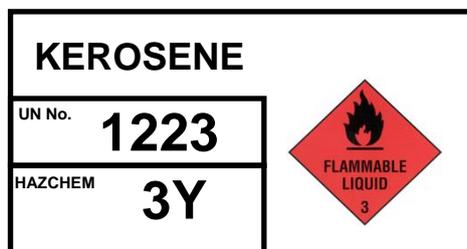


HAZCHEM



COMBUSTIBLE LIQUID



Placarding for storage of hazardous chemicals

under the *Work Health and Safety Act 2011*

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1. Introduction

When emergency services respond to fires and chemical spills at workplaces using, storing and handling hazardous chemicals, the responders need to know the potential hazards. For effective and efficient emergency action, they need information about the type, quantity and locations of the hazardous chemicals stored at the workplace.

Placards are a way to alert emergency services and other people to the presence of hazardous chemicals and provide information about them. They are an important part of an overall safety management strategy for workplaces storing or handling hazardous chemicals.

Workplaces using, storing and handling hazardous chemicals in tanks or in quantities exceeding prescribed quantities are required to be placarded under the Work Health and Safety Regulation 2011 (WHS Regulation).

This guide provides information on:

- how to identify when placarding is needed
- the types of placards required.

Function of placards

- Alert people (workers, contractors, visitors and emergency service personnel) to the presence of hazardous chemicals.
- Identify hazardous chemicals stored in bulk (e.g. tanks).
- Identify areas where significant quantities of hazardous chemicals in packages are stored.
- Identify the hazards of goods present.
- Indicate the required emergency actions for hazardous chemicals in tanks through the use of the HAZCHEM code.

Application of placards

Placards are applicable to storages of Schedule 11 hazardous chemicals under the WHS Regulation. Refer to Part 7.1 Division 1 for further details on the application of the hazardous chemicals provisions.

Placarding requirements under the WHS Regulation are similar to what was required under the former Dangerous Goods Safety Management Regulation 2001 (repealed on 31 December 2011) with differences including:

- GHS¹ categories are now reflected in the placarding and manifest table (Schedule 11) replacing the references to the ADG Code dangerous goods classes, divisions, and packing groups
- prescribed placarding quantity for flammable gases (e.g. LP gas and acetylene in cylinders at a workplace) is reduced from 500 litres to 200 litres
- prescribed placarding quantity for industrial gases (e.g. compressed nitrogen, argon or oxygen in cylinders) is reduced to 1000 litres
- Class 9 dangerous goods are no longer included in Schedule 11 table for placarding.

It should be noted that while the WHS Regulation has introduced the GHS for classification and labelling of hazardous chemicals, the associated GHS pictograms are not referred to for placarding purposes. That is, GHS pictograms are not used for placarding of tanks and storage areas. Class labels from the ADG Code have been retained for the purposes of identifying hazardous chemical storages at workplaces. Appendix 1 shows the ADG Code class labels that will be applicable for the equivalent GHS hazard categories to which the WHS Regulation apply.

¹ GHS refers to the Globally Harmonised System of Classification and Labelling of chemicals. Further Information is available at www.worksafe.qld.gov.au.

2. Definitions

ADG Code means the document known as the Australian Dangerous Goods Code comprising the *Australian Code for the Transport of Dangerous Goods by Road and Rail*, 7th Edition, available at www.ntc.gov.au.

Aerosol means a non-refillable metal aerosol dispenser, pressurised by liquefied, dissolved or compressed propellant gas.

Bulk means any quantity of a hazardous chemical that is:

- in a container with a capacity exceeding 500 litres or net mass of more than 500 kilograms or
- if the hazardous chemical is a solid - an undivided quantity exceeding 500 kilograms.



Figure 1: Static tanks and transportable containers such as isotainers and intermediate bulk containers (IBCs) are examples of bulk containers (i.e. tanks) requiring a tank placard for Schedule 11 hazardous chemicals at a workplace.

Class means the hazard class of the dangerous goods as stated in the ADG Code. A class may include divisions and the following packing groups (PG):

- PG I – great danger
- PG II – medium danger
- PG III – minor danger.

Goods too dangerous to be transported (GTDTBT) means goods listed in Appendix A of the ADG Code as goods too dangerous to be transported. These goods are inherently unstable but it may be possible to transport the goods after mixing them with diluents, stabilisers, inhibitors, desensitisers, phlegmatizers, solvents, wetting agents or adulterants to overcome the instability.

