AS 3773—1990

Australian Standard®

Bulk solids containers—Safety requirements

This Australian Standard was prepared by Committee BD/65, Loads on Bulk Solids Containers. It was approved on behalf of the Council of Standards Australia on 9 February 1990 and published on 12 March 1990.

The following interests are represented on Committee BD/65:

Bureau of Steel Manufacturers of Australia

CSIRO, Division of Building, Construction and Engineering

Institution of Engineers Australia

Railways of Australia Committee

State Electricity Commission of Victoria

The Association of Consulting Engineers, Australia

University of Melbourne

University of Sydney

University of Wollongong

Additional interests participating in preparation of Standard:

Agriculture Protection Board of Western Australia

Bulk Grain Handling Authorities of Australia

Grain Council of Australia

Metal Trades Industry Association of Australia

National Farmers Federation

The Workcover Authority, New South Wales

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PREFACE

This Standard was prepared by the Standards Australia Committee on Loads on Bulk Solids Containers in response to Parliamentary concern for the safety of children at farm grain silos.

In the preparation of this Standard, reference was made to the following sources:

(a) ISO 8456, *Storage equipment for loose bulk materials — Safety code*.

(b) *Draft design code for silos, bins, bunkers and hoppers*, prepared by BSI in conjunction with British Materials Handling Board.

The Standard specifies design requirements and operational procedures, and gives guidance on inspection, maintenance, and cleaning to ensure the safety of personnel in and around bulk solids containers; and to prevent containers from becoming subject to loads greater than those for which they were designed.

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Bulk solids containers — Safety requirements

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard specifies general safety requirements for the design and operation of fixed and relocatable bulk solids containers but excluding permanently mobile containers and temporary containers (e.g. steel mesh containers).

Requirements for design of structural components of a container are outside the scope of this Standard.

NOTE: Recommendations for maintenance, inspection and cleaning of containers is given in Appendix A.

1.2 REFERENCED DOCUMENTS. The following document is referred to in this Standard:

AS 1657 SAA Code for Fixed Platforms, Walkways, Stairways and Ladders.

1.3 DEFINITIONS. For the purpose of the Standard, the definitions below apply.

1.3.1 Bulk solids container — a generic name for all types of structures for containment of bulk solids, generally equipped with discharge outlets and capable of being emptied by gravity or by mechanical or pneumatic means.

1.3.2 Relocatable container — a container able to be made temporarily mobile for the purpose of transport from one location to another by means of fixed or removable wheels or skids.

NOTE: Relocatable containers do not include mobile containers capable of being relocated when filled.

SECTION 2. DESIGN REQUIREMENTS

2.1 FIXED LADDERS, STAIRWAYS AND PLATFORMS. Fixed ladders, stairways and platforms shall be designed in accordance with AS 1657.

A suitable means shall be provided to prevent use of the external access ladder or stairway by unauthorized personnel.

NOTE: Statutory Authorities may consider small silos as special structures in accordance with AS 1657.

2.2 CONTAINER OPENINGS.

2.2.1 Openings above maximum level of stored material. Where unauthorized access is not restricted, and where there is permanent access to the opening above the maximum level of stored material, each opening shall be fitted with a guard to prevent anyone falling through.

The guard shall cover the opening in its entirety and be designed so as to withstand the impact of an 80 kg person falling from a height of 1 m.

The guard shall be constructed of bars or a rigid wire mesh screen. The bars or mesh may be arranged in any configuration provided that the maximum dimension of any aperture (or diameter in the case of circular openings) does not exceed 250 mm and the area of any opening does not exceed 0.0625 m^2.

The guard shall be permanently attached to the container in at least one location, to prevent it falling into the container or being unintentionally removed, when open.

NOTE: A hinge is a means of permanently attaching the guard to the container.

Fasteners used for fixing the guard in the closed position shall be such that they can only be removed by use of a tool, e.g. a screwdriver or spanner.

2.2.2 Openings below maximum level of stored material. Outward-opening containment devices below the maximum level of stored material, and in contact with the stored material shall be designed such that —

(a) they cannot open accidentally, e.g. by vibration or by being knocked by people or vehicles;

(b) the extent of the initial opening is restricted by mechanical means; and

(c) opening shall be effected from a position and with a procedure that protects the operator from injury.

A readily visible sign shall be permanently affixed to each outward opening containment device displaying the following warning:

DANGER OF STREAMING MATERIAL — OPEN WITH CAUTION

Containment devices to openings which are located below the maximum load of stored material and in contact with the stored material, which do not comply with the requirements of Items (a), (b) and (c), shall not open outwards. Covers or doors over a containment device that do not bear any load from the stored material may open outwards.

2.3 CONTAINER DISCHARGE GATES AND VALVES. Container discharge gates and valves shall be designed so that they cannot open accidentally. The means of operating container gates or valves whether manual or mechanical, shall be accessible only to, or operable by, authorized persons. Where vehicles are to be directly loaded under the container gate, the gate control shall be placed so as to—