

Manual for

COMPREHENSIBILITY TESTING

of the Global Harmonized System of
Classification and Labelling of Chemicals
(GHS)

Developed in the context of the
UNITAR/ILO Global GHS Capacity Building Programme
based on previous versions developed by the
University of Cape Town, South Africa and the ILO

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Manual for COMPREHENSIBILITY TESTING of the Global Harmonized System of Classification and Labelling of Chemicals (GHS)

1. Overview of CT

Comprehensibility testing is a survey based method for obtaining information on the understanding of GHS hazard communication elements among the public. “Comprehensibility” refers to the ability of an individual reading a label, warning, or safety data sheet to understand the information sufficiently to take the appropriate precautionary measures. Comprehensibility testing is therefore a key tool for assessing the effectiveness of chemical hazard communication pictograms and/or key statements and provides important feedback for developing a chemical hazard communication system and targeted training. The results of comprehensibility testing can be used to inform the situation and gap analysis in the four key sectors of GHS implementation: industrial workplace, agriculture, transport and consumer products. This can help countries to subsequently identify areas where capacity building interventions are needed in order to improve understanding of GHS-based hazard communication elements, thereby improving protection of human health and the environment.

This comprehensibility testing instrument provides a methodology for the assessment of the comprehensibility of labels and Safety Data Sheets (SDS) for chemical hazards. It has been developed in the context of the UNITAR/ILO Global GHS Capacity Building Programme, based on a previous version developed by the Occupational and Environmental Health Research Unit (OEHRU) in the School of Public Health and Family Medicine at the University of Cape Town, South Africa. It also builds on previous work conducted for the International Labour Office (ILO) Working Group on Hazard Communication as part of international efforts to promote the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). The objective of this updated version of the testing is to provide focused results with minimal resources.

GHS Comprehensibility Testing has thus far been conducted in Zambia, South Africa, Nigeria, Senegal, the Gambia, Indonesia, Philippines, Thailand, Cambodia, Laos, Vietnam and Jamaica.¹

¹ The Zambian and South African studies were supported by the Government of the Netherlands, the Fund for Research into Development, Growth and Equity (FRIDGE) (for the South African study), with support from UNITAR. The projects in Nigeria, Senegal, Gambia, Indonesia, Philippines, Thailand, Cambodia, Laos, Vietnam and Jamaica were supported by the Government of Switzerland and the European Union in the context of the pilot projects to develop a national GHS implementation strategy with the UNITAR/ILO Global GHS Capacity Building Programme.

2. Overview of the GHS Comprehensibility Testing Package

To conduct GHS comprehensibility testing, the following resources are available:

- **The GHS CT Manual:** This manual provides a description of the testing procedure, including an overview of the questionnaire, its modules, objectives, and expected outcomes, as well as general issues related to conducting interviews and testing.
- **Questionnaire:** This form describes the pre-interview text to be read, and gives instructions on how each question should be asked and how the information should be recorded. Space is also provided for interviewers to record respondent answers.
- **Sample Safety Data Sheets, labels and pictogram table:** Sample SDSs and labels and a pictogram table are provided to be used with the modules and are given to respondents to test their comprehension of hazard communication elements.

3. Questionnaire Overview

Within the questionnaire, each module tests a particular aspect of comprehensibility. The layout of the questionnaire is such that the instructions are clearly marked for those administering the comprehensibility tests.

3.1 Overview of each module

The table below provides a summary of each module, the design of the module, expected time needed to complete the module, and labels and/or SDSs used for that module.

Table 1: Module Overview
Module 1: General Interview <ul style="list-style-type: none">– To be completed by all sectors– Design: Descriptive data collection to inform analyses of subsequent modules.– Approximate Duration: 5 minutes– No labels or SDSs are required for this module
Module 2: General Comprehensibility of Labels <ul style="list-style-type: none">– To be completed by all sectors– Design: General questions about familiarity with labels; review of sample label with questions based on label.– Approximate Duration: 15 minutes– Label 1 is required for Module 2
Module 3: General Comprehensibility of Safety Data Sheets <ul style="list-style-type: none">– Consumers are not tested on SDSs. Therefore, this module is left out of the questionnaires for respondents from the consumer sector.– Design: General questions about familiarity with SDSs; Review of sample SDS with questions based on SDS.– Approximate Duration: 10 minutes– SDS 1 is required for Module 3
Module 4: Safety Data Sheets and Labels <ul style="list-style-type: none">– Consumers are not tested on SDSs. Therefore, this module is left out of the questionnaires for respondents from the consumer sector.– Design: Questions are focused on identifying information, where the subject can either look at the SDS or label.– Approximate Duration: 10 minutes– SDS and label 2 are required for Module 4
Module 5: Comprehension of Pictograms and Hazard Communication Elements <ul style="list-style-type: none">– To be completed by all sectors– Design: Subjects are asked to relate pictograms with hazards, and to identifying the severity of hazards by comparing hazard communication elements– Approximate Duration: 15 minutes– Label 1 and 2, and table 1 are required for module 5
Module 6 - Post Interview <ul style="list-style-type: none">– To be completed by all sectors– Design: Descriptive data collection to inform analyses of preceding modules.– Approximate Duration: 10 minutes– No labels or SDS's are required for this module

