

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




Implementation of the GHS in Canada

Consumer Chemical Products

TABLE 2 Comparison of Hazard Communication: Consumer Chemicals [Physical]

Explosive



CCCR	The <i>Hazardous Products Act</i> (HPA) under which the CCCR falls, does not apply to explosives within the meaning of the <i>Explosives Act</i> .
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GHS				1.4*	1.5*	1.6*
	Danger Explosive; mass explosion hazard	Danger Explosive; severe projection hazard	Danger Explosive; fire, blast or projection hazard	Warning Fire or projection hazard	Warning May explode in fire	

Division 1.1 1.2 1.3 1.4 1.5 1.6

* Apply to substances or mixtures subject to the UN Recommendations for the Transport of Dangerous Goods, Model Regulations




Flammable

<p>CCCR</p>	<p>Flammable -a gas, other than a gas in a spray container, that forms a flammable mixture with air at a concentration of 13% or less by volume at normal atmospheric pressure; or -a gas, other than a gas in spray container, that forms a flammable mixture with air over a concentration range of 12% or more by volume at normal atmospheric pressure.</p>  <p>Danger Flammable Contents May Catch Fire</p>	<p>No criteria</p>
<p>GHS</p>	<p>Category 1 - ignitable when in a mixture of 13% or less by volume of air; or - have a flammable range of at least 12 percentage points, regardless of lower flammable limit</p>  <p>Danger Extremely flammable gas</p>	<p>Category 2 -gases, other than those in Category 1, have a flammable range while mixed in air</p> <p>No symbol</p> <p>Warning Flammable gas</p>

Analysis: Under the CCCR, the criteria for Flammable Gases aligns with Category 1 of the GHS and are essentially the same. The flammable symbol will be modified to a revised flammable glyph and a red diamond border. The GHS label hazard statement is Extremely Flammable for Category 1 whereas the CCCR is Flammable. Signal word is the same. The GHS has criteria for lower hazard flammable gases in Category 2 whereas the CCCR do not classify.

Future Work: Consider Category 2 for consumer products if applicable.

Flammable Aerosols

<p>CCCR</p>	<p>Very Flammable - a liquid or gas in spray container that has a flame projection of 100 cm or more; or exhibits a flashback. (Generally prohibited)</p>	<p>Flammable - a liquid or gas in a spray container that has a flame projection of 15 cm or more but less than 100 cm.</p> <p style="text-align: center;"></p> <p style="text-align: center;">Danger Flammable Contents May Catch Fire</p>
<p>GHS</p>	<p style="text-align: center;">Category 1</p> <p>-contains $\geq 85\%$ flammable components and has a heat of combustion ≥ 30 kJ/g. -for spray aerosols, has an ignition distance ≥ 75cm. -for foam aerosols, has a flame height ≥ 20 cm and a flame duration ≥ 2s or a flame height ≥ 4 cm and a flame duration ≥ 7s.</p> <p style="text-align: center;"></p> <p style="text-align: center;">Danger Extremely flammable aerosol</p>	<p style="text-align: center;">Category 2</p> <p>-for spray aerosols, does not have a heat of combustion < 20 kJ/g -has an ignition distance ≥ 15cm -in the enclosed space ignition test has a time equivalent ≤ 300 s/m³; or deflagration density ≤ 300 g/m³. - for foam aerosols, has a flame height ≥ 4 cm and a flame duration ≥ 2s.</p> <p style="text-align: center;"></p> <p style="text-align: center;">Warning Flammable aerosol</p>

Flammable Aerosols

Analysis:

The criteria for this endpoint differ for the GHS and the CCCR as they are based on different tests. Under the CCCR, the criteria for spray containers (which includes aerosol and pump-spray containers) are based on flame projection and flashback tests. The GHS criteria use the chemical heat of combustion and if applicable, the results of the foam test (flame height and flame duration) for foam aerosols, and ignition distance test and enclosed spray test for spray aerosols. Flashback is not part of the GHS criteria.


The flammable symbol will be modified to a revised flammable glyph and a red diamond border. Signal words and hazard statements differ slightly.

