CHEMICAL MANAGEMENT GUIDELINES
Research Laboratory
School of Dental Sciences, USM Health Campus

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1. INTRODUCTION

The Chemical Management Guidelines have been developed to ensure the safe and efficient handling of chemicals within the Biomaterial Laboratory, Craniofacial Science Laboratory, and Oral Pathology Laboratory. By adhering to these processes, the aim is to ensure the safe and legal management of chemicals, protecting both personnel and the environment while maintaining efficient laboratory operations that support groundbreaking research and innovation in these research laboratories.

The primary purpose of these guidelines is to provide clear instructions and information to all authorized personnel involved in the purchase, handling, and use of chemicals. This includes:

a) **Operators / Staff:** Personnel who handle and manage chemicals during laboratory procedures.
b) **Users:**
   i. Students
   ii. Researchers
   iii. Research assistants; or
   iv. External parties/any person that in charge of the operations who utilize chemicals in their experiments and daily tasks.

The owner of the chemical will hold responsibility for any incidents caused by improper chemical usage handling and storage recommended by this guideline

2. OBJECTIVES

a) To enhance the efficiency of laboratory operations by implementing standardized procedures for the procurement, storage, handling, and disposal of chemicals.
b) To ensure all chemical management practices comply with relevant local, national, and international regulations and standards.
c) To protect the health and safety of all personnel working in the Biomaterial Laboratory, Craniofacial Science Laboratory, and Oral Pathology Laboratory by minimizing risks associated with chemical handling.

3. DEFINITION

a) Chemical : Chemical elements, or compounds or mixtures thereof, whether natural or synthetic, but does not include micro-organism

b) Chemical Hazardous to Health : Any chemical or preparation which:
   i. Is listed in Schedule I and II USECHH Regulation 2000.
   ii. Possesses any of the properties categorised in Part B of Schedule I of the CLASS Regulation 2013.
   iii. Comes within the definition of " pesticide " under the Pesticides Act 1974; or
   iv. Is listed in the First Schedule of the Environmental Quality (Schedule Wastes) Regulations 1989.

c) Chemical waste : Waste of chemical which are no longer needed by the respective Department / School / Centre. Hence, they must be disposed of from the Centres of Responsibility (Pusat Tanggungjawab i.e. PTJ) buildings or work areas.

4. ABBREVIATION

a)	OSH	:	Occupational Safety And Health
b)	PIC	:	Person Incharge
c)	PTPO	:	Pembantu Tadbir (Perkeranian/Operasi)
d)	PPE	:	Personal Preventive Equipment
e)	R&I	:	Research and Innovation Office
f)	SDS	:	Safety Data Sheets
g)	SO	:	Science Officer
h)	UKKP	:	Unit Keselamatan Dan Kesihatan Pekerjaan USM

5. REFERENCES

a) Guidelines for The Preparation of a Chemical Register (2000). P.U. (A) 131/2000. Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations 2000 (USECHH)

b) Prosedur Pengurusan Keselamatan dan Kesihatan Pekerjaan (KKP) JKKPU.
Pautan – https://ukkp.usm.my/index.php

c) Guidelines on Storage of Hazardous Chemicals: A Guide for Safe Warehousing of Packaged Hazardous Chemicals (2005). Department of Occupational Safety and Health, Ministry of Human Resources Malaysia

d) Occupational Safety and Health Act 1994 (Classification, Labelling, and Safety Data Sheet of Hazardous Chemicals) Regulation 2013

e) Procedure for Disposal and Management of Chemical Waste (JKKPU) on 03 July 2017

f) Safety Data Sheets (SDS)

6. PROCEDURE AND RESPONSIBILITY

NO	ACTIVITY	RESPONSIBILITY
6.1	**PROCUREMENT**	
	6.1.1. In the planning of ordering chemicals, all authorize personnel should: a) Make sure procurement or purchasing is carried out based on resource needs for research, consulting, service activities, general activities or teaching and learning b) Elimination and Substitution: i. **Safer Alternatives**: Explore other chemicals, methods, and procedures that are safer and do not involve hazardous substances. Evaluate the types and quantities of waste produced by different activities to minimize environmental and health impacts. ii. **Substitution of less hazardous chemicals**: Choose the less hazardous chemicals instead of one currently used which have more risk. Some major considerations to look at when considering the suitability of potential substitutes are the effectiveness, the compatibility, existing control measure, waste disposal and hazard assessment. For example, hexane can be substituted with heptane. N-heptane will not form toxic metabolites. iii. **Reduce the size:** Always purchase minimal volumes for the rate of use that is required. For example, if only 50 g will be required within a six-month period, buy only 50 g pack size. **If large quantities are purchased and then not used, they will require disposal at some point in the future which may increase the cost needed.** iv. **Reduced the concentration:** Always purchase the lowest concentration of chemicals as far as practicable for the activity c) Engineering and Isolation i. **Access to adequate storage facilities:** Always take into consideration chemical incompatibility, space and stability. For example, an oxidising chemical should not be placed near the flammable chemicals, the chemical cabinet has enough space for the new chemicals and refrigerators are available for chemicals which require low temperature storage. ii. **Access to specific facilities required for handling:** For example, a fume cupboard or local exhaust ventilation (LEV) is provided and well-functioning which is required as the risk control for chemicals that produce corrosive fumes, stench/ odour or flammable vapours. d) **Training and Safe Work Procedure:** Ensure complete appropriate training and demonstrate competency in safe procedures for handling high-risk chemicals before use.	**All authorized personnel**