3.2 Objectives and Expected Outcomes by Module

Table 2: Objectives and Outcomes by Module			
Module	Contents	Objectives	Outcome
Module 1	General Interview	<ul style="list-style-type: none"> - To collect general demographic data as a basis for analysis of comprehensibility. - To ascertain linguistic, educational and work experience as possible factors influencing comprehension. 	<ul style="list-style-type: none"> - Relevant demographic and other data for linking to study results and analysis.
Module 2	General comprehensibility of labels	<ul style="list-style-type: none"> - To evaluate subjects' familiarity with a label, in visual identification, name and use. - To examine the order in which subjects recall label elements. - Assess the ease of understanding the label. - To test the comprehensibility of hazard statements. - To evaluate subjects' ability to identify precautionary statements on a label. 	<ul style="list-style-type: none"> - The a priori familiarity with labels evaluated. - The most recalled elements of a label identified. - The label elements that are easy and difficult to comprehend identified. - Gain a general sense of comprehension of hazard statements. - Subjects' understanding of hazard statements tested. - The ability of users to identify precautionary information evaluated.
Module 3 <i>(consumer sector does not complete this module)</i>	General comprehensibility of safety data sheets	<ul style="list-style-type: none"> - To evaluate subjects' familiarity with a SDS, in visual identification, name and use. - To assess the ease of understanding and identifying information on the SDS. 	<ul style="list-style-type: none"> - The a priori familiarity with SDS evaluated. - Areas where comprehension of SDS elements are identified. - Subjects' ability to identify and understand various sections of the SDS tested.
Module 4 <i>(consumer sector does not complete this module)</i>	Safety data sheets and labels	<ul style="list-style-type: none"> - To observe subjects' use of the label and SDS in finding necessary and relevant information related to the chemical. 	<ul style="list-style-type: none"> - Subjects' use of hazard communication tools understood.
Module 5	Comprehension of pictograms and hazard communication elements	<ul style="list-style-type: none"> - To test subjects' ability to the possible hazards associated with particular pictograms. - To assess subjects' understanding of what pictograms should be used with which hazards. - To evaluate subjects' ability to discern more and less hazardous chemicals from particular hazard communication elements. 	<ul style="list-style-type: none"> - Understanding of the relationship between certain hazards and their corresponding pictograms assessed. - Subjects' awareness of more or less hazardous chemicals based on communication elements evaluated.
Module 6	Post Interview	<ul style="list-style-type: none"> - To ascertain exposure to chemicals and training. - To identify chemical information needs from subjects. 	<ul style="list-style-type: none"> - Results will indicate role for training.

4. General Issues for Testing

4.1 Comprehensibility Testing Training

The testing materials require careful administration and quality control. Training of interviewers is therefore critical. Organizing a GHS CT training serves to inform interviewers of the objectives of comprehensibility testing and can be a forum for interviewers to learn about the GHS. Having trained interviewers can also facilitate consistent administration of the questions to help ensure data is collected in a uniform manner. For further information on organizing a CT training workshop, please see the CT Testing Package note available from UNITAR.

4.2 Sampling

4.2.1 Context

The context under which comprehensibility testing is carried out is crucial to the accurate evaluation of meaning and understanding. This is particularly so amongst workers with little formal education who use contextual cues to improve their understanding of hazard messages. For this reason, the bulk of testing in this instrument makes use of complete labels rather than elements of a label or SDS. While well-educated subjects may find it conceptually easier to respond to the isolated elements, the interpretation of such elements may have little bearing to real world learning situations. For this reason, all testing is to be conducted using realistic labels and SDSs. See section 6 for further information.

