

524 CMR: BOARD OF ELEVATOR REGULATIONS

524 CMR 19.00: DUMB-WAITERS (FOR INSTALLATIONS MADE PRIOR TO JUNE 7, 1991)

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19.01: Hoistway Enclosures

- (1) The hoistways of all dumb-waiters shall be enclosed throughout their height.
- (2) Where the dumb-waiter hoistway penetrates any fully enclosed solid floor above the bottom landing, the walls shall be of not less than two-hour fire-resistive rating.  
All plans for electric dumbwaiter installations shall be signed by a registered professional engineer or a registered architect and shall bear his registering stamp certifying that he has examined the plans and finds that the hoistway structure will comply with the contract load plus its tare. The complete dumb-waiter installation shall comply with 524 CMR now in effect.
- (3) Where the dumbwaiter either serves only open construction floors or serves only open balcony floors within one story, the walls shall be of non-combustible materials of either solid construction or open metal construction which will reject a two inch ball, provided such open construction fronts or panels are not less than two inches from any moving equipment within the enclosure. Where less than two inches from moving equipment, open construction shall reject a 1/2 inch ball.
- (4) Where a hoistway extends into the top story of a building, fire-resistive hoistway or machinery enclosures, where required, shall be carried to the underside of the roof if the roof is of fire-resistive construction, and at least three feet above the top surface of the roof if the roof is of non-fire-resistive construction.
- (5) Where hoistway enclosures are not required to continue through the roof, the top of the shaftway shall be of fire-resistive construction equivalent to that required for the walls.
- (6) More than one dumb-waiter may be installed in the same shaftway.
- (7) Emergency stop switches shall be installed in all dumbwaiter pits.
- (8) Electric contacts shall be installed on all machine access doors and access panels on all dumbwaiters.

19.02: Machine Sheave Enclosures

- (1) Dumb-waiter machines or sheaves shall be enclosed.
- (2) Where fire-resistive hoistway enclosures are required, machine room enclosures shall be of solid construction and of not less than two-hour fire-resistive construction. Where fire-resistive hoistway enclosures are not required, machine room enclosures shall be of non-combustible material, either solid or openwork which shall reject a two inch ball.
- (3) Enclosures shall be located:
  - (a) Above the top of the hoistway;

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- (b) Below the hoistway;
  - (c) Adjacent to and on any side of the hoistway;
  - (d) Within the hoistway itself, in which instance the hoistway may serve as the enclosure.
- (4) Dumb-waiter support beams shall be of steel, designed with a factor of safety of not less than five.
- (5) Flooring or floor covering within enclosures, where provided, shall be of materials other than wood.
- (6) Doors to machine or sheave enclosures shall be of not less than one and one half hour fire-resistive construction and shall be equipped with locks. Swing type doors shall be self-closing.
- (7) Loads on overhead beams and their supports shall be computed as follows: The total load on overhead beams shall be equal to the weight of all apparatus resting on the beams plus twice the maximum static load suspended from the beams.

