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**INTERNATIONAL LABOUR OFFICE**

**ILO WORKING GROUP ON HARMONIZATION OF  
CHEMICAL HAZARD COMMUNICATION**

**PROPOSAL**

**HARMONIZED HAZARD  
COMMUNICATION TOOLS**

**FOR THE**

**GLOBALLY HARMONISED SYSTEM FOR THE  
CLASSIFICATION AND LABELLING OF CHEMICALS**

**May 2001**

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## INTRODUCTION

1. At its 76th Session in June 1989, the General Conference of the International Labour Organization, adopted a Resolution presented by the Government of India during the first discussion concerning the International Labour Organization convention on safety in the use of chemicals at work. This Resolution concerned the harmonization of systems of classification and labelling for the use of hazardous chemicals at work, and invited the Governing Body of the ILO to request the Director-General to assess the size of the task of harmonizing national and regional criteria and classification systems established for the use of chemicals at work and to prepare a report on the results of this assessment. Following the adoption by the ILO of a Chemicals Convention in 1990, the International Labour Office prepared the requested report and initiated a project to harmonize existing systems for the classification and labelling of chemicals.

2. This goal was further endorsed by the 1992 UN Conference on Environment and Development (UNCED) and included as one of the six areas for action identified in Chapter 19 of Agenda 21 on environmentally sound management of toxic chemicals. UNCED recommended "a globally harmonised hazard classification and compatible labelling system, including material safety data sheets and easily understandable symbols, (which) should be available, if feasible, by the year 2000". This goal was later endorsed by both the Intergovernmental Forum on Chemical Safety (IFCS) and the Inter-Organization Programme for the Sound Management of Chemicals (IOMC) which coordinates the actions of World Health Organization (WHO), ILO, United Nations Environment Programme (UNEP), Food and Agriculture Organisation (FAO), United Nations Industrial Development Organization (UNIDO), United Nations Institute for Training and Research (UNITAR) and the Organisation for Economic Cooperation and Development (OECD) aimed at implementing Chapter 19.

3. In 1992 the ILO established a Co-coordinating Group for the Harmonization of Chemical Classification Systems CG/HCCS to oversee the elaboration of a Globally Harmonized System for the Classification and Labelling of Chemicals (GHS). This evolved to become an IOMC Coordinating Group although the ILO continues to provide the secretariat for this Group. Overall, the technical work of harmonization is carried out through three Focal Points, namely the OECD for health and environmental hazard classification criteria, the UN Committee of Experts on Transport of Dangerous Goods (UN CETDG) for physical hazard classification criteria, and the ILO for Hazard Communication. The Governing Body of the ILO established a tripartite Working Group for the Harmonization of Chemical Hazard Communication (WG/HCCS) in March 1998 and this group has met on a roughly biannual basis since that time.

4. This Document is the third and final stage of the ILO Working Group's consideration of harmonization of chemical hazard communication. In November 2001 the Governing Body of the ILO will meet to consider the outcome of the work. The document presents the basis for the new system and highlights the final issues to be resolved by the Working Group at its meeting in May 2001. The results of the Working Group's considerations will be forwarded to the CG/HCCS for incorporation into the final GHS. Thereafter the management of the system will pass to of a new sub-committee of experts within the United Nations Committee of Experts for the Transport of Dangerous Goods and Globally Harmonised System of Classification and Labelling of Chemicals.

5. The Step 3 proposal is the culmination of many years of work spent by individuals from the project's conception, the detailed review and discussion of existing systems, and the examination of numerous options for bringing these together into a single harmonised global system. Many individuals have devoted considerable time and energy to the project during this time and the ILO wishes to express its heartfelt thanks for this commitment. This new system will provide a strong foundation for countries to use in developing comprehensive chemical control strategies and will make a considerable contribution to raising standards of worker and consumer protection throughout the world.

6. The production of this document was overseen by a Drafting Group established by the ILO Working Group and comprised the following individuals - Australia (Stephen Holland), Canada (Kim Headrick), Finland (Anna-Liisa Sundquist), Germany (Gregor Oberreuter), UK (Andrew Fasey), USA (Jennifer Silk), two IOE representatives (Michele Sullivan and Ulrich Haas) and a Labour representative (Mike Wright). They were supported in their endeavours by Iona Pratt (Ireland and Chairperson of the Working Group), Isaac Obadia (ILO) and Julie Wyeth (ILO working on secondment from the UK Health and Safety Executive).

## **PART A – GENERAL PRINCIPLES**

### **Objectives and Scope**

7. The Working Group's objective has been the development of a harmonised hazard communication system including labelling and (material) safety data sheets and easily understandable symbols based on the classification criteria developed by the other focal points within the IOMC Coordinating Group for the Harmonisation of Chemical Classification Systems CG/HCCS. The proposed harmonised arrangements are described in this document with Part B describing the harmonised labelling system, and Part C the system for (material) safety data sheets.

8. There are a number of important points regarding principles, scope and the application of the system, which are described in this introductory Part A. These are designed to provide some guidance to the rationale for the approaches taken by the Working Group in formulating the Step 3 proposals. These were steered largely by the Working Group Terms of Reference, which in summary were designed to take account of:

- the need to ensure the health and safety of target audiences and the environment;
- the right of workers and consumers to know the identity and hazards of the chemicals they use;
- the need to facilitate international trade and protect confidential business information;
- the need for a system that is simple, effective, easy to apply and takes account of the needs in developing countries;
- the need for compatibility with existing international instruments;
- the use of the harmonised hazard classification criteria for all hazards covered by the GHS;
- the comprehensibility, accuracy and completeness of information;
- the different settings in which target audiences encounter hazardous chemicals;
- some consideration of risk in communication to certain target audiences;
- the role of education and training;
- recognition of the need for guidance.

9. In addition the principles contained in the IOMC CG/HCCS Terms of Reference and the document 'Description and Further Clarification of the Anticipated Application of the GHS (also referred to as 'The Scope Document') also applied to the work on harmonisation of hazard communication.

### **Life-cycle**

10. The overarching principles that define how the GHS applies to products containing hazardous chemicals and therefore how labelling arrangements should apply were taken from the IOMC Scope document:

*“The work on harmonisation of hazard classification and labelling focuses on a harmonised system for all chemicals, and mixtures of chemicals. The application of the components of the system may vary by type of product or stage of the life cycle. Once a chemical is classified, the likelihood of adverse effects may be considered in deciding what informational or other steps should be taken for a given product or use setting. Pharmaceuticals, food additives and pesticide residues in food will not be covered (by the work on harmonisation) in terms of labelling at the point of intentional intake.*

*However, these types of chemicals would be covered where workers may be exposed, and in transport if potential exposure warrants. The CG/HCCS recognises that further discussion will be required to address specific application issues for some product use categories which may require the use of specialised expertise.”*

## **Hazard and risk**

11. There have been a number of discussions within the GHS on the terms hazard and risk. The following explanation of hazard and risk was used during the Working Group discussions of hazard-based and risk-based labelling and was taken from the IOMC Scope document:

***“ The degree of a chemical’s capacity to harm depends on its intrinsic properties i.e. its capacity to interfere with normal biological processes, and its capacity to burn, explode, corrode etc. The concept of risk or the likelihood of harm occurring, and subsequent communication of that information, is introduced when exposure is considered in conjunction with the data regarding potential hazards. The basic approach to risk assessment therefore is the simple formula:***

$$\text{Hazard} \times \text{Exposure} = \text{Risk}$$

***Thus if you can minimize either hazard or exposure, you minimize the risk or likelihood of harm. Successful hazard communication alerts the user to the presence of a hazard and the need to minimize exposures and the resulting risks.”***

## **Application of the harmonised hazard communication system**

12. The harmonised system for hazard communication includes the appropriate labelling tools to convey information about each of the hazard classes and categories in the GHS. These are described in Part B. The use of different symbols, signal words or hazard statements other than those which have been assigned to each of the GHS hazard classes and categories would be contrary to harmonization. There has however been considerable discussion about how the GHS should be applied in different use settings to provide some flexibility to take account of the needs of the different target-audiences. The Working Group considered the application of the following General Principle described in the IOMC CG/HCCS Terms of Reference:

***“harmonization means establishing a common and coherent basis for chemical hazard classification and communication, from which the appropriate elements relevant to means of transport, consumer, worker and environment protection can be selected.” (The Building Block Principle).***

13. The Working Group recognized that there will be circumstances where the demands and rationale of systems may warrant some flexibility in whether to incorporate certain hazard classes and categories for certain target audiences. For example, the scope of the UN RTDG encompasses only the most severe hazard categories of the acute toxicity hazard class. This system would not label substances or mixtures falling within the scope of the less severe hazard categories (i.e. those falling within the oral range > 300mg/kg). However, should the scope of that system be amended to incorporate substances and mixtures falling in these less severe hazard categories, they should be labelled with the appropriate GHS labelling tools. The use of different cut-offs to determine which products are labelled in a hazard category, would be contrary to harmonization.

