

NEW DIRECTIONS IN BUILDING SERVICES®

NEW DIRECTIONS IN BUSINESS SAFETY® FIRE ASSESS™



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Storage & Handling of Hazardous Waste

Ian Childs - Director

NEW DIRECTIONS INTERNATIONAL BUSINESS SERVICES PTY LIMITED ABN 49 083 183 751



Overview

- Classes of Dangerous Goods
- Hazardous wastes that are DGs
- Laws that cover DG storage and transport
- Storage of DG
- Transport of DG



Acronyms & Definitions

DG – dangerous goods

Packing Group (PG) - all DG's are assigned (except Class 1, 2 and 7) to reflect the relative hazard of the goods

PG I – great danger

PG II – medium danger

PG III – low danger



Classes of Dangerous Goods

There are 9 Classes of DG:

- Class 1 Explosives
- Class 2 Gases
- Class 3 Flammable liquids
- Class 4 Flammable solids
- Class 5 Oxidizing agents
- Class 6 Poisons
- Class 7 Radioactives
- Class 8 Corrosives
- Class 9 Miscellaneous Dangerous Goods



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Dangerous Goods



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Class 1 Explosives



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Class 2 Compressed Gas

Class 2.1 Flammable Gas



eg. LP Gas Acetylene
Aerosols, etc.

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Class 2 Compressed Gas

Class 2.2 Non-flammable Non-toxic Gas

eg. argon, oxygen, nitrogen



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Class 2 Compressed Gas

Class 2.3 Toxic Gas

eg. chlorine, ammonia



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Class 3 Flammable Liquids

eg. Petrol, kerosene, ethanol



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Class 4 Flammable Solids

Class 4.1 Flammable Solids

eg. Sulphur





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Class 4 Flammable Solids

Class 4.2 Spontaneously Combustible

eg. xanthates (SEX, PAX),
zirconium powder

*These are substances liable to
spontaneous combustion*

Minesites, chemical warehouses





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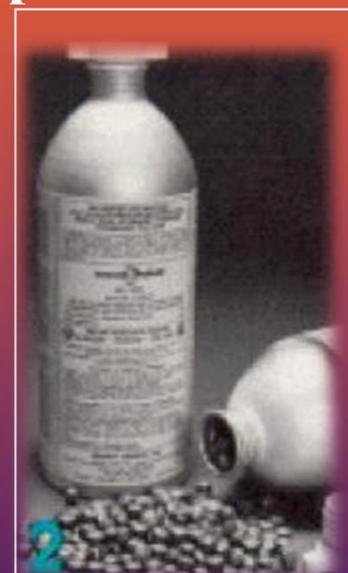


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Class 4 Flammable Solids

Class 4.3 Dangerous when wet

eg. Alumimium phosphide



These are substances that in contact with water produce flammable gasses



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Class 5 Oxidizing Substances

Class 5.1 Oxidizing Agent



eg. Ammonium Nitrate, Solid Pool Chlorine



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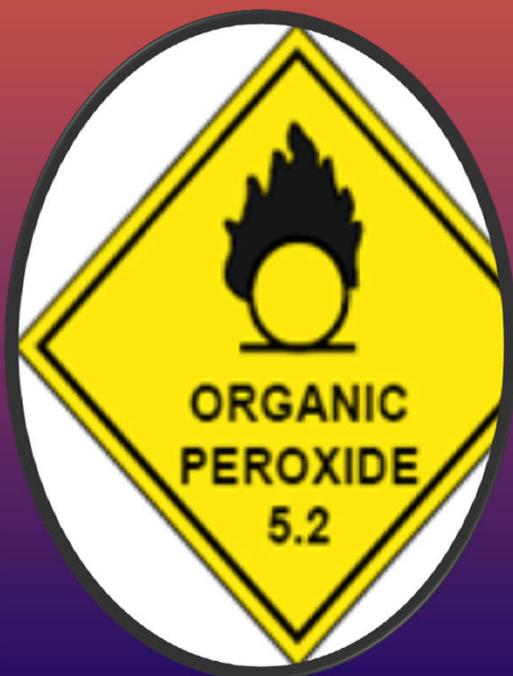


