

Module 2:

Types of dangerous goods and hazardous substances



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Module objectives

At the end of **Module 2: Types of dangerous goods and hazardous substances**, you will be able to:

Explain the difference between dangerous goods and hazardous substances

Describe the negative physical, health and environmental risks



Dangerous goods vs. hazardous substances

Have hazardous properties which have the potential to cause **harm** to:



Come in the form of **gases, liquids** or **solids**

Key difference:

Their relevant legislation and classifications

Dangerous goods



Australian Code for the Transport of
Dangerous Goods by Road & Rail

Hazardous substances



Globally Harmonized System of Classification
and Labelling of Chemicals



Many dangerous goods are also classed as
hazardous substances.

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What are the dangerous goods classes?

Grouped into different 'classes'



Represented by a distinctive diamond shaped label

Click on each class to find out more.

Class 1

Class 2

Class 3

Class 4

Class 5

Class 6

Class 7

Class 8

Class 9

What are the dangerous goods classes?

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Click on each class to find out more.

Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9
								
1.1 Explosives with a mass explosion hazard	1.2 Explosives with a projectile or fragmentation hazard	1.3 Explosives with a fire hazard and either a minor blast hazard or minor projection hazard or both	1.4 Explosives which present no significant hazard	1.5 Explosives with a mass explosion hazard that are also very insensitive	1.6 Explosives with no mass explosion hazard that are also extremely insensitive			



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2.1

Flammable gas that can ignite in air and cause a fire and explosion hazard



2.2

Non-flammable, non-toxic gas that may cause asphyxiation in confined spaces



2.3

Toxic gas that may cause death or injury when inhaled



What are the dangerous goods classes?

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3

Liquids or mixtures of liquids and solids which produce vapour that can be ignited in air on contact with a suitable ignition source



What are the dangerous goods classes?

Grouped into different 'classes'  Represented by a distinctive diamond shaped label

Click on each class to find out more.

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Class 7

Class 8

Class 9



4.1

Substances that are easily ignited and may cause fire through friction heat or other ignition sources



4.2

Substances that are liable to spontaneously heat up and ignite under normal transport conditions or in contact with air



4.3

Substances that in contact with water emit flammable or toxic gases

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Class 9



5.1

Oxidising substances that are not necessarily combustible but may create oxygen which then causes or contributes to the combustion of other material



5.2

Substances that are thermally unstable and likely to react dangerously with other substances



What are the dangerous goods classes?

Grouped into different 'classes'



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Class 1

Class 2

Class 3

Class 4

Class 5

Class 6

Class 7

Class 8

Class 9



6.1

Substances liable to either cause death, serious injury or harm human health if swallowed, inhaled or absorbed through the skin



6.2

Substances that are known or reasonably expected to contain pathogens



What are the dangerous goods classes?

Grouped into different 'classes'  Represented by a distinctive diamond shaped label

Click on each class to find out more.

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Class 2

Class 3

Class 4

Class 5

Class 6

Class 7

Class 8

Class 9



7

Radioactive materials includes substances (either solid or liquid) that spontaneously emit ionising radiation.

Substances are categorised into Category 1, 2 or 3, depending on the radiation level of the transport package, with level 1 representing the lowest level of radiation.



What are the dangerous goods classes?

Grouped into different 'classes'



Represented by a distinctive **diamond shaped label**

Click on each class to find out more.

Class 1

Class 2

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Class 8

Class 9



8

Solids or liquids that will cause severe damage to living tissue, steel or other materials on contact



What are the dangerous goods classes?

Grouped into different 'classes'



Represented by a distinctive diamond shaped label

Click on each class to find out more.

Class 1

Class 2

Class 3

Class 4

Class 5

Class 6

Class 7

Class 8

Class 9



9

Those that present a danger during transport but are not covered by the other classes



Mixed Class Label

Used on transport vehicles that are transporting more than one class of dangerous goods.

This is an alternative to displaying the labels for each type of dangerous good being carried.



What are the hazardous substances categories?

Grouped into three **hazard categories**:

Physical hazards



Health hazards








Environmental hazards



Each category is then divided into **divisions**

What are physical hazards?

Similar to the dangerous goods classes:

Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9
								
Explosives Self-reactive substances and mixtures Organic peroxides	Flammable gases Flammable aerosols Flammable liquids Flammable solids Self-reactive substances/mixtures Pyrophoric liquids Pyrophoric solids Self-heating substances/mixtures Substances and mixtures which, in contact with water, emit flammable gases Organic peroxides	Oxidizing gases Oxidizing liquids Oxidizing solids	Gases under pressure	Corrosive to metals				





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What are health hazards?