<table>
<tr><th>NO</th><th>ACTIVITY</th><th>RESPONSIBILITY</th></tr>
<tr><td></td><td>e) Ensure the chosen manufacturer or supplier is able to supply chemical together with SDS dated within the last five years (5), compliant with the correct SDS format as follows:
<table>
<tr><td>Section 1:
Identification of the hazardous chemical and of the supplier.</td><td>Section 9:
Physical and chemical properties.</td></tr>
<tr><td>Section 2:
Hazard Identification.</td><td>Section 10:
Stability and reactivity.</td></tr>
<tr><td>Section 3:
Composition and information of the ingredients of the hazardous chemicals.</td><td>Section 11:
Toxicology information.</td></tr>
<tr><td>Section 4:
First-aid measures.</td><td>Section 12:
Ecological information.</td></tr>
<tr><td>Section 5:
Fire-fighting measures.</td><td>Section 13:
Disposal information.</td></tr>
<tr><td>Section 6:
Accidental release measures.</td><td>Section 14:
Transportation information.</td></tr>
<tr><td>Section 7:
Handling and storage.</td><td>Section 15:
Regulatory information.</td></tr>
<tr><td>Section 8:
Exposure controls and personal protection.</td><td>Section 16:
Other information.</td></tr>
</table>
6.1.2. Consult the Laboratory Manager or PIC Chemical Store of each laboratory regarding oversight of purchases.
a) List of chemical available
b) Current stock level
c) Quantities of chemicals and their use at the facility
d) Storage capacity available at the storage location
https://docs.google.com/spreadsheets/d/1Ogzm6bsryuSULo-U1RHJw4aXNgbvdYdZ60Pesy4tYeo/edit?usp=sharing (Inventory until July 2024)

https://docs.google.com/spreadsheets/d/1QKaqOwieIx5fw5QgdvVqECjrTcUa5Q3rzkhd3A6QC0A/edit?usp=sharing (current inventory)

6.1.3. Use the USM e-procurement method to place orders.
a) Ensure that the SDS and/or certificate of analysis (CoA) specified in the e-procurement specification are provided in bilingual (Malay and English version by company</td><td>All authorized personnel

Provider (PTPO) / Reviewer (SO R&I Office) / Approver (Dean)</td></tr>
<tr><td>6.2</td><td>ACQUISITION / RECEIVING CHEMICAL</td><td></td></tr>
<tr><td></td><td>6.2.1. Ensure supplier uploads the bilingual SDS along with Delivery Order (D.O.) and invoice in additional information section
6.2.2. Ensure SDS being uploads and email to respective users

6.2.3. Approval of chemical receipt with SDS by the Dean
6.2.4. Ensure that ordered chemicals are delivered only to the designated chemical store

6.2.5. Contact the user for the process of claiming the chemical materials.
6.2.6. Inspection of Chemicals Upon Arrival: Utilize the checklist provided in Appendix A to inspect the chemical materials

6.2.7. Maintain a hard copy of the SDS if provided with the chemical delivery, or a soft copy if an online system or email is used, ensuring that it is accessible to all authorized personnel during working hours.
Note:
The SDS should be updated regularly, especially when new types of chemicals are purchased or acquired</td><td>Supplier / PTPO

SO R&I Office / User
Dean
All authorized personnel

Staff
All authorized personnel

All authorized personnel</td></tr>
</table>

<table>
<tr><th>NO</th><th>ACTIVITY</th><th>RESPONSIBILITY</th></tr>
<tr><td>6.3</td><td>CHEMICAL REGISTRATION</td><td></td></tr>
<tr><td></td><td>Register all chemical properly (Refer Appendix B)</td><td>Staff</td></tr>
<tr><td>6.4</td><td>CHEMICAL INVENTORY</td><td></td></tr>
<tr><td></td><td>6.4.1. Scan the QR code located at the entrance of the chemical store for registering and withdrawing chemicals (Refer Appendix C)
6.4.2. Removed hazardous substances from the inventory, after they are used or disposed
6.4.3. Update the current inventory of existing chemicals (minimum every 6months)

Note:
The chemical register must be updated when a new chemical is added to the work place as soon as possible and must be accessible to all laboratory personnel who are exposed or likely to be exposed to chemical hazardous to health at the workplace</td><td>All authorized personnel</td></tr>
<tr><td>6.5</td><td>CHEMICAL STORAGE</td><td></td></tr>
<tr><td></td><td>6.5.1. Display warning signs/stickers noting that the area is a storage area for hazardous chemicals at the entrance of chemical store to notify all authorize personnel
6.5.2. Example of warning signage at the entrance of the working area:
a) Give warning of the hazards
b) Written in National and English language.
c) Attract attention to afford a rapid interaction of dangers, and to facilitate their identification.
d) Coloured print on white paper
 
6.5.3. Safe chemical storage locations typically refer to the use of shelves, cabinets, refrigerators, freezers, and the like.

6.5.4. Unsafe storage locations include on tables, in drawers, in laminar flow cabinets, on the floor, in drawers, under sinks, and places higher than eye level.

