Australian Standard®

Underground mining—Shaft equipment

Part 2: Friction winding arresting systems

This Australian Standard was prepared by Committee ME/18, Mining Equipment. It was approved on behalf of the Council of Standards Australia on 1 May 1991 and published on 12 July 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, Victoria
Department of Minerals and Energy, New South Wales
Department of Resource Industries, Queensland
Department of Mines and Energy, Tasmania
Department of Mines, Western Australia
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
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Additional interests participating in preparation of Standard:

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Mining equipment manufacturers and suppliers
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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 3: *Drum winding gripper systems.*

(c) *Underground mining—Shaft equipment,* Part 4: *Conveyances for vertical shafts.*

(d) *Underground mining—Shaft equipment,* Part 5: *Headframes.*

(e) *Underground mining—Shaft equipment,* Part 6: *Guides and rubbing ropes for conveyances.*

(f) *Underground mining—Shaft equipment,* Part 7: *Sheaves.*

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FOREWORD

Arresting systems should be incorporated in friction winding installations to limit the damage or injury resulting from an overwind which may follow a malfunction or failure of the winder control or safety system (or both).

Arresting systems are designed for specific overwind conditions. These do not include rope detachment or rope breakage.

In the event of travel occurring beyond normal hoisting limits and outside the winding installation design conditions, overwind safety catches are generally installed in the headframe in association with arrestors. These do not complement the arresting system. They act during an overwind to prevent excessive fall-back of the ascending conveyance in the event of a failure of the conveyance suspension equipment or any winding ropes.

STANDARDS AUSTRALIA

Australian Standard

Underground mining—Shaft equipment

Part 2: Friction winding arresting systems

1 SCOPE This Standard specifies requirements for arresting systems in vertical shaft friction winding installations.

This Standard does not apply to vertical shaft drum winding installations and it makes no provision for an arrest at a velocity greater than the maximum entry velocity.

NOTE: Appendices A and B give guidelines on information to be provided by the purchaser and the supplier. Appendix C gives guidelines on the design requirements for an arresting system.

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

2.1 Approved and approval—approved or by approval of the authority.

2.2 Arresting system—an assembly, incorporating one or more arrestors, for decelerating and stopping a winding system in the event of an overwind in a friction winding installation.

2.3 Arrestor—a device in an arresting system used for absorbing winding system energy.

2.4 Authority—the authority having statutory powers to approve the design, manufacture and use of mine hoisting equipment in the State or Territory in which such equipment is used.

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

2.6 Conveyance—any car carriage, cage, skip, kibble, or stage, in which persons, minerals or materials are wound through a shaft or any counterweight.

2.7 Dead load—the load due to the mass of all permanent conveyance structures, ropes, and attachments.

2.8 Entry velocity—the velocity of the conveyance at the point of entry.

2.9 Friction winding installation—a winding system in which the driving force is transmitted to all hoisting ropes by friction between the drive pulley and the rope.

2.10 Headframe—the structure, including its footing, which supports the rope loads in a mine winding installation.

2.11 Operating distance—the travel distance of a winding system when under the influence of an arrestor system.

2.12 Overwind—unintentional travel of either the ascending or descending conveyance beyond its normal operating limits.

2.13 Point of entry—the particular position in the winding cycle after which further movement of the winding system is under the influence of the arrestor system (see Figure 1).

2.14 Point of impact—the lowest position of the ascending conveyance in the headframe during an arrest when any further upward movement is prevented by either—

(a) the conveyance striking the headframe or skyshaft structure; or

(b) the conveyance attachments jamming between the conveyance and the headframe or skyshaft structure.

2.15 Shall—indicates that a statement is mandatory.

2.16 Should—indicates that a statement is advisory.

2.17 Skyshaft—a structure, including its footings, which is primarily designed to support the conveyance guides above the shaft collar and to withstand impact loads resulting from an overwind.

2.18 Winding rope—one or more wire ropes that connect the winder to the top of the conveyance. For a conveyance which has more than one rope attached to the top of it, all of these ropes so attached shall be considered to be one rope for the purposes of this Standard.

2.19 Winding system—a system for raising and lowering conveyances in a vertical mine shaft.

3 MATERIALS The materials used in the fabrication of the arresting system shall be selected with due regard for their impact properties at the lowest expected ambient temperature. Due regard shall also be given to the selection of materials likely to be affected by environmental factors such as ultraviolet rays, mine water or other such conditions.