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Standard Consumer Safety Performance Specification for Motorized Partitions¹

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INTRODUCTION

This consumer safety performance specification is necessary to minimize the entrapment or crush hazard posed by motorized partitions when they are in motion. Such entrapment and crush hazards have led to serious injury and death.

This specification addresses incidents associated with motorized partitions identified by the U.S. Consumer Product Safety Commission (CPSC).

In response to incident data compiled by the CPSC, this specification attempts to minimize the following hazards: entrapment and crush hazards.

This specification is intended to cover normal use and reasonably foreseeable use of the product(s). This specification is written within the current state of the art of motorized partition technology and will be updated whenever substantive information becomes available that necessitates additional requirements or justifies the revision of existing requirements.

1. Scope

1.1 This consumer safety performance specification establishes performance requirements, test methods, and labeling requirements for motorized partitions.

1.2 Motorized partitions are used to provide flexibility in the size of spaces typically used for meetings, sports, recreational areas, schools, or social functions where children are often present.

1.3 Motorized partitions include a motor to direct the opening and closing of the partition and are operated by trained individuals who control the on/off mechanism and opening and closing movement of the partition.

1.4 The partition is made up of a series of rigid panels that move along a track.

1.5 This specification does not include motorized curtains, elevator or garage doors, or non-motorized partitions.

1.6 This specification shall be taken into consideration by owners/operators, architects, planners, engineers, equipment manufacturers, construction companies, construction contractors, and appropriate inspectors who may be involved in the design and construction of new facilities.

1.7 This specification applies to the installation of new motorized partitions but may be useful for renovation projects such as updating older motorized partitions.

1.8 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.9 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.10 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

- 2.1 *ASTM Standards*:²
[D3359 Test Methods for Rating Adhesion by Tape Test](#)
- 2.2 *ANSI Standard*:³
[ANSI Z535.4 Product Safety Signs and Labels](#)

¹ This consumer safety performance specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.78 on Motorized Partitions.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

3. Terminology

3.1 Definitions:

3.1.1 *backup system, n*—secondary system that can reverse the motion of the motorized partition.

3.1.2 *entrapment prevention device, n*—device used as part of a safety system to prevent the entrapment of an individual by the movement of a motorized partition.

3.1.2.1 *Discussion*—Examples of entrapment prevention devices include infrared (IR) technology (also laser sensor), safety mats, and motion sensors.

3.1.3 *infrared (IR) technology, n*—wireless mobile technology that uses electromagnetic radiation waves as device communication over short ranges; also laser sensor.

3.1.4 *leading edge sensor, n*—contact sensor that detects when the leading edge of the partition contacts an obstruction.

3.1.4.1 *Discussion*—Used primarily for the protection of equipment and not necessarily a standalone life-saving device.

3.1.5 *manual detachment device, n*—device that allows for the non-electronic means to detach the motorized partition from the electronic safety system that would be used as a secondary measure in case of entrapment of an individual.

3.1.6 *motion sensor, n*—electronic device that is designed to detect movement.

3.1.7 *motorized partition, n*—movable wall-like dividers that include a motor to direct the opening and closing of the partition.

3.1.7.1 *Discussion*—Motorized partitions are used to provide flexibility in the size of spaces typically used for meetings, sports, recreational areas, schools, or social functions where children are often present and are operated by trained individuals who control the on/off mechanism and opening and closing movement of the partition. The partition is made up of a series of rigid panels that move along a track.

3.1.8 *safety mat, n*—pressure-sensing mat that, when sufficient force is applied, stops the panel from starting until the object is removed.

3.1.8.1 *Discussion*—Mats are placed on stacking side of partition. The mat shall be of a sufficient size to cover the entire stack area floor. Several mats may be required depending on the size of the stack area floor.

3.1.9 *trained individual/operator, n*—individual who is trained and certified to operate the partition.

3.1.10 *two-key operation system, n*—safety system that involves two simultaneous actions on separate mechanisms for operation.

4. Calibration and Standardization

4.1 The unit shall be assembled by an authorized and trained installer in accordance with the manufacturer's instructions.

4.2 A final inspection and testing shall be conducted after installation by the trained installer to verify the effective operation of the motorized partition and safety equipment.

5. General Requirements

5.1 When a sensor is triggered, the partition shall stop. After the operator determines that the area is clear, the operator may continue to deploy the system.

5.2 Required Devices:

5.2.1 A minimum of two non-contact sensors (photoelectric sensor, IR, or equivalent), one on each side of the partition, shall be located along the side of the wall path and de-energize the partition if a person or object is detected from the stack area to the terminating wall. If a single pair of sensors is not adequate to complete the safe operation of the length of the wall, another pair of sensors shall be used.

5.2.2 At a minimum, one non-contact sensor is located to the right and the other one is to the left of the stacking side of the partition.

5.2.3 The partition shall be operated using an actuating device that requires continuous pressure to maintain opening or closing and includes a three-position key control switch with a spring-loaded return to off position or at least one touch-sensitive pad at the control station that requires operator to be present during operation.

5.2.3.1 These switches shall be at a minimum of 7 ft (2 m) from the edge of the operating path of the partition.

5.2.4 Pressure-sensing safety mats shall be installed in stacking area to stop the panel from starting until the person or object is removed.

5.2.4.1 Safety mats shall detect forces of at least 33 lbf (150 N).

5.2.5 A manual detachment device shall be accessible to the operator and not accessible to children to allow for the non-electronic means to detach the motorized partition from the electronic safety system.

