

# GHS Fact sheet

## HS681: An introduction to the Globally Harmonised System of Classification and Labelling of Chemicals

Never Stand Still

To address inconsistencies in the way chemicals are classified by various regulatory bodies in different countries, the United Nations has developed a new system for categorising chemicals on the basis of their inherent hazards and for ensuring consistent labelling of such chemicals worldwide. This system is called the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*.

To enable compliance in Australia, the GHS system was incorporated into Chapter 7 of the [Work Health and Safety Regulation 2011](#)

### 1. What will this mean for UNSW? (and see point 14 'What do I need to do now?')

The main impact will be on manufacturers' and suppliers' who are required to label chemicals in accordance with the criteria set out in GHS publication (the [Purple Book](#)) and to ensure their Safety Data Sheets conform to the GHS system. There is a five year implementation plan for the GHS system to be fully implemented in Australia (i.e. from 1st January 2012 until 31 December 2016). Over the next few years we can expect labelling on chemical containers to look different and new terms to be introduced.

### 2. What are the main changes?

The GHS system is holistic in terms of defining chemical hazards; hazards are classified in terms of their Physical, Health and Environmental hazards. There are 16 Physical Hazard Classes which are very similar to the current Dangerous Goods classification. Each of these hazard classes are further sub-divided into hazard categories based on their risk (similar concept to packing groups). Some of the physical hazard classes have only got one hazard category (e.g. gases) but others (e.g. flammable liquids) can have up to 4 hazard categories. This table shows the Hazard Classes and Hazard Categories within the PHYSICAL hazards group:

GHS PHYSICAL Hazard Classes	Corresponding Hazard Categories						
	Unstable explosive	Div 1.1	Div 1.2	Div 1.3	Div 1.4	Div 1.5	Div 1.6
1. Explosives	Unstable explosive						
2. Flammable Gases	1						
3. Flammable Aerosols	1	2					
4. Oxidising Gases	1						
5. Gases Under Pressure							
i. Compressed Gas	1						
ii. Liquefied Gas	1						
iii. Dissolved Gas	1						
iv. Refrigerated Liquefied Gas	1						
6. Flammable Liquids	1	2	3	4			
7. Flammable Solids	1	2					
8. Self reactive Substances	Type A	Type B	Type C	Type D	Type E	Type F	Type G
9. Pyrophoric Liquids	1						
10. Pyrophoric Solids	1						
11. Self-heating Substances	1	2					
12. Water reactive chemicals that could emit flammable gas	1	2	3				
13. Oxidising Liquids	1	2	3				
14. Oxidising Solids	1	2	3				
15. Organic Peroxides	Type A	Type B	Type C	Type D	Type E	Type F	Type G
16. Corrosive to Metals	1						



As with the packing group system in place for dangerous goods a Hazard Category 1 chemical has a higher risk than a Hazard Category 3 chemical. The corresponding hazard statement (see section 3 below) provides a description to distinguish between the hazard categories. There are 10 Health hazard classes and each are further subdivided into hazard categories based on risk.

Below are the Hazard Classes and Hazard Categories within the HEALTH Hazards group:

GHS <u>HEALTH</u> Hazard Classes	Corresponding Hazard Categories			
1. Acute Toxicity: Oral, Dermal, Inhalation	1	2	3	4
2. Skin Corrosion / Irritation	1A	1B	1C	2
3. Serious Eye Damage / Irritation	1	2A		
4. Sensitisation – Respiratory / Skin	1	1A	1B	
5. Germ Cell Mutagenicity	1A	1B	2	
6. Carcinogenicity	1A	1B	2	
7. Toxic to Reproduction	1A	1B	2	
8. Specific Target Organ Toxicity (single)	1	2	3	
9. Specific Target Organ Toxicity (repeated)	1	2		
10. Aspiration Hazard	1			







Highest Risk






Lowest Risk

There are 2 environmental hazard classes but their use is not mandatory in Australia.