Future Work:

For spray aerosols, the length of flame projection and ignition distance are theoretically different tests. It is not known whether their practical applications may be similar. This would require further analysis. It has been recommended to Transport Canada who had worked on this endpoint that the GHS criteria also include the consideration of flashback and the length of flame projection. A formal proposal may be presented to the GHS Subcommittee for work for the second biennium.


The CCCR also covers refillable spray containers (pump-sprays) which are not covered by the GHS. It has been recommended that the GHS develop criteria for flammable liquids in refillable spray containers. In addition to the flashpoint, the length of flame projection should be measured and the product classified into the higher level of hazard.





Oxidizing Gases

CCCR	No criteria
GHS	<p data-bbox="968 350 1115 383" style="text-align: center;">Category 1</p> <p data-bbox="432 388 1656 453" style="text-align: center;">Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.</p> <div data-bbox="968 456 1115 599" style="text-align: center;"></div> <p data-bbox="795 716 1289 781" style="text-align: center;">Danger May cause or intensify fire; oxidizer</p>

Analysis: This endpoint may not be applicable to the CCCR but this should be confirmed.

Gases Under Pressure

<p>CCCR</p> <p>Pressurized Containers Applies to a pressurized container that (a) contains or will contain a substance that, when in a liquid state, has an absolute vapour pressure greater than 275 kPa at 37.8°C as determined using ASTM D 323; or (b) is or will be pressurized to an absolute pressure greater than 275 ± 1 kPa at 21.1°C or 717 ± 2 kPa at 54.4°C.</p> <div style="text-align: center;">  <p>Caution</p> <p>Contents Under Pressure Container May Explode If Heated</p> </div>

<p>GHS</p> <p>GHS Definition: Gases under pressure are gases which are contained in a receptacle at a pressure no less than 280 kPa at 20 degrees Celsius or as a refrigerated liquid. Specific criteria for each of the following groups in outlined in Table 1 of Chapter 2.5 of the GHS document.</p>			
<p>Compressed Gas</p> <div style="text-align: center;">  <p>Warning</p> <p>Contains gas under pressure; may explode if heated</p> </div>	<p>Liquified Gas</p> <div style="text-align: center;">  <p>Warning</p> <p>Contains gas under pressure; may explode if heated</p> </div>	<p>Refrigerated Liquified Gas</p> <div style="text-align: center;">  <p>Warning</p> <p>Contains refrigerated gas; may cause cryogenic burns or injury</p> </div>	<p>Dissolved Gas</p> <div style="text-align: center;">  <p>Warning</p> <p>Contains gas under pressure; may explode if heated</p> </div>

Gases Under Pressure

Analysis:

The CCCR criteria is essentially similar to the GHS definition for gases under pressure. It is assumed that a pressure of 275 kPa at 21.1 °C is essentially the same as 280 kPa at 20°C.






The CCCR however, does not have specific criteria for each of the 4 groups: compressed gas, liquified gas, dissolved gas and refrigerated liquified gas.

The hazard symbol will now be a compressed gas cylinder as opposed to an exploding rock which under the GHS has been reserved for explosives. The octagon border will be replaced by the red diamond border under the GHS.

The signal word of “Caution” will be replaced by “Warning” under the GHS. The hazard statements differ slightly and are more specific under the GHS.

The CCCR apply to an empty container that will be filled.

Flammable Liquids

<p>CCCR</p>	<p>Very Flammable (prohibition)</p>  <p>Extreme Danger</p> <p>Very Flammable</p>	<p>Flammable</p>  <p>Danger</p> <p>Flammable Contents May Catch Fire</p>		<p>Combustible</p> <p>No symbol</p> <p>Keep away from flames or sparks.</p>	<p>No criteria</p>	
<p>GHS</p>	<p>Category 1</p>  <p>Danger</p> <p>Extremely flammable liquid and vapour</p>	<p>Category 2</p>  <p>Danger</p> <p>Highly flammable liquid and vapour</p>	<p>Category 3</p>  <p>Warning</p> <p>Flammable liquid and vapour</p>	<p>Category 4</p> <p>No symbol</p> <p>Warning</p> <p>Combustible liquid</p>		
<p>Flashpoint Initial Boiling Pt</p>	<p><-18°C</p>	<p><23°C ≤35°C</p>	<p><23°C >35°C</p>	<p>37.8°C</p>	<p>60°C</p>	<p>93°C</p>

Flammable Liquids

Analysis:

Criteria for both systems is based on the flashpoint of the substance or mixture. The GHS, however, also includes consideration of initial boiling point for extremely or highly flammable substances. In general, the criteria cut-offs for both systems do not align in any category.