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Class 5 Oxidizing Substances

Class 5.2 Organic Peroxides

Fibreglass businesses eg pool manufacturers
(used as catalyst)



eg. MEKP (methyl ethyl ketone peroxide)

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Class 6.1 Toxic Substances

eg. Sodium cyanide, pesticides



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Class 7 Radioactive Substances



eg. Uranium, Cobolt 60,
Plutonium

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Class 8 Corrosive Substances



eg. Hydrochloric Acid,
Caustic Soda

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Class 9 Miscellaneous dangerous goods

eg. dry ice, PCBs, Fish meal - stabilized





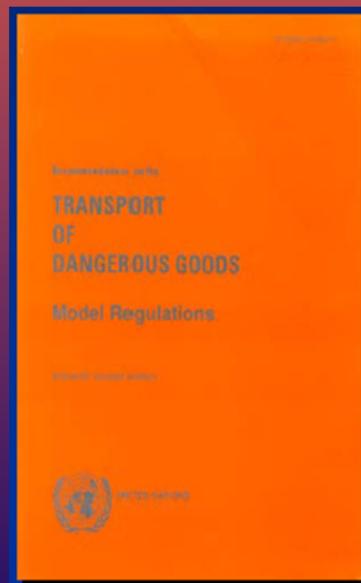
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Dangerous goods classification

Based on UN recommendations “Orange book”
Australian Dangerous Goods Code 6th Edition





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Class 3 Dangerous goods

- Based on flammability
- Flashpoint (<math><60.5^\circ</math> closed cup or <math><65.6^\circ</math> open cup)
- Initial boiling point



Hazard Grouping Based on Flammability

<i>Packing Group</i>	<i>Flash point (closed cup)</i>	<i>Initial boiling point</i>
I	–	$\leq 35^\circ\text{C}$
II	$< 23^\circ\text{C}$	$> 35^\circ\text{C}$
III	$\geq 23^\circ\text{C} - \leq 60.5^\circ\text{C}$	$> 35^\circ\text{C}$



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Class 6.1 Dangerous goods

- Based on toxicity values
 - Oral/Dermal
 - Inhalation
- LD₅₀ and LC₅₀



GROUPING CRITERIA FOR ADMINISTRATION THROUGH ORAL INGESTION, DERMAL CONTACT AND INHALATION OF DUSTS AND MISTS

Packing Group	Oral toxicity LD ₅₀ (mg/kg) ¹	Dermal toxicity LD ₅₀ (mg/kg) ¹	Inhalation toxicity by dusts and mists LC ₅₀ (mg/L)
I	≤ 5	≤ 40	≤ 0.5
II	> 5 - 50	> 40 - 200	> 0.5 - 2
III ²	Solids: > 50 - 200 Liquids: > 50 - 500	> 200 - 1000	> 2 - 10



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Class 8 Dangerous goods

Based on corrosivity

Packing Group II – liquid wastes
substances $< \text{pH } 2$ or $> \text{pH } 12.5$





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Sources of common hazardous wastes



- Printing industry – Class 3
- Panel beaters – Class 3
- Drycleaners – Class 6.1
- Electroplaters – Class 8/Class 6.1
- Motor industry – Class 3



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Packaging for hazardous wastes

- UN performance-tested packaging required
- PG I requires X packaging
- PG II requires Y packaging
- PG III requires Z packaging

Petrol
Class 3, PGII



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Labelling of hazardous waste packages

- Class/Sub-risk labels
- Proper shipping name
- UN Number
- Name and Address of Manufacturer or Australian Agent





