T / F - Both you and your employer must sign your TDG training certificate.

4. T / F - Regardless of the quantity and type of product that you are transporting, you must be trained in TDG and carry a shipping document.

5. M.C. - A TDG training certificate is valid for how long?
 - a) 1 year
 - b) 3 years
 - c) never expires

6. T / F - Every product that has been tested and is known to be dangerous is issued a ULC number.

7. M.C. - Cylinders and tanks that are used for storing and transporting dangerous goods have to be inspected and re-tested every:
 - a) 1 year
 - b) 5 years
 - c) 10 years
 - d) It all depends on what the tank or cylinder is made of and what product it is used for.