



GUIDELINES FOR LABELLING OF HAZARDOUS CHEMICALS

**DEPARTMENT OF OCCUPATIONAL SAFETY AND HEALTH
MINISTRY OF HUMAN RESOURCES
MALAYSIA
1997**

**JKKP: GP (I) 5/97
ISBN 983-99156-7-3**

Table of Contents

	Page
Preface	1
1. General	2
2. Information on a Label	3
3. Miscellaneous	7
4. References	8
Appendix 1 : An Explanation of the International Union Of Pure and Applied Chemistry (IUPAC) Nomenclature System	9
Appendix 2 : Sample Label for All Category of Chemical Products Containing a Single Hazardous Ingredient	10
Appendix 3 : Sample Label for All Category of Hazardous Chemicals Preparations	11
Appendix 4 : Sample Layouts (Layouts 1, 2, 3, 4)	12
Appendix 5 : Examples Pertaining to Dimensions of the of A Preparation	14
Appendix 6 : Specifications on the Dimensions of the Danger Symbol	15
Appendix 7 : Sample Label 5	16
Appendix 8 : Criteria for Selection of Safety Phrases	17
Appendix 9 : Criteria for Selection of First Aid Phrases	28
Appendix 10 : Risk Phrases (Ungkapan Risiko)	30
Appendix 11 : Safety Phrases (Ungkapan Keselamatan)	39
Appendix 12 : A Guide on Selection of Generic Names	45
Appendix 13 : Sample Symbol	55

PREFACE

These guidelines are officially titled the **Guidelines for Labelling of Hazardous Chemicals**.

The purpose of the Guidelines is to complement and explain the requirements stipulated in the Occupational Safety and Health (Classification, Packaging and Labelling of Hazardous Chemicals) Regulations 1997 [P.U. (A) 143], with respect to labelling of hazardous chemicals. The relevant Regulations are regulations 7 and 8 pertaining to labelling and dimension of label respectively. Readers are advised to read these guidelines in conjunction with the Occupational Safety and Health (Classification, Packaging and Labelling of Hazardous Chemicals). Whenever there is any conflict or inconsistency between these Guidelines and the Regulations, the requirement of the Regulation will prevail.

Suppliers of hazardous chemicals are expected to use these guidelines as the official interpretations of the requirement of the Regulations. However, they may choose to comply with the requirement differently from what is recommended in these Guidelines, provided that they prove the Department of Occupational Safety and Health that their method of compliance is on a par with or better than what is stipulated in these guidelines.

These Guidelines will be reviewed from time to time. Suppliers are welcome to give inputs to the Department with a view to improving these Guidelines and hence promoting compliance with the Occupational Safety and Health (Classification, Packaging and Labelling of Hazardous Chemicals) Regulations 1997.

Director General
Department of Occupational Safety and Health
Malaysia

December 1997

1. GENERAL

- 1.1 These guidelines may be cited as the “Guidelines for Labelling of Hazardous Chemicals”.
- 1.2 For the purpose of these guidelines, labelling is the process where a supplier of hazardous chemicals affix a label onto a packaging containing information about the hazardous chemicals contained within the packaging.
- 1.3 The terms listed below, wherever they appear in these guidelines, will be interpreted as follows:
- “container” includes a box, a bag, a jar, a vessel, etc. made from different materials with the purpose of holding hazardous chemicals, including any means of closing;
- “label” means -
- a) a piece of paper, plastic sheet etc. attached to the packaging and carrying information about the hazardous chemical contained therein; or
 - b) a print on the packaging containing information about the hazardous chemical contained therein;
- “packaging” includes containers and any other components or materials necessary for performing the containment function;
- “risk phrase” means a phrase which conveys a general description of the hazard posed by the hazardous chemical; and
- “safety phrase” means a phrase which provides information on safe storage, handling and personal protection for the hazardous chemical.
- 1.4 The duty to label packaging containing a hazardous chemical is on the supplier and this duty is stipulated under regulation 7 of the Occupational Safety and Health (Classification, Packaging and Labelling of Hazardous Chemicals) Regulations 1997 herein after referred to as “the Regulations”.
- 1.5 For purpose of these guidelines, the duty to label hazardous chemicals or preparations produced locally lies with the manufacturer or formulator while the duty to label imported chemicals or preparations lies on the importer.

2. INFORMATION ON A LABEL

Regulation 7 of the Regulations stipulates the information which must be provided on a label. The following are clarification and interpretation of the requirements of regulation 7:

2.1. the name of the hazardous chemical in accordance with the internationally recognised nomenclature

- (i) The prescribed *internationally recognised nomenclature* is the nomenclature which has been devised by the International Union of Pure and Applied Chemistry (IUPAC) to name chemical substances.
Appendix 1 contains an explanation of the IUPAC naming system.
- (ii) The name of a *single ingredient hazardous chemical* on a label, besides following the IUPAC system, should also include its common name or CAS name. For example methyl benzene is the name for toluene in accordance with the IUPAC system. In labelling, both names should appear on the label with the common name or CAS name written in parentheses or in smaller lettering (1 font size smaller) located below the IUPAC name.
See Appendix 2 as an example.
- (iii) The name of a *hazardous preparation* or mixture should use the product name or the trade name. However, the hazardous ingredients should be listed using the IUPAC name in descending order of proportion. The hazardous ingredients are to be disclosed in terms of their *percentage weight (for solids or liquids) or percentage volume (for gases)*.
Please refer to Appendix 3.
- (iv) If the name of the chemical, the name of the ingredients in a preparation and the concentration of the ingredients constitute **confidential information**, the information may be omitted if -
 - a) the chemical or the ingredient are determined to be non-hazardous according to the Guidelines on the Classification of Hazardous Chemical;
 - b) the chemical or the ingredients are classified as irritant or harmful; or
 - c) the proportion of the ingredient in the preparation is at a concentration below the lowest cut-off level for the ingredient as listed in the List of Hazardous Chemicals contained in the Guidelines on the Classification of Hazardous Chemical.

However, the *generic name* of the chemical or the ingredients should be disclosed on the label and the concentration of each hazardous ingredient should be disclosed in the *appropriate concentration range* i.e. **>60% or 30-60% or 10-30% or <10%** .

Please refer to Appendix 5 .

- (v) To assist suppliers in selecting the appropriate generic names, a guide is included in Appendix 12.
- (vi) The name of a *complex mixture* should give as much information as possible on each hazardous ingredient giving the concentration within the appropriate range as in paragraph (iv). Chemical classes of the complex mixture should be identified such as aliphatic or aromatic hydrocarbon, aliphatic alcohol or phenol, etc.

2.2. the name, address and telephone number of the supplier

- (i) The name and address of the manufacturer, whether foreign or local, must be stated on the label.
- (ii) The name and address of the local supplier of the hazardous chemical. The supplier here refers to the importer (for imported products) or the principal distributor. The address is the full postal address of the company's marketing office in Malaysia, including the postcode number.
- (iii) The telephone number is the local telephone number of the supplier in Malaysia (including area code) where advice can be obtained, especially in an emergency. However, if the chemical is an imported chemical, the foreign manufacturer's contact number (24 hours) may be included for advice during an emergency.

2.3. the danger symbol and indication of danger as specified in Schedule II

- (i) The danger symbol and corresponding indication of danger used must be in accordance with regulation 7(2) of the Regulations.
- (ii) Danger symbol(s) assigned to a hazardous chemical must take into consideration its physicochemical properties and the adverse health effects.

A **maximum of only two danger symbols** is suggested. One to represent the hazard solely due to its physicochemical properties (Part A of Schedule I of the Regulations) and the other the hazard solely due to its adverse health effects (Part B of Schedule I of the Regulations).

- (iii) The indication of danger is the hazard classification determined using the Guidelines on the Classification of Hazardous Chemicals. This indication of danger has already been included together with the danger symbol in the diamond shape figure as depicted in Schedule II of the Regulations.
- (vi) If there are two danger symbols, they should be placed together and located either -
 - a) top and bottom on the right hand portion (*Sample 1 of Appendix 5*),

- b) side by side at the top portion (see *Sample 2 of Appendix 5*), or
- c) diagonally positioned on the right hand portion (see *Sample 3 of Appendix 5*)

of the label.

- (vii) Each danger symbol should cover at least **one-tenth** of the surface area of the label and should not be less than **one square centimetre**.
(*The danger symbol is a diamond shape figure with the sides tilted at 45 degrees to the horizontal*). Please refer to *Appendix 6*.

2.4. the nature of the special risk associated with the use of the chemical as specified in Schedule III

- (i) The nature of the special risk associated with the use of the hazardous chemical is described by the risk phrase also known as the *r-phrase*. This phrase should give notice of the hazards present with the normal or reasonably foreseeable handling or use of the hazardous chemical and should include effects of overexposure or any likely chronic effects following multiple low level exposure.
- (ii) Where a chemical has been determined to be a hazardous chemical, the provision of risk phrase(s) should be in accordance with the hazard classification that has been determined using the Guidelines on the Classification of Hazardous Chemical. The Guidelines spell out the criteria for choosing the appropriate risk phrase(s) for the hazardous chemical.
- (iii) Where a chemical poses more than one hazard, an appropriate risk phrase for each hazard should be included, with the most significant being placed first. The most appropriate risk phrases should be selected from *Appendix 7*. In general, no more than four phrases should be necessary. Additional risk phrases may be used for risks not identified in *Appendix 7*.
- (iv) When more than four phrases apply, it may be possible to eliminate phrases which refer to the lowest degree of hazard, provided that the overall effectiveness of the warning is not reduced. The use of suitable safety phrases (*s-phrases*) may also make certain risk phrases superfluous.

2.5. the safety precautionary measures as specified in Schedule IV

- (i) The safety precautionary measures are described by the safety phrase otherwise known as the *s-phrase*.
- (ii) When choosing the safety phrase, the risks indicated by the risk phrase chosen for the label should be considered together with the intended use of the hazardous chemical.

- (iii) Generally, a safety phrase which gives obvious advice in relation to a related risk which have been taken care by the r-phrase should be omitted from the label unless it is used to give particular emphasis to a specific warning. For example, the risk phrase '*Contact with water liberates toxic gas*' need not be supplemented with the safety phrase '*Never add water to this product*'.
- (iv) When a safety phrase refers to personal protective equipment, the safety phrase should where appropriate, specify the type of protective equipment needed. For example, '*Wear suitable gloves*' becomes '*Wear gloves - neoprene*'.
- (v) The most appropriate safety phrases should be selected from *Appendix 8* (reproduced from Schedule IV to the Regulations and in dual languages) and, in general, no more than four phrases should be necessary. The criteria for selecting safety phrase(s) is given in *Appendix 9*.
- (vi) First aid instructions should be included where contact or exposure to the chemical substance warrants immediate treatment. The most appropriate first aid phrases should be selected from *Appendix 10*. Additional first aid phrase(s) may be used for situations not identified in *Appendix 10*.