Dangerous goods storage

- Placarding
- Separation to buildings and boundaries
- Segregation of incompatible chemicals
- Spill containment or bunding
- Ventilation



Dangerous goods storage

- Exclusion of ignition sources
- Fire protection
- Emergency planning
- Package and tank standards
- Housekeeping
- Correct racking and stacking

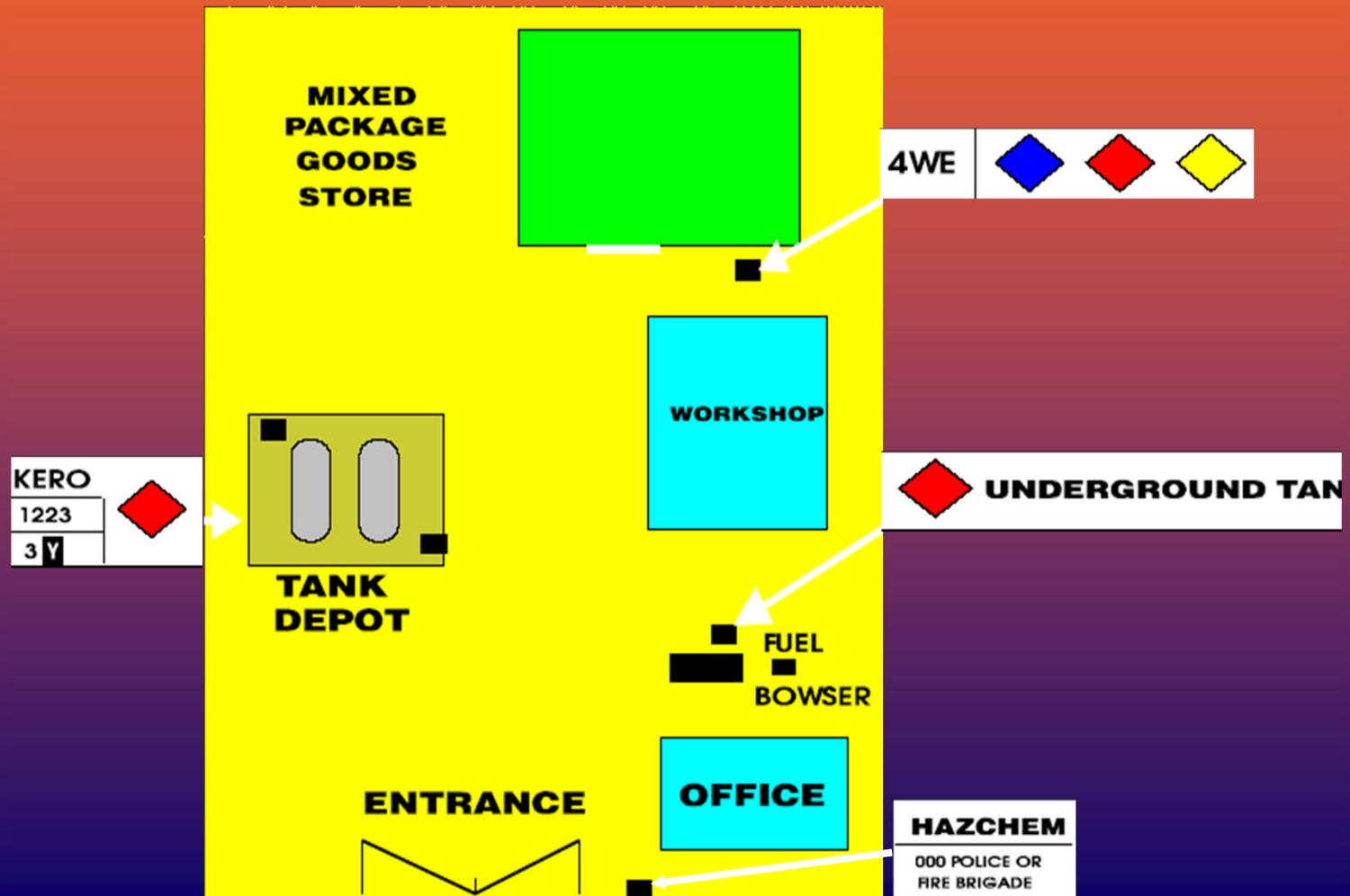


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Location of Placards

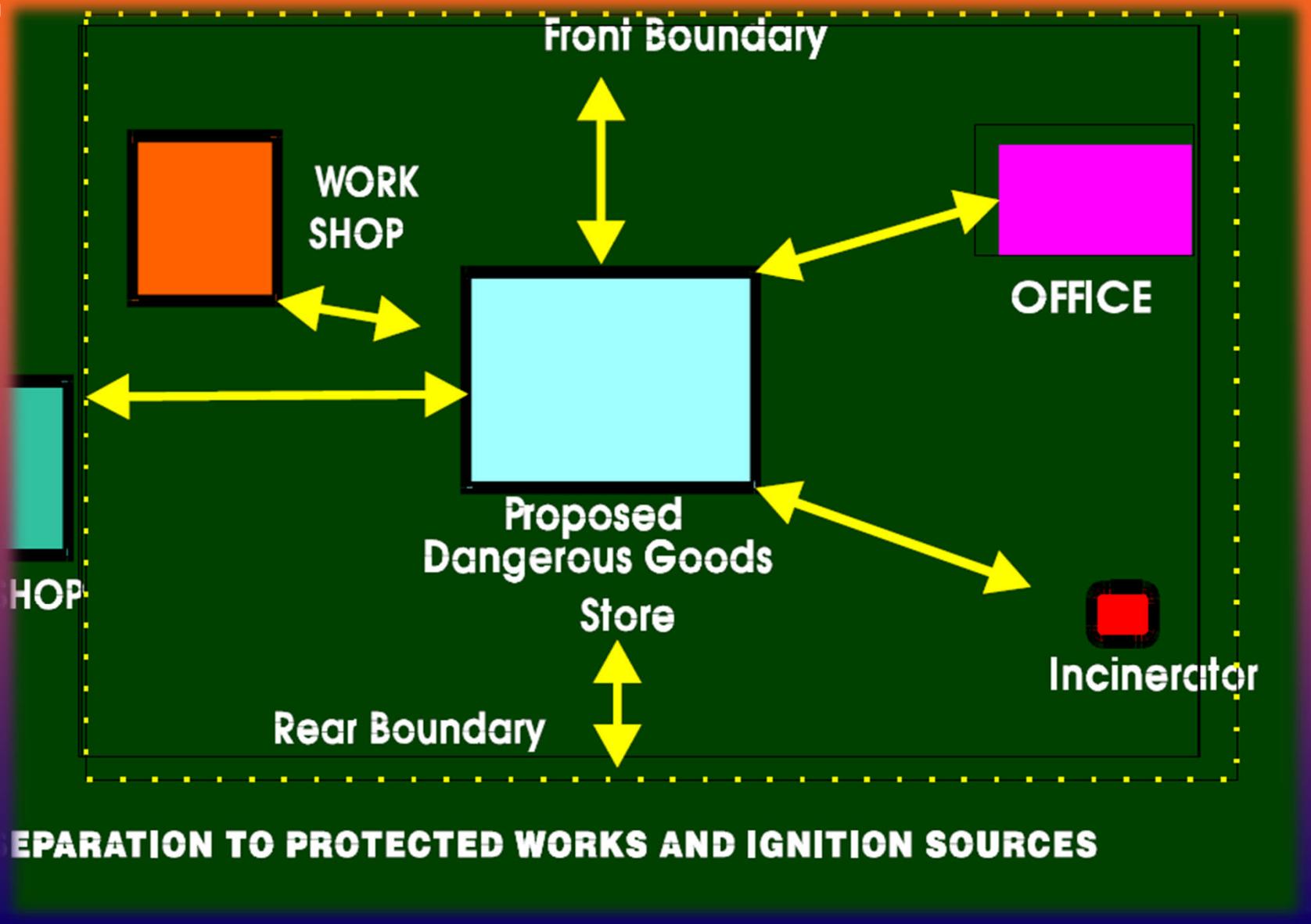




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SEPARATION TO PROTECTED WORKS AND IGNITION SOURCES



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Segregation of Incompatible Chemicals