14. It is recognized that the UN RTDG model regulations provide label information primarily in a graphic form because of the needs of its target audiences. Therefore the UN RTDG may choose not to include signal words and hazard statements in the model regulations as part of the information provided on the label.

## Terminology

15. During Working Group discussions, different terminology was used at times to describe the same or similar things. For example, health and environmental hazards were referred to as toxicological "endpoints" or danger classes. A similar problem arose for descriptions of the level of hazard, the variants of which included hazard class, hazard level and hazard category. A description of common terms and working definitions which is specific to certain issues in this document is as follows:

**“Alloy”.** An alloy is a metallic material, homogeneous on a macroscopic scale, consisting of two or more elements so combined that they cannot be readily separated by mechanical means. Alloys are considered to be mixtures for the purpose of classification under the GHS.

**“Chemical identity”.** Chemical identity means a name that will uniquely identify a chemical, This can be a name that is in accordance with the nomenclature systems of the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS), or a technical name.

**“Hazard Category”.** This is the term used in the document to describe the division of criteria within each hazard class i.e. oral acute toxicity has five hazard categories and flammable liquids has four hazard categories. These compare hazard severity within a hazard class and should not be taken as a comparison of hazard categories more generally.

**“Hazard Class”.** This is the term used in the document to describe the nature of the physical, health or environmental hazard i.e. carcinogen, flammable solid, oral acute toxicity.

**“Hazard Statement”.** A hazard statement means a phrase assigned to a hazard class and category that describes the nature of the hazards of a hazardous product, including, where appropriate, the degree of hazard.

**“Label”.** A label means an appropriate group of written, printed or graphic information elements concerning a hazardous product, selected as relevant to the target sector(s), that is affixed to, printed on, or attached to the immediate container of a hazardous product, or to the outside packaging of the hazardous product .

**“Label Element”.** A label element means one type of information that has been harmonized for use in a label, e.g. pictogram, signal word.

**“Pictogram”.** A pictogram means a composition that may include a symbol plus other graphic elements, such as a border, background pattern or colour that is intended to convey specific information.

**“Precautionary statement”.** A precautionary statement means a phrase (and/or pictogram) that describes recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous product, or improper storage or handling of a hazardous product.

**“Product identifier”.** A product identifier means the name or number used for a hazardous product on a label or in the SDS. It provides a unique means by which the product user can identify the substance or mixture within the particular use setting e.g. transport, consumer or workplace.

**“Signal word”.** A signal word means a word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label.

**“Supplemental Label Element”.** A supplemental label element means any additional non-harmonized type of information supplied on the container of a hazardous product that is not required or specified under the GHS. In some cases this information may be required by other competent authorities or it may be additional information provided at the discretion of the manufacturer/distributor.

**“Symbol”.** A symbol means a graphical element intended to succinctly convey information.

**“Technical name”.** A name that is generally used in commerce, regulations and codes to identify a substance or mixture, other than the IUPAC or CAS name, and that is recognized by the scientific community. Examples of technical names include those used for complex mixtures (e.g., petroleum fractions or natural products), pesticides (e.g., ISO or ANSI systems), dyestuffs (Colour Index system) and minerals.

## **Target audiences**

16. The Working Group spent considerable time identifying and considering the needs of the target audiences that will be the primary end-users of the harmonised hazard communication scheme. Particular attention has been given to a discussion of the manner in which these target audiences will receive and use the information conveyed about hazardous chemicals. Factors discussed include the potential use of products, availability of information other than the label and the availability of training.

17. The Working Group recognized that it is difficult to completely separate the needs of different target audiences. For example, both workers and emergency responders use labels in storage facilities, and products such as paints and solvents are used both by consumers and in workplaces. That said there are certain characteristics which are particular to the different target audiences. The following paragraphs in this section consider the target audiences and the type of information they need.

### **Workplace**

18. Employers and workers need to know the hazards specific to the chemicals used and or handled in the workplace, as well as information about the specific protective measures required to avoid the adverse effects that might be caused by those hazards. In the case of storage of chemicals, potential hazards are minimised by the containment (packaging) of the chemical, but in the case of an accident, workers and emergency responders need to know what mitigation measures are appropriate. Here they may require information which can be read at a distance. The label, however, is not the sole source of this information, which is also available through the SDS and workplace risk management system. The latter should also provide for training in hazard identification and prevention. The nature of training provided and the accuracy, comprehensibility and completeness of the information provided on the SDS may vary. However, compared to consumers for example, workers can develop a more in depth understanding of symbols and other types of information.

### **Consumers**

19. The label in most cases is likely to be the sole source of information readily available to the consumer. The label, therefore, will need to be sufficiently detailed and relevant to the use of the product. There are considerable philosophical differences within the Working Group on the approach to providing information to consumers. Labelling based on the likelihood of injury (i.e. risk communication) is considered to be an effective approach in this respect by some consumer labelling systems, whilst others take account of the ‘right to know’ principle in providing information to consumers which is solely based on the products hazards. Consumer education is more difficult and less efficient than education for other audiences. Providing sufficient information to consumers in the simplest and most easily understandable terms presents a considerable challenge. The issue of comprehensibility is of particular importance for this target audience, since consumers may rely solely

on label information.

### **Emergency responders**

20. Emergency responders need information on a range of levels. To facilitate immediate responses, they need accurate, detailed and sufficiently clear information. This applies in the event of an accident during transportation, in storage facilities or at workplaces. Fire-fighters and those first at the scene of an accident for example, need information that can be distinguished and interpreted at a distance. Such personnel are highly trained in the use of graphical and coded information. However, emergency responders also require more detailed information about hazards and response techniques, which they obtain from a range of sources. The information needs of medical personnel responsible for treating the victims of an accident or emergency may differ from those of fire-fighters.

### **Transport (UN RTDG model regulations)**

21. The UN RTDG model regulations cater for a wide range of target audiences although transport workers and emergency responders are the principal ones. Others include employers, those who offer or accept dangerous goods for transport or load or unload packages of dangerous goods into or from transport vehicles, or freight containers. All need information concerning general safe practices that are appropriate for all transport situations. For example, a driver will have to know what has to be done in case of an accident irrespective of the substance transported: (e.g. report the accident to authorities, keep the shipping documents in a given place, etc.) Drivers may only require limited information concerning specific hazards, unless they also load and unload packages or fill tanks etc. Workers who might come into direct contact with dangerous goods, for example on board ships, require more detailed information.

## **Comprehensibility**

22. Comprehensibility of the information provided has been one of the most important issues addressed in the development of the hazard communication system. The aim of the harmonised system is to present the information in a manner that the intended audience can easily understand. The Working Group has identified some guiding principles to assist this process:

- Information should be conveyed in more than one way.
- The comprehensibility of the components of the system should take account of existing studies and literature as well as any evidence gained from testing.
- The phrases used to indicate degree (severity) of hazard should be consistent across different hazard types.

23. The latter point was subject to some debate concerning the comparison of severity between long-term effects such as carcinogenicity and physical hazards such as flammability. Whilst it might not be possible to directly compare physical hazards to health hazards, it may be possible to provide target audiences with a means of putting the degree of hazard into context and therefore convey the same degree of concern about the hazard.

### **Comprehensibility testing methodology**

24. A preliminary review of the literature undertaken by the University of Maryland indicated that common principles related to comprehensibility could be applied to the development of the harmonised hazard communication scheme. The University of Cape Town developed these into a comprehensive testing methodology to assess the comprehensibility of the hazard communication system. In addition to testing individual label components, this methodology considers the

comprehensibility of label components in combination. This was considered particularly important to assess the comprehensibility of warning messages for consumers where there is less reliance on training to aid understandability. The testing methodology also includes a means of assessing SDS comprehensibility.