- Note:**
- a) The risk and safety phrases need not be given in the case of irritant, highly flammable, flammable and oxidising chemicals where the package contain 125 millilitres or less of the hazardous chemical.
 - b) For labelling of certain class of hazardous chemical as mentioned in paragraph (b), the danger symbols may be positioned in the middle of the label. See *Sample 4 of Appendix 4*.

2.6. The information required under sub-regulation (1) shall be supplied in the national language and English

- (i) The labels should be written in both the national language (Bahasa Malaysia) and English. The lettering in English should not be bigger than those in Bahasa Malaysia. Refer to Section 3 of these guidelines for the lettering sizes.
- (ii) Where no translation of a particular word or phrase is available in the national language, the English word or phrase may be used and the word or phrase should be in parentheses.

3. MISCELLANEOUS

3.1 Background Colours for Label

The background colour for a label is either white or a light colour which will not camouflage the symbol. The background colour for the danger symbols, as stipulated in Schedule II to the Regulations, are as follows:

Colour	BS 381C*	AS 2700**	PMS***
Light orange	No. 557	X15(orange)	Pantone 151
Signal red	No. 537	R13(signal red)	Pantone 192
Canary yellow	No. 309	Y11(canary)	Pantone 109

* British Standards

** Australian Standards

*** Pantone Matching System published by Pantone Inc, USA.

Please refer to Appendix 13.

3.2 Letters and Numerals

The letters and numerals are to be in print and should be of font size not smaller than 7 points (example of font size 7). The letters and numerals should be black in colour.

3.3 Revision of Label

If an hazardous preparation changes, for example a new ingredient is introduced, or if new information about the health hazards of a chemical becomes known, then the existing label must be revised to take into consideration the new information. This revision of a label should be in line with the mandatory review of the Chemical Safety Data Sheet (CSDS).

4. REFERENCES

1. Occupational Safety and Health (Classification, Packaging and Labelling) Regulations, 1997. Government gazette, April 1997.
2. Guidelines on the Classification of Hazardous Chemicals. Department of Occupational Safety and Health, 1997.
3. National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. The National Health and Safety Commission, Australia. Mac 1994.
4. Malaysian Standards MS 683:1982 Labelling of Dangerous Substance.

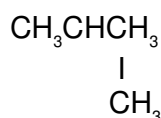
APPENDIX 1

**AN EXPLANATION OF THE INTERNATIONAL UNION OF PURE AND APPLIED
CHEMISTRY (IUPAC) NOMENCLATURE SYSTEM**

This is a system devised by the IUPAC to address the problem of naming complicated compounds. Further references can be made from any organic chemistry textbooks. The following is an example of the rules of the IUPAC system for naming alkanes:

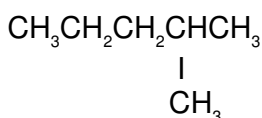
ALKANES

1. Select as the parent structure the longest continuous chain, and then consider the compound to have been derived from this structure by the replacement of hydrogen by various alkyl groups. Iso-butane (Illustration I) can be considered to arise from propane by the replacement of a hydrogen atom by a methyl group, and thus may be named "methyl propane".



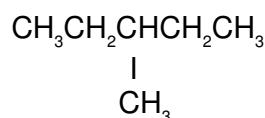
Methyl propane
(Iso-butane)

Illustration I



2-Methylpentane

Illustration II



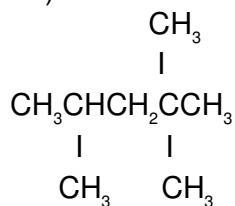
3-Methylpentane

Illustration III

2. Where necessary, as in isomeric methyl pentanes (Illustrations II and III), indicate by a number the carbon atom to which the alkyl group is attached.

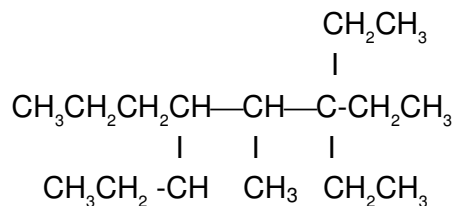
3. In numbering the parent carbon chain, start at whichever end which results in the use of the lowest numbers: thus Illustration II is called 2-methylpentane rather than 4-methylpentane.

4. If the same alkyl group occurs more than once as a side chain, indicate this by the prefix di-, tri-, tetra-, etc., to show how many of these alkyl groups there are, and indicate by various numbers the positions of each group, as in 2,2,4-trimethylpentane (Illustration IV).



2,2,4-Trimethylpentane

Illustration IV





3,3-Dethyl-5-isopropyl-4-methyloctane

Illustration V

5. If there are several different alkyl groups attached to the parent chain, name them in alphabetical order; as in 3,3-diethyl-5-isopropyl-4-methyloctane (Illustration V).


APPENDIX 2

**SAMPLE LABEL FOR ALL CATEGORY OF CHEMICAL PRODUCTS CONTAINING
A SINGLE HAZARDOUS INGREDIENT**

<p>METILBENZENA (METHYL BENZENE) toluena (toluene)</p>		 <p>SANGAT MUDAH TERBAKAR HIGHLY FLAMMABLE</p>
<p>RISIKO >Sangat mudah terbakar >Memudaratkan melalui penyedutan, jika bersentuhan dengan kulit dan jika ditelan</p>	<p>RISKS >Highly flammable >Harmful by inhalation, in contact with skin and if swallowed</p>	
<p>KESELAMATAN >Jauhkan daripada sumber pencucuhan- Dilarang merokok >Elakkan daripada bersentuhan dengan mata >Jangan buang ke dalam longkang >Ambil langkah berjaga-jaga terhadap luahan statik</p>	<p>SAFETY >Keep away from sources of ignition- No smoking >Avoid contact with eyes >Do not empty into drains >Take precautionary measures against static discharges</p>	 <p>MEMUDARATKAN HARMFUL</p>
<p>PENGILANG: Cyborg Chemical Company (Manufacturer) 13th Mile, Jalan Jelatek 55555 Petaling Jaya. Tel: 03- 9876543 (24 jam)</p>		
<p>PEMBEKAL: Syarikat Kimia Sdn. Bhd., Jalan Pelarut, (Supplier) 54200 Kuala Lumpur. Tel: 03-123456 atau 010-2345678</p>		