Pool chlorine



solvents

No

Perchloroethylene





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Segregation of Incompatible Chemicals

eg fuel/oil away from pool chlorine



T= 0 min.



T= 8 min.



T= 9 min.

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Spill Containment (bunding)



110% of the capacity of the largest tank

25% of the volume of the packages stored

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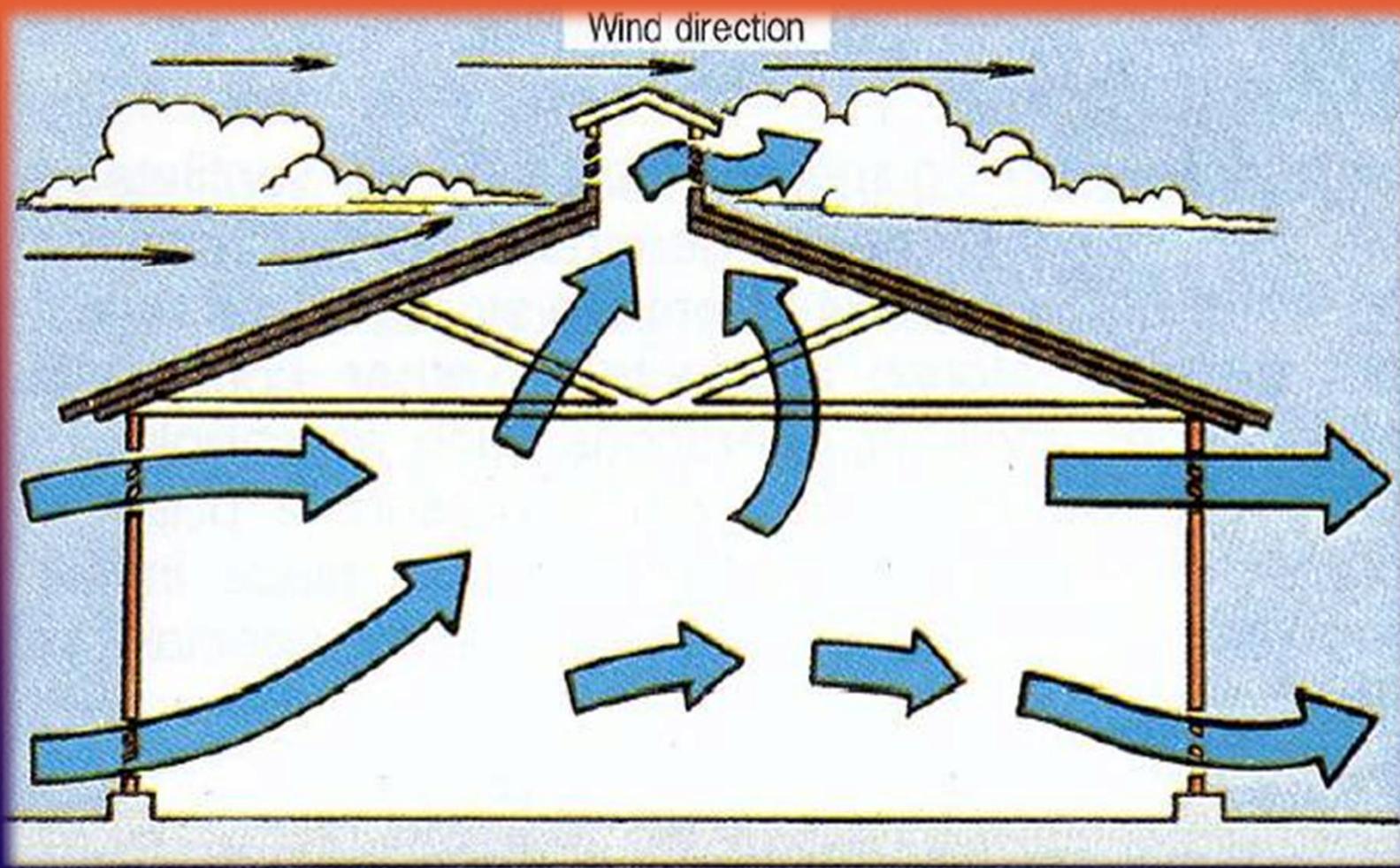


