







The Globally Harmonized System for the Classification and Labelling of Chemicals
(The GHS)
Implementation of the GHS in Canada

Workplace Hazardous Materials Information System (WHMIS)

TABLE 2 Comparison of Hazard Communication: WHMIS and the GHS [Health and Environment]







Acute Toxicity: Oral

CPR	Acute Oral Toxicity D1A, Very Toxic Material Acute Lethality 		Acute Oral Toxicity D1B, Very Toxic Material Acute Lethality 		No criteria	
GHS	Category 1  Danger Fatal if swallowed	Category 2  Danger Fatal if swallowed	Category 3  Danger Toxic if swallowed	Category 4  Warning Harmful if swallowed		Category 5 No symbol Warning May be harmful if swallowed
LD₅₀ (mg/kg body weight)	0	5	50	300	500	2000 5000

Analysis:

Under the *CPR* health hazard classification for acute oral toxicity is divided into 2 categories; D1A, materials causing immediate and serious toxic effects, LD₅₀ from 0 to 50 and D1B, materials causing slightly less immediate and serious toxic effects, LD₅₀ from 50 to 300. Under the GHS, the health hazard is broken down into 5 categories. There is finer definition under the GHS and it ensures that materials not currently covered by the *CPR* are covered by the GHS. Changes will be required to the *CPR* to encompass this expansion from an LD₅₀ of 500 to 5000. There will also be changes required to the symbols.






Acute Toxicity: Skin

<p>CPR</p>	<p>Acute Skin Toxicity D1A, Very Toxic Material Acute Lethality</p> 		<p>Acute Skin Toxicity D1B, Very Toxic Material Acute Lethality</p> 	<p>No Criteria</p>	
<p>GHS</p>	<p>Category 1</p>  <p>Danger</p> <p>Fatal in contact with skin</p>	<p>Category 2</p>  <p>Danger</p> <p>Fatal in contact with skin</p>	<p>Category 3</p>  <p>Danger</p> <p>Toxic in contact with skin</p>	<p>Category 4</p>  <p>Warning</p> <p>Harmful in contact with skin</p>	<p>Category 5</p> <p>No symbol Warning</p> <p>May be harmful in contact with skin</p>
<p>LD₅₀ 0 50 200 1000 2000 5000 (mg/kg body weight)</p>					

Analysis:

Under the *CPR* health hazard classification for acute Skin toxicity is divided into 2 categories; D1A, materials causing immediate and serious toxic effects, LD₅₀ from 0 to 200 and D1B, materials causing slightly less immediate and serious toxic effects, LD₅₀ from 200 to 1000. Under the GHS, the health hazard is broken down into 5 categories. Category 1 and 2 match that of D1A and category 3 matches D1B. Changes will be required to the *CPR* to encompass this expansion from an LD₅₀ of 1000 to 5000. There will also be changes required to the symbols







Acute Toxicity: Inhalation - Gases

<p>CPR</p>	<p>Acute Inhalation (Gases) Toxicity D1A, Very Toxic Material Acute Lethality Materials causing immediate and serious toxic effects</p> 			<p>No criteria</p>		
<p>GHS</p>	<p>Category 1</p>  <p>Danger Fatal if inhaled</p>	<p>Category 2</p>  <p>Danger Fatal if inhaled</p>	<p>Category 3</p>  <p>Danger Toxic if inhaled</p>	<p>Category 4</p>  <p>Warning Harmful if inhaled</p>	<p>Category 5</p> <p>No symbol Warning May be harmful if inhaled</p>	
<p>LC₅₀ (ppmV)</p>	<p>0</p>	<p>100</p>	<p>500</p>	<p>2500</p>	<p>5000</p>	<p>12,500</p>

Analysis:

Under the *CPR* health hazard classification for acute inhalation (gases) toxicity is not divided. D1A, materials causing immediate and serious toxic effects, LC₅₀ from 0 to 2500. Under the GHS, the health hazard is broken down into 5 categories. Category 1, 2 and 3 match that of D1A under the *CPR*. Under the GHS there are also two other categories from LC50 2000 to 5000 and 5000 to 12,500. Changes will be required to the *CPR* to encompass this expansion of the criteria. There will also be changes required to the symbols.