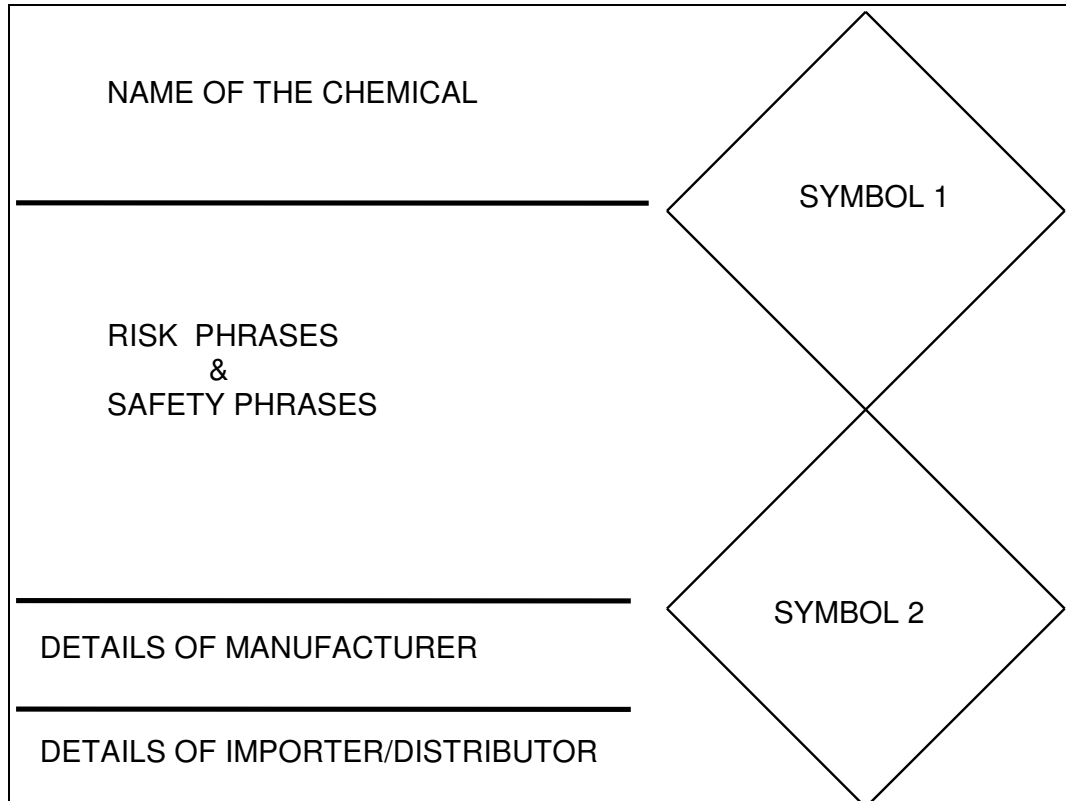
APPENDIX 3

SAMPLE LABEL FOR ALL CATEGORY OF HAZARDOUS CHEMICAL PREPARATIONS

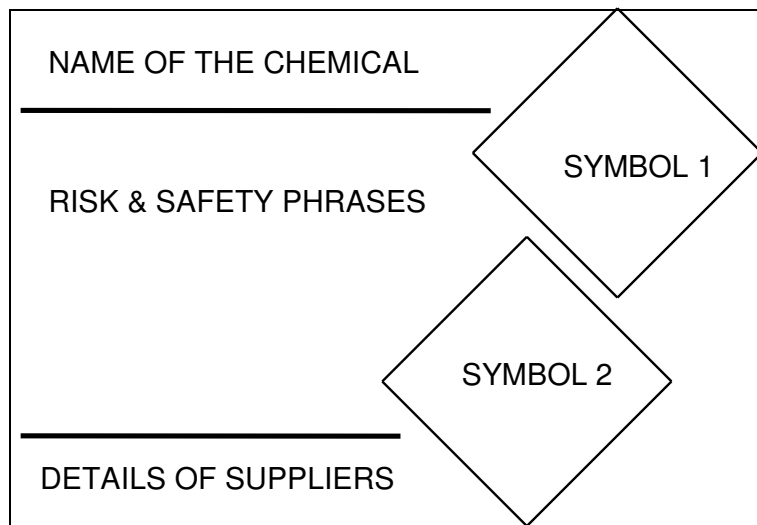
<p>ABC THINNERS</p> <p>metilbenzena (methylbenzene) 65%</p> <p>trimetilbenzena (trimethylbenzene) 35%</p>		
<p>RISIKO</p> <ul style="list-style-type: none"> >Sangat mudah terbakar >Memudaratkan melalui penyedutan, jika bersentuhan dengan kulit dan jika ditelan 	<p>RISKS</p> <ul style="list-style-type: none"> >Highly flammable >Harmful by inhalation, in contact with skin and if swallowed 	
<p>KESELAMATAN</p> <ul style="list-style-type: none"> >Jauhkan daripada sumber pencucuhan- Dilarang merokok >Elakkan daripada bersentuhan dengan mata >Jangan buang ke dalam longkang >Ambil langkah berjaga-jaga terhadap luahan statik 	<p>SAFETY</p> <ul style="list-style-type: none"> >Keep away from sources of ignition- No smoking >Avoid contact with eyes >Do not empty into drains >Take precautionary measures against static discharges 	
<p>PERUMUS : Syarikat Pelarut Organik Sdn. Bhd. (Formulator) No. 1, Jalan Jelatek 55555 Petaling Jaya. Tel: 03- 9876543 (24 jam)</p>		
<p>PEMBEKAL: Syarikat Kimia Sdn. Bhd., Jalan Air Molek, (Supplier) 70000 Seremban. Tel: 06-123456 atau 018-2345678</p>		

APPENDIX 4

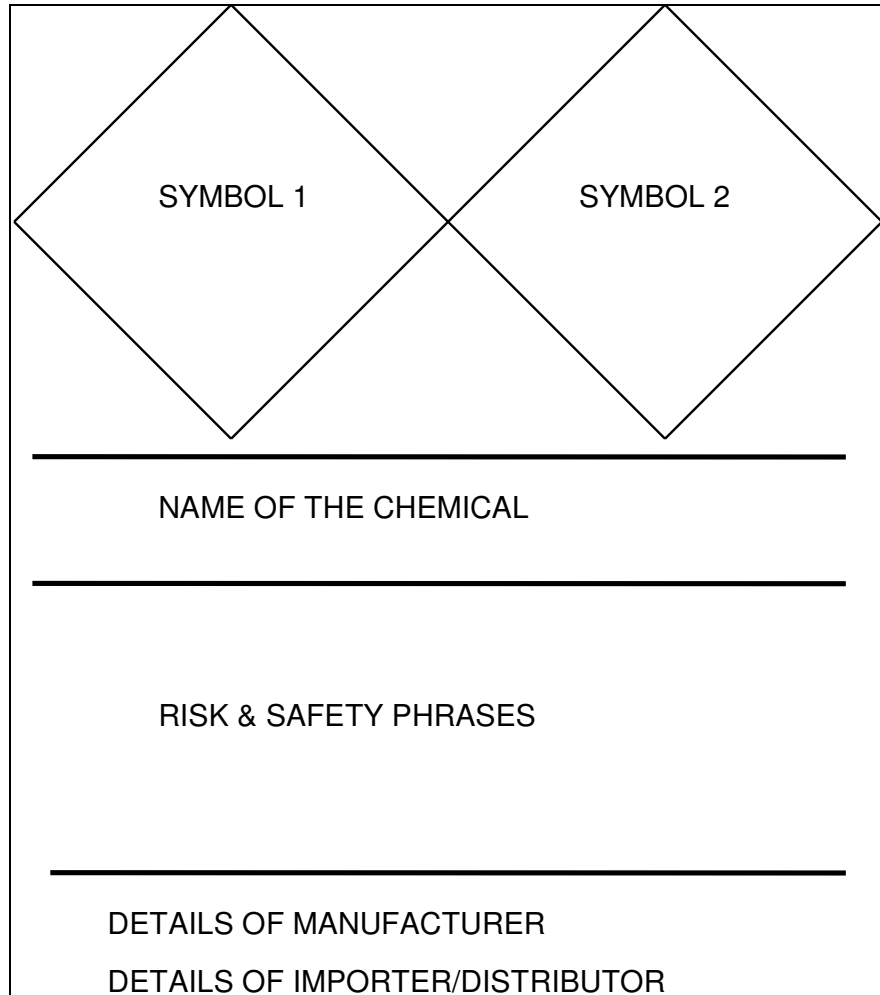
SAMPLE LAYOUT 1 (Label size 114 x 148)



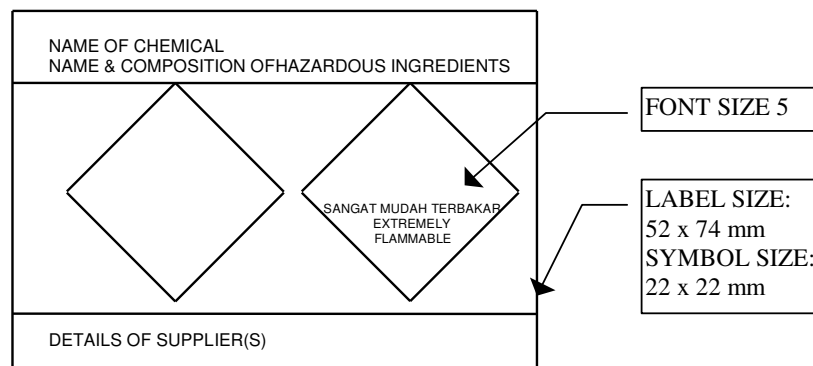
SAMPLE LAYOUT 2 (Label size 74 x 105 mm)



SAMPLE LAYOUT 3 (Label size:122 x 148 mm , symbol size 43 x 43 mm)



SAMPLE LAYOUT 4 : For packages containing 125 millilitres or less of an irritant, flammable, highly flammable or oxidising chemical substance



APPENDIX 5

**EXAMPLES PERTAINING TO DISCLOSURE OF INGREDIENTS OF A
PREPARATION**

The examples below are for the following mixture:

methylbenzene (toluene)	55 %
ethyl methyl ketone	40 %
methanol	3.5 %
2-butanol	1 %
dimethylbenzene (xylene)	0.5 %

Note: xylene and 2-butanol are not listed in the following examples because they have been determined not to be hazardous at these concentrations.

Example 1. *Where full disclosure of ingredients and proportions is possible:*

This product contains:

methylbenzene	55 %
ethyl methyl ketone	40 %

Also contains:

methanol	3.5 %
----------	-------

Example 2. *Where exact proportions of ingredients are commercially confidential:*

This product contains:

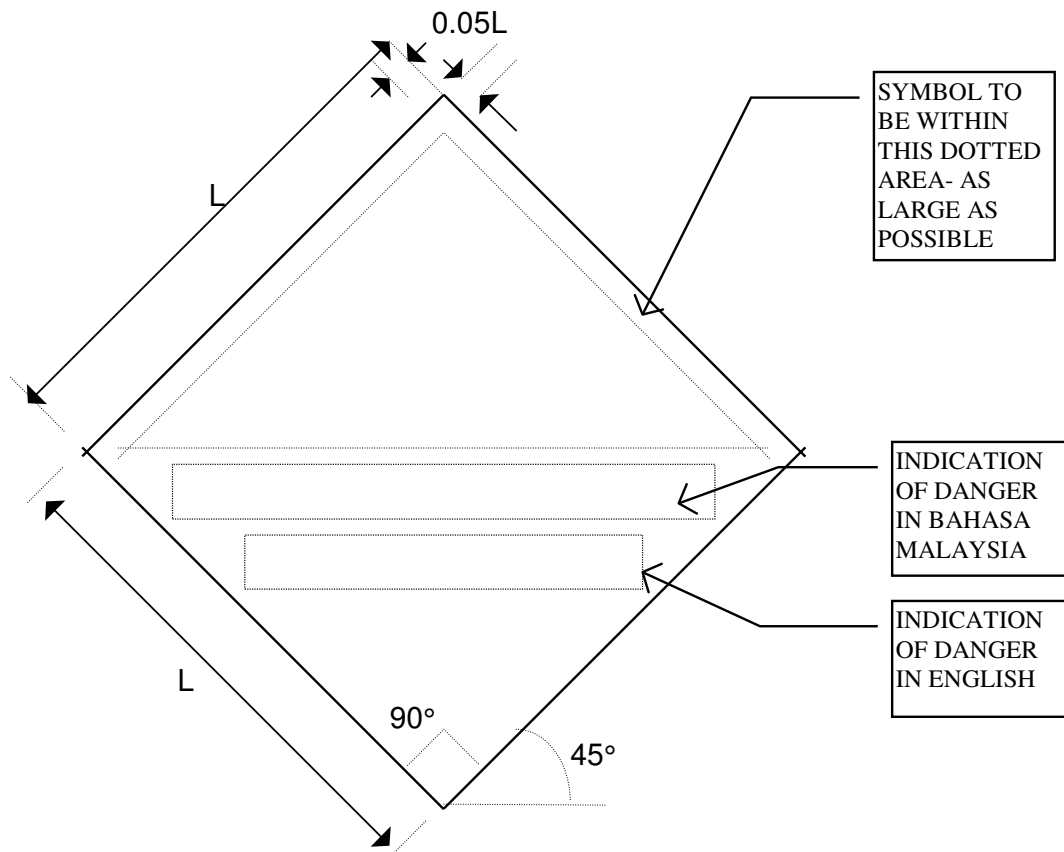
methyl benzene	30 - 60 %
ethyl methyl ketone	30 - 60 %

Also contains:

methanol	< 10 %
----------	--------

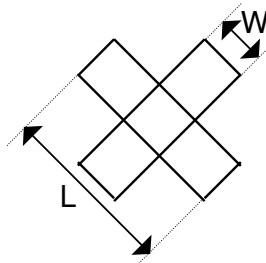
APPENDIX 6

DIMENSION AND SPECIFICATION OF DANGER SYMBOL



DANGER SYMBOL : HARMFUL


Ratio L : W of 4.0



APPENDIX 7

SAMPLE LABEL 5 : PRINT WITH FONT SIZE 7
 (Label size 84 x 114 mm)

ABC THINNERS	
metilbenzena (methylbenzene)	65%
trimetilbenzena (trimethylbenzene)	35%
RISIKO	RISKS
>Sangat mudah terbakar	>Highly flammable
>Memudaratkan melalui penyedutan, jika bersentuhan dengan kulit dan jika ditelan	>Harmful by inhalation, in contact with skin and if swallowed
KESELAMATAN	SAFETY
>Jauhkan daripada sumber pencucuhan- Dilarang merokok	>Keep away from sources of ignition - No smoking
>Elakkan daripada bersentuhan dengan mata	>Avoid contact with eyes
>Jangan buang ke dalam longkang	>Do not empty into drain
>Ambil langkah berjaga-jaga terhadap luahan statik	>Take precautionary measures against static discharges
PENGILANG: Cyborg Chemical Company (Manufacturer) 13 th Mile, Jalan Jelatek 55555 Petaling Jaya. Tel: 03- 9876543 (24 jam)	
PEMBEKAL: Syarikat Kimia Sdn. Bhd., JalanPelarut, (Supplier) 54200 Kuala Lumpur. Tel: 03-123456	



APPENDIX 8

CRITERIA FOR SELECTION OF SAFETY PHRASES

Safety phrases should be assigned in accordance with the criteria listed below:

S1 Pastikan sentiasa berkunci

Keep locked up

Applicability

Very toxic, toxic and corrosive chemicals

Criteria for use

Obligatory for those chemicals mentioned above likely to be used for members of the general public.

