

SINGAPORE STANDARD

**Specification for hazard communication
for hazardous chemicals and dangerous
goods**

– Part 1 : Transport and storage of dangerous
goods



Published by

Enterprise
Singapore

SS 586 : Part 1 : 2014
(ICS 13.300)

SINGAPORE STANDARD

**Specification for hazard communication for
hazardous chemicals and dangerous goods**

– Part 1 : Transport and storage of dangerous goods

All rights reserved. Unless otherwise specified, no part of this Singapore Standard may be reproduced or utilised in any form or by any means, electronic or mechanical, including photocopying and microfilming, without permission in writing from Enterprise Singapore. Request for permission can be sent to: standards@enterprisesg.gov.sg.

ISBN 978-981-4557-31-3

SS 586 : Part 1 : 2014

This Singapore Standard was approved by Chemical Standards Committee on behalf of the Singapore Standards Council on 7 February 2014.

First published, 2008

First revision, 2014

The Chemical Standards Committee, appointed by the Standards Council, consists of the following members:

	Name	Capacity
Chairman	: Dr Keith Carpenter	<i>Member, Standards Council</i>
Deputy Chairman	: Dr Tay Kin Bee	<i>Individual Capacity</i>
Secretary 1	: Ms Elane Ng	<i>Standards Development Organisation @Singapore Chemical Industry Council</i>
Secretary 2	: Ms Jillian Chin	<i>Standards Development Organisation @Singapore Chemical Industry Council</i>
Members	: Ms Ang Chin Chin	<i>Maritime and Port Authority of Singapore</i>
	Mr Khong Bee Wee	<i>Individual Capacity</i>
	Mr Koh Min Ee	<i>National Environment Agency</i>
	Mr Terence Koh	<i>Singapore Chemical Industry Council Limited</i>
	Prof Lee Hian Kee	<i>National University of Singapore</i>
	Dr Lee Tong Kooi	<i>Chemical Metrology Division, Health Sciences Authority</i>
	Mr Leong Kwai Yin	<i>Individual Capacity</i>
	Prof Leung Pak Hing	<i>Nanyang Technological University</i>
	Mr Lim Eng Kiat	<i>Individual Capacity</i>
	Mr Lim Kian Chye	<i>Housing & Development Board</i>
	Dr Jerry Liu Jian Lin	<i>Singapore Water Association</i>
	Dr Loh Wah Sing	<i>Individual Capacity</i>
	Dr Ng Sek Yeo	<i>Singapore Polytechnic</i>
	Ms Pamela Phua	<i>Singapore Paint Manufacturers' Association</i>
	Mr Seah Khen Hee	<i>Individual Capacity</i>
	Mr Tan Yok Gin / Mr Chia Poh Soo	<i>PUB, the National Water Agency</i>
	Ms Bernice Tay	<i>SPRING Singapore</i>
Co-opted Members	: Prof Andy Hor	<i>Individual Capacity</i>
	Assoc Prof Thomas Liew	<i>Individual Capacity</i>
	Mr Nee Pai How	<i>Individual Capacity</i>
	Mr Pitt Kuan Wah	<i>Individual Capacity</i>

The Technical Committee, appointed by the Chemical Standards Committee and responsible for the preparation of this standard, consists of representatives from the following organisations:

	Name	Capacity
Chairman	: Mr Leong Kwai Yin	<i>Individual Capacity</i>
Secretary	: Ms Jillian Chin	<i>Standards Development Organisation @Singapore Chemical Industry Council</i>
Members	: Mr Cheah Sin Moh	<i>Singapore Polytechnic</i>
	Mr Chia Poh Soo	<i>PUB, the National Water Agency</i>
	Ms Veronica Chow	<i>Ministry of Manpower</i>
	Dr Gao Feng	<i>Institute of Chemical and Engineering Sciences</i>
	Dr Goh Chee Keong	<i>Singapore National Institute of Chemistry</i>
	Mr Aaron Kalachelvan	<i>Industrial Gases Association of Singapore</i>
	Mr Koh Min Ee	<i>National Environment Agency</i>
	Prof Lee Jim Yang	<i>National University of Singapore</i>
	Mr Lei Zhi Pei	<i>Setsco Services Pte Ltd</i>
	Mr Collin Lim	<i>Chemical Industries (Far East) Limited</i>
	MAJ Lo Wai Mun	<i>Singapore Civil Defence Force</i>
	Ms Vivian Mak	<i>Singapore Chemical Industry Council Limited</i>
	Dr Ng How Yong	<i>Singapore Water Association</i>
	Ms June Ng	<i>Dow Chemicals Pacific (Singapore) Pte Ltd</i>
	Ms Ong Kah Kee	<i>Eastman Chemical Singapore Pte Ltd</i>
	Mr Teah Choon Lee	<i>SPCI Pte Ltd</i>
	Dr Richard Yee Cheong Shin Koy Sien	<i>Health Sciences Authority</i>
	Mr Philip Yeo Hock Beng / Mr New Chee Wee	<i>Maritime and Port Authority of Singapore</i>

The Working Group, appointed by the Technical Committee for Chemistry to assist in the review of this standard, comprises the following experts who contributed in their *individual capacity*:

	Name
Convenor	: Ms Veronica Chow
Secretary	: Ms Jillian Chin
Members	: Mr Cheah Sin Moh
	Ms Dahliyah Hamid
	Ms Linda Lai
	Ms Vivian Mak
	Ms Ong Li Lian
	Ms Alice Seto
	Mr Henry Tan
	Ms Francis Wong
	Mr Philip Yeo Hock Beng
	Ms Cissie Yeung

The organisations in which the experts of the Working Group are involved are:

Bayer (South East Asia) Pte Ltd
Evonik Oil Additives Asia Pacific Pte Ltd
ExxonMobil Chemical Asia Pacific
Infineum Singapore Pte Ltd
Maritime and Port Authority of Singapore
Ministry of Manpower
National Environment Agency
Petrochemical Corporation of Singapore
Shell Eastern Petroleum (Pte) Ltd
Singapore Civil Defence Force
Singapore Polytechnic

The Working Group acknowledges the contributions of Mr Wang Hui Hua.

Contents

	Page
Foreword _____	6
1 Scope _____	8
2 References _____	9
3 Definitions _____	9
4 Requirements _____	10
5 Recommended colour codes _____	11
 Annexes	
A Storage and transport placards for dangerous goods (informative) _____	12
B National authorities regulating the transport of dangerous goods on road (informative) _	14
C Transport emergency information panel (TEIP) (normative) _____	15
D Table of minimum quantities – Road transportation (normative) _____	20
E Storage requirements for dangerous goods (normative) _____	21
F Recommended colour codes (informative) _____	25
 Table	
C.1 Guide to display dangerous goods placard/ Transport emergency information panel (TEIP) _____	19
 Figures	
1a Illustration of dangerous goods (for transport purposes) _____	8
1b Illustration of hazardous substances (for workplace purposes) _____	9
C.1 Transport emergency information panel (TEIP) _____	16
C.2 Display of transport emergency information panel (TEIP) on road tank vehicle with single/multiple compartments _____	19
E.1 Storage emergency information panel (SEIP) _____	22
E.2 Example of placard for package stores _____	23
E.3 Warning panel for dangerous goods storage in public areas _____	24

Foreword

This Singapore Standard was prepared by the Working Group appointed by the Technical Committee for Chemistry under the direction of the Chemical Standards Committee. It is a revision of SS 586 : Part 1 : 2008. This revision includes an update on the requirements, transport emergency information panel and storage emergency information panel.

SS 586 'Specification for hazard communication for hazardous chemicals and dangerous goods' consists of the following three parts which are complementary to one another:

- Part 1 : Transport and storage of dangerous goods,
- Part 2 : Globally harmonised system of classification and labelling of chemicals – Singapore's adaptations, and
- Part 3 : Preparation of safety data sheets (SDS).