To standardise opportunities for comprehension, the chemicals identified in the labels are not real chemicals, although they are made to look as if they could be genuine agents. This aims to retain context, while not disadvantaging those unfamiliar with a particular chemical.

4.2.2 Sample

Four main categories (sectors) have been identified in the GHS process for sampling. These are:

- Industrial Workplaces: including workers, managers, factory laboratory scientists, supervisors
- Transport: including road, rail, air and sea transport workers
- Agricultural: including farm workers, managers and other related agricultural categories
- Consumers: including people in the market place and residential areas

4.2.2.1 Stratification and sampling

In the four categories, at least 30-50 subjects should be included. Ideally there would be to have at least 50 subjects under each of the four sectors (i.e., N=200).

- Avoid sampling clumps of workers from one site as this will introduce a design effect. It may still be possible to achieve economy of scale by interviewing the same overall number of workers, but from nearby plants.
- Because the chemical industry is an important user and generator of chemicals, it will require some over-sampling of the industry, to the order of 25% of the industrial sector sample from the chemical industry itself, with the balance of 75% spread across other industrial sectors
- Important categories to include in the non-chemical sector are health care, domestic works, and cleaning industries.

4.3 Policy on rewards or compensation to participants

While it is not required to compensate the participants of the study, some countries do prefer to provide something to acknowledge their appreciation of each participant's time in responding to the questionnaire. Some countries, for example, have given a certificate for participating in the study. Participants in the consumers sector may receive a modest payment for giving up their time to participate (to be determined in each project context). Participants can also receive a label card explaining the meaning of GHS commonly used symbols (this card is attached to annex A of this manual).

4.4 Translations

Language is a key to effective hazard communication. Although this instrument seeks to take account of language differences, poor and un-standardised translations may introduce considerable error into the testing. For this reason, careful attention needs to be paid to accurate translation. We recommend the following procedure to be followed if translation is required:

- Two persons fluent in the language of the current instrument (e.g., English) independently translate the questionnaire into the index language (i.e., the language of the target group).
- Both of these translations are then translated back into the language of the original instrument by a new pair of translators independent of each other and of the original translators.

Back-translations should aim to achieve less than 5% errors in the first round. Clarification of the errors in the translation should be conducted to correct ambiguities. Where possible, a combined translation should try to include all elements correctly translated and back translated from either questionnaire. If the latter is not possible, the translation with the lower rate of errors should be taken as the translation of preference. A second round of back translation will be necessary if errors exceed 5%.

4.5 Timing of Interviews

Interviews must be set up at a convenient time for both the interviewee and their employer (when this applies). Farm workers should not be requested to attend an interview during a crucial and busy period for farmers (e.g., planting,

ploughing, spraying, or harvest). Workers should be interviewed during working time and should not suffer financial loss for their participation. It is not recommended that workers participate in their own time (lunch or after hours) without adequate compensation. If workers agree to participate during lunch break, the time must be adequate and suitable recompense provided (e.g. time back, lunch provided, etc).

4.6 Consent and testing

4.6.1 Consent

Before administering the questionnaire, respondents should first give informed consent. To do so, the purpose of the exercises should be explained to them, as well as the procedures that will be asked of them. Participants should not be coerced into participating and should know that they have the right to withdraw their participation at any time. The nature of the information provided in the consent procedure is sufficiently generic so as not to give away the explicit hypotheses being tested.

Consent procedures are outlined in the opening section of module 1 (consent procedure). Irrespective of whether the same subjects complete all modules or not, a consent procedure must always be applied.

4.6.2 Clarification on testing

Before administering the questionnaire, it is important to make clear to the participant that the interview is not a “test” in the sense of looking for the “right” answer. The purpose of the testing is simply to gather information on how people in general perceive different hazard communication elements. The results will inform decision makers what kind of training is needed to improve chemicals safety and management. The respondents should not feel pressured to provide a “right” answer, but only to say that they think something means. Further guidance on conducting interviews can be found in the “interviewer’s guidelines”.

Wording for the consent and introduction are provided in the questionnaire.

4.7 Analyses and reporting

Analyses proposed for these modules are simple computations of proportions and means in relation to different strata. An overall estimate for comprehensibility should be adjusted for weightings by stratum and by other demographic factors known to affect comprehensibility.

The report should summarise the data collected and analysed from the questionnaire results. There is no set way which the information should be presented, but the report should include a summary and analysis of the data collected, as well as recommendations for capacity building and awareness raising training needed based on the results.

