

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

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

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Item 3 of the provisional agenda

Hazard communication issues

Report about the activities of the correspondence group on the revision of Section 9 of the SDS

**Transmitted by the expert from Germany on behalf of the
correspondence group**

Introduction

1. Since the last Sub-Committee meeting in December 2011 and the corresponding last informal document INF.29 on its progress, the correspondence group had two phone conferences. These phone conferences were very constructive and fruitful (although it requires the delegates from the United States to be on the phone very early in the morning and the Australian colleagues have to stay up very late, so thanks again for that good cooperation!).
2. In the following, the correspondence group wishes to outline the discussions and decisions taken in some more detail in order to keep the Sub-Committee up-dated.

Status of work

3. As already reported at the 22nd session in INF.29 the group has agreed that instead of just listing the properties as currently done in the GHS in Annex 4 Section 9 they should be amended by including some remarks or guidance to give further information on what types of individual properties are required and what kind of information is expected to be provided, etc.
4. The group has agreed that this is best achieved by presenting the information in tables with three columns in which the first column is a numeration, the second gives the property and the third column adds remarks and guidance with relevant information as stated above in paragraph 3.
5. Furthermore, the group has decided that it would be beneficial to divide/structure the properties required for Section 9 of the SDS. A first table would cover basic physical-chemical properties. A second and maybe a third table would contain safety characteristics and properties relevant for classification, e. g. flash point, burning rate, heat of decomposition, flammable range etc.
6. During the last meetings and the phone conferences the correspondence group (almost) finished the discussions regarding the basic chemical properties.

7. The group has decided that it would also present a justification to the Sub-Committee for every property that it proposes to add or to remove.
8. Furthermore, the group reviewed and amended the introductory text for Annex 4, Section 9.
9. The results reflecting this work are outlined in Annex I to this document. It contains a preliminary draft text for Annex 4, Section 9. This preliminary text is not yet finalized and is provided to the Sub-Committee for information only. The table contained therein is also not complete yet and contains those properties that the correspondence group has discussed so far.
10. Annex II contains the same table as Annex I but amended by the justifications as mentioned in paragraph 7 and by an indication whether the respective property should be mentioned in Table 1.5.2.

Further work

11. The correspondence group has not yet discussed the other (non-basic) properties (safety characteristics, properties related to physical hazards). Therefore, some properties currently contained in Section 9 such as flash point, decomposition temperature, etc. are currently not contained in Annex I or II to this document.
12. Furthermore, the group still has to discuss implications on Table 1.5.2 of the GHS in detail.

Requests to the Sub-Committee of experts on the GHS

13. The correspondence group would like the Sub-Committee to consider the work of the correspondence group as outlined in Annex I and II and would appreciate if the Sub-Committee took the opportunity to comment, as appropriate, so that the correspondence group has the chance to take into account these comments as early as possible.

Annex I

Preliminary draft text for Annex 4, Section 9 currently considering only basic physical-chemical properties

“A4.3.9 SECTION 9: Physical and chemical properties

A4.3.9.1 Describe the empirical data of the substance or mixture (if possible) in this section.

A4.3.9.2 In the case of a mixture, the entries should clearly indicate to which ingredient the data apply, unless it is valid for the whole mixture. The data included in this sub-section should apply to the substance or mixture.

A4.3.9.3 The information given in this Section of the SDS should be such that it is possible to derive the physical hazards classification of the substance or mixture based on the information given in Section 9.

A4.3.9.4 Generally the information given in this section of the SDS should relate to standard conditions for temperature and pressure (temperature of 20 °C and absolute pressure of 101.3 kPa). If other conditions apply, these should be indicated together with the respective property.

A4.3.9.5 If relevant for the interpretation of the information or numeric value given, the method of determination should be provided (e.g., for flash point, open-cup/closed-cup).

A4.3.9.6 If specific properties do not apply (based on the respective information about relevance in the column "Remarks/Guidance") they do not have to be listed in the SDS.

A4.3.9.7 If information on specific properties is not available, they should still be listed in the SDS with a statement that they are not available unless they are not applicable in accordance with the remarks/guidance in the third column (e.g., the melting point does not have to be listed for gases).

A4.3.9.8 Other physical or chemical parameters in addition to those listed in the tables below may also be included in this section of the SDS.

A4.3.9.9 Clearly identify the properties and safety characteristics as indicated in the following Tables and specify appropriate units of measure.