6.5.5. Ensure that chemical storage meet all of the following criteria:
<table><tr><th>Do</th><th>Don’t</th></tr><tr><td>Use appropriate storage as specified in SDS</td><td>Do not store excessive quantities of chemicals in the laboratory.</td></tr><tr><td>Label storage cabinets, lockers, and refrigerators with the type of chemicals they contain</td><td>Do not use the laboratory bench as a permanent storage location for chemicals.</td></tr><tr><td>Wear appropriate personal protective equipment (PPE) when handling hazardous chemicals, ensuring that PPE is undamaged</td><td>Do not use fume hood as a permanent storage location for chemicals, except for chemicals with strong odours that may require ventilation</td></tr><tr><td>It is not recommended to store chemicals at higher levels than eye levels.</td><td>Do not store chemicals on shelves higher than 1.5 meters or above shoulder level</td></tr></table></td><td>PIC Chemical Store

PIC Chemical Store

All authorized personnel

All authorized personnel

All authorized personnel</td></tr>
</table>

<table>
<tr><th>NO</th><th>ACTIVITY</th><th>RESPONSIBILITY</th></tr>
<tr><td></td><td>
<table>
<tr><th>Do</th><th>Don’t</th></tr>
<tr><td>Fix shelves to the wall and install rim guards on the edges to prevent falls.</td><td>Do not store any chemicals in glass containers on the floor.</td></tr>
<tr><td>Place heavier or larger bottles on lower shelves.</td><td>Do not expose chemicals to heat or direct sunlight.</td></tr>
<tr><td>Ensure chemical containers and lids are in good, secure condition.</td><td>No eating, drinking, and smoking in chemical storage areas.</td></tr>
<tr><td>Regularly inspect all chemicals to identify signs of contamination and check the integrity of chemical labels</td><td>Do not store food or beverages in refrigerators used for chemical storage. Label these areas with: "No Food – Chemical Storage Only."</td></tr>
</table>
</td><td>All authorized personnel</td></tr>
<tr><td></td><td>6.5.6. Separate and segregate chemical based on chemical properties or hazard classification and compatibility with other chemical (Refer Appendix D).</td><td>All authorized personnel</td></tr>
<tr><td></td><td>6.5.7. Store and label chemicals container as follows:
a) Name of the chemical owner/user
b) Date of receipt</td><td>All authorized personnel</td></tr>
<tr><td>6.6</td><td>CHEMICAL HANDLING</td><td></td></tr>
<tr><td></td><td>6.6.1. Procedures for Safe Chemical Handling:
a) Identify the chemical in work process
b) Comprehend the relevant SDS before handling any chemicals.
c) Observe and comply the in-house guideline
d) Ensure you are familiar with the hazards and know what to do in the event of incidents such as instant release or spillage.
e) Wear suitable Personal Protective Equipment (PPE). Verify that the PPE used is undamaged and within its expiry period
f) Ensure that the chemical fume hood is operational and use it to control exposure during the experiment.
g) Have disposal containers ready ahead of time.
h) Ensure that the work surface is clean before beginning the work and after completion
i) Excess reagent / chemical are never to be returned to stock bottles

6.6.2. The following guidelines for chemical use should be observed at all times.
a) Use the first-in, first-out (FIFO) method.
b) Before using, make sure to read the labels on the chemicals.
c) Keep SDS up to date by reviewing it on a regular basis for new information (minimum once a year).
d) Keep track of when the chemical was first opened.
e) Never mix unknown compounds.
f) Chemicals should not be stored in food containers.
g) To avoid chemical inhalation of dust/fumes, use ventilation systems.
h) Hands are washed after working with chemicals
i) Only small working quantities of chemicals are allowed in laboratories; excess chemicals must be stored in a chemical store</td><td>All authorized personnel</td></tr>
</table>

NO	ACTIVITY	RESPONSIBILITY
6.7	**TRANSPORTING CHEMICAL**	
	Transporting chemicals requires strict adherence to safety protocols to prevent spills, exposure, and accidents a) Wear appropriate PPE when transporting chemicals. b) Transport only the minimum amount of material in the lowest concentration necessary for the demonstration or educational activities. c) Plan routes and destinations to minimize travel time and distance and ensure the pathway is clear of obstructions and tripping hazards. d) Use bottle carriers or trolleys as secondary containers to contain spillage in case of breakage. e) Use sturdy carts when transporting heavy containers or transporting over long distances. f) Never leave chemicals unattended or stored in a vehicle. g) Do not leave or store hazardous chemicals in corridors, departmental offices, or other non-laboratory locations. h) Do not place incompatible chemicals together in the same container during movement. i) Immediately update chemical inventories to reflect the relocation of chemicals	**All authorized personnel**
6.8	**CHEMICAL LABELLING AND RE-LABELLING**	
	6.8.1. Labelled all chemicals properly for the benefit of current users, emergency personnel and future users 6.8.2. Unknown chemicals can be expensive to dispose of 6.8.3. Make sure all labels are legible and in good condition. Repair or replace damaged or missing labels 6.8.4. Do not removed or defaced the original manufacturers' labels 6.8.5. Delivered chemicals has clear labelling comply with CLASS 2013 Regulations such as: a) The product identifier b) The supplier identification c) Name of active ingredient d) Physical form of chemical e) The hazard statement f) The hazard pictogram g) The precautionary statement 6.8.6. Relabel the chemical when transferred to a container other than the one in which it was originally supplied. a) For **chemicals hazardous to health** that are not used during normal working hours and are used in a chemical testing laboratory: The container shall be relabeled according to Appendix E or comply with CLASS 2013 Regulations. b) For **chemicals hazardous to health that are used immediately**: The chemical does not need to be relabeled. c) For non-hazardous chemicals used in working solutions during normal working hours: i. Re-label according to Appendix E (non-hazardous label). ii. Include the date of preparation and a 3-month expiry date. iii. Re-label with the chemical name or trade name as specified on the original label. **Note:** For precise size and format of labeling, users may refer to the Express Labeling Self-Assessment (ELSA) checklist by DOSH Malaysia https://www.dosh.gov.my/index.php/competent-person-form/occupational-health/osh-info/chemical-management-1/promotional-materials/2706-23-express-labelling-self-assessment-elsa	**All authorized personnel**