Acute Toxicity: Inhalation - Vapours







<p>CPR</p>	<p>Acute Inhalation (Vapours) Toxicity D1A, Very Toxic Material Acute Lethality</p> 		<p>Acute Inhalation (Vapours) Toxicity D1B, Very Toxic Material Acute Lethality</p> 	<p>No criteria</p>		
<p>GHS</p>	<p>Category 1</p>  <p>Danger</p> <p>Fatal if inhaled</p>	<p>Category 2</p>  <p>Danger</p> <p>Fatal if inhaled</p>	<p>Category 3</p>  <p>Danger</p> <p>Toxic if inhaled</p>		<p>Category 4</p>  <p>Warning</p> <p>Harmful if inhaled</p>	<p>Category 5</p> <p>No symbol</p> <p>Warning</p> <p>May be harmful if inhaled</p>

LC₅₀
(ppmV) 0 100 500 1500 2500 5000 12,500

Analysis:

Under the *CPR*, this category for classification of health hazards, is divided into 2 categories; D1A, materials causing immediate and serious toxic effects, LC₅₀ from 0 to 1500 and D1B, materials causing slightly less immediate and serious toxic effects, LD₅₀ from 1500 to 2500. Under the GHS acute toxicity (inhalation vapours) is divided into 5 categories. In fact, the *CPR* stops at an LC₅₀ of 2500 and the GHS has category 4 from 2500 to 5000 and from 5000 to 12,500. This will require changes to the *CPR* to encompass the new categories under the GHS and changes will be required because of the symbols.


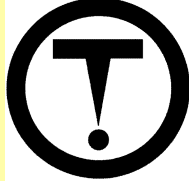





Acute Toxicity: Inhalation - Dusts & Mists

<p>CPR</p>	<p>Acute Inhalation (Vapours) Toxicity D1A, Very Toxic Material Acute Lethality</p> 		<p>Acute Inhalation (Dusts & Mists) Toxicity D1B, Very Toxic Material Acute Lethality</p> 		<p>No criteria</p>		
<p>GHS</p>	<p>Category 1</p>  <p>Danger Fatal if inhaled</p>	<p>Category 2</p>  <p>Danger Fatal if inhaled</p>	<p>Category 3</p>  <p>Danger Toxic if inhaled</p>	<p>Category 4</p>  <p>Warning Harmful if inhaled</p>	<p>Category 5 No symbol Warning May be harmful if inhaled</p>		
<p>LC₅₀ (mg/L)</p>	<p>0</p>	<p>0.05</p>	<p>0.5</p>	<p>1.0</p>	<p>2.5</p>	<p>5</p>	<p>10</p>

Analysis:

In this classification for health hazards, the *CPR* breaks acute dust and mist inhalation toxicity down into 2 categories; D1A, materials causing immediate and serious toxic effects, LC₅₀ from 0 to 0.5 and D1B, materials causing slightly less immediate and serious toxic effects, LC₅₀ from 0.5 to 2.5. The *GHS* breaks the health hazard down into 5 categories. Hazards currently not covered by the *CPR* above LC₅₀ are covered by the *GHS*. This will require changes to the *CPR*. Changes to the *CPR* will be required because of the symbols.

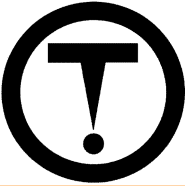



Skin Corrosion/Irritation

<p>CPR</p>	<p>Class E Causes visible necrosis of human skin tissue</p> 			<p>Class D2B Causes skin irritation</p> 	
<p>GHS</p>	<p>Category 1A</p>  <p>Corrosive Danger Causes severe skin burns and eye damage</p>	<p>Category 1B</p>  <p>Corrosive Danger Causes severe skin burns and eye damage</p>	<p>Category 1C</p>  <p>Corrosive Danger Causes severe skin burns and eye damage</p>	<p>Category 2</p>  <p>Warning Causes skin irritation</p>	<p>Category 3</p>  <p>Causes mild skin irritation</p>
	<p>Corrosive</p>	<p>Corrosive</p>	<p>Corrosive</p>	<p>Irritant</p>	<p>Mild Irritant</p>

Analysis:

Under the *CPR*, materials that cause skin corrosion/irritation are found in two classes. Materials that cause visible skin necrosis are included in Class E. Materials that cause eye or skin irritation are included into Class D2B. The GHS has broken this into 5 different categories. Categories 1A, B, C, causes severe skin burns and eye damage would be included in *CPR* Class E. Categories 2 and 3, causes skin irritation and mild skin irritation would be included in *CPR* Class D2B. Changes to the *CPR* will be required in order to allow for the finer splitting of both categories. Changes will also be required for the changes to the symbols

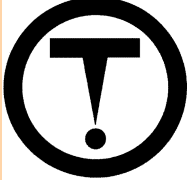

Serious Eye Damage/Irritation

<p>CPR</p>	<p>Class D2B Skin or Eye Irritation</p> 		
<p>GHS</p>	<p>Category 1</p>  <p>Danger</p> <p>Causes serious eye damage</p> <p>Irreversible eye effects</p>	<p>Category 2A</p>  <p>Warning</p> <p>Causes serious eye irritation</p> <p>Reversible eye effects in 14 days</p>	<p>Category 2B</p>  <p>Warning</p> <p>Causes eye irritation</p> <p>Reversible eye effects in 7 days</p>

Analysis:

Under the *CPR*, materials that cause skin/eye irritation are classified as D2B. Under the GHS this classification is broken down into 3 categories, 1, causing serious eye damage that are irreversible, 2A causing serious eye irritations that are reversible in 14 days and 2B, causing eye irritations that are reversible in 7 days. Changes to the *CPR* will be required in order to allow for the finer splitting of Class D2B for Serious Eye Damage/irritation. Changes will also be required for the changes to the symbols.



