UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

DATE: June 19, 2019

BALLOT VOTE SHEET

This document has been electronically approved and signed.

TO: The Commission
Alberta E. Mills, Secretary

THROUGH: Patricia M. Hanz, General Counsel
Mary T. Boyle, Executive Director

FROM: Patricia M. Pollitzer, Assistant General Counsel
Hyun S. Kim, Attorney, OGC

SUBJECT: Proposed Rule: Safety Standard for Gates and Enclosures

BALLOT VOTE DUE Tuesday, June 25, 2019

Staff is forwarding to the Commission, a briefing package recommending that the Commission issue a proposed rule under section 104 of the Consumer Product Safety Improvement Act of 2008 (CPSIA), to incorporate by reference the voluntary standard, ASTM F1004-19, *Standard Consumer Safety Specification for Expansion Gates and Expandable Enclosures*, as the mandatory federal safety standard for children's gates and enclosures. The Office of the General Counsel is providing the attached draft proposed rule for Commission consideration.

Please indicate your vote on the following options:

I. Approve publication of the attached document in the *Federal Register*, as drafted.

_____ _____
(Signature) (Date)

II. Approve publication of the attached document in the *Federal Register*, with the specified changes.

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_____ _____

(Signature) (Date)

III. Do not approve publication of the attached document in the *Federal Register*.

_____ _____

(Signature) (Date)

IV. Take other action specified below.

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_____ _____

(Signature) (Date)

Attachment: Draft *Federal Register* Notice: Proposed Rule to Establish a Safety Standard for Gates and Enclosures.

Billing Code 6355-01-P

CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Parts 1112 and 1239

[Docket No. CPSC-2019-00XX]

Safety Standard for Gates and Enclosures

AGENCY: Consumer Product Safety Commission.

ACTION: Proposed rule.

SUMMARY: The Consumer Product Safety Improvement Act of 2008 (CPSIA) requires the United States Consumer Product Safety Commission (Commission or CPSC) to promulgate consumer product safety standards for durable infant or toddler products. Accordingly, the Commission is proposing a safety standard for gates and enclosures in response to the direction under Section 104(b) of the CPSIA. The Commission is also amending its regulations regarding third party conformity assessment bodies to include the safety standard for gates and enclosures in the list of notice of requirements (NORs) issued by the Commission.

DATES: Submit comments by [**INSERT DATE 75 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Comments related to the Paperwork Reduction Act aspects of the marking, labeling, and instructional literature of the proposed rule should be directed to the Office of Information and Regulatory Affairs, OMB, Attn: CPSC Desk Officer, FAX: 202-395-6974, or e-mailed to oira_submission@omb.eop.gov.

Other comments, identified by Docket No. CPSC-2019-00XX, may be submitted electronically or in writing:

Electronic Submissions: Submit electronic comments to the Federal eRulemaking Portal at: http://www.regulations.gov. Follow the instructions for submitting comments. The CPSC does not accept comments submitted by electronic mail (e-mail), except through www.regulations.gov. The CPSC encourages you to submit electronic comments by using the Federal eRulemaking Portal, as described above.

Written Submissions: Submit written submissions in the following way: Mail/Hand delivery/Courier (for paper, disk, or CD-ROM submissions), preferably in five copies, to: Division of the Secretariat, Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda, MD 20814; telephone (301) 504-7923.

Instructions: All submissions received must include the agency name and docket number for this proposed rulemaking. All comments received may be posted without change, including any personal identifiers, contact information, or other personal information provided, to: http://www.regulations.gov. Do not submit confidential business information, trade secret information, or other sensitive or protected information that you do not want to be available to the public. If furnished at all, such information should be submitted in writing.

Docket: For access to the docket to read background documents or comments received, go to: http://www.regulations.gov, and insert the docket number, CPSC-2019-00XX, into the "Search" box, and follow the prompts.

FOR FURTHER INFORMATION CONTACT: Hope Nesteruk, Project Manager, Directorate for Engineering Sciences, Consumer Product Safety Commission, 5 Research Place, Rockville, MD 20850; telephone: 301-987-2579; e-mail: hnesteruk@cpsc.gov.

SUPPLEMENTARY INFORMATION:

I. Background and Statutory Authority

Section 104(b) of the CPSIA, part of the Danny Keysar Child Product Safety Notification Act, requires the Commission to: (1) examine and assess the effectiveness of voluntary consumer product safety standards for durable infant or toddler products, in consultation with representatives of consumer groups, juvenile product manufacturers, and independent child product engineers and experts; and (2) promulgate consumer product safety standards for durable infant and toddler products. These standards are to be "substantially the same as" the applicable voluntary standards or more stringent than the voluntary standard if the Commision concludes that more stringent requirements would further reduce the risk of injury associated with the product. The term "durable infant or toddler product" is defined in section 104(f)(1) of the CPSIA as "a durable product intended for use, or that may be reasonably expected to be used, by children under the age of 5 years." "Gates and other enclosures for confining a child" are specifically identified in section 104(f)(2)(G) of the CPSIA as a durable infant or toddler product.

Pursuant to Section 104(b)(1)(A), the Commission consulted with manufacturers, retailers, trade organizations, laboratories, consumer advocacy groups, consultants, and members of the public in the development of this proposed standard, largely through the ASTM process. The proposed rule is based on the voluntary standard developed by ASTM International, ASTM F1004-19, *Standard Consumer Safety Specification for Expansion Gates and Expandable Enclosures* (ASTM F1004-19).

The ASTM standard is copyrighted, but it can be viewed as a read-only document during the comment period on this proposal, at: : https://www.astm.org/CPSC.htm, by permission of ASTM.

II. Product Description

A. Definition of "Gates and other Enclosures"

ASTM F1004–19 defines an "expansion gate" as a "barrier intended to be erected in an opening, such as a doorway, to prevent the passage of young children, but which can be removed by older persons who are able to operate the locking mechanism" (section 3.1.7). ASTM F1004-19 defines an "expandable enclosure" as a "self-supporting barrier intended to completely surround an area or play-space within which a young child may be confined" (section 3.1.6). These products are intended for young children aged 6 months through 24 months (section 1.2).

Although the title of the ASTM F1004–19 standard and its definitions include the word "expansion" and "expandable" before the words "gate" and "enclosure," respectively, the scope of the ASTM F1004–19 standard includes all children's gates and enclosures, whether they expand or not. ASTM F1004–19 covers: "[p]roducts known as expansion gates and expandable enclosures, *or by any other name,"* (section 1.2, emphasis added).[1] Both expandable gates and non-expandable gates may serve as barriers that are intended to be erected in an opening, such as a doorway, to prevent the passage of young children. Both expandable enclosures and non-expandable enclosures may serve as barriers intended to completely surround an area or play-space to confine young children. Similarly, all children's gates and enclosures, whether they expand or not, can be removed by older persons who are able to operate the locking mechanism.

[1] Gates or enclosures for non-domestic use (such as commercial or industrial), and those intended for pets only, are not covered under the scope of ASTM F1004-19.

CPSC staff's review of enclosures shows that all enclosures are expandable. Staff's review of gates showed that there some non-expandable, fixed-sized gates available for sale.[2] However, most of the gates and enclosures sold in the United States that are intended for children expand because they vary in width (for gates) or shape (enclosures). CPSC staff's review of hazard patterns indicates that all children's gates and enclosures present the same hazards, whether they expand or not. These hazards include injuries caused by hardware-related issues, slat problems, poor quality materials and finish, design issues, and installation problems. Accordingly, the proposed CPSC standard addresses all children's gates and enclosures intended for confining a child, including non-expandable, fixed-sized gates and enclosures.

Gates and enclosures may be made of a wide range of materials: plastic, metal, wood, cloth, mesh, or combinations of several materials. Gates typically have a means of egress that allows adults to pass through them; but some enclosures (*i.e.*, some self-supporting barriers have egress panels that resemble gates) also have a means of egress. Gates may be hardware-mounted, pressure-mounted, or both. Hardware-mounted gates generally require screws and cannot be removed without tools. Pressure-mounted gates attach like a pressure-fit curtain rod, using pressure on each end to hold the gate stable; they are intended for consumers who prefer to be able to move their gate, or who do not want to permanently mark their walls. Mounting cups can be attached to one or more locations, and the gate can be removed, as needed, or moved to other locations.

B. Market Description

Approximately 113 firms supply gates and enclosures to the U.S. market. The vast majority of suppliers to the U.S. market are domestic (109 firms). Of these, 83 appear to be very

[2] The vast majority of non-expandable, fixed-size gates are sold by home-based manufacturers with very low sales volumes.

small, home-based domestic manufacturers. Approximately 10.86 million gates/enclosures were in use in U.S. households with children under the age of 5 in 2013, according to the CPSC's 2013 Durable Nursery Product Exposure Survey (DNPES).

Gates and enclosures vary widely in price. Plastic pressure gates can be purchased for as little as $10, but designer metal gates can cost as much as $430. Retail prices for enclosures and products that can operate either as an enclosure or gate range from $74 to $585, with the less expensive products tending to be made of plastic, and the more expensive products tending to be made of wood.[3] Gates supplied by home-based manufacturers average $200, although fabric gates are less expensive ($44 on average), and wooden gates with iron spindles are more expensive ($525 on average).

III. Incident Data

CPSC staff reviewed incident data associated with children's gates and enclosures as reported through the Consumer Product Safety Risk Management System (CPSRMS).[4] Staff also reviewed national injury estimates, discussed below. Although these products are intended for use with young children between the ages of 6 months and 24 months, interaction with the gates and enclosures with older siblings and adult caregivers is a foreseeable use pattern, and adults are required to install such products properly to prevent injuries. CPSC staff reviewed the incident data involving older children and adults to determine hazard patterns; however, only *injuries* sustained by children younger than 5 years of age were included in the incident data reported for the proposed rule. The Commission is aware of a total of 436 reported incidents

[3] Some of the enclosures designed for daycare centers and preschools can run above $1,000 with all the specialty extensions.

[4] The CPSC databases searched were the In-Depth Investigation (INDP) file, the Injury or Potential Injury Incident (IPII) file, and the Death Certificates (DTHS) file. These reported deaths and incidents are neither a complete count of all that occurred during this time period nor a sample of known probability of selection. However, they do provide a minimum number of deaths and incidents occurring during this time period and illustrate the circumstances involved in the incidents related to children's gates and enclosures.

related to gates and enclosures that occurred between January 1, 2008 and October 31, 2018. Of the 436 incidents, 394 were associated with the use of a gate, while 42 were associated with an enclosure. Nineteen of the incidents reported a fatality; 108 of the 417 nonfatal incidents reported an injury. Because reporting is ongoing, the number of reported fatalities, nonfatal injuries, and non-injury incidents may change in the future.

A. Fatalities

The Commission is aware of 19 deaths that occurred between January 1, 2008 and October 31, 2018. Seventeen of the deaths were associated with the use of a gate, while two were associated with an enclosure. Fifteen of the 19 decedents drowned, 13 in a backyard pool, one in a backyard hot tub, and one in a 5-gallon bucket of water inside the house. In these incidents, the decedents managed to get past the gate/enclosure when it was left open or was opened somehow, without the caregiver's knowledge (10 incidents); the gate/enclosure was knocked down or pushed out by the decedent due to incorrect or unsecured installation (4 incidents); or the decedent climbed over the gate/enclosure (1 incident). The decedents ranged in age from 9 months to 3 years.

Of the remaining four of 19 total deaths reported: an 8-month-old was found trapped between a mattress and an expansion gate in a recreational vehicle; a 23-month-old was trapped under a TV that fell on him when he was hanging on the edge of a safety gate that was secured to the TV stand with a rope; a 20-month-old was entrapped between a wall and a repaired/modified safety gate when the gate partially detached from the wall; and a 2-year-old got his neck entrapped between two safety gates set up in a stacked configuration.

B. Nonfatalities

The Commission is aware of a total of 417 nonfatal incidents related to safety gates and enclosures that reportedly occurred between January 1, 2008 and October 31, 2018. Of these, 108 incidents reported an injury to a child younger than 5 years of age.