NO	ACTIVITY	RESPONSIBILITY
6.9	**CHEMICAL DISPOSAL**	
	6.9.1. Chemical eligible for disposal a) Chemical with expiration date on the original bottle: Discard immediately after expiry date. b) Chemical with no expiration date on the original bottle: i. Store more than 5 years or ii. In the condition of chemical showed any physical changes, the chemical must be disposed immediately. c) Unlabeled or improper labelling d) In poor state e) Expired f) No longer required **Note:** All matters related to chemical waste handling work such as mixing, packaging, labelling, segregation etc. are entrusted to the PTJ. 6.9.2. Scheduled Wastes Management: a) Identification and separation i. Identify SW code and prepare waste card (Refer First Schedule, Scheduled Waste Regulation, Environmental Quality Act, 2005) ii. Separate waste based on incompatibility (Refer 4th Schedule, Scheduled Waste Regulation, Environmental Quality Act, 2005). iii. Incompatible waste is stored in separate container and place in separate secondary containment areas b) Dispose through sewerage treatment system (sanitary sewer system) i. Most chemical wastes that are soluble in water and does not pose hazards can be disposed of into sinks that are connected to the sewerage treatment systems ii. Prohibited to dispose chemical through laboratory sink if not connected to sanitary sewer system iii. Refer Appendix 2 and 3 in Procedure for Disposal and Management of Chemical Waste (JKKPU) on 03 July 2017 c) Waste labelling i. Fill and fix the label by using following information on the waste container **(Refer Appendix F) with hazard symbol according to type of waste** ii. The date of the waste refers to the first day of the waste generated and store in the container d) Waste storage i. Use suitable container compatible with waste, durable and able to prevent spillage or leakage ii. Sorted chemical waste into proper waste bottle or containers iii. Ensure the waste container is suitable for its contents. Do not pour chemical waste that is incompatible with previously stored chemicals into an active container, even if the bottle has been washed. iv. Keep the container close all the times. The container can only be opened for adding or removing the wastes. v. Collect chemically contaminated solid waste and broken glass in sharp bin vi. Never placed in waste at common areas such as corridors, or near floor drainage points. vii. Do not fill the container to full. Transfer waste to temporary storage area when the waste already filled about approximately 85% level c) Reporting of chemical waste produced to UKKP every month using the application form UKKP/SK1 d) Store chemical as in step 6.9.4 until collection notice being announced e) Site inspection by UKKP and fill up UKKP/BK1. Dispose waste as in step 6.9.5	**Laboratory Manager / PIC Chemical Store**

NO	ACTIVITY	RESPONSIBILITY
	6.9.3. Disposal of stocks of unused /applied chemical stocks: a) This procedure applies to unused chemicals when there are no requests, no takers and the surplus exceeds 50% of the original container's content. b) Labelling and marking c) Announced and offered to departments or other parties in need. d) If no takers, then fill up Borang Laporan Lembaga Pemeriksa Pelupusan Stok (KEW.PS-19) Pekeliling Perbendaharaan Malaysia (AM6.8) Lampiran A e) Sent the completed form together with an official memo/email indicating/proving that the stock of these chemicals has been distributed/offered and cover letter (sign by Dean) to Sekreteriat Jawatankuasa Pelupusan Aset dan Barang Universiti, Jabatan Bendahari for approval f) Store chemical as in step 6.9.4 until collection notice being announced g) Site inspection by Jawatankuasa Pelupusan Aset dan Barang Universiti, Jabatan Bendahari h) Sent approval to UKKP and dispose waste as in step 6.9.5 6.9.4. Temporary collection and storage of laboratory chemical disposal: a) Store at a designated place safely and properly b) Ensure storage area is a well ventilated and away from any fire source c) Mark and label the waste area to increase visibility; DANGER - Temporary Schedule Waste Storage Area d) Inspect disposal periodically from time to time for any spills or leak e) Ensure compatibility in the mixing and segregation of the chemical wastes at all time. Never mix or combine incompatible chemical 6.9.5. Disposal at prescribed premises: a) Coordinating and managing the collection of chemical waste by UKKP b) Treatment and disposal done by Syarikat Kualiti Alam Sdn Bhd **Note:** Routine collection must be made for chemical disposal from on-site processing and should not be collected on a large extent.	**Laboratory Manager / PIC Chemical Store / Dean**
6.10	**CHEMICAL SPILLAGE INCIDENTS AND EMERGENGY RESPONSE**	
	6.10.1. The following equipment must be maintained in laboratories for dealing with chemical spills: a) Chemical spill kits b) Personal protective equipment c) Scoops and dustpans d) Dry sand 6.10.2. For emergency response and handling spills, refer **Appendix G**	**All authorized personnel**

INSPECTION OF CHEMICALS UPON ARRIVAL

A) CHECKLIST ON RECEIPT OF CHEMICAL

Y/N	Aspect
	The special requirements of the chemicals are met. Example: refrigerator, secure/locked storage, receipt only to an authorized person.
	Delivered chemicals match the description as per the order
	Packaging is free from contamination.
	Delivered chemicals has clear labelling comply with CLASS 2013 Regulations such as: a) The product identifier b) The supplier identification c) Name of active ingredient d) Physical form of chemical e) The hazard statement f) The hazard pictogram g) The precautionary statement
	Invoice and delivery order (D.O.) is provided for finance purposes.