Hazardous chemical means a substance, mixture or article that satisfies the criteria for a hazard class in the GHS as defined in the WHS Regulation. Hazardous chemicals that are subject to the WHS Regulation covers dangerous goods **excluding** explosives (Class 1), radioactive materials (Class 7), infectious substances (Division 6.1) and certain Class 9 miscellaneous dangerous goods.

Packaged hazardous chemicals means Schedule 11 hazardous chemicals in a container with either:

- a capacity not exceeding 500 litres
- a net mass not exceeding 500 kilograms.

The term refers to the complete product consisting of the goods and their packaging for transport.



Figure 2: Gas cylinders, steel drums, and various bottles and small containers are examples of packages.

Subsidiary risk of the dangerous goods means the class or division number of any important risks that have been identified by the classification system and are shown in Table 3.2.3 Column 4 of the ADG Code and the product safety data sheet (SDS).

3. Placarding requirements

The provision of placards is addressed in Regulation 349 and 350 and Schedule 11 and 13 of the WHS Regulation. Placards are required to be made of durable and weather-resistant material and be maintained in good repair and legible condition.

3.1 Types of placards

The types of placards under the WHS Regulation include:

- outer warning placard for the entrance to the workplace
- information placards for hazardous chemicals in bulk (i.e., tanks and stockpiles)
- information placards for hazardous chemicals in packages.

3.1.1 Outer warning placards

An **outer warning placard**, or HAZCHEM sign, is required at the entrance to the workplace when the workplace exceeds a prescribed placarding quantity in the Schedule 11 table. It must conform to the design in Schedule 13 of the WHS Regulation as shown in Figure 3. The word HAZCHEM must be in red lettering, not less than 100 mm high, on a white or silver background.

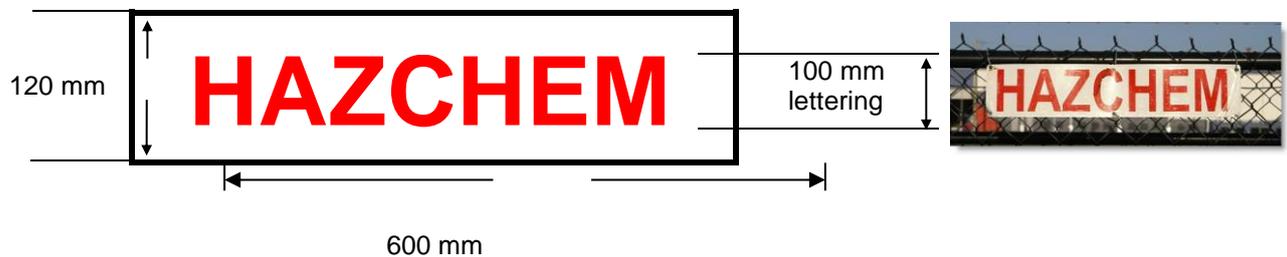


Figure 3: Form and minimum dimensions of an outer warning placard.

Note that this requirement no longer applies to fuel retailers (i.e. service stations). An exemption is provided in Regulation 349 (3).

3.1.2 Information placards for hazardous chemicals in bulk

Bulk containers such as tanks used to contain hazardous chemicals are required to have specific information placards that have the form and dimensions shown in Figure 4.

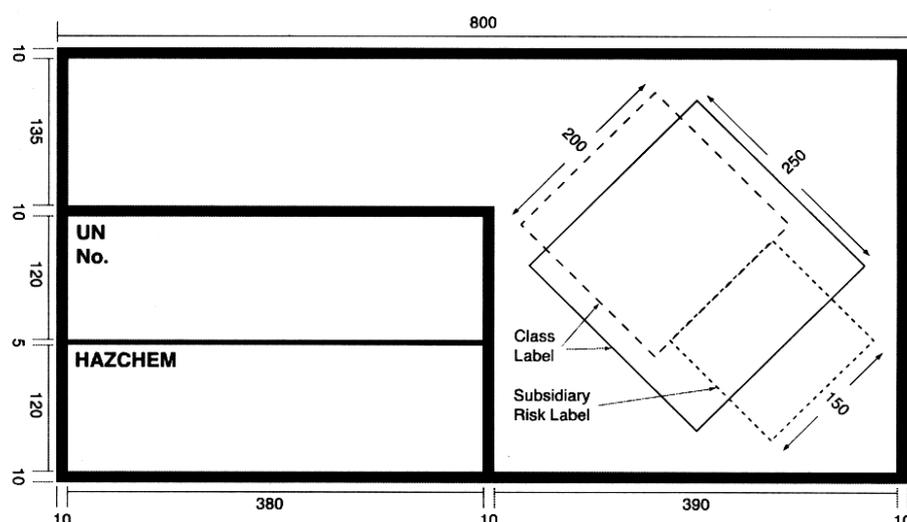


Figure 4: Form and dimensions for a hazardous chemicals tank placard.