Three of the injuries reportedly required hospitalization and two additional injuries needed overnight observation at a hospital. Among the hospitalized were a 2-year-old and an 18-month-old, both suffered a near-drowning episode, and another 2-year-old who ended up in a coma due to a fall when she pushed through a safety gate at the top of stairs. Of the two children who were held at a hospital for overnight observation, one fell down stairs when a safety gate collapsed, and the other swallowed a bolt or screw that liberated from a gate.

Fifteen additional children were reported to have been treated and released from a hospital emergency department (ED). Their injuries included: (a) finger fractures, amputations, and/or lacerations usually from a finger getting caught at the hinge; and (b) near-drowning, poison ingestion, arm fracture, thermal burn, head injury, or contusions.

Among the remaining injury reports, some specifically mentioned the type of injury, while others only mentioned an injury, but no specifics about the injury. Head injuries, concussions, teeth avulsions, sprains, abrasions, contusions, and lacerations were some of the common injuries reported.

The remaining 309 incidents reported that no injury had occurred or provided no information about any injury. However, some of the descriptions regarding the incidents indicated the potential for a serious injury or even death.

C. National Injury Estimates

CPSC staff also reviewed injury estimates from the National Electronic Injury Surveillance System (NEISS), a statistically valid injury surveillance system.[5] NEISS injury data are gathered from EDs of hospitals selected as a probability sample of all the U.S. hospitals with EDs. CPSC staff found an estimated total of 22,840 injuries (sample size=820, coefficient of variation=0.10) related to children's gates and enclosures that were treated in U.S. hospital EDs over the 10-year period 2008-2017. There was no statistically significant trend observed over the entire 2008-2017 period. NEISS data for 2018 will be reviewed prior to the issuance of a final rule.

No fatalities were reported through NEISS. About 19 percent of the injured victims were less than a year old; 40 percent were at least a year old, but less than 2 years of age; and another 41 percent were at least 2, but less than 5 years of age. NEISS injury descriptions are brief and focus more on the injury than the scenario-specific details. Therefore, a detailed hazard pattern characterization, as conducted for incidents reported through CPSRMS, is not feasible. However, based on the limited information available, CPSC staff determined that some of the most frequent NEISS injury characteristics were as follows:

- Hazard – falls (57%) and impact on gate/enclosure (31%). Most of the falls occurred when:
    - a child successfully climbed over the barrier and (usually) fell down a flight of steps; when a child unsuccessfully attempted to climb over the barrier; or a child-carrying-adult tripped on a gate/enclosure and dropped the child;
    - gates failed to remain upright and locked; or

[5] According to the NEISS publication criteria, to derive a reportable national estimate, an estimate must be 1,200 or greater, the sample size must be 20 or greater, and the coefficient of variation must be 33 percent or smaller.

- a child managed to defeat the barrier by crawling/sliding under, or "getting around" the barrier in an unspecified manner.

- Injury – almost 10 percent of the impact injuries occurred when a child fell down a flight of steps and hit a safety gate at the bottom of the stairs:
  - Injured body part – head (40%), face (21%), and mouth (10%).
  - Injury type – lacerations (28%), internal organ injury (23%), and contusions/abrasions (20%).

Most of the injured victims were treated and released (97%).

IV. Hazard Pattern Identification

CPSC staff reviewed 436 reported incidents (19 fatal and 417 nonfatal) to identify hazard patterns associated with the use of children's gates and enclosures. Staff grouped the hazard patterns into three categories: product-related, non-product-related, and undetermined. Most of the reported problems (94%) were product-related. The categories and subcategories (in order of descending frequency) are:

A. Product-Related

- ***Hardware issues:*** Of the 436 incidents, 163 (37%) reported some sort of hardware-related problems. These problems were due to:
  - lock/latch hardware (*e.g.,* lock or latch breaking, not latching correctly, opening too easily, or getting stuck)
  - hinge hardware (mostly breaking and causing the gate to fall off)
  - mounting hardware (mostly breaking and causing gate to fall off), or
  - other hardware such as a slide guide or a swing-control clip (breaking or coming loose).

These hardware failures were associated with 38 injuries, such as contusions, lacerations, head injuries, and two fractures; five of the injuries were treated in a hospital ED, and one needed overnight observation at a hospital.

- ***Slat problems:*** Of the 436 incidents, 107 (25%) reported slats breaking or detaching from the safety gate or enclosure. Sixteen injuries were reported in this category, resulting in contusions/abrasions or lacerations. Once the slat(s) broke, the child either got injured on it, fell forward through the gap created, or lost balance and fell backwards. One of the injuries was treated at a hospital ED.
- ***Poor quality material and finish:*** Of the 436 incidents, 50 (11%) reported problems with small parts liberating, splintered welding, sharp edges and protrusions, rails bending out of shape, fabric/mesh panels sagging, and poor quality of stitching on fabric panels. Eighteen injuries, mostly lacerations and abrasions, were reported in this category.
- ***Design issues:*** Of the 436 incident reports, 42 (10%) indicated some problems with the design of the gate or enclosure. The reported problems were with:
    - the opening size between slats or enclosure panels that allowed a child to get their limbs or head entrapped;
    - the pinch-point created during the opening and closing action of the door on the gate or enclosure;
    - a specific design, which created a foot-hold that a child could use to climb over the safety gate; or
    - a specific design that posed a trip hazard when the gate was in the open position.

Nineteen injuries were in this category, including three fractures of the finger and one severed fingertip, all treated at a hospital ED.

- ***Installation problems:*** Of the 436 incident reports, 20 (5%) indicated problems with installation due to:
    - unclear installation instructions;
    - mismatched dimensions between the safety gate and the doorway/hallway opening; or
    - unknown reasons; in these cases, the gate/enclosure was reported to have been installed, but was somehow "pushed out" or "pulled down."

Four drowning fatalities were reported in this category. In addition, there were four nonfatal injuries: one a hospitalization of a comatose child; another child treated and released from a hospital ED following a near-drowning episode; and the remaining two, relatively minor laceration/contusion injuries.

- ***Miscellaneous other issues and consumer comments:*** Seven of the 436 incident reports (2%) included three complaints about an ineffective recall remedy, one complaint about poor product packaging, and three consumer concerns about the safety of a specific design. There was one unspecified injury in this category.
- ***Instability issues in enclosures:*** Three of the 436 incidents (< 1%) reported problems with flimsy and/or unstable enclosures. Two laceration/contusion injuries were reported in this category.
- ***Multiple problems from among the above:*** Twenty of the 436 incident reports (5%) described two or more problems from the preceding product-related issues. Two minor injuries were reported in this category.[6]

[6] Redistributing these 20 complaints among the other pertinent subcategories within the product-related issues does not alter the ranking of the listed subcategories. However, the redistribution would result in the within-subcategory

B. Non-Product-Related

Eleven of the 436 incident reports (3%) described non-product-related issues, such as incorrect use of the product, or the child managing to bypass the barrier altogether. Specifically:

- Four incidents reported the child climbing over the gate/enclosure;
- Three incidents reported caregiver missteps allowing the gate/enclosure not to be secured in place;
- Three incidents reported misuse of gates in a hazardous manner; and
- One report involving a gate previously repaired/modified and structurally compromised.

Eight deaths are included in this category: four due to drowning, three due to entrapments, and one due to a TV tip over. Among the three injuries, one required hospitalization following a near-drowning episode, and one fractured arm was treated at a hospital ED; the third injury was a concussion of the forehead.

C. Undetermined

Thirteen of the 436 incident reports (3%) fell into the undetermined category. There was insufficient information on the scenario-specific details for CPSC staff to determine definitively whether the product failed or user error resulted in the incidents. Seven drowning deaths were reported in this category. Among the five nonfatal injuries, one was a hospitalization due to near-drowning, two were treated at a hospital ED for poisonous ingestion and burn, respectively, and two were minor injuries.

D. Product Recalls

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incident numbers adding up to *more* than the total number of incident reports. To prevent that, the 20 incidents were grouped in a separate subcategory.

CPSC staff reviewed recalls involving children's gates and enclosures from January 2008 to December 2018. During that period, there were five recalls involving baby gates and one recall involving an enclosure. The total number of units recalled was 1,318,180. The recalls involved fall, entrapment, tripping, and laceration hazards to children. There were a total of 215 incidents reported, of which 13 resulted in injuries.

V. Voluntary Standard - ASTM F1004

A. History of ASTM F1004

The voluntary standard for gates and enclosures was first approved and published in 1986 (ASTM F1004-86, *Standard Consumer Safety Specification for First-Generation Standard Expansion Gates and Expandable Enclosures*). Between 1986 and 2013, ASTM F1004 underwent a series of revisions to improve the safety of gates and enclosures and the clarity of the standard. Revisions made during this period included provisions to address foot-pedal actuated opening systems, warnings, evaluation of all manufacturer's recommended use positions, test fixture improvements, entrapment in openings along the side of the gate, lead-containing substances in surface, along with other minor clarifications and editorial corrections.

Beginning in 2014, CPSC staff worked closely with ASTM to address identified hazards and to strengthen the voluntary standard and improve the safety of children's gates and enclosures in the U.S. market. ASTM made revisions through several versions of the standard (ASTM F1004-15, ASTM F004-15a, ASTM F1004-16, ASTM F1004-16a, ASTM F1004-16b, and ASTM F1004-18) to address hazards associated with bounded openings, slat breakage/slat connection failures, mounting/hinge hardware issues, latch/lock failures, pressure gate push-out forces, and warning labels and instructions. The current voluntary standard is ASTM F1004-19, which was approved on June 1, 2019.

B. Description of the Current Voluntary Standard-ASTM F1004-19

ASTM F1004-19 includes the following key provisions: Scope (section 1), Terminology (section 3), General Requirements (section 5), Perfomance Requirements (section 6), Test Methods (section 7), Marking and Labeling (section 8), and Instructional Literature (section 9).

Scope. This section states the scope of the standard, and includes products known as expansion gates and expandable enclosures, or by any other name, and that are intended for young children age 6 months through 24 months. ASTM has stated that the standard applies to all children's gates, including non-expandable, fixed-sized gates and enclosures.

Terminology. This section provides definitions of terms specific to the standard.

General Requirements. This section addresses numerous hazards with several general requirements, most of which are also found in the other ASTM juvenile product standards. ASTM F1004–19 has requirements to address the following safety issues common to many juvenile products. The general requirements included in this section address:

- Wood parts;
- Screws;
- Sharp edges or points;
- Small parts;
- Openings;
- Exposed coil springs;
- Scissoring, shearing, and pinching;
- Labeling;
- Lead in paint; and
- Protective components.

Performance Requirements and Test Methods. These sections contain performance requirements specific to children's gates and enclosures and the test methods that must be used to assess conformity with such requirements. These requirements include:

- **Completely bounded openings:** Openings within the gate or enclosure, and completely bounded openings between the gate and the test fixture, shall not permit the complete passage of the small torso probe when it is pushed into the opening with a 25-pound force. This requirement is intended to address incidents where children were found with their heads entrapped after having pushed their way into gaps created between soft or flexible gate and enclosure components, and between the gate and the sides of passageway to be blocked off, *e.g.*, door frame or wall.
- **Height of sides:** The vertical distance from the floor to the lowest point of the uppermost surface shall not be less than 22 inches when measured from the floor. The requirement is intended to prevent intended occupants from being able to lean over, and then tumble over the top of the gate.
- **Vertical strength:** After a 45 pound force is exerted downward along the uppermost top rail, edge, or framing component, gates and enclosures must not fracture, disengage, fold nor have a deflection that leaves the lowest point of the top rail below 22 inches from the ground. For gates, the 45 pound vertical test force is applied five times to the mid-point of the horizontal top rail, surface or edge of each gate (or each of the top points of a gate that doesn't have a horizontal top edge). This test is carried out with the gate installed at both the maximum and minimum opening widths recommended by the manufacturer. For enclosures, the 45 pound force is applied to every other uppermost rail, surface, or edge and every other top joint of the enclosure. The requirement is intended to check that gates

and enclosures retain their intended occupants even when children hang from or attempt to climb up the gates.