- Hazard Statements** will replace the term 'Risk Phrases'. The concept is the same i.e. a short, concise phrase to explain the main hazard. A Hazard category 1 Flammable liquid will have 'Extremely flammable liquid and vapour' as its hazard statement whereas the hazard statement for a hazard category 3 flammable liquid will be 'flammable liquid and vapour'.
- Precautionary Statements** will replace Safety Phrases – again same concept but precautionary statements are much more comprehensive in that they are further divided into preventative, response, storage and disposal categories.
- Pictograms** replace dangerous goods class diamonds (except for transport purposes e.g. tankers and outer packing of bulk supplies and for storage of placard quantities of dangerous goods). There are 9 pictograms used in the GHS system; each having a standard look in that the image is in black on a white background contained within a red diamond. The following table shows the 9 GHS pictograms and the hazard classes with which they are associated:

		
Unstable Explosive Division 1.1 to 1.4 Explosive Self- reactive substances -Type A and B Organic Peroxides - Type A and B	Compressed gas Liquefied gas Dissolved gas Refrigerated Liquefied gas	Flammable Solids, Liquids, Gases Flammable Aerosols Pyrophoric Solids and Liquids Self- reactive substances – Type C to F Organic Peroxides - Type C to F Self heating substances Water reactive substances
		
Oxidising Solids, Oxidising Liquids Oxidising Gases	Acute Toxicity – Oral – Cat 1-3 Acute Toxicity Dermal – Cat 1-3 Acute Toxicity :Inhalation – Cat 1-3	Corrosive to Metals Skin Corrosion / Irritation Cat. 1A to 1C Serious Eye Damage / Irritation Cat. 1


		
Respirator Sensitiser Cat. 1, 1A, 1B Germ Cell Mutagenicity Carcinogen Reproductive Toxin Specific Target Organ Toxicity - ...Single exposure - Cat. 1, 2 Specific Target Organ Toxicity – ...Repeated exposure -	Acute Toxicity Cat. 4 Skin Corrosion / Irritant Cat. 2 Serious Eye Damage / Irritant Cat. 2A Specific Target Organ Toxicity Cat. 3 Skin Sensitiser Cat. 1, 1A, 1B	Toxic to the Aquatic Environment May harm the Ozone Layer  <i>Not mandatory to be used in Australia</i>

See the [GHS Hazard table](#) on the HS website which provides a summary of each of the 28 Hazard Classes as well as showing the comparison between the pictograms under the GHS system and the Dangerous Goods Class system. This has been reproduced from information available in Appendix G of the Code of Practice for [Labelling of Workplace Hazardous Chemicals](#).

## 6. Are there any new Pictograms?

The Pictogram used to indicate Long Term Health Effects is new.

The below table summarises all possible hazard classes, categories and hazard statements which will accompany this pictogram.

Pictogram	Hazard Class	Hazard Category	Corresponding Hazard Statements
	Respiratory Sensitiser	1, 1A, 1B	May cause allergy /asthma symptoms or breathing difficulties if inhaled
	Germ Cell Mutagenicity	1A, 1B	May cause genetic defects
		2	Suspected of causing genetic defects
	Carcinogenicity	1A, 1B	May cause cancer
		2	Suspected of causing cancer
	Toxic to Reproduction	1A, 1B	May damage fertility or the unborn child
		2	Suspected of damaging fertility or the unborn child
	Specific Target Organ Toxicity (Single Exposure)	1	Causes damage to organs (state particular organ or all organs affected)
2		May cause damage to organs	
Specific Target Organ Toxicity (Repeated Exposure)	1	Causes damage to organs through prolonged or repeated exposure	
	2	May cause damage to organs through prolonged or repeated exposure	
Aspiration Hazard	1	May be Fatal if swallowed and enters airways	

## 7. Safety Data Sheets

Material Safety Data Sheets (MSDS) are now referred to as Safety Data Sheets (SDS). Information required is similar but more standardised. Schedule 7 of the WHS Regulation outlines the content required for a legally compliant SDS to ensure standardisation and consistency of hazard communication across the globe.

## 8. Do labels on existing stocks of chemicals have to be changed?

Not yet. The transition period for full compliance also applies to UNSW so we have until 1 January 2017 to comply. However any opportunity to update to the new system should be taken such as during laboratory clear outs, annual stock takes, refurbishment or relocation scenarios etc.

## 9. What label is required for a substance made up in the laboratory today?

Since there is a 5 year transition period for full implementation of the GHS system the label for a substance made up in the laboratory today can comply with either:

- [NOHSC National Code of Practice for the Labelling of Workplace Substances](#) [NOHSC:2012 (1994)] - the existing system OR
- Safe Work Australia [Code of Practice 'Labelling of Workplace Hazardous Chemicals](#) Dec 2011 – the GHS system

Under the GHS system reduced labelling requirements apply in certain situations such as for:

- Small containers
- Research chemicals or samples for analysis
- Decanted or transferred chemicals
- Hazardous chemicals with known hazards NOT supplied to another workplace.
- Hazardous waste products

Many people may find that labelling in accordance with the GHS system is easier and may wish to comply with the GHS system straightaway.