Table 1: Basic physical and chemical properties

No.	Property	Remarks/Guidance All relevant information to protect people and the environment such as a short description, value(s), unit, conditions (e.g. temperature, pressure), method, each as appropriate
9.1.1	Physical state	<ul style="list-style-type: none"> - generally at standard conditions - for definitions for gas, liquid and solid see chapter 1.2 of the GHS
9.1.2	Colour	
9.1.3	Odour	<ul style="list-style-type: none"> - give a qualitative description of the odour if it is well-known or described in the literature - if available, indicate odour threshold (qualitatively or quantitatively)
9.1.4	Density and/or Relative density	<ul style="list-style-type: none"> - generally at standard conditions - for liquids and solids it is recommended to indicate the density - for gases it is recommended to indicate the relative density based on air at 20 °C as reference
9.1.5	Relative vapour density	<ul style="list-style-type: none"> - relevant for liquids only
9.1.6	Melting point / freezing point	<ul style="list-style-type: none"> - at standard pressure - indicate up to which temperature no melting point was observed in case the melting point is above the measuring range of the method - indicate if decomposition or sublimation occurs prior to or during melting - for waxes and pastes the softening point/range may be indicated instead - not relevant for gases
9.1.7	Boiling point or initial boiling point and boiling range	<ul style="list-style-type: none"> - generally at standard pressure (a boiling point at lower pressure might be indicated in case the boiling point is very high or decomposition occurs before boiling) - indicate up to which temperature no boiling point was observed in case the boiling point is above the measuring range of the method - indicate if decomposition occurs prior to or during boiling
9.1.8	Vapour pressure	<ul style="list-style-type: none"> - generally at standard temperature - indicate the vapour pressure at 50 °C for volatile fluids in addition (in order to enable distinction between gases and liquids based on the definitions in chapter 1.2 of the GHS) - indicate the most volatile component for mixtures where the vapour pressure is predominantly determined by this component - the saturated vapour concentration (SVC) may be indicated in addition. The saturated vapour concentration (in ml/m³) is linked to the vapour pressure (in hPa = mbar) as follows: SVC = vapour pressure · 987.2
9.1.9	Critical temperature	<ul style="list-style-type: none"> - relevant for gases only - for gas mixtures indicate the pseudocritical temperature. It is estimated as the mole weighted average of the critical temperatures of the components as follows: $\sum_{i=1}^n x_i \cdot T_{Ci}$ where x_i is molar concentration of the component i and T_{Ci} is the critical temperature of component i

No.	Property	Remarks/Guidance All relevant information to protect people and the environment such as a short description, value(s), unit, conditions (e.g. temperature, pressure), method, each as appropriate
9.1.10	Partition coefficient n-octanol/water (log value)	<ul style="list-style-type: none"> - not relevant for inorganic and ionic liquids - may be calculated (using QSAR – Quantitative structure-activity relationship) indicate whether the value is based on testing or on calculation
9.1.11	Solubility	<ul style="list-style-type: none"> - generally at standard temperature - indicate solubility in water - solubility in other (non-polar) solvents may also be included
9.1.12	pH	<ul style="list-style-type: none"> - indicate concentration of test substance in water - not applicable to gases - not applicable to non-aqueous liquids and solutions because the pH is linked to aqueous media by definition and any other measurement carried out in other media than aqueous liquids or solutions is not the pH
9.1.13	Kinematic viscosity	<ul style="list-style-type: none"> - relevant for liquids only - the dynamic viscosity may be indicated in addition. The kinematic viscosity is linked to the dynamic viscosity by the density: kinematic viscosity = dynamic viscosity / density
9.1.14	Particle characteristics	<ul style="list-style-type: none"> - relevant for solids only - indicate the particle size (median and range) - if available, further properties may be indicated in addition: <ul style="list-style-type: none"> - size distribution - shape and aspect ratio - crystallinity - dustiness - specific surface area - degree of aggregation or agglomeration, and dispersibility

Annex II

Preliminary draft text for Table 1 of Annex 4, Section 9 together with justifications

