

**Committee of Experts on the Transport of Dangerous Goods
and on the Globally Harmonized System of Classification
and Labelling of Chemicals**

12 March 2024

**Sub-Committee of Experts on the
Transport of Dangerous Goods**

Sixty-fourth session

Geneva, 24 June- 3 July 2024

Item 10 (b) of the provisional agenda

**Issues relating to the Globally Harmonized System
of Classification and Labelling of Chemicals:**

**Simultaneous classification in physical hazards and
possible combination of hazards**

**Sub-Committee of Experts on the Globally Harmonized
System of Classification and Labelling of Chemicals**

Forty-sixth session

Geneva, 3-5 July 2024

Item 2 (b) of the provisional agenda

**Work on the Globally Harmonized System of
Classification and Labelling of Chemicals:**

**Simultaneous classification in physical hazards and
precedence of hazards**

**Proposal for clarifications on the combinations of aerosols
and chemicals under pressure with other hazard classes in
the GHS**

**Transmitted by the expert from Germany on behalf of the informal
working group on combinations of physical hazards**

This informal document sets out the changes as proposed in section II of document ST/SG/AC.10/C.3/2024/4-ST/SG/AC.10/C.4/2024/1. Existing (unchanged) text is shown in black, ~~deleted text in blue and strikethrough~~ and new text in red and underlined.

Annex

Chemicals under pressure: amendments to 2.3.2.1 and 2.3.2.2 of the GHS

Option 1	Option 2
<p>2.3.2.1 <i>Definition <u>and general considerations</u></i></p> <p><u>2.3.2.1.1</u> <i>Chemicals under pressure</i> are liquids or solids (e.g. pastes or powders), pressurized with a gas at a pressure of 200 kPa (gauge) or more at 20 °C in pressure receptacles other than aerosol dispensers and which are not classified as gases under pressure.</p> <p><i>NOTE:</i> <i>Chemicals under pressure typically contain 50 % or more by mass of liquids or solids whereas mixtures containing more than 50 % gases are typically considered as gases under pressure.</i></p> <p><u>2.3.2.1.2</u> <i>Chemicals under pressure do not fall additionally within the scope of section 2.3.1 (aerosols), chapters 2.2 (flammable gases), 2.5 (gases under pressure), 2.6 (flammable liquids) and 2.7 (flammable solids).</i></p> <p><u>NOTE:</u> <i>Depending on their contents, chemicals under pressure may fall within the scope of other hazard classes.</i></p>	<p>2.3.2.1 <i>Definition <u>and general considerations</u></i></p> <p><u>2.3.2.1.1</u> <i>Chemicals under pressure</i> are liquids or solids (e.g. pastes or powders), pressurized with a gas at a pressure of 200 kPa (gauge) or more at 20 °C in pressure receptacles other than aerosol dispensers and which are not classified as gases under pressure.</p> <p><i>NOTE:</i> <i>Chemicals under pressure typically contain 50 % or more by mass of liquids or solids whereas mixtures containing more than 50 % gases are typically considered as gases under pressure.</i></p> <p><u>2.3.2.1.2</u> <i>Chemicals under pressure do not fall additionally within the scope of section 2.3.1 (aerosols), chapters 2.2 (flammable gases), 2.5 (gases under pressure), 2.6 (flammable liquids) and 2.7 (flammable solids).</i></p> <p><u>NOTE 1:</u> <i>Depending on their contents, chemicals under pressure may fall within the scope of other hazard classes.</i></p> <p><u>NOTE 2:</u> <i>Some sectors, e.g. transport, may have other specific provisions regarding the applicability of additional hazard classes. For the transport of chemicals under pressure, see special provision 362 of the Model Regulations.</i></p>

2.3.2.2 Classification criteria

2.3.2.2.1 Chemicals under pressure are classified in one of three categories of this hazard class, in accordance with table 2.3.3, depending on their content of flammable components and their heat of combustion (see 2.3.2.4.1).

2.3.2.2.2 Flammable components are components which are classified as flammable in accordance with the GHS criteria, i.e.:

- Flammable gases (see chapter 2.2);
- Flammable liquids (see chapter 2.6);
- Flammable solids (see chapter 2.7).

Table 2.3.3: Criteria for chemicals under pressure

Category	Criteria
1	Any chemical under pressure that: (a) contains ≥ 85 % flammable components (by mass); and (b) has a heat of combustion of ≥ 20 kJ/g.
2	Any chemical under pressure that: (a) contains > 1 % flammable components (by mass); and (b) has a heat of combustion < 20 kJ/g; or that: (a) contains < 85 % flammable components (by mass); and (b) has a heat of combustion ≥ 20 kJ/g.
3	Any chemical under pressure that: (a) contains ≤ 1 % flammable components (by mass); and (b) has a heat of combustion of < 20 kJ/g.