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Ventilation



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Racking & Stacking of drums



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Control of ignition sources



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Fire protection



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Emergency pre-planning

Accidents/incidents do happen and contingency planning is essential



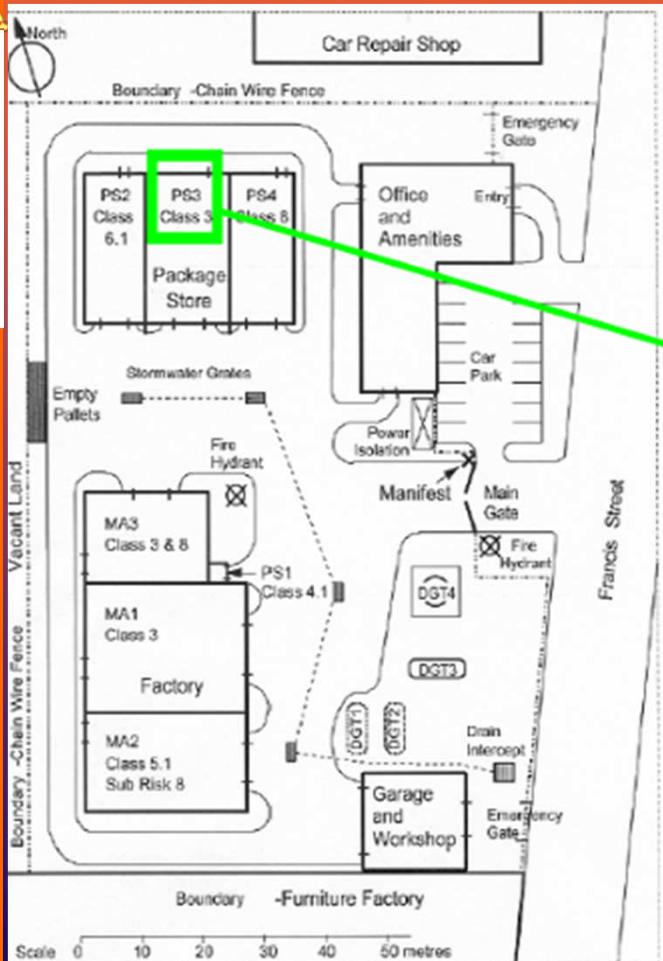


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Emergency service manifest



2. PACKAGE STORAGE AREAS

2.1 Packaged dangerous goods of Packing Group I or Class 2.3

Storage area	Dangerous goods					Quantity	
	Name	Class	Sub Risk	UN No.	PG	Average	Maxim
PS1	Sodium Picramate	4.1		1349	I	20 kg	50

2.2 Other packaged dangerous goods

Storage Area	Class	Sub Risk(s)	Packing Group	Average Quantity	Maximur Quantit
PS2	6.1		III	10,000 kg/L	15,000 kg
PS3	3		II	15,000 L	20,000
	3		III	15,000 L	25,000
	3	8	III	600 L	1,000
	C1			15,000 L	20,000
	C2			4,000 L	8,000
PS4	8		II	8,000 kg/L	12,000 kg

