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Australian Standard 1692—1983

TANKS FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS

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STANDARDS ASSOCIATION OF AUSTRALIA
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The following interests are represented on Committee ME/17:

Association of Australian Port and Marine Authorities
Australian Institute of Petroleum Limited
Confederation of Australian Industry
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Department of Defence
Department of Transport and Construction
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AUSTRALIAN STANDARD

TANKS FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS

AS 1692—1983

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PREFACE

This edition of this standard was prepared by the Association's Committee on Flammable and Combustible Liquids, to supersede AS 1692—1975. The standard was originally derived from AS CB5, Oil Fuel Installations, which was first issued in 1942. When AS 1940, SAA Flammable and Combustible Liquids Code, was issued in 1976, the requirements for the construction of tanks, as distinct from their installation, were extracted to be dealt with in a separate reference standard.

At that time a decision was made to limit the standard to steel tanks, largely as a matter of convenience and expediency, i.e. the framework already existed in AS CB5 and other standards, and steel tanks were well understood and quite common, while requirements for other materials would have needed time to develop.

This edition extends the scope to include stainless steel tanks. Thicknesses proposed have been chosen on the same premise as before, i.e. the thicknesses for all tanks except Category 6 are empirical, being the result of experience rather than accurate stress calculations. It has been considered that stresses will be comparatively low and that the need to be reasonably sturdy for handling, or a need for corrosion allowance and similar practical factors dictate the material thickness. This standard does not insist on compliance with any particular material standards, or the use of specific grades of materials.

Consideration had been given to the inclusion of aluminium as a construction material, and proposals had been made when the draft of this edition was circulated for comment. However, the very wide variety of alloys, with widely differing strengths and susceptibility to corrosion, made it difficult to recommend thicknesses with any degree of confidence. Since aluminium is not in widespread use and then mainly in special cases where compatibility with the contents is a major consideration, it was decided to omit it from the standard, and treat it under Clause 1.6.

Tanks of glass fibre reinforced plastics are not covered in detail in this standard as the technology is still developing to some extent and there exist a number of specialist standards or publications on the subject. It is hoped that the standards which are being developed from draft Australian standards DR 81167 to DR 81170 will be sufficient for the purpose.

The dimensional requirements of the first edition had been compared with UL 59, UL 142, BS 799, BS 2594 and the relevant French and German standards to ensure that they were not inconsistent with general trends. The new dimensions for stainless steel were derived from AS 2014, Road Tank Vehicles for Flammable Liquids, in the absence of any other source.

The committee recognized that there are situations in which liquids other than petroleum derivatives are stored and in which tank materials other than those covered may be suitable. However, it has not been possible to explore all the alternatives, and such special cases should be negotiated individually with the Authority.

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Australian Standard
for
TANKS FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard specifies requirements for the design and construction of tanks for the storage of flammable and combustible liquids, together with certain accessories. It does not deal with their installation, nor does it deal with road, rail or marine tankers, or with fuel tanks for vehicles. It is applicable only to the storage of materials that are liquid at normal temperatures and pressures.

NOTES:

1. This standard is basically oriented towards cylindrical tanks of commercial grade low carbon steel for petroleum fuel storage, this being the most common application for tank storage, but it also provides for stainless steel tanks. Glass-fibre reinforced plastics (fibreglass) are recognized alternative materials, but are dealt with in other standards, notably BS 4994 and AS XXXX. It is recognized that the storage of other types of liquid, or the use of other materials of construction, may render part or all of this standard inappropriate; any such substitutions should be the subject of specific approval.
2. Attention is drawn to Appendix A, which sets out details of particular information that the purchaser should supply to the manufacturer with an enquiry or order.

1.2 CLASSIFICATION. Tanks within the scope of this standard are classified as follows:

Category 1—tanks up to 1200 L capacity, for above-ground use, intended principally for the storage of oil fuel in domestic type applications.

Category 2—vertical or horizontal cylindrical tanks up to 2500 L capacity, for above-ground use, intended principally for farms and similar open space locations.

Category 3—rectangular tanks and tanks of unconventional shapes, intended principally for industrial use above-ground as elevated head tanks or storage tanks.

Category 4—horizontal cylindrical tanks up to 150 m³ capacity, for underground or above-ground use, intended principally for industrial or service station use.

Category 5—vertical cylindrical tanks up to 150 m³ capacity, for above-ground use, intended for industrial use.

Category 6—vertical tanks up to any capacity, of a size and type that is usually erected on site.

1.3 APPLICATION. Tanks in Categories 1 to 5 shall comply with all the relevant requirements of Section 2 and the specific requirements of Section 3, as appropriate to the category. Tanks in Category 6 shall comply with Clause 3.6.

1.4 REFERENCED DOCUMENTS. The following documents are referred to in this standard:

AS 1020	SAA Static Electricity Code
AS 1170	SAA Loading Code Part 2—Wind Forces
AS 1210	SAA Unfired Pressure Vessels Code
AS 1250	SAA Steel Structures Code
AS 1554	SAA Structural Steel Welding Code
AS 1657	SAA Code for Fixed Platforms, Walkways, Stairways and Ladders
AS 1940	SAA Flammable and Combustible Liquids Code
AS 2624	Steel Plate and Strip for the Construction of Welded Steel Tanks for Oil Storage
AS XXXX	Chemical Plant Equipment Made from Glass-fibre Reinforced Plastics (GRP) Based on Thermosetting Resins* Part 1—Laminates—Contact Moulded, Filament Wound and Centrifugal Cast Part 2—Ducts and Fittings Part 3—Pipes and Fittings Part 4—Tanks (Stationary Non-pressure Vessels)
BS 2654	Vertical Steel Welded Storage Tanks with Butt-welded Shells for the Petroleum Industry
BS 5500	Unfired Fusion Welded Pressure Vessels
API 620	Recommended Rules for Design and Construction of Large, Welded Low-pressure Storage Tanks
API 650	Welded Steel Tanks for Oil Storage
ASTM D 5	Test for Penetration of Bituminous Materials†

1.5 DEFINITIONS. For the purpose of this standard, the following definitions apply:

1.5.1 Approved (approval)—approved by (approval of) the authority concerned.

1.5.2 Authority, Authority having jurisdiction—the authority having statutory (legal) control of the installation which incorporates the tank.

1.5.3 Liquid—any material which has a fluidity greater than that of 300 penetration asphalt when tested in accordance with ASTM D 5. Flammable and combustible liquids are classified in four groups as follows:

Class A—flashpoint up to but excluding 23°C Class B—flashpoint 23°C up to but excluding 61°C	flammable

*In course of preparation.
†Identical with IP 49.