

DASMA 204-2018
Standard for Fire Rated Rolling Door Assemblies
*** Denotes NFPA definition**
Approved by DASMA September 19, 2018

1.0 Scope

1.1 This standard defines minimum design and performance specifications for fire rated rolling door assemblies in commercial and industrial applications, consisting of assembled, interlocking slats of steel or stainless steel. Refer to individual manufacturer's listings.

1.2 This standard for fire rated rolling door assemblies is intended to cover commercial and industrial type warehouses, factories and other facilities where a service counter fire door, fire shutter or fire door is required to close an opening in a firewall during an emergency. Rolling fire doors intended for frequent use should be designed for high cycle operation. Refer to section 13.1.2.

1.3 This standard is not intended to cover doors used for egress passage, nor other types of doors such as rigid, folding or multi-leaf sectional type doors, coiling doors without interlocking slats (sheet doors), perforated slat construction or special applications.

1.4 Without limitation, DASMA does not represent or imply that this standard relates to any component or system other than the rolling doors expressly identified and described herein.

2.0 Definitions

2.1 *Astragal: A compressible seal provided on the underside of the bottom bar.

2.2 *Authority Having Jurisdiction

(AHJ): The organization, office, or individual responsible for approving equipment, an installation, or a procedure.

2.3 *Automatic Closing Device: A device, that causes the door or window to close when activated by a fusible link or detector.

2.4 *Automatic Fire Detectors: A device designed to detect the presence of a fire signature and to initiate action.

2.5 *Barrel Assembly: A cylindrical horizontal member at the head of the opening that supports the door curtain and contains the counterbalance springs.

2.6 *Bottom Bar: A reinforcing member at the lower edge of the door curtain assembly. It shall be permitted to be provided with an astragal or sensing edge.

2.7 *Brackets: Plates bolted to the wall or to extensions of the guide wall angles that serve to support the barrel and form end closures for the hood.

2.8 *Closed Position: A position of the door curtain with the underside of the bottom bar, including an astragal or sensing edge, if provided, in contact with the sill along the entire width of the opening.

2.9 Counterbalance Assembly: An assembly consisting of torsion springs, spring anchors, and a shaft, which is positioned inside the barrel assembly.

2.10 *Crush Plates: Bearing plates provided where doors are mounted on concrete masonry wall units with hollow cells to accommodate through-wall bolts to prevent crushing of the hollow concrete masonry unit.

2.11 *Curtain: Interlocked slats assembled together.

2.12 *Curtain Slats: Formed sheet steel members that, when interlocked together, form the door curtain.

2.13 Cycle: An action on the door from the fully closed position, to the fully open position, and returned to the fully closed position.

2.14 *Detector: See Automatic Fire Detector.

2.15 Fascia: A metal closure for back of the door housing.

2.16 *Fire Door: The door component of a fire door assembly.

2.17 *Fire Door Assembly: Any combination of a fire door, a frame, hardware, and other accessories that together provide a specific degree of fire protection to the opening.

2.18 *Fire Protection Rating: The designation indicating the duration of the fire test exposure to which a fire door assembly or fire window assembly was exposed and for which it successfully met all acceptance criteria as determined in accordance with NFPA 252.

2.19 *Fire Shutter: A fire door assembly used for the protection of a window opening in an exterior wall.

2.20 *Flame Baffle: A hinged piece of sheet metal within the hood that, when released, closes the space between the top of the curtain and the hood of a rolling steel fire door.

2.21 *Fusible Link: Two pieces of metal held together by low-melting-point solder.

2.22 *Governor: A device that limits the rate of descent of the door during automatic closure.

2.23 *Guide: Vertical assembly in which the curtain travels and that is fastened to the jamb, retaining the edges of the door curtain and closing the space between the curtain edges and the jamb.

2.24 *Hood: A sheet metal housing that mounts horizontally between the brackets, serving as an enclosure for the coiled curtain and closing the space between the door coil and the lintel.

2.25 *Labeled: Equipment or materials to which has been attached an identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by which the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

2.26 *Lintel: A horizontal member spanning and carrying the load above an opening.

2.27 *Rolling Steel Fire Door: A fire door assembly consisting of a curtain, bottom bar, barrel, guides, brackets, hood and an automatic closing device.

2.28 *Sensing Edge: A device added to the underside of the bottom bar of a power operated rolling steel fire door or fire shutter that stops or reverses the door curtain upon contact with an obstruction when closing under power.

2.29 * Service Counter Fire Door: A labeled assembly consisting of a rolling steel fire door that incorporates a four-sided frame used for the protection of openings in walls where the primary purpose of the opening is for non-pedestrian use, such as counter service for food, a pharmaceutical dispensary, package and baggage transfer, or observation ports.