S2 Jauhkan daripada kanak-kanak

Keep out of reach of children

Applicability

All hazardous chemicals

Criteria for use

Obligatory for all hazardous chemicals likely to be used by members of the general public or likely to be used in places to which members of the general public have access unless there is no fear any danger, particularly to children.

S3 Simpan di tempat dingin

Keep in cool place

Applicability

Organic peroxides.

Criteria for use

Obligatory for organic peroxides unless S47 is used.

Recommended for other hazardous substances having a boiling point $\leq 40^{\circ}\text{C}$

S4 Jauhkan dari tempat kediaman

Keep away from living quarters

Applicability

Very toxic and toxic chemicals

Criteria for use

Normally limited to very toxic and toxic chemicals when desirable to supplement S13, for example, when there is an inhalation risk and the chemical should be stored away from living quarters. The advice is not intended to preclude proper use of the chemical in living quarters.

- S5 Simpan dalam ... (cecair berkenaan hendaklah dinyatakan oleh pengilang)**
Keep under ... (appropriate liquid to be specified by manufacturer)
- Applicability
Spontaneously flammable solid substances
- Criteria for use
Normally limited to special cases, for example, sodium, potassium or white phosphorus.
- S6 Simpan dalam ... (gas lengai hendaklah dinyatakan oleh pengilang)**
Keep under ... (inert gas to be specified by manufacturer)
- Applicability
Hazardous chemicals which must be kept under an inert atmosphere.
- Criteria for use
Normally limited to special cases, for example, certain organo metallic compounds.
- S7 Pastikan bekas sentiasa ditutup rapat**
Keep container tightly closed
- Applicability
Organic peroxides.
Chemicals which can give off very toxic, toxic, harmful or highly flammable vapours.
Chemicals which on contact with moisture give off highly flammable gases.
Highly flammable solids
- Criteria for use
Obligatory for organic peroxides in the combination of S3/7/9.
- S8 Pastikan bekas sentiasa kering**
Keep container dry
- Applicability
Chemicals which may react violently with water.
Chemicals which on contact with water liberate highly flammable gases.
Chemicals which on contact with water liberate very toxic or toxic gases.
- Criteria for use
Normally limited to the fields of application mentioned above when necessary to reinforce warnings given by R14, R15 in particular, and R29.
- S9 Simpan bekas di tempat yang mempunyai pengalihan udara yang baik**
Keep container in a well ventilated place
- Applicability
Organic peroxides.
Volatile chemicals which may give off very toxic, toxic or harmful vapours.
Highly flammable liquids and gases.
- Criteria for use
Obligatory for organic peroxides in the combination S3/7/9.
Recommended for volatile chemicals which may give off very toxic, toxic or harmful vapours.
Recommended for highly flammable liquids or gases.

S12 Jangan biarkan bekas ditutup

Do not keep container sealed

Applicability

Chemicals which will, by giving off gases or vapours, be liable to burst the container.

Criteria for use

Normally limited to the special cases mentioned above

S13 Jauhkan daripada makanan, minuman dan barang makanan haiwan

Keep away from food, drink and animal feeding stuff

Applicability

Very toxic, toxic and harmful chemical.

Criteria for use

Recommended when such chemicals are likely to be used by members of the general public.

S14 Jauhkan dari ... (bahan yang tidak sesuai hendaklah dinyatakan oleh pengilang)

Keep away from ... (incompatible materials to be indicated by manufacturer)

Applicability

Organic peroxides.

Criteria for use

Obligatory for, and normally limited to, organic peroxides. However, may be useful in exceptional cases when incompatibility is likely to produce a particular risk.

S15 Jauhkan daripada panas

Keep away from heat

Application

Chemicals which may decompose or react spontaneously under the effect of heat.

Criteria for use

Normally limited to special cases, for example, monomers, but not assigned if risk phrases R2, R3 and/or R5 have already been applied.

S16 Jauhkan daripada sumber pencucuhan - Dilarang Merokok

Keep away from sources of ignition - No Smoking

Applicability

Highly flammable liquids and gases.

Criteria for use

Recommended for the chemicals mentioned above but not assigned if risk phrases R2, R3 and/or R5 have already been applied.

S17 Jauhkan dari bahan mudah terbakar

Keep away from combustible

Applicability

Chemicals which may form explosive or spontaneously flammable mixtures with combustible material.

Criteria for use

Available for use in special cases, for example, to emphasise R8 and R9.

S18 Kendali dan buka bekas dengan berhati-hati

Handle and open container with care

Applicability

Chemicals liable to produce an overpressure in the container.
Chemicals which may form explosive peroxides.

Criteria for use

Normally limited to the above-mentioned cases when there is risk of damage to the eyes and/or when the chemicals are likely to be used by members of the general public.

S20 Jangan makan atau minum apabila menggunakannya

When using do not eat or drink

Applicability

Very toxic, toxic and corrosive chemicals.

Criteria for use

Normally limited to special cases, for example, arsenic and arsenic compounds and fluoracetates, in particular, when any of these are likely to be used by members of the general public.

S21 Jangan merokok apabila menggunakannya

When using, do not smoke

Applicability

Chemicals which produce toxic products on combustion.

Criteria for use

Normally limited to special cases, for example, halogenated compounds.

S22 Jangan menyedut habuk

Do not breathe dust

Applicability

All solid hazardous chemicals

Criteria for use

Recommended for those chemicals mentioned above which are liable to form inhalable dusts and when it is necessary to draw the attention of the user to inhalation risks not mentioned in the risk phrases which have been ascribed. However, may be used in exceptional cases to emphasise such risk phrases, in particular to emphasise R42.

S23 Jangan menyedut gas/wasap/wap/semburan (*perkataan yang sesuai hendaklah dinyatakan oleh pengilang*)

Do not breathe gas/fumes/vapour/spray (*appropriate wording to be specified by manufacturer*)

Applicability

All liquids or gaseous hazardous chemicals.

Criteria for use

Recommended when it is necessary to draw the attention of the user to inhalation risks not mentioned in the risk phrases which have to be ascribed. However, it may be used in exceptional cases to emphasise such risk phrases, in particular, to emphasise R42.

Recommended for chemicals in the form of aerosols which are likely to be used by members of the general public.

S24 Elakkan daripada bersentuhan dengan kulit

Avoid contact with skin

Applicability

All hazardous chemicals

Criteria for use

Recommended when it is necessary to draw the attention of the user to skin contact risks not mentioned in the risk phrases which have to be ascribed. This will apply to cryogenic chemicals and compressed gases. However, may be used in exceptional cases to emphasise such risk phrases, in particular, to emphasise R43.

S25 Elakkan daripada bersentuhan dengan mata

Avoid contact with eyes

Applicability

Corrosive or irritant chemicals.

Criteria for use

Normally to special cases, that is, when it is considered essential to emphasise the risk to eyes denoted by use of R34, R35, R36 or R41. Therefore, it is important if these chemicals are likely to be used by members of the general public and eye or face protection may not be available.

S29 Jangan buang ke dalam longkang

Do not empty into drains

Applicability

Highly flammable liquids.

Criteria for use

Recommended for those highly flammable liquids which are miscible with water. The intention is to avoid accidents, for example, fire and explosion, and not to emphasise general pollution problems.

S30 Jangan campurkan air kepada keluaran ini

Never add water to this product

Applicability

Chemicals which react violently with water.

Criteria for use

Normally limited to special cases, for example, sulphuric acid, and may be used, as appropriate, to give the clearest possible information, either to emphasise R14 or as an alternative to R14.

S33 Ambil langkah berjaga-jaga terhadap luahan statik

Take precautionary measures against static discharges

Applicability

Highly flammable chemicals.

Criteria for use

Recommended for chemicals which are used in industry and which do not absorb moisture. Virtually never used for chemicals that are placed on the market for use by members of the general public.

S34 Elakkan daripada kejutan dan geseran

Avoid shock and friction

Applicability

Explosive chemicals

Criteria for use

Obligatory for, and normally limited, to explosive organic peroxides.

S35 Bahan ini dan bekasnya hendaklah dilupuskan dengan cara yang selamat

This material and its container must be disposed of in a safe manner

Applicability

Explosive chemicals.

Very toxic and toxic substances.

Chemicals dangerous to the environment.

Criteria for use

Obligatory for explosive chemicals other organic peroxides.

Recommended for very toxic and toxic chemicals, particularly when such chemicals are likely to be used by members of the general public.

S36 Pakailah pakaian perlindungan yang sesuai

Wear suitable protective clothing

Applicability

Very toxic, toxic, harmful or corrosive chemicals.

Organic peroxides.

Criteria for use

Recommended for chemicals used in industry which are:

- very toxic, toxic or corrosive; and/or
- harmful and easily absorbed by the skin; and/or
- liable to damage health by prolonged exposure.

S37 Pakailah sarung tangan yang sesuai

Wear suitable gloves

Applicability

Very toxic, toxic, harmful or corrosive chemicals.

Organic peroxides.

Chemicals irritating to the skin

Criteria

Recommended when S36 is not used for very toxic, toxic and corrosive chemicals, for example, by members of the general public.

Recommended for organic peroxides as the combinations S37/39.

Recommended for chemicals irritating to the skin, particularly when R38 is not shown on the label.

- S38 Jika pengalihan udara tidak mencukupi, pakailah kelengkapan pernafasan yang sesuai**
In case of insufficient ventilation, wear suitable respiratory equipment

Applicability

Very toxic or toxic chemicals.

