

AS 3785.5—1991

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Australian Standard®

**Underground mining—Shaft
equipment**

Part 5: Headframes



This Australian Standard was prepared by Committee ME/18, Mining Equipment. It was approved on behalf of the Council of Standards Australia on 15 February 1991 and published on 15 April 1991.

The following interests are represented on Committee ME/18:

Australasian Institute of Mining and Metallurgy
Australian Coal Association
Australian Mining Industry Council
Broken Hill Mining Managers Association
Bureau of Steel Manufacturers of Australia
Chamber of Mines of Western Australia
Confederation of Australian Industry
Department of Industry and Economic Planning, Vic.
Department of Minerals and Energy, N.S.W.
Department of Mines, W.A.
Department of Resource Industries, Qld
Department of Resources and Energy, Tas.
Institution of Engineers, Australia
Institution of Mining Electrical and Mining Mechanical Engineers
New South Wales Coal Association
Queensland Chamber of Mines
Queensland Coal Association
Queensland Coal Board
South Australian Chamber of Mines
University of New South Wales

Additional interests participating in preparation of this Standard:

Mining companies
Mining consultants
Mining equipment manufacturers and suppliers

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This Standard was issued in draft form for comment as DR 90031.

STANDARDS AUSTRALIA

Amendment No. 1
to
AS 3785.5—1991
Underground mining—Shaft equipment
Part 5: Headframes

REVISED TEXT

The 1991 edition of AS 3785.5 is amended as follows; the amendments should be inserted in the appropriate place.

SUMMARY: This Amendment applies to Clause 3.3.

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Page 12 Clause 3.3(a)

Add 'other than stability' after 'emergency load combinations':

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Page 12 Clause 3.3(d)(ii)

- 1 Item (B), *delete* 'if crane loads are included'.
 - 2 *Delete* item (C).
-

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Page 13 Clause 3.3(e)

Delete existing Clause and *substitute*:

'For stability calculations, the design loadings shown in Table 2.1 shall be separated into those tending to cause instability and those tending to resist instability. The partial load factors applied to the existing loads shall be taken to be 1.0 for USD and LSD and 0.7 for WSD. The partial load factors shown in Table 3.1 shall be applied to the design loads tending to cause instability. The headframe and skyshaft shall be designed such that the ratio of the design resistance effect to design action effect is not less than: 1.25 for USD and LSD or 1.75 for WSD.'

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**Underground mining—Shaft
equipment**

Part 5: Headframes

First published as AS 3785.5—1991.

PREFACE

This Standard was prepared by the Standards Australia Committee on Mining Equipment. It is one of a series of Standards on mine shaft equipment. The other Standards in the series are as follows:

- (a) *Underground mining—Shaft equipment, Part 1: Drum winding overwind safety catch systems*
- (b) *Underground mining—Shaft equipment, Part 2: Friction winding arresting systems*
- (c) *Underground mining—Shaft equipment, Part 3: Drum winding gripper systems*
- (d) *Underground mining—Shaft equipment, Part 4: Conveyances for vertical shafts*
- (e) *Underground mining—Shaft equipment, Part 6: Guides and rubbing ropes for conveyances*
- (f) *Underground mining—Shaft equipment, Part 7: Sheaves*

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

South African Standard SABS 0208—1986: *Code of practice for the design of structures for the mining industry, Part 1: Headgear*

German Standard DIN 4118—1981: *Head frames and winding towers for mines—Design loads, calculation principles and design principles*

British Standard BS 5950: *Structural use of steelwork in building, Part 1: Code of practice for design in simple and continuous construction: Hot rolled sections*

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STANDARDS AUSTRALIA
Australian Standard
Underground mining—Shaft equipment
Part 5: Headframes

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies design requirements for headframes and skyshafts, for use on mine winding installations.

1.2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:
AS

- 1170 SAA Loading Code
- 1170.1 Part 1: Dead and live loads and load combinations
- 1170.2 Part 2: Wind loads
- 1250 SAA Steel Structures Code
- 1418 SAA Crane Code
- 1418.1 Part 1: General requirements
- 1657 SAA Code for Fixed Platforms, Walkways, Stairways, and Ladders
- 1664 SAA Aluminium Structures Code
- 1720 SAA Timber Structures Code
- 1720.1 Part 1: Design methods
- 2121 SAA Earthquake Code
- 2670 Evaluation of human exposure to whole body vibration
- 3600 Concrete structures
- 3785 Underground mining—Shaft equipment
- 3785.6 Part 6: Guides and rubbing ropes
- 4100 Steel structures
- 4100 Supplement 1: Steel structures—Commentary

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

1.3.1 Approved—approved by the Statutory Authority.

1.3.2 Arresting distance—the distance between the point of entry and the point of impact.

1.3.3 Arrestor anchor—the anchor which fixes the arrestor to the headframe or skyshaft.

1.3.4 Balance rope—one or more wire ropes connecting the undersides of a pair of conveyances.

1.3.5 Collar level—the top of the shaft.

1.3.6 Conveyance—any car, carriage, cage, skip, kibble or stage in which persons, minerals, or materials are moved through a mine shaft, and any counterweight.

1.3.7 Conveyance rope attachments—an assembly of components used to connect the ends of the winding rope or balance rope to the conveyance.

1.3.8 Conveyance design load—the weight of a fully-loaded conveyance including the weight of attachments and the appropriate portion of the balance ropes but excluding the weight of the winding rope.

1.3.9 Dead load—the weight of all permanent construction together with all permanently installed equipment and services on the structure.

NOTE: For tower headframes, the winder(s) and associated equipment are deemed to be dead loads.

1.3.10 Drum winder—a winder having a driven drum of circular cross-section which acts as a rope coiler and anchors one end of the rope. Such drums may be cylindrical, conical, or cylindro-conical.

1.3.11 Earthquake load—the forces on the headframe or skyshaft resulting from seismic action.

1.3.12 Fleet angle—the angle formed between the line of the rope and the normal at its point of incidence on the drum or sheave, measured in the plane of the rope. This definition applies to ground-mounted drum winders only.