4.8 Feedback and Follow-up

All subjects should be offered the opportunity to see the final results of the comprehensibility evaluations, and to give feedback on the interview and testing procedures.

4.9 Follow-up evaluation

When resources permit, countries may wish to re-interview subjects participating in these evaluations after one year to assess retention and long-term benefits of exposure to GHS-based hazard communication elements.

4.10 Using Results to Inform Awareness Raising and Capacity Building

Based on the results of the CT, targeted training of identified areas of low comprehensibility related to hazard communication and chemical safety can be initiated to improve GHS comprehension among chemicals users and the public.

5. Specific Module Issues for Testing in Different Countries

5.1 Module 1

Section 1.3 – Language:

Each country must fill in the languages commonly used in their country under the key (section 1.3.3). Countries will also need to identify which language or languages are commonly found on labels and SDS's in their respective countries (section 1.3.3).

Section 1.4 – Educational Status:

Each country can edit the schooling categories appropriate for their country (section 1.4.1).

5.2 Modules 2, 3, 4, 5

The comprehensibility testing package provides sample Labels and SDSs to be used in the testing. However, ideally, these samples would, as far as possible, reflect the typical local situation of what a chemical user may find on chemicals labels and SDSs. Therefore, CT administrators may consider adapting the sample labels and SDSs provided with this manual to fit to the testing country's labels and SDS. Any changes made to testing labels and SDSs will have to be incorporated into the questions asking about labels.

6. Interviewer's Guidelines

These guidelines are for interviewers administering face to face questionnaires. It is advised that they are read and carefully studied.

6.1 Introduction

Always introduce yourself as an interviewer and the organisation you represent. The questionnaire being administered will have an introduction written on it that should be followed word for word. Let the person know you will conduct the questionnaire as quickly as possible, and give the approximate time it should take.

6.2 Questionnaire Questions - Face-to-face

Interviewing someone in person requires the interviewer to pay attention. The interviewer must keep their voice, body language and facial expression neutral, and must not react if the person says something surprising.

A few tips: Be neutral, but pay attention. Face the person at a comfortable distance and keep eye contact. Be accepting of the person. Do not show any judgement of the person through your body language, voice or facial expression.

An important part of interviewing is asking the same questions in the same way to each person being interviewed. Follow the questionnaire as closely as possible and do not add extra information of your own. Do not lead, suggest or give an opinion or an answer. If you disagree with the participant, do not argue; instead remain neutral throughout the interview and just write down their responses. Remember you are the “pen” for the person being interviewed. It is not an issue of writing down a “right” or “wrong” answer, instead it is important that you write down what the person said only!

During the interview, the person may give extra information. Unless an open-ended question has been asked, always record the answer to the survey question first, and then the extra information. (It is good to write this extra information in the margins of the questionnaire.)

If the person asks questions about what you have just asked, it is best to first answer by repeating the question. If they still do not understand, give general information.

Example: If the question is “How many times have you eaten meat in the past week?” and the person asks “Well, I ate soup with meat in it, does that count?” a correct response would be, “Yes, this means all types of food containing meat.” An incorrect response would be, “Well, I’m sure you’ve eaten meat more than that. I’ll just say you’ve eaten it three times.”

Be careful not to lead the person, and most importantly, never change answers!

Example of interviewer bias: If the question is: “What foods do you commonly eat?” and the person says “potatoes, rice, tomatoes, pumpkin” an interviewer bias/influencing response would be “don’t you mean that you eat maize”.

Questions need to be asked in the same way by each interviewer. Do not prompt or lead the person to answer (this introduces bias into the study). Ask the question and let the person answer – DO NOT HELP THEM ANSWER. If you have a problem, question or the person seems to misunderstand the question, call the person in charge of the interviews for assistance.

6.3 Probes

At times you may ask a question and the answer will not be helpful, or the person will just be silent. The person may be thinking or may have forgotten the answer. For many questions, it may be a good idea to have a comment (“probe”) ready to help the person think of an answer.

When necessary, prompt to make things clear and probe if an answer is “I do not know”. Remain silent first; then repeat the question. If necessary use a neutral statement to find out more.

Example: If the person cannot remember travelling by taxi in the past month, the interviewer could say, “Just to let you know, we are interested in the time between when schools started and the long weekend for Easter.”

This may help the person to remember details.