Criteria for use

Normally limited to special cases involving the use of very toxic or toxic chemicals in industry or in agriculture.

- S39 Pakailah perlindungan mata/muka**

Wear eye/face protection

Applicability

Organic peroxides.

Corrosive chemicals including irritants which give rise to risk of serious damage to the eyes.

Very toxic and toxic chemicals.

Criteria for use

Recommended for organic peroxides as the combination S37/39.

Recommended for corrosive chemicals and eye irritants, in particular when there is a risk of splashing.

Normally limited to exceptional cases for very toxic chemicals where there is a risk of splashing and there are likely to be easily absorbed by the skin.

- S40 Untuk bersihkan lantai dan semua benda yang dicemari oleh bahan ini gunakan ...**

(hendaklah dinyatakan oleh pengilang)

To clean the floor and all objects contaminated by this material use ... *(to be specified by manufacturer)*

Applicability

All hazardous chemicals

Criteria for use

Normally limited to those hazardous chemicals for which water is not considered to be a suitable cleansing agent, for example, where absorption by powdered material or dissolution by solvent is necessary, and where it is important for health and or safety reasons to provide a warning on the label.

- S41 Dalam hal kebakaran dan/atau letupan jangan menyedut wasap**

In case of fire and/or explosion do not breathe fumes

Applicability

Hazardous chemicals which, on combustion, give off very toxic or toxic gases.

Criteria for use

Normally limited to special cases.

- S42 Semasa pewasapan/penyemburan pakailah kelengkapan pernafasan yang sesuai**

(perkataan yang sesuai hendaklah dinyatakan)

During fumigation/spraying wear suitable respiratory equipment *(appropriate wording to be specified)*

Applicability

Chemicals intended for such use, but which endanger the health and safety of the user unless proper precautions are taken.

Criteria for use

Normally limited to special cases.

- S43 Jika berlaku kebakaran, gunakan ...** (*nyatakan dalam ruang jenis kelengkapan pemadam kebakaran yang tepat. Jika air meningkatkan risikonya, tambah - **Jangan gunakan air***)
 In case of fire, use ... (*indicate in the space the precise type of fire fighting equipment. If water increases the risk, add - Never use water*)

Applicability

Highly flammable and flammable chemicals.

Criteria for use

Obligatory for chemicals which in contact with water or damp air evolve highly flammable gases. Recommended for highly flammable and flammable chemicals, particularly when they are immiscible with water.

- S47 Kekalkan pada suhu yang tak melebihi ... °C** (*hendaklah dinyatakan oleh pengilang*)
 Keep at temperature not exceeding ... °C (*to be specified by manufacturer*)

Applicability

Chemicals which become unstable at a certain temperature.

Criteria for use

Normally limited to special cases, for example, certain organic peroxides.

- S48 Kekalkannya sentiasa basah dengan ...** (*bahan yang sesuai hendaklah dinyatakan oleh pengilang*)
 Keep wetted with ... (*appropriate material to be specified by manufacturer*)

Applicability

Chemicals which may become very sensitive to sparks, friction or impact if allowed to dry out.

Criteria for use

Normally limited to special cases, for example, nitrocelluloses.

- S49 Simpan hanya dalam bekas asal sahaja**
 Keep only in the original container

Applicability

Chemicals sensitive to catalytic decomposition.

Criteria for use

Normally limited to chemicals sensitive to catalytic decomposition, for example, certain organic peroxides.

- S50 Jangan campurkan dengan ...** (*hendaklah dinyatakan oleh pengilang*)
 Do not mix with ... (*to be specified by manufacturer*)

Applicability

Chemicals which may react with the specified product to evolve very toxic or toxic gases. Organic peroxides.

Criteria for use

Recommended for chemicals mentioned above which are likely to be used by members of the

general public, when it is better alternative to R31 or R32.
Obligatory with certain peroxides which may give violent reaction with accelerators or promoters.

- S51** **Gunakan hanya di tempat yang mempunyai pengalihan udara yang baik sahaja**
Use only in well ventilated areas

Applicability

Chemicals likely to, produce vapours, sprays, fumes, mists which give rise to inhalation risks or to a fire or explosion risk.

Criteria for use

Recommended when use of S38 would be inappropriate. Therefore, it is important when such chemicals are likely to be used by members of the general public.

- S52** **Tidak disyorkan untuk kegunaan dalaman pada keluasan permukaan yang besar**

Not recommended for interior use on large surface areas

Applicability

Volatile, very toxic, toxic and harmful chemicals.

Criteria for use

Recommended when damage to health is likely to be caused by prolonged exposure to these chemicals by reason of its volatilisation from large treated surfaces in the home or other enclosed places where persons congregate.

- S53** **Elakkan pendedahan - dapatkan arahan khas sebelum menggunakannya**
Avoid exposure - obtain special instruction before use

Applicability

Carcinogenic, mutagenic and/or teratogenic chemicals.

Criteria for use

Obligatory for chemicals mentioned above to which R45, R46, R47 and/or R49 have been ascribed.

APPENDIX 9

CRITERIA FOR SELECTION OF FIRST AID PHRASES

First aid phrases are s-phrases which provide instructions where contact to a chemical requires immediate treatment. The most appropriate phrases should be selected in accordance with the criteria set out in this appendix. Other first aid phrases may only be used for situations not covered by this appendix.

The first aid phrases to be used are:

S26 Jika bersentuhan dengan mata, basuh segera dengan menggunakan air yang banyak dan dapatkan nasihat perubatan

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

Applicability

Corrosive or irritant chemicals

Criteria for use

Obligatory for corrosive chemicals and those which R41 has already been ascribed.

Recommended for irritant chemicals to which the risk phrase R36 has already been ascribed.

S27 Tanggalkan semua pakaian yang tercemar dengan segera

Take off immediately all contaminated clothing

Applicability

Organic peroxides.

Very toxic, toxic or corrosive chemicals.

Criteria for use

Obligatory for organic peroxides.

Recommended for very toxic and toxic chemicals which are easily absorbed by the skin and for corrosive chemicals unless safety phrase S36 can be considered sufficient by itself.

S28 Selepas bersentuhan dengan kulit, basuh segera dengan ... yang banyak

(hendaklah dinyatakan oleh pengilang)

After contact with skin, wash immediately with plenty of ... *(to be specified by manufacturer)*

Applicability

Very toxic, toxic or corrosive chemicals.

Criteria for use

Recommended for the chemicals mentioned above, in particular when water is not the most appropriate rinsing fluid.

S44 Jika anda merasa kurang sihat, dapatkan nasihat perubatan (tunjukkan label jika perlu)

If you feel unwell, seek medical advice (show the label where possible)

Applicability

Toxic substances.

Criteria for use

Obligatory for the chemicals mentioned above when used in industry and not likely to be used by members of the general public.

S45 Dalam hal kemalangan atau jika anda merasa kurang sihat, dapatkan nasihat perubatan dengan segera (tunjukkan label jika perlu)

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

Applicability

Very toxic chemicals.
Toxic and corrosive chemicals.

Criteria for use

Obligatory for the very toxic chemicals mentioned above.
Obligatory for toxic and corrosive chemicals mentioned above when likely to be used by members of the general public.

S46 Jika tertelan dapatkan nasihat perubatan dengan segera (tunjukkan bekas atau label)

If swallowed seek medical advice immediately (show the container or label)

Applicability

All hazardous chemicals other than those which are toxic or very toxic.

Criteria for use

Obligatory for all hazardous chemicals mentioned above which are likely to be used by members of the general public, unless there is no reason to fear any danger from swallowing, particularly by children.

APPENDIX 10

UNGKAPAN RISIKO (RISK PHRASE)

A.	Tanda bagi Risiko Khas Indication of Special Risks
R1	Mudah meletup apabila kering Explosive when dry
R2	Risiko letupan melalui kejutan, geseran, kebakaran atau sumber pencucuhan lain Risk of explosion by shock, friction, fire or other sources of ignition
R3	Risiko letupan yang amat sangat melalui kejutan, geseran, kebakaran atau sumber pencucuhan lain Extreme risk of explosion by shock, friction, fire or other sources of ignition
R4	Membentuk sebatian logam mudah meletup yang sangat sensitif Forms very sensitive explosive metallic compound
R5	Pemanasan boleh menyebabkan letupan Heating may cause an explosion
R6	Mudah meletup dengan atau tanpa pendedahan udara Explosive with or without contact with air
R7	Boleh menyebabkan kebakaran May cause fire
R8	Sentuhan dengan bahan mudah terbakar boleh menyebabkan kebakaran Contact with combustible material may cause fire
R9	Mudah meletup apabila dicampurkan dengan bahan boleh terbakar Explosive when mixed with combustible material
R10	Mudah terbakar Flammable
R11	Sangat mudah terbakar Highly flammable
R12	Amat mudah terbakar Extremely flammable
R13	Gas cecair amat mudah terbakar Extremely flammable liquefied gas
R14	Bertindak balas secara kuat dengan air Reacts violently with water
R15	Sentuhan dengan air membebaskan gas sangat mudah terbakar Contact with water liberates highly flammable gases
R16	Mudah meletup jika bercampur dengan bahan pengoksidan Explosive when mixed with oxidising substances

- R17 Mudah terbakar secara spontan di udara**
Spontaneously flammable in air
- R18 Boleh membentuk campuran mudah terbakar/mudah meletup apabila digunakan**
In use, may form flammable/explosive vapour-air mixture
- R19 Boleh membentuk peroksida mudah meletup**
May form explosive peroxides
- R20 Memudaratkan melalui penyedutan**
Harmful by inhalation
- R21 Memudaratkan jika bersentuhan dengan kulit**
Harmful in contact with skin
- R22 Memudaratkan jika ditelan**
Harmful if swallowed
- R23 Toksik melalui penyedutan**
Toxic by inhalation
- R24 Toksik jika bersentuhan dengan kulit**
Toxic in contact with skin
- R25 Toksik jika ditelan**
Toxic if swallowed
- R26 Sangat toksik melalui penyedutan**
Very toxic by inhalation
- R27 Sangat toksik jika bersentuhan dengan kulit**
Very toxic in contact with skin
- R28 Sangat toksik jika ditelan**
Very toxic if swallowed
- R29 Sentuhan dengan air membebaskan gas toksik**
Contact with water liberates toxic gas
- R30 Boleh menjadi sangat mudah terbakar apabila digunakan**
Can become highly flammable in use
- R31 Sentuhan dengan asid membebaskan gas toksik**
Contact with acid liberates toxic gas
- R32 Sentuhan dengan asid membebaskan gas sangat toksik**
Contact with acid liberates very toxic gas
- R33 Bahaya kesan kumulatif**
Danger of cumulative effects
- R34 Menyebabkan luka terbakar**
Causes burns
- R35 Menyebabkan luka terbakar yang teruk**
Cause severe burns

