



# **MALAYSIAN STANDARD**

**MS 1042-9:2015**

## **Safety in laboratories - Code of practice - Part 9: Storage of chemicals**

**ICS: 71.040.10**

Descriptors: code of practice, safety, laboratory, chemical, storage

**© Copyright 2015**

**DEPARTMENT OF STANDARDS MALAYSIA**

# DEVELOPMENT OF MALAYSIAN STANDARDS

The **Department of Standards Malaysia (STANDARDS MALAYSIA)** is the national standards and accreditation body of Malaysia.

The main function of STANDARDS MALAYSIA is to foster and promote standards, standardisation and accreditation as a means of advancing the national economy, promoting industrial efficiency and development, benefiting the health and safety of the public, protecting the consumers, facilitating domestic and international trade and furthering international cooperation in relation to standards and standardisation.

Malaysian Standards (MS) are developed through consensus by committees which comprise balanced representation of producers, users, consumers and others with relevant interests, as may be appropriate to the subject at hand. To the greatest extent possible, Malaysian Standards are aligned to or are adoption of international standards. Approval of a standard as a Malaysian Standard is governed by the Standards of Malaysia Act 1996 [Act 549]. Malaysian Standards are reviewed periodically. The use of Malaysian Standards is voluntary except in so far as they are made mandatory by regulatory authorities by means of regulations, local by-laws or any other similar ways.

For the purposes of Malaysian Standards, the following definitions apply:

**Revision:** A process where existing Malaysian Standard is reviewed and updated which resulted in the publication of a new edition of the Malaysian Standard.

**Confirmed MS:** A Malaysian Standard that has been reviewed by the responsible committee and confirmed that its contents are current.

**Amendment:** A process where a provision(s) of existing Malaysian Standard is altered. The changes are indicated in an amendment page which is incorporated into the existing Malaysian Standard. Amendments can be of technical and/or editorial nature.

**Technical corrigendum:** A corrected reprint of the current edition which is issued to correct either a technical error or ambiguity in a Malaysian Standard inadvertently introduced either in drafting or in printing and which could lead to incorrect or unsafe application of the publication.

NOTE: Technical corrigenda are not to correct errors which can be assumed to have no consequences in the application of the MS, for example minor printing errors.

STANDARDS MALAYSIA has appointed **SIRIM Berhad** as the agent to develop, distribute and sell Malaysian Standards.

For further information on Malaysian Standards, please contact:

**Department of Standards Malaysia**  
Ministry of Science, Technology and Innovation  
Level 1 & 2, Block 2300, Century Square  
Jalan Usahawan  
63000 Cyberjaya  
Selangor Darul Ehsan  
MALAYSIA

Tel: 60 3 8318 0002  
Fax: 60 3 8319 3131  
<http://www.jsm.gov.my>  
E-mail: [central@jsm.gov.my](mailto:central@jsm.gov.my)

OR **SIRIM Berhad**  
(Company No. 367474 - V)  
1, Persiaran Dato' Menteri  
Section 2, P. O. Box 7035  
40700 Shah Alam  
Selangor Darul Ehsan  
MALAYSIA

Tel: 60 3 5544 6000  
Fax: 60 3 5510 8095  
<http://www.sirim.my>  
E-mail: [msonline@sirim.my](mailto:msonline@sirim.my)

## Contents

	Page
Committee representation .....	iii
Foreword.....	iv
 SECTION 1: SCOPE AND GENERAL	
1.1 Scope .....	1
1.2 Application.....	1
1.3 Normative references.....	2
1.4 Terms and definitions.....	2
1.5 Interpretation .....	5
 SECTION 2: BASIC PRINCIPLES OF STORAGE	
2.1 Scope of section .....	5
2.2 Documentation .....	5
2.3 Knowledge of materials.....	5
2.4 Choice of risk control measures .....	5
2.5 Storage procedures .....	6
2.6 Principles of storage .....	7
 SECTION 3: REQUIRED FEATURES FOR A LABORATORY, STOREROOM OR SPACE, CHEMICAL STORAGE CABINETS, LABORATORY CUPBOARDS, RACKS AND SHELVES	
3.1 Scope of section .....	9
3.2 Laboratory .....	9
3.3 Chemical storage cabinets.....	9
3.4 Laboratory cupboards .....	10
3.5 Refrigerators.....	11
3.6 Display of hazard identification information.....	11
3.7 Storeroom or space .....	11
3.8 Room for opening packages .....	11
3.9 Shelves and racks .....	11
 SECTION 4: USE AND STORAGE OF CHEMICALS AND GAS CYLINDERS WITHIN A LABORATORY	
4.1 Scope of section .....	11
4.2 Gases and cryogenic liquids .....	11
4.3 Size of packages .....	12
4.4 Quantities of chemicals in storage within a laboratory.....	13
4.5 Method of keeping chemicals.....	14
4.6 Restriction on opening packages .....	15
4.7 Segregation in storage .....	15