- **Bottom spacing:** The space between the floor and the bottom edge of an enclosure or gate shall not permit the complete passage of the small torso probe when it is pushed into the opening with a 25 pound force. This requirement is intended to address incidents where children were found with their heads entrapped after having pushed their way, feet first, into gaps created between the gate and the floor.
- **Configuration of uppermost edge:** Partially bounded openings at any point in the uppermost edge of a gate or enclosure that is greater than 1.5 inches in width and more than 0.64 inches in depth must not allow simultaneous contact between more than one surface on opposite sides of a specified test template. The template was dimensioned so as to screen out non-hazardous openings with angles that are either too narrow to admit the smallest user's neck, or too wide to entrap the largest user's head. This requirement is intended to address head/neck entrapment incidents reported in the "V" shaped openings common in older, "accordion style" gates.
- **Latching/locking and hinge mechanisms:** This hardware durability test requires egress panels on gates and enclosures to be cycled through their fully open and closed positions 2,000 times. Pressure gates without egress panels are cycled through installation and removal 550 times. The 2,000 cycles tests the durability of gates or enclosures having egress panels which are expected to be operated twice a day through the lifetime of the product. Pressure gates without egress panels are intended to be installed in locations not accessed as frequently, and thus, are tested through a reduced 550 cycle test. This pre-

conditioning test is intended to address incidents involving failures of latches, hinges, and hardware.

- **Automatic closing system:** Immediately following the cyclic preconditioning test, an egress panel marketed to have an automatic closing feature must continue to automatically close when opened to a width of 8 inches as well as when it is opened to its maximum opening width. This requirement is intended to check that a gate fully closes and locks as it is expected and advertised to do, thereby reducing the likelihood of an occupant accessing potentially hazardous conditions on the other side of an unintentionally unsecured gate.
- **Push-out force strength:** Five test locations are specified for this test: the four corners of the gate as well as the center. A horizontal push-out force is applied five times to each of the test locations and the maximum force applied before the gate pushes out of the test fixture is recorded and averaged for each test location (up to a maximum of 45 lb). The maximum force of 45 lb was selected because it simulates the effects of the largest intended occupant's weight. The average push-out force shall exceed 30 lb in all five test locations (and each individual force shall exceed 20 lb.) The requirement is intended to prevent the intended occupant from being able to dislodge the gate and gain access to a hazardous area the gate was meant to protect them from.
- **Locking devices:** Locking devices shall meet one of two conditions: 1) if the lock is a single-action latching device, the release mechanism must require a minimum force of 10 lb to activate and open the gate, or else 2) the lock must have a double action release mechanism. This requirement is intended to prevent the intended occupant being contained by the gate from being able to operate the locking mechanism.

- **Toys:** Toy accessories shall not be attached to, or sold with, a gate. Toy accessories attached to, removable from, or sold with an enclosure, shall meet applicable requirements of specification ASTM F963 *"Consumer Safety Specification for Toy Safety."*
- **Slat Strength:** This test verifies that no wood or metal vertical members (slats) completely break or either end of the slats completely separate from the gate or enclosure when a force of 45 pounds is applied horizontally. The test is conducted on 25 percent of all gate slats, excluding adjacent slats. The requirement is intended to check that gates and enclosures retain their structural integrity when children push or pull on the gate or enclosure slats.
- **Label testing:** Paper and non-paper labels (excluding labels attached by a seam) shall not liberate without the aid of tools or solvents. Paper or non-paper attached by a seam shall not liberate when subjected to a 15-lb pull force.

Warning, Labeling and Instructions. These provisions specify the marking, labeling and instructional literature requirements that must appear on or with each gate or enclosure.

- All gates and enclosures must include warnings on the product about the risk of serious injury or death when a product is not securely installed, must warn the consumer to never use the gate with a child who is able to climb over or dislodge the gate, and to never use the gate to prevent access to a pool.
- Pressure-mounted gates with a single-action locking mechanism on one side of the gate must include the following warning: Install with this side AWAY from child.
- Enclosures with locking or latching mechanisms must include the following warnings: Use only with the [locking/latching] mechanism securely engaged.

- Gates that do not pass the push-out test requirements must include the following warning on the product: You MUST install [wall cups] to keep gate in place. Without [wall cups] child can push out and escape.

  These warnings are also required on the retail packaging unless they are visible in their entirety to consumers on the gate or enclosure at point of purchase.

VI. Adequacy of ASTM F1004-19 Requirements

The Commission concludes that the current voluntary standard, ASTM F1004-19, sufficiently addresses many of the general hazards associated with the use of children's gates and enclosures, such as wood parts, sharp points, small parts, lead in paint, scissoring, shearing, pinching, openings, exposed coil springs, locking and latching, and protective components.

In addition to the general requirements, ASTM F1004–19 contains performance requirements and test methods specific to gates and enclosures. The Commission determines that the current voluntary standard addresses the primary hazard patterns identified in the incident data. This section discusses the hazard patterns that account for the reported incidents and injuries and how the current voluntary standard addresses each. To assess the adequacy of ASTM F1004-19, CPSC staff considered all 436 reported incidents (19 fatal and 417 nonfatal) to identify hazard patterns associated with children's gates and enclosures.

A. Hardware Issues

This hazard is associated with 163 incidents (37%). The CPSC incident data show that hardware failures, (*e.g.*, broken hinges, locks, and mounting brackets) led to contusions, lacerations, head injuries, and fractures. To identify gates and enclosures that have hardware issues, such as those found in the incident data, ASTM F1004-19 provides a latching/locking and hinge performance test that cycles gates through 2,000 complete "open and closing" cycles and

550 installation/removal cycles for pressure gates without egress panels. The Commission, concludes that this performance requirement adequately addresses the hazard pattern associated with hardware failures.

B. Slat Problems

This hazard is associated with 107 incidents (25%). The CPSC incident data show that problems occurred when slats broke or detached from gates or enclosures, resulting in contusions and lacerations. The ASTM F1004-19 standard includes a performance requirement that slats must withstand a 45-pound force, which is the pulling force of the largest intended occupant. The Commission concludes that this performance requirement adequately addresses the hazard pattern associated with slat failures.

C. Material and Finish

This hazard is associated with 50 incident reports (11%). The CPSC incident data show that problems occurred with small parts breaking free to become potential choking hazards; splintering wood, or welding, sharp edges, protrusions, rails bending out of shape; fabric/mesh panels sagging, and poor quality stitching on fabric panels. ASTM F1004-19 (General Requirements) contains many requirements that address these issues, such as sharp points or edge, small parts, and bans on the use of transverse/lateral joints in all wood components. ASTM F1004-19 also tests openings within gates or enclosures and completely bounded openings, as well as bottom spacing between the bottom of the gate or enclosure and the floor, which also help reduce issues with rails or flexible barrier materials bending out of shape. The Commission concludes that these performance requirements adequately address the hazard pattern associated with material and finish failures.

D. Design Issues

This hazard is associated with 42 incident reports (10%). The CPSC incident data show that problems occurred when an aspect of the design of the gate or enclosure failed, such as the opening size between slats or panels that allowed for entrapments, moving gate components causing scissoring or pinching issues, features that were able to be used as footholds, or sections that posed a trip hazard when the gate was in an opened position. ASTM F1004-19 contains several performance tests that specifically address entrapments in openings, including the completely bounded openings and bottom spacing tests. The general openings and scissoring, shearing, and pinching performance requirements also help address hazards related to openings. The Commission concludes that these performance requirements adequately address the hazard pattern associated with design issues.

E. Installation Problems

This hazard is associated with 20 incidents (5%). The CPSC incident data show that problems occurred when there were unclear instructions, mismatched dimensions between gates and the openings they were meant to fit into, and failure of the gate to remain upright in the opening. ASTM F1004-19 includes several provisions requiring that warnings, labeling, and instructions be easy to read and understand for proper installation of gates. In addition, ASTM F1004-19 provides that all gates must meet a 30 lbs of push-out force at five test locations.

The Commission agrees that the requirement to meet the 30-lb push-out force for all gates will improve children's safety, if the gate is installed correctly. The ASTM F1004-19 standard allows the use of mounting hardware or wall cups to meet the 30-lb push-out force requirement. Although the Commission determines that these provisions generally address the installation hazard patterns because they help clarify the requirements for proper installation,

ASTM may be able to make improvements in the future to increase the consumer's awareness of the importance of proper installation of pressure-mounted gates.

Currently, the ASTM standard does not require pressure-mounted gates to provide the consumer with reliable feedback indicating that the gate has been installed correctly with enough side pressure to prevent a child from knocking it over. Manufacturers' instructions for some pressure-mounted gates provide little or no clear direction for consumers to know when the gate is installed correctly or will stay in place after several uses. Some of the designs require the user to push or pull on the gate to have a *feel* that the gate is properly installed (*e.g.* "turn the nut . . . until the gate is snug"; "turn the hand wheels until firm tension is achieved"); or make precise measurements for installation (*e.g.,* the distance between the gate frame and the wall to ensure both sides are equally spaced). These tasks are often subjective or cumbersome to guarantee proper installation.

CPSC staff intends to collaborate with ASTM in the future to improve the installation of pressure-mounted gates with the use of visual side-pressure indicators. Because pressure-mounted gates rely on friction force to resist a push-out force applied to the gate, side-pressure force is a key component to the gate performance. The more side-pressure force exerted by the gate to the wall/door opening, the more resistance to push-out forces. Effective visual side-pressure indicators would make it more likely that test technicians install the gate with sufficient side-force pressure and could provide consistency and validity to the test results. Equally important, visual side-pressure indicators could provide a way for consumers to know when their gate is installed with sufficient side pressure, particularly as they are not expected to have or use force gauges during installation. Visual indicators may also help inform consumers during the lifecycle of the product, when readjustment is necessary. Accordingly, the Commission seeks

comment regarding the use and feasibility of visual side pressure indicators for pressure-mounted gates and whether such indicators would be effective in addressing installation failures.

F. Miscellaneous

Seven of the incidents (2%) raised miscellaneous issues, including three complaints about an ineffective recall remedy, one complaint about poor product packaging, and three consumer concerns about the safety of a specific design. The issues are not addressed in ASTM 1004-19, but they do not relate directly to improving the safety of gates or enclosures. Accordingly, the Commission does not recommend changes to the ASTM standard to address these issues.

G. Enclosure Instability

A few (<1%) incident reports came from consumers who described problems with flimsy or unstable enclosures. ASTM F1004–19 contains several requirements that help address the product durability issues reported in these enclosure incidents. The vertical strength requirement was expanded to test not only the joints between the enclosure panels, but also to test the top rails of the panels themselves. Additionally, the cyclic locking/latching tests whether the hardware in these products is durable and capable of withstanding regular use. Many of the general requirements, such as those concerning sharp edges, small parts, wood parts, and protective components, also help to address issues in this category. The Commission concludes that these performance requirements are adequate to address the hazard pattern associated with unstable enclosures.

H. Warnings and Instructional Literature

ASTM F1004-19 includes updated warning format requirements that are aligned with ASTM's Ad Hoc Wording Task Group recommendations. The Ad Hoc Task Group harmonized the wording and language used across nursery product standards. This task group also developed

recommendations for harmonizing warning formats across standards. CPSC staff has worked closely with this group to develop ad hoc recommendations that are based largely on the requirements of the ANSI Z535.4, *American National Standard for Product Safety Signs and Labels.*

The Commission expects that the ASTM F1004-19's labeling requirements will reduce inconsistencies currently seen on gates and enclosures, and will address numerous warning format issues to capture consumer attention better, improve readability, and increase hazard perception and avoidance behavior. In addition, the Commission determines that the instructional literature, also aligned with the Ad Hoc Task Group's wording design or form requirements, improves the required warning statements in the instructions. However, the Commission believes that additional collaboration with ASTM regarding the placement and wording of the warning label on gates for wall cups on pressure-mounted gates may improve consumers' awareness of the importance of proper wall cup installation.

