AS 2294.3—1997
ISO 3449:1992

Australian Standard®

# Earth-moving machinery—Protective structures

# Part 3: Laboratory tests and performance requirements for falling-object protective structures

[ISO title: Earth-moving machinery — Falling-object protective structures — Laboratory tests and performance requirements]

This Australian Standard was prepared by Committee ME/63, Earthmoving Equipment. It was approved on behalf of the Council of Standards Australia on 29 August 1997 and published on 5 December 1997.

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The following interests are represented on Committee ME/63:

AUSTROADS

Construction and Mining Equipment Association of Australia

Department of Defence

Department of Mineral Resources, N.S.W.

Department of Mines and Energy, Qld

Department of Natural Resources and Environment, Vic.

Metal Trades Industry Association of Australia

Queensland Forest Research Institute

Safety Institute of Australia

Sydney Water Corporation

Telstra Corporation

Tractor and Machinery Association of Australia

WorkCover New South Wales

Additional interests participating in preparation of Standard:

Roll-over protective structures manufacturers

Falling-object protective structures manufacturers

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*This Standard was issued in draft form for comment as DR 96486.*

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# Earth-moving machinery—Protective structures

# Part 3: Laboratory tests and performance requirements for falling-object protective structures

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# PREFACE

This Standard was prepared by the Standards Australia Committee ME/63, Earthmoving Equipment, to supersede, in part, AS 2294—1990, *Earth-moving machinery—Protective structures*.

The objective of this Standard is to provide designers, manufacturers, suppliers, employers and users of earth-moving machinery with specifications covering technical means to minimize the risks to health and safety of employees and others working with or otherwise near earth-moving machinery.

This Standard is identical with and has been reproduced from ISO 3449:1992, *Earth-moving machinery—Falling-object protective structures—Laboratory tests and performance requirements*.

The AS 2294 series now comprises the following:

| AS | |
|---|---|
| 2294 | Earth-moving machinery—Protective structures |
| 2294.1 | Part 1: General |
| 2294.2 | Part 2: Laboratory tests and performance requirements for roll-over protective structures |
| 2294.3 | Part 3: Laboratory tests and performance requirements for falling-object protective structures (this Standard) |
| 2294.4 | Part 4: Specifications for deflection limiting volume |

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

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text, 'this International Standard' should read 'this Australian Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

(d) References to International Standards should be replaced by references to the following Australian or Joint Australian/New Zealand Standards:

| *Reference to International Standard* | | *Australian or Joint Australian/New Zealand Standard* | |
|---|---|---|---|
| ISO | | AS/NZS | |
| 148 | Steel—Charpy impact test (V-notch) | — | |
| 898 | Mechanical properties of fasteners | 4291 | Mechanical properties of fasteners |
| 898.1 | Part 1: Bolts, screws and studs | 4291.1 | Part 1: Bolts, screws and studs |
| 898.2 | Part 2: Nuts with specified proof load values—Coarse thread | 4291.2 | Part 2: Nuts with specified proof load values—Coarse thread |
| 3164 | Earth-moving machinery—Laboratory evaluations of roll-over and falling-object protective structures—Specifications for the deflection-limiting volume | AS 2294<br>2294.4 | Earth-moving machinery—Protective structures<br>Part 4: Specifications for the deflection-limiting volume |
| 3411 | Earth-moving machinery—Human physical dimensions of operators and minimum operator space envelope | 2953<br>2953.2 | Earth-moving machinery—Human dimensions<br>Part 2: Physical dimensions of operators and minimum operator space envelope |

| | | | |
|---|---|---|---|
| 3471 | Earth-moving machinery— Roll-over protective structures— Laboratory tests and performance requirements | 2294<br>2294.2 | Earth-moving machinery— Protective structures<br>Part 2: Laboratory tests and performance requirements for roll-over protective structures |
| 6165 | Earth-moving machinery— Basic types—Vocabulary | 2951<br>2951.1 | Earth-moving machinery— Nomenclature<br>Part 1: Basic types |

The term ‘normative’ has been used in this Standard to define the application of the annex to which it applies. A ‘normative’ annex is an integral part of a Standard.

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AUSTRALIAN STANDARD

# Earth-moving machinery—Protective structures

## Part 3:
## Laboratory tests and performance requirements for falling-object protective structures

### 1 Scope

**1.1** This International Standard specifies

a) the laboratory tests for measurement of structural characteristics, and

b) the performance requirements in a representive test,

of a falling-object protective structure (FOPS).

**1.2** The laboratory tests are a means of testing the characteristics of the structures used to protect the operator from localized impact penetration and, indirectly, of the load-carrying capacity of the supporting structure to resist impact loading.

**1.3** This International Standard establishes a consistent, repeatable means of evaluating characteristics of FOPS under loading and prescribes performance requirements for these structures under such loading in a representative test.

NOTE 1 For the purposes of this International Standard, "representative test" means a test of a specimen whose material, dimensional, and processing requirements are typical of those FOPS currently being produced.

**1.4** This International Standard applies to the following types of operator-controlled machines, regardless of the type of steering system used, as defined in ISO 6165:

— crawler loaders, wheel loaders and backhoe loaders:

— crawler tractors and wheel tractors;

— graders;

— tractor-scrapers.

**1.5** This International Standard does not apply to

— self-propelled compactors;

— drills;

— paving machines;

— machines having a power rating less than 15 kW (20 hp);

— belt loaders;

— excavators;

— cranes;

— drag lines.

### 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 148:1983, *Steel — Charpy impact test (V-notch).*

ISO 898-1:1988, *Mechanical properties of fasteners — Part 1: Bolts, screws and studs.*

ISO 898-2:—[1)], *Mechanical properties of fasteners — Part 2: Nuts with specified proof load values — Coarse thread.*

1) To be published. (Revision of ISO 898-2:1980)