Similar to the dangerous goods classes:

Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9
								
Acute toxicity			Acute toxicity Serious eye damage/eye irritation Respiratory or skin sensitization Specific target organ toxicity – single exposure		Skin corrosion or irritation Serious eye damage/eye irritation		Respiratory or skin sensitization Germ cell mutagenicity Carcinogenicity Reproductive toxicity Specific target organ toxicity – single exposure Specific target organ toxicity – repeated exposure Aspiration hazard	

 Class 7 (Radioactive Materials) are classified as **dangerous goods only** and do not have an equivalent hazardous substance category.

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What are environmental hazards?

Similar to the dangerous goods classes:

Class 1

Class 2

Class 3

Class 4

Class 5

Class 6

Class 7

Class 8

Class 9



Hazardous to the aquatic environment

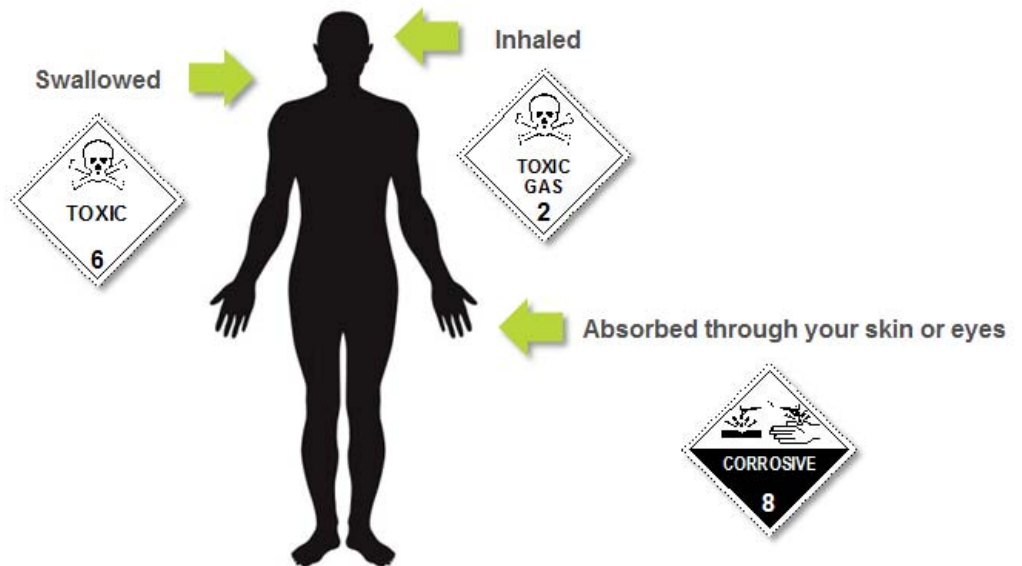


Hazardous to the ozone layer



How can they enter your body?

Can enter your body in different ways:



How and when can you be exposed to them?

Click on each question to find out more.

How can I be exposed?

What is the frequency and duration of my exposure?



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How and when can you be exposed to them?

Click on each question to find out more.

How can I be exposed?

- Working **directly** with it
- Working in the **vicinity** of it
- Entering an **enclosed** space
- Disturbing **deposits** of it
- Touching contaminated **surfaces**
- Disposing** of the material
- Disposing** of the container



What is the frequency and duration of my exposure?

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How and when can you be exposed to them?

Click on each question to find out more.

How can I be exposed?

What is the frequency and duration of my exposure?



Exposed:

Regular
Ad-hoc

Duration:

Short
Medium
Long



What are the negative health effects?

Potential to cause:



Headaches
Nausea
Vomiting
Skin burns

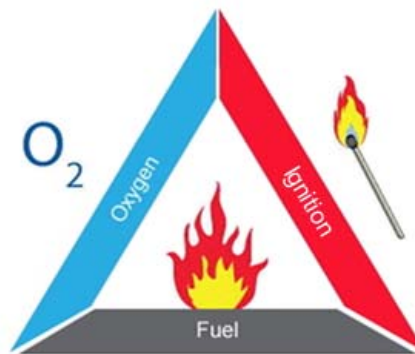
Asthma
Dermatitis
Nerve damage
Cancer

What are the negative physical effects?

Cause catastrophic physical effects on **people** and **property** due to their physical or chemical properties

Can contribute to these fire and explosion risks:

Oxygen gas
Compressed air in cylinders
Chemical oxidisers
Peroxides



Flames
Sparks
Heat
Equipment



Flammable solids, liquids, gases and dusts

What are the negative environmental effects?

Cause short and long term environmental effects to:



- Marine life
- Plants
- Animals
- Quality of the water

The ozone layer in the upper atmosphere





Module Summary



Congratulations! You have completed Module 2.

You should now be able to:

-  Explain the difference between dangerous goods and hazardous substances
-  Describe the negative physical, health and environmental risks

You can now return to the home page and move on to the next module which will look at an appropriate **risk management approach**.



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