2.30 Stops: Bars mounted at top of guides to prevent bottom bar from traveling out of the guides when the curtain is fully raised.

2.31 *Sill: The bottom part of an opening onto which the door curtain and bottom bar come to rest when in the closed position.

2.32 Spring Anchor: A component in a counterbalance assembly, that holds a spring in place while it is under tension.

2.33 Tension Wheel: A component attached to the counterbalance tension shaft, which controls the spring tension as it is locked to the bracket.

2.34 Torsion Spring: A helical wound spring in a counterbalance assembly, used to counterbalance the curtain.

3.0 General

3.1 A rolling steel fire door assembly shall retard the passage of fire through a wall opening and the assembly shall include a Fire Protection Rating, an Automatic Closing Device and a Governor.

3.2 Fire resistance testing shall be in accordance with NFPA 252 or UL

10B.

4.0 Material Thickness

4.1 Metal gauge shall comply with the manufacturer's Label Procedure and with DASMA TDS-154.

5.0 Automatic Closing

5.1 The fire door shall include an automatic closing device.

5.2 In the event of fire, the fire door shall descend automatically to the completely closed position.

5.3 The door descent shall be at a controlled rate, not less than 6 in/sec nor greater than 24 in/sec.

6.0 Guide Assemblies

6.1 Guide assemblies shall contain the curtain edges throughout the door operation.

6.2 Guide assembly design shall allow for installation variances in the distance between left and right guides of $\pm 1/8$ inch (3 mm) within the specified value provided by the door manufacturer.

6.3 Guide assemblies and fastener location shall be designed to allow for thermal expansion.

6.4 The guide assemblies shall be constructed to support the total weight of the door and loads transmitted by the governor and motor (if supplied).

6.5 Guide assemblies shall include curtain stops on the guides to ensure the bottom bar stops at a designated position.

6.6 Crush plates shall be installed when fire doors are mounted to hollow concrete masonry units.

7.0 Curtains

7.1 Curtain slats shall interlock to allow the full range of angular rotation required to wrap around the barrel assembly without binding or separation.

7.2 Curtain shall be designed to resist lateral motion.

7.3 The attachment of the curtain to the barrel and curtain slats shall be designed to not pull apart when subjected to operating forces.

7.4 Steel slats shall conform to ASTM-A653, G40 minimum zinc coating, with grade chosen by manufacturer to meet performance requirements set forth herein. Slats may be painted.

7.5 Stainless steel slats shall conform to ASTM-A240 or equivalent.

7.6 The door manufacturer's listing may be referred to for other materials and finishes.

8.0 Bottom Bars

8.1 The bottom bar may incorporate an astragal or sensing edge for motor operated doors.

8.2 The bottom bar may be designed to incorporate a locking mechanism that engages at one or both ends of the bottom bar. If a locking mechanism is incorporated on a motor operated door, one of the following shall be installed:

8.2.1 An interlock switch, or switches, activated by the lock mechanism

8.3 An operator with the ability to sense either torque or starting current to the motor.

The bottom bar may bear a ($\frac{3}{4}$, 1½, 3, 4) hour fire protection-rating label, from a recognized listing agency, indicating that the door has been manufactured in accordance with the listing agency requirements.

9.0 Brackets

9.1 Brackets shall be designed to support the weight of the barrel assembly and the total curtain assembly weight.

9.2 Brackets shall be designed to incorporate an automatic closing device.

10.0 Hoods and Hood Flame Baffles

10.1 A metal hood shall be designed to enclose the coiled curtain.

10.2 A hood, or hood fasteners, shall not be in contact with the curtain at any position of the door.

10.3 A hood flame baffle (when required) shall actuate through fusible links or other automatic means. These links may be independent of the links that deploy the automatic closing device. When deployed, the baffle shall maintain full-width contact with the curtain when the door is closed.

10.4 A hood flame baffle shall not hinder operation of the door.

11.0 Fascia

11.1 Fascia shall be designed to enclose the exposed partial or no header in the back of the door coil. Standard for between jamb mounted doors.

12.0 Barrel Assemblies

12.1 Torsion Springs

12.1.1 Helical wound spring wire shall comply with ASTM-A229 or equivalent.

12.1.2 Springs shall be designed for a minimum of 10,000 cycles of operation. Higher cycle life may be specified.

12.1.3 The selection of wire size relative to coiled diameter shall be such that mean coil diameter is at least six times the wire diameter.

12.2 Spring Anchors

12.2.1 Spring anchors, shall be designed to withstand the radial and lateral forces exerted by the torsion spring to properly retain the spring when fully wound or unwound and allow the application of torque.