~~NOTE 1: Some sectors, e.g. transport, may have specific provisions regarding the applicability of additional hazard classes differing from those in 2.3.2.1.2 and the related Note. For the transport of chemicals under pressure, see special provision 362 of the Model Regulations. The flammable components in a chemical under pressure do not include pyrophoric, self-heating or water reactive, substances and mixtures because such components are not allowed in chemicals under pressure in accordance with the UN Model Regulations.~~

~~NOTE 2: Chemicals under pressure do not fall additionally within the scope of section 2.3.1 (aerosols), chapters 2.2 (flammable gases), 2.5 (gases under pressure), 2.6 (flammable liquids) and 2.7 (flammable solids). Depending on their contents, chemicals under pressure may however fall within the scope of other hazard classes, including their labelling elements.~~

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2	Any chemical under pressure that: (a) contains > 1 % flammable components (by mass); and (b) has a heat of combustion < 20 kJ/g; or that: (a) contains < 85 % flammable components (by mass); and (b) has a heat of combustion ≥ 20 kJ/g.
3	Any chemical under pressure that: (a) contains ≤ 1 % flammable components (by mass); and (b) has a heat of combustion of < 20 kJ/g.

~~NOTE 1: The flammable components in a chemical under pressure do not include pyrophoric, self-heating or water reactive, substances and mixtures because such components are not allowed in chemicals under pressure in accordance with the UN Model Regulations.~~

~~NOTE 2: Chemicals under pressure do not fall additionally within the scope of section 2.3.1 (aerosols), chapters 2.2 (flammable gases), 2.5 (gases under pressure), 2.6 (flammable liquids) and 2.7 (flammable solids). Depending on their contents, chemicals under pressure may however fall within the scope of other hazard classes, including their labelling elements.~~

Aerosols: amendments to 2.3.1.1 and 2.3.1.2 of the GHS

Option 1	Option 2
<p>2.3.1.1 <i>Definition <u>and general considerations</u></i></p> <p><u>2.3.1.1.1</u> <i>Aerosols, this means aerosol dispensers, are any non-refillable receptacles made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state.</i></p> <p><u>2.3.1.1.2</u> <i>Aerosols do not fall additionally within the scope of section 2.3.2 (chemicals under pressure), chapters 2.2 (flammable gases), 2.5 (gases under pressure), 2.6 (flammable liquids) and 2.7 (flammable solids).</i></p> <p><i>NOTE:</i> <u>Depending on their contents, aerosols may fall within the scope of other hazard classes.</u></p>	<p>2.3.1.1 <i>Definition <u>and general considerations</u></i></p> <p><u>2.3.1.1.1</u> <i>Aerosols, this means aerosol dispensers, are any non-refillable receptacles made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state.</i></p> <p><u>2.3.1.1.2</u> <i>Aerosols do not fall additionally within the scope of section 2.3.2 (chemicals under pressure), chapters 2.2 (flammable gases), 2.5 (gases under pressure), 2.6 (flammable liquids) and 2.7 (flammable solids).</i></p> <p><i>NOTE 1:</i> <u>Depending on their contents, aerosols may fall within the scope of other hazard classes.</u></p> <p><i>NOTE 2:</i> <u>Some sectors, e.g. transport, may have other specific provisions regarding the applicability of additional hazard classes. For the transport of aerosols, see special provision 63 of the Model Regulations.</u></p>

2.3.1.2 Classification criteria

2.3.1.2.1 Aerosols are classified in one of the three categories of this hazard class, in accordance with table 2.3.1, depending on:

- their flammable properties;
- their heat of combustion; and
- if applicable, test results from the ignition distance test, the enclosed space ignition test and the aerosol foam flammability test, performed in accordance with subsections 31.4, 31.5 and 31.6 of the *Manual of Tests and Criteria*.

They should be considered for classification in Category 1 or 2 if they contain more than 1 % components (by mass) which are classified as flammable according to the GHS criteria, i.e.:

- Flammable gases (see chapter 2.2);
- Flammable liquids (see chapter 2.6);
- Flammable solids (see chapter 2.7);

or if their heat of combustion is at least 20 kJ/g.