Under the CCCR, products that are Very Flammable will be classified as Extremely or Highly Flammable under the GHS. There will be minor change to the symbol such that the flame glyph will be modified slightly and the GHS red diamond border will replace the octagon. The signal word will change from “Extreme Danger” to “Danger” for substances with flashpoints below -18 °C. The primary hazard statement will be modified as above. The current prohibition of products below -18 °C is outside of the scope of the GHS and will continue.



Under the CCCR, some products (those with flashpoints up to 23 °C) that are Flammable will be classified as Extremely or Highly Flammable under the GHS. The symbol will be modified as indicated above. The signal word will remain as “Danger” and the primary hazard statement will be modified.



Under the CCCR, Flammable products with flashpoints between 23 °C and 37.8 °C will be classified also as Flammable under the GHS. The symbol is modified as indicated above and the signal word of “Warning” will replace “Danger”. The primary hazard statement will also be modified.

Under the CCCR, products that are Combustible will be classified as Flammable under the GHS. The flammable symbol will now be required where it was not required under the CCCR. A signal word will now be required and the primary hazard statements will be modified.

Under the CCCR, products with higher flashpoints (greater than 60 °C) are not classified. Under the GHS, these products will now be classified as Combustible. No symbol will be required. A primary hazard statement will be required.

Flammable Solids

<p>CCCR</p>	<p>Very Flammable A solid, paste or gel that emits a vapour that has a flash point of less than -18C.</p> <p>Generally prohibited.</p>  <p>Extreme Danger</p> <p>Very Flammable Vapour May Catch Fire</p>	<p>Flammable A solid, paste or gel that emits a vapour that has a flash point of -18C or more but not more than 37.8C.</p>  <p>Danger</p> <p>Flammable Vapour May Catch Fire</p>	<p>Combustible A solid, paste or gel that emits a vapour that has a flash point of more than 37.8C but not more than 60.0 C.</p> <p>No symbol</p> <p>Keep away from flames or sparks.</p>
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<p>GHS</p>	<p>Category 1 -substances or mixtures other than metal powders (a) wetted zone does not stop fire & (b) burning time < 45 sec burning rate > 2.2 mm/sec -metal powders: burning time ≤ 5 min</p>  <p>Danger Flammable solid</p>	<p>Category 2 -substances or mixtures other than metal powders (a) wetted zone stops fire for at least 4 min & (b) burning time < 45 sec or burning rate > 2.2 mm/sec -metal powders: burning time > 5 min and ≤ 10 min</p>  <p>Warning Flammable solid</p>
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Flammable Solids

Analysis:





The CCCR criteria are aimed at measuring the flashpoint of the vapours that are emitted from solids, pastes or gels as opposed to the material itself. The GHS criteria are aimed at measuring the burning time and rate of the actual solid material such as powders and are not concerned with the vapour. The criteria for this endpoint therefore cannot be compared.

The GHS criteria for flammable liquids may be more appropriate measuring the flashpoint of the vapours that are emitted from solids, pastes and gels as opposed to the criteria for flammable solids.

Future Work:

It may be recommended that solids, gels and pastes that emit flammable vapours be classified as per the GHS flammable liquids criteria in addition to the criteria for flammable solids (if applicable).


Self-Reactive Substances

CCCR	No criteria				
GHS	Type A	Type B	Type C & D	Type E & F	Type G
					No label elements
	Danger Heating may cause an explosion	Danger Heating may cause a fire or explosion	Danger Heating may cause a fire	Warning Heating may cause a fire	

Analysis:

It may be unlikely that self reactive substances or mixtures are sold as consumer products, however, this should be verified.


