

Fact sheet

Winding systems for small gemstone mines

September 2022

Introduction

This fact sheet outlines the minimum safety standards for winding system used in small gemstone mines, as prescribed in section 34, 50, 51 & 52 of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2022.

The *Work Health and Safety Act 2011* Division 3 has requirements for designers, manufactures of plant and part 5.1 of the Work Health and Safety Regulation 2017 has general duties for plant and structures.

With the commencement of the regulation on 1 September 2022, the class exemption for winding systems that are not design registered has been revoked, and all winders which are not design registered must now comply with these requirements.

A winding system, for the purposes of the Regulation, is defined as plant, other than a portable winch or plant that is manually operated, that is used in a shaft to lift a person to or from an underground mine or between levels.

These requirements do not apply to winders that are used solely for the purpose of hoisting mined material, however, do represent best practice for all winder applications.

Shaft access

Section 52(5) of the Regulation requires that control measure must be in place to prevent persons, rock, material, and plant from falling down a shaft.

Shaft conveyance

The shaft conveyance must:

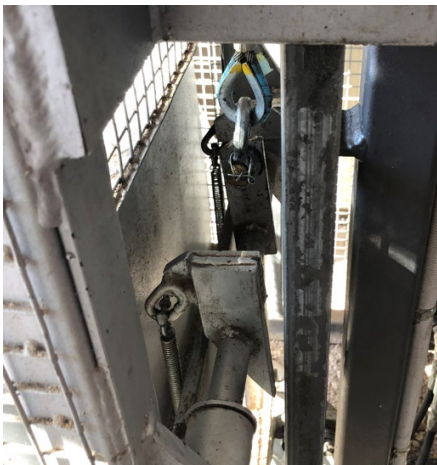
- prevent workers from falling out of it
- prevent entanglement of person and shaft
- have an emergency arresting device fitted
- be fitted with an emergency stop
- be fitted with the controls

Fact sheet

Figure 1: Shaft conveyance



Figure 2: Emergency arresting device



If a shaft conveyance that combine a cage and skip is used, material is not to be carried in the skip while people are being carried in the cage.

Winder frame and ladder assembly

Section 21(2) of the WHS Act requires a duty holder to ensure, so far as is reasonably practicable, that plant does not pose a risk to the health and safety of a person.

Section 50(1)(a) of the Regulation also requires that devices on a winder can reasonably withstand all forces that can be applied to them.

Fact sheet

The winding system frame must:

- be designed to withstand and control the forces applied from a loaded shaft conveyance moving as it operates up and down in the shaft
- have designated points to secure frame to ground or when transporting, and
- be suitably anchored to the ground.

Clause 78(3) of the Work Health and Safety Regulation 2017 requires any work which involves the risk of a fall should be carried out on a solid construction. The ladder system must be:

- of solid construction
- designed to hold the conveyance when the emergency arresting device is engaged
- fitted with suitable shaft hold offs
- fitted with suitable anchor points to hold ladder in position to the shaft.

Winch and drive motor assembly

Section 50(1)(b) of the Regulation requires specific controls to prevent a loss of control of the winder. The winch and drive motor assembly must:

- be capable of lifting and lowering the end of rope load
- have a drive motor capable of lowering, raising, and holding stationary without run on, the shaft conveyance with the maximum foreseeable load
- have all drive components suitably rated for the loads being applied to them.

Brakes

Section 50(1)(c)(ii) of the Regulation requires that at least one brake must be fitted to prevent a freefall event such as rope failure, drum coupling failure, motor failure or hydraulic hose failure. The braking system must be of failsafe design.

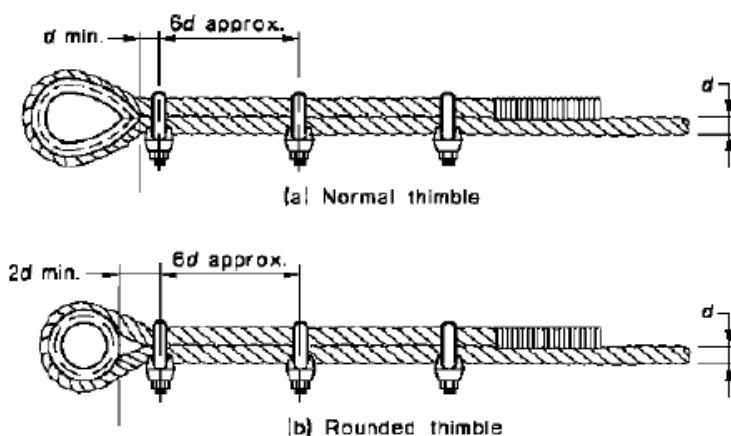
Ropes, rope sheaves and devices

Section 50(1)(a) of the Regulation requires that as a minimum the winding system rope must:

- be able to withstand all forces reasonably expected to be borne upon it
- be securely attached to both drum and conveyance

Where the anchorage relies on clamping action it should consist of two or more clamps refer to figure 3 below.

Figure 3: Rope clamps positions to thimble type



Fact sheet

There should always be a minimum of 2 turns of wire rope left on the drum once the conveyance reaches the bottom of the shaft.

Rope sheaves and devices must be:

- able to withstand all forces reasonably expected to be borne upon it
- be compatible with the rope.

Guarding

Clause 208 of the Work Health and Safety Regulation 2017 requires that guarding must be:

- fitted around all moving components to include belts and pulleys.
- of solid construction.
- secured in a manner that requires a tool to remove.

Guarding can be either:

- direct guarding – fitted directly to the component.
- indirect guarding – fitted to prevent access to the component.

Figure 4: Direct guarding example



Figure 5: Indirect guarding example



Control system

The control system must:

- incorporate an automatic means of stopping the shaft conveyance at both the top and bottom of the shaft.
- have a slack rope device fitted that stops movement in the event of a slack rope or over spool event

Fact sheet

Section 34 of the Regulation requires all electrical equipment to be adequately rated and protected as per the Australian wiring rules.

Winding system controls

Clause 210 of the Work Health and Safety Regulation 2017 requires that the winding system controls must be:

- clearly identified to indicate their nature and function and direction
- located to be operated readily and conveniently by each person using the winding system
- located or guarded to prevent unintentional activation
- able to be locked in the 'off' position or include an alternative secure method of power isolation.

Clause 211(2)(a) of the Work Health and Safety Regulation 2017 requires an emergency stop to be fitted at each controller of the winder.

Isolation of energies

Section 50(4) of the Regulation requires energy lock out devices to be fitted to all mechanical and electrical plant associated with the winding system, including mechanical and electrical plant associated with the operation, maintenance or use of the shaft.

Other relevant information published NSW Resources Regulator:

DATE PUBLISHED	REFERENCE	TITLE
September 2022	Technical reference guide	<u>Winding system for small gemstone mines</u>
November 2019	Safety Bulletin SB19-16	<u>Hoist rope unravels overhead sheave</u>