Respiratory Sensitization

CPR	<p style="text-align: center;">Class D2A Respiratory Tract Sensitization</p> 
GHS	<p style="text-align: center;">Category 1</p>  <p style="text-align: center;">Danger</p> <p style="text-align: center;">May cause allergy or asthma symptoms or breathing difficulties if inhaled</p>

Analysis:

Under the *CPR*, materials that cause respiratory sensitization are classified as D2A, if there is evidence that shows that they cause respiratory tract sensitization in people after exposure. Under the GHS this classification is for materials where there is evidence in of specific respiratory hypersensitivity and yields positive results from animal tests. The *CPR* will have to be modified to include this criteria and it will have to be modified to include changes to the symbol.


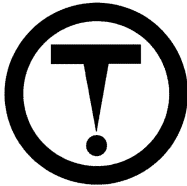



Skin Sensitization

CPR	Class D2B Skin Sensitizer 
GHS	Category 1  Warning May cause an allergic skin reaction

Analysis:

Under the *CPR*, materials that cause skin sensitization are classified as D2B, if there is evidence that shows that they cause respiratory skin sensitization in people after exposure. There are criteria for animal assays. Under the GHS this classification is for materials where there is evidence in of sensitization by skin contact and yields positive results from animal tests. The *CPR* will not have to be modified in terms of classification criteria. It will have to be modified to include changes to the symbol.

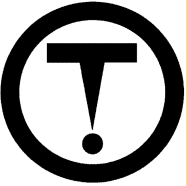



Germ Cell Mutagenicity

<p>CPR</p>	<p>Class D2A Germ Cell Mutagens Evidence from epidemiological studies and positive results <i>in vivo</i> tests</p> 	<p>Class D2B Germ Cell Mutagens Evidence of mutagenicity in mammalian tests <i>in vivo</i></p> 	
<p>GHS</p>	<p>Category 1A</p>  <p>Danger</p> <p>May cause genetic defects (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</p>	<p>Category 1B</p>  <p>Danger</p> <p>May cause genetic defects (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</p>	<p>Category 2</p>  <p>Warning</p> <p>Suspected of causing genetic defects (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</p>

Analysis:

Under the *CPR*, materials that cause germ cell mutagenicity are classified as D2A and D2B. If there is evidence from epidemiological studies and positive results from *in vivo* tests then the material is classified as D2A. If there is only evidence of mutagenicity then the material is classified as D2B. Under the GHS for these types of materials is broken down into 1A, 1B 2. Categories 1A and 1B correspond to *CPR* D2A. Category 1A is for positive epidemiological results, 1B corresponds to positive results for *in vivo* tests and category 2 corresponds to the availability of some. The *CPR* will have to be modified. It will also have to be modified to include changes to the symbol.





Carcinogenicity

<p>CPR</p>	<p>Class D2A A pure substance or tested mixture as defined by TLV booklet published by ACGIH or the IARC list of carcinogens.</p> 		
<p>GHS</p>	<p>Category 1A</p>  <p>Danger</p> <p>May cause cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</p>	<p>Category 1B</p>  <p>Danger</p> <p>May cause cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</p>	<p>Category 2</p>  <p>Warning</p> <p>Suspected of causing cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</p>
<p>Known human carcinogen</p>		<p>Presumed human carcinogen</p>	<p>Suspected human carcinogen</p>

Analysis:

Under the *CPR*, materials that meet the criteria for carcinogens, D2A are materials that are listed in the sections A1a, A1b, or A2 of Appendix A of the TLV Booklet published by ACGIH, or if the material is listed in Groups 1 or 2 in the IARC monographs. Under GHS, this is split into 3 categories based on known data. That is the material is classified in 1A if data reveals that it is a known carcinogen, 1B if the material is a presumed carcinogen based on demonstrated animal evidence and category 2 if material is only a suspected carcinogen with limited data. The *CPR* will have to be modified. It will also have to be modified to include changes to the symbol.