5.3 Optional Devices:

5.3.1 Optional contact sensors are only to be used in addition to a non-contact safety sensor system.

5.3.2 Lead edge sensors are required to activate with a minimum of force of 1.5 lb (0.7 kg) and 0.3 in. (0.8 cm) displacement.

5.4 Labeling:

5.4.1 *Permanence of the Labeling*—Samples of the warning label shall be adhered to a representative sample of the material where the warning will be displayed. Warning labels shall be permanent when tested in accordance with 7.3.

5.5 Maintenance and Installation Instructions:

5.5.1 Installation instructions, use and maintenance instructions, proper calibration and adjustment instructions, proper startup, and periodic testing procedures shall be provided with each unit.

5.5.2 Installation instructions provided with the unit shall contain the following statements or equivalent: "This device shall be installed by an individual who meets the qualifications established by the motorized partition manufacturer."

6. Instructions and Operational Literature

6.1 The manufacturer shall provide installation instructions and operational instructional literature (owner's manual, user's manual, operational manual) with the product shipment in

English language that shall be easy to read and understand. These instructions shall include, where applicable, the following information.

6.1.1 The owner's manual shall contain information related to the safety detection systems and shall include:

6.1.1.1 Model designation and manufacture;

6.1.1.2 A description of device operation, including diagrams illustrating basic design;

6.1.1.3 A statement confirming that the device meets the requirements of this specification, F3660;

6.1.1.4 A statement that the motorized partition is designed to prevent crushing and entrapment;

6.1.1.5 Name, telephone number, and other relevant contact information of manufacturer and an appropriate service location;

6.1.1.6 Methods and criteria to be used to identify malfunctions or problems;

6.1.1.7 Operating instructions that clearly describe proper function of the device and the operating and maintenance responsibilities of the owner and authorized service personnel including preventative maintenance procedures and schedule;

6.1.1.8 An overview of the function of each required and optional device and other components, and the expected function of the entire device when all components are properly assembled and connected;

6.1.1.9 Periodic testing in accordance with manufacturer's instructions to verify proper operation; and

6.1.1.10 Instructions to locate, reach, and operate the manual detachment device shall be provided to the operator.

6.1.2 Operators are to be trained by qualified personnel to operate motorized partitions. Qualified personnel are designated and trained by the manufacturer or are operators who have been trained by qualified personnel. Training shall be completed and documented for each individual at least once each year.

6.1.3 Only trained individuals can operate motorized partitions and have access to operating equipment, such as a key or thumb print recognition system.

6.1.4 Instructional literature shall be available at a designated location accessible to trained individuals.

6.1.5 The instructional literature shall provide the following operational instructions, at a minimum:

6.1.5.1 There shall be two operators, one at each control station located at each side of the partition.

6.1.5.2 Operators shall have a full, unobstructed view of the operating area before and during operation of the motorized partition.

6.1.5.3 Before operation, operators shall inspect all areas of possible intrusion to the operating area ensuring that all areas are free of people and debris, including behind folded doors, the path of the motorized partition, and the surrounding area.

6.1.5.4 The operator shall ensure that all people in the area are in clear view and at the maximum possible distance from all areas of the motorized partition during operation.

6.1.5.5 Operators shall avoid contact with the moving equipment.

6.1.5.6 If an operator determines that the motorized partition is not operating correctly or safely for any reason, appropriate personnel should be immediately contacted for corrective action.

6.1.5.7 Operators shall operate the motorized partition only when the area is clear and safe.

6.1.5.8 Operators shall turn off the motorized partition when the motorized partition is fully closed or open.

6.1.6 The installation manual shall include:

6.1.6.1 Statement that the motorized partition is to be installed and tested only by a qualified professional in accordance with manufacturer's instructions;

6.1.6.2 List of device components, illustration, or photograph;

6.1.6.3 Unpacking instructions including safety considerations, identification of fragile components, and measures to avoid damage to the device;

6.1.6.4 A sequential installation procedure;

6.1.6.5 Definition of installation requirements, including applicable structural and electrical requirements;

6.1.6.6 A clear statement describing any limitations of motorized partitions or usage or both;

6.1.6.7 Testing criteria of safety devices after installation to verify the proper operation in accordance with manufacturer instructions; and

6.1.6.8 Repair or replacement instructions.

7. Test Methods

7.1 *Installers/Manufacturers:*

7.1.1 Manufacturers shall train and certify installers in the proper installation and setting of safety systems as described by this specification.

7.1.2 The installers who are installing the product shall have received training and certification from the manufacturer of the specific product.

7.1.3 Safety systems shall be tested annually.

7.2 *Operators/Owners:*

7.2.1 Operators/owners have a responsibility to test the product periodically, at least annually.

7.2.2 Owners have the responsibility of training the operators using, as a minimum, the owner's manual and, if possible, video material.

7.2.3 An in-person, on-site training is preferred.

7.2.4 *Operator/Owner Training Procedures:*

7.2.4.1 With the partition in the stacked position and the system disarmed, the tester shall physically enter the protection zones of each sensor. With each disturbance of a zone, the sensor will activate the system into an alarm condition. The indicator at the main control station will identify any disturbance of the protective zone.

7.2.4.2 With the system armed and the partition operating, another person shall safely enter the protection zone. The partition will stop immediately and emit an alarm when a zone is disturbed. (**Warning**—Extreme caution shall be exercised to remain clear of the operable partition to avoid the possibility of injury during the test procedure.)

7.2.4.3 With the partition in the open position and the system disarmed, place an object weighing at least 34 lb ± 1 lb