



## HAZMAT Transport

- Policy, procedural and legal requirements
- HAZMAT Transport
- Schedule
- Markings
- Emergency Response
- Manifesting
- Training

## DAOD 4003-1

# Hazardous Products Management

Requires carriers, shippers and receivers who transport HAZMAT to:

- Package, label and place symbols and placards
- Load and unload
- Record manifests
- Choose the appropriate mode of transportation
- Provide spill response

# Dependent Legislation

National Fire Code of Canada

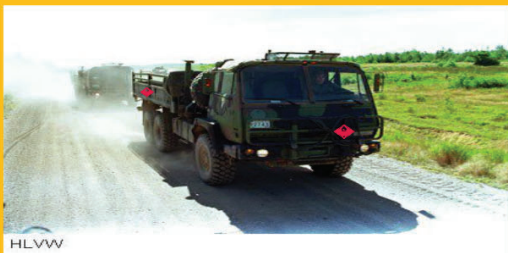
- Spill containment
- Storage compartment labeling
- Compatibility

# Training

TDG training is required for those who:

- Handle DG
- Offer DG for transport
- Transport DG

## HAZMAT Transport and Storage Within DND/CF

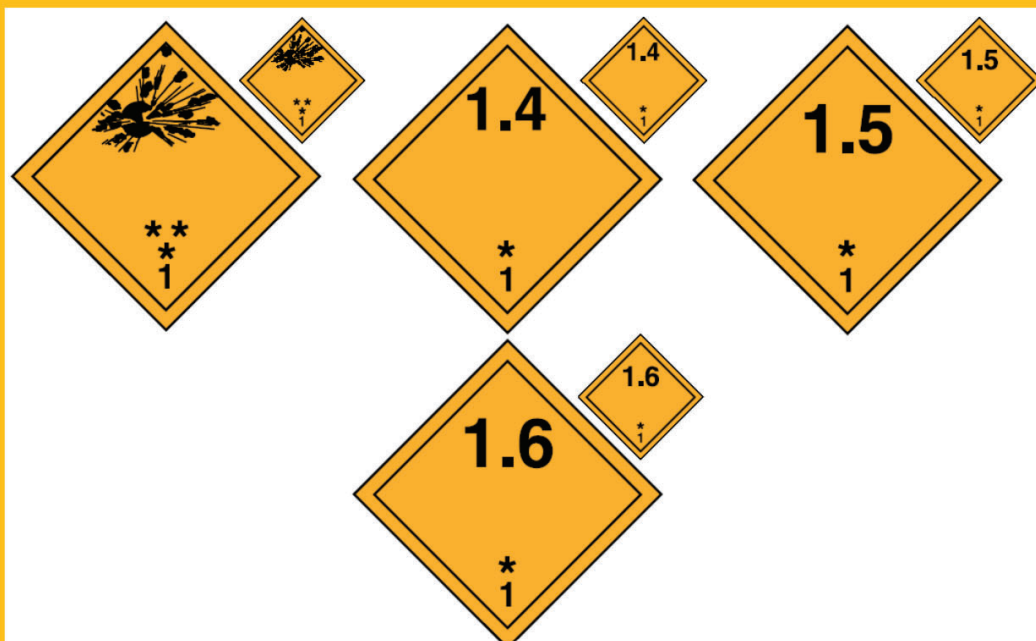


# What is a Dangerous Good?

- Product
- Substance
- Organism
- Included in classes of the Schedule to the Act

## Schedule

Class 1 Explosives



# Schedule

Class 2.1 Flammable Gases



Class 2.2 Non-flammable and  
Non-toxic Gases  
Oxidizing Gases



Class 2.3 Toxic  
Gases



- Class 2.1 Flammable compressed gases such as propane, acetylene, methane & hydrogen
- Needs to be in right concentration to burn

## Upper & Lower Explosive Limits

### Upper Explosive Limit "UEL"

- Maximum concentration of gas or vapor in the air that will ignite - if higher known as too RICH and will not burn.

### Lower Explosive Limit "LEL"

- Minimum concentration of a gas or vapor in air that will ignite - if lower known as too LEAN and will not burn.

Acetylene 1.0%-99%

Hydrogen 4%-75%

Propane 2.4%-9.5%



- Class 2.2 Non-flammable, non toxic compressed gases such as breathing air (SCBA), nitrogen, carbon dioxide fire extinguisher and oxygen
- They do have physical hazards resulting from being stored under pressure.



- Class 2.3 Toxic gases
- Toxic or corrosive to humans
- Gases such as chlorine, ammonia, carbon monoxide & nerve gas



# Schedule

Class 2.1 Flammable Gases



Class 2.2 Non-flammable and  
Non-toxic Gases  
Oxidizing Gases



Class 2.3 Toxic  
Gases



# Schedule

Class 3 Flammable Liquids



## Flammability

- Flash point - temperature at which enough vapours are given off that mix with air to be flammable
- TDGA - Flammable ---> Regulated < 60°C
- WHMIS - Flammable ---> < 37.8°C

## Class 3 Flammable Liquids - Flash Point Examples

- Kerosene 37.8°C ---> - 65°C
- Fuel Oils 100°C ---> - 300°C
- Gasoline -45.0°C
- Diesel Fuel 100°C ----> 130°C
- Liquid Thinner -11°C

## Schedule

Class 4.1 Flammable Solid



Class 4.2 Substances Liable to Spontaneous Combustion



Class 4.3 Water Reactive Substances



# Schedule

Class 5.1 Oxidizing Substances



Class 5.2 Organic Peroxides



- A substance that gives off oxygen at room temperature or under slight heating
  - React with organic materials and can generate enough heat to ignite the material
  - Oxygen is released as the substance burns, increasing the rate of burning
  - e.g. sodium hypochlorite, ammonium nitrate