Toxic to Reproduction

<p>CPR</p>	<p align="center">Class D2A</p> <p>A substance or tested mixture is a toxic to reproduction if there is evidence that shows that it causes sterility or an adverse effect on reproductive capability as shown in animal assays according to OECD test guidelines.</p> 		
<p>GHS</p>	<p align="center">Category 1A</p>  <p align="center">Danger</p> <p align="center">May damage fertility or the unborn child (state specific effect if known) (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</p>	<p align="center">Category 1B</p>  <p align="center">Danger</p> <p align="center">May damage fertility or the unborn child (state specific effect if known) (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</p>	<p align="center">Category 2</p>  <p align="center">Suspected of damaging fertility or the unborn child (state specific effect if known) (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</p>
<p>Category</p>	<p align="center">Known human reproductive or developmental toxicant</p>	<p align="center">Presumed human reproductive or developmental toxicant</p>	<p align="center">Suspected human reproductive or developmental toxicant</p>

Analysis:

Under the *CPR*, materials are considered to be toxic to reproduction, D2A, if there is evidence that show that it causes causes sterility or an adverse effect on reproductive capability as shown in animal assays according to OECD test guidelines. Under the GHS, this is split into 3 categories based on known or presumed data. That is the material is classified in 1A if data reveals that it is a known reproductive toxicant, 1B if the material is a reproductive toxicant and category 2 if material is only a suspected reproductive toxicant. The *CPR* will have to be modified as well as for symbol changes.

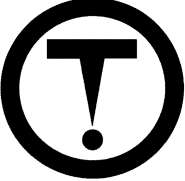
Biohazardous Infectious Material

CPR	<p style="text-align: center;">Class D3 Biohazardous Material</p> 
GHS	

Analysis:

Under the *CPR*, materials that have been shown to cause disease or reasonably believed to cause disease in persons or animals and the toxins of such an organism fall into class D3. This has been harmonized to the WHO risk group classification. There is no equivalent classification under GHS. There will be no changes to the *CPR*.



Effects on or via Lactation

CPR	Class D2A 
GHS	Category 1 No Symbol No Signal Word May cause harm to breast-fed children

Analysis:

There are no specific symbols designated by the GHS. Under the current *CPR*, products in this class would fall under D2A which is as a poisonous, infectious material that has an adverse effect on reproduction. One of the categories of inclusion in this class is lactation.

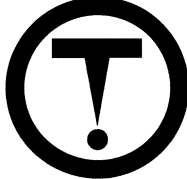



Target Organ Systemic Toxicity (Single Exposure)

CPR	Not covered by the <i>CPR</i>	
GHS	<p style="text-align: center;">Category 1</p>  <p style="text-align: center;">Danger</p> <p style="text-align: center;">Causes damage to (state all organs affected, or use a general statement where there is no definite evidence that other organs are not affected) if (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</p>	<p style="text-align: center;">Category 2</p>  <p style="text-align: center;">Warning</p> <p style="text-align: center;">Causes damage to (state all organs affected, or use a general statement where there is no definite evidence that other organs are not affected) if (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</p>

Analysis:

This classification is not covered by the *CPR*.


Target Organ Systemic Toxicity (Repeated Exposure)

CPR	 D2A	D2B 
GHS	Category 1  Danger Causes (state all organs affected, or use a general statement where there is no definite evidence that other organs are not affected) damage through prolonged or repeated exposure (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)	Category 2  Warning Causes (state all organs affected, or use a general statement where there is no definite evidence that other organs are not affected) damage through prolonged or repeated exposure (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)

Analysis:



Under the *CPR*, materials would be considered to be systemic organ toxicant, D2A. Under the GHS, this is split into 2 categories based on known or presumed data. That is the material is classified in 1 if data reveals that the material produces significant toxicity in humans and 2 if data reveals that the material may be harmful to human health. The *CPR* will have to be modified as well as for symbol changes.

Aquatic Toxicity (Acute)

CPR	WHMIS exempt		
GHS	Category 1  Warning Very toxic to aquatic life	Category 2 No symbol No signal word Toxic to aquatic life	Category 3 No symbol No signal word Harmful to aquatic life

This category is exempt from the WHMIS.

Aquatic Toxicity: Chronic

CPR	WHMIS Exempt			
GHS	<p>Category 1</p>  <p>Warning</p> <p>Very toxic to aquatic life with long lasting effects</p>	<p>Category 2</p>  <p>Toxic to aquatic life with long lasting effects</p>	<p>Category 3</p> <p>No symbol</p> <p>No signal word</p> <p>Harmful to aquatic life with long lasting effects</p>	<p>Category 4</p> <p>No symbol</p> <p>No signal word</p> <p>May cause long lasting harmful effects to aquatic life</p>

This category is exempt from the WHMIS.