3. MANUFACTURING AREAS

Area	Class	Sub Risk(s)	Packing Group	Max. Quanti
MA1	3		II	2,000
	3		III	10,000
	C2			2,000
MA2	5.1	8	II	1,500
MA3	3		II	200
	3		III	2
	8		II	10
	8		III	2,000

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Good housekeeping



Keep dangerous goods away from combustibles

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Examples of poor DG management



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Transport placarding of DG load



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Transport stowage & restraint



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Transport - shipping document

'El torro transport'

PO Box 9582 Warrigal Grove NSW 2890

Specialist advice phone 1800 987 654

DANGEROUS GOOD SHIPPING DOCUMENT

Consigned to:

Chemical Recycling Pty Limited

2576 South Street Rydalmearly NSW 2754

from:

Heavy Vehicle Servicing & Maintenance

568 Illawarra Highway Mt Hothat NSW 2679

Name	Class	UN No	PG	Pack Size	Number	Quantity
Waste Solvent	3	1993	II	200L	20	4000L

I, ***Driver Name*** have undertaken a JSA of the above goods in my care wit respect to transport, handling and any emergency procedure and incident response required.

Signed: *thedriver* date: *<today>* time: *<tod>* at: *<location>*



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Emergency Information



**Standards Australia
HB-76**
Initial emergency response guide

EMERGENCY PROCEDURE GUIDE—TRANSPORT AS 1678 2.2.002
Fifth edition—March 1999

NAME	UN No	HAZCHEM
CHLORINE	1017	2XE

TOXIC GAS 2
CORROSIVE

Toxic greenish-yellow gas with a sharp odour.
Gas is transported as a liquid under pressure in tankers, drums and cylinders.
Liquid vaporizes rapidly on release and can spread widely.
Gas is heavier than air.

EMERGENCY CONTACTS
POLICE OR FIRE BRIGADE: Dial 000—if ineffective dial 1100 (exchange)
POISONS INFORMATION CENTRE: 13 11 26

Organization	Location	Telephone	Ask for

Includes area code in brackets

HAZARDS

Fire	Non-flammable, but may ignite combustibles. Fire can occur on contact with organic substances. Can react explosively with fuel gas, hydrocarbons, alcohols, ammonia and acetylene.
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**Individual Emergency
Procedure Guide
(EPG)**

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Emergency Information Holder

- Holder location
 - inside door of cab, or
 - conspicuous position adjacent to door
- Holder must be labelled



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Safety equipment on vehicles

For placard loads

- fire extinguishers
- eyewash
- breakdown triangles
- PPE Items
 - faceshield,
 - gloves,
 - torch etc.

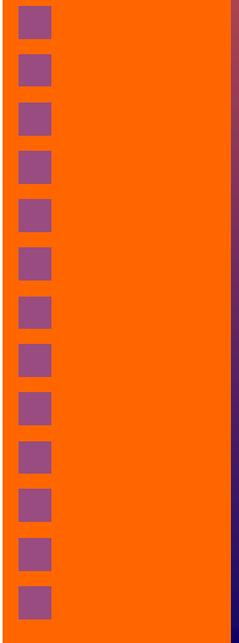




Summary



- **What are DGs**
- **All DGs potentially become wastes**
- **Need to handled correctly for transport and storage**



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Where to

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The greatest failure: the failure to learn



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**Thank you
for
your attention**



Check out the other services that we provide:

Fire Engineering

PO Box 26 Oatley NSW 2223 Australia

Ph. (02)9594-4477

Ian Mob.0414-472-042

Fax .(02)8569-1015

Alex Mob.0414=472-044

www.fireassess.com.au e-mail ndibs@ndibs.com.au

www.ndibs.com.au

www.safeworkmethod.com.au