### **Translation**

25. Options for the use of textual information present an additional challenge for comprehensibility. Clearly words and phrases need to retain their comprehensibility when translated, whilst conveying the same meaning. The IPCS Chemical Safety Card Programme has gained experience of this in translating standard phrases in a wide variety of languages. The EU also has experience of translating terms to ensure the same message is conveyed in multiple languages e.g. hazard, risk etc. Similar experience has been gained in North America where the North American Emergency Response Guidebook, which uses key phrases, is available in a number of languages.

### **Standardization**

26. To fulfil the goal of having as many countries as possible adopt the system, the Working Group has based much of the system on standardised approaches to make it easier for companies to comply with and for countries to implement the system. The Working Group identified that standardisation could be applied to certain label elements – symbols, signal words, statements of hazard, precautionary statements – and to label format and colour and to SDS format. It employed a clear mechanism for the identification and development of options for the standardised elements.

### **Application of standardization in the harmonised system**

27. For labels, the hazard symbols, signal words and hazard statements have all been standardised and assigned to each of the hazard categories. These standardised elements should not be subject to variation, and should appear on the GHS label as indicated in Part B of this document. For safety data sheets, Part C provides there is a standardised format for the presentation of information. Whilst precautionary information was considered for standardisation, there was insufficient time to develop detailed proposals. However, there are examples of precautionary statements and pictograms in Annexes II and III of Part B and it remains a goal to develop them into fully standardised label elements.

### **Use of non-standardized or supplemental information**

28. There are many other label elements which may appear on a label, which have not been standardized in the harmonised system. Some of these clearly need to be included on the label, for example precautionary statements. Additional information may be required by competent authorities, or suppliers may choose to add supplementary information on their own initiative. In order to ensure that the use of non-standardized information does not lead to unnecessarily wide variation in information or undermine GHS information, the use of supplementary information should be limited to the following circumstances:

- the supplementary information provides further detail and does not contradict or cast doubt on the validity of the standardized hazard information, or;
- the supplementary information provides information about hazards not yet incorporated into the GHS.

In either instance, the supplementary information should not lower standards of protection.

29. The labeller should have the option of providing supplementary information related to the hazard, such as physical state or route of exposure, with the hazard statement rather than in the supplementary information section on the label, see also paragraph 54.

### **Updating Information**

30. All systems should specify a means of responding in an appropriate and timely manner to new information and updating labels and SDS information accordingly. Examples of how this could be achieved will be provided in guidance.

### **Confidential Business Information**

31. Systems adopting the GHS should consider what provisions may be appropriate for the protection of confidential business information (CBI). Such provisions should not compromise the health and safety of workers or consumers, or the protection of the environment. As with other parts of the GHS, the rules of the importing country should apply with respect to CBI claims for imported chemicals.

32. Where a system chooses to provide for protection of confidential business information, competent authorities should establish appropriate mechanisms, in accordance with national law and practice, and consider:

- whether the inclusion of certain chemicals or classes of chemicals in the arrangements is appropriate to the needs of the system;
- what definition of "confidential business information" should apply, taking account of factors such as the accessibility of the information by competitors, intellectual property rights and the potential harm disclosure would cause to the employer or supplier's business; and
- appropriate procedures for the disclosure of confidential business information, where necessary to protect the health and safety of workers or consumers, or to protect the environment, and measures to prevent further disclosure.

33. Specific provisions for the protection of confidential business information may differ among systems in accordance with national law and practice. However, they should be consistent with the following general principles:

- a) For information otherwise required on labels or safety data sheets, CBI claims should be limited to the names of chemicals, and their concentrations in mixtures. All other information should be disclosed on the label and/or (material) safety data sheet, as required.
- b) Where CBI has been withheld, the label or chemical safety data sheet should so indicate.
- c) CBI should be disclosed to the competent authority upon request. The competent authority should protect the confidentiality of the information in accordance with applicable law and practice.
- d) Where a medical professional determines that a medical emergency exists due to exposure to a hazardous chemical or a chemical mixture, mechanisms should be in place to ensure timely disclosure by the supplier or employer or competent authority of any specific confidential information necessary for treatment. The medical professional should maintain the confidentiality of the information.
- e) For non-emergency situations, the supplier or employer should ensure disclosure of confidential information to a safety or health professional providing medical or other safety

and health services to exposed workers or consumers, and to workers or workers' representatives. Persons requesting the information should provide specific reasons for the disclosure, and should agree to use the information only for the purpose of consumer or worker protection, and to otherwise maintain its confidentiality.

- f) Where non disclosure of CBI is challenged, the competent authority should address such challenges or provide for an alternative process for challenges. The supplier or employer should be responsible for supporting the assertion that the withheld information qualifies for CBI protection.

## **Training**

34. Training users of hazard information is an integral part of hazard communication. Systems should identify the appropriate education and training for GHS target audiences who are required to interpret label and/or SDS information and to take appropriate action in response to chemical hazards. Training requirements should be appropriate for and commensurate with the nature of the work or exposure. Key target audiences for training include workers, emergency responders, and those involved in the preparation of labels, SDS and hazard communication strategies as part of risk management systems. Others involved in the transport and supply of hazardous chemicals also require training to varying degrees.

35. In addition systems should also consider strategies required for educating consumers in interpreting label information on products that they use.

## **PART B - LABELLING PROCEDURES**

### **Assignment of Label Elements**

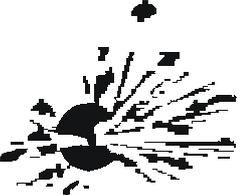
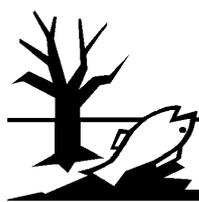
36. The tables in **Annex I** detail the label elements (symbol, signal word, hazard statement) that have been assigned to each of the hazard categories of the GHS (these reflect the harmonised classification criteria). There are special arrangements, which apply to the use of certain mixture concentrations in the GHS to take account of the information needs of different target audiences. These are described in

### **Precautionary statements and pictograms**

37. The GHS label should include appropriate precautionary information and Annex II contains examples of precautionary statements which can be used. Annex III contains examples of precautionary pictograms which can be used where allowed by the Competent Authority. There are a number of reference sources providing advice on the use of precautionary information which will be made available in the guidance document.

### **Reproduction of the symbol**

38. The following symbols are the standard symbols which should be used in the GHS. With the exception of the new symbol which will be used for certain health hazards, the exclamation mark and the fish and tree, they are the standard symbol set used in the UN RTDG model regulations.

<b>Flame</b>	<b>Flame over circle</b>	<b>Exploding bomb</b>	<b>Corrosion</b>
			
<b>Gas cylinder</b>	<b>Skull and crossbones</b>	<b>Exclamation Mark</b>	<b>Environment</b>
			

<b>New Symbol</b>	
	<b>The new symbol which will be used for certain health hazards will be referred to the IOMC coordinating group for consideration by September 7, 2001.</b>

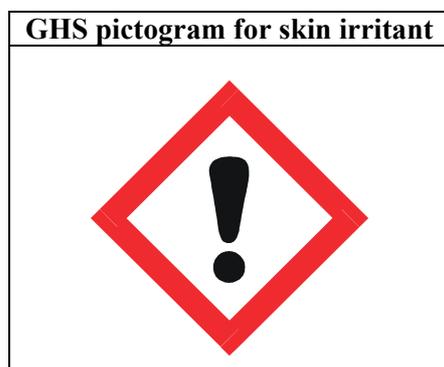
## Reproduction of the hazard pictogram

### Shape and colour

39. All hazard pictograms used in the harmonized system should be in the shape of a square set at a point.
40. Pictograms prescribed by the UNRTDG Model regulations will use a background and symbol colour as specified by those regulations. An example of the pictogram used in the UNRTDG for flammable liquid is provided in the table below.

<b>Pictogram for flammable liquid in the UN RTDG model regulations</b>


41. Pictograms prescribed by the GHS but not the UN RTDG model regulations should have a black symbol on a white background with a red frame sufficiently wide to be clearly visible. However, when such a pictogram appears on a label for a package which will not be exported, the Competent Authority may choose to give suppliers and employers discretion to use a black border. In addition, Competent Authorities may allow the use of UN RTDG pictograms in other use settings where the package is not covered by the UN RTDG. An example of a GHS pictogram used for a skin irritant is provided in the table below.