- R36 Merengsa kepada mata**
Irritating to eyes
- R37 Merengsa kepada sistem pernafasan**
Irritating to respiratory system
- R38 Merengsa kepada kulit**
Irritating to skin
- R39 Bahaya kesan tak berbalik yang sangat serius**
Danger of very serious irreversible effects
- R40 Kemungkinan risiko kesan tak berbalik**
Possible risk of irreversible effects
- R41 Risiko yang menjejaskan mata secara serius**
Risk of serious damage to eyes
- R42 Boleh menyebabkan pemekaan melalui penyedutan**
May cause sensitisation by inhalation
- R43 Boleh menyebabkan pemekaan melalui sentuhan kulit**
May cause sensitisation by skin contact
- R44 Risiko letupan jika dipanaskan di dalam ruang terbatas**
Risk of explosion if heated under confinement
- R45 Boleh menyebabkan barah**
May cause cancer
- R46 Boleh menyebabkan kerosakan genetik turun-temurun**
May cause heritable genetic damage
- R47 Boleh menyebabkan kecacatan kelahiran**
May cause birth defects
- R48 Bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan**
Danger of serious damage to health by prolonged exposure
- R49 Boleh menyebabkan barah melalui penyedutan**
May cause cancer by inhalation
- R50 Sangat toksik kepada organisma akuatik**
Very toxic to aquatic organisms
- R51 Toksik kepada organisma akuatik**
Toxic to aquatic organisms
- R52 Memudaratkan kepada organisma akuatik**
Harmful to aquatic organisms
- R53 Boleh menyebabkan kesan buruk jangka panjang kepada alam sekitar akuatik**
May cause long term adverse effects in the aquatic environment
- R54 Toksik bagi flora**

Toxic to flora

- R55 Toksik bagi fauna**
Toxic to fauna
- R56 Toksik bagi organisma tanah**
Toxic to soil organisms
- R57 Toksik bagi lebah**
Toxic to bees
- R58 Boleh menyebabkan kesan buruk jangka panjang kepada alam sekitar**
May cause long term adverse effects in the environment
- R59 Bahaya bagi lapisan ozon**
Dangerous for ozone layer

B. Gabungan Risiko Khas
Combination of Special Risks

- R14/15 Bertindak balas secara kuat dengan air, membebaskan gas yang sangat mudah terbakar**
Reacts violently with water, liberating highly flammable gases
- R15/29 Sentuhan dengan air membebaskan gas toksik yang sangat mudah terbakar**
Contact with water liberates toxic, highly flammable gas
- R20/21 Memudaratkan melalui penyedutan dan jika bersentuhan dengan kulit**
Harmful by inhalation and in contact with skin
- R20/21/22 Memudaratkan melalui penyedutan, jika bersentuhan dengan kulit dan jika ditelan**
Harmful by inhalation, in contact with skin and if swallowed
- R20/22 Memudaratkan melalui penyedutan dan jika ditelan**
Harmful by inhalation and if swallowed
- R21/22 Memudaratkan jika bersentuhan dengan kulit dan jika ditelan**
Harmful in contact with skin and if swallowed
- R23/24 Toksik melalui penyedutan dan jika bersentuhan dengan kulit**
Toxic by inhalation and in contact with skin
- R23/24/25 Toksik melalui penyedutan, jika bersentuhan dengan kulit dan jika ditelan**
Toxic by inhalation, in contact with skin and if swallowed
- R23/25 Toksik melalui penyedutan dan jika ditelan**
Toxic by inhalation and if swallowed
- R24/25 Toksik jika bersentuhan dengan kulit dan jika ditelan**
Toxic in contact with skin and if swallowed
- R26/27 Sangat toksik melalui penyedutan dan jika bersentuhan dengan kulit**
Very toxic by inhalation and in contact with skin
- R26/27/28 Sangat toksik melalui penyedutan, jika bersentuhan dengan kulit dan jika ditelan**

	Very toxic by inhalation, in contact with skin and if swallowed
R26/28	Sangat toksik melalui penyedutan dan jika ditelan Very toxic by inhalation and if swallowed
R27/28	Sangat toksik jika bersentuhan dengan kulit dan jika ditelan Very toxic in contact with skin and if swallowed
R36/37	Merengsa kepada mata dan sistem pernafasan Irritating to eyes and respiratory sistem
R36/37/38	Merengsa kepada mata, sistem pernafasan dan kulit Irritating to eyes, respiratory system and skin
R36/38	Merengsa kepada mata dan kulit Irritating to eyes and skin
R37/38	Merengsa kepada sistem pernafasan dan kulit Irritating to respiratory system and skin
R39/23	Toksik - bahaya kesan tak berbalik yang sangat serius melalui penyedutan Toxic - danger of very serious irreversible effects through inhalation
R39/23/24	Toksik - bahaya kesan tak berbalik yang sangat serius melalui penyedutan dan jika bersentuhan dengan kulit Toxic - danger of very serious irreversible effects through inhalation and in contact with skin
R39/23/24/25	Toksik - bahaya kesan tak berbalik yang sangat serius melalui penyedutan, jika bersentuhan dengan kulit dan jika ditelan Toxic - danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed
R39/23/25	Toksik - bahaya kesan tak berbalik yang sangat serius melalui penyedutan dan jika ditelan Toxic - danger of very serious irreversible effects through inhalation and if swallowed
R39/24	Toksik - bahaya kesan tak berbalik yang sangat serius jika bersentuhan dengan kulit Toxic - danger of very serious irreversible effects in contact with skin
R39/24/25	Toksik - bahaya kesan tak berbalik yang sangat serius jika bersentuhan dengan kulit dan jika ditelan Toxic - danger of very serious irreversible effects in contact with skin and if swallowed
R39/25	Toksik - bahaya kesan tak berbalik yang sangat serius jika ditelan Toxic - danger of very serious irreversible effects if swallowed
R39/26	Sangat toksik - bahaya kesan tak berbalik yang sangat serius melalui penyedutan Very toxic - danger of very serious irreversible effects through inhalation
R39/26/27	Sangat toksik - bahaya kesan tak berbalik yang sangat serius melalui penyedutan dan jika bersentuhan dengan kulit Very toxic - danger of very serious irreversible effects through inhalation and in contact with skin

R39/26/27/28	Sangat toksik - bahaya kesan tak berbalik yang sangat serius melalui penyedutan, jika bersentuhan dengan kulit dan jika ditelan Very toxic - danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed
R39/26/28	Sangat toksik - bahaya kesan tak berbalik yang sangat serius melalui penyedutan dan jika ditelan Very toxic - danger of very serious irreversible effects through inhalation and if swallowed
R39/27	Sangat toksik - bahaya kesan tak berbalik yang sangat serius jika bersentuhan dengan kulit Very toxic - danger of very serious irreversible effects in contact with skin
R39/27/28	Sangat toksik - bahaya kesan tak berbalik yang sangat serius jika bersentuhan dengan kulit dan jika ditelan Very toxic - danger of very serious irreversible effects in contact with skin and if swallowed
R39/28	Sangat toksik - bahaya kesan tak berbalik yang sangat serius jika ditelan Very toxic - danger of very serious irreversible effects if swallowed
R40/20	Memudaratkan - kemungkinan risiko kesan tak berbalik melalui penyedutan Harmful - possible risk of irreversible effects through inhalation
R40/20/21	Memudaratkan - kemungkinan risiko tak berbalik melalui penyedutan dan jika bersentuhan dengan kulit Harmful - possible risk of irreversible effects through inhalation and in contact with skin
R40/20/21/22	Memudaratkan - kemungkinan risiko kesan tak berbalik melalui penyedutan, jika bersentuhan dengan kulit Harmful - possible risk of irreversible effects through inhalation, in contact with skin and if swallowed
R40/20/22	Memudaratkan - kemungkinan risiko kesan tak berbalik melalui penyedutan dan jika ditelan Harmful - possible risk of irreversible effects through inhalation and if swallowed
R40/21	Memudaratkan - kemungkinan risiko kesan tak berbalik jika bersentuhan dengan kulit Harmful - possible risk of irreversible effects in contact with skin
R40/21/22	Memudaratkan - kemungkinan risiko kesan tak berbalik jika bersentuhan dengan kulit dan jika ditelan Harmful - possible risk of irreversible effects in contact with skin and if swallowed
R40/22	Memudaratkan - kemungkinan risiko kesan tak berbalik jika ditelan Harmful - possible risk of irreversible effects if swallowed
R42/43	Boleh menyebabkan pemekaan melalui penyedutan dan jika bersentuhan dengan kulit May cause sensitisation by inhalation and skin contact
R48/20	Memudaratkan - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan Harmful - danger of serious damage to health by prolonged exposure

R48/20/21	<p>Memudaratkan - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan melalui penyedutan dan jika bersentuhan dengan kulit</p> <p>Harmful - danger of serious damage to health by prolonged exposure through inhalation and in contact with skin</p>
R48/20/21/22	<p>Memudaratkan - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan melalui penyedutan, jika bersentuhan dengan kulit dan jika ditelan</p> <p>Harmful - danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed</p>
R48/20/22	<p>Memudaratkan - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan melalui penyedutan dan jika ditelan</p> <p>Harmful - danger of serious damage to health by prolonged exposure through inhalation and if swallowed</p>
R48/21	<p>Memudaratkan - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan dan jika bersentuhan dengan kulit</p> <p>Harmful - danger of serious damage to health by prolonged exposure and in contact with skin</p>
R48/21/22	<p>Memudaratkan - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan jika bersentuhan dengan kulit dan jika ditelan</p> <p>Harmful - danger of serious damage to health by prolonged exposure, in contact with skin and if swallowed</p>
R48/22	<p>Memudaratkan - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan dan jika ditelan</p> <p>Harmful - danger of serious damage to health by prolonged exposure and if swallowed</p>
R48/23	<p>Toksik -bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan melalui penyedutan</p> <p>Toxic - danger of serious damage to health by prolonged exposure through inhalation</p>
R48/23/24	<p>Toksik - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan melalui penyedutan dan jika bersentuhan dengan kulit</p> <p>Toxic - danger of serious damage to health by prolonged exposure through inhalation and in contact with skin</p>
R48/23/24/25	<p>Toksik - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan melalui penyedutan, jika bersentuhan dengan kulit dan jika ditelan</p> <p>Toxic - danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed</p>
R48/23/25	<p>Toksik - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan melalui penyedutan dan jika ditelan</p> <p>Toxic - danger of serious damage to health by prolonged exposure through inhalation and if swallowed</p>
R48/24	<p>Toksik - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan dan jika bersentuhan dengan kulit</p> <p>Toxic - danger of serious damage to health by prolonged exposure and in contact with skin</p>