Placard information includes:

- the proper shipping name
- UN number
- HAZCHEM code
- ADG Code class label
- Subsidiary risk label (if applicable). For more than one subsidiary risk, the width of the area on the right-hand side for the subsidiary risk label may be extended.

This information is available from the product's SDS and the ADG code.

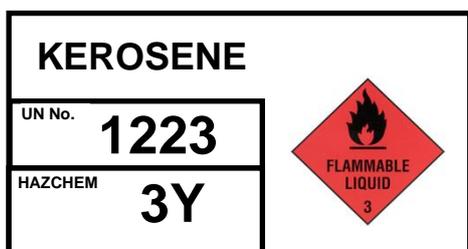


Figure 5: Example of information included on a placard for a bulk container.

Information on the placard must meet the following specifications:

- text must be black on white background
- lettering must be at least 100mm high, unless two lines are used (50mm lettering)
- the class and subsidiary risk label must be in the form and colouring of the ADG Code
- the class label must have sides of not less than 250mm
- where there is a subsidiary risk, the main class label must have sides of not less than 200mm and the subsidiary risk label(s) must have sides of not less than 150mm.

Information placards for tanks containing hazardous chemicals are similar to the full-size emergency information placards (EIP) required by the ADG Code for bulk transport, with the emergency contact detail removed. Tanks must be placarded at all times unless they are confirmed to be free of hazardous chemicals (e.g. no hazardous residues/vapours).

Combustible liquids in tanks

Category 4 flammable liquids are equivalent to C1 combustible liquids having a flash point of $>60^{\circ}\text{C}$ and $\leq 93^{\circ}\text{C}$. An example of a hazardous chemical in this category is diesel fuel.

The information placard for a tank of Category 4 flammable liquid must have the words COMBUSTIBLE LIQUID in lettering not less than 100mm high in black on a white or silver background. Figure 7 below illustrates the form and dimension required.



Figure 6: Combustible liquid placard.



Figure 7: Placard for category 4 flammable liquids.

Goods too dangerous to be transported (GTDTBT) in tanks

Information placards for **GTDTBT in tanks** must be in the form and dimensions as shown previously in Figure 4 with the following adjustments:

- the name of the goods given in Appendix A of the ADG code must be shown in the top left-hand area
- the field reserved for the UN number must be left blank
- the field reserved for the HAZCHEM code must be left blank
- the label displaying the words 'Unstable goods' and 'Too dangerous to transport' shown in Figure 8 must be shown in the field normally reserved for the class label and have sides of not less than 250 mm.



Figure 8: Form of ADG Code Class label for GTDTBT

How to calculate quantity of hazardous chemicals in tanks

- Solids - the quantity is to be calculated by the mass in kilograms that the tank is designed to hold.
- Liquids - the quantity is to be calculated by the design capacity of the tank in litres.
- Gases - the quantity is to be calculated by the total water capacity in litres of the tank.

Exemption for tank placards at service stations

Information placards are not required for underground fuel tanks at fuel retailers (i.e. service stations). An exemption is provided for fuel retailers storing flammable liquids in underground tanks used to refuel vehicles in Section 350 (3) (b) of the WHS Regulation.

This exemption is not applicable to production facilities, works depots or fuel distributors which may have underground tanks for flammable liquids. Underground tanks at these locations must be identified using information placards.

How to calculate quantity of solid hazardous chemicals not in a tank or package

The quantity of solid hazardous chemicals not in tanks or packages such as a stockpile is the undivided mass of the goods in kilograms.

3.1.3 Information placards for hazardous chemicals in packages

Individual storage areas where hazardous chemicals in packages are kept must display an information placard when the prescribed placarding quantities in Schedule 11 table are exceeded. The form and dimension of placards for hazardous chemicals in packages are shown in Figure 9.