B) CHECKLIST WHEN CHEMICAL ARRIVED TO THE LABORATORY

Y/N	Aspect
	Ensure the current SDS and/or Certificate of Analysis (CoA) is provided / accessible
	Store SDS in a dedicated folder on a secure shared drive (soft copy) and accessible for all users
	Contact the user for the process of claiming the chemical materials
	Update the Chemical Inventory and Chemical Register.
	For chemicals with **NO expiration date**, use and store until five (5) years from manufacturing date. Upon receiving the product, assign an expiry date that is 5 years from the opening date (which must be within one year of the delivery order date), and record this expiry date in the chemical registration inventory.
	Write date of receipt on chemical container.
	Store the chemicals correctly and safely.

Note: Y: Yes, or N: No

CHEMICAL REGISTRATION FORM

USM UNIVERSITI SAINS MALAYSIA APEX	RESEARCH LABORATORIES SCHOOL OF DENTAL SCIENCES REGISTER OF CHEMICALS HAZARDOUS TO HEALTH	Page : Revision : Date :

Section A: COMPANY INFORMATION

Name : Address : City : Postcode : State : Telephone no : Email :	DOSH Registration No : (Refer to Appendix 4 for Code of Sector & Appendix 5 for Class of Industry) Code of Sector : Class of Industry : Company Activity (Please enter (/) in the appropriate box : Manufacturer : Distributor : Formulator : Importer : End-user :

SECTION B : LIST OF CHEMICALS HAZARDOUS TO HEALTH

Location :
Process Operation :
No. of Hazardous Chemical :
No. of Workers Male :
Female:

Product Name	Name of Chemical	Physical Form of Chemical	No of Worker Exposed	Type of Control Measures		Usage Of Chemical		CAS No	Name of Active Ingredients	Comply with Classification, Labeling and Safety Data Sheet (CLASS 2013) Regulation			Name, Address of Supplier and Contact Number (Tel.No/email)
				Engineering control	PPE	Type	Quantity (monthly /yearly)			SDS (Y/N)	Class	Label (Y/N)	

Product Name	Name of Chemical	Physical Form of Chemical	No of Worker Exposed	Type of Control Measures		Usage of Chemical		CAS No	Name of Active Ingredients	Comply with Environmental Quality (Scheduled Wastes) Regulation 2005			Name, Address of Waste Generator and Contact Number (Tel.No/email)
				Engineering control	PPE	Type	Quantity (monthly)			Waste Card (Y/N)	Waste Code	Label (Y/N)	

SECTION C : NAME OF PERSON WHO PREPARED OR REVIEWED

PREPARED BY : Name : Title : Date : (Signature)	REVIEWED BY : Name : Title : Date : (Signature)

CHEMICALS INVENTORY QR CODE
At the entrance of Chemical Store

INVENTORY RECEIPTS RECORDS IN THE CHEMICAL STORE (STOCK IN) – GOOGLE FORM	**INVENTORY WITHDRAWAL RECORDS IN THE CHEMICAL STORE (STOCK OUT) – GOOGLE FORM**
MANDATORY: **Scan this QR code BEFORE STORING your chemical** https://docs.google.com/forms/d/e/1FAIpQLSfHBHqfo8kmh-Sf9LMPgyAyzO14fjL9Ve8yEJzJ0xbkqZnSeA/viewform **"If you DO NOT properly record stored items, they may be at risk of being disposed of or lost"**	**MANDATORY:** **Scan this QR code BEFORE TAKING OUT your chemical** https://docs.google.com/forms/d/e/1FAIpQLSf4Z4isE2rvD99qNA6r2RjGV-cFk8X1TPc1JVyx594umYKEIg/viewform **"Applies ONLY to stock taken out and NOT RETURNED"**

BASIC REGULATIONS ON CHEMICAL STORAGE

1) Hazard Classification

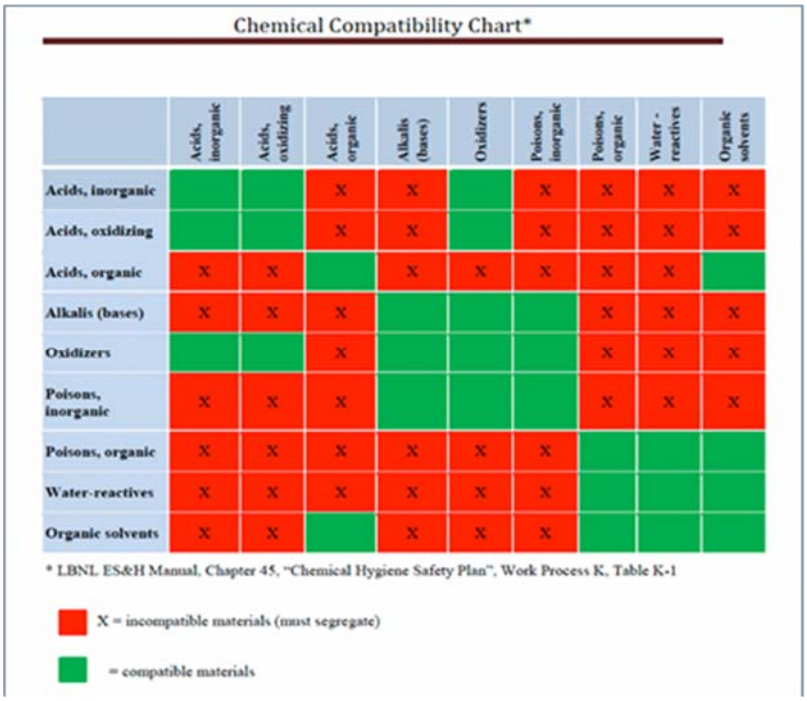
There are 9 hazard categories which comprise four hazard categories based on physicochemical properties (i.e.: explosive, oxidising, compressed gas and flammable and 5 hazard categories based on health effect (i.e.: environmental hazard, health hazard, toxic, corrosive, and harmful).