Much more reactive than 5.1

- Can be very explosive – heat, shock and friction sensitive
- MEKP hardening agent in polyester & acrylic resins
- Explosions and fire can occur if mixed with POL or other organic materials

## Schedule

Class 5.1 Oxidizing Substances



Class 5.2 Organic Peroxides



# Schedule

Class 6.1 Toxic Substances



Class 6.2 Infectious Substances



# Schedule

Class 7 Radioactive Materials



Class 7 Radioactive Materials Category I  
White



Class 7 Radioactive Materials Category II  
Yellow



Class 7 Radioactive Materials Category III  
Yellow



# Schedule

Class 8  
Corrosives



## Examples of Corrosives

|                                 |         |
|---------------------------------|---------|
| Hydrochloric Acid/Muriatic Acid | 1-2     |
| Fluorosilicic Acid              | 1.2     |
| Acetic Acid/Vinegar             | 3       |
| Urine                           | 5-7     |
| Blood                           | 7.3-7.5 |
| Ammonium Hydroxide              | 11      |
| Sodium Hydroxide/Drain O        | 14      |



The measure of acidity or alkalinity expressed on the pH scale (logarithmic)

- Pure water has a pH of 7 “NEUTRAL”
- TDG Regulated Acids have a pH 2 - 0
- TDG Regulated Caustics have a pH of 12.5 - 14

## Examples of Corrosives

|                                 |         |
|---------------------------------|---------|
| Hydrochloric Acid/Muriatic Acid | 1-2     |
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| Urine                           | 5-7     |
| Blood                           | 7.3-7.5 |
| Ammonium Hydroxide              | 11      |
| Sodium Hydroxide/Drain O        | 14      |



# Schedule

Class 9 Miscellaneous Products  
Substances or Organisms



















## Examples of Class 9 Products

- Does not fit in the other 8 Classes
- Hazardous waste destined for disposal
- 83 Leachate substances in TDG
- Asbestos
- Contaminated soil (Pb, Cr, creosote, ...)

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- Does not fit in the other 8 Classes
- Hazardous waste destined for disposal
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**Equivalency Chart.** Note that these are approximately equivalent. Verify specific classification with the SDS.

| WHMIS 2015   | TDG   |
|--|---|
|  Gases under pressure   |   |
|  Flammables (gases, aerosols, liquids, solids), Pyrophoric (liquids, solids, gases), Self-heating substances and mixtures, Substances and mixtures which, in contact with water, emit flammable gases               |   |
|  Oxidizing (liquids, solids, gases)   |   |
|  Acute toxicity (fatal, toxic or harmful)   |   |
|  Carcinogenicity, Germ cell mutagenicity, Respiratory sensitization, Reproductive toxicity, Specific target organ toxicity - single exposure, Specific target organ toxicity - repeated exposure, Aspiration hazard | N/A   |
|  Biohazardous infections materials  |   |
|  Skin corrosion, Serious eye damage, Skin irritation, Eye irritation, Skin sensitization, Corrosive to metals   |   |
|  Self-reactive substances and mixtures, Organic peroxides   |   |
| N/A  |  |

Mixed Load Shipment



Markings

Orange Panel



Elevated Temperature Sign



Placard placement



Marine Pollutant Mark

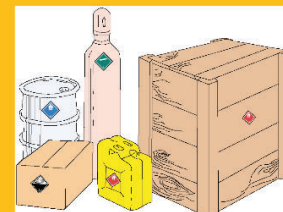


Fumigation Sign

|  |  |
|--|--|
| <b>DANGER</b>                            |  |
| This unit is under fumigation with _____ | Cette unité est sous fumigation avec _____ |
| (Name of fumigant)                       | (Nom du fumigant)                          |
| Applied on _____                         | Depuis le _____                            |
| Date _____                               | Date _____                                 |
| Time _____                               | Heure _____                                |
| DO NOT ENTER                             | DÉFENSE D'ENTRER                           |



Labelled products



# TDG Manifest

| SHIPPING DOCUMENT  |                                     |                                     |  |                                    |                     |                                 |
|--|-------------------------------------|-------------------------------------|--|------------------------------------|---------------------|---------------------------------|
| Destination(City-Town)<br>Name:<br>Address:  |                                     |                                     | Consignor<br>Name:<br>Address:                         |                                    |                     |                                 |
| Name of carrier  | Prepaid<br><input type="checkbox"/> | Collect<br><input type="checkbox"/> | Transport unit no.                                     |                                    |                     |                                 |
| Point of origin  |                                     | Shipping date                       |  | Shipper's no.                      |                     |                                 |
| <b>REGULATED DANGEROUS GOODS</b>   |                                     |                                     | 24 HOUR NUMBER :<br>ERP reference & telephone number : |                                    |                     |                                 |
| Shipping name<br>(technical name) if applicable  | class<br>primary                    | class<br>subsi-<br>diary            | UN<br>number   | packing<br>group/<br>risk<br>group | quantity            | packages<br>requiring<br>labels |
|  |                                     |                                     |  |                                    |                     |                                 |
|  |                                     |                                     |  |                                    |                     |                                 |
|  |                                     |                                     |  |                                    |                     |                                 |
| THIS IS TO CERTIFY THAT THE ABOVE NAMED ARTICLES ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELLED AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE TRANSPORTATION OF DANGEROUS GOODS REGULATIONS |                                     |                                     |  |                                    |                     |                                 |
| <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 above in apparent good order  |                                     |                                     | Driver's signature                                     |                                    | Drivers' no.        |                                 |

# ERG 2020



- Provides Fire, Explosion and Health Hazards
- Emergency response for spills, fire, exposure
- Safe distances