- R48/24/25** **Toksik - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan, jika bersentuhan dengan kulit dan jika ditelan**
Toxic - danger of serious damage to health by prolonged exposure, in contact with skin and if swallowed
- R48/25** **Toksik - bahaya yang menjejaskan kesihatan secara serius melalui pendedahan yang berpanjangan dan jika ditelan**
Toxic - danger of serious damage to health by prolonged exposure and if swallowed

APPENDIX 11

UNGKAPAN KESELAMATAN (SAFETY PHRASES)

A.	Tanda bagi Langkah-Langkah Keselamatan Indication of Safety Precautions
S1	Pastikan sentiasa berkunci Keep locked up
S2	Jauhkan daripada kanak-kanak Keep out of reach of children
S3	Simpan di tempat dingin Keep in cool place
S4	Jauhkan dari tempat kediaman Keep away from living quarters
S5	Simpan dalam ... (<i>cecair berkenaan hendaklah dinyatakan oleh pengilang</i>) Keep under ... (<i>appropriate liquid to be specified by manufacturer</i>)
S6	Simpan dalam ... (<i>gas lengai hendaklah dinyatakan oleh pengilang</i>) Keep under ... (<i>inert gas to be specified by manufacturer</i>)
S7	Pastikan bekas sentiasa ditutup rapat Keep container tightly closed
S8	Pastikan bekas sentiasa kering Keep container dry
S9	Simpan bekas di tempat yang mempunyai pengalihan udara yang baik Keep container in a well ventilated place
S12	Jangan biarkan bekas ditutup Do not keep container sealed
S13	Jauhkan daripada makanan, minuman dan barang makanan haiwan Keep away from food, drink and animal feeding stuff
S14	Jauhkan dari ... (<i>bahan yang tidak sesuai hendaklah dinyatakan oleh pengilang</i>) Keep away from ... (<i>incompatible materials to be indicated by manufacturer</i>)
S15	Jauhkan daripada panas Keep away from heat
S16	Jauhkan daripada sumber pencucuhan - Dilarang Merokok Keep away from sources of ignition - No Smoking
S17	Jauhkan dari bahan mudah terbakar Keep away from combustible

- S18 Kendali dan buka bekas dengan berhati-hati**
Handle and open container with care
- S19 Jangan biarkan bekas ditutup**
Do not keep container sealed
- S20 Jangan makan atau minum apabila menggunakannya**
When using do not eat or drink
- S21 Jangan merokok apabila menggunakannya**
When using do not smoke
- S22 Jangan menyedut habuk**
Do not breathe dust
- S23 Jangan menyedut gas/wasap/wap/semburan** (*perkataan yang sesuai hendaklah dinyatakan oleh pengilang*)
Do not breathe gas/fumes/vapour/spray (*appropriate wording to be specified by manufacturer*)
- S24 Elakkan daripada bersentuhan dengan kulit**
Avoid contact with skin
- S25 Elakkan daripada bersentuhan dengan mata**
Avoid contact with eyes
- S26 Jika bersentuhan dengan mata, basuh segera dengan menggunakan air yang banyak dan dapatkan nasihat perubatan**
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
- S27 Tanggalkan semua pakaian yang tercemar dengan segera**
Take off immediately all contaminated clothing
- S28 Selepas bersentuhan dengan kulit, basuh segera dengan ... yang banyak**
(*hendaklah dinyatakan oleh pengilang*)
After contact with skin, wash immediately with plenty of ... (*to be specified by manufacturer*)
- S29 Jangan buang ke dalam longkang**
Do not empty into drains
- S30 Jangan campurkan air kepada keluaran ini**
Never add water to this product
- S33 Ambil langkah berjaga-jaga terhadap luahan statik**
Take precautionary measures against static discharges
- S34 Elakkan daripada kejutan dan geseran**
Avoid shock and friction
- S35 Bahan ini dan bekasnya hendaklah dilupuskan dengan cara yang selamat**
This material and its container must be disposed of in a safe manner
- S36 Pakailah pakaian perlindungan yang sesuai**
Wear suitable protective clothing
- S37 Pakailah sarung tangan yang sesuai**
Wear suitable gloves

- S38** Jika pengalihan udara tidak mencukupi, pakailah kelengkapan pernafasan yang sesuai
In case of insufficient ventilation, wear suitable respiratory equipment
- S39** Pakailah perlindungan mata/muka
Wear eye/face protection
- S40** Untuk bersihkan lantai dan semua benda yang dicemari oleh bahan ini gunakan ...
(hendaklah dinyatakan oleh pengilang)
To clean the floor and all objects contaminated by this material use ... (to be specified by manufacturer)
- S41** Dalam hal kebakaran dan/atau letupan jangan menyedut wasap
In case of fire and/or explosion do not breathe fumes
- S42** Semasa pewasapan/penyemburan pakailah kelengkapan pernafasan yang sesuai
(perkataan yang sesuai hendaklah dinyatakan)
During fumigation/spraying wear suitable respiratory equipment (appropriate wording to be specified)
- S43** Jika berlaku kebakaran, gunakan ... (nyatakan dalam ruang jenis kelengkapan pemadam kebakaran yang tepat. Jika air meningkatkan risikonya, tambah - **Jangan gunakan air**)
In case of fire, use ... (indicate in the space the precise type of fire fighting equipment. If water increases the risk, add - Never use water)
- S44** Jika anda merasa kurang sihat, dapatkan nasihat perubatan (tunjukkan label jika perlu)
If you feel unwell, seek medical advice (show the label where possible)
- S45** Dalam hal kemalangan atau jika anda merasa kurang sihat, dapatkan nasihat perubatan dengan segera (tunjukkan label jika perlu)
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
- S46** Jika tertelan dapatkan nasihat perubatan dengan segera (tunjukkan bekas atau label)
If swallowed seek medical advice immediately (show the container or label)
- S47** Kekalkan pada suhu yang tak melebihi ...°C (hendaklah dinyatakan oleh pengilang)
Keep at temperature not exceeding ...°C (to be specified by manufacturer)
- S48** Kekalkannya sentiasa basah dengan ... (bahan yang sesuai hendaklah dinyatakan oleh pengilang)
Keep wetted with ... (appropriate material to be specified by manufacturer)
- S49** Simpan hanya dalam bekas asal sahaja
Keep only in the original container
- S50** Jangan campurkan dengan ... (hendaklah dinyatakan oleh pengilang)
Do not mix with ... (to be specified by manufacturer)
- S51** Gunakan hanya di tempat yang mempunyai pengalihan udara yang baik sahaja
Use only in well ventilated areas
- S52** Tidak disyorkan untuk kegunaan dalaman pada keluasan permukaan yang besar
Not recommended for interior use on large surface areas
- S53** Elakkan pendedahan - dapatkan arahan khas sebelum menggunakannya

Avoid exposure - obtain special instruction before use

- S56 Jangan buang ke dalam longkang atau persekitaran, lupus ke tempat pemungutan sisa yang dibenarkan**
Do not discharge into drains or the environment, dispose of to an authorised waste collection point
- S57 Gunakan kaedah pengurungan yang sesuai untuk mengelakkan pencemaran alam sekitar**
Use appropriate containment to avoid environmental contamination
- S59 Rujuk kepada pengilang/pembekal bagi maklumat tentang pemulihan hasil/kitaran semula**
Refer to manufacturer/supplier for information on recovery/recycling
- S60 Bahan ini dan/atau bekasnya hendaklah dilupus sebagai sisa berbahaya**
This material and/or its container must be disposed of as hazardous waste
- S61 Elakkan daripada melepaskan ke persekitaran. Rujuk kepada arahan khas/risalah data keselamatan**
Avoid release to the environment. Refer to special instructions/safety data sheets

B. Gabungan Langkah-Langkah Keselamatan
Combination of Safety Precautions

- S1/2 Pastikan sentiasa berkunci dan jauhkan daripada kanak-kanak**
Keep locked up and out of reach of children
- S3/7/9 Pastikan bekas sentiasa ditutup rapat, di tempat dingin dan mempunyai pengudaraan yang baik**
Keep container tightly closed, in a cool well ventilated place
- S3/9 Simpan di tempat dingin, yang mempunyai pengalihan udara yang baik**
Keep in a cool, well ventilated place
- S3/9/14 Simpan di tempat yang dingin, yang mempunyai pengalihan udara yang baik jauh dari ... (bahan yang tidak sesuai hendaklah dinyatakan oleh pengilang)**
Keep in a cool, well ventilated place away from ... (incompatible material to be indicated by manufacturer)
- S3/9/14/49 Simpan hanya dalam bekas asal di tempat dingin, yang mempunyai pengalihan udara yang baik jauh dari ... (bahan yang tidak sesuai hendaklah dinyatakan oleh pengilang)**
Keep only in the original container in a cool, well ventilated place away from ... (incompatible material to be indicated by manufacturer)
- S3/9/49 Simpan hanya dalam bekas asal di tempat dingin, yang mempunyai pengalihan udara yang baik**
Keep only in the original container in a cool, well ventilated place
- S3/14 Simpan di tempat yang dingin jauh dari ... (bahan yang tidak sesuai hendaklah dinyatakan oleh pengilang)**
Keep in a cool place away from ... (incompatible material to be indicated by manufacturer)
- S7/8 Pastikan bekas sentiasa ditutup rapat dan kering**

- Keep container tightly closed and dry
- S7/9** **Pastikan bekas sentiasa ditutup rapat dan disimpan di tempat yang mempunyai pengalihan udara yang baik**
Keep container tightly closed and in well ventilated place
- S20/21** **Jangan makan, minum atau merokok apabila menggunakannya**
When using do not eat, drink or smoke
- S24/25** **Elakkan daripada bersentuhan dengan kulit dan mata**
Avoid contact with skin and eyes
- S36/37** **Pakailah pakaian perlindungan dan sarung tangan yang sesuai**
Wear suitable protective clothing and gloves
- S36/37/39** **Pakailah pakaian perlindungan, sarung tangan dan perlindungan mata/muka yang sesuai**
Wear suitable protective clothing, gloves and eyes/face protection
- S36/39** **Pakailah pakaian perlindungan dan perlindungan mata/muka yang sesuai**
Wear suitable protective clothing, eye/face protection
- S37/39** **Pakailah sarung tangan dan perlindungan mata/muka yang sesuai**
Wear suitable gloves and eye/face protection
- S47/49** **Simpan hanya dalam bekas asal pada suhu yang tidak melebihi ...°C (hendaklah dinyatakan oleh pengilang)**
Keep only in the original container at temperature not exceeding ...°C (to be specified by manufacturer)

APPENDIX 12**SELECTING GENERIC NAMES****A. Division of Chemicals into Families**

a) The families are defined in the following manner:

- 1) inorganic or organic substances whose properties are identified by having a common chemical element as their chief characteristic. The family name is derived from the name of the chemical element. These families are identified as in section C1 by the atomic number of the chemical element (e.g. 001 for hydrogen compounds); and
- 2) organic substances whose properties are identified by having a common functional group as their chief characteristic.
 - the family name is derived from the functional group name, and
 - these families are identified by the number convention found in section C2 (e.g. 601 for hydrocarbons)

b) Sub-families have been added in certain cases.