For open-ended questions, this could be “Could you tell me more about that?” or “How did you feel about that?”

For closed-ended questions, repeating the question or suggesting dates, times of day or holidays might help the person to remember.

For example, the question “What did you eat for lunch on 27 December?” could be followed with, “That was the Wednesday after Christmas.”

Concentrate on what the person is saying. Do not let your mind wander, or interrupt the person. Have patience.

6.4 Other issues

6.4.1 Language problems

If you cannot understand what the person is saying, ask the person to speak more slowly. If you still cannot understand, ask for the person in charge of the research/interviewing to help you.

6.4.2 Person refuses to answer

If it is clear that the person is uncomfortable with a question, move on to the next question. Participants are allowed to refuse to answer questions. If the person seems confused by the question, ask if they understand what you are asking. Do not rephrase the question, that is, ask it in another way or in your own words.

6.4.3 Impatient or tired participant

If the person becomes impatient or says they are tired during the interview, encourage the person by saying:

“This should only be a few more minutes. I will go as quickly as I can.”

“We are very thankful for your help with this questionnaire- it should only be a few more minutes of your time.” “Would you like to take a short break?”

If the person refuses to finish the interview, find out if there is a time when you can complete the interview and thank the person.

6.4.4 Person gets off the subject

Do not act as though you are not interested, but guide the person back to the question. For example:

“That’s interesting! Now I want to ask you...(and repeat the question)”

“I do not want to keep you for too long. Here is the next question.”

“There are some questions about that later in the questionnaire. Remember that thought for just a minute.”

6.4.5 *Person does not understand the question or gives an answer that isn’t useful*

If the person does not seem to understand the question, do not say anything to make them feel bad. Instead say something like, “I think I read that question wrong, let me repeat it.”

6.4.6 Person asks for feedback or extra information

A person may want to know if his/her answers are “right”. Rather say that you “do not know”, or that “there are no right or wrong answers”. Then move on to the next question.

6.5 Closing an Interview

At the end of the interview, remember to thank the person for their time.

6.6 Conclusion

It is a good idea to practise on other co-workers or volunteers and hear their feedback. When you are doing an interview, use “active listening”- that means keeping your ears open, answering the person’s questions right away and keeping the final aims of the study in mind.

Remember that questions should always be asked in the same way for each person. The interviewer should not lead the person to certain answers. If you have problems or questions, always ask for assistance from your supervisor. Maintain a professional and friendly approach.

7. The 10 Commandments of Interviewing

1. *Never begin an interview cold.* Remember to spend a few minutes chatting with the person first. If you are in the person’s home, look around the room and ask about things like photographs, books, banners and so forth to start this chatting. The idea is to make the person feel comfortable with you.
2. *Remember your purpose.* You are doing the interview in order to get information. Try to keep the person on track and if you are working with a schedule always have a copy with you.
3. *Act natural.* Be as relaxed and natural as you can.
4. *Show that you are listening.* If the person says something funny, smile. If they tell you something sad, look sad. If they say that something upset them, try to say something supportive. Do not look as though you are not interested or are not aware.
5. *Think about appearance.* Be sure that you have dressed to suit the setting and the kind of person you are working with. Generally it is best to look professional. Remember to think how you look to other people.
6. *Interview in a comfortable place.* Be sure that the location of the interview is somewhere the person feels comfortable. If the person is worried about being overheard or being seen, they will not be happy to talk.
7. *Don’t be happy with just one-word answers.* Yes and no answers will not give much information for the final report. When the person answers like this, be sure to probe with questions like “Can you tell me a little bit more about that?” or “What else happened?” Even just a pause and silence may get extra information.
8. *Be respectful.* Be sure that the person feels important to your research and knows that you care about their answers. Often a

person will say something like “You don’t really want to know how I feel about that.” Or “What I think is not important” Make sure that they know that you are interested in what they have to say. Never laugh at a response the person gives unless it is meant to be a joke.










9. *Practice, practice and practice some more.* The only way to become good at interviewing is to go out and do interviews.
10. *Be polite and thankful.* Remember to thank the person when you finish and answer any questions he/she may have about the research. If the person is left feeling unhappy, this may affect other researchers who would like to interview the same person or in the same area in the future.

Annex A GHS Label Card for Study Participants

This card may be copied, laminated, and provided to participants at the end of the interview in order to inform them of the pictograms and the hazards they represent.