ASTM F1004-19 currently requires a warning statement about the hazard of installing gates without wall cups. This warning statement is included within the general warning label; however, the label can have as many as six different required messages in one location:

As discussed, there is no objective measure for consumers to confirm the correct installation of the gate. CPSC staff intends to work with ASTM to improve the installation of pressure-mounted gates with the use of visual side-pressure indicators to provide an objective way for test technicians and consumers to know when their gate is installed with sufficient side pressure. In addition, although some pressure-gate manufacturers generally instruct consumers that wall cups are required if they need to install a pressure-mounted gate at the top of the stairs, consumers may not be aware that wall cups need to be installed if the gate is used in other locations, or that wall cups need to be reinstalled if the gate is moved to a different location. Additional collaboration with ASTM is needed to assess whether a wall cup warning label statement that is separate and distinct from the general warning label, and placed conspicuously on the top rail of the gate, may increase the likelihood of the consumer noticing, comprehending, and complying with the warning. Accordingly, the Commission seeks comment on whether the placement and wording of the wall cup warning should be modified, and whether such changes would be effective in addressing installation failures.

VII. International Standards

CPSC staff reviewed the performance requirements of the current ASTM standard, ASTM F1004-19, to the performance requirements of other standards that address children's gates and enclosures including:

- The European Standard, EN 1930:2011/A1, Child use and care articles – Safety barriers – Safety requirements and test methods (EN standard); and
- The Canadian regulation, SOR/2016-179, Expansion Gates and Expandable Enclosures Regulations (SOR standard).

CPSC staff determined that, for most of the relevant performance requirements, the SOR standard refers to an older version of ASTM F1004, published in 1986 (ASTM F1004-86), which has been superseded. Staff compared the applicable performance requirements of the SOR standard and EN standard to the current ASTM F1004 standard, ASTM F1004-19, including the following requirements: side height and vertical load, footholds, head entrapment, latch/oock conditioning test and automatic closing system, scissoring, shearing, and pinching, entanglement by protruding parts, neck entrapment in V shaped opening, packaging, construction and structural integrity, push-out test, hazardous materials, flammability, and protective components. CPSC staff's review showed that, for all of the requirements, the current ASTM F1004-19 standard is adequate, or more stringent than, the international standards in addressing the hazards identified in incidents associated with children's gates and enclosures.

VIII. Incorporation by Reference

The Commission is proposing to incorporate by reference, ASTM F1004-19, without change. The Office of the Federal Register (OFR) has regulations concerning incorporation by reference. 1 CFR part 51. These regulations require that, for a proposed rule, agencies discuss in the preamble to the NPR ways that the materials the agency proposes to incorporate by reference are reasonably available to interested persons, or explain how the agency worked to make the materials reasonably available. In addition, the preamble to the proposed rule must summarize the material. 1 CFR 51.5(a).

In accordance with the OFR's requirements, section V.B of this preamble summarizes the provisions of ASTM F1004-19 that the Commission proposes to incorporate by reference. ASTM F1004-19 is copyrighted. By permission of ASTM, the standard can be viewed as a read-only document during the comment period on this NPR, at: http://www.astm.org/cpsc.htm.

Interested persons may also purchase a copy of ASTM F1004-19 from ASTM, through its website (http://www.astm.org), or by mail from ASTM International, 100 Bar Harbor Drive, P.O. Box 0700, West Conshohocken, PA 19428; http://www.astm.org. Alternatively, interested parties may inspect a copy of the standard at CPSC's Division of the Secretariat.

IX. Effective Date

The Administrative Procedure Act (APA) generally requires that the effective date of a rule be at least 30 days after publication of the final rule (5 U.S.C 553(d)). The Commission proposes that the standard become effective 6 months after publication of a final rule in the *Federal Register*. Barring evidence to the contrary, the Commission generally considers 6 months to be sufficient time for suppliers to come into compliance with a new standard, and this is typical for other CPSIA section 104 rules. Six months is also the period that the Juvenile Products Manufacturers Association (JPMA) typically allows for products in their certification program to shift to a new standard once that new standard is published. The Commission is not aware of any information suggesting that 6 months is not an appropriate time frame for suppliers to come into compliance. Therefore, juvenile product manufacturers are accustomed to adjusting to new standards within this time frame. The Commission believes that most firms should be able to comply with the 6-month time frame, but asks for comments, particularly from small businesses, regarding the feasibility of complying with the proposed 6-month effective date. We also propose a 6-month effective date to the amendment to part 1112.

X. Assessment of Small Business Impact

A. Introduction

The Regulatory Flexibility Act (RFA) requires that proposed rules be reviewed for their potential economic impact on small entities, including small businesses. Section 603 of the RFA

requires that agencies prepare an initial regulatory flexibility analysis (IRFA) and make it available to the public for comment when the general notice of proposed rulemaking (NPR) is published, unless the head of the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Based on current information, the Commission cannot rule out that incorporating by reference ASTM F1004-19 as a mandatory CPSC safety standard would have a significant impact on a substantial number of small entities involved in the manufacturing or importing of children's gates and enclosures,

B. Small Entities to Which the Proposed Rule Would Apply

CPSC staff identified 113 firms supplying gates and enclosures to the U.S. market. The vast majority of suppliers are domestic (109 firms). The U.S. Small Business Administration (SBA) size guidelines identify any manufacturer as "small" if it employs fewer than 500 employees. Out of 113 firms, 83 appear to be very small, home-based domestic manufacturers.[7] They typically have only one or two gates in their product line and supply few other products. They generally also have low sales volumes. None of the home-based manufacturers appears to supply enclosures.

An additional 30 firms that are larger than the home-based suppliers supply gates and/or enclosures; 26 of the 30 are domestic. These firms include manufacturers and importers. Twenty-three of the 30 firms, although not as small as the home-based suppliers, are still small domestic entities, based on SBA guidelines for the number of employees in their North American Industry Classification System (NAICS) codes. These firms typically have eight to nine gate models in their product lines and have much larger sales volumes than the home-based suppliers. Of the 23

[7] These suppliers were identified online, and staff believes that there may be additional home-based suppliers operating in the gates market on a very small scale (possibly including some without an online presence).

small domestic suppliers, 13 supply only gates, six supply only enclosures, and four firms supply gates and enclosures. The remaining four firms are foreign manufacturers.

A. Costs of Proposed Rule to Be Incurred by Small Manufacturers

CPSC staff is aware of 106 small, domestic firms currently marketing gates and enclosures in the United States. It appears unlikely that there would be a significant economic impact on the 17 suppliers (12 manufacturers and 5 importers) of compliant gates and enclosures. These suppliers are already compliant with the current ASTM voluntary standard (ASTM F1004-18) and are likely to remain compliant with the new standard. However, based upon current information, the Commission cannot rule out a significant economic impact on six suppliers of noncompliant gates and enclosures and 83 home-based suppliers of gates.

For the three domestic manufacturers of gates and enclosures that do not comply with the voluntary standard, the cost of bringing products into compliance may be significant.[8] Several firms indicate that the cost of a redesign could be between $400,000 and $1 million, depending on the materials used to construct the product. The changes in the requirements for instruction manuals and labeling are not expected to be significant for these firms. Typically, these firms have already developed and provided warning labels and instruction manuals with their products. For two of the three small manufacturers of noncompliant gates, third party testing costs are not expected to exceed 1 percent of revenue because they have high revenue levels and few gate models in their product lines. The revenue level for the third firm is unknown.

For the three domestic importers/wholesalers that supply gates and enclosures that do not comply with the voluntary standard, the cost of ensuring compliance with the proposed standard

[8] Generally, we believe that impacts of less than one percent of a firm's revenue are unlikely to be significant. We cannot rule out the possibility that impacts of greater than one percent of revenue could be significant for some firms in some cases.

could be significant, depending upon the extent of the changes required, and the response of their supplying firms. Finding another supplier, or dropping the product line entirely, are options for importers/wholesalers if their existing supplier does not make the necessary product changes. However, the impact on a given firm will depend on the revenue generated by the product line, the cost of finding an alternative supplier, and the variety of other products in their product line. Third party testing costs may also have a significant impact. However, CPSC staff was unable to find revenue information for two firms, and testing costs could exceed 1 percent of revenue for the third firm.

Additionally, it is likely that all 83 of the very small, home-based suppliers identified would be significantly impacted, regardless of whether they require modifications to meet the performance requirements of the proposed standard. Most of the firms are likely to leave the market because their revenue from the sale of gates does not appear to be sufficiently large to justify third party testing costs and the cost of developing warning labels and instructional literature if these have not been provided before. If confronted by these costs, most of these very small, home-based manufacturers could stop selling gates or go out of business.

The Commission seeks comments on the changes that may be required to meet the voluntary standard, ASTM F1004-19, and in particular, whether redesign would be necessary, and what the associated costs are and the time required to bring the products into compliance. The Commission also seeks comments from individuals/firms familiar with various gates made by home-based suppliers who can provide additional information on the different styles of gates provided by home-based versus non-home-based suppliers. The Commission is particularly interested in how these firms are likely to respond to the proposed rule and the costs and time frame that would be required to modify any product, if applicable. Additionally, the Commission

requests information on the number of home-based suppliers, and on the significance of gates sales specifically, to their total revenue.

B. Alternatives

The Commission is proposing a 6-month effective date for the rule. A later effective date could reduce the economic impact on firms in two ways. First, firms would be less likely to experience a lapse in production/importation, which could result if they are unable to comply and have their products tested by a third party within the required timeframe. Second, firms could spread costs over a longer time period, thereby reducing their annual costs, as well as the present value of their total costs. Suppliers interviewed for the rulemaking indicated that 12–18 months might be necessary if a complete product redesign were required. Additional time might also be necessary for home-based suppliers that currently are not providing warning labels or instructional materials with their products to develop them.

The Commission seeks comments on the impact of the proposed rule on small manufacturers and importers, in general, as well as alternative effective dates, or any other alternatives that could mitigate the impact on small firms. When suggesting an alternative, please provide specific information on the alternative, and the extent to which it could reduce the impact.

XI. Environmental Considerations

The CPSC's regulations address whether we are required to prepare an environmental assessment or an environmental impact statement. 16 CFR part 1021. Those regulations state that certain categories of CPSC actions normally have "little or no potential for affecting the human environment," and therefore, do not require an environmental assessment or an environmental impact statement. 16 CFR 1021.5(c)(1). Rules or safety standards that provide design or

performance requirements for products are among the listed exempt actions. Thus, the proposed rule falls within the categorical exemption.

XII. **Paperwork Reduction Act**

This proposed rule contains information collection requirements that are subject to public comment and review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (PRA; 44 U.S.C. 3501–3521). Under 44 U.S.C. 3507(a)(1)(D), an agency must publish the following information:

- a title for the collection of information;
- a summary of the collection of information;
- a brief description of the need for the information and the proposed use of the information;
- a description of the likely respondents and proposed frequency of response to the collection of information;
- an estimate of the burden that shall result from the collection of information; and
- notice that comments may be submitted to the OMB.

In accordance with this requirement, the CPSC provides the following information:

Title: Safety Standard for Gates and Enclosures

Description: The proposed rule would require each gates and enclosure to comply with ASTM F1004-19, *Standard Consumer Safety Specification for Expansion Gates and Expandable Enclosures*, with no modifications. Sections 8 and 9 of ASTM F1004-19 contain requirements for marking, labeling, and instructional literature. These requirements fall within the definition of "collection of information," as defined in 44 U.S.C. 3502(3).

Description of Respondents: Persons who manufacture or import gates or enclosures.

Estimated Burden: We estimate the burden of this collection of information under 16 CFR part 1239 as follows:

Table 1 – Estimated Annual Reporting Burden

Burden Type	Type of Supplier	Number of Respondents	Frequency of Responses	Total Annual Responses	Hours per Response	Total Burden Hours
Labeling	Home-based manufacturers	83	2	166	7	1,162
	Other Suppliers	30	8	240	1	240
Labeling Total						**1,402**
Instructional literature	Home-based manufacturers	83	2	50	100	8,300
TOTAL BURDEN						**9,702**

Our estimate is based on the following:

Two groups of firms that supply gates and enclosures to the U.S. market may need to modify their existing warning labels. The first are very small, home-based manufacturers (83), who may not currently have warning labels on their gates (CPSC staff did not identify any home-based suppliers of enclosures). CPSC staff estimates that it would take home-based manufacturers approximately 15 hours to develop a new label; this translates to approximately 7 hours per response for this group of suppliers. Therefore, the total burden hours for very small, home-based manufacturers is 7 hours per model x 83 entities x 2 models per entity = 1,162 hours.

