

**SECTION 08 33 00
COILING DOORS AND GRILLES**

SPEC WRITER NOTES:

1. Use this section only for NCA projects.
2. Delete between //---// if not applicable to project. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies coiling // doors // and // grilles // of sizes shown, complete as specified.

1.2 RELATED WORK

- A. Lock cylinders for cylindrical locks: Section 08 71 00, DOOR HARDWARE.
 B. Field painting: Section 09 91 00, PAINTING.
 C. Electric devices and wiring: DIVISION 26, ELECTRICAL.

1.3 MANUFACTURER'S AND INSTALLER'S QUALIFICATIONS

- A. Provide coiling door // and grille // products of manufacturers regularly engaged in manufacturing items of type specified.
 B. Install items under direct supervision of manufacturer's representative or trained personnel.

1.4 FIRE RATED COILING DOOR REQUIREMENTS

- A. Where fire coiling doors exceed the size for which testing and labeling is available, submit certificates stating that the doors and hardware is identical in design, materials, and construction to a door that has been tested and meets the requirements for the class indicated.

1.5 SUSTAINABILITY REQUIREMENTS

- A. Materials in this section may contribute towards contract compliance with sustainability requirements. See Section 01 81 11, SUSTAINABLE DESIGN REQUIRMENTS, for project // local/regional materials, // low-emitting materials, // recycled content, // _____// requirements.

1.6 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

SPEC WRITER NOTES:

1. Grilles are never electrically operated; remove reference to electrical and motors for projects including only grilles.

- B. Shop Drawings:

1. Include each type of door // and grille // showing details of construction, accessories and hardware, electrical and mechanical items supporting brackets for motors, location, and ratings of motors, and safety devices.
 2. Provide wiring diagrams for motors and controls, including wiring diagram for door, showing electrical interlock of motor with manually operated dead lock, electrical rough-in.
- C. Manufacturer's Literature and Data:
1. Brochures or catalog cuts; each type door or grille.
 2. Manufacturer's installation procedures and instructions.
 3. Maintenance instructions and parts lists.
- D. Certificates:
1. Attesting doors, anchors and hardware will withstand the horizontal loads specified.
 2. Attesting oversize fire doors and hardware are identical in design, material, and construction to doors that meet the requirements for the class specified.

1.7 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by the basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

SPEC WRITER NOTES:

1. Remove reference citations that do not remain in Part 2 or Part 3 of edited specification.
2. Verify and make dates indicated for remaining citations the most current at date of submittal; determine changes from date indicated on the TIL download of the section and modify requirements impacted by the changes.

- B. American Society for Testing and Materials (ASTM):

A36/A36M-12	Structural Steel
A167-99(2009)	Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip
A653/A653M-11	Steel Sheet, Zinc-Coated (Galvanized) Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
B209-10	Aluminum and Aluminum-Alloy Sheet and Plate

- B221-13 Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
- C. Master Painters Institute (MPI):
- MPI #35-13 Exterior Bituminous Coating
- MPI #76-13 Quick Drying Alkyd Metal Primer
- D. National Electrical Manufacturers Association (NEMA):
- ICS 1-00 (R2008) Industrial Control and Systems General Requirements
- ICS 2-00 (R2005) Industrial Control, and Systems, Controllers, Contactors, and Overload Relays
- ICS 6-93 (R2006) Industrial Control and Systems Enclosures
- MG 1-11 Motors and Generators
- E. National Fire Protection Association (NFPA):
- 70-11 National Electrical Code
- 80-13 Fire Doors and Fire Windows
- F. Underwriters Laboratories, Inc. (UL):
- Fire Resistance Directory

PART 2 - PRODUCTS

SPEC WRITER NOTES:

1. Update materials requirements to agree with applicable requirements specified in the reference Applicable Publications. Update and specify only that which applies to the project.