Pyrophoric Liquids

CCCR	No criteria
GHS	<p>Category 1 -liquid ignites within 5 min when added to an inert carrier and exposed to air, or it ignites or chars a filter paper on contact with air within 5 min</p>  <p>Danger</p> <p>Catches fire spontaneously if ignited</p>

Analysis:

It may be unlikely that pyrophoric liquids or mixtures are sold as consumer products, however, this should be verified.




Pyrophoric Solids

CCCR	no criteria
GHS	<p>Category 1</p> <p>-solid ignites within 5 min of coming into contact with air</p>  <p>Danger</p> <p>Catches fire spontaneously if ignited</p>

Analysis:

It may be unlikely that pyrophoric solids or mixtures are sold as consumer products, however, this should be verified.

Self Heating Substances

CCCR	<p>Spontaneously Combustible (a) A product that spontaneously combusts under reasonably foreseeable conditions of use; or (b) A product that heats spontaneously on contact with air to the point that it begins to burn</p>  <p>CAUTION</p> <p>Read Instructions Before Using Danger of Combustion</p>	
GHS	<p>Category 1 Criteria are based on results of tests outlined in Table 1 of Chapter 2.11 of the GHS document.</p>  <p>Danger</p> <p>Self-heating; may catch fire</p>	<p>Category 2 Criteria are based on results of tests outlined in Table 1 of Chapter 2.11 of the GHS document.</p>  <p>Warning</p> <p>Self-heating in large quantities; may catch fire</p>

Self Heating Substances

Analysis:




Under the GHS, self-heating of substances, leading to spontaneous combustion, is caused by reaction of the substance with oxygen (in the air) and the heat developed not being conducted away rapidly enough to the surroundings. Spontaneous combustion occurs when the rate of heat production exceeds the rate of heat loss and the auto-ignition temperature is reached.

The GHS criteria is concerned mainly with the self-heating of a solid substance. The CCCR criteria are directed at liquid and paste products that are intended to be used with rags for cleaning, rubbing or polishing purposes. A used rag that is not disposed of properly may create conditions for a fire caused by spontaneous combustion. Drying oils like linseed oil may meet this criteria.

Future Work:

It is uncertain if this endpoint can apply to liquid or paste products that may cause spontaneous combustion in foreseeable conditions of use. It may be more appropriate to develop a separate endpoint to deal with this hazard or it may be determined that this hazard is rather a risk posed by flammable liquids or pastes due to a foreseeable condition of use and not an inherent hazard related to the substance or mixture. Application of this endpoint for consumer products will require more discussion.




Substances, which in contact with water, emit flammable gases

CCCR	No criteria		
GHS	Category 1  Danger In contact with water releases flammable gases which may ignite spontaneously.	Category 2  Danger In contact with water releases flammable gases	Category 3  Warning In contact with water releases flammable gases

Analysis:

It may be unlikely that these substances are sold as consumer products, however, this should be verified.




Oxidizing Liquids

CCCR	No criteria		
GHS	Category 1  Danger May cause fire or explosion; strong oxidizer	Category 2  Danger May intensify fire; oxidizer	Category 3  Warning May intensify fire; oxidizer

Analysis:

It may be unlikely that these substances are sold as consumer products, however, this should be verified.






Oxidizing Solids

CCCR	No criteria		
GHS	Category 1  Danger May cause fire or explosion; strong oxidizer	Category 2  Danger May intensify fire; oxidizer	Category 3  Warning May intensify fire; oxidizer

Analysis:

It may be unlikely that these substances are sold as consumer products, however, this should be verified.


Organic Peroxides

CCCR	No criteria				
GHS	Type A  Danger Heating may cause an explosion	Type B   Danger Heating may cause a fire or explosion	Type C & D  Danger Heating may cause a fire	Type E & F  Warning Heating may cause a fire	Type G No label elements

Analysis:

It may be unlikely that these substances are sold as consumer products, however, this should be verified.

Corrosive to Metals

CCCR	No criteria
GHS	Category 1  Warning May be corrosive to metals

Analysis:

It may be unlikely that these substances are sold as consumer products, however, this should be verified.