Proposed Revision of ANSI/BHMA A156.19-2013

STANDARD

FOR

POWER ASSIST AND LOW ENERGY POWER OPERATED DOORS

SPONSOR

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION, INC.

Committee Review Copy

Changes in the last revision
Knowing Act Switch A-5: added time delay options and rearranged text
Added note about secondary activation to A-7
Combined Tables 1 and 2 as shown in the draft
In A-6 replaced qualified inspector with AAADM certified
Added “or secondary activation” to A-7

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FOREWORD (This Foreword is not a part of ANSI/BHMA A156.19)

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. Power Operated Doors 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. GENERAL

1.1 Requirements in this Standard apply only to swing door operators. The operator types are power assist, and low energy power operators, for pedestrian use, and some small vehicular use. It does not address doors, finish or hardware. The activation of all doors described in this standard requires a knowing act. Included are provisions intended to reduce the chance of user injury or entrapment.

1.2 Doors that require higher speeds, forces, shorter time delays, and activating sensing devices shall comply with ANSI/BHMA A156.10 for Power Operated Pedestrian Doors and are not covered in A156.19.

1.3 This Standard does not attempt to assess any factors that exist with respect to custom design installations which are not required to meet the requirements of this Standard.

1.4 Unless otherwise specified, all references to time delay, opening speed and forces in this standard, refer to the operator in the power mode as opposed to the manual mode.

1.5 Required dimensions are expressed in US units first and the SI (metric) equivalents given in parentheses are approximate. All values which do not carry specific tolerances or are not marked maximum or minimum shall have the following tolerances: Linear dimensions shall be ± 1/16 in (1.6 mm). Pounds or pound force shall be ± 5%. Angular measurements shall be ± 4 degrees. Voltage measurements shall be ± 5 percent. Temperature measurements shall be ± 4 degrees F (±2 degrees C).

1.6 Compliance with the requirements of this standard shall be accomplished through factory settings or field adjustments as necessary.

1.7 Operators used on labeled fire door assemblies shall be listed or labeled by a nationally recognized independent testing laboratory, and be subject to a periodic in-plant follow-up service. Consult the authority having jurisdiction for the appropriate fire test requirements.

2. DEFINITIONS

2.1 **Knowing Act** Consciously initiating the powered opening of a low-energy door using acceptable methods including: wall or jamb-mounted contact switches such as push plates; fixed non-contact switches; the action of manual opening (pushing or pulling) a door; and controlled access devices such as keypads, card readers, and keyswitches.

2.2 **Low Energy Power Operated Door** A door with a power mechanism that opens the door upon receipt of a knowing act activating signal, does not generate more kinetic energy than specified in this Standard, and is closed by a power mechanism or by other means.

2.3 **Power Assist Door** A door with a power mechanism that activates by pushing or pulling the door, reducing the opening resistance of a self-closing door to allow easier manual opening of the door. If the opening force on the door is released, the door shall come to a stop and either immediately begin to close, or begin to close after a predetermined time.

2.4 **Push-Pull Activation** A door where the user pushes or pulls a door equipped with a Low Energy Power Operator to activate a mechanism, causing the door to go through a complete cycle of automatic opening, hold open time delay, and closing.

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

3. REQUIREMENTS FOR POWER ASSIST DOORS

3.1 **Activation** Power assist doors shall operate only by pushing or pulling the door. An activating means is permitted to be used to put the door in the power assist mode.

3.2 **Opening** If the opening force on the door is released, the door shall come to a stop and either immediately begin to close or begin to close after a predetermined time.

3.3 **Time Delay** Not required.

3.4 **Closing** Doors shall close from 90 degrees to 10 degrees from closed, in 3 seconds or longer as required in Table I. Doors shall close from 10 degrees to fully closed in not less than 1.5 seconds.

3.5 **Force and Kinetic Energy** The force required to prevent a door from closing shall not exceed 15 lbf (67 N) measured 1 inch (25 mm) from the latch edge of the door at any point in the closing cycle. Doors shall open with a manual force not to exceed 15 lbf (67 N) to release a latch if equipped with a latch, 30 lbf (133 N) to set the door in motion, and 15 lbf (67 N) to fully open the door. The forces shall be applied at 1 inch (25 mm) from the latch edge of the door.

3.6 **Signage** See Section 6 for signage.

4. REQUIREMENTS FOR LOW ENERGY POWER OPERATED DOORS

4.1 **Activation** The operator shall be activated by a knowing act.

4.2 **Opening** Doors shall open from closed to back check, or 80 degrees which ever occurs first, in 3 seconds or longer as required in Table I. Backcheck shall not occur before 60 degrees opening. Total opening time to 90 degrees shall be as in Table II. If the door opens more than 90 degrees, it shall continue at the same rate as backcheck speed.