GHS SYMBOLS & MEANINGS

The Global Harmonized System of Classification & Labelling of Chemicals (GHS) is a new system with the objective of harmonizing information on labels & SDSs. The goal is to protect human health & the environment.

GHS Pictograms and Hazard Classes		
		
<ul style="list-style-type: none"> • Oxidizers 	<ul style="list-style-type: none"> • Flammables • Self-reactives • Pyrophorics • Self-heating • Emits flammable gas • Organic peroxides 	<ul style="list-style-type: none"> • Explosives • Self-reactives • Organic peroxides
		
<ul style="list-style-type: none"> • Acute toxicity (severe) 	<ul style="list-style-type: none"> • Corrosive to metals • Skin corrosion • Serious eye damage 	<ul style="list-style-type: none"> • Gases under pressure
		
<ul style="list-style-type: none"> • Carcinogenicity • Respiratory sensitization • Reproductive toxicity • Specific target organ toxicity (repeated) • Germ cell mutagenicity • Aspiration hazard 	<ul style="list-style-type: none"> • Aquatic toxicity (acute) • Aquatic toxicity (chronic) 	<ul style="list-style-type: none"> • Acute toxicity (harmful) • Skin/eye irritation • Skin sensitization • Specific target organ toxicity (single) • Hazardous to the ozone layer

Annex B Important Definitions Related to the GHS

(These definitions are as found in the GHS document, third revised edition.)

For the purposes of the GHS:

Alloy means 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;

Aspiration means the entry of a liquid or solid chemical into the trachea and lower respiratory system directly through the oral or nasal cavity, or indirectly from vomiting;

CA means “competent authority”;

Carcinogen means a substance or a mixture which induce cancer or increase its incidence;

CAS means “Chemical Abstract Service”;

CBI means “confidential business information”;

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;

Competent authority means any national body(ies) or authority(ies) designated or otherwise recognized as such in connection with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS);

Compressed gas means a gas which when packaged under pressure is entirely gaseous at -50 °C; including all gases with a critical temperature \leq -50 °C;

Corrosive to metal means a substance or a mixture which by chemical action will materially damage, or even destroy, metals;

Critical temperature means the temperature above which a pure gas cannot be liquefied, regardless of the degree of compression;

Dermal corrosion: see *skin corrosion*;

Dermal irritation: see *skin irritation*;

Dissolved gas means a gas which when packaged under pressure is dissolved in a liquid phase solvent;

Dust means solid particles of a substance or mixture suspended in a gas (usually air);

Explosive article means an article containing one or more explosive substances;

Explosive substance means a solid or liquid substance (or mixture of substances) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic substances are included even when they do not evolve gases;

Eye irritation means the production of changes in the eye following the application of test substance to the anterior surface of the eye, which are fully reversible within 21 days of application;

Flammable gas means a gas having a flammable range with air at 20 °C and a standard pressure of 101.3 kPa;

Flammable liquid means a liquid having a flash point of not more than 93 °C;

Flammable solid means a solid which is readily combustible, or may cause or contribute to fire through friction;

Flash point means the lowest temperature (corrected to a standard pressure of 101.3 kPa) at which the application of an ignition source causes the vapours of a liquid to ignite under specified test conditions;

Gas means a substance which (i) at 50 °C has a vapour pressure greater than 300 kPa (absolute); or (ii) is completely gaseous at 20 °C at a standard pressure of 101.3 kPa;

GHS means the “Globally Harmonized System of Classification and Labelling of Chemicals”;

Hazard category means the division of criteria within each hazard class, e.g. oral acute toxicity includes five hazard categories and flammable liquids includes four hazard categories. These categories compare hazard severity within a hazard class and should not be taken as a comparison of hazard categories more generally;

Hazard class means the nature of the physical, health or environmental hazard, e.g. flammable solid, carcinogen, oral acute toxicity;

Hazard statement means a statement 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;

Initial boiling point means the temperature of a liquid at which its vapour pressure is equal to the standard pressure (101.3 kPa), i.e. the first gas bubble appears;

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 a hazardous product;

Label element means one type of information that has been harmonized for use in a label, e.g. pictogram, signal word;

Liquefied gas means a gas which when packaged under pressure, is partially liquid at temperatures above - 50 °C. A distinction is made between:

- (i) High pressure liquefied gas: a gas with a critical temperature between -50 °C and +65 °C; and
- (ii) Low pressure liquefied gas: a gas with a critical temperature above +65 °C;