19.03: Venting of Hoistways

- (1) General. Hoistways of dumb-waiters serving more than three stories shall be provided with means for venting smoke and hot gases to the outer air in case of fire.  
EXCEPTION: Hoistways not extending into the top story of a building, other than hotels, apartment houses, hospitals, and similar buildings with overnight sleeping quarters, where the hoistways are equipped with approved automatic sprinklers connected to the building water-supply system or to an approved automatic sprinkler system. (In case any question arises as to what is the best practice, work done in accordance with the requirements of National Fire Protection Association, Standards No. 13, entitled "Sprinkler Systems," dated August 9, 1996, will be considered as compliance.)
- (2) Location of Vents. Vents shall be located:
- (a) In the side of the hoistway enclosure directly below the floor or floors at the top of the hoistway, and shall open directly to the outer air or through noncombustible ducts to the outer air; or,
  - (b) In the wall or roof of the penthouse or overhead machinery space above the roof, provided that openings of at least equivalent area are provided in the floor or floors at the top of the hoistway.
- (3) Area of Vents. The area of the vents shall be not less than 3½% of the area of the hoistway nor less than ½ square foot of each dumb-waiter car, whichever is greater. Of the total vent area described, not less than one-third shall be of the permanently open type.  
EXCEPTIONS: Where mechanical ventilation providing equivalent venting of the hoistway is provided in the overhead elevator machine room (see 524 CMR 17.02(8)), required vent area may be reduced subject to the following:
- (a) The building is not a hotel, apartment house, hospital, or similar building with overnight sleeping quarters;
  - (b) The machine room is so located that it has no outside exposure;
  - (c) The hoistway does not extend to the top story of the building;
  - (d) The machine room exhaust fan is automatically reactivated by thermostatic means.
- (4) Closed Vents. Closed portions of the required vent area shall consist of windows, skylights, or duct openings glazed with plain glass not more than 1/8" thick.
- (5) Window and Skylight Frames and Sash. Window and skylight frames and sash shall be of metal.

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- (6) Skylight Guards. A guard, securely anchored to the supporting structure, consisting of a wire-mesh screen of at least #13 steel wire gauge with openings which will reject a ball one inch in diameter, or an expanded metal screen of equivalent strength and open area, shall be installed above every dumb-waiter skylight. A similar screen of at least #18 steel wire gauge, or of expanded metal of equivalent strength and open area, shall be installed below every dumb-waiter skylight.
- (7) Windows are permitted only in external walls of hoistway enclosures.
- (8) All windows and window frames in fire-resistive hoistway enclosures shall be fire windows conforming to local laws and ordinances.
- (9) Exterior windows in the hoistway less than 100' above the ground or less than 30' above an adjacent roof shall be guarded on the outside by one of the following methods:
- (a) By vertical bars not less than 5/8" in diameter, or equivalent, spaced not less than ten inches on centers, and not more than ten inches between the window jamb and the center of the nearest bar.
  - (b) By metal sash having solid-section steel muntins of not less than 1/8" thickness, spaced not more than eight inches apart.

### 19.04: Thoroughfares

If the hoistway of a dumb-waiter does not extend to the lowest floor of a building and the space under the bottom of the car or counterweight is used for any purpose, the following requirements shall be met:

- (a) The car and its counterweight shall be provided with a safety device of the instantaneous type, designed and installed to apply and stop the fully loaded car and counterweight without appreciable delay on the breaking of the suspension means, irrespective of the location of the break.
- (b) The construction of the hoistway under the car and counterweight shall be sufficiently strong to withstand, without failure the impact of the fully loaded car and of the counterweight descending at 125% of contract speed.
- (c) Where calculations, based on good engineering practice demonstrate that the structure under the hoistway is capable of withstanding, without failure, the impact of the fully loaded car or its counterweight, falling freely from their upper limits of travel, no safety device shall be required for the car or counterweight.

### 19.05: Pipes and Wiring

- (1) No electrical conduits or cables or any other installation other than those used to furnish or control power, light, heat or signals for the dumb-waiter or hoistway shall, in any way, be located within the hoistway.
- (2) Pipes, conduits and armored cables shall be securely fastened in the hoistway construction.
- (3) Pressure in steam pipes shall not exceed 15 lbs. above atmospheric pressure.
- (4) No part of any electric circuit having a rated system or circuit voltage in excess of 250 volts shall be used either for any operating circuit or for any control circuit on any equipment which is located in the hoistway, on the car, on the landing doors, or at the landing openings.
- (5) All wiring for electricity shall be done in accordance with the best practice. In case any question arises as to what is the best practice, work done according to the requirements of 527 CMR 12.00: *Massachusetts Electrical Code* shall be the standard.

