AS 3785.1—2005

Australian Standard™

Underground mining—Shaft equipment

Part 1: Drum winding overwind safety catch system

STANDARDS AUSTRALIA

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Australian Chamber of Commerce and Industry
Australian Coal Association
Australian Industry Group
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Department of Labour New Zealand
Department of Mineral Resources N.S.W.
Department of Natural Resources and Mines (Qld)
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South Australian Chamber of Mines and Energy

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PREFACE

This Standard was prepared by the Standards Australia Committee ME-018, Mining Equipment, to supersede AS 3785.1—1990.

This Standard is part of a series on mine shaft equipment, as follows:

AS		
3785	Underground mining—Shaft equipment	
3785.1	Part 1:	Drum winding overwind safety catch systems
3785.2	Part 2:	Friction winding arresting systems
3785.3	Part 3:	Drum winding gripper systems
3785.4	Part 4:	Conveyances for vertical shafts
3785.5	Part 5:	Headframes
3785.6	Part 6:	Guides and rubbing ropes for conveyances
3786.7	Part 7:	Sheaves

The objective of this Standard is to provide a specification for drum winding overwind safety catch systems installed in shafts in underground mines, which ensures adequate safety in operation. This Standard is for reference by designers, manufacturers, mine operators and regulators.

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FOREWORD

Overwind safety catch systems should be incorporated in drum winding installations to provide a safeguard against malfunction of the detaching hook catch mechanism or failure of the suspension gear in the event of an overwind.

During an overwind that causes the detaching hook to be drawn into the catchplate or detaching bell and the rope to be detached, the conveyance will continue upward until its kinetic energy is dissipated either by potentially destructive impact or by harmless conversion to gravitational potential energy. The possibility of damage to the conveyance, the conveyance suspension gear, and the conveyance contents should be avoided by designing the conveyance suspension equipment with sufficient length and freedom of movement to ensure that the conveyance can rise unimpeded until the kinetic energy is harmlessly dissipated.

Overwind safety catch systems are not intended to handle a crash.

This free upward movement will result in slack suspension equipment, which can be severely stressed and possibly broken if the conveyance is allowed to fall back through an excessive distance. The overwind safety catch system should act to limit the distance that a conveyance can fall back following such an overwind.

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1 SCOPE

This Standard specifies requirements for overwind safety catch systems in vertical shaft drum winding installations. It makes provision for an overwind with a detach velocity up to the maximum detach velocity.

NOTES:

1 Guidelines on information that should be provided by the purchaser are given in Appendix A.

2 Guidelines on information that should be provided by the supplier are given in Appendix B.

2 DEFINITIONS

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

2.1 Approved and approval

Approved by or approval of the statutory authority.

2.2 Catchplate/Detaching bell

An apparatus in a headframe which operates a detaching hook in the event of an overwind and from which the detached conveyance is suspended.

2.3 Conveyance

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

2.4 Detach velocity

The velocity of the ascending conveyance at the point of detach.

2.5 Detaching hook

A device located between the end of a winding rope and a conveyance so that in the event of an overwind an ascending drum-wound conveyance is detached from the rope and held in the headframe.

2.6 Fall-back distance

The maximum distance that an overwound conveyance that has passed the point of engagement can descend before being halted by the overwind safety catch system (see Figure 2).

2.7 Headframe

The structure, including its footings, that supports the rope loads in a winding installation.

2.8 Operating distance

The distance from the point of detach to the point of impact.

2.9 Overwind

Unintentional travel of an ascending conveyance beyond its normal operating limits.