SS 532:2024
(ICS 13.220; 13.300)

SINGAPORE STANDARD

Code of practice for the storage of flammable liquids

Singapore Standards Council

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Contents

Foreword

This Singapore Standard was prepared by the Working Group on Review SS 532 set up by the Technical Committee on Petroleum Processes and Products under the purview of the Chemical Standards Committee.

This is a revision of SS 532:2016, which captures changes in both industry practices and technological advancements.

In this revision, one of the key changes made was to allow non-metallic container to be used for storage of chemicals, but subjected to approval from the relevant authority. Existing firefighting, safeguards and mitigation measures were also enhanced by referencing to latest practices found in applicable NFPA and Singapore Standards. Existing storage requirements have also been streamlined to the needs of portable units which can be located either indoor or outdoor. The revised SS 532 does not contain recommendations to set up a vapour barrier in line with current industry practices.

The standard provides requirements for the safety of persons and the prevention of damage to property when storing or handling flammable liquids. It covers storage and handling of flammable liquids in installations but does not include their transportation.

The revised edition is aligned with requirements and practices of the industry, emergency response services, environmental requirements and local publications/standards as well as the United Nations guidelines on GHS.

Users of this standard are responsible to carry out their respective risk assessment in order to identify any possible gaps or enhancement works for improvement. Additional fire safety provisions and mitigation measures may be required to put in place, and be integrated as one system.

It is presupposed that in the course of their work, users will comply with all relevant regulatory and statutory requirements. Some examples of relevant regulations and acts are listed in the Bibliography. The Singapore Standards Council and Enterprise Singapore shall not be responsible for identifying all of such legal obligations.

In preparing this Singapore Standard, reference was made to the following publications:

1. Australian Standard AS 1940 : 2004, incorporating its amendment No. 1, The storage and handling of flammable and combustible liquids

2. South African National Standard SANS 10089-1 : 2008, The petroleum industry, Part 1 : Storage and distribution of petroleum products in above-ground bulk installations

3. National Fire Protection Association NFPA No. 30 : 2012 Edition, Flammable and combustible liquids code

4. ‘Guidelines on storage of flammable & combustible liquids in aboveground atmospheric storage tanks’, 1991 edition by Oil and Petrochemical Industry Technical & Safety Committee (OPITSC) and the former Singapore Joint Civil Defence Forces

5. ‘Globally Harmonized System of Classification and Labelling of Chemicals (GHS)’, Revision 5, 2013 by United Nations

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

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 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. Where SSs are deemed to be stable, i.e. no foreseeable changes in them, they will be classified as "mature standards". Mature standards will not be subject to further review unless there are requests to review such standards.*

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 and the Singapore Standards Council 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. Although care has been taken to draft this standard, users are also advised to ensure that they apply the information after due diligence.*

3. *Compliance with a SS or TR does not exempt users from any legal obligations.*

Code of practice for the storage of flammable liquids

1 Scope

This Singapore Standard sets out the requirements and recommendations for the safe storage and handling of flammable liquids, as classified in the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS), listed in the Chapter of Flammable Liquids. The standard covers flammable liquids of Category 1, 2, 3 and 4 as classified in the GHS. In addition, the standard also covers liquids with a flash point of up to 150 °C.

This standard does not apply to the following:

(a) Shipboard installations;

(b) Any storage that is still in transit (fuel tanks and tankers, ISO tanks and tankers);

(c) Any plant or equipment in which liquid is processed, together with any vessels which form an integral part of the processing plant or equipment;

(d) Bitumen storage and its mixtures prepared for road-making;

(e) Flammable liquids stored in a tank exceeding 175 millibar above atmospheric pressure;

(f) Liquefied gases that are maintained in the liquid phase for storage by means of pressure or refrigeration;

(g) Laboratories (except when referenced from SS 641);

(h) Petrol service stations.

(i) Unstable liquids such as oxidising agents, peroxides that are spontaneously flammable, or liquids that may give rise to spontaneous reactions with other materials.

2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API SPEC 6FA	Fire test for valves
API STD 650	Welded steel tanks for oil storage
API STD 2000	Venting atmospheric and low-pressure storage tanks – Non refrigerated and refrigerated
API RP 2003	Protection against ignitions arising out of static, lightning and stray currents
ASME B31.3	Process piping standard
BS EN 124	Gully tops and manhole tops for vehicular and pedestrian areas