

AS 1940—1993

Australian Standard[®]

**The storage and handling of
flammable and combustible liquids**

This Australian Standard was prepared by Committee ME/17, Flammable Combustible Liquids. It was approved on behalf of the Council of Standards Australia on 18 August 1993 and published on 11 October 1993.

The following interests are represented on Committee ME/17:

Association of Australian Port and Marine Authorities
Australian Chamber of Commerce and Industry
Australian Fire Authorities Council
Australian Institute of Petroleum
Australian Paint Manufacturers Federation
Australian Steel Underground Tank Technical Association
Department of Defence, Australia
Department of Housing and Local Government, Qld
Department of Labour, S.A.
Occupational Health and Safety Authority, Vic.
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PREFACE

This Standard was prepared by the Standards Australia Committee on Flammable and Combustible Liquids to supersede AS 1940—1988. This new edition is the result of a comprehensive review of the Standard from cover to cover. Aside from minor editorial changes and clarifications of intent, the principal areas of change from the previous edition are as follows:

- (a) The overall structure of the Standard has been changed slightly by the rearrangement of the Sections. Certain requirements are common to various types of installation, i.e. package stores, tank depots, service stations and the like. Some of these had been grouped in Section 1 where they often went unnoticed, while others were scattered repetitively through the various Sections. To rationalize, a new Section 3 has been introduced. Substantial rearrangements and the consolidation of the general requirements of Sections 7, 8, and 9 are described later in this Preface.
- (b) The scope, and particularly the exclusions, have been adjusted in detail. The exclusion of processing plant remains under debate. Obviously major refining process plant has no place in this Standard, being designed under specific controls. Industrial processes that consume or use flammables under less expert control, while technically subject to analysis of hazardous zones, are to be a subject for future consideration.
- (c) The definitions of classes of flammable or combustible liquids have been reviewed in detail. The decimal numerical system of subdividing Class 3 liquids could not be retained, because of difficulties in achieving alignment with national and international classification systems. Some thought was given to returning to the original A, B, C and D system on the grounds of simplicity and independence, but the ultimate decision was to align the flammable classes with the packaging-group system of the Australian Dangerous Goods Code. Since combustible liquids are not part of that system, they have an independent class identification, but this has advantages in that it becomes easier to highlight the lower level of hazards and to make special provisions for them.
- (d) The definitions of liquids and of manufactured products have been altered to cater more clearly for viscous liquids and pastes.
- (e) All previous editions have made a distinction between protected works, which are mainly off-site uninvolvement buildings, and those on-site facilities which include offices, workshops and the like associated with the activity. To minimize misunderstanding, the distinction has been clarified by the use of two specifically-defined terms, i.e. 'protected works', and 'on-site facilities'.
- (f) Minor storage has been thoroughly reviewed, and the quantities in Table 2.1 have been adjusted substantially. In addition, manufactured products are treated as a separate class of goods.
- (g) Section 4 has been totally rewritten. Much of this exercise has been editorial, i.e. an attempt to express more clearly the principles already established. However, there are a number of changes to detail, and illustrations have been introduced to clarify the intent of separation distances.
- (h) The control of access, general site security and the provision of warning and exclusion notices, have been refined, with some attention being given to the distinction between the restriction of the public on one hand and the control of one's own staff activities on the other. As a consequence, security fences feature prominently in separation distance considerations.
- (i) A very large number of adjustments have been made throughout the Section on tank installations to such things as height of firewalls, capacity of compounds, sub-divisions within compounds, drainage, and the use of tank chambers. Of particular note, previous editions had permitted a reduction of the catchment volume of a compound where only combustible liquids were stored. This concession has been withdrawn, so that all liquids, even those of low combustibility, require full bunding.

- (j) Section 7, Systems for Piping, Valves, Pumps and Tank Heating has been modernized and now incorporates a former separate Section that dealt with the heating of liquids, and which has been substantially trimmed of redundancies.
- (k) Section 8 now deals with the loading of flammable liquids into tankers, a subject which was not treated in sufficient detail in previous editions.
- (l) Section 9, Operations, has been totally restructured following a review of basic philosophy which has led to a fresh approach. Procedures are seen as the key to all operations; it is essential to formulate them, to promulgate them, to train to them, to enforce and police them, and finally to ensure that they are kept up-to-date.
- (m) The Fire Protection Section has been significantly revised.

It is foreshadowed that the next revision of this Standard will—

- (i) broaden the coverage to include potable liquids in containers over 20 L and with a strength exceeding 24% V/V ethanol. Organizations planning construction or expansion activities should take due cognizance of this proposal;
- (ii) increase the water supply duration of Clause 10.11.7 for cooling and hydrant water from 1.5 to 4 h; and
- (iii) consider limitations on tank farm layouts, including cluster tanks, to two rows from an access road.

This Standard, as amended from time to time, reflects changes in technology, and incorporates improvements which are derived from operational experience and the lessons of accidents and near misses. It also reflects control philosophies which have evolved and been proven in the intervening period since the last edition.

Users of this Standard should recognize that it represents a significant improvement in loss control over past editions and is intended to be applied in its entirety to new facilities built after the Standard's publication date.

The Committee encourages users of this Standard to critically reassess their sites, equipment and procedures whenever a new edition is published and supports initiatives by users to adopt and implement those parts which are practicable and which can improve overall site safety.

The Committee does not suggest that any of the provisions of this Standard are retrospective; however, users should check with the relevant statutory authority where this Standard has been adopted through legislation.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

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