The second group of firms supplying gates and enclosures to the U.S. market that may need to make some modifications to their existing warning labels are non-home-based manufacturers and importers (30). These are also mostly small domestic firms, but are not home-based and do not operate at the low production volume of the home-based firms. For this second

group, all of whom have existing warning labels on their products and are used to working with warning labels on a variety of other products, we estimate that the time required to make any modifications now or in the future would be about 1 hour per model. Based on an evaluation of supplier product lines, each entity supplies an average of 8 models of gates and/or enclosures; therefore, the estimated burden associated with labels is 1 hours per model x 30 entities x 8 models per entity = 240 hours.

The total burden hours attributable to warning labels is the sum of the burden hours for both groups of entities: very small home-based manufacturers (1,162 burden hours) + non-home-based manufacturers and importers (240 burden hours) = 1,402 burden hours. We estimate the hourly compensation for the time required to create and update labels is $34.50 (U.S. Bureau of Labor Statistics, "Employer Costs for Employee Compensation," December 2018, Table 9, total compensation for all sales and office workers in goods-producing private industries: http://www.bls.gov/ncs/). Therefore, the estimated annual cost to industry associated with the labeling requirements is $48,369 ($34.50 per hour x 1,402 hours = $48,369). No operating, maintenance, or capital costs are associated with the collection.

ASTM F1004-19 also requires instructions to be supplied with the product. Under the OMB's regulations (5 CFR 1320.3(b)(2)), the time, effort, and financial resources necessary to comply with a collection of information that would be incurred by persons in the "normal course of their activities" are excluded from a burden estimate, where an agency demonstrates that the disclosure activities required to comply are "usual and customary." As with the warning labels, the reporting burden of this requirement differs for the two groups.

Many of the home-based gate manufacturers supplying on a very small scale may provide either no instructions or only limited instructions with their products as part of their "normal

course of activities." CPSC staff estimates that each home-based entity supplying homemade gates and/or enclosures might require 50 hours to develop an instruction manual to accompany their products. Although the number of home-based suppliers of gates and/or enclosures is likely to vary substantially over time, based on CPSC staff's review of the marketplace, currently, there are approximately 83 home-based suppliers of gates and/or enclosures operating in the U.S. market. These firms typically supply two gates on average. Therefore, the costs of designing an instruction manual for these firms could be as high as $286,350 (50 hours per model x 83 entities x 2 models per entity = 8,300 hours x $34.50 per hour = $286,350). Not all firms would incur these costs every year, but new firms that enter the market would and this may be a highly fluctuating market.

The non-home-based manufacturers and importers likely are providing user instruction manuals already with their products, under the normal course of their activities. Therefore, for these entities, there are no burden hours associated with providing instructions.

Based on this analysis, the proposed standard for gates and enclosures would impose an estimated total burden to industry of 9,702 hours at a cost of $334,719 annually.

In compliance with the PRA (44 U.S.C. 3507(d)), we have submitted the information collection requirements of this rule to the OMB for review. Interested persons are requested to submit comments regarding information collection by **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, to the Office of Information and Regulatory Affairs, OMB (see the ADDRESSES section at the beginning of this notice). Pursuant to 44 U.S.C. 3506(c)(2)(A), we invite comments on:

- the estimated burden hours required for very small, home-based manufacturers to modify (or, in some cases, create) warning labels;

- the estimated burden hours required for very small, home-based manufacturers to modify (or, in some cases, create) instruction manuals;
- whether the collection of information is necessary for the proper performance of the CPSC's functions, including whether the information will have practical utility;
- the accuracy of the CPSC's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used;
- ways to enhance the quality, utility, and clarity of the information to be collected;
- ways to reduce the burden of the collection of information on respondents, including the use of automated collection techniques, when appropriate, and other forms of information technology; and
- the estimated burden hours associated with label modification, including any alternative estimates, for both home-based and non-home-based suppliers.

XIII. Preemption

Section 26(a) of the CPSA, 15 U.S.C. 2075(a), provides that where a consumer product safety standard is in effect and applies to a product, no state or political subdivision of a state may either establish or continue in effect a requirement dealing with the same risk of injury unless the state requirement is identical to the federal standard. Section 26(c) of the CPSA also provides that states or political subdivisions of states may apply to the CPSC for an exemption from this preemption under certain circumstances. Section 104(b) of the CPSIA refers to the rules to be issued under that section as "consumer product safety rules," thus, implying that the preemptive effect of section 26(a) of the CPSA would apply. Therefore, a rule issued under section 104 of the CPSIA will invoke the preemptive effect of section 26(a) of the CPSA when it

becomes effective.

XIV. Certification and Notice of Requirements (NOR)

Section 14(a) of the CPSA imposes the requirement that products subject to a consumer product safety rule under the CPSA, or to a similar rule, ban, standard or regulation under any other act enforced by the CPSC, must be certified as complying with all applicable CPSC-enforced requirements. 15 U.S.C. 2063(a). Section 14(a)(2) of the CPSA requires that certification of children's products subject to a children's product safety rule be based on testing conducted by a CPSC-accepted third party conformity assessment body. Section 14(a)(3) of the CPSA requires the Commission to publish a notice of requirements (NOR) for the accreditation of third party conformity assessment bodies (or laboratories) to assess conformity with a children's product safety rule to which a children's product is subject. The proposed rule for 16 CFR part 1239, "Safety Standard for Gates and Enclosures," when issued as a final rule, will be a children's product safety rule that requires the issuance of an NOR.

The CPSC published a final rule, *Requirements Pertaining to Third Party Conformity Assessment Bodies*, 78 FR 15836 (March 12, 2013), which is codified at 16 CFR part 1112 (referred to here as Part 1112). This rule took effect on June 10, 2013. Part 1112 establishes requirements for accreditation of third party conformity assessment bodies (or laboratories) to test for conformance with a children's product safety rule in accordance with Section 14(a)(2) of the CPSA. The final rule also codifies all of the NORs that the CPSC had published, to date. All new NORs, such as the gates and enclosures standard, require an amendment to part 1112. Accordingly, in this document, we propose to amend part 1112 to include the gates and enclosures standard, along with the other children's product safety rules for which the CPSC has issued NORs.

Test laboratories applying for acceptance as a CPSC-accepted third party conformity assessment body to test to the new standard for gates and enclosures would be required to meet the third party conformity assessment body accreditation requirements in part 1112. When a laboratory meets the requirements as a CPSC-accepted third party conformity assessment body, it can apply to the CPSC to have 16 CFR part 1239, *Safety Standard for Gates and Enclosures*, included in its scope of accreditation of CPSC safety rules listed for the laboratory on the CPSC website at: www.cpsc.gov/labsearch.

In connection with the part 1112 rulemaking, CPSC staff conducted an analysis of the potential impacts on small entities of the proposed rule establishing accreditation requirements, 77 FR 31086, 31123-26 (May 24, 2012), as required by the RFA and prepared an Initial Regulatory Flexibility Analysis (IRFA). The IRFA concluded that the requirements would not have a significant adverse impact on a substantial number of small laboratories because no requirements are imposed on laboratories that do not intend to provide third party testing services under section 14(a)(2) of the CPSA. The only laboratories that are expected to provide such services are those that anticipate receiving sufficient revenue from providing the mandated testing to justify accepting the requirements as a business decision. Laboratories that do not expect to receive sufficient revenue from these services to justify accepting these requirements would not likely pursue accreditation for this purpose. Similarly, amending the part 1112 rule to include the NOR for gates and enclosures would not have a significant adverse impact on small laboratories. Moreover, based upon the number of laboratories in the United States that have applied for CPSC acceptance of the accreditation to test for conformance to other juvenile product standards, we expect that only a few laboratories will seek CPSC acceptance of their accreditation to test for conformance with the gates and enclosures standard. Most of these

laboratories will have already been accredited to test for conformance to other juvenile product standards and the only costs to them would be the cost of adding the gates and enclosures standard to their scope of accreditation. As a consequence, the Commission certifies that the proposed notice requirements for the gates and enclosures standard will not have a significant impact on a substantial number of small entities.

XIV. Request for Comments

This proposed rule begins a rulemaking proceeding under section 104(b) of the CPSIA for the Commission to issue a consumer product safety standard for gates and enclosures, and to amend part 1112 to add gates and enclosures to the list of children's product safety rules for which the CPSC has issued an NOR. In addition to requests for specific comments elsewhere in this NPR, the Commission invites all interested persons to submit comments on any aspect of the proposed rule.

Comments should be submitted in accordance with the instructions in the **ADDRESSES** section at the beginning of this notice.

List of Subjects

16 CFR Part 1112

Administrative practice and procedure, Audit, Consumer protection, Reporting and recordkeeping requirements, Third party conformity assessment body.

16 CFR Part 1239

Consumer protection, Imports, Incorporation by reference, Infants and children, Labeling, Law enforcement, and Toys.

For the reasons discussed in the preamble, the Commission proposes to amend Title 16 of the Code of Federal Regulations as follows:

PART 1112—REQUIREMENTS PERTAINING TO THIRD PARTY CONFORMITY ASSESSMENT BODIES

1. The authority citation for part 1112 continues to read as follows:

Authority: 15 U.S.C. 2063; Pub. L. 110-314, section 3, 122 Stat. 3016, 3017 (2008).

2. Amend § 1112.15 by adding paragraph (b)(49) to read as follows:

§ 1112.15 When can a third party conformity assessment body apply for CPSC acceptance for a particular CPSC rule and/or test method?

*** * * * ***

(b) The CPSC has published the requirements for accreditation for third party conformity assessment bodies to assess conformity for the following CPSC rules or test methods:

* * * * *

(49) 16 CFR part 1239, Safety Standard for Gates and Enclosures.

PART 1239-SAFETY STANDARD FOR GATES AND ENCLOSURES

Sec.

1239.1 Scope.

1239.2 Requirements for Gates and Enclosures.

Authority: Sec. 104, Pub. L. 110-314, 122 Stat. 3016 (15 U.S.C. 2056a).

§ 1239.1 Scope.

This part establishes a consumer product safety standard for gates and enclosures.

§ 1239.2 Requirements for gates and enclosures.

Each gate and enclosure must comply with all applicable provisions of ASTM F1004-19, Standard Consumer Safety Specification for Expansion Gates and Expandable Enclosures, approved on June 1, 2019. The Director of the Federal Register approves this incorporation by

reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may obtain a copy from ASTM International, 100 Bar Harbor Drive, P.O. Box 0700, West Conshohocken, PA 19428; http://www.astm.org/cpsc.htm. You may inspect a copy at the Division of the Secretariat, U.S. Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda, MD 20814, telephone 301-504-7923, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:

http://www.archives.gov/federal_register/code_of_federal regulations/ibr_locations.html.

Dated: _____

_____
Alberta E. Mills,
Secretary, Consumer Product Safety Commission

Staff Briefing Package

Draft Notice of Proposed Rule for Gates and Enclosures Under the Danny Keysar Child Product Safety Notification Act

June 19, 2019

I. Table of Contents

Briefing Memorandum

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
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Memorandum

This document has been electronically approved and signed.