Liquid means a substance or mixture which at 50 °C has a vapour pressure of not more than 300 kPa (3 bar), which is not completely gaseous at 20 °C and at a standard pressure of 101.3 kPa, and which has a melting point or initial melting point of 20 °C or less at a standard

pressure of 101.3 kPa. A viscous substance or mixture for which a specific melting point cannot be determined shall be subjected to the ASTM D 4359-90 test; or to the test for determining fluidity (penetrometer test) prescribed in section 2.3.4 of Annex A of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR);

Mist means liquid droplets of a substance or mixture suspended in a gas (usually air);

Mixture means a mixture or a solution composed of two or more substances in which they do not react;

Mutagen means an agent giving rise to an increased occurrence of mutations in populations of cells and /or organisms;

Mutation means a permanent change in the amount or structure of the genetic material in a cell;

NGO means “non-governmental organization”;

Organic peroxide means a liquid or solid organic substance which contains the bivalent -O-O- structure and may be considered a derivative of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term also includes organic peroxide formulations (mixtures);

Oxidizing gas means any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does;

NOTE: “Gases which cause or contribute to the combustion of other material more than air does” means pure gases or gas mixtures with an oxidizing power greater than 23.5% as determined by a method specified in ISO 10156:1996 or 10156-2:2005.

Oxidizing liquid means a liquid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material;

Oxidizing solid means a solid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material;

Ozone Depleting Potential (ODP) means an integrative quantity, distinct for each halocarbon source species, that represents the extent of ozone depletion in the stratosphere expected from the halocarbon on a mass-for-mass basis relative to CFC-11. The formal definition of ODP is the ratio of integrated perturbations to total ozone, for a differential mass emission of a particular compound relative to an equal emission of CFC-11.

Pictogram means a graphical 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 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 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;

Pyrophoric liquid means a liquid which, even in small quantities, is liable of igniting within five minutes after coming into contact with air;

Pyrophoric solid means a solid which, even in small quantities, is liable of igniting within five minutes after coming into contact with air;

Pyrotechnic article means an article containing one or more pyrotechnic substances;

Pyrotechnic substance means a substance or mixture of substances designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as the result of non-detonative self-sustaining exothermic chemical reactions;

Readily combustible solid means powdered, granular, or pasty substance or mixture which is dangerous if it can be easily ignited by brief contact with an ignition source, such as a burning match, and if the flame spreads rapidly;

Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria means the latest revised edition of the United Nations publication bearing this title, and any published amendment thereto;

Recommendations on the Transport of Dangerous Goods, Model Regulations means the latest revised edition of the United Nations publication bearing this title, and any published amendment thereto;

Refrigerated liquefied gas means a gas which when packaged is made partially liquid because of its low temperature;

Respiratory sensitizer means a substance that induces hypersensitivity of the airways following inhalation of the substance;

SDS means “Safety Data Sheet”;

Self-heating substance means a solid or liquid substance, other than a pyrophoric substance, which, by reaction with air and without energy supply, is liable to self-heat; this substance differs from a pyrophoric substance in that it will ignite only when in large amounts (kilograms) and after long periods of time (hours or days);

Self-reactive substance means a thermally unstable liquid or solid substance liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes substances or mixtures classified under the GHS as explosive, organic peroxides or as oxidizing;

Serious eye damage means the production of tissue damage in the eye, or serious physical decay of vision, following application of a test substance to the anterior surface of the eye, which is not fully reversible within 21 days of application;

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. The GHS uses “Danger” and “Warning” as signal words;

Skin corrosion means the production of irreversible damage to the skin following the application of a test substance for up to 4 hours;

Skin irritation means the production of reversible damage to the skin following the application of a test substance for up to 4 hours;

Skin sensitizer means a substance that will induce an allergic response following skin contact.;

Solid means a substance or mixture which does not meet the definitions of liquid or gas;

Substance means chemical elements and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition;

Substance which, in contact with water, emits flammable gases means a solid or liquid substance or mixture which, by interaction with water, is liable to become spontaneously flammable or to give off flammable gases in dangerous quantities;

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 means a graphical element intended to succinctly convey information;

Technical name means 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;

UNITAR means the “United Nations Institute for Training and Research”;

UNSCEGHS means the “United Nations Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals”;

UNSCETDG means the “United Nations Sub-Committee of Experts on the Transport of Dangerous Goods”;

Vapour means the gaseous form of a substance or mixture released from its liquid or solid state.