Property	Remarks / Guidance	Justification	Table 1.5.2
	All relevant information to protect people and the environment such as a short description, value(s), unit, conditions (e.g. temperature, pressure), method, each as appropriate		
Physical state	<ul style="list-style-type: none"> - generally at standard conditions - for definitions for gas, liquid and solid see chapter 1.2 of the GHS 	currently (a)	yes
Colour		currently (a)	yes
Odour	<ul style="list-style-type: none"> - give a qualitative description of the odour if it is well-known or described in the literature - if available, indicate odour threshold (qualitatively or quantitatively) 	currently (b) and (c)	yes
Density and/or Relative density	<ul style="list-style-type: none"> - generally at standard conditions - for liquids and solids it is recommended to indicate the density - for gases it is recommended to indicate the relative density based on air at 20 °C as reference 	currently (m)	yes
Relative vapour density	<ul style="list-style-type: none"> - relevant for liquids 	currently (l)	yes
Melting point / freezing point	<ul style="list-style-type: none"> - at standard pressure - indicate up to which temperature no melting point was observed if the melting point is above the measuring range of the method - indicate if decomposition or sublimation occurs prior to or during melting - for waxes and pastes the softening point/range may be indicated instead - not relevant for gases 	currently (e)	yes
Boiling point or initial boiling point and boiling range	<ul style="list-style-type: none"> - generally at standard pressure (a boiling point at lower pressure might be indicated in case the boiling point is very high or decomposition occurs before boiling) 	currently (f)	yes

Property	Remarks / Guidance	Justification	Table 1.5.2
	<p>All relevant information to protect people and the environment such as a short description, value(s), unit, conditions (e.g. temperature, pressure), method, each as appropriate</p> <ul style="list-style-type: none"> - indicate up to which temperature no boiling point was observed if the boiling point is above the measuring range of the method - indicate if decomposition occurs prior to or during boiling 		
Vapour pressure	<ul style="list-style-type: none"> - generally at standard temperature - indicate the vapour pressure at 50 °C for volatile fluids in addition (in order to enable distinction between gases and liquids based on the definitions in chapter 1.2 of the GHS) - indicate the most volatile component for mixtures where the vapour pressure is predominantly determined by this component - the saturated vapour concentration (SVC) may be indicated in addition. The saturated vapour concentration (in ml/m³) is linked to the vapour pressure (in hPa =mbar) as follows: SVC = vapour pressure x 987.2 	currently (k)	yes
Evaporation rate		Evaporation rate is effectively covered by the vapour pressure and all aspects that are important with regard to occupational safety and the risk of exposure can be dealt with based on the vapour pressure and the saturated vapour concentration (see above the comments for vapour density. As opposed to the vapour pressure it is also not an absolute number but only a comparison with a specified other chemical. It therefore is not needed in addition to the vapour pressure.	no

Property	Remarks / Guidance	Justification	Table 1.5.2
Critical temperature	<p>All relevant information to protect people and the environment such as a short description, value(s), unit, conditions (e.g. temperature, pressure), method, each as appropriate</p> <ul style="list-style-type: none"> - relevant for gases only - for gas mixtures indicate the pseudocritical temperature. It is estimated as the mole weighted average of the critical temperatures of the components T_{Ci} as follows: $\sum_{i=1}^n x_i \cdot T_{Ci}$ <p>where x_i is molar concentration of the component i and T_{Ci} is the critical temperature of component i</p>	The critical temperature is necessary for the distinction of the categories (groups) in the hazard class of gases under pressure. It therefore is proposed to add critical temperature.	yes
Partition coefficient n-octanol/water (log value)	<ul style="list-style-type: none"> - not relevant for inorganic and ionic liquids - may be calculated (using QSAR – Quantitative structure-activity relationship) - indicate whether the value is based on testing or on calculation 	currently (o)	yes
Solubility	<ul style="list-style-type: none"> - generally at standard temperature - indicate solubility in water - solubility in other (non-polar) solvents may also be included 	currently (n)	yes
pH	<ul style="list-style-type: none"> - indicate concentration of test substance in water - not applicable to gases - not applicable to non-aqueous liquids and solutions because the pH is linked to aqueous media by definition and any other measurement carried out in other media than aqueous liquids or solutions is not the pH 	currently (d)	yes
Kinematic viscosity	<ul style="list-style-type: none"> - relevant for liquids only - the dynamic viscosity may be indicated in addition. The kinematic viscosity is linked to the dynamic viscosity by the density: kinematic viscosity = dynamic viscosity / density 	currently (r)	yes

Property	Remarks / Guidance All relevant information to protect people and the environment such as a short description, value(s), unit, conditions (e.g. temperature, pressure), method, each as appropriate	Justification	Table 1.5.2
Particle characteristics	<ul style="list-style-type: none"> - relevant for solids only - indicate the particle size (median and range) - if available, further properties may be indicated in addition: <ul style="list-style-type: none"> - size distribution shape and aspect ratio - crystallinity - dustiness - specific surface area - degree of aggregation or agglomeration, and dispersibility 	Important information for health hazard assessment and for physical hazard classification of solids.	yes