AS 3785.1—2006

Australian Standard®

Underground mining—Shaft equipment

Part 1: Shaft overwind safety catch system

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- Australasian Institute of Mining and Metallurgy
- Australian Chamber of Commerce and Industry
- Australian Industry Group
- Department of Consumer and Employment Protection (WA)
- Department of Labour New Zealand
- Department of Natural Resources, Mines and Water (Qld)
- Department of Primary Industries, Mine Safety (NSW)
- Engineers Australia

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Part 1: Shaft overwind safety catch system

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PREFACE

This Standard was prepared by the Standards Australia Committee ME-018, Mining Equipment, to supersede AS 3785.1—2005, *Underground mining—Shaft equipment*, Part 1: *Drum winding overwind safety catch system*.

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

AS		
3785	Underground mining—Shaft equipment	
3785.1	Part 1:	Shaft overwind safety catch systems (this Standard)
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 shaft 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.

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

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FOREWORD

Overwind safety catch systems are intended to hold the conveyance stationary following an overwind event.

DRUM WINDERS

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 energy-absorbing devices 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.

FRICTION WINDERS

Overwind safety catch systems should be incorporated in friction winding installations to provide a safeguard against conveyance or counterweight fallback in the event of an overwind.

During an overwind resulting from loss of control, the conveyance will enter the arresting system to be brought to rest. The safety catch system is intended to hold and prevent fallback of the conveyance. Loss of control could occur as a result of load imbalance causing slippage, brake failure, contamination of the groove resulting in rope slip and similar.

The overwind safety catch system should act to limit the distance that a conveyance can fall back following such an overwind.

STANDARDS AUSTRALIA

Australian Standard
Underground mining—Shaft equipment

Part 1: Shaft overwind safety catch system

1 SCOPE

This Standard specifies requirements for overwind safety catch systems in vertical shaft winding installations.

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 REFERENCED DOCUMENTS

The following document is referred to in this Standard:

AS
3785 Underground mining—Shaft equipment
3785.5 Part 5: Headframes

3 DEFINITIONS

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

3.1 Arresting system

An assembly, incorporating one or more arrestors, for decelerating and stopping the conveyance(s) and the rope(s) within a winding system.

3.2 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.

3.3 Conveyance

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

3.4 Entry velocity

The velocity of the ascending conveyance at the point of entry to the safety catch system.

3.5 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.

3.6 Fallback 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 1).