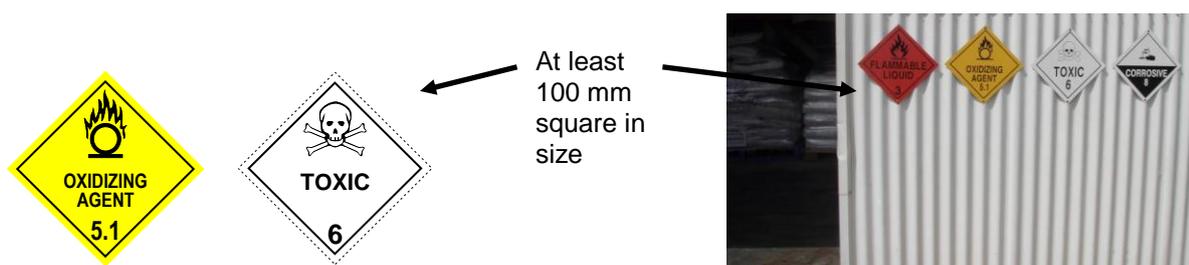


Figure 9: Example placards for a storage location for hazardous chemicals in packages.

The placard must have a white or silver background and be large enough to accommodate the number of class labels required to be displayed on it. The class label (i.e. 'diamond') must have sides not less than 100mm.

The class labels required by the WHS Regulation should be grouped together. They need not be placed in the one horizontal line on a shared sign as illustrated in Schedule 13 of the Regulation, provided they are clearly visible against a contrasting background. Vertical or diagonal grouping is equally acceptable.

Note: The information placard for a package store does not require the HAZCHEM code.

Combustible liquids in packages

Placards for Category 4 flammable liquids (i.e. C1 combustible liquids having a flash point $>60^{\circ}\text{C}$ to $\leq 93^{\circ}\text{C}$) must have the words COMBUSTIBLE LIQUID in lettering not less than 100 mm high in black on a white or silver background. **Figure 10** below illustrates the form and dimension required.



Figure 10: Combustible liquid placard.

Schedule 13 clause 6 (3) (b) requires a Class 3 label to be displayed when packages containing combustibile liquids are stored with packages containing flammable liquids. A combustibile liquid placard will not be applicable in this case.

GTDTBT in packages

Where GTDTBT are stored in packages exceeding the prescribed placarding quantity, the label shown in Figure 4 will be required along with any other applicable class labels. The label must have sides not less than 100mm.

Placards for IBCs stored in a package store

When a Schedule 11 hazardous chemical is contained in an IBC intended for transport and not intended for use at the workplace, the IBC must display a tank placard and the storage area must be placarded as required for a package store as per Schedule 13 (6), i.e. the appropriate ADG Code class label (i.e. 'coloured diamond').



Figure 11: IBC storage.

3.2 Location of placards

Requirements for locations of placards are specified in clause 1 of Schedule 13. An outer warning placard must be displayed on every entrance to a workplace so that it is clearly visible from normal approaches.

Information placards must be located within the workplace at the relevant storage location so that they are clearly visible from normal approaches. For hazardous chemicals stored in an indoor area, the information placards must be located:

- at the main point of entry to the building where the goods are stored
- at the entry to each room or area where the goods are stored.

For hazardous chemicals stored in an outdoor area, the placard must be located either adjacent to them, or when storage is a tank, on the external surface of the tank or adjacent to the tank.

The warning placard must be positioned separately from any other sign or notice so that the placard is not capable of being confused with the other sign or notice. Placards must be kept legible and unobstructed.



Figure 12: Placard adjacent to tank.

For storage and handling areas where there is regular variation in the types of hazardous chemicals (e.g. in transit storage locations and transport storage areas), it may be more convenient to use frames for slip-in/slip-out labels that are commonly used on vehicles for the transport of dangerous goods. In locations where the public may have access to the placards, labels that attach more permanently will be required.

3.3 When are placards required and which type for package stores?

To identify the placarding for a package store, the quantity of hazardous chemicals for each GHS category at the workplace must be determined and compared with the prescribed placarding quantity in column 3 of the Schedule 11 table. For the purposes of this calculation, all hazardous chemical packages should be assumed to be full, even if they are not.

