

**§ 75.1405 Automatic couplers.**

[STATUTORY PROVISIONS]

All haulage equipment acquired by an operator of a coal mine on or after March 30, 1971, shall be equipped with automatic couplers which couple by impact and uncouple without the necessity of persons going between the ends of such equipment. All haulage equipment without automatic couplers in use in a mine on March 30, 1970, shall also be so equipped within 4 years after March 30, 1970.

**§ 75.1405-1 Automatic couplers, haulage equipment.**

The requirement of § 75.1405 with respect to automatic couplers applies only to track haulage cars which are regularly coupled and uncoupled.

WIRE ROPES

SOURCE: Sections 75.1429 through 75.1438 appear at 48 FR 53239, Nov. 25, 1983, unless otherwise noted.

**§ 75.1429 Guide ropes.**

If guide ropes are used in shafts for personnel hoisting applications other than shaft development, the nominal strength (manufacturer's published catalog strength) of the guide rope at installation shall meet the minimum value calculated as follows: Minimum value=Static Load×5.0.

**§ 75.1430 Wire ropes; scope.**

(a) Sections 75.1430 through 75.1438 apply to wire ropes in service used to hoist—

(1) Persons in shafts or slopes underground; or

(2) Loads in shaft or slope development when persons work below the suspended loads.

(b) These standards do not apply to wire ropes used for elevators.

**§ 75.1431 Minimum rope strength.**

At installation, the nominal strength (manufacturer's published catalog strength) of wire ropes used for hoisting shall meet the minimum rope strength values obtained by the following formulas in which "L" equals the maximum suspended rope length in feet:

(a) *Winding drum ropes* (all constructions, including rotation resistant).

For rope lengths less than 3,000 feet:  
Minimum Value=Static Load×(7.0-0.001L)  
For rope lengths 3,000 feet or greater:  
Minimum Value=Static Load×4.0

(b) *Friction drum ropes.*

For rope lengths less than 4,000 feet:  
Minimum Value=Static Load×(7.0-0.0005L)  
For rope lengths 4,000 feet or greater:  
Minimum Value=Static Load×5.0

(c) *Tail ropes* (balance ropes).

Minimum Value=Weight of Rope×7.0

[48 FR 53239, Nov. 25, 1983; 48 FR 54975, Dec. 8, 1983]

**§ 75.1432 Initial measurement.**

After initial rope stretch but before visible wear occurs, the rope diameter of newly installed wire ropes shall be measured at least once in every third interval of active length and the measurements averaged to establish a baseline for subsequent measurements. A record of the measurements and the date shall be made by the person taking the measurements. This record shall be retained until the rope is retired from service.

[48 FR 53239, Nov. 25, 1983, as amended at 60 FR 33723, June 29, 1995]

**§ 75.1433 Examinations.**

(a) At least once every fourteen calendar days, each wire rope in service shall be visually examined along its entire active length for visible structural damage, corrosion, and improper lubrication or dressing. In addition, visual examination for wear and broken wires shall be made at stress points, including the area near attachments, where the rope rests on sheaves, where the rope leaves the drum, at drum cross-overs, and at change-of-layer regions. When any visible condition that results in a reduction of rope strength is present, the affected portion of the rope shall be examined on a daily basis.

(b) Before any person is hoisted with a newly installed wire rope or any wire rope that has not been examined in the previous fourteen calendar days, the wire rope shall be examined in accordance with paragraph (a) of this section.

(c) At least once every six months, nondestructive tests shall be conducted

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of the active length of the rope, or rope diameter measurements shall be made—

- (1) Wherever wear is evident;
- (2) Where the hoist rope rests on sheaves at regular stopping points;
- (3) Where the hoist rope leaves the drum at regular stopping points; and
- (4) At drum crossover and change-of-layer regions.

(d) At the completion of each examination required by paragraph (a) of this section, the person making the examination shall certify, by signature and date, that the examination has been made. If any condition listed in paragraph (a) of this standard is present, the person conducting the examination shall make a record of the condition and the date. Certifications and records of examinations shall be retained for one year.

(e) The person making the measurements or nondestructive tests as required by paragraph (c) of this section shall record the measurements or test results and the date. This record shall be retained until the rope is retired from service.

[48 FR 53239, Nov. 25, 1983, as amended at 60 FR 33723, June 29, 1995]

**§ 75.1434 Retirement criteria.**

Unless damage or deterioration is removed by cutoff, wire ropes shall be removed from service when any of the following conditions occurs:

- (a) The number of broken wires within a rope lay length, excluding filler wires, exceeds either—
  - (1) Five percent of the total number of wires; or
  - (2) Fifteen percent of the total number of wires within any strand;
- (b) On a regular lay rope, more than one broken wire in the valley between strands in one rope lay length;
- (c) A loss of more than one-third of the original diameter of the outer wires;
- (d) Rope deterioration from corrosion;
- (e) Distortion of the rope structure;
- (f) Heat damage from any source;
- (g) Diameter reduction due to wear that exceeds six percent of the baseline diameter measurement; or

(h) Loss of more than ten percent of rope strength as determined by non-destructive testing.

**§ 75.1435 Load end attachments.**

(a) Wire rope shall be attached to the load by a method that develops at least 80 percent of the nominal strength of the rope.

(b) Except for terminations where use of other materials is a design feature, zinc (spelter) shall be used for socketing wire ropes. Design feature means either the manufacturer's original design or a design approved by a registered professional engineer.

(c) Load end attachment methods using splices are prohibited.

**§ 75.1436 Drum end attachment.**

(a) For drum end attachment, wire rope shall be attached—

- (1) Securely by clips after making one full turn around the drum spoke;
- (2) Securely by clips after making one full turn around the shaft, if the drum is fixed to the shaft; or
- (3) By properly assembled anchor bolts, clamps, or wedges, provided that the attachment is a design feature of the hoist drum. Design feature means either the manufacturer's original design or a design approved by a registered professional engineer.

(b) A minimum of three full turns of wire rope shall be on the drum when the rope is extended to its maximum working length.

**§ 75.1437 End attachment retermination.**

Damaged or deteriorated wire rope shall be removed by cutoff and the rope reterminated where there is—

- (a) More than one broken wire at an attachment;
- (b) Improper installation of an attachment;
- (c) Slippage at an attachment; or
- (d) Evidence of deterioration from corrosion at an attachment.

**§ 75.1438 End attachment replacement.**

Wire rope attachments shall be replaced when cracked, deformed, or excessively worn.