#### **Packages covered by the UN RTDG model regulations and other labelling systems**

44. Where a UN RTDG pictogram appears on a label, a GHS pictogram for the same hazard should not appear.

#### **Guidance**

45. There have been some concerns about how the label elements should appear on different packagings. There will be guidance and examples provided in the GHS Guidance Document which is currently under development.

### **Product and supplier identification**

#### **Product identifier**

46. A product identifier should be used on a GHS label and it should match the product identifier used on the SDS. Where a substance or mixture is also covered by the UN RTDG, the UN proper shipping name should also be used on the package.

47. The label for a substance should include the chemical identity of the substance. For mixtures or alloys, the label should include the chemical identities of all ingredients or alloying elements that contribute to acute toxicity, skin or eye corrosion, germ cell mutagenicity, carcinogenicity, reproductive toxicity, skin or respiratory sensitization, or TOST, when these hazards appear on the label. Alternatively, the Competent Authority may require the inclusion of all ingredients or alloying elements that contribute to the hazard of the mixture or alloy.

48. Where a substance or mixture is supplied exclusively for workplace use, the competent authority may choose to give suppliers discretion to include chemical identities on the SDS, in lieu of including them on labels.

49. The competent authority rules for CBI take priority over the rules for product identification. This means that where an ingredient would normally be included on the label, if it meets the competent authority criteria for CBI, its identity does not have to be included on the label.

### **Supplier Identification**

50. The name, address and telephone number of the manufacturer or supplier of the substance or mixture should be provided on the label.

51. The following arrangements apply where a substance or mixture presents more than one GHS hazard. It is without prejudice to the building block principle described in Part A, paragraphs 12 and 13. Therefore where a system does not provide information on the label for a particular hazard, the application of the arrangements should be modified accordingly.

### **Precedence for the allocation of symbols**

52. For substances and mixtures covered by the UN RTDG, the precedence of symbols for physical hazards should follow the rules of the UN RTDG. In workplace situations, the Competent Authority may require all symbols for physical hazards to be used. For health hazards the following principles of precedence apply:

- if the skull and crossbones applies, the exclamation mark should not appear;
- if the corrosive symbol applies, the exclamation mark should not appear where it is used for skin or eye irritation;
- if the new health hazard symbol appears for respiratory sensitisation, the exclamation mark should not appear where it is used for dermal sensitisation or for skin or eye irritation.

### **Precedence for allocation of signal words**

53. If the signal word 'Danger' applies, the signal word 'Warning' should not appear.

### **Precedence for allocation of hazard statements**

54. All assigned hazard statements should appear on the label. The competent authority may choose to specify the order in which they appear.

### **Arrangements for presenting the label elements on the label.**

#### **Location of GHS information on the label**

55. The GHS hazard pictograms signal word and hazard statements should be located together on the label. The competent authority may choose to provide a specified layout for the presentation of these and for the presentation of precautionary information, or allow supplier discretion.

#### **Supplemental information**

56. The competent authority has the discretion to allow the use of supplemental information subject to the parameters outlined in Part A, paragraph 28. The competent authority may choose to specify where this information should appear on the label or allow supplier discretion. In either approach, the placement of supplemental information should not impede identification of GHS information.

#### **Use of colour outside pictograms**

57. In addition to its use in pictograms, colour can be used on other areas of the label to implement special labelling requirements such as the use of the pesticide bands in the FAO Labelling Guide, for signal words and hazard statements or as background to them, or as otherwise provided for by the competent authority.

## **Special arrangements.**

### **General**

58. The competent authority may chose to allow communication of certain hazard information for carcinogens, reproductive toxicity and target organ systemic toxicity repeat exposure on the label and on the SDS, or through the SDS alone (see the OECD Integrated Document for details of relevant cut-offs for these classes).

59. Similarly, for metals and alloys, the competent authority may chose to allow communication of the hazard information through the SDS alone when they are supplied in the massive, non-dispersible, form.

### **Workplace labelling**

60. Products falling within the scope of the GHS will carry the GHS label at the point where they are supplied to the workplace, and that label should be maintained on the supplied container in the workplace. The GHS label or label elements should also be used for workplace containers. However, the competent authority can allow employers to use alternative means of giving workers the same information in a different written or displayed format when such a format is more appropriate to the workplace and communicates the information as effectively as the GHS label. For example, label information could be displayed in the work area, rather than on the individual containers. The GHS guidance document will contain further examples of where alternative arrangements may be appropriate.

### **Consumer Product Labelling Based on the Likelihood of Injury**

61. All systems should use the GHS classification criteria. Consistent with the IOMC scope paper, however, some consumer labelling systems will provide label information based solely on hazard, while other consumer labelling systems may provide information based on the likelihood of harm (risk-based labelling). In the latter case the Competent Authority would establish procedures for determining the potential exposure and risk for the use of the product. Labels based on this approach provide targeted information on identified risks but may not include certain information on chronic health effects (e.g. TOST following repeated exposure, reproductive toxicity and carcinogenicity), that would appear on a label based on hazard alone. The GHS Guidance Document contains a general explanation of the broad principles of the risk-based labelling.

### **Tactile warnings**

62. If tactile warnings are used, the technical specifications shall conform with EN ISO standard 11683 (1997 edition) relating to tactile warnings of danger.

## **PART C –SAFETY DATA SHEETS**

### **Role of the SDS in the harmonised system**

63. The SDS should provide comprehensive information about a chemical substance or mixture for use in workplace chemical control regulatory frameworks. Both employers and workers use it as a source of information about hazards, including environmental hazards, and to obtain advice on safety precautions. The information acts as a reference source for the management of hazardous chemicals in the workplace. The SDS is product related and, usually, is not able to provide specific information that is relevant for any given workplace where the product may finally be used, although where products have specialized end uses the SDS information may be more workplace-specific. The

information therefore enables the employer to develop an active programme of worker protection measures, including training, which is specific to the individual workplace and to consider any measures which may be necessary to protect the environment.

64. In addition, the SDS provides an important source of information for other target audiences in the GHS. So certain elements of information may be used by those involved with the transport of dangerous goods, emergency responders (including poison control centres), those involved in the professional use of pesticides and consumers. However, these audiences receive additional information from a variety of other sources such as the UN RTDG document and package inserts for consumers and will continue to do so. The introduction of a harmonised labelling system therefore, is not intended to affect the primary use of the SDS which is for workplace users.

## **WHEN THE SDS IS REQUIRED**

65. The SDS should be produced for all substances and mixtures which meet the criteria for physical, health or environmental hazards under the GHS. The competent authority may choose also to require SDSs for hazardous substances in concentrations exceeding the cut-off limits specified by the criteria for mixtures. It should provide a clear description of the data used to identify the hazards.

## **SDS Format**

66. The information in the SDS should be presented using the following 16 headings in the order given below.

1. Identification.
2. Hazard(s) identification.
3. Composition/information on ingredients.
4. First-aid measures.
5. Fire-fighting measures.
6. Accidental release measures.
7. Handling and storage.
8. Exposure controls/personal protection.
9. Physical and chemical properties.
10. Stability and reactivity.
11. Toxicological information.
12. Ecological information.
13. Disposal considerations.
14. Transport information.
15. Regulatory information.
16. Other information.

## **SDS Content**

67. The following minimum information should be included, where applicable or available, on the SDS under the relevant headings. If specific information is not applicable or not available under a particular subheading, the SDS should clearly state this. Additional information may be required by competent authorities. Further information on the compilation of SDS, including reference to relevant standards, will be included in the Guidance Document.

### **1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER**

- GHS product identifier
- Other means of identification.
- Recommended use of the chemical and restrictions on use.
- Supplier's details (inc name, address, phone number etc).

- Emergency phone number.

## **2. HAZARDS IDENTIFICATION**

- GHS classification of the substance/mixture and any regional information.
- GHS label elements, including precautionary statements. (Hazard symbols may be provided as a graphical reproduction of the symbols in black and white or the name of the symbol e.g. flame, skull and crossbones.)
- Other hazards which do not result in classification (e.g. dust explosion hazard) or are not covered by the GHS.

## **3. COMPOSITION/INFORMATION ON INGREDIENTS**

### Substance

- Chemical identity
- Common name, synonyms etc.
- CAS number, EC number etc.
- Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance.

