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STANDARD for
POWER AND MANUAL OPERATED REVOLVING PEDESTRIAN DOORS

SPONSOR
BUILDERS HARDWARE MANUFACTURERS ASSOCIATION, INC.

AMERICAN NATIONAL STANDARDS INSTITUTE
Approved March 20, 2024

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FOREWORD (This Foreword is not a part of ANSI/BHMA A156.27)

The general classification of builders hardware includes a wide variety of items which are divided into several categories. To recognize this diversity, a sectional classification system has been established. Section P, Power Doors and Components is one such section and this Standard is a result of the collective efforts of members of the Builders Hardware Manufacturers Association, Inc. who manufacture this product. The total Product Standards effort is, therefore, a collection of sections, each covering a specific category of items.

Performance tests and, where necessary, dimensional requirements have been established to ensure a degree of safety. There are no restrictions on design except for those dimensional requirements imposed for reasons of safety.

This Standard is not intended to obstruct but rather to encourage the development of improved products, methods and materials. The BHMA recognizes that errors will be found, items will become obsolete, and new products, methods and materials will be developed. With this in mind, the Association plans to update, correct and revise these Standards on a regular basis. It shall also be the responsibility of manufacturers to request such appropriate revisions.

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1. SCOPE

1.1 Requirements in this standard apply to power operated revolving type doors which rotate automatically when approached by pedestrians, some small vehicular use, and manual revolving type doors for pedestrians. Included are provisions to reduce the chance of user injury and entrapment.

1.2 Where this standard contains specifications relating to maximum and minimum dimensions of various components of revolving doors for pedestrian use and some small vehicular traffic, such dimensions are included to provide user protection for what are in the industry, standard application conditions. This standard does not attempt to assess any factors that exist with respect to custom installations.

1.3 Enclosure sizes shown in the charts are considered by the industry to be standard and practical to meet the majority of the market needs and are shown as a guide to installers, service providers, owners and architects. Deviation from enclosure sizes shown does not constitute non-compliance if the door complies with all requirements in the standard.

1.4 Tests described in this standard are performed under laboratory conditions. Measurements shall be taken under neutral air pressure conditions. In actual usage, results vary because of installation, maintenance and environmental conditions.

2. DEFINITIONS

2.1 **Active Area** An area where sensors detect presence or motion.

2.2 **Automatic Door Operator** A power operated mechanism that is attached to a revolving door for the purpose of mechanically opening a door upon the receipt of an activating signal. (Also called a power door operator.)

2.3 **Automatic Home Positioning** Manual revolving doors with automatic home positioning are small diameter 3 or 4 wing revolving doors that utilize a Low Energy operator or mechanism to return the doors to the Home position once a person exit the door and the door stops rotating.

2.4 **Automatic Door Speed** The rate at which an automatic revolving door rotates measured in revolutions per minute (RPM). Three classifications are used:

Standard Speed The maximum allowable RPM for a revolving door.

Slow Speed One half of standard speed.

Low Energy Speed Door speed resulting in a maximum of 2.5 lbf.–ft. (3.4Nm) of kinetic energy.

2.5 **Bottom Rail** The lower horizontal member of the door wing.

2.6 **Breakout** A process whereby wings and/or door panels can be pushed open manually for emergency egress.

2.7 **Canopy** The area above the wings and enclosure comprised of a ceiling (soffit), fascia, and roof (optional).

2.8 **Center Shaft** The rotating center, 12 in. (305 mm) or less in diameter, of revolving doors to which the wings are attached.

2.9 **Clearance** The minimum gap around the wing to the ceiling, enclosure, and floor, not including the weather stripping, at any point in its rotation.

2.10 **Control** A unit containing electrical components for automatic control of door operation and

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overload protection.

2.11 **Control Mat** A presence sensing device that detects pressure from people or objects to give an activating signal to the automatic revolving door.

2.12 **Core** The rotating central portion, greater than 12 in. (305 mm) in diameter, of a large diameter revolving door to which the wings are attached.

2.13 **Enclosure** The walls in which the wings operate. Also known as Drum.

2.14 **Entry Point Sensor** A presence sensor designed to detect a person in the area between the outer leading edge of the enclosure wall and the approaching outer leading edge of the wing.

