Transportation of Dangerous Goods (TDG)

Transportation of Dangerous Goods (TDG) - 9 Classes

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What is the purpose of the TDG Act and Regulations?

The purpose of the Transportation of Dangerous Goods (TDG) Act and Regulations is to promote public safety when dangerous goods are being imported, offered for transport, handled, or transported by road, rail, air, or water (marine). TDG also establishes safety requirements.

Note: The information below is provided as guidance only and is for the transportation of dangerous goods by road. Always check the TDG Act and Regulations to ensure compliance.

Please also see the following documents in this series:

- Transportation of Dangerous Goods (TDG) - Overview (Road)
- Transportation of Dangerous Goods (TDG) - Training (Road)
- Transportation of Dangerous Goods (TDG) - Classification (Road)
- Transportation of Dangerous Goods (TDG) - "Special Case" and "Special Provision" Exemptions (Road)
- Transportation of Dangerous Goods (TDG) - Dangerous Goods Marks or Dangerous Goods Safety Marks (Road)
- Transportation of Dangerous Goods (TDG) - Reporting Requirements
- Transportation of Dangerous Goods (TDG) - Emergency Response (Road)
- Transportation of Dangerous Goods (TDG) - Means of Containment (Road)

- Transportation of Dangerous Goods (TDG) - Segregation of Means of Containment (Road)
- Transportation of Dangerous Goods (TDG) - Shipping Documents (Road)

How will I know what class a substance has been assigned to?

Dangerous goods are classified into 9 classes, based on the substance's characteristics and properties. These criteria are outlined in the TDG Regulations.

Assigning a substance into a hazard class is usually done by the consignor. The person deciding the classification must be competent, meaning they have the education, training, and experience required for the task. Some substances have been assigned classes in the TDG Regulations.

For more information on how classification works, please see OSH Answers include.

What are the nine TDG classes and their hazards?

Always consult the TDG Regulations for full details on classes, divisions, and exemptions. This table provides a general overview of each class.

Class	Hazard	Examples
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) • Ammunition, Smoke, White Phosphorus • Pyrotechnic substances (e.g., Safety Devices, Pyrotechnic) • Signals, Distress
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, compressed • Nitrogen, refrigerated liquid • Carbon dioxide • Air, compressed • Sulfur hexafluoride • Liquefied petroleum gas • Hydrogen sulfide
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 • Kerosene • Ethanol solution
Class 4 Substances/ Products include: Flammable Solids; Substances	Class 4 has three divisions: flammable solids, substances liable to spontaneous combustion, and water reactive substances.	• Sulphur • Safety matches • Naphthalene, crude • Naphthalene, refined

Liable to Spontaneous Combustion; Substances That on Contact with Water Emit Flammable Gases (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 into contact with air.	• Carbon, activated • Calcium carbide
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 • Calcium peroxide • Organic Peroxide Type C, Liquid
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.	Toxic substances examples: • Strychnine • Arsenic • Chloroform • Phenol, solid Infectious substances examples: • Bacteria such as Anthracis•Viruses such as Hantavirus

	Medical or clinical waste may also be classified as an infectious substance if they contain regulated properties.	
Class 7 Radioactive Materials Category I – White Category II – Yellow Category III - Yellow Fissile Material	Radioactive materials are classified in accordance with the Packaging and Transport of Nuclear Substances Regulations 2015. Class 7 Radioactive material has no divisions or packing groups. Instead, there are three categories based on the maximum radiation dose exposure from the packages. The three categories are identified with the following labels: • Radioactive White-I – low hazard • Radioactive Yellow-II – moderate hazard • Radioactive Yellow-III – high hazard Radioactive materials emit invisible radiation that can cause serious health effects. High radiation levels can cause reduced blood count, nausea, fatigue, hair loss, etc. Small amounts of radiation received over a long period may cause long-term health effects such as cancer and genetic mutations.	• Radioactive material, Type B(M) Package, Fissile

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. Substances that cause corrosion of steel or aluminum surfaces are also included in this TDG class.	• Acetic acid, solution (10 to 50%) • Sulphuric acid, spent • Battery fluid, acid • Battery fluid, alkali
Class 9 Miscellaneous Products, Substances or Organisms Class 9 Lithium batteries	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 • Liquid substances transported at or above 100 degrees C • Solid substances transported at or above above 240 degrees C

What are the dangerous goods marks or dangerous goods safety marks for each class?

Recently, the TDG Regulations were amended. The definition of “dangerous goods safety mark” was **withdrawn** from the TDG Regulations. However, the TDG regulations and many Transport Canada publications still refer to the former terminology of “dangerous goods safety marks.” Thus, we include both terms in our OSH Answers fact sheet.

The TDG Act defines a “dangerous goods mark” as a symbol, device, sign, label, placard, letter, word, number or abbreviation, or any combination of those things, that is to be displayed to indicate the presence or nature of danger on dangerous goods, or on a means of containment or means of transport used in importing, offering for transport, handling or transporting dangerous goods.

The size, shape and colour of the required dangerous goods marks or dangerous goods safety marks are outlined in the TDG Regulations.

The following table shows common dangerous goods marks or dangerous goods safety marks for each class. To view all the required dangerous goods marks or dangerous goods safety marks, please see the Appendix in Part 4 of the TDG Regulations.

Class	Sample Dangerous Goods Mark(s) or Dangerous Goods Safety Mark(s)
Class 1 Explosives	 Sample shows: Class 1.1., 1.2 and 1.3
Class 2 Gases	 Samples show: Class 2.1 Flammable gases; Class 2.2 Non-flammable and non-toxic gases; Class 2.3 Toxic gases, and Class 2 dangerous goods mark with yellow background for oxidizing gases
Class 3 Flammable Liquids	

	Sample shows: Class 3 Flammable liquids
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 5 Oxidizing Substances, including Organic Peroxides	 Sample shows: Glass 5.1 Oxidizing substances
Class 6 Toxic and Infectious Substances	  Samples show: Class 6.1 Toxic substances; Class 6.2 Infectious substances

Class 7 Radioactive Materials Category I – White Category II – Yellow Category III - Yellow Fissile Material	 Sample shows: Class 7 Radioactive materials, Category I White
Class 8 Corrosive Substances	 Sample shows: Class 8 Corrosives
Class 9 Miscellaneous Products, Substances or Organisms	  Samples show: Class 9 Miscellaneous Products, Substances or Organisms; Class 9 Lithium Batteries

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