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19.06: Dumb-Waiter Hoistway Doors

- (1) All landing openings in dumb-waiter fire-resistive shaftways shall be provided with doors, panels or fronts of not less than one and one half hour fire-resistive construction. Where fire-resistive hoistway enclosures are not required, doors may be of open metal construction which will reject a ball two inches in diameter.
- (2) The landing door opening shall not exceed the width and height of the car and in no case shall the height exceed four feet provided that one landing door may be of a larger size to permit installing or removing the car.
- (3) Hoistway landing doors of power driven dumb-waiters, other than where hoistway type interlocks are used, shall be of the vertical sliding type and shall be provided with hoistway unit-system type contacts and mechanical locks which are arranged so that the car cannot be operated unless each hoistway landing door is in the closed position.
- (4) Mechanical locks, where used, shall be of a double hook or multiple hook type arranged to lock the door after the car departs from the landing zone.
- (5) Landing doors in shaftways for hand-powered dumb-waiters shall be of the self-closing type, or shall be equipped to close automatically in case of fire.

19.07: Car Construction

- (1) Dumb-waiter cars shall be of rigid construction and designed to sustain the contract load.
- (2) Cars shall be made of wood or metal.
- (3) Cars for power dumb-waiters shall be reinforced with metal from the bottom of the car to the point of suspension.
- (4) Metal cars shall be of metal sections rigidly riveted, welded or bolted together.
- (5) Cars may be provided with hinged or removable shelves.
- (6) Dumb-waiter cars shall be capable of sustaining the loads given in 524 CMR, 19.07: *Table 1* with factors of safety not less than six for steel and nine for cast iron or other materials. The motive power need not be sufficient to raise the structural-capacity load.

524 CMR 19.07, TABLE 1.

<u>Effective Platform Area</u> (Sq. ft.)	<u>Minimum Deign Capacity</u> (lbs.)
4	100
5	150
6.25	300
9	500

- (7) A metal capacity plate shall be provided which shall be fastened in a conspicuous place and shall bear the following information in not less than one quarter inch letters or figures, stamped, etched, or raised on the surface of the plate:

CONTRACT LOAD \_\_\_\_\_ POUNDS

19.08: Hydraulic Driving Machines

Hydraulic driving machines shall be of the direct plunger type and shall conform to 524 CMR

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17.23(1).

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### 19.09: Power Dumb-waiter Machines

- (1) Dumb-waiter machines shall be securely fastened to their supports. The factors of safety, based upon the ultimate strength of the materials and the contract load, plus the weight of the car, ropes, counterweights, to be used in the design of dumb-waiter machines shall be not less than six for steel, and nine for cast iron or other materials.
- (2) Sheaves or idlers shall not be suspended in cast iron stirrups from the under side of the supporting beam.
- (3) Belts and chains may be used as the driving means between motors and driving sheaves or drums of power dumb-waiters subject only to the following restrictions:
  - (a) When flat belts are used, the contract speed shall not exceed 50 F.P.M.
  - (b) Where multiple "V" belts are used, the contract speed shall not exceed 150 F.P.M.