### Mixture

- The chemical identity and concentration or concentration ranges of all ingredients which are hazardous within the meaning of the GHS and are present above their cut-off levels.

*Note: For information on ingredients, the competent authority rules for CBI take priority over the rules for product identification.*

## **4. FIRST AID MEASURES**

- Description of necessary measures, subdivided according to the different routes of exposure, i.e. inhalation, skin and eye contact and ingestion.
- Most important symptoms/effects, acute and delayed.
- Indication of immediate medical attention and special treatment needed, if necessary.

## **5. FIRE-FIGHTING MEASURES**

- Suitable (and unsuitable) extinguishing media.
- Specific hazards arising from the chemical (e.g. nature of any hazardous combustion products).
- Special protective equipment and precautions for fire-fighters.

## **6. ACCIDENTAL RELEASE MEASURES**

- Personal precautions, protective equipment and emergency procedures.
- Environmental precautions.
- Methods and materials for containment and cleaning up.

## **7. HANDLING AND STORAGE**

- Precautions for safe handling.
- Conditions for safe storage, including any incompatibilities.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- Control parameters e.g. occupational exposure limit values or biological limit values.
- Appropriate engineering controls.
- Individual protection measures, such as personal protective equipment.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance (physical state, colour etc)
- Odour
- Odour threshold
- pH
- melting point/freezing point
- initial boiling point and boiling range
- flash point:
- evaporation rate
- flammability (solid, gas)
- upper/lower flammability or explosive limits
- vapour pressure
- vapour density
- relative density:
- solubility(ies)
- partition coefficient: n-octanol/water:
- auto-ignition temperature
- decomposition temperature

## 10. STABILITY AND REACTIVITY

- Chemical stability.
- Possibility of hazardous reactions.
- Conditions to avoid (e.g. static discharge, shock or vibration)
- Incompatible materials
- Hazardous decomposition products

## 11. TOXICOLOGICAL INFORMATION

**Concise but complete and comprehensible description of the various toxicological (health) effects and the available data used to identify those effects, including:**

- information on the likely routes of exposure (inhalation, ingestion, skin and eye contact);
- Symptoms related to the physical, chemical and toxicological characteristics;
- Delayed and immediate effects and also chronic effects from short- and long-term exposure.
- Numerical measures of toxicity (such as acute toxicity estimates)

## 12. ECOLOGICAL INFORMATION

- Ecotoxicity (aquatic and terrestrial, where available).
- Persistence and degradability
- Bioaccumulative potential
- Mobility in soil
- Other adverse effects

## 13. DISPOSAL CONSIDERATIONS

- Description of waste residues and information on their safe handling and
- methods of disposal, including any contaminated packaging.

#### **14. TRANSPORT INFORMATION**

- UN number
- UN Proper shipping name.
- Transport Hazard class(es).
- Packing group, if applicable.
- Marine pollutant (Y/N).
- Special precautions which a user needs to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises.

#### **15. REGULATORY INFORMATION**

- Safety, health and environmental regulations specific for the product in question.

#### **16. OTHER INFORMATION INCLUDING INFORMATION ON PREPARATION AND REVISION OF THE SDS**

##### **Access to SDS**

68. Workers and their representatives will have ready access to the SDS as will the competent authority and emergency personnel.

## **ANNEX I**

## Allocation of Label Elements

The assigned symbol, followed by a signal word and hazard statement are given in that order for each hazard category of the hazard class in the tables below:

ACUTE TOXICITY: ORAL				
Category 1	Category 2	Category 3	Category 4	Category 5
 <b>Danger</b> Fatal if swallowed	 <b>Danger</b> Fatal if swallowed	 <b>Danger</b> Toxic if swallowed	 <b>Warning</b> Harmful if swallowed	No symbol  <b>Warning</b> May be harmful if swallowed
ACUTE TOXICITY: DERMAL				
Category 1	Category 2	Category 3	Category 4	Category 5
 <b>Danger</b> Fatal in contact with skin	 <b>Danger</b> Fatal in contact with skin	 <b>Danger</b> Toxic in contact with skin	 <b>Warning</b> Harmful in contact with skin	No symbol  <b>Warning</b> May be harmful in contact with skin
ACUTE TOXICITY: INHALATION				
Category 1	Category 2	Category 3	Category 4	Category 5
 <b>Danger</b> Fatal if inhaled	 <b>Danger</b> Fatal if inhaled	 <b>Danger</b> Toxic if inhaled	 <b>Warning</b> Harmful if inhaled	No symbol  <b>Warning</b> May be harmful if inhaled

SKIN CORROSION/IRRITATION				
Category 1A	Category 1B	Category 1C	Category 2	Category 3
 <p><b>Danger</b></p> <p>Causes severe skin burns and eye damage</p>	 <p><b>Danger</b></p> <p>Causes severe skin burns and eye damage</p>	 <p><b>Danger</b></p> <p>Causes severe skin burns and eye damage</p>	 <p><b>Warning</b></p> <p>Causes skin irritation</p>	<p><b>No symbol</b></p> <p><b>Warning</b></p> <p>Causes mild skin irritation</p>
EYE CORROSION/IRRITATION				
Category 1	Category 2A	Category 2B	-	-
 <p><b>Danger</b></p> <p>Causes severe eye damage</p>	 <p><b>Warning</b></p> <p>Causes severe eye irritation</p>	<p><b>No symbol</b></p> <p><b>Warning</b></p> <p>Causes eye irritation</p>		
RESPIRATORY SENSITIZATION *				
Category 1	-	-	-	-
 <p><b>Danger</b></p> <p>May cause allergy or asthma symptoms or breathing difficulties if inhaled</p>	<p>* <b>Note:</b> There has been considerable discussion about what to convey to those exposed about sensitization effects, and at what point it should be conveyed. While the current cut-off for mixtures is 1%, it appears that the major systems all believe information should be conveyed below that level. This may be appropriate both to warn those already sensitized, as well as to warn those who may become sensitized. This issue was not clear during the initial deliberations on the criteria for mixtures containing sensitizers, and thus has not been adequately discussed nor options explored. Before the system becomes implemented, this issue should be revisited by the ECOSOC Subcommittee on GHS as one of its priorities. It should be noted that the sensitization criteria for substances will also have to be re-opened to consider this issue and the inclusion of a test method currently being reviewed that addresses the question of strong sensitizers versus those that are weaker. Appropriate hazard communication should be considered along with the discussions on the criteria and the availability of an appropriate test method.</p>			

**DERMAL SENSITIZATION\***

<b>Category 1</b>	-	-	-	-
 <p><b>Warning</b> May cause an allergic skin reaction</p>	<p><b>*Note:</b> There has been considerable discussion about what to convey to those exposed about sensitization effects, and at what point it should be conveyed. While the current cut-off for mixtures is 1%, it appears that the major systems all believe information should be conveyed below that level. This may be appropriate both to warn those already sensitized, as well as to warn those who may become sensitized. This issue was not clear during the initial deliberations on the criteria for mixtures containing sensitizers, and thus has not been adequately discussed nor options explored. Before the system becomes implemented, this issue should be revisited by the ECOSOC Subcommittee on GHS as one of its priorities. It should be noted that the sensitization criteria for substances will also have to be re-opened to consider this issue and the inclusion of a test method currently being reviewed that addresses the question of strong sensitizers versus those that are weaker. Appropriate hazard communication should be considered along with the discussions on the criteria and the availability of an appropriate test method.</p>			

**GERM CELL MUTAGENICITY**

<b>Category 1A</b>	<b>Category 1B</b>	<b>Category 2</b>	-	-
 <p><b>Danger</b> May cause genetic defects <i>(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard )</i></p>	 <p><b>Danger</b> May cause genetic defects <i>(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</i></p>	 <p><b>Warning</b> Suspected of causing genetic defects <i>(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)</i></p>		