How to calculate quantity of hazardous chemicals in packages

- For solids, the quantity is to be calculated by the net mass in kilograms of the goods in the package.
- For liquid goods, the quantity is to be calculated by the net capacity in litres of the package.
- For gases, the quantity of gas in a package (e.g. cylinder) is based on the water capacity (WC), which refers to the number of litres of water that would be required to fill the cylinder. However, the labelling usually indicates the mass of gas they are intended to hold. To determine the volume of a gas cylinder, look for the stamp on the cylinder neck or foot ring, usually accompanied by a 'WC' mark. An example is shown in Figure 13. Confirmation of the water capacity of a gas cylinder may also be obtained from the supplier. Aggregate quantities for each GHS category for gases will need to be determined for comparison with the prescribed quantities. Placards required for gases are shown in the table in Appendix 1.



Figure 13. Gas cylinder and a close-up view showing WC value.

How to calculate quantity of articles or things

The quantity of hazardous chemicals that are part of an article or thing is the net quantity of that part of the article or thing that is hazardous chemicals (e.g. number of litres of acid in a wet-acid battery).

4. Examples for placarding determination

GHS hazard categories provided in these examples are indicative for illustrative purposes only. When determining the GHS hazard categories for the products always check the manufacturer's product SDS as they may vary depending on the formulations.

Example 1

A pool shop stores the following Schedule 11 hazardous chemicals in packages:

Proper shipping name	ADG code class	GHS hazard category	Quantity (kg or L)	Placard quantity	Exceeded?
Sodium dichloroisocyanurate	5.1	Oxidising solid Category 2	300	250	Y
Trichloroisocyanuric acid	5.1	Oxidising solid Category 2	200	250	N
Calcium hypochlorite	5.1	Oxidising solid Category 2	300	250	Y
Hydrochloric acid	8	Skin corrosion Category 1B	200	250	Y for combination of Cat 1B and 1C (1000)
Hypochlorite solution	8	Skin corrosion Category 1C	900	1000	

1. Outer warning placard.



2. Information placard for hazardous chemicals stored in packages displaying ADG code class labels for Class 5.1 and 8 at the storage area.



Example 2

A company which supplies chemicals for dry cleaning and laundry facilities stores the following hazardous chemicals in packages in a suitably segregated and separated arrangement as well as a combustible liquid in a tank:

Proper shipping name	ADG code class	GHS hazard category	Quantity (kg or L)	Placard quantity	Exceeded?
Freon (gas under pressure)	2.2	Gases not stated elsewhere	1200	1000	Y
White spirit (in cabinet)	3	Flammable liquid Category 2	200	1000	N
Hydrogen peroxide	5.1	Oxidising liquid Category 2	500	250	Y
Perchloroethylene	6.1	Acute toxicity Category 3	1200	1000	Y
Hydrochloric acid	8	Skin corrosion 1B	100	250	Y for a combination of Cat 1B and 1C (>1000 L)
Sodium hydroxide	8	Skin corrosion 1B	100	250	
Sodium hypochlorite	8	Skin corrosion 1C	800	1000	
Phosphoric acid	8	Skin corrosion 1C	100	1000	
Diesel fuel	Combustible liquid in a tank	Flammable liquid Category 4	12,000	10,000	Y

Thus, the following placards are required:

1. Outer warning placard.



2. Information placards for a combustible liquid in bulk (tank).



3. Information placards for various hazardous chemicals stored in packages displaying the relevant ADG Code class labels.



Example 3

The following tanks are located at a fuel retailing premises used for refuelling vehicles (i.e. service station):

Tank ID	Product name	UN No.	ADG code class	GHS hazard category	Type*	Capacity (L)
DG T1	LP gas	1075	2.1	Flammable gas Category 1	a/g	3,000
DG T2	Petrol	1203	3	Flammable liquid Category 2	u/g	30,000
DG T3	Diesel	Combustible liquid		Flammable liquid Category 4	a/g	20,000

* u/g - underground, a/g - aboveground

The workplace exceeds placarding thresholds so an outer warning placard would normally be required however an exemption now applies for service stations (fuel retailers only) so that the outer warning placard is no longer required.

An information placard is required for the Diesel tank as it is in an aboveground bulk container. An information placard is also required for the LP Gas aboveground tank. As the petrol tank is used for storage in an underground tank at retail premises for refuelling purposes, an information placard is not required as per WHS Regulation 350(3)(b).

In this example, the outer warning placard is no longer required at a fuel retailer.

