ANSI/DASMA 203-2004

AMERICAN NATIONAL STANDARD

STANDARD FOR NON-FIRE RATED ROLLING DOORS

ANSI/DASMA 203-2004

Door & Access Systems Manufacturers' Association, International

Sponsor:

DASMA
Door & Access Systems Manufacturers Association International

1300 Sumner Ave
Cleveland, Ohio 44115-2851

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Non-Fire Rated Rolling Doors

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American National Standard

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Suggestions for improvement of this standard will be welcome.
They should be sent to the Door & Access Systems Manufacturers' Association, International.

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Foreword (This foreword is included for information only and is not part of ANSI/DASMA 203-2004, *Standard for Non-Fire Rated Rolling Doors.*)

This standard was developed by the Technical Committee of the DASMA Rolling Door Division. It incorporates years of experience in designing and testing non-fire-rated rolling doors.

The DASMA Rolling Door Division approved the standard as a DASMA standard on June 9, 2003. DASMA employed the canvass method to demonstrate consensus and to gain approval as an American National Standard. The ANSI Board of Standards Review granted approval as an American National Standard on October 22, 2004.

DASMA recognizes the need to periodically review and update this standard. Suggestions for improvement should be forwarded to the Door & Access Systems Manufacturers' Association, International, 1300 Sumner Avenue, Cleveland, Ohio, 44115-2851.

ANSI/DASMA 203-2004

AMERICAN NATIONAL STANDARD

Standard for Non-Fire Rated Rolling Doors

*** Denotes NFPA definition**
**** Denotes Similar to NFPA definition**

1.0 Scope

1.1 This standard defines minimum design and performance specifications for non-fire rated rolling doors in commercial and industrial applications, consisting of assembled, interlocking slats of steel, stainless steel, or aluminum.

1.2 This standard for non-fire rated rolling door assemblies shall be intended to cover commercial and industrial type warehouses, factories and other facilities. Rolling doors intended for frequent use should be designed for high cycle operation. Refer to section 11.1.2.

1.3 This standard is not intended to cover doors such as rigid, folding or multi-leaf sectional type doors, fire-rated rolling 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.

1.5 See informational statements in Appendix A on important design and operation information.

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

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

2.5 *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.

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

2.7 Counter Shutter: A door used to close an opening, which includes a counter-type sill.

2.8 *Curtain: Interlocked slats assembled together.

2.9 **Curtain Slats: Formed sheet metal or extruded members that, when interlocked together, form the door curtain.

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

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

2.12 *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.

2.13 *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.

2.14 Hood Baffle: A flap of material with one end secured to the interior of the hood and the other and resting on the curtain, and is designed to retard air infiltration over the top of the curtain and through the hood. (optional)

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

2.16 **Sensing Edge: A device added to the underside of the bottom bar of a power operated rolling door, which stops or reverses the door curtain upon contact with an obstruction when closing under power.

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

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

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

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

2.21 Windlock: A component which is attached at predetermined intervals to slat ends to prevent curtain from leaving the guides under wind load, and which are used in conjunction with wind bars inside the guides.

3.0 General

3.1 Wind Loads

3.1.1 Door system shall be designed to withstand a minimum wind load as required by the authority having jurisdiction over the geographic location where the door is to be installed. When required by the authority having jurisdiction, structural tests shall be in accordance with DASMA 206 or other accepted means required by the authority having jurisdiction.

3.1.2 Where resistance to windborne debris is required by the authority having jurisdiction over the geographic location where the door is to be installed, a door system shall meet the requirements of DASMA 205 or other accepted means as required by the authority having jurisdiction.

3.1.3 Exception: Counter shutter doors are not wind loaded.

4.0 Material Thickness

4.1 Metal gauge shall comply with Figure 1.

5.0 Guide Assemblies

5.1 Guide assemblies shall contain the curtain edges throughout the door operation and under the required wind load.

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

5.3 Guide assemblies shall be constructed to support the weight of the door and the wind loads transmitted by the curtain.

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

6.0 Curtains

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

6.2 Curtains shall be designed to resist lateral motion.

6.3 Where windlocks are required, windlock construction, material and attachment to curtain slats shall be adequate to resist wind load.

6.4 When subjected to the provisions of Section 3.1, curtain performance shall be such that the door shall remain operable after removal of the wind load.

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

6.6 Steel slats shall conform to ASTM A653/A653M, G40 minimum zinc coating, with grade chosen by manufacturer to meet performance requirements set forth herein. Slats may be painted.

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

6.8 Aluminum slats shall conform to ASTM -B209, ASTM-B221 or equivalent. Slats may be anodized.

6.9 Other materials and finishes contact manufacturer for availability.

6.10 Foam plastics used in insulated rolling doors shall meet requirements established by the authority having jurisdiction for flame spread and smoke development.