CARCINOGENICITY				
Category 1A	Category 1B	Category 2	-	-
 <p><b>Danger</b></p> <p>May cause cancer <i>(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard )</i></p>	 <p><b>Danger</b></p> <p>May cause cancer <i>(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard )</i></p>	 <p><b>Warning</b></p> <p>Suspected of causing cancer <i>(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard )</i></p>		
TOXIC TO REPRODUCTION				
Category 1A	Category 1B	Category 2	Additional Category	-
 <p><b>Danger</b></p> <p>May damage fertility or the unborn child <i>(state specific effect if known or route of exposure if it is conclusively proven that no other routes of exposure cause the hazard )</i></p>	 <p><b>Danger</b></p> <p>May damage fertility or the unborn child <i>(state specific effect if known or route of exposure if it is conclusively proven that no other routes of exposure cause the hazard )</i></p>	 <p><b>Warning</b></p> <p>Suspected of damaging fertility or the unborn child <i>(state specific effect if known or route of exposure if it is conclusively proven that no other routes of exposure cause the hazard )</i></p>	<p><b>Effects on or via lactation</b></p> <p>May cause harm to breast-fed children.</p>	

TARGET ORGAN SYSTEMIC TOXICITY (SINGLE EXPOSURE)				
Category 1	Category 2	-	-	-
 <p><b>Danger</b></p> <p>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><b>Warning</b></p> <p>May cause 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>			
TARGET ORGAN SYSTEMIC TOXICITY (REPEATED EXPOSURE)				
Category 1	Category 2	-	-	-
 <p><b>Danger</b></p> <p>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 )</p>	 <p><b>Warning</b></p> <p>May cause (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 )</p>			

<b>AQUATIC TOXICITY (ACUTE)</b>				
<b>Category 1</b>	<b>Category 2</b>	<b>Category 3</b>	<b>-</b>	<b>-</b>
 <p><b>Warning</b></p> <p><b>Very toxic to aquatic life</b></p>	<p><b>No symbol</b></p> <p><b>No signal word</b></p> <p><b>Toxic to aquatic life</b></p>	<p><b>No symbol</b></p> <p><b>No signal word</b></p> <p><b>Harmful to aquatic life</b></p>		
<b>AQUATIC TOXICITY (CHRONIC)</b>				
<b>Category 1</b>	<b>Category 2</b>	<b>Category 3</b>	<b>Category 4</b>	<b>-</b>
 <p><b>Warning</b></p> <p><b>Very toxic to aquatic life with long lasting effects</b></p>	 <p><b>No signal word</b></p> <p><b>Toxic to aquatic life with long lasting effects</b></p>	<p><b>No symbol</b></p> <p><b>No signal word</b></p> <p><b>Harmful to aquatic life with long lasting effects</b></p>	<p><b>No symbol</b></p> <p><b>No signal word</b></p> <p><b>May cause long lasting harmful effects to aquatic life</b></p>	

FLAMMABLE LIQUID				
Category 1	Category 2	Category 3	Category 4	-
 <p><b>Danger</b></p> <p>Extremely flammable liquid and vapour.</p>	 <p><b>Danger</b></p> <p>Highly flammable liquid and vapour.</p>	 <p><b>Warning</b></p> <p>Flammable liquid and vapour.</p>	<p><b>No symbol</b></p> <p><b>Warning</b></p> <p>Combustible liquid</p>	
FLAMMABLE SOLID				
Category 1	Category 2	-	-	-
 <p><b>Danger</b></p> <p>Flammable solid</p>	 <p><b>Warning</b></p> <p>Flammable solid</p>			
FLAMMABLE GAS				
Category 1	Category 2	-	-	-
 <p><b>Danger</b></p> <p>Extremely flammable gas</p>	<p><b>No symbol</b></p> <p><b>Warning</b></p> <p>Flammable gas</p>			
PYROPHORIC LIQUID				
Category 1	-	-	-	-
 <p><b>Danger</b></p> <p>Catches fire spontaneously if exposed to air</p>				

PYROPHORIC SOLID				
Category 1	-	-	-	-
 <b>Danger</b> Catches fire spontaneously if exposed to air				
SELF-HEATING SUBSTANCE				
Category 1	Category 2	-	-	-
 <b>Danger</b> Self-heating; may catch fire	 <b>Warning</b> Self-heating in large quantities; may catch fire			
SELF-REACTIVE SUBSTANCES				
Type A	Type B	Types C and D	Types E and F	Type G
 <b>Danger</b> Heating may cause an explosion	   <b>Danger</b> Heating may cause a fire or explosion	 <b>Danger</b> Heating may cause a fire	 <b>Warning</b> Heating may cause a fire	<i>Note:            There are no label elements allocated here</i>

SUBSTANCES WHICH IN CONTACT WITH WATER EMIT FLAMMABLE GASES				
Category 1	Category 2	Category 3	-	-
 <p><b>Danger</b></p> <p>In contact with water releases flammable gases which may ignite spontaneously.</p>	 <p><b>Danger</b></p> <p>In contact with water releases flammable gases.</p>	 <p><b>Warning</b></p> <p>In contact with water releases flammable gases.</p>		
OXIDIZING LIQUID				
Category 1	Category 2	Category 3	-	-
 <p><b>Danger</b></p> <p>May cause fire or explosion; strong oxidizer.</p>	 <p><b>Danger</b></p> <p>May intensify fire; oxidizer</p>	 <p><b>Warning</b></p> <p>May intensify fire; oxidizer</p>		
OXIDIZING SOLID				
Category 1	Category 2	Category 3	-	-
 <p><b>Danger</b></p> <p>May cause fire or explosion; strong oxidizer.</p>	 <p><b>Danger</b></p> <p>May intensify fire; oxidizer</p>	 <p><b>Warning</b></p> <p>May intensify fire; oxidizer</p>		

OXIDIZING GAS				
Category 1	-	-	-	-
 <p><b>Danger</b></p> <p>May cause or intensify fire; oxidizer.</p>				
ORGANIC PEROXIDE				
Type A	Type B	Types C and D	Types E and F	Type G
 <p><b>Danger</b></p> <p>Heating may cause an explosion</p>	   <p><b>Danger</b></p> <p>Heating may cause a fire or explosion</p>	 <p><b>Danger</b></p> <p>Heating may cause a fire</p>	 <p><b>Warning</b></p> <p>Heating may cause a fire</p>	<p><i>There are no label elements allocated to this hazard class</i></p>

<b>EXPLOSIVE</b>					
<b>Unstable/ Division 1.1</b>	<b>Division 1.2</b>	<b>Division 1.3</b>	<b>Division 1.4</b>	<b>Division 1.5</b>	<b>Division 1.6</b>
Substances and articles which have a mass explosion hazard	Substances and articles which have a projection hazard but not a mass explosion hazard	Substances and articles which have a fire hazard and either a minor projection or both, but not a mass explosion hazard.	Substances and articles which present no significant hazard	Very insensitive substances which have a mass explosion hazard	Extremely insensitive articles which do not have a mass explosion hazard
			1.4 * <b>Warning</b> Fire or projection hazard	1.5 * <b>Warning</b> May explode in fire	1.6 *
<b>Danger</b> Explosive; mass explosion hazard	<b>Danger</b> Explosive; severe projection hazard	<b>Danger</b> Explosive; fire, blast or projection hazard.	* Apply to substances or mixtures subject to UN CETDG requirements only (see also par. 41)		
<b>CORROSIVE TO METALS</b>					
<b>Category 1</b>	-	-	-	-	-
					
<b>Warning</b> May be corrosive to metals					
<b>COMPRESSED GAS</b>					
Gases which are contained in a receptacle at a pressure not less than 280 kPa at 20 °C, or as a refrigerated liquid, are considered as dangerous irrespective of the fact that they may also present other hazardous properties such as toxicity or flammability. Gases, for packing purposes, are also divided as follows:					
<b>Compressed gas</b>	<b>Liquefied gas</b>	<b>Refrigerated liquefied gas</b>	<b>Dissolved gas</b>		
					
<b>Warning</b> Contains gas under pressure; may explode if heated	<b>Warning</b> Contains gas under pressure; may explode if heated	<b>Warning</b> Contains refrigerated gas; may cause cryogenic burns or injury	<b>Warning</b> Contains gas under pressure; may explode if heated		

## ANNEX II

### PRECAUTIONARY STATEMENTS

Statements that are frequently used in existing systems to provide precautionary information are listed below. It is not an exhaustive list, rather it is designed to provide examples of statements that may be appropriate to the label provided for the specific substance or mixture. Systems or suppliers should make use of those which are most appropriate to the particular situation. Where a statement contains words in brackets, any of the words in brackets may be used in addition to the core information contained in the phrase, or instead of some of this information, as appropriate. e.g. “Keep away from heat” or “Keep away from heat and sparks” or “Keep away from heat, sparks, and flame” or “Keep away from sparks and flame”, etc. Similarly, statements from different groups may be used in combination, e.g. “Keep away from heat and ignition sources and store in a cool well-ventilated place”. The IPCS Chemical Safety Cards Programme includes a compilers guide, which provides some explanation of precautionary statements and the context for their use. This and other reference sources for the use of precautionary statements will be referred to or provided in the final GHS document.