12.3 Pipe Deflection

12.3.1 The deflection of the pipe, with the weight of the curtain and counterbalance assemblies applied, shall not exceed .03 inches per foot of length while supported only on both ends.

13.0 Tension Wheels

13.1 Tension wheels and locking mechanism shall be designed with sufficient strength to withstand the maximum torque from torsion springs, and/or winding devices, and impact load when applicable.

14.0 Operation

14.1 A door normally operated by chain hoist shall not require more than 35 pounds (156 N) of force to operate the door.

14.2 A door normally operated by using a crank shall not require more than 25 pounds (111 N) of force to operate the door.

14.3 A door normally operated by manually pushing up the door shall not require more than 30 pounds (134 N) of force to operate the door. Recommended maximum door size shall be 80 square feet (7.44 square meters), recommended maximum door width shall be 10 feet (3.05 m), and recommended maximum door height shall be 8 feet (2.44 m).

15.0 Installation and General Operation

15.1 The door manufacturer shall furnish standard details and instructions for proper installation and general operation. Such instructions shall include warnings relative to the installation, general operation testing and resetting of the automatic closing device of the door. A drop test form (see DASMA TDS-271) shall be provided to certify that door operates and been tested in accordance with the manufacturer installation.

15.2 Installation of door and accessories and fusible link routing shall be in accordance with NFPA 80, DASMA TDS-254 and DASMA TDS-255.

15.3 Installation of detectors shall be in accordance with NFPA 80, NFPA 72 and DASMA TDS-254.

16.0 Maintenance

16.1 The door manufacturer shall furnish a list of components requiring regular maintenance, with instructions on and frequencies for such maintenance.

16.2 The door shall be inspected and tested not less than annually, to the requirements of NFPA 80.

17.0 Labels

17.1 Fire door assemblies up to the maximum size tested in accordance with the listing agency shall bear a label attached to the bottom bar. Fire door assemblies over the size opening tested shall be provided with an oversize label.

17.2 Oversize doors.

17.2.1 Oversize label shall be attached to the bottom bar of an oversize fire door, which indicates that the door is larger than the size fire tested but has been manufactured in accordance with the listing agency requirements.

17.2.2 Oversize certificate document may be provided for an oversize fire door, which indicates that the door is larger than the size fire tested but has been manufactured in accordance with the listing agencies requirements. The oversize certificate may be provided in lieu of an oversize label.

17.2.3 Oversize doors shall be subject to approval by the authority having jurisdiction.

17.3 Each door shall be labeled to identify the name and address of the door manufacturer.

17.4 DASMA labels RDD-200, RDD-201, and RDD-202 referenced in DASMA TDS-267, shall be placed on the door.

17.4.1 Warning labels in accordance with the provisions of ANSI-Z535.1, ANSI-Z535.3, ANSI-Z535.4, shall be placed on the door.

18.0 Durability

18.1 Rolling doors shall be designed to operate at a minimum of 10,000 cycles when they are properly selected, installed, operated, and maintained.

18.2 Rolling doors shall be designed to operate for the specified cycle life when more than 10,000 cycles are specified, and when they are properly selected, installed, operated, and maintained.

Referenced Standards/Documents

ASTM-A229, *Standard Specification for Steel Wire, Oil-Tempered for Mechanical Springs*

ASTM-A240, *Standard Specification for Heating-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications*

ASTM A653, *Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process*

ANSI-Z535.1, *Safety Color Code*

ANSI-Z535.3, *Criteria for Safety Symbols*

ANSI-Z535.4, *Product Safety Signs and Labels*

DASMA TDS-154, *Steel Gauge Chart*

DASMA TDS-254, *Guidelines for Installation of Rolling Steel Fire Door Release Assembly*

DASMA TDS-255, *Guidelines for Fusible Links*

DASMA TDS-267, *Rolling Door Labels*

DASMA TDS-271, *Rolling Steel Fire Doors Drop Testing and Follow-Up*

DASMA TDS-272, *Rolling Door Counterbalancing*

NFPA 72, *National Fire Protection Association, National Fire Alarm Code*

NFPA 80, *National Fire Protection Association, Standard for Fire Doors and Other Opening Protectives*

NFPA 252, *National Fire Protection Association, Fire Test of Fire Door Assemblies*

UL 10B, *Standard for Fire Tests of Door Assemblies*

Appendix A: Informational Statements

A.1. Manual operation of rolling doors (push up, hand chain or crank to open) is generally heavy in the bottom half to two-thirds of door travel and light for the top third. Refer to DASMA Technical Data Sheet TDS-272 for additional information.