AS 4324.1:2017

Mobile equipment for continuous handling of bulk materials

Part 1: General requirements for the design of steel structures

This Australian Standard® was prepared by Committee ME-043, Bulk Handling Equipment. It was approved on behalf of the Council of Standards Australia on 26 October 2017.
This Standard was published on 5 December 2017.

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- Australasian Institute of Mining and Metallurgy
- Australian Industry Group
- Consult Australia
- Engineers Australia
- Minerals Council of Australia
- Ports Australia
- SafeWork NSW
- University of Newcastle
- University of Sydney
- University of Western Sydney
- University of Wollongong
- Welding Technology Institute of Australia

This Standard was issued in draft form for comment as DR AS 4324.1:2017.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Australian Standard®

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Originated as AS 4324.1—1995.
Second edition AS 4324.1:2017.

Published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001, Australia

ISBN 978 1 76035 956 0

PREFACE

This Standard was prepared by the Standards Australia Committee ME-043, Bulk Handling Equipment, to supersede AS 4324.1—1995, *Mobile equipment for continuous handling of bulk materials*, Part 1: *General requirements for the design of steel structures*.

This is the first part of what is planned to be a four-part series dealing with mobile equipment for continuous handling of bulk materials, with Part 2 to deal with mechanisms, Part 3 to deal with electricals and controls and Part 4 to deal with commissioning, operation and asset management. Parts 2, 3 and 4 are intended to be sequentially developed with the necessary revisions to Part 1 incorporated as the other Parts are published.

The development of the first edition of this Standard in 1995 was based largely on the German Code for structural design, BG—1986 Regulations, *Calculations and dimensioning of large machines in open cuts*, and the International Standard ISO 5049-1:1994, *Mobile equipment for continuous handling of bulk materials*, Part 1: *Rules for the design of steel structures*, but included a number of variations to provide coverage of a more comprehensive range of machinery and loading conditions.

The objectives of this revision are to achieve greater clarity in loading requirements and greater simplicity in the prescription of structural design requirements. This led to more emphasis being placed on specifying design requirements that are specific to the machine, and the recognition that effective controls, protective devices systems and load limiting devices play an integral part in the operation and limitation of applied loading to structures of this type. Duplication of requirements for structural materials and design rules has been avoided where possible by direct reference to established Australian or International Standards. Following structural reliability analyses, the ultimate limit state approach has been modified to accommodate the load factor (per primary load case) and resistance design/partial safety factor approach. The preferred method of structural design is a subject for agreement between the purchaser and the supplier or prescription via the technical specification.

Committee ME-043 recognizes that some load cases are based on general industry knowledge and other international precedents. For future revisions of specific values in certain clauses, co-ordinated field-testing or a significant level of research across a wide variety of machines and materials is likely to be required.

Explanatory notes on the drafting of this Standard are given in Appendix A.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard.

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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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies general requirements, design loads and specific requirements for the design of structures of mobile equipment for continuous handling of bulk materials, including appliances and machines that are intended to carry out similar functions (e.g. excavators, stackers, reclaimers, ship loaders, ship unloaders, belt wagons, sizing rigs and spreaders).

This Standard may, in some instances, be applied to the design of certain stationary plants.

It is not intended that this Standard be applied to the following equipment, but may be applied to parts of such equipment:

(a) Feeders, fixed conveyors, bucket elevators and storage structures with through flow of materials.

(b) Intermittent operation bulk handling equipment (i.e. equipment that handles or excavates material on a cyclic basis, such as draglines and power shovels).

NOTE: Explanatory notes on the drafting of this Standard are given in Appendix A.

1.2 APPLICATION

It is not intended that this Standard be applied to equipment that was designed before the publication of this Standard (i.e. AS 4324.1:2017). This Standard should be used as part of a risk assessment process for assessment of existing machine structures for continued use, upgrade or modification.

The application, omission, or variation within the requirements of specific clauses of this Standard shall be in a documented technical specification (see Clauses 1.6.42 and 1.8), subject to the minimum requirements indicated in this Standard.

Specified omission or reduction of the requirements of this Standard shall only occur following the assessment of the risk of that load case occurring, with consideration of the effectiveness of the controls and protections that will be implemented to prevent the situation occurring and the consequences should the event occur. This risk assessment shall be documented with justifications provided as technically and practicably valid. Refer to AS/NZS ISO 31000.

Appendix B prescribes information that is required to be established within a technical specification for supply of a machine.

1.3 INNOVATION

This Standard shall not be interpreted so as to prevent the use of new or unusual materials or methods not specifically referred to herein, provided that the requirements of Section 5 are conformed to.