2.1 MATERIAL

- A. Steel: Comply with ASTM A653 for forming operation; ASTM A36 for structural sections.
- B. Stainless Steel: ASTM A167, Type 302 or 304.
- C. Aluminum, Plate and Sheet: ASTM B209/B209M.
- D. Aluminum, Extruded: ASTM B221/B221M.
- E. Alkyd Metal Primer: MPI No. 76.
- F. Bituminous Coating: MPI No. 35.

2.2 DESIGN REQUIREMENTS

- A. Coiling doors // and grilles // to be spring counter balanced, overhead coiling type, inside face mounted with guides at jambs set back a sufficient distance to provide a clear opening when door is in open position.
- B. Design doors, hardware, and anchors to withstand a horizontal or wind pressure of //958 // _____ // Pa (// 20 // _____ //psf) of door area without damage.

- C. Provide motor operators with manual emergency mechanical operators.
- D. Provide fire rated coiling doors conforming to the requirements specified herein and to NFPA 80 for the class indicated; doors to bear Underwriters Laboratories, Inc. label indicating the applicable fire rating.
- E. //Smoke Control: In corridors and smoke barriers, provide doors that are listed and labeled with the letter "S" on the fire-rating label by a qualified testing agency for smoke- and draft-control based on testing according to UL 1784. //
- F. Operation Cycles: Door components and operators capable of operating for not less than 10,000 cycles; one operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.
- G. Where doors in excess of 7.4 m² (80 sf) are indicated to be manually operated, make provision in the design and construction to permit future installation of electric-power operation.

2.3 FABRICATION

- A. Coiling Door Curtains:
 - 1. Form of interlocking slats of galvanized steel // aluminum // of shapes standard with the manufacturer, except that slats for exterior doors to be flat type.
 - 2. Thickness of slats as required to resist loads specified except not less than the following:
 - a. For doors less than 4500 mm (15 feet) wide: 0.75 mm (0.0299 inch).
 - b. For doors from 4530 mm (15 feet 1 inch) to 6300 mm (21 feet wide): 0.90 mm (0.0359 inch).
 - c. For doors wider than 6330 mm (21 feet 1 inch): 1.20 mm (0.0478 inch).
 - 3. Thickness of aluminum slats as follows:
 - a. For doors less than 4500 mm (15 feet wide): 1 mm (0.040 inch).
 - b. For doors from 4530 mm (15 feet 1 inch) to 6300 mm (21 feet wide): 1.45 mm (0.057 inch).
 - c. For doors wider than 6330 mm (21 feet 1 inch): 1.65 mm (0.064 inch).
- B. Grilles:
 - 1. Form of //galvanized steel // aluminum // stainless steel // horizontal rods, 8 mm (5/16 inch) minimum diameter spaced not over

50 mm (two inches) on center with hinged vertical connecting links; links spaced not over 225 mm (9 inches) apart.

2. Provide tubular bottom rail at bottom end of grille.

C. Endlocks and Windlocks:

1. Manufacturer's stock design of galvanized malleable iron or galvanized steel or stamped cadmium steel for doors//or grilles.//
2. Provide ends of each slat for exterior doors and each alternate slat for grilles and interior doors with endlocks.
3. Provide windlocks at ends of at least every sixth slat. Windlocks must prevent curtain from leaving guide because of deflection from wind pressure or other forces.

D. Bottom Bar:

1. Two angles of equal weight, one on each side, standard extruded aluminum members not less than 3 mm (0.125 inch) thick.
2. Bottom bar designed to receive weather-stripping and safety device, and be securely fastened to bottom of curtain or grille.

E. Barrel and Spring Counterbalance:

1. Curtain to coil on a barrel supported at end of opening on brackets and be balanced by helical springs.
2. Barrel fabricated of steel pipe or commercial welded steel tubing of proper diameter and thickness for the size of curtain, to limit deflection with curtain rolled up, not to exceed 1 in 400 (0.03 inch per foot) of span.
3. Close ends of barrel with cast iron plugs, machined to fit the opening.
4. Within the barrel, install an oil-tempered, helical, counter balancing steel spring, capable of producing sufficient torque to assure easy operation of the door curtain from any position.
5. At least 80 percent of the door weight must be counter balanced at any position.
6. Spring-tension must be adjustable from outside of bracket without removing the hood // or motor operator//.