7.0 Bottom Bars

7.1 A bottom bar may incorporate an astragal or sensing edge for motor operated doors.

7.2 A bottom bar shall be designed to incorporate locks that engage 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:

- **7.2.1** An interlock switch, or switches, activated by the lock mechanism.
- **7.2.2** An operator with the ability to sense either torque or starting current to the motor.

8.0 Brackets

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

9.0 Hoods and Hood Baffles

9.1 Hoods, when specified, shall be constructed with gauge thickness in accordance with Figure 1.

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

9.3 A hood baffle (when required) shall maintain full-width contact with the curtain when the door is closed.

9.4 A hood baffle shall not hinder operation of the door.

10.0 Fascia

10.1 Metal fascia, when specified, shall be constructed with gauge thickness in accordance with Figure 1.

11.0 Barrel Assemblies

11.1 Torsion Springs

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

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

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

11.2 Spring Anchors

11.2.1 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.

11.3 Pipe Deflection

11.3.1 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.

12.0 Tension Wheels

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

13.0 Operation

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

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

13.3 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).

14.0 Installation and General Operation

14.1 The door manufacturer shall furnish standard details and instructions for proper installation and general operation. Such instructions shall include warnings relative to the installation and general operation of the door.

15.0 Maintenance

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

16.0 Labels

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

16.2 DASMA labels RDD-201 and RDD-202 shall be placed on the door as described in TDS-267.

16.2.1 Labels in accordance with the applicable provisions of ANSI-Z535.1, ANSI-Z535.3, ANSI-Z535.4, shall be placed on the door.

Referenced Standards

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-B209, *Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate*

ASTM-B221, *Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire*

ASTM A653/A653M, *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-251*, Architects and Designers Should Understand Loads Exerted by Overhead Coiling Doors*

DASMA TDS-267, *Rolling Door Labels*

DASMA TDS-272, *Rolling Door Counterbalancing*

DASMA 205, *Standard Method for Testing Rolling Steel Doors: Determination of Structural Performance Under Missile Impact and Cyclic Wind Pressure*

DASMA 206, *Standard Method for Testing Rolling Steel Doors: Determination of Structural Performance Under Uniform Static Air Pressure Difference*

Appendix A: Informational Statements

A.1. Most rolling doors with windlocks cannot be operated when wind load engages the windlocks, due to the sliding friction of the curtain within the guides. Contact the manufacturer for special requirements.

A.2. Loads are imposed onto the building structure from two sources: Wind load and door weight. Wind loading can produce substantial catenary forces in rolling doors as a result of the locking action of the curtain edges within the guides. The jambs must be designed to withstand these loads. These loads are in addition to those created by the direct wind pressure and weight of the door assembly. The magnitude and direction of these loads should be obtained from the manufacturer. DASMA Technical Data Sheet TDS-251 may be used to state these loads.

A.3. After being subjected to wind loading, rolling doors may retain some curvature in the curtain, particularly on narrow doors.

A.4. Calculations for overall performance and pass/fail prediction of the door system are well established. Detailed stresses in the curtain slats under wind loads cannot be calculated accurately since the large-deflection of these parts invalidates the assumptions used to derive common engineering formulae.

A.5. 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.

Figure 1 (DASMA Gauge Chart)

GAUGE NO.	Bare Steel	Steel G-40	Steel G-60	Steel G-90	Aluminum	Stainless Steel
14	0.0697	0.0704	0.0707	0.0712	.060	.0751
16	0.0548	0.0555	0.0558	0.0563	.050	.0595
18	0.0438	0.0445	0.0448	0.0453	.040	.0480
20	0.0329	0.0336	0.0339	0.0344	.032	.0355
22	0.0269	0.0276	0.0279	0.0284	.025	.0293
24	0.0209	0.0216	0.0219	0.0224	.020	.0235
26	0.0159	0.0166	0.0169	0.0174	N/A	.0178

NOTES:

1. CHART REPRESENTS UNPAINTED THICKNESS MINIMUMS (IN INCHES) PER GAUGE NUMBER AND SEVERAL COMMON GALVANIZING WEIGHTS.
2. CHART IS BASED ON AISI REFERENCES AND TOLERANCES.
3. BARE STEEL THICKNESSES REPRESENT STEEL WITHOUT THE ADDITION OF GALVANIZING.
4. REFERENCE DASMA TDS-154, STEEL GAUGE CHART.

DASMA – The Door & Access Systems Manufacturers Association, International – is North America's leading trade association of manufacturers of garage doors, rolling doors, garage door operators, vehicular gate operators, and access control products. With Association headquarters based in Cleveland, Ohio, our 90 member companies manufacture products sold in virtually every county in America, in every U.S. state, every Canadian province, and in more than 50 countries worldwide. DASMA members' products represent more than 95% of the U.S. market for our industry.

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