June 19, 2019

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SUBJECT: Staff's Draft Notice of Proposed Rulemaking for Gates and Enclosures under the Danny Keysar Child Product Safety Notification Act

I. Introduction

The Danny Keysar Child Product Safety Notification Act, *i.e.*, section 104 of the Consumer Product Safety Improvement Act of 2008 (CPSIA), requires the U.S. Consumer Product Safety Commission (CPSC) to: (1) examine and assess voluntary safety standards for certain infant or toddler products, and (2) promulgate mandatory consumer product safety standards that are substantially the same as or more stringent than the voluntary standards if the Commission determines that more stringent standards would further reduce the risk of injury associated with these products. Section 104(f) of the CPSIA defines "durable infant or toddler products" as "durable products intended for use, or that may be reasonably expected to be used, by children under the age of 5 years." The list of products in section 104(f)(2) specifically includes "gates and other enclosures for confining a child." (16 CFR § 1130.2(a)(5))

Section 104 of the CPSIA also requires the Commission to consult with representatives of consumer groups, juvenile product manufacturers, and independent child product engineers and

experts, to examine and assess the effectiveness of the relevant voluntary standards. CPSC staff regularly participates in the juvenile products subcommittee meetings of ASTM International (ASTM). ASTM subcommittees consist of members who represent producers, users, consumers, government, and academia.[1] The consultation process for this rulemaking commenced when staff presented their initial recommendations during the ASTM subcommittee meeting in fall 2014. Since then, staff has been actively participating with the ASTM F15.16 subcommittee for Expansion Gates and Enclosures in revising ASTM F1004, *Standard Consumer Safety Specification for Expansion Gates and Expandable Enclosures*, to improve the stringency of the voluntary standard.

This briefing package and draft proposed CPSC standard is for gates and other enclosures confining a child. ASTM F1004 – 19 defines "expansion gate" as a "barrier intended to be erected in an opening, such as a doorway, to prevent the passage of young children, but which can be removed by older persons who are able to operate the locking mechanism" (§ 3.1.7). The voluntary standard also addresses "expandable enclosures," which are defined as "self-supporting barrier[s] intended to completely surround an area or play-space within which a young child may be confined" (§ 3.1.6). The meaning of "young child" is specified in the scope section (§1.2) as: "intended for young children aged six months through 24 months."

Although the title of the ASTM F1004 – 19 standard and its definitions include the word "expansion" before the words "gate" and "enclosure," the scope of the ASTM F1004 – 19 standard is more inclusive, and includes all children's gates and enclosures. The scope of ASTM F1004 – 19 specifically covers: "[p]roducts known as expansion gates and expandable enclosures, *or by any other name."* (§ 1.2). Both expandable gates and non-expandable gates may serve as barriers that are intended to be erected in an opening, such as a doorway, to prevent the passage of young children. Both expandable enclosures and non-expandable enclosures may serve as barriers intended to completely surround an area or play-space to confine young children. Similarly, all children's gates and enclosures, whether they are expandable or not, can be removed by older persons who are able to operate the locking mechanism. In addition, although there are some fixed-sized gates, most gates and enclosures intended for children expand because they vary in width (for gates) or shape (enclosures). In 1986, the initial standard, focused on head/neck entrapment incidents reported in the "V" shaped openings, which were typical of the accordion-style gates of the time, which inherently expand. However, as shown by the incident data detailed below and in Tab A, the hazard patterns indicate that the same hazards apply to all children's gates and enclosures, whether they are expandable or not. These hazards include injuries caused by hardware-related issues, slat problems, poor quality materials and finish, design issues, and installation problems. Therefore, staff's briefing package and the draft proposed CPSC standard address all gates and other enclosures for confining a child.[2]

This briefing package: (1) reviews the incident data; (2) assesses the effectiveness of the current voluntary standard for gates and enclosures; (3) examines recent recalls associated with gates and enclosures; (4) discusses the impact of a rule on small businesses; and (5) provides staff's recommendations to the Commission.

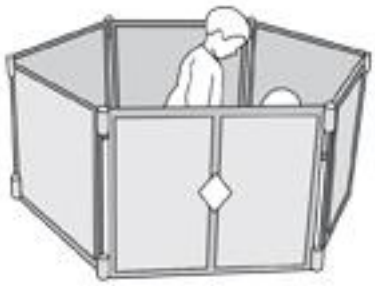
[1] ASTM International website: www.astm.org, About ASTM International.
[2] 16 CFR § 1130.2(a)(5).

II. Background

Product Review

ASTM F1004 – 19 § 3.1.7 defines a "gate" as a "barrier intended to be erected in an opening, such as a doorway, to prevent the passage of young children, but which can be removed by older persons who are able to operate the locking mechanism"; while § 3.1.6 defines an "enclosure" as a "self-supporting barrier intended to completely surround an area or play-space within which a young child may be confined." Enclosures may be intended "for indoor or outdoor use, or both," and they "do not include an attached floor." There are also several products on the market that can be used as either a hardware-mounted gate or as a freeform enclosure.

Gate



Enclosure

Figure 1. Example products

Gates and enclosures may be made of a wide range of materials: plastic, metal, wood, cloth, mesh, or combinations of several materials. As noted above, gates typically have a means of egress that allows adults to pass through them, but so do some enclosures (*i.e.*, some self-supporting barriers have egress panels that resemble gates). Gates may be either hardware-mounted, pressure-mounted, or both. Hardware-mounted gates generally require the use of tools and screws and cannot be removed without tools. Pressure-mounted gates attach like a pressure-fit shower curtain rod, using pressure on each end to hold the gate stable; they are intended for consumers who prefer to be able to move their gate, or who do not want to permanently mark their walls. Mounting cups for pressure gates can be attached to one or more locations, and the gate can be removed, as needed, or moved to other locations.

III. Incident Data (Tab A)

A. Injuries

NEISS Injury Estimates

CPSC staff reviewed incident data reported through the National Electronic Injury Surveillance System (NEISS), a statistically valid injury surveillance system.[3] An estimated total of 22,840 injuries (sample size=820, coefficient of variation=0.10) related to safety gates and enclosures were treated in U.S. hospital emergency departments over the 10-year period 2008-2017, or about 2,280 annually. Until NEISS data for 2018 is finalized in spring 2019, partial estimates for 2018 are not available. The injury estimates for individual years are reported in Tab A. Although there was a statistically significant increase observed in the estimated injuries from 2009 to 2010, there was no statistically significant trend observed over the entire 2008-2017 period.

Non-NEISS Reported Incidents

Staff also reviewed incident data reported through CPSC's epidemiological databases, other than NEISS.[4] CPSC staff is aware of a total of 436 reported incidents related to children's gates and enclosures reported. Of the 436 incidents, 394 were associated with the use of a gate, while 42 were associated with an enclosure. Nineteen of the incidents reported a fatality; 108 of the 417 nonfatal incidents reported an injury. These incidents were reported to have occurred between January 1, 2008 and October 31, 2018. Although ASTM F1004 indicates that these products are meant to be used with young children between the ages of 6 months and 24 months, interaction of these gates and enclosures with older siblings and adult caregivers is a foreseeable use pattern. As such, staff considered incidents involving older children—5 years and above—and adults to be in-scope incidents for determining hazard patterns. *Injuries* sustained by anyone 5 years or older in age, however, were excluded from this durable infant/toddler product regulatory package.

B. Fatalities

CPSC staff is aware of 19 deaths involving children's gates and enclosures that reportedly occurred between January 1, 2008 and October 31, 2018. Seventeen of the deaths were associated with the use of a gate, while two were associated with an enclosure.

Fifteen of the 19 decedents drowned, 13 in a backyard pool, one in a backyard hot tub, and one in a 5-gallon bucket of water inside the house. In these incidents, the decedents managed to get past the gate/enclosure when it was left open or was opened somehow, without the caregiver's knowledge

[3] NEISS injury data are gathered from emergency departments of hospitals, with 24-hour service and at least 6 beds, selected as a probability sample of all U.S. hospitals with emergency departments. The surveillance data gathered from the sample hospitals enable CPSC staff to make timely national estimates of the number of injuries associated with specific consumer products.

[4] The non-NEISS epidemiological databases contain data submitted by various sources such as consumer reports, retailer reports, newspaper clippings, death certificates, state/local authorities, advocacy groups, etc., and any follow-up in-depth investigations based on these source reports. These reported deaths and incidents do not provide a complete count of all that occurred during this time period. However, they do provide a minimum number of incidents occurring during this time period and illustrate the circumstances involved in the incidents related to gates and enclosures.

(10 incidents); the gate/enclosure was knocked down or pushed out by the decedent, due to incorrect or unsecured installation (4 incidents); or the decedent climbed over the gate/enclosure (1 incident). The decedents ranged in age from 9 months to 3 years.

The remaining four of 19 total deaths reported: an 8-month-old was found trapped between a mattress and an expansion gate in a recreational vehicle; a 23-month-old was trapped under a TV that fell on him when he was hanging on the edge of a safety gate that was secured to the TV stand with a rope; a 20-month-old was entrapped between a wall and a repaired/modified safety gate when the gate partially detached from the wall; and a 2-year-old got his neck entrapped between two safety gates that were set up in a stacked configuration.

C. Hazard Patterns

Issues	***Total Incidents***		***Fatalities***		***Nonfatal Injuries***	
	Count	*Percentage*	*Count*	*Percentage*	*Count*	*Percentage*
Product-Related	**412**	**94**	**4**	**21**	**100**	**93**
Hardware	*163*	*37*	--	--	*38*	*35*
Slats	*107*	*25*	--	--	*16*	*15*
Material/Finish	*50*	*11*	--	--	*18*	*17*
Design	*42*	*10*	--	--	*19*	*18*
Installation	*20*	*5*	*4*	*21*	*4*	*4*
Misc. Other	*7*	*2*	--	--	*1*	*< 1*
Instability	*3*	*< 1*	--	--	*2*	*2*
Multiple	*20*	*5*			*2*	*2*
Non-Product-Related	**11**	**3**	**8**	**42**	**3**	**3**
Climb-over	*4*	*< 1*	*1*	*5*	*3*	*3*
Caregiver Misstep	*3*	*< 1*	*3*	*16*	--	--
Misuse	*3*	*< 1*	*3*	*16*	--	--
Repaired/Modified	*1*	*< 0.5*	*1*	*5*	--	--
Undetermined	**13**	**3**	**7**	**37**	**5**	**5**
Total	**436**	**100**	**19**	**100**	**108**	**100**

Source: CPSC epidemiological databases INDP, IPII, and DTHS.
Note: Row percentages may not add to subtotal percentages and subtotal percentages may not add to 100, due to rounding.
Injuries and fatalities shown were sustained by children under 5 years of age.

IV. Voluntary Standard

A. History of the ASTM Voluntary Standard (Tab B)

The voluntary standard for gates and enclosures was first approved and published in 1986 (ASTM F1004-86, *Standard Consumer Safety Specification for First-Generation Standard Expansion Gates and Expandable Enclosures*). This standard addressed the head/neck entrapment incidents reported in the "V" shaped openings, which were typical of the accordion-

style gates of the time. During this time, the subcommittee members, including CPSC staff, considered specifying requirements for push-out force (terminology used in 1986 was *security* of a gate); however, due to technical difficulties, they were not able to develop repeatable test methods. The task group decided to defer push-out requirements to a "second generation" of the standard, to avoid delaying the publication of requirements to address head and neck entrapment.

Summary of Revisions 1986-2013

Between 1986 and 2013, ASTM F1004 underwent a series of revisions to improve the safety of gates and enclosures and the clarity of the standard. Nine of these revisions occurred between 2000 and 2013. Revisions during this period included provisions to address foot-pedal actuated opening systems, warnings, evaluation of *all* manufacturers' recommended-use positions, test fixture improvements, entrapment in openings along the side of the gate, lead-containing substances in surfaces, along with other minor clarifications and editorial corrections.

Revisions 2014 – Present

Beginning in 2014, CPSC staff worked with ASTM to address identified hazards and to increase the stringency of the voluntary standard and the safety of the gates and enclosures in the U.S. market. Specifically, staff was concerned with the following issues and hazards: bounded openings, slat breakage/slat connection failures, mounting/hinge hardware issues, latch/lock failures, pressure gate push-out forces, and hazard communication (*i.e.*, warning labels and instructions). The seven revisions during this time period address provisions relating to these six areas, along with other clarifications and improvements, as shown in Table 1 below. Tab B contains further details of each revision.