F. Brackets:

1. Steel plate designed to form end closure and support for hood and the end of the barrel assembly.
2. End of barrel or shaft to screw into bracket hubs fabricated of cast iron or steel.

3. Equip bracket hubs or barrel plugs with pre-lubricated ball bearings, shielded or sealed.

G. Hoods:

1. Steel galvanized, 0.6 mm (0.0239 inch) thick // Aluminum, not less than 1 mm (0.040 inch) thick//.
2. Form hood to fit contour of end brackets.
3. Reinforce at top and bottom edges with rolled beads, rods or angles. Hoods more than 3600 mm (12 feet) in length must have intermediate supporting brackets.
4. Fasten to brackets with screws or bolts and provide for attachment to wall with bolts.
5. Provide a weather baffle at the lintel or inside the hood of each exterior door to minimize seepage of air through the hood enclosure.

SPEC WRITER NOTES:

1. Use steel guides with steel curtains and grilles, and aluminum guides with aluminum curtains and grilles.

H. Guides:

1. Manufacturer's standard formed sections or angles of steel // or aluminum//.
 - //a. Steel sections not less than 5 mm (3/16 inch) thick. //
 - //b. Aluminum sections not less than 5 mm (0.1875 inch) thick.//
2. Form a channel pocket of sufficient depth to retain the curtain in place under the horizontal pressure specified, and prevent ends of curtain from slipping out of guide slots.
3. Flare top sections for smooth entry of curtain to vertical sections facilitating entry of curtain.
4. Provide stops to limit curtain travel above top of guides.
5. Provide guide of aluminum with replaceable wear strips to prevent metal to metal contact.
6. Mounting brackets to provide closure between guides and jambs.

I. Weather-stripping:

1. Manually Operated Doors: Provide exterior doors with compressible and replaceable rubber, neoprene, or vinyl weather seal attached to bottom bar.
2. Motor Operated Doors: Provide bottom bar safety device as combination compressible seal and safety device specified in paragraph, ELECTRIC MOTOR OPERATORS.

3. At exterior doors, provide replaceable sweep type continuous vinyl or neoprene weather seals on guides and across head on exterior to seal against wind infiltration.

J. Locking:

SPEC WRITER NOTES:

1. Locking devices are required if there is no other entry to room or space, if motor operated door or grille is required to be secured against possible operation by unauthorized persons, and if door or grille is manually operated.
1. Cylinder locks to receive standard screw in cylinders furnished under Section, 08 71 00, DOOR HARDWARE.
2. For each manually operated exterior door // or grille //, provide manufacturer's standard cylinder dead lock type locking device on the inside at each door jamb, key operated from the exterior and interior // by turn knob //.

SPEC WRITER NOTES:

1. Use key from interior to prevent unauthorized operation unless door or grille is only means of exit.
- //3. For motor operated doors, provide manufacturer's standard cylinder dead lock type locking device on the inside, key operated from both sides, interlocked with motor to prevent motor from operating when locks are activated.//

2.4 ELECTRIC MOTOR OPERATORS

- A. Provide operators complete with electric motor, machine cut reduction gears, steel chain and sprockets, magnetic brake, overload protection, brackets, push button controls, limit switches, magnetic reversing contactor, and other accessories necessary for proper operation including emergency manual operator.
- B. Design:
 1. Design the operator so that the motor may be removed without disturbing the limit-switch timing and without affecting the emergency manual operators.
 2. Make provision for emergency manual operation of door by chain-gear mechanism.
 3. Arrange the emergency manual operating mechanism so that it may be immediately put into and out of operation from the floor with an electrical or mechanical device, which will disconnect the motor

from the operating mechanism when the emergency manual operating mechanism is engaged, and its use cannot affect the timing of the limit switches, in case of electrical failure.