SS 586 : Part 1 provides information and guidance on the classification of dangerous goods (DG) by the types of hazards they present. It also provides information on standard hazard communication DG labels. This part applies to the storage and transportation of dangerous goods by road in Singapore, which includes carriages in bulk, tank-vehicles, vehicles with demountable tanks as well as by vehicles carrying dangerous goods in packages. The transportation of dangerous goods by sea and air is subject to the requirements of International Maritime Organisation (IMO) and International Air Transport Association (IATA) / International Civil Aviation Organisation (ICAO) respectively and is not covered in this standard.

SS 586 : Parts 2 and 3 provide guidance for the implementation of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) and Preparation of Safety Data Sheets (SDS) in Singapore. GHS is an international system for the classification of chemicals by the types of hazards they present. It provides information on standard hazard communication elements including DG labels and SDS. The GHS helps to ensure that information on physical hazards, health hazards and environmental hazards from chemicals is made available, in order to enhance the protection of human health and the environment during the handling, transport, storage and use of these chemicals. The GHS also provides for the global harmonisation of rules and regulations on the classification, labelling and SDS of chemicals.

In preparing this part of the Singapore Standard, reference was made to the United Nations Recommendations on the Transport of Dangerous Goods (UNRTDG Orange Book, 17th revised edition). The UNRTDG document may be obtained by:

1. Purchasing directly from the United Nations (<https://unp.un.org/>) as a book or a CD.
2. Downloading from the internet as pdf files (http://www.unece.org/trans/danger/publi/unrec/rev17/17files_e.html).

Acknowledgement is made for the use of information from the above publications.

This standard is expected to be used by chemical manufacturers, importers, suppliers, users, and supply chain service providers. The national competent authorities such as the Agri-Food and Veterinary Authority of Singapore (AVA), Health Sciences Authority (HSA), Ministry of Health (MOH), Ministry of Manpower (MOM), National Environment Agency (NEA), Singapore Civil Defence Force (SCDF) and Singapore Police Force (SPF) may use this standard to supplement their regulations and / or guidelines.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions.*
2. *An SS or TR is voluntary in nature except when it is made mandatory by a regulatory authority. It can also be cited in contracts making its application a business necessity. Users are advised to assess and determine whether the SS or TR is suitable for their intended use or purpose. If required, they should refer to the relevant professionals or experts for advice on the use of the document. Enterprise Singapore shall not be liable for any damages whether directly or indirectly suffered by anyone or any organisation as a result of the use of any SS or TR.*
3. *Compliance with a SS or TR does not exempt users from any legal obligations.*

Specification for hazard communication for hazardous chemicals and dangerous goods – Part 1 : Transport and storage of dangerous goods

IMPORTANT – The colours represented in the electronic file of this part of SS 586 can be neither viewed on screen nor printed as true representations. Although the copies of this part of SS 586 printed have been produced to correspond (with an acceptable tolerance as judged by the naked eye) to the colour requirements, it is not intended that these printed copies be used for colour matching. Instead, it is recommended that reference be made to the colour codes identified in Annex F.

1 Scope

This Singapore Standard adopts the United Nations' Recommendations on the Transport of Dangerous Goods, which provides an international system for the classification of dangerous goods by the types of hazards that they present. It also specifies standard hazard communication DG labels.

This standard applies to the storage and transportation of dangerous goods on land in Singapore. The transportation of dangerous goods by sea and air is subject to the requirements of International Maritime Organisation (IMO) and International Air Transport Association (IATA) / International Civil Aviation Organisation (ICAO) respectively and is not covered in this standard.

Figure 1 shows the illustration of dangerous goods (for transport purposes) and hazardous substances (for workplace purposes).