#### Statements for physical hazards

##### Flammable liquids, solids and gases

###### Avoidance of ignition sources

- Keep away from fire [– No Smoking]
- Keep away from heat, [sparks] [and flame] [– No Smoking]
- Keep away from heat and ignition sources [– No Smoking].
- Keep away from sources of ignition – No Smoking
- Avoid contact with heat and ignition sources [and oxidizers] [– No Smoking].
- No open flames, no sparks and no smoking
- Take precautionary measures against static charges
- Do not use sparking tools.
- Keep from direct sunlight.

###### Precautions regarding the container

- Keep container closed
- Keep container tightly closed
- Keep container closed when not in use.
- Store in a tightly closed container
- Keep only in the original container

###### Storage of the container or package

- Keep in a cool place
- Keep at a temperature not exceeding ...°C
- Decomposes below boiling point at [ ]°C
- Decomposes below melting point at [ ]°C
- Keep container/package in a well-ventilated place
- Keep container/package tightly closed in a cool [, well-ventilated] place
- Keep only in the original container/package in a cool well-ventilated place.
- Keep container/package tightly closed and in a well-ventilated place.
- Store in a cool/low-temperature, well-ventilated [dry] place [away from heat and ignition sources].
- Store and transport according to packing list of dangerous chemicals.
- Explosive limit ranges

#### Storage separately from incompatible materials

- Do not store and transport with oxidizers etc.
- Separate from oxidizers [oxygen], [explosives], [halogens], [compressed air] [acids], [bases] [and food chemicals] etc. in transport [and storage].
- Do not store and transport with oxidizers, [acids] [and bases] etc.

#### Fire-fighting

- Use CO<sub>2</sub>, dry chemical, or foam.
- In case of fire, use [..]

#### **Pyrophoric Liquids and Solids**

- Use any combination of the phrases in 1.1 plus one or more of the following:
- Keep under [insert name of inert gas]
- Do not allow contact with air.
- Protect from light, moisture and damage.

#### **Self-heating Substances**

- Use any combination of the phrases in 1.1, in particular phrases relating to storage separately from incompatible materials, plus the following:
- Keep at a temperature not exceeding [ ].

#### **Substances which, in contact with water, emit flammable gases**

- Use any combination of the phrases in 1.1 as appropriate, plus one or more of the following:
- Keep away from water
- Keep container dry
- Never add water to this product
- Keep from any possible contact with water
- No contact with water
- Do not add water to contents while in a container because of violent reaction and possible flash fire
- Store in a dry place, [protect from moisture].
- Protect from moisture and damage
- Handle under nitrogen, [protect from moisture]..

#### **Oxidising liquids, solids and gases**

- Use any combination of the phrases in 1.1 relating to precautions regarding the container and storage of the container or package as appropriate, plus one or more of the following:
- Keep away from combustible material
- Keep away from (incompatible material to be specified by manufacturer)
- Keep from contact with clothing and other combustible materials to avoid fire
- Prevent contamination with readily oxidizable materials and polymerisation accelerators.
- Do not store near combustible materials.
- Drying of this product on clothing or combustible materials may cause fire.
- Put safety caps and shockproof rubber rings on cylinders in transport.
- Do not store and transport with flammable/combustible materials etc.
- Isolate from reducers and flammable/ combustible materials etc in storage.
- Do not store and transport with halogens and acids etc.
- Separate from reducers and finely powdered metals etc in storage and transport.

### **Organic peroxides**

- Use any combination of the phrases in 1.1 relating to precautions regarding the container and storage of the container or package as appropriate, plus one or more of the following:
- Keep away from heat
- Keep away from combustible material
- Keep away from (incompatible material to be specified by manufacturer)
- Keep from contact with clothing and other combustible materials to avoid fire
- Prevent contamination with readily oxidizable materials and polymerisation accelerators.
- Do not store near combustible materials.
- Drying of this product on clothing or combustible materials may cause fire.
- Put safety caps and shockproof rubber rings on cylinders in transport.
- Do not store and transport with flammable/combustible materials etc.
- Isolate from reducers and flammable/ combustible materials etc in storage.
- Do not store and transport with halogens and acids etc.
- Separate from reducers and finely powdered metals etc in storage and transport

### **Self reactive substances**

- Keep away from heat
- Keep at temperature not exceeding .....°C
- Keep away from fire
- Keep away from heat, [sparks] [and flame]
- Keep away from heat and ignition sources
- Keep away from sources of ignition
- Avoid contact with heat and ignition sources
- No open flames, no sparks and no smoking
- Keep away from combustible material
- Keep away from (incompatible material to be specified by manufacturer)
- Keep from contact with clothing and other combustible materials to avoid fire
- Prevent contamination with readily oxidizable materials and polymerisation accelerators.
- Do not store near combustible materials.
- Drying of this product on clothing or combustible materials may cause fire.
- Put safety caps and shockproof rubber rings on cylinders in transport.
- Do not store and transport with flammable/combustible materials etc.

### **Explosives**

- Use any combination of the phrases in 1.1 relating to avoidance of sources of ignition, plus one or more of the following:
  - Avoid shock, [impact],[friction] [and rough handling].
  - Keep away from fire
  - No open flames, no sparks and no smoking
  - Keep away from sources of ignition – No Smoking
  - Do not use sparking tools.
  - Store and transport according to packing list of dangerous chemicals.
  - Above [ ] explosive vapour/air mixtures may be formed
  - Gas/air or vapour/air mixtures are explosive
  - Finely dispersed particles form explosive mixtures with air
  - Do not use compressed air for filling, discharging or handling.

### **Corrosive to metal**

- Store and transport according to packing list of dangerous chemicals.
- Suitable materials for containment (storage and transport) are listed in the SDS
- Avoid contact with skin and eyes
- Do not get on skin
- Do not get in eyes

### **Statements to prevent potential misuse and exposure to health**

#### **VENTILATION CONTROLS**

##### **USE ONLY IN WELL VENTILATED AREAS**

- Use only with adequate ventilation [or closed system ventilation].
- Do not enter areas where used or stored until adequately ventilated.
- Use only with adequate ventilation to keep exposures (airborne levels of dust, fume, vapour etc) below recommended exposure limits.
- Use adequate ventilation to remove vapours (fumes, dust etc).
- Use adequate ventilation and/or engineering controls in high temperature processing to prevent exposure to vapours.
- Prevent vapour build up by providing adequate ventilation during and after use.
- [Use with] [ventilation], local exhaust ventilation [or breathing protection].

##### **DO NOT USE IN AREAS WITHOUT ADEQUATE VENTILATION**

#### **HYGIENE MEASURES**

- When using do not [smoke[, [eat] [or drink]

##### **DO NOT EAT, DRINK OR SMOKE DURING WORK.**

- Wash hands before eating [, drinking] [or smoking].

##### **WASH THOROUGHLY AFTER HANDLING.**

##### **AVOID ALL CONTACT. STRICT HYGIENE.**

- Avoid contact with skin and eyes
- Do not get on skin
- Do not get in eyes

#### **PERSONAL PROTECTIVE EQUIPMENT**

- Wear suitable [protective clothing] [, gloves] [and eye/face protection].
- Wear protective clothing and gloves (specify protective clothing and type of gloves)
- Wear protective eyewear (goggles, face shield, or safety glasses)
- Wear appropriate personal protective equipment, avoid direct contact.

#### **Respiratory Protective Equipment**

- In case of insufficient ventilation, wear suitable respiratory equipment.
- During fumigation/spraying, wear suitable respiratory equipment (appropriate wording to be specified by the manufacturer).
- Have available emergency self-contained breathing apparatus or full-face airline respirator when using this chemical.
- Always wear a self-contained breathing apparatus or full-face airline respirator when using this chemical.
- Wear a mask or pesticide respirator jointly approved by the Mine Safety and Health Administration and NIOSH [US EPA]

- Wear (identify specific respiratory device approved by the Mine Safety and Health Administration and NIOSH). [US EPA]
- Use NIOSH approved respiratory protection (US requirements).