4.3 **Time Delay** When powered open, the door shall remain at the fully open position for not less than 5 seconds. Exception: When push-pull activation is used, the door shall remain at the fully open position for not less than 3 seconds.

4.4 **Closing** Doors shall close from 90 degrees to 10 degrees in 3 seconds or longer as required in Table I. Doors shall close from 10 degrees to fully closed in not less than 1.5 seconds.

4.5 **Force and Kinetic Energy** The force required to prevent a stopped door from opening or closing shall not exceed 15 lbf (67 N) measured 1 inch (25 mm) from the latch edge of the door at any point during opening or closing. The kinetic energy of a door in motion shall not exceed 1.25 lbf-ft (1.69 Nm). Table I provides minimum times for various widths and weights of doors for obtaining results complying with this kinetic energy. Doors shall open with a manual force not to exceed 15 lbf (67 N) to release a latch, if equipped with a latch, 30 lbf (133 N) to set the door in motion, and 15 lbf (67 N) to fully open the door. The forces shall be applied at 1 inch (25 mm) from the latch edge of the door.

4.6 **Signage** See Section 6 for signage.

5. CYCLE TESTS

5.1 Low Energy Power Operated, and Power Assist doors shall be cycle tested for 300,000 cycles.

5.2 Use the widest and heaviest test specimen recommended for use by the manufacturer. Narrower or lighter doors of the same configurations shall then be considered to meet the cycle test requirements.

5.3 Use the requirements in Table I and Table II to determine opening and closing times. Open the door to a 90 $\pm$ 5 degree open position and close the door to the 0 + 2 degree closed position using appropriate equipment. One opening and closing constitutes one cycle. In the case of Power Assist doors, use an actuator exerting an equivalent force equal to a 15 lbf (67 N) measured at 1 in (25 mm) from the latch edge of the door applied in the opening direction and allow the closing device furnished to close the door.

5.4 At the conclusion of the cycle test, the doors shall operate in accordance with requirements of Table I, Table II and the actual opening and closing time shall be within -10 % to +20 % of their respective values at the commencement of the test.

Table I

Minimum Opening Time to Back Check or 80 degrees (whichever occurs first) and Minimum Closing Time from 90 degrees to Latch Check or 10 degrees (whichever occurs first)

"D" Door Leaf Width - Inches (mm)	**"W" Door Weight in Pounds (kg)**				
	100 (45.4)	**125 (56.7)**	**150 (68.0)**	**175 (79.4)**	**200 (90.7)**
***30 (762)**	3.0	3.0	3.0	3.0	3.5
36 (914)	3.0	3.5	3.5	4.0	4.0
42 (1067)	3.5	4.0	4.0	4.5	4.5
48 (1219)	4.0	4.5	4.5	5.0	5.5

Table II

Total Opening Time to 90 Degrees

Backcheck at 60 degrees	Backcheck at 70 degrees	Backcheck at 80 degrees
Table I plus 2 seconds	Table I plus 1.5 seconds	Table I plus 1 second
If the door opens more than 90 degrees, it shall continue at the same rate as backcheck speed		

Matrix values are in seconds

Note: To determine minimum times from close to full open, the operator shall be adjusted as shown in the chart. Back check occurring at a point between positions in Table II shall use the lowest setting. For example, if the backcheck occurs at 75 degrees, the full open shall be the time shown in Table I plus 1.5 seconds.

* Check applicable Building Codes for clear width requirements in Means of Egress.

Doors of other weights and widths can be calculated using the formula:

$T = D\sqrt{W}/133$ in US Units $\quad T = D\sqrt{W}/2260$ in SI (metric) units

Where: T = Time, seconds

D = Door width, inches (mm)

W = Door weight, lbs. (kg)

The values for "T" time have been rounded up to the nearest half second. These values are based on a kinetic energy of 1.25 lbf-ft.

6. SIGNAGE

6.1 Doors shall be equipped with signage visible from either side of the door, instructing the user as to the operation and function of the door. The signs shall be mounted 50" +/- 12" (1270 mm +/- 305 mm) from the floor to the center line of the sign. The letters shall be 5/8 inch (16 mm) high minimum.

6.2 Consistent with section 2.2.1 of ANSI Z535.4 - 2002 the "signage and warnings" guidelines of A156.19 are recognized, industry-specific standards that predate the adoption of Z535.4 and are not replaced by the standards set forth therein.

6.3 Power Assist Doors

6.3.1 When a separate wall switch is used to initiate power assist, the doors shall be provided with signs on both sides of the door with the message "EASY OPEN DOOR - ACTIVATE SWITCH THEN OPEN DOOR". The lettering shall be white and the background shall be blue.

6.3.2 When remote devices, and/or pushing or pulling the door are used to initiate power assist, the doors shall be provided with the messages "EASY OPEN DOOR - PUSH TO OPERATE" on the push side of the door and "EASY OPEN DOOR - PULL TO OPERATE" on the pull side of the door. The lettering shall be white and the background shall be blue.

