AS 3785.1:2024

Australian STANDARD®

STANDARDS Australia

Underground mining — Shaft equipment

Part 1: Overwind safety catch and winding arresting systems

AS 3785.1:2024

This Australian Standard® was prepared by ME-018, Mining Equipment. It was approved on behalf of Standards Australia's Standards Development and Accreditation Committee on 06 November 2024.

This Standard was published on 22 November 2024.

The following are represented on Committee ME-018:

Australian Industry Group
Construction and Mining Equipment Industry Group
Department of Energy, Mines, Industry Regulation and Safety Western Australia
Department of Regional NSW
Engineers Australia
Engineers Australia/Mining Electrical and Mining Mechanical Engineering Society
Minerals Council of Australia
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The Australasian Institute of Mining & Metallurgy
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This Standard was issued in draft form for comment as DR AS 3785.1:2024.

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ISBN 978 1 76139 904 6

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Originated as AS 3785.1—2006 and AS 3785.2—2006.
AS 3785.1—2006 and AS 3785.2—2006 amalgamated, revised and redesignated as AS 3785.1:2024.

Preface

This Standard was prepared by the Australian members of the joint Standards Australia Committee ME-018, Mining Equipment, to amalgamate, revise and supersede AS 3785.1—2006 and AS 3785.2—2006 as AS 3785.1:2024.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to continue to develop this document as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this document is to provide a specification for overwind safety catch and winding arresting systems installed in shafts in underground mines that enables safe operation. It is for reference by designers, manufacturers, mine operators and regulators.

This document forms part of the AS 3785 series on mine shaft equipment. A list of all parts in this series can be found in the Standards Australia online catalogue.

The major changes in this edition are as follows:

(a) Amalgamation of AS 3785.1 and AS 3785.2.

(b) Revision of design to reflect current philosophy of interaction with rope attachment strings.

(c) Revision of testing requirements to address impracticalities of previous requirements

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

Contents

Introduction

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

Arresting systems should be incorporated in 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. Such devices may be installed in the headframe/skyshaft and/or at the bottom of the shaft.

The use of risk management techniques is recommended for the specification of these systems. This document provides guidance for the use of these systems.

In the event of travel occurring beyond normal winding limits and outside the winding installation design conditions, overwind safety catches are generally installed in the headframe in association with arrestors. These 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.

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.

Overwind safety catch systems are not intended to handle an entry velocity greater than the design entry velocity, see Clause 5.1.

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 and resultant loss of friction between the rope and drum, or in the event of the head ropes breaking.

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.

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Part 1: Overwind safety catch and winding arresting systems

1 Scope

This document specifies requirements for overwind safety catch and winding arresting systems in vertical shaft winding installations.

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

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

2 Normative references

There are no normative references in this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

3 Terms and definitions

For this document, the following terms and definitions apply.

3.1
arresting system
assembly, incorporating one or more arrestors, for decelerating and stopping the conveyance(s) and the rope(s) within a winding system

3.2
arrestor
device in an arresting system used for absorbing winding system energy

3.3
balance rope
One or more wire ropes connecting the undersides of a pair of conveyances

3.4
catchplate
detaching bell
apparatus in a headframe which operates a detaching hook in the event of an overwind and from which the detached conveyance is suspended

3.5
competent person
person who has acquired, through education, training, qualification or experience or a combination of these, the knowledge and skill enabling that person to perform the task required

3.6
conveyance
car, carriage, cage, skip, kibble, or stage in which persons, minerals, or materials are wound through a shaft or any counterweight

3.7
dead load
load due to the mass of all permanent conveyance structures, ropes, and attachments