//4. Provide interlock with motor to prevent motor from operating when manual locks are activated. //

C. Motors:

1. Conform to NEMA MG1, suitable for operation on current of the characteristics indicated, and operate at not more than 3600 rpm. // Single-phase motors must not have commutation or more than one starting contact. Motor enclosures to be the drip proof type of NEMA TENV type. //
2. High starting torque, reversible type, of sufficient horsepower and torque output to move the door in either direction from any position, and produce a door travel speed of not less than 0.66 foot or more than one foot per second, without exceeding the rated capacity.

D. Controls:

1. Conform to NEMA ICS 1 and 2.
2. Control enclosures to be NEMA ICS 6, Type 12 or Type 4, except that contractor enclosures may be Type 1.
3. Place remote control switches minimum 1500 mm (5 feet) above the floor line, and located so that the operator will have complete visibility of the door at all times.
4. Provide each door motor with an enclosed, across-the-line type, magnetic reversing contactor, thermal overload protection, solenoid operated brake, limit switches, and remote control switches at locations shown.
5. Use key activated switches on exterior requiring constant pressure to operate.
6. Use three-button type, push button switch on interior, unless noted to be key activated, with the buttons marked, OPEN, CLOSE, and STOP.
 - a. The OPEN and STOP buttons to be of the type requiring only momentary pressure to operate. The CLOSE button to be of the type requiring constant pressure to maintain the closing motion of the door. When the door is in motion, and the STOP button is pressed, the door must stop instantly and remain in the stop position; from the stop position, the door may then be operated in either direction by the OPEN or Close buttons.

- b. Push buttons to be full-guarded to prevent accidental operation.
- 7. Provide limit switches to automatically stop the doors at their fully open and closed positions. Positions of the limit switches must be readily adjustable.
- 8. Safety Device:
 - a. The bottom bar of power-operated doors to have a fail-safe safety device that will immediately stop and reverse the door in its closing travel upon contact with an obstruction in the door opening, or upon failure of the device, or any component of the device, or any component of the control system, and cause the door to return to its full open position. The door closing circuit to be electrically locked out and the door manually operable until the failure or damage has been corrected.
 - b. Do not use safety device as a limit switch.
 - c. Safety device connecting cable to motor to be flexible "Type SO" cable and spring loaded automatic take up reel or equivalent device, as required for proper operation of the doors.
- 9. Transformer: Provide a control transformer in power circuits as necessary to reduce the voltage on the control circuits to 120 volts or less.
- 10. Provide electrical components conforming to NFPA 70. // Electrical materials, equipment, and devices for installation in hazardous locations as defined by NFPA 70 must be specifically approved by Underwriters Laboratories for the particular chemical group and the class and division of hazardous location involved //.

2.5 MANUAL OPERATORS

- A. Push-up Operation:
 - 1. Provide one lifting handle on each side of door and counterbalance in a manner to provide easy operation while raising or lowering the curtain by hand.
 - 2. The maximum exertion or pull required for lift handle operation cannot exceed 1197 Pa (25 psf).
 - //3. Provide pull-down straps or pole hooks on bottom rail of doors over 2100 mm (7 feet) high. //
- B. Hand Chain Operation:
 - 1. Galvanized, endless chain operating over a sprocket and extending to within 900 mm (3 feet) of floor.

2. Obtain reduction by use of suitable permanently lubricated gearing connected by roller chain and sprocket drive.
3. Calculate gear reduction to reduce pull required on hand chain, not to exceed 1676 Pa (35 psf).

C. Crank Operation:

1. Locate crank approximately 854 mm (34 inches) above the floor.
2. Connect vertical shaft, gear box, and gears to curtain.
3. Calculate gear reduction to reduce pressure exerted on crank to not over 958 Pa (20 pounds).