**Contents** *(continued)*

	<b>Page</b>
<b>SECTION 5: STORING CHEMICALS IN A SEPARATE STORE</b>	
5.1	Scope of section ..... 17
5.2	Store location..... 17
5.3	Exclusions ..... 17
5.4	Store requirements ..... 18
5.5	Method of storage..... 21
5.6	Restriction on opening of packages..... 22
5.7	Segregation in storage..... 22
5.8	Fire protection..... 22
5.9	Display of hazard identification information..... 22
5.10	Safety equipment..... 22
<b>SECTION 6: STORING GASES AND CRYOGENIC LIQUIDS IN A DEDICATED STORE</b>	
6.1	Scope of section ..... 23
6.2	General ..... 23
6.3	Requirements and location of store..... 23
6.4	Maximum quantities..... 24
6.5	Method of storage..... 24
6.6	Segregation in storage..... 25
6.7	Ignition sources ..... 25
6.8	Display of hazard identification information..... 25
<b>SECTION 7: PACKAGE OPENING AND TRANSFER</b>	
7.1	General ..... 25
7.2	Work procedures for package opening..... 26
7.3	Transferring and repackaging ..... 26
7.4	Liquid transfer..... 26
7.5	Spillage containment..... 27
7.6	Fire protection..... 27
<b>SECTION 8: PERIODIC INSPECTION OF THE STORE ..... 27</b>	
<b>Annex A Normative references ..... 28</b>	

## Committee representation

The Industry Standards Committee on Occupational Safety and Health (ISC W) under whose authority this Malaysian Standard was developed, comprises representatives from the following organisations:

Business Council for Sustainability and Responsibility Malaysia  
Chemical Industries Council of Malaysia  
Construction Industry Development Board Malaysia  
Department of Agriculture  
Department of Chemistry, Malaysia  
Department of Environment  
Department of Occupational Safety and Health Malaysia  
Department of Standards Malaysia  
Federation of Malaysian Manufacturers  
Jabatan Bomba dan Penyelamat Malaysia  
Lloyd's Register Technical Services Sdn Bhd  
Malaysia International Chamber of Commerce and Industry  
Malaysian Employer Federation  
Malaysian Industrial Hygiene Association  
Malaysian Nuclear Agency  
Malaysian Society for Occupational Safety and Health  
Malaysian Trade Union Congress  
Minerals and Geoscience Department Malaysia  
Ministry of Health Malaysia  
Ministry of International Trade and Industry  
National Institute of Occupational Safety and Health  
SIRIM Berhad (Secretariat)  
SIRIM QAS International Sdn Bhd  
SME Corporation Malaysia  
Suruhanjaya Tenaga  
The Institution of Engineers, Malaysia  
Universiti Kebangsaan Malaysia

The Technical Committee on Safety in Laboratories which developed this Malaysian Standard consists of representatives from the following organisation:

Department of Agriculture (Pesticides Board)  
Department of Chemistry, Malaysia  
Department of Occupational Safety and Health Malaysia  
Institute for Medical Research  
Institute of Chemistry Malaysia  
Jabatan Bomba dan Penyelamat Malaysia  
Malaysian Industrial Hygiene Association  
National Institute of Occupational Safety and Health  
National Pharmaceutical Control Bureau  
SIRIM Berhad (Secretariat)  
SIRIM QAS International Sdn Bhd  
Sterling Drug (M) Sdn Bhd  
Suruhanjaya Tenaga  
Universiti Kebangsaan Malaysia

### Co-opted member:

Novalab (M) Sdn Bhd

## **Foreword**

This Malaysian Standard was developed by the Technical Committee on Safety in Laboratories under the authority of the Industry Standards Committee on Occupational Safety and Health.

MS 1042 consists of the following parts, under the general title *Safety in laboratories - Code of practice*:

*Part 1: General*

*Part 2: Chemical aspects*

*Part 3: Microbiological aspects and containment facilities*

*Part 4: Ionising radiations*

*Part 5: Non-ionising radiations - Electromagnetic, sound and ultrasound<sup>1</sup>*

*Part 6: Mechanical aspects*

*Part 7: Fume cupboards*

*Part 8: Recirculating fume cabinet<sup>1</sup>*

*Part 9: Storage of chemicals*

It is recommended that Part 1, be used in conjunction with this part, and that additional parts be obtained where justified and by the type of operations carried out in the particular laboratory.

The term 'shall' is used in this standard to indicate the requirements that have to be met for compliance with this Standard. The term 'should' indicates a recommendation while the term 'may' indicates the existence of an option.

This standard is Part 9 of a 9 part series provide details specification for the storage of chemicals in laboratories. It allows a high level of flexibility if a large range of chemicals need to be stored. It also set out the requirements for storage within the laboratory.

This part also makes references to other standard publications and literatures and these are listed in Annex A and Bibliography.

Compliance with a Malaysian Standard does not of itself confer immunity from legal obligations.

---

<sup>1</sup> To be develop