2.15 **Fascia** The vertical surface(s) of the canopy.

2.16 **Home Position** The desired at-rest position for a revolving door.

Home Position "X" position (4 wing) stops in the (X) position with all four wings in contact with the entrance wall posts.;

Home Position "+" position (4 wing) stops in the (+) position with two wings in contact with the wall center mullions and two wings in the middle of the throat opening;

Home Position "Y" position (3 wing) stops in the Y position with two wings in contact with the entrance wall posts and one wing in contact with the wall center mullion.

2.17 **Knowing Act** Activating a contact or non-contact device with the intent of operating the door.

2.18 **Manual Operation** The capability of rotating the revolving door by a person applying a force to a door wing.

2.19 **Manual Speed Control** A device used to regulate manual revolving door speed by making it difficult to push the door beyond the maximum allowed RPM.

2.20 **Motion Sensor** A sensor designed to detect the movement of a person or equivalent at the point of entry to the door that gives an activating signal to the power operated door.

2.21 **Obstruction Force** The maximum static force the door is allowed to apply to a person or object measured at the outside edge of the rotating wing.

2.22 **Power Assist Door** A door with a power mechanism that activates by pushing the door, reducing the rotating resistance to assist the user while they are pushing the door.

2.23 **Power Operated Door** A (revolving) door with a power operated mechanism that is attached to it for the purpose of mechanically opening the door upon the receipt of an activating signal. (Also called Automatic Door.)

2.24 **Peripheral Speed** The rotating speed of a revolving door measured at the outer edge of the wing.

2.25 **Presence Sensor** A sensor designed to detect the presence of a stationary person in the vicinity of the doorway and give a signal to the power operated door.

2.26 **Push Bar** A bar attached to the wing upon which pressure is applied to set a manual revolving door in motion. A push bar is not required on automatic revolving doors.

2.27 **Push to Slow Device** A knowing act switch used to initiate a signal to cause the reduction of speed of the revolving door.

2.28 **Safety Glass** Comprised of either fully tempered or laminated glass or other safety rated glazing to prevent injuries from breakage.

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2.29 **Sensor** A device that detects the motion or presence of a person or object.

2.30 **Small Vehicular** Carts used to transport people or objects.

2.31 **Stile** A vertical edge member of the door wing.

2.32 **Throat Opening** The width between the enclosure sidewalls that creates the entry point.

2.33 **Trained Traffic** People trained in the safe use and operation of a particular automatic door installation.

2.34 **Weather Stripping** The material used to fill the clearance.

2.35 **Wing** A panel which rotates within and seals the enclosure. (Sometimes called a leaf.)

3. GENERAL

3.1 Required dimensions are expressed in U.S. units first. SI metric values, given in parentheses, are approximate.

3.2 Referenced American National Standards are available from the American National Standards Institute, www.ansi.org, or The Builders Hardware Manufacturers Association www.buildershardware.com.

3.3 **Tolerances** Where only minus tolerances are given, the dimensions are permitted to be exceeded at the option of the manufacturers. Linear dimensions shall be ± $^1/_4$ in. (6.35 mm) unless otherwise specified.

3.4 Measuring equipment shall consist of linear measuring devices, commercial torque measuring devices, force meters, load dynamometers and tension loading devices capable of a combined calibration and reading accuracy within 5% to obtain test data as specified in the applicable Performance Tests.

3.5 Revolving door systems come in a variety of configurations. A manual revolving door shall include speed control and breakout for the safety and convenience of the user. Automatic revolving doors shall include safety systems, other control devices and proper signage for the safety and convenience of the user as described in the respective sections.

3.6 Acceptable Door Speeds are based on calculated kinetic energy for the heaviest common door materials.

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4. MANUAL REVOLVING DOORS

4.0 This section of the standard deals with manual revolving door systems with a center shaft. This is a small diameter revolving door with 3 or 4 wings. The wings are attached to a center shaft and surrounded by an enclosure.

4.1 **Enclosure Size** Maximum inside diameter 10ft (3048mm). Maximum height under canopy 12ft (3658mm). To limit the total door mass, the diameter added to the height shall not exceed 17ft (5182mm).