		
Exploding Bomb ● Explosives ● Self-reactive ● Organic Peroxides	**Corrosion** ● Skin corrosion/burns ● Eye damage ● Corrosive to metals	**Flame over circle** ● Oxidizing gasses ● Oxidizing liquids ● Oxidizing solids
		
Gas Cylinder ● Gasses under pressure	**Environment** ● Aquatic toxicity	**Skull & Crossbones** ● Acute toxicity (fatal or toxic)
		
Exclamation Mark ● Irritant (eye & skin) ● Skin sensitizer ● Acute toxicity ● Narcotic effects ● Respiratory tract irritant ● Hazardous to ozone layer (non-mandatory)	**Health hazard** ● Carcinogen ● Mutagenicity ● Reproductive toxicity ● Respiratory sensitizer ● Target organ toxicity ● Aspiration toxicity	**Flame** ● Flammables ● Pyrophorics ● Self-heating ● Emits flammable gas ● Self-reactive ● Organic peroxides

2) CHEMICAL COMPATABILITY

a) In brief, incompatible chemicals are combinations of substances that are typically in a concentrated form, react with each other to produce highly exothermic reactions that are uncontrollable and explosive, and/or release toxic substances, usually in the form of gasses. The following are hazards resulting from the reaction of two or more incompatible chemicals:
   i. The production of heat.
   ii. The generation of flames that can lead to fires.
   iii. Explosions occurring.
   iv. The release of toxic gases or steam.
   v. The formation of end products is more toxic than the original materials.
   vi. The formation of compounds sensitive to shock or friction.
   vii. Increased pressure within a closed container.
   viii. The dissolution of toxic substances.
   ix. The dispersion of toxic dust and fumes.
   x. Uncontrolled polymerization.

b) Users should refer to the SDS to assess the hazards of the stored chemicals. Most chemicals have multiple hazards. Therefore, decisions for segregation for storage purposes should be prioritized according to the following hazard hierarchy:
   i. Segregated and stored according to their chemical family or hazard classification
   ii. If a chemical exhibit more than one hazard, separate it based on its primary hazard classification.
   iii. Only chemicals in the same hazard category should be stored alphabetically.
   iv. Each chemical family should be separated from all other chemical families by an approved non-combustible partition or by a distance of twenty feet.
   v. Incompatible chemicals must not be stored together.
   vi. **Flammable:** store the chemical in a dedicated cabinet designed for flammable substances.
   vii. **Reactivity:**
      - If a chemical readily reacts with water, it should be stored in a dry cabinet and away from water sources, including safety shower areas
      - If a chemical substance has the potential to cause combustion (for example, oxidizing materials), it must be separated from flammable substances
   viii. **Toxic:** Separate toxic chemicals from being stored together with other chemicals. <u>If there are toxic chemicals that are also flammable, they should be stored in a specialized cabinet for flammable chemicals.</u>



CHEMICAL LABELING TEMPLATE
Please ensure the SDS is referred to for filling in the relevant information on the label

CHEMICAL NAME (NAMA BAHAN KIMIA) (CAS NO.:)

SIGNAL WORD

HAZARD STATEMENT

PERNYATAAN BAHAYA

PRECAUTIONARY STATEMENT

PERNYATAAN BERJAGA-JAGA

MANUFACTURER (PENGILANG):

SUPLIER (PEMBEKAL):

CHEMICAL NAME (NAMA BAHAN KIMIA) (CAS NO.:)

SIGNAL WORD

Read Safety Data Sheet before use
Baca Helaian Data Keselamatan sebelum

MANUFACTURER (PENGILANG):

SUPLIER (PEMBEKAL):

Note: The size of the label depends on the size of the container.

Hazard Communication Pictogram

*Choose the appropriate pictogram and drag it to the label above

CHEMICAL LABELING TEMPLATE

Please ensure the SDS is referred to for filling in the relevant information on the label

CHEMICAL LABELLING AND RELABELING INFORMATION

1 Product name: **FORMALDEHYDE SOLUTION**
Ingredient & Concentration: Formaldehyde (CAS. No.:50-00-0) : 37%
Water : 63%

3 Hazard Pictograms

2 Signal word: **DANGER**
BAHAYA

4 Hazard statements

HAZARD STATEMENT
Causes skin irritation.
Toxic if swallowed, in contact with or if inhaled.
Causes severe skin burns and eye damage.
May cause an allergic skin reactions.