6.4 Low Energy Doors

6.4.1 All low energy doors shall be marked with signage visible from both sides of the door, with the words "AUTOMATIC CAUTION DOOR" (See Figure 1). The sign shall be a minimum of 6 inches (152 mm) in diameter with black lettering on a yellow background. Additional information may be included. Additionally one or both of the following knowing act signs shall be applied:

Figure 1

6.4.2 When a **Knowing Act Switch** is used to initiate the operation of the door operator, the doors shall be provided with signs on each side of the door where the switch is located, with the message "ACTIVATE SWITCH TO OPERATE". The lettering shall be white and the background shall be blue.

6.4.3 When push/pull is used to initiate the operation of the door operator, the doors shall be provided with the message "PUSH TO OPERATE" on the push side of the door and "PULL TO OPERATE" on the pull side of the door. The lettering shall be white and the background shall be blue.

APPENDIX (NOT A PART OF ANSI/BHMA A156.19)

A-1 CONFORMANCE CRITERIA

Certification that products offered meet the requirements of this Standard and conform to individual manufacturer's drawings, specifications, standards and quality assurance practices are available and in some circumstances are required. Buyer requirements determine the need for proof of conformance such as first article inspection, test laboratory reports or listings. Specifiers requiring assertions of conformance utilize statements of conformance by individual manufacturers, or test reports acceptable to the buyer.

A-2 PRESERVATION, PACKAGING, AND PACKING

Unless other arrangements between buyer and seller are made, preservation, packaging and packing shall be sufficient to protect containers and their contents under normal shipping and handling conditions from the source of supply to the destination point.

A-3 MARKING

Unless other arrangements between buyer and seller are made, marking shall be in accordance with the individual manufacturer's standard practice.

A-4 APPLICATION

As described by the titles, Low Energy, and Power Assist, this Standard applies to products designed to open and close slowly with minimal kinetic energy. Their primary application is to provide easier accessibility through doorways.

A-5 KNOWING ACT SWITCHES

- The switch should be located a maximum distance of 12 feet from the center of the door, remain accessible when the door is opened, and shall not be located in a position where the user would be in the path of the moving door.
- It is generally preferable for the switch to be located within one to five feet from the door. If located more than ~~5~~ 12 feet from the center of the door, an additional time delay beyond the five second minimum is recommended. The additional time delay shall be a minimum of one second for each additional foot of distance.
- The switch should be installed a minimum of 34 in. (864mm) and a maximum of 48 in. (1219mm) from the floor, or as specified by the local building code.
- The switch should be mounted so the user can see the door when activating.
- Consult A117.1 and other applicable building codes for additional information regarding accessibility requirements for the door and area around the door.

A-6 RECOMMENDED MAINTENANCE AND INSPECTION

The manufacturer should provide an owner's manual with the sale of each operator to explain how the owner should perform regular safety checks.

Low Energy doors require periodic maintenance and inspection to ensure compliance with this standard. It is strongly recommended that they are inspected at the time of installation, and at a minimum annually thereafter, by an AAADM certified inspector. It is also recommended that the doors are maintained on a regular basis by a qualified professional per the manufacturer's instructions. Compliance to current standards at the time of service is encouraged.

A-7 RECOMMENDED PRACTICES AND OTHER INFORMATION

The following comments are provided for guidance in Custom Installations recognizing there will be certain installations that require deviation from the Standard requirements. It is important, when exceptions are absolutely necessary, to obtain guidance from qualified experts.

- Special security installations such as airport checkpoints or government buildings might require a shorter time delay.
- Low Energy Swing Door Operators are a solution to installations that do not have the necessary maneuvering room on the swing side of the door for manual opening. Installing an activating switch in an accessible location on the swing side can be the solution.
- Fixed non-contact switches should have a detection range no greater than 12 in. (305mm) to ensure a knowing act is utilized to activate the door.
- In special applications where safety sensors or secondary activation sensors are used on a low energy door, they should comply with the criteria set forth in A156.10 for the type of sensor selected.
- Guide rails are not required for doors in this standard and could interfere with the operation of the door if only push/pull to operate is the activating method.
- It is important to determine the door weight to properly set the speed adjustments. Very heavy doors will result in slow cycle speeds which may not be appropriate for certain applications. For example, a 175 lb. (79kg) door will have a cycle speed of approximately 17.5 seconds. Heavier doors will result in even longer cycle times.

  Example adjustment for a door weighing 175 pounds (79kg), 48 in. (1219mm) width:

Opening time to 80 degrees	5 seconds
80 degrees to full opening of 90 degrees	1 second
Hold open time delay	5 seconds
Closing time to 10 degrees	5 seconds
10 degrees to close	1.5 seconds
Total cycle time	17.5 seconds