4.2 **Acceptable Door Speed** The maximum allowable RPM of the door shall be:

Maximum Inside Diameter	6ft (1828mm)	7ft (2133mm)	8ft (2438mm)	9ft (2743mm)	10ft (3048mm)
Manual Speed Control RPM	12	11	10	9	8

4.3 **Egress** shall be in accordance with Section 10.

4.4 **Signage** Not applicable.

4.5 **Glazing** shall be in accordance with Section 12.

4.6 **Clearances** shall be in accordance with Section 13.

4.7 Manual Doors with automatic home positioning shall also comply with the following:

4.7.1 The automatic home positioning shall not generate more than 1.25 lbf – ft (1.69Nm) of kinetic energy during the home positioning or have a speed no greater than 2 rpm and an obstruction force of 30 lbf. (133 N) maximum. The automatic home positioning shall cease once the door reaches the home position.

4.7.2 Where equipped with power assist, when the pushing force on the door is released, the door shall automatically continue to the home position. An activating device is permitted to be used to put the door in the power assist mode.

4.7.3 In the event of a power failure the door shall remain compliant with Section 4.2

5. AUTOMATIC REVOLVING DOORS WITH A CENTER SHAFT

5.0 This section of the standard deals with automatic revolving door systems with a center shaft. This is a small diameter revolving door with 3 or 4 wings. The wings are attached to a center shaft and surrounded by an enclosure.

5.1 **Enclosure Size** Maximum nominal diameter shall be 24 ft (7315mm). The maximum height under the canopy shall be 8 ft. 6 in. (2590mm).

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5.2 **Acceptable Door Speed** The maximum allowable RPM of the door shall be:

Nominal Revolving Door Diameter	8ft 2438mm	9ft 2743mm	10ft 3048mm	11ft 3352mm	12ft 3657mm	12ft 6in. 3810mm	14ft 4270mm	16ft 4876mm	18ft 5490mm	20ft 6100mm	24ft 7315mm
Standard Speed RPM (All)	7.2	6.4	5.7	5.2	4.8	4.6	4.1	3.6	3.2	2.9	2.4
Slow Speed RPM (All)	3.6	3.2	2.8	2.6	2.4	2.3	2	1.8	1.6	1.5	1.3
Low Energy Speed RPM 3 Wing Aluminum	2.5	2.1	1.8	1.6	1.4	1.3	1.1	1.0	0.9	0.7	0.6
Low Energy Speed RPM 4 Wing Aluminum	2.1	1.8	1.6	1.4	1.2	1.1	0.9	0.8	0.6	0.5	0.4
Low Energy Speed RPM 3 Wing Clad	2.2	1.9	1.6	1.4	1.3	1.2	1.0	1.0	0.8	0.7	0.5
Low Energy Speed RPM 4 Wing Clad	1.9	1.6	1.4	1.2	1.1	1.0	0.9	0.7	0.6	0.5	0.4

Low Energy Speed RPM shown for ¼ in. (6mm) glass in wing design. See Tables 2 & 3.

5.3 **Egress** shall be in accordance with Section 10.

5.4 **Signage** shall be in accordance with Section 11.

5.5 **Glazing** shall be in accordance with Section 12.

5.6 **Clearances** shall be in accordance with Section 13.

5.7 **Obstruction Force** shall be in accordance with Section 14.

5.8 **Slow Speed Operation** shall be in accordance with Section 15.

5.9 **Wing Sensors** shall be in accordance with Section 16 .

5.10 **End Wall and Bottom Rail Guard Sensors** shall be in accordance with Section 17.

5.11 **Kinetic Energy Requirements** shall be in accordance with Section 18.

5.12 **Door out of Position** shall be in accordance with Section 19.

5.13 **Emergency Stop Switch** shall be in accordance with Section 20.

5.14 **Activating Device** shall be in accordance with Section 21.

5.15 **Entry Point Sensor** shall be in accordance with Section 22.

5.16 **Monitoring** shall be in accordance with Section 23.

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6. AUTOMATIC REVOLVING DOORS WITH A CORE

6.0 This section of the standard deals with automatic revolving door systems with a core. This is a large diameter revolving door with 3 or 4 wings. The wings are attached to a center core and surrounded by an enclosure.

6.1 **Enclosure Size**: Maximum nominal diameter 24 ft. (7315mm), maximum height under the canopy 8 ft (2438mm).