PERNYATAAN HAZARD
Menyebabkan kerengsaan kulit.
Maut jika tertelan, terkena kulit atau jika tersedut.
Menyebabkan lencuran kulit dan kerosakan mata yang teruk.
Boleh menyebabkan tindak balas alahan kulit.

5 Precautionary statements

PRECAUTIONARY STATEMENT
Keep away from heat/sparks/open flames/hot surface.
No smoking.
Avoid breathing vapour.
Use only outdoors or in a well ventilated area.
Wash hands thoroughly after handling.
Obtain special instruction before use.
Do not handle until all safety precautions have been read and understood.

PERNYATAAN BERJAGA-JAGA
Jauhkan dari haba/percikan api/nyalaan terbuka/permukaan panas.
Dilarang merokok.
Elakkan daripada menyedut wap.
Gunakan hanya di luar bangunan atau di dalam kawasan pengudaraan yang baik.
Basuh tangan dengan baik selepas mengendalikan.
Dapatkan arahan khas sebelum menggunakan bahan.
Jangan kendalikan bahan sehingga semua langkah berjaga-jaga keselamatan telah dibaca dan difahami.

6 Manufacturer & Supplier identification

Manufacturer: XYZ Co. Limited, 515 Touhy Avenue, Des Plaines, IL 60018 USA (24hr Emergency Tel No. 800 424-9300)
(Pengilang)
Supplier: ABCD Kimia Sdn. Bhd., 1126, Jalan Kg. Arap, 50534 Kuala Lumpur (Tel : 03-273 1234, Fax: 03- 0000-1234, Emergency: 1-800-1234567.
(Pembekal)

7 Supplementary information

Prepared by: Date prepared :
Date Expired :

Content of the packaging	Dimensions of Label (mm)
Not exceeding 3 liters	if practible, at least 52 x 74
≥ 3 liters ≤ 50 liters	At least 74 x 105
≥ 50 liters ≤ 500 liters	At least 105 x 148
≥ 500 liters	At least 148 x 210

CHEMICAL LABELLING AND RELABELING INFORMATION

1 Product name: **FORMALDEHYDE SOLUTION**
Ingredient & Concentration: Formaldehyde (CAS. No.:50-00-0) : 37%
Water : 63%

3 Hazard Pictograms

2 Signal word: **DANGER**
BAHAYA

Read Safety Data Sheet before use
Baca helaian data Keselamatan sebelum digunakan

4 Manufacturer & Supplier identification

Manufacturer: XYZ Co. Limited, 515 Touhy Avenue, Des Plaines, IL 60018 USA (24hr Emergency Tel No. 800 424-9300)
(Pengilang)
Supplier : ABCD Kimia Sdn. Bhd., 1126, Jalan Kg. Arap, 50534 Kuala Lumpur (Tel : 03-273 1234, Fax: 03- 0000-1234, Emergency: 1-800-1234567.
(Pembekal)

5 Supplementary information

Prepared by: Date prepared :
Date Expired :

For packaging 125ml and below

CHEMICAL LABELLING INFORMATION
FOR NON HAZARDOUS

1 Product name: **DISTILLED WATER**

2 Supplementary information

Prepared by: Date prepared :
Date Expired :

LABEL BEKAS PENYIMPANAN SISA KIMIA

Perkara	Penerangan	
Nama Kandungan Utama Sisa Kimia (IUPAC). [Jika Campuran, Nyatakan Setiap Komposisi Kimia]		
Tarikh Mula Dikumpul		
Kod Buangan [Jadual I - Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005]		
Nama & No. Bilik/ Makmal		
Nama Pegawai/ Penjana Sisa		Samb Tel:

Catatan :

1) Label ini perlu dicetak oleh PTJ masing-masing untuk ditampal pada bekas-bekas pengumpulan
2) Saiz label tidak boleh kurang daripada 18 cm x 15 cm (panjang x lebar) kecuali jika saiz bekas atau bungkusan memerlukan label yang saiznya lebih kecil

EMERGENCY RESPONSE PROCEDURE

a) Responsibility and Accountability

a) Review of Safety Data Sheets (SDS) for all chemicals used in the laboratory.
b) Prepare a chemical spill kit based on the potential chemical spills and the hazards associated with chemicals used in his/her laboratory.
c) Ensure all authorize personnel receive appropriate chemical safety training and familiarize themselves with the spill response plan.
d) It is the responsibility of all authorize personnel to acquire sufficient knowledge in chemical safety, use PPE that are available in the chemical spill kit and follow this SOP in case of emergency

b) Spill Control/ Containment and Clean-up Materials/ Supplies

a) Every laboratory that uses chemicals must have access to a spill control kit appropriate to the chemicals used with at least enough containment and cleanup materials to handle an approximately 1 L to 2 L spill of liquid or 1 kg of dry chemical (or the largest container in the laboratory).
b) As items depleted, it is the responsibility of each PIC to replace the items.
c) The kit needs to be checked periodically by the safety officer to ensure that proper spill kit materials are maintained.

c) Chemical Spill Kit Contents:

Spill kits must be located strategically and easily accessible in an emergency.