B. Establishing the Generic Name

a) General principles:

In selecting a generic name, the following approach is adopted:

- i) identity of the functional groups and chemical elements present in the molecule; and
- ii) determine the most important functional groups and chemical elements which contribute to its properties.

The identified functional groups and elements taken into account are the names of the families and sub-families set out in section C in the form of a list.

b) Practical application:

After having conducted a search to see if the substance belongs to one or more families or sub-families on the list, the generic name can be established in the following way:

- i) If the name of the family or sub-family is sufficient to characterise the chemical elements or important functional groups, this name will be chosen as the generic name.

Examples:

- 1,4-dihydroxybenzene
family 604 : phenols and derivatives
⇒ generic name : phenol derivative.
- butanols
family 603 : alcohols and derivatives
sub-family : aliphatic alcohols
⇒ generic name : aliphatic alcohol
- 2-Isopropoxyethanol
family 603 : alcohols and derivatives
sub-family : glycolethers
⇒ generic name : glycolether
- methacrylate
family 607 : organic acids and derivatives
sub-family : acrylates
⇒ generic name : acrylate

- ii) If the name of a family or sub-family is not sufficient to characterise the chemical elements of important functional groups, the generic name should be a combination of the corresponding different family or sub-family names:

Examples:

- lead hexafluorosilicate
family 009 : fluorine compounds
sub-family : inorganic fluorides
family 082 : lead compounds
⇒ generic name : inorganic lead fluoride
- chlorobenzene
family 602 : halogenated hydrocarbons
sub-family : halogenated aromatic hydrocarbons
family 017 : chlorine compounds
⇒ generic name : chlorinated aromatic hydrocarbon
- 2,3,6-trichlorophenylacetic acid
family 607 : organic acids

sub-family : halogenated aromatic acids
family 017 : chlorine compounds
⇒ generic name : chlorinated aromatic acid

- 1-chloro-1-nitropropane
family 610 : chlorinated derivatives
family 601 : hydrocarbons
sub-family : aliphatic hydrocarbons
⇒ generic name : chlorinated aliphatic hydrocarbon

- tetrapropyl dithiopyrophosphate
family 015 : phosphorus compounds
sub-family : phosphoric esters
family 016 : sulphur compounds
⇒ generic name : thiophosphoric ester

NB: In the case of certain elements, notably metals, the name of the family or sub-family may be indicated by the words 'organic' or 'inorganic'.

Examples:

- dimercury chloride
family 080 : mercury compounds
⇒ generic name : inorganic mercury compound

- barium acetate
family 056 : barium compounds
⇒ generic name : organic barium compound

- ethyl nitrite
family 007 : nitrogen compounds
sub-family : nitrites
⇒ generic name : organic nitrite

- sodium hydrosulphite
family 016 : sulphur compounds
⇒ generic name : inorganic sulphur compound

C. Division of Substances into Families and Sub-Families**C1. Chemical Elements**

Family Number	Families	Sub-Families
001	Hydrogen compounds	Hydrides
002	Helium compounds	
003	Lithium compounds	

Family Number	Families	Sub-Families
004	Beryllium compounds	
005	Boron compounds	Boranes Borates
006	Carbon compounds	Carbamates Inorganic carbon compounds Salts of hydrogen cyanide Urea and derivatives
007	Nitrogen compounds	Quaternary ammonium compounds Acid nitrogen compounds Nitrates Nitrites
008	Oxygen compounds	
009	Flourine compounds	Inorganic flourides
010	Neon compounds	
011	Sodium compounds	
012	Magnesium compounds	Organometallic magnesium derivatives
013	Aluminium compounds	Organometallic aluminium derivatives
014	Silicon compounds	Silicanes Silicates
015	Phosphorus compounds	Acid phosphorus compounds Phosphonium compounds Phosphoric esters Phosphates

		Phosphites Phosphoramides and derivatives
016	Sulphur compounds	Acid sulphur compounds Mercaptans Sulphates Sulphites
017	Chlorine compounds	Chlorates Perchlorates
018	Argon compounds	
019	Potassium compounds	
020	Calcium compounds	

Family Number	Families	Sub-Families
021	Scandium compounds	
022	Titanium compounds	
023	Vanadium compounds	
024	Chromium compound	Chromium VI compounds
025	Manganese compounds	
026	Iron compounds	
027	Cobalt compounds	
028	Nickel compounds	
029	Copper compounds	
030	Zinc compounds	Organometallic zinc derivatives
031	Gallium compounds	
032	Germanium compounds	
033	Arsenic compounds	
034	Selenium compounds	
035	Bromine compounds	
036	Krypton compounds	

037	Rubidium compounds	
038	Strontium compounds	
039	Yttrium compounds	
040	Zirconium compounds	
041	Niobium compounds	
042	Molybdenum compounds	
043	Technetium compounds	
044	Ruthenium compounds	
045	Rhodium compounds	
046	Palladium compounds	

Family Number	Families	Sub-Families
047	Silver compounds	
048	Cadmium compounds	
049	Indium compounds	
050	Tin compounds	Organometallic tin derivatives
051	Antimony compounds	
052	Tellurium compounds	
053	Iodine compounds	
054	Xenon compounds	
055	Caesium compounds	
056	Barium compounds	
057	Lanthanum	
058	Cerium compounds	
059	Praseodymium compounds	
060	Neodymium compounds	
061	Promethium compounds	

062	Samarium compounds	
063	Europium compounds	
064	Gadolinium compounds	
065	Terbium compounds	
066	Dysprosium compounds	
067	Holmium compounds	
068	Erbium compounds	
069	Thulium compounds	
070	Ytterbium compounds	
071	Lutetium compounds	
072	Hafnium compounds	

Family Number	Families	Sub-Families
073	Tantalum compounds	
074	Tungsten compounds	
075	Rhenium compounds	
076	Osmium compounds	
077	Iridium compounds	
078	Platinum compounds	
079	Gold compounds	
080	Mercury compounds	Organometallic mercury derivatives
081	Thallium compounds	
082	Lead compounds	Organometallic lead derivatives
083	Bismuth compounds	
084	Polonium compounds	
085	Astate compounds	
086	Radon compounds	

087	Francium compounds	
088	Radium compounds	
089	Actinium compounds	
090	Thorium compounds	
091	Protactinium compounds	
092	Uranium compounds	
093	Neptunium compounds	
094	Plutonium compounds	
095	Americum compounds	
096	Curium compounds	
097	Berkelium compounds	
098	Californium compounds	

Family Number	Families	Sub-Families
099	Einsteinium compounds	
100	Fermium compounds	
101	Mendelevium compounds	
102	Nobelium compounds	
103	Lawrencium compounds	

C2. Organic Substances

Family Number	Families	Sub-Families
601	Hydrocarbons	Aliphatic hydrocarbons Aromatic hydrocarbons Alicyclic hydrocarbons Polycyclic aromatic hydrocarbons (PAH)
602	Halogenated hydrocarbons	Halogenated aliphatic hydrocarbons* Halogenated aromatic hydrocarbons* Halogenated alicyclic hydrocarbons*

		*Specify according to the family corresponding to halogen
603	Alcohols and derivatives	Aliphatic alcohols Aromatic alcohols Alicyclic alcohols Alcanolamines Epoxy derivatives Ethers Glycolethers Glycols and polyols
604	Phenols and derivatives	Halogenated phenol derivatives* *Specify according to the family corresponding to halogen.
605	Aldehydes and derivatives	Aliphatic aldehydes Aromatic aldehydes Alicyclic aldehydes Aliphatic acetals Aromatic acetals Alicyclic acetals
606	Ketones and derivatives	Aliphatic ketones Aromatic ketones* Alicyclic ketones *Quinones included

Family Number	Families	Sub-Families
607	Organic acids and derivatives	Aliphatic acids Halogenated aliphatic acids* Aromatic acids Halogenated aromatic acids* Alicyclic acids Halogenated alicyclic acids* Aliphatic acid anhydrides Halogenated aliphatic acid anhydrides* Aromatic acid anhydrides Halogenated aromatic acid anhydrides* Alicyclic acids anhydrides Halogenated alicyclic acid anhydrides* Salts of aliphatic acid Salts of halogenated aliphatic acid* Salts of aromatic acids Salts of halogenated aromatic acid* Salts of alicyclic acid Salts of halogenated alicyclic acid* Esters of aliphatic acid Esters of halogenated aliphatic acid* Esters aromatic acid Esters of halogenated aromatic acid* Esters of alicyclic acid Esters of halogenated alicyclic acid*

	Methacrylates	Esters of glycol ether Acylates Lactones Acyl halogenides *Specify according to the family corresponding to halogen
608	Nitriles and derivatives	
609	Nitrated derivatives	
610	Chloronitrated derivatives	
611	Azoxy and azoic derivatives	
612	Aminated derivatives	Aliphatic amines and derivatives Aromatic amines and derivatives Alicyclic amines and derivatives Aniline and derivatives Benzidine and derivatives
613	Heterocyclic basis and derivatives	Benzimidazole and derivatives Imidazole and derivatives Pyrethroids Quinoline and derivatives Triazine and derivatives Triazole and derivatives

Family Number	Families	Sub-Families
614	Glucosides and alkaloids	Alkaloids and derivatives Glucosides and derivatives
615	Cyanates and isocyanates	Cyanates Isocyanates
616	Amides and derivatives	Acetamide and derivatives Anilides
617	Organic Peroxides	