Thus, the following information placards are required for:

1. Aboveground LPG tank.



2. Aboveground combustible liquid tank.



5. Further information

Consultants and industry associations

Workplace Health and Safety Queensland maintain a voluntary list of consultants specialising in hazardous chemical safety management as a contact service. Refer to 'industry consultants for hazardous chemicals' at www.worksafe.qld.gov.au.

The Australasian Institute of Dangerous Goods Consultants provides a contact list at www.aidgc.org.au.

Manufacturers, suppliers and local distributors may be able to provide technical assistance regarding their products, including the provision of SDS for product hazard classification information.

Workplace Health and Safety Queensland

For further information on the *Work Health and Safety Act 2011* and *Work Health and Safety Regulation 2011*, visit www.worksafe.qld.gov.au or call 1300 362 128.

Enquiries relating to this guide may be directed to the hazardous chemicals team at hicb@oir.qld.gov.au .

Appendix 1 — Schedule 11 of the WHS Regulation

Placard quantities and type for package stores

Column 1	Column 2	Column 3	Column 4	Placard to display
Item	Description of hazardous chemical		Placard quantity	
1	Flammable gases	Category 1	200	
2	Gases under pressure	With acute toxicity categories 1,2,3 or 4 Note—Category 4 only up to LC50 of 5000 ppmV	50	
3		With skin corrosion categories 1A, 1B, 1C	50	
4		Aerosols	5000	 If any 2.1 present, else 2.2 (green class label) shown below
5		Not stated elsewhere in this table	1000	
6	Flammable liquids	Category 1	50	
7		Category 2	250	
8		Category 3	1000	
9		Any combination of chemicals from items 6 to 8 where none of the items exceeds the quantities in column 4 on their own		
10		Category 4	10 000	
11	Self-reactives substances	Type A	5 kg or L	
12		Type B	50 kg or L	
13		Type C to F	250 kg or L	
14	Flammable solids	Category 1	250 kg or L	
15		Category 2	1000 kg or L	
16		Any combination of chemicals from items 12 to 15 where none of the items exceeds the quantities in column 4 on their own	1000 kg or L	
17	Pyrophoric liquids and solids	Category 1	50 kg or L	
18	Self-heating substances and mixtures	Category 1	250 kg or L	
19		Category 2	1000 kg or L	
20		Any combination of chemicals from items 17 to 19 where none of the items exceeds the quantities in column 4 on their own	1000 kg or L	
21	Substances which in contact with water emit flammable gas	Category 1	50 kg or L	
22		Category 2	250 kg or L	
23		Category 3	1000 kg or L	
24		Any combination of chemicals from items 21 to 23 where	1000 kg or L	

Column 1	Column 2	Column 3	Column 4	Placard to display
Item	Description of hazardous chemical		Placard quantity	
		none of the items exceeds the quantities in column 4 on their own		
25	Oxidising liquids and solids	Category 1	50 kg or L	
26		Category 2	250 kg or L	
27		Category 3	1000 kg or L	
28		Any combination of chemicals from items 25 to 27 where none of the items exceeds the quantities in column 4 on their own	1000 kg or L	
29	Organic peroxides	Type A	5 kg or L	
30		Type B	50 kg or L	
31		Type C to F	250 kg or L	
32		Any combination of chemicals from items 30 to 31 where none of the items exceeds the quantities in column 4 on their own	250 kg or L	
33	Acute toxicity	Category 1	50 kg or L	
34		Category 2	250 kg or L	
35		Category 3	1000 kg or L	
36		Any combination of chemicals from items 33 to 35 where none of the items exceeds the quantities in column 4 on their own	1000 kg or L	
37	Skin corrosion	Category 1A	50 kg or L	
38		Category 1B	250 kg or L	
39		Category 1C	1000 kg or L	
40		Corrosive to metals	Category 1	
41		Any combination of chemicals from items 37 to 40 where none of the items exceeds the quantities in column 4 on their own	1000 kg or L	

Determination of classification of flammable liquids

For this table, if a flammable liquid category 4 is used, handled or stored in the same spill compound as one or more flammable liquids of categories 1, 2 or 3, the total quantity of flammable liquids categories 1, 2 or 3 must be determined as if the flammable liquid category 4 had the same classification as the flammable liquid in the spill compound with the lowest flash point.

For example, for placarding, a spill compound containing 1,000L of flammable liquid category 2 (e.g. petrol) and 1,000L of flammable liquid category 4 (e.g. diesel) is considered to contain 2,000L of flammable liquid category 2.