### 19.10: Terminal Stopping and Machine Safety Devices

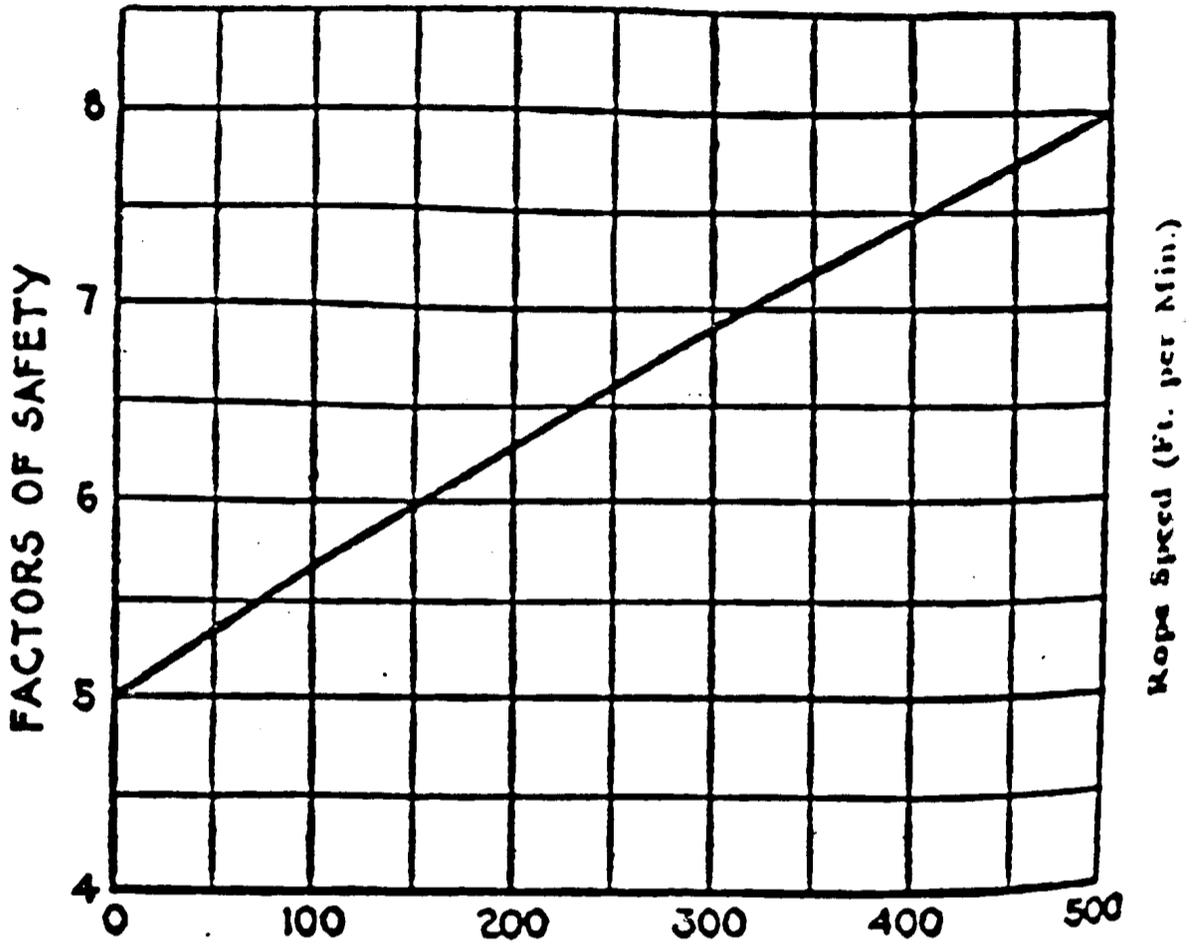
- (1) Power dumb-waiters shall be provided at each terminal with means independent of manual operation to stop the car automatically within the limits of overtravel.
- (2) Power dumb-waiters, other than hydraulic dumb-waiters, shall be equipped with brakes which are automatically applied when the power is cut off the motor.
- (3) Power dumb-waiters operated by winding-drum machines shall be provided with a slack-rope device.

### 19.11: Suspension Means

- (1) Power dumb-waiters other than those of the direct plunger type shall be provided with one or more iron or steel hoisting ropes or chains. No covering shall be permitted on ropes other than where liability to excessive corrosion or other hazards exists, in which case Marline covering may be used. Chains, when used, shall be of the roller or block type.
- (2) Steel wire hoisting ropes or chains secured to the car or counterweight or rope hitch shall be babbitted sockets or rope clamps.
- (3) The factor of safety for car and counterweight ropes based on static loads and ultimate strength of the rope shall be not less than the values given in 524 CMR 19.11 Figure 1, below, corresponding to the contract speed of the car. For chains the factor of safety shall be not less than 25% greater than given in 524 CMR 19.11: *Figure 1*.

19.11: continued

FIGURE 1.  
FACTORS OF SAFETY FOR HOISTING ROPES FOR DUMB-WAITERS



REGULATORY AUTHORITY

524 CMR 19.00: M.G.L. c. 143, § 69.