Table 1. Revisions to ASTM F1004 Since 2014

Issues	Hazard	Standard Version(s) Addressing Issue	Provisions/Revision
Bounded openings	Design(entrapment)	1004-16a 1004-18	• clarified that the openings in the "Completely-Bounded Openings" performance requirement are the ones contained within the gate or enclosure, and created between the gate and the test fixture • required completely bounded openings test to be performed with a probe in combination with a 25 lbf • modified completely bounded openings and bottom spacing test to improve repeatability and reliability of results
Slat breakage/slat connection failures	Hardware Slats Material/finish	1004-15a 1004-16a 1004-18	• prohibited the use of lateral/transverse joints on wood slats • required testing not only every other joint between enclosure panels, but also the top rail of every other enclosure panel • required testing the strength of wood and metal slats
Mounting/hinge hardware issues	Hardware Design	1004-16a 1004-18	• added a hardware durability test • required testing not only every other joint between enclosure panels, but also the top rail of every other enclosure panel

			• Required that the latching/locking and hinge mechanism must remain engaged and operational during and upon completion of testing
Latch/lock failures	Hardware	1004-15a 1004-16a 1004-18	• required that locks must either have double action release mechanism or else they must pass a minimum operation force requirement test • required that automatic closing systems must continue to operate as advertised after the hardware cycle test is complete • required that the locking/latching device must remain engaged and operational during and upon completion of the latching/locking and hinge mechanism testing
Remaining upright (including push out)	Installation	1004-15a 1004-18 1004-19	• required that products must comply with all requirements with and without the use of any and all extension panels • required that products must pass performance requirements when installed in any of the manufacturer's recommended use positions • required that units must remain in the manufacturer's recommended use position and all locks/latches must function as normal upon completion of vertical strength testing • modified test fixture construction and setup • revised completely bounded openings and bottom spacing test, and push-out tests to improve repeatability and reliability of results • required that all gates must meet 30 pounds of push force before dislodging from the opening • required that gates that use wall cups must meet certain provisions regarding packaging, warnings, and instructions
Hazard communication	Installation	1004-15 1004-18 1004-19	• required that packaging must indicate the range of operating widths for which the gate is designed. • required that installation instructions must provide information regarding where to install the gate, relative to the floor • required marking and labeling requirements to align with formatting requirements of ANSI Z535.4, *American National Standard for Product Safety Signs and Labels*, and other requirements consistent with the Ad Hoc Wording task group recommendations • required that installation instructions must specify the minimum distance to the first step of the stairs for gates that are recommended for use at the top of stairs • required that gates that use wall cups must include the warning "You MUST install wall cups to keep gate in place. Without wall cups, child can push out and escape."
Other		1004-16 1005-16b	• clarification regarding enclosure floors • specified order of tests

B. Provisions in ASTM F1004 – 19 (Tab B)

ASTM F1004-19 addresses numerous hazards with several general requirements, most of which are also found in the other ASTM juvenile product standards. ASTM F1004 – 19 has requirements to address the following safety issues common to many juvenile products:

- Wood parts
- Threaded fasteners may not be used on components intended to be removed by the consumer for daily operations
- Sharp points
- Small parts
- Opening size
- Exposed coil springs
- Scissoring, shearing, and pinching
- Labeling
- Lead paint
- Protective components

In addition to the general requirements listed above, ASTM F1004 – 19 contains performance requirements and test methods specific to gates and enclosures, including requirements pertaining to:

- Completely bounded openings
- Height of sides
- Vertical strength
- Bottom spacing
- Configuration of uppermost edge/Partially bounded openings
- Latching/locking and hinge mechanisms
- Automatic closing system
- Push-out strength
- Locking devices
- Toys
- Slat strength
- Warning, labeling, and instructions

Many of these provisions have been strengthened through the consultation process between CPSC staff and ASTM that started in 2014, including those related to bounded openings, slat breakage/slat connection failures, mounting/hinge hardware issues, latch/lock failures, pressure gate push-out forces, and hazard communication (*i.e.,* warning labels and instructions). Full discussion of the provisions in the voluntary standard can be found in Tab B.

V. Voluntary Standard Assessment

A. Adequacy of ASTM 1004 – 19 Requirements (Tabs B and C)

ASTM developed the voluntary standard to mitigate the risk of injury by addressing the hazard patterns associated with the use of gates and enclosures. This includes instructions and on-product warnings to help inform caretakers of the primary hazards during use of the product.

Based on the engineering assessment (see Tab B) and human factors assessment (see Tab C), staff concludes the requirements contained in the current voluntary standard, ASTM F1004 - 19, adequately address the majority of identified hazards associated with the use of gates and enclosures, such as hardware issues, slat problems, poor quality materials and finishes, and design issues, which together account for over three-quarters of the reported incidents. Five percent of reported incidents, including four fatalities, are related to installation issues. The most recent revision, ASTM F1004 – 19, represents a large step forward in addressing installation issues, especially related to pressure-mounted gate push-out hazards, by requiring that all gates meet the same push-out force (*e.g.* 30 pounds) with provisions which allow the use of wall cups to meet this requirement. However, CPSC staff believes that additional work through the voluntary standards process may be necessary to further strengthen the standard to increase the likelihood that caregivers install pressure-mounted gates properly to confine their child. The draft NPR seeks comments regarding adequacy of the requirements of ASTM 1004-19 to address the hazard patterns presented and, in particular, comments about the adequacy of the current labeling requirements and the necessity of adding visual pressure indicators in pressure-mounted gates, as discussed in more detail in section V.D, below.

B. Hazard Patterns addressed by ASTM F1004 – 19

Table 2. Identified Hazard Patterns from Tab A

Issues	***Total Incidents***		***Fatalities***		***Nonfatal Injuries***	
	Count	*Percentage*	*Count*	*Percentage*	*Count*	*Percentage*
Product-Related	**412**	**94**	**4**	**21**	**100**	**93**
Hardware	*163*	*37*	--	--	*38*	*35*
Slats	*107*	*25*	--	--	*16*	*15*
Material/Finish	*50*	*11*	--	--	*18*	*17*
Design	*42*	*10*	--	--	*19*	*18*
Installation	*20*	*5*	*4*	*21*	*4*	*4*
Misc Other	*7*	*2*	--	--	*1*	*< 1*
Instability	*3*	*< 1*	--	--	*2*	*2*
Multiple	*20*	*5*			*2*	*2*
Non-Product-Related	**11**	**3**	**8**	**42**	**3**	**3**
Climb-over	*4*	*< 1*	*1*	*5*	*3*	*3*
Caregiver Mis-step	*3*	*< 1*	*3*	*16*	--	--
Misuse	*3*	*< 1*	*3*	*16*	--	--
Repaired/Modified	*1*	*< 0.5*	*1*	*5*	--	--
Undetermined	**13**	**3**	**7**	**37**	**5**	**5**
Total	**436**	**100**	**19**	**100**	**108**	**100**

Source: CPSC epidemiological databases INDP, IPII, and DTHS.
Note: Row percentages may not add to subtotal percentages and subtotal percentages may not add to100 due to rounding.
Injuries and fatalities shown were sustained by children under 5 years of age.

Staff reviewed the identified hazard patterns associated with the incident data collected by CPSC for incidents that occurred between January 2008 and October 2018 (Tab A) and the applicable requirements found in ASTM F1004-19. Staff identified eight different product-related hazard patterns in the incident reports. Staff found a total of eleven incidents were not related to the product and were attributed to incorrect product usage or children bypassing gates entirely. Forty-two percent of deaths were classified in this non-product-related incident category. However, because the main purpose of a gate is to contain a child, staff considered children bypassing a gate to be a hazard pattern of concern. After reviewing the incident data, staff considered each hazard pattern to assess the adequacy of ASTM F1004 – 19.

Hardware Issues: More than a third of the incident reports that CPSC collected involved hardware failures, *e.g.*, ,broken hinges, locks, mounting brackets, etc., that led to contusions, lacerations, head injuries, and two fractures. In July 2016, the subcommittee added a new hardware durability requirement, which was published in ASTM F1004 – 16a (§6.2), to address these types of problems. This provision is included in ASTM F1004– 19. After comprehensive lab testing, CPSC staff recommended including a latching/locking and hinge performance test which cycles gates through 2,000 complete "open and closing" cycles (550 installation/removal cycles for pressure gates without egress panels). This test identified gates known to have hardware issues such as those found in the incident data. Directorate for Engineering Sciences, Division of Mechanical and Combustion Engineering (ESMC) staff determines this performance requirement adequately addresses the hardware failures hazard pattern.

Slat Problems: A quarter of the incident reports involved slats breaking or detaching from gates or enclosures resulting in contusions and lacerations. The ASTM F1004 – 18 standard included a performance requirement that slats must withstand a 45 pound force (§6.6), which is the pulling force of the largest intended occupant.[5] This provision is included in ASTM F1004 – 19. ESMC staff determines this performance requirement, adequately addresses the slat failure hazard pattern.

Material and Finish: The 50 incident reports captured in this category included problems with small parts breaking free to become potential choking hazards, splintering wood or welding, sharp edges, protrusions, rails bending out of shape, fabric/mesh panels sagging, and poor quality of stitching on fabric panels. ASTM F1004-19 contains many general requirements which address these issues, such as sharp points or edges in §5.3, small parts in §5.4, and the use of screws in §5.2. In 2015, the standard expanded the wood parts provision to ban the use of transverse/lateral joints in all wood components. The 2016 and 2018 updates to the completely

[5] The 45-lb force used in the Slat Strength test was based on the 95th percentile "pull" force of 2-year-old males (38.5 lb). The "pull" force is found in a study titled "A Study of the Strength Capabilities of Children Ages Two through Six by Brown & Buchanan, 1973. The "pull" force value was used since it was larger than the push force found in the study, and children may both push and pull on gates. The forces for a two year old child were used recognizing that this child is between the ages of two and three, and larger than the recommended age for a gate or enclosure, a 15 percent safety factor was added, and then rounded up to 45 lb.

bounded openings and bottom spacing test, which now simulates a child pressing through openings (versus the previous, basic template evaluation) will also help reduce issues with rails or flexible barrier materials bending out of shape. These provisions are included in ASTM F1004-19. ESMC staff determines these performance requirements, along with the recent revisions, effectively address breaking gates creating choking and or laceration hazards.

Design Issues: Approximately 10 percent of the incident reports involved problems with some aspect of the design of gates or enclosures, such as the opening size between slats or panels that allowed for entrapments, moving gate components causing scissoring or pinching issues, features that were able to be used as footholds, or sections that posed a trip hazard when the gate was in an opened position. ASTM F1004-19 contains several performance tests that specifically address entrapments in openings (§§ 7.10 and 7.11), including the 2016 and 2018 updates to the completely bounded openings and bottom spacing tests which replaced simplistic evaluations of openings using a template with more stringent probe tests. The general openings (§5.5) and scissoring, shearing, and pinching performance requirements (§5.7) also help address reports captured in this category. ESMC staff assess the latest version of the standard, including the revised performance requirements, adequately addresses this hazard pattern.

Installation Problems: 20 incidents fall into this hazard pattern. Some of these incident reports identify problems with unclear instructions, mismatched dimensions between gates and the openings they were meant to fit into, and failure of the gate to remain upright in the opening. ASTM F1004-19 includes several warning, labeling, and instructional provisions and revisions in section 8 and 9 that require gates to clarify proper installation. A full analysis of the product warning and instruction provisions is detailed below in Section C.

Specific items in the warnings and instructions that address installation include:

- a provision that requires instructional literature to specify the exact opening dimensions a gate is designed for (added in 2015),
- a provision to provide information regarding where to install the gate, relative to the floor (added in 2016), and
- a provision to specify the minimum distance to the first step of the stairs, for gates that are recommended for use at the top of stairs (added in 2018).

These provisions generally address the installation hazard patterns because they help clarify the requirements for proper installation. However, staff believes there are additional improvements that could further improve the installation of pressure-mounted gates that use wall cups. Therefore, staff recommends additional collaboration with ASTM, detailed below in Section D, to better address these issues.