Table 2.3.1: Criteria for aerosols

Category	Criteria
1	(a) Any aerosol that contains $\geq 85\%$ flammable components (by mass) and has a heat of combustion of ≥ 30 kJ/g; (b) Any aerosol that dispenses a spray that, in the ignition distance test, has an ignition distance of ≥ 75 cm; or (c) Any aerosol that dispenses a foam that, in the foam flammability test, has: <ul style="list-style-type: none"> (i) a flame height of ≥ 20 cm and a flame duration of ≥ 2 s; or (ii) a flame height of ≥ 4 cm and a flame duration of ≥ 7 s.
2	(a) Any aerosol that dispenses a spray that, based on the results of the ignition distance test, does not meet the criteria for Category 1, and which has: <ul style="list-style-type: none"> (i) a heat of combustion of ≥ 20 kJ/g; (ii) a heat of combustion of < 20 kJ/g along with an ignition distance of ≥ 15 cm; or (iii) a heat of combustion of < 20 kJ/g and an ignition distance of < 15 cm along with either, in the enclosed space ignition test: <ul style="list-style-type: none"> - a time equivalent of ≤ 300 s/m³; or - a deflagration density of ≤ 300 g/m³; or (b) Any aerosol that dispenses a foam that, based on the results of the aerosol foam flammability test, does not meet the criteria for Category 1, and which has a

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- their flammable properties;
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- if applicable, test results from the ignition distance test, the enclosed space ignition test and the aerosol foam flammability test, performed in accordance with subsections 31.4, 31.5 and 31.6 of the *Manual of Tests and Criteria*.

They should be considered for classification in Category 1 or 2 if they contain more than 1 % components (by mass) which are classified as flammable according to the GHS criteria, i.e.:

- Flammable gases (see chapter 2.2);
- Flammable liquids (see chapter 2.6);
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2	(a) Any aerosol that dispenses a spray that, based on the results of the ignition distance test, does not meet the criteria for Category 1, and which has: <ul style="list-style-type: none"> (i) a heat of combustion of ≥ 20 kJ/g; (ii) a heat of combustion of < 20 kJ/g along with an ignition distance of ≥ 15 cm; or (iii) a heat of combustion of < 20 kJ/g and an ignition distance of < 15 cm along with either, in the enclosed space ignition test: <ul style="list-style-type: none"> - a time equivalent of ≤ 300 s/m³; or - a deflagration density of ≤ 300 g/m³; or (b) Any aerosol that dispenses a foam that, based on the results of the aerosol foam flammability test, does not meet the criteria for Category 1, and which has a

	flame height of ≥ 4 cm and a flame duration of ≥ 2 s.		flame height of ≥ 4 cm and a flame duration of ≥ 2 s.
3	<p>(a) Any aerosol that contains $\leq 1\%$ flammable components (by mass) and that has a heat of combustion < 20 kJ/g; or</p> <p>(b) Any aerosol that contains $> 1\%$ (by mass) flammable components or which has a heat of combustion of ≥ 20 kJ/g but which, based on the results of the ignition distance test, the enclosed space ignition test or the aerosol foam flammability test, does not meet the criteria for Category 1 or Category 2.</p>	3	<p>(a) Any aerosol that contains $\leq 1\%$ flammable components (by mass) and that has a heat of combustion < 20 kJ/g; or</p> <p>(b) Any aerosol that contains $> 1\%$ (by mass) flammable components or which has a heat of combustion of ≥ 20 kJ/g but which, based on the results of the ignition distance test, the enclosed space ignition test or the aerosol foam flammability test, does not meet the criteria for Category 1 or Category 2.</p>
<p>NOTE 1: Flammable components do not cover pyrophoric, self heating or water reactive substances and mixtures because such components are never used as aerosol contents.</p>		<p>NOTE 1: Flammable components do not cover pyrophoric, self heating or water reactive substances and mixtures because such components are never used as aerosol contents.</p>	
<p>NOTE 2: Aerosols containing more than 1% flammable components or with a heat of combustion of at least 20 kJ/g, which are not submitted to the flammability classification procedures in this chapter should be classified as aerosols, Category 1.</p>		<p>NOTE 2: Aerosols containing more than 1% flammable components or with a heat of combustion of at least 20 kJ/g, which are not submitted to the flammability classification procedures in this chapter should be classified as aerosols, Category 1.</p>	
<p><u>NOTE 2: Some sectors, e.g. transport, may have specific provisions regarding the applicability of additional hazard classes differing from those in 2.3.1.1.2 and the related Note. For the transport of aerosols, see special provision 63 of the Model Regulations.</u></p>		<p>NOTE 3: Aerosols do not fall additionally within the scope of chapter 2.2 (flammable gases), section 2.3.2 (chemicals under pressure), chapters 2.5 (gases under pressure), 2.6 (flammable liquids) and 2.7 (flammable solids). Depending on their contents, aerosols may however fall within the scope of other hazard classes, including their labelling elements.</p>	
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