a) Absorbents
   i. Universal Spill Absorbent - 1:1:1 mixture of Flor-Dri (or unscented kitty litter), sodium bicarbonate, and sand. This all-purpose absorbent is good for most chemical spills including solvents, acids (not good for hydrofluoric acid), and bases.
   ii. Vermiculate, zeolite
b) Neutralizers (in spray bottle)
   i. Acid Spill Neutralizer - sodium bicarbonate, sodium carbonate, or calcium carbonate.
   ii. Alkali (Base) Neutralizer - sodium bisulfate.
   iii. Solvents/Organic Liquid Absorbent - Inert absorbents such as vermiculite, clay, sand, Flo Dri, and Oil Dri.
   iv. Bromine Neutralizer - 5% solution of sodium thiosulfate and inert absorbent.
   v. Hydrofluoric Acid - HF compatible spill pillow or neutralize with lime and transfer to a polyethylene container
c) Personal Protective Equipment (PPE)
   i. Goggles and Face Shield
   ii. Heavy Neoprene Gloves
   iii. Disposable Lab Coat and Corrosive Apron
   iv. Plastic Vinyl Booties (PVC boots)
   v. Shoe covers
   vi. Dust Mask/Respirator (All lab personnel must be properly fit tested before using a respirator.)
d) Clean-Up Material
   i. Plastic Dust Pan and Scoop
   ii. Laboratory tongs - to pick up broken glasses
   iii. Plastic Bags (30 Gallon, 3 mil thickness) for contaminated PPE
   iv. One Plastic Bucket (5-gallon polyethylene) with lid for spill and absorbent residues
   v. Sealing tapes
   vi. Hazardous waste labels, warning signs
e) Others
   i. Hydrofluoric Acid Antidote Gel - Calcium Gluconate gel (always check expiration date)
   ii. Mercury Spill Kit - Aspirator Bulb and Mercury Decontaminating Powder
   iii. Alkali Metals - Dry sand or a Class “D” Fire Extinguisher
   iv. Acid Chlorides - Oil Dri, Zorb-All, or dry sand

d) Precaution:
   i. Attend to any injured or contaminated people first.
   ii. Protect yourself and others – keep a safe distance from the spilled chemical - cordon off the spill area to prevent additional worker and environment contamination.
   iii. If a volatile, flammable chemical is spilled, ventilate the area and extinguish any open flames (e.g. Bunsen burner). Due to the possibility of sparks, do not operate light switches, telephones, or fire alarms.
   iv. Avoid inhaling vapours from the spill.
   v. Think, plan clean up carefully.
   vi. Consult SDS and determine appropriate clean up procedures for the chemical.
   vii. Decide if you can safely handle the spill. Do not take unnecessary risks.
   viii. If unsure, consult USM OSHE Unit / UKKP
   ix. Wear appropriate personal protective equipment.
   x. Wash your hands before leaving the laboratory.

e) Spill Handling Procedures

a) Basic

   i. Worker injury (if any) must be taken care of FIRST, and spill cleanup SECOND.
   ii. Assess the spill, its hazards, and the danger to people in the vicinity quickly before taking action.
   iii. In the event the spilled chemical is unknown, assume the worst and evacuate. The safety of those in the vicinity is top priority.
   iv. Apply the “Three C” procedure:

Control the spill	Immediate steps should be taken to control or stop the spill. Do not leave the area unattended, cordon off the spill site.
Contain the spill	Contain the spilled chemical in as small an area as possible and prevent it from spreading.
Clean up the spill	Clean and decontaminate.

b) Chemical Splash into the Eye(s)

   i. Forcibly keep eye lids open.
   ii. Wash eyes gently using clean cold water or normal saline from an Eyewash Station/water source.
   iii. Keep washing steadily for at least 20 minutes.
   iv. Rinse/wash hands/body thoroughly using a Shower to remove chemical.
   v. Remove contact lens if you are wearing one.
   vi. Do not rub eyes.
   vii. Do not use eye drops until seen by a doctor.
   viii. Seek medical help immediately.
   ix. Remember the name of the chemical and take its SDS along with the personnel to the treating doctor.
   x. Notify the incident through the helpdesk system and complete the incident report form

c) Chemical splash on skin

   i. Remain calm.
   ii. Quickly remove all contaminated clothing.
   iii. Immediately wash away contaminant using the safety shower or other available source of water.
   iv. Allow water to run over the affected body area for at least 15 minutes.
   v. Do not use neutralizing chemicals, creams, or lotions.
   vi. Do not move an injured person unless they are in further danger.
   vii. Seek medical help immediately.
   viii. Remember the name of the chemical and take its SDS along with the personnel to the treating doctor.
   ix. Notify the incident to UKKP and complete the incident report form

d) Minor Chemical Spill

i. Remain calm.
ii. Quickly remove all contaminated clothing.
iii. Immediately wash away contaminant using the safety shower or other available source of water.
iv. Allow water to run over the affected body area for at least 15 minutes.
v. Do not use neutralizing chemicals, creams, or lotions.
vi. Do not move an injured person unless they are in further danger.
vii. Seek medical help immediately.
viii. Remember the name of the chemical and take its SDS along with the personnel to the treating doctor.
ix. Notify the incident to UKKP and complete the incident report form

e) Major Chemical Spill

i. Remain calm.
ii. Quickly remove all contaminated clothing.
iii. Immediately wash away contaminant using the safety shower or other available source of water.
iv. Allow water to run over the affected body area for at least 15 minutes.
v. Do not use neutralizing chemicals, creams, or lotions.
vi. Do not move an injured person unless they are in further danger
vii. Seek medical help immediately.
viii. Remember the name of the chemical and take its SDS along with the personnel to the treating doctor.
ix. Notify the incident to UKKP and complete the incident report form