<p><u>Dangerous goods (for transport purposes) – United Nations' recommendations on the transport of dangerous goods</u></p> <ul style="list-style-type: none">• Explosives• Gases• Flammable liquids• Flammable solids• Oxidising substances and organic peroxides• Toxic and infectious substances• Radioactive material• Corrosive substances• Miscellaneous dangerous substances /articles (including environmentally hazardous substances and wastes)

Figure 1 (a) – Illustration of dangerous goods (for transport purposes)

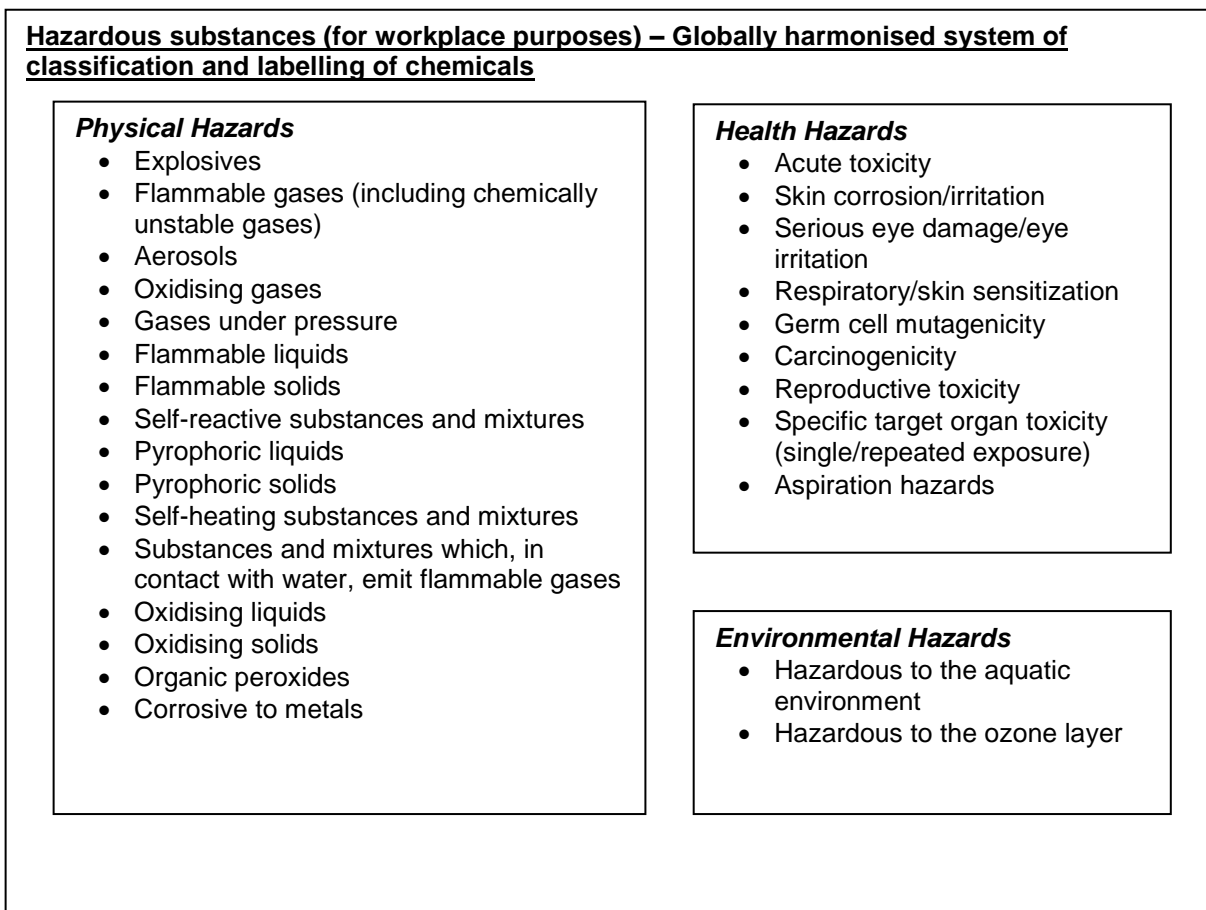


Figure 1 (b) – Illustration of hazardous substances (for workplace purposes)

2 References

2.1 Normative reference

The United Nations' Recommendations on the Transport of Dangerous Goods referred to as "UNRTDG" or the "Orange Book" in this standard is indispensable for the application of this standard. The latest edition of the document (including any amendments) applies.

2.2 Informative reference

Storage and transport placards for dangerous goods are provided in Annex A.