6.2 **Acceptable Door Speed** The maximum allowable RPM of the door shall be:

Nominal Revolving Door Diameter	10ft (3048mm)	12ft (3657mm)	14ft (4270mm)	16ft (4876mm)	18ft (5490mm)	20ft (6100mm)	24ft (7315mm)
Standard Speed RPM (All)	5.7	4.8	4.1	3.6	3.2	2.9	2.4
Slow Speed RPM (All)	2.8	2.4	2.0	1.8	1.6	1.4	1.2
Low Energy Speed RPM 3 Wing Aluminum	1.2	0.9	0.7	0.6	0.5	0.4	0.3
Low Energy Speed RPM 4 Wing Aluminum	1.1	0.8	0.6	0.5	0.4	0.4	0.3
Low Energy Speed RPM 3 Wing Clad	1.1	0.9	0.7	0.6	0.5	0.4	0.3
Low Energy Speed RPM 4 Wing Clad	1.0	0.7	0.6	0.5	0.4	0.3	0.3

Low Energy Speed RPM shown for ¼ in. (6mm) glass in wing design. See Tables 2 & 3.

6.3 **Egress** shall be in accordance with Section 10.

6.4 **Signage** shall be in accordance with Section 11.

6.5 **Glazing** shall be in accordance with Section 12.

6.6 **Clearances s**hall be in accordance with Section 13.

6.7 **Obstruction Force** shall be in accordance with Section 14.

6.8 **Slow Speed Operation s**hall be in accordance with Section 15.

6.9 **Wing Sensors** shall be in accordance with Section 16.

6.10 **End Wall and Bottom Rail Guard Sensors** shall be in accordance with Section 17.

6.11 **Kinetic Energy Requirements** shall be in accordance with Section 18.

6.12 **Door Out of Position** shall be in accordance with Section 19.

6.13 **Emergency Stop Switch** shall be in accordance with Section 20.

6.14 **Activating Device** shall be in accordance with Section 21.

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6.15 **Entry Point Sensor** shall be in accordance with Section 22.

6.16 **Monitoring** shall be in accordance with Section 23.

7. AUTOMATIC TWO WING REVOLVING DOORS

7.0 This section of the standard deals with automatic revolving doors with 2 wings. The wings have panels at the perimeter to seal off the throat and the wings are surrounded by an enclosure.

7.1 **Enclosure Size**: Maximum nominal diameter 18 ft. (5490mm) maximum height under the canopy 8 ft (2438mm).

7.2 **Acceptable Door Speed**: The maximum allowable RPM of the door shall be (typical sizes shown, see appendix for formulas for other sizes):

Nominal Revolving Door Diameter	10ft (3048mm)	12ft (3657mm)	14ft (4270mm)	16ft (4876mm)	17ft (5181mm)	18ft (5490mm)
Standard Speed RPM	5.7	4.8	4.1	3.6	3.4	3.2
Slow Speed RPM	2.8	2.4	2.0	1.8	1.7	1.6
Low Energy Speed RPM Aluminum	0.9	0.7	0.6	0.5	0.4	0.4
Low Energy Speed RPM Clad	0.8	0.6	0.5	0.4	0.4	0.4

Low Energy Speed RPM shown for ¼ in. (6mm) glass in wing design. See Table 1.

7.3 **Egress** shall be in accordance with Section 10.

7.4 **Signage** shall be in accordance with Section 11.

7.5 **Glazing** shall be in accordance with Section 12.

7.6 **Clearances** shall be in accordance with Section 13.

7.7 **Obstruction Force** shall be in accordance with Section 14.

7.8 **Slow Speed Operation** shall be in accordance with Section 15.

7.9 **Wing Sensors** shall be in accordance with Section 16.

7.10 **End Wall and Bottom Rail Guard Sensors** shall be in accordance with Section 17.

7.11 **Kinetic Energy Requirements** shall be in accordance with Section 18.

7.12 **Door out of Position** shall be in accordance with Section 19.

7.13 **Emergency Stop Switch** shall be in accordance with Section 20.

7.14 **Activating Device** shall be in accordance with Section 21.

7.15 **Entry Point Sensor** shall be in accordance with Section 22.

7.16 **Monitoring** shall be in accordance with Section 23.

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