## **Statements explaining appropriate action in the event of an accident**

### **Spills**

- In event of a spill, evacuate danger area.
- In event of a spill, consult an expert.
- To clean the floor and all objects contaminated by this material use (to be specified by manufacturer).
- Cover with absorbent or contain. Collect and dispose.
- Cover the spilled material with [...].
- Absorb remaining liquid in sand or inert absorbent and remove to safe place.
- Treat remaining liquid [with.....].
- Wash away spilled liquid [remainder] with plenty of water.
- Do NOT wash away into sewer.
- Avoid run off to waterways and sewers.
- Clean up spill immediately.
- Allow product to cool/solidify and pick up as a solid.
- Sweep up and remove immediately.
- Use non-sparking equipment when picking up flammable spill, [remove all ignition sources.
- Ensure adequate ventilation to remove vapours, fumes, dust etc.
- Collect leaking liquid in sealable (metal/plastic) containers.
- Cautiously neutralize spilled liquid.
- Collect leaking and spilled liquid in sealable (metal/plastic) containers as far as possible.
- Do not place spilled materials back in the original container.
- Vacuum spilled material.
- Sweep spilled substances into [ ] containers.
- Sweep spilled substances into [ ] containers; if appropriate moisten first to prevent dusting. Cautiously neutralize remainder. Then wash away with plenty of water.
- Carefully collect remainder.
- Wipe up remainder in [ ] then remove to safe place.
- Do NOT absorb in saw-dust or other combustible absorbents.
- NEVER direct water jet on liquid..

### **Fire-fighting**

- In case of fire, use (indicate the precise type of fire fighting equipment).
- If water increases the risk, never use water.
- Use CO<sub>2</sub>, dry chemical, or foam.
- Water can be used to cool and protect exposed material.
- Allow gas to burn if flow cannot be shut off.
- Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out; in other cases, extinguish with (select appropriate medium from list)
- In case of fire in the surroundings: all extinguishing agents allowed.
- In case of fire in the surroundings: (use the appropriate agent).
- Fire fighters should wear complete protective clothing including self-contained breathing apparatus.

## **First aid**

### **General**

- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

### **Accident caused by inhalation**

- In case of accident by inhalation, remove casualty to fresh air and keep at rest.
- Obtain medical attention immediately if inhaled.
- [Remove person to] fresh air, [rest].
- Remove to fresh air immediately. Get medical attention immediately.
- If signs/symptoms continue, get medical attention.
- If breathing has stopped, apply artificial respiration.
- If breathing is labored, administer oxygen.
- Half upright position.
- Artificial respiration if indicated.
- No mouth-to-mouth respiration.
- If inhaled, give oxygen or artificial respiration, call a physician.
- If inhaled, give amylis nitris, call a physician.

### **Accident caused by ingestion**

- Obtain medical attention immediately if ingested
- If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.
- If swallowed, seek medical advice immediately and show this container or label.
- If swallowed, rinse mouth with water (only if the person is conscious).
- If swallowed, and the victim is conscious and alert, induce vomiting immediately, as directed by medical personnel.
- [Do not induce vomiting]. [If conscious, give 2 glasses of water. Get immediate medical attention].
- Drink (one glass) (two glasses) of water. Call a physician (or poison control centre immediately).
- Rinse mouth.
- Give a slurry of activated charcoal in water to drink.
- Induce vomiting (only in conscious persons).
- Do NOT induce vomiting.
- Give nothing to drink.
- Give plenty of water to drink.
- Rest.
- Wear protective gloves when inducing vomiting
- If ingested, drink lukewarm, induce vomiting, gastric irrigate, call a physician
- If ingested, drink lukewarm, induce vomiting, gastric irrigate, catharsis, call a physician.
- If ingested, drink plant oil, induce vomiting, call a physician.
- If ingested, wash out mouth with water, drink milk or egg white.
- If ingested, flush the material in stomach with 5% sodium thiosulfate.
- If ingested, flush the material in stomach with 1% sodium thiosulfate.
- If ingested, induce vomiting, flush the material in stomach with sodium bicarbonate solution.
- If ingested, induce vomiting, clyster and flush the material in stomach with plant oil.
- If ingested, flush the material in stomach immediately with 2% copper sulfate.
- If ingested, flush the material in stomach with sodium sulfate solution, catharsis.
- If ingested, induce vomiting, flush the material in stomach with potassium permanganate solutions.

- If ingested, drink milk or egg white, gastric irrigate, call a physician.
- If ingested, wash out mouth with water. Flush with water the material in stomach of victim, which has not corrosion symptoms.
- If ingested, induce vomiting, flush the material in stomach with 60 ml of 1% potassium iodide.

#### Accident caused by skin contact

- After contact with skin, take off immediately all contaminated clothing and wash immediately with plenty of ( to be specified by manufacturer). [If irritation develops and persists, get medical attention]
- If irritation develops and persists, get medical attention
- Immediately wash with tincture of green soap in flowing water for 15 minutes. Flush skin with large amounts of water. [If irritation develops and persists, get medical attention].
- Immediately flush skin with large amounts of water. Remove contaminated clothing. If irritation (redness, rash, blistering) develops, get medical attention.
- Wash contaminated clothing before reuse.
- Remove clothing and wash thoroughly before use.
- Remove contaminated clothing and wash clothing before reuse Flush the contaminated area of body with large amounts of water.
- Wash the contaminated area of body with soap and fresh water.
- If contact with body directly, immediately obtain medical attention.
- Flush with fresh water if contact with skin or eyes.
- If frostbite, call a physician. If skin contact, spread immediately with 2% silver nitrate.

#### Accident caused by contact with eyes

- In case of contact with eyes rinse immediately with plenty of (to be specified by manufacturer)
- Immediately flush eyes for at least 15 minutes. Get medical attention.
- Flush eyes with water for at least 15 minutes. Get medical attention if eye irritation develops or persists.
- Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.
- Flush eyes with water for at least 15 minutes while holding eyelids open.
- Remove contact lenses if worn. Get medical attention immediately.
- First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
- If contact with eyes directly, flush with gently flowing fresh water thoroughly.

### **Statements for environmental protection and appropriate disposal**

#### **Environmental protection**

- Use appropriate containment to avoid environmental contamination.
- Avoid release to the environment. Refer to special instructions/safety data sheet.
- Avoid release to the environment.
- Prevent release to the environment.
- Use appropriate containment.
- Do not let this chemical/product enter the environment.
- Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark.
- Do not contaminate water when cleaning equipment or disposing of equipment washwaters.
- Do not apply directly to water.
- This chemical has properties and characteristics associated with chemicals detected in ground water. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground-water contamination.

- This chemical is known to leach through soil into ground water under certain conditions as a result of label use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground-water contamination.

### **Disposal**

- Dispose of this container to hazardous or special waste collection point.
- Dispose of this material and its container as hazardous waste.
- This material and its container must be disposed of as hazardous waste.
- Do not dispose of with household waste, trash or other solid waste.
- Dispose of wastes in an approved waste disposal facility.
- Do not empty into drains.
- Do not empty into drains; dispose of this material and its container in a safe way.
- Do not empty into drains; dispose of this material and its container to hazardous or special waste collection point.
- This material and its container must be disposed of in a safe way.
- Do not contaminate water, food, or feed by storage disposal.
- Do not allow into any sewer on the ground, or into any body of water.
- Refer to manufacturer/supplier for information on recovery/recycling. The (preferred) waste management option(s) is (are) to (select the appropriate statement listed below):
  - Reuse
  - Recycle
  - Reuse or recycle
  - Send to a licensed recycler, reclaimer or incinerator
  - Burn
  - Burn in a municipal incinerator
  - Dispose of in an approved landfill

### **Special statements for consumer products**

- Keep locked up.
- Keep out of the reach of children.
- Keep locked up and out of the reach of children.
- Keep away from food, drink, and animal feedstuffs
- Keep out of the reach of children.
- Avoid exposure during pregnancy.

**ANNEX III**  
**PRECAUTIONARY PICTOGRAMS**

<b>From European Union (COUNCIL DIRECTIVE 92/58/EEC of 24 June 1992)</b>		
		
		

<b>From South African Bureau of Standards (SABS 0265:1999)</b>			
			
			