See the UNSW HS429 Labelling of Hazardous Chemicals guideline.

## 10. Will the template for a Chemical register change under the GHS system?

One of the key purposes of the chemical register is to enable summary data to be obtained for those chemicals possessing physical hazards which can cause immediate emergencies. Such physical hazards include: Flammable, Oxidiser, Acute Toxicity and Explosive hazards. We need to be able to summarise the data for the emergency services who may need to respond to an emergency. It is important that we can supply such summary data in the format that is useful for the emergency services. Since they require the information to be presented using the GHS hazard classes and categories, the template for the chemical register will change accordingly. However existing templates are still valid and both the existing and a new replacement template will be available on the HS website for at least the next 12months.

## 11. Will the [HSIS](#) database still be relevant?

The Hazardous Substances Information System (HSIS) is a resource produced by Safe Work Australia which enables 'at a glance' information on a chemical to be obtained such as CAS number, UN Number, hazard classification (e.g. corrosive or toxic), information for labelling (including risk phrases), concentration cutoffs (i.e. the concentration below which the chemical has a reduced hazard category or is no longer considered hazardous) as well as exposure standards.

Safe Work Australia has indicated that HSIS will remain as a resource as its main aim is to provide Exposure Standards data. The concentration cut offs are based on the previously used hazard categories and risk phrases which are not directly comparable to the GHS system. However it is still useful in determining an approximate reduction in the hazard based on dilution. Safe Work Australia has directed us to the information and similar databases on the [European Commission](#) websites.

## 12. Where can I get downloadable images of the new GHS pictograms?

GHS pictograms are available for download from the following [United Nations GHS](#) website.

## 13. Can I still use Dangerous Goods class diamonds?

The DG diamonds used to represent the 9 classes of dangerous goods will remain in use for dangerous goods transport purposes. Additionally they will be used for dangerous goods storage locations wherever dangerous goods are stored at 'placard' quantities. Such quantities are outlined in Schedule

11 of the WHS Regulation 2011 and also in UNSW's HS333 Dangerous Goods Placarding, Manifests, Notification and Emergencies Procedure.

It is also still possible to use the DG label on a label for a chemical if the DG label provides more specific information. For example:

This is the **GHS pictogram** for a flammable solid.  
This label does not distinguish it from a flammable liquid.



On the other hand this is the **DG class diamond** for a flammable solid. It is clearly distinguishable from a flammable liquid.



This symbol can be used on the label provided the GHS pictogram is not used as well i.e. only one symbol should be used to indicate the particular hazard class.

If the substance happened to possess acute toxic properties or be corrosive or, for illustration purposes, possess all properties then the following pictograms could be used on the label:



#### 14. What do I need to do now?

- Communicate the new GHS by displaying posters in your laboratory. Contact any of your large chemical suppliers and request a GHS poster. You can also download one from the [Safe Work Australia](#) website.
- Use GHS pictograms on the Safety Hazards door poster which will replicate those found on the labels for the chemical containers. This will help people become more familiar with the GHS system.
- You could use GHS labels when making your own labels from ChemAlert.
- Dangerous Goods Labels will still apply to bulk dangerous goods storage areas e.g. Flammable Liquid Cabinets and cryogen tanks. These should not be replaced with GHS labels. Such dangerous goods labels are still required under Schedule 13 of the [Work Health and Safety Regulation](#).
- For small quantities being stored in cupboards either a GHS label or a DG diamond can be used. However as with the point being made in s13 above, if the DG class diamond provides more specific information then it is preferable that this be used instead (e.g. for 'organic peroxides', 'dangerous when wet', 'spontaneously combustible' chemicals).
- You may wish to have a supply of GHS adhesive labels available in your work areas. These can be purchased from [Brady](#) or downloaded from the [United Nations GHS](#) website.
- If you wish to label your chemicals straightaway according to the reduced labelling requirements that apply for certain laboratory situations use the HS429 Labelling of Hazardous Chemicals guideline.
- All of the above actions can be implemented progressively between now and December 2016. Full compliance is required on 1 January 2017.

#### 15. Refer also to the following UNSW guidance material:

- The GHS Hazard Classes
- HS332: Hazardous Chemicals Procedure
- HS429 Guidelines for chemical labelling
- Schedule 11 Hazardous Chemicals Placard and Manifest Quantities
- HS333 Dangerous Goods Placarding, Manifests, Notification and Emergencies Procedure