2.6 FIRE RATED COILING DOORS

A. Provide B-labeled fire doors complete with hardware, accessories, and automatic closing device as required by NFPA 80.

B. Manual Fire Rated Coiling Doors:

1. Equip fire rated doors with an automatic closing mechanism actuated by fusible links to release at 54 oC (130 oF).
2. Doors to be forced into a closed position by an auxiliary spring in the barrel which is inoperative during normal operation and when activated will not affect the adjustment of the counterbalance spring.
3. The auxiliary spring to exert pressure on the curtain until the release device is reset.
4. Door to come to rest on the floor without impact.
5. Control descent of curtain by an oscillating governor.
6. Provide handles for push up operation.

C. Automatic-Closing Device for Fire-Rated Doors: Equip each fire-rated door with an automatic-closing device or holder-release mechanism and governor unit complying with NFPA 80 and an easily tested and reset release mechanism; release mechanism for motor-operated doors must allow testing without mechanical release of the door.

D. Automatic-closing device designed for activation by the following:

1. Replaceable fusible links with temperature rise and melting point of 165 deg F interconnected and mounted on both sides of door opening.
2. Building fire-detection, smoke-detection, and -alarm systems.
3. Fire-rated coiling doors to be provided with electric operator capable of auto resetting by the "open" control operator, without manual effort.

2.7 FINISHES

A. Steel:

1. Clean surfaces of steel free from scale, rust, oil and grease, and then apply a light colored shop prime paint after fabrication.
 2. Non-galvanized steel: Treat to assure maximum paint adherence, and apply corrosion inhibitive primer.
 3. Galvanized steel: Apply a phosphate treatment and a corrosion inhibitive primer.
- B. Stainless Steel:
1. Mill finish on concealed surfaces.
 2. No. 4 finish on all exposed surfaces.

SPEC WRITER NOTES:

1. On most projects, specify finish of aluminum by using description, do not use Aluminum Association's designation.

- C. Aluminum: Finish exposed metal surfaces as follows:
1. Mill finish, as fabricated.
 2. //AA-C22A41 // medium matte, with clear anodic coating, Class I Architectural, 0.7 mils thick. //

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install doors // and grilles // in accordance with approved shop drawings and manufacturer's instructions.
- B. Locate anchors and inserts for guides, brackets, // motors, switches, // hardware, and other accessories accurately.
- C. Securely attach guides to adjoining construction with not less than 9 mm (3/8 inch) diameter bolts, near each end and spaced not over 600 mm (24 inches) apart.
- D. Locate control switches where shown.
- E. Install all electric devices and wiring as specified in DIVISION 26 - ELECTRICAL, and DIVISION 28 - ELECTRONIC SAFETY AND SECURITY.

3.2 REPAIR

- A. Repair prime painted zinc-coated surfaces and bare zinc-coated surfaces that are damaged by the application of galvanizing repair compound. Spot prime all damaged shop prime painted surfaces including repaired prime painted zinc-coated surfaces.
- B. Lubricate coiling doors // and grilles // and properly adjust and demonstrate to operate freely.

3.3 PROTECTION

- A. Isolate aluminum in contact with or fastened to dissimilar metals other than stainless steel, white bronze or other metals not compatible with aluminum by one of the following:
 - 1. Paint the dissimilar metal with a prime coat of Zinc-Molybdate or other suitable primer, followed by two coats of aluminum paint.
 - 2. Place an approved caulking compound, or a non-absorptive tape, or gasket between the aluminum and the dissimilar metal.
- B. Paint aluminum in contact with or built into mortar, concrete, plaster or other masonry materials with a coat of bituminous paint.
- C. Paint aluminum in contact with wood or other absorptive materials, that may repeatedly become wet, with a coat of bituminous paint or two coats of aluminum paint.

3.4 INSPECTION

- A. Upon completion, doors to be weathertight and doors // and grilles // free from warp, twist, or distortion.

- - - E N D - - -