Miscellaneous: Seven miscellaneous issues found in the incident reports include three complaints about an ineffective recall remedy, one complaint about poor product packaging, and three consumer concerns about the safety of a specific design. At this time, no provisions in the ASTM standard address the various incidents falling into this miscellaneous category. Considering these miscellaneous issues are not widespread, and most of them do not relate directly to the safety of the gate or enclosure product itself, ESMC staff considers the existing ASTM standard adequate.

Enclosure Instability: A few (<1%) incident reports came from consumers who described problems with flimsy or unstable enclosures. ASTM F1004 – 19 contains a several requirements that help address the product durability issues reported in these enclosure incidents. The vertical strength requirement in §7.8 was expanded to test not only the joints between the enclosure panels, but also to test the top rails of the panels themselves. Additionally, the cyclic locking/latching test in §7.3 tests that the hardware in these products is durable and capable of withstanding regular use. Many of the general requirements, such as those concerning sharp edges, small parts, wood parts, and protective components also help to address issues captured in this category. ESMC staff determines these performance requirements, along with the recent revisions, effectively address this hazard pattern.

Multiple: Twenty reports described two or more problems from the preceding product-related issues. Given the assessment of the performance requirements to address these issues as described above, ESMC staff considers the existing ASTM standard adequate.

Climb Over[6]: ASTM does not include performance provisions that address climb over. However, this hazard is addressed by warning labels instructing caregivers to stop using the gate when child can climb over it. As discussed in Tab B, (footholds section), staff is not aware of an effective and reasonable performance requirement to address climb over. For this reason, ESMC considers the existing ASTM standard adequate.

C. Warnings and Instructions

Section 8 of ASTM F1004-19 specifies labeling and warning requirements for gates and enclosures. All gates and enclosures must include warnings on the product about the risk of serious injury or death when a product is not securely installed, must warn the consumer to never use with a child able to climb over or dislodge the gate, and to never use the gate to prevent access to a pool. Pressure mounted gates, gates with locking mechanisms, and enclosures require other warning messages specific to the hazards posed by these different types of gates or enclosures, with as many as six different messages required.

Specifically, the warnings required for all gates and enclosures are:

> Children have died or been seriously injuries when [gates/enclosures] are not securely installed. ALWAYS install and use [gate/enclosure] as directed using all required parts. (§ 8.5.1)
>
> STOP using when a child can climb over or dislodge the [gate/enclosure]. (§8.5.2)
>
> NEVER use to keep child away from pool. (§ 8.5.6)

Pressure-mounted gates with a single-action locking mechanism on one side of the gate must include the following warning:

> Install with this side AWAY from child. (§ 8.5.3)

Enclosures with locking or latching mechanisms must include the following warnings:

[6] Climb Over was categorized as non-product related hazard in Tab A. Since ASTM and EN standards have provisions to address this issue, the climb over hazard was considered in the evaluation of the adequacy of the ASTM standard.

Use only with the [locking/latching] mechanism securely engaged. (§ 8.5.4)

These warnings are required on the retail packaging unless they are visible in their entirety to consumers on the gate at point of purchase.

The 2019 version of the ASTM standard requires the on-product warning label to have a format that is aligned with Ad Hoc TG recommendations, which should address its noticeability and readability. Therefore, ESHF staff agrees that these formatting requirements will reduce inconsistencies currently seen on gates and enclosures, and will address numerous warning format issues related to capturing consumer attention, improving readability, and increasing hazard perception and avoidance behavior. According to the placement requirements of ASTM F1004 – 19, a single warning label that includes all of the warnings shown in Figure 2 would have to be visible to the caregiver standing near the gate or enclosure at any one position around the gate or enclosure, but not necessarily be visible from all positions. When considering that the warning is primarily directed at hazards posed by installation, this existing requirement is consistent with ANSI Z535.4, which states that warnings must be placed so they are readily visible to the intended viewer and will alert the viewer in time to take appropriate action (§9.1).[7] Even if the warning is not viewable from all locations while the gate or enclosure is in use, it will be viewable during installation. Further, ESHF staff recognizes that there are gates more than twelve feet long designed for open floor plan houses and repositionable enclosures with similar perimeters. Because of the long gates and enclosures, staff does not recommend modifying the conspicuity requirement such that all warnings be viewable from all possible caregiver locations.

Although staff supports the requirements described above, staff believes that further collaboration with the ASTM subcommittee could result in improvements to the voluntary standard.

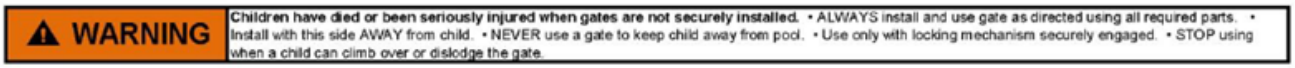


Figure 2. Example warning label

D. Further work and request for comments

Wall Cup Warning

Warnings, if well-designed, can influence consumer's behavior by arming them with required information to make informed decisions and overcome perceptions of safe product use that may not, in fact, be safe. For warnings to be effective, consumers must first notice the label, then read and comprehend the label, and finally be motivated enough to comply with the warning. Staff concludes that a warning label in a format that complies with the Ad Hoc[8]

[7] But not presented so far in advance of a hazard that the consumer might forget the warning when presented with the hazard.
[8] The ASTM Ad Hoc Wording task group's purpose is to develop recommended wording for sections of the ASTM standards that are common to multiple standards, which includes recommendations for warning label format and design.

recommendations increases the likelihood that the label will be noticed. In addition to formatting and content, placement of the warning label is critical so that consumers are likely to see and act upon the label. To improve the likelihood the warning label is acted upon, the location of the label is important. Because the installation-related incidents include deaths and serious injuries, and wall cups are critical features to the correct installation of some pressures gates, CPSC staff suggested[9] that ASTM consider locating the wall cup warning as a separate and distinct warning positioned in a highly conspicuous location, such as along the top rail of the gate. This location would be within the caregiver's line of sight and oriented in a readable direction during normal use of the gate.

Staff recommends further collaboration with stakeholders at ASTM to assess whether moving the wall cup warning language from its current location, among the other warning statements, to a highly conspicuous separate and distinct label, shown below, visible to a caregiver operating the gate along the top rail of the gate is appropriate or necessary. The draft proposed rule seeks comments on whether the warning label should be relocated to the top rail, or whether a different conspicuous location is appropriate or necessary. The text of the warning shown below is the same message currently required in the general warning label shown in Figure 2; however, CPSC staff believes this critical warning should be separate and distinct. CPSC staff welcomes comments on the adequacy of the current ASTM F1004-19 requirements and any changes to these requirements that may reduce installation problems. The draft proposed rule specifically requests comments on the placement of the wall cup warning and visual indicators on pressure gates.

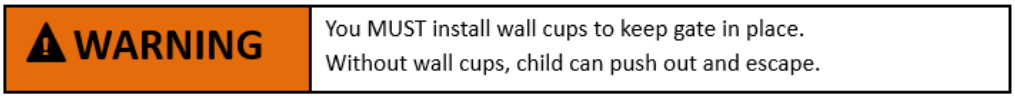


Figure 3. Wall cup warning

Visual Indicators

In January 2018, staff presented to the F15.16 subcommittee a series of recommendations to improve the installation of pressure gates, including improvements to the push-out test and the potential use of visual indicators. Over the past year, the subcommittee has made the recommended improvements to the push-out test, in addition to requiring all gates to meet 30 pounds of push-out resistance. Although some pressure gates are capable of meeting 30 pounds of push-out resistance without wall cups when they are installed perfectly, most pressure gates will use wall cups to meet this requirement. Currently, there is no requirement to provide an indication to the test technician or the end consumer that such a pressure gate is installed properly. The test technician is instructed to install with a specific installation force, which is difficult to measure for gates that use bolts and tightening nuts, while the end consumer receives no feedback as to whether their installation is correct. For example, current instructions for some pressure-mounted gates provide little or no clear direction to help consumers know when the gate is installed correctly or that it stays in place after several uses. For example, some gates

[9] For example, CPSC staff response to ASTM ballot F15 (18-11) Item 1, December 11, 2018

currently on the market may instruct the consumer to adjust until secure, or to push the gate to *feel* if it is secure. One set of instructions found online advises the consumer to ensure that the gate is properly fixed and secured, but provides no information on how the consumer should do this. Another set of instructions states that the gate is installed safely when there is equal spacing among each of four spindle rods.

Staff testing and analysis, discussed in detail in Tab C, suggests that visual indicators could improve the safety of pressure gates that do not use wall cups. Staff intends to continue to work with ASTM to develop an effective requirement for side pressure indicators will address the installation hazard for gates that can pass the push-out test without wall cups, but only when installed with sufficient side forces. The draft proposed rule seeks comments on the usefulness and feasibility of visual indicators for pressure gates that do not use wall cups.

E. International Standards (Tab B)

CPSC staff concludes that that the ASTM standard is equivalent to, or more stringent than, other international standards in most areas and addresses the hazard patterns seen in the incident data reported to the CPSC. Furthermore, ASTM F1004 – 19 was developed through the collaborations between CPSC staff and stakeholders since its inception in 1986. Therefore, staff concludes ASTM F1004 is more appropriate than other international standards. Table 3 summarizes the relevant requirements for each standard and assesses the adequacy and stringency compared to ASTM F1004 – 19.

Table 3. International Standards Comparison

Requirement	ASTM F1004	EN 1930	Health Canada SOR	Comments
Side Height and Vertical Load	22 inches[10] with 45 lb vertical load.	25.5 inches with 56 lb vertical load.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM is adequate
Foot hold	Label – stop using when child can climb over gate.	Foot probe test	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM is adequate
Head entrapment	Torso probe	Torso probe	No requirement exists.	ASTM more stringent

[10] The ASTM subcommittee concluded that 22 in. is a sufficient height to retain a child of the specified age group.

	(3 x 5.5 inches[11] with 25 lb push force)	(2.5 x 4.1 inches with a 6.75 lb push force)	Regulation refers to an 1986 version of ASTM F1004 standard already superseded by recent versions.	
Latch/Lock	Double action release mechanism or single action mechanism with a minimum 10 lb force. Foot-operated release mechanism with a minimum 35 lb force. Shall function after 2,000 cycles	Double-action release mechanism or two separate but consecutive release actions. Shall function after 300 cycles.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM more stringent
Automatic Closing system	Maximum and minimum opening width of 8 inches (the minimum hip breadth of an adult caregiver)[12] Shall operate after 2,000 cycles of latch/lock conditioning test.	Maximum and minimum opening width. Requires audible or visual means of indicating whether the barrier has closed or remains open. Shall operate 10 times after 300 cycles of latch/lock conditioning test.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM more stringent
Scissoring shearing, pinching	Dimensional tolerances provisions for the complete gate/enclosure design that address scissoring, shearing, and pinching.	Specific dimensional tolerances for the gap created between the frame and the egress panel on pressure mounted gates (Figure 8). The gap is evaluated with a 56 lb vertical load on top center of the barrier.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM is adequate
Entanglement by protruding parts	No requirement exists.	Ball chain loop test.	No requirement exists.	ASTM is adequate

[11] Per the 1975 SAE Anthropometry of U.S. Infants and Children, the 5th percentile 5 to 6 month old's buttocks depth is 3.0 in. (actually reported as 2.99 in.). Per the 1977 University of Michigan Anthropometry of Infants, Children, and Youths, the 5th percentile 6 to 8 month old's hip breadth is 5.5 in.

[12] According to current anthropometric data, 8 inches is the minimum width a gate would need to open to allow passage based on a small female of child-bearing age. (Source: PeopleSize Pro v 2.02).

			Regulation refers to an 1986 version of ASTM F1004 standard already superseded by recent versions.	
Entrapment in V shaped opening	Test Template B (Figure 5)	No requirement exists.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004. standard already superseded by recent versions.	ASTM more stringent

VI. Discussion

F. Compliance Recalls (Tab D)

Compliance staff reviewed the recalls involving gates and enclosures from January 2008 to December 2018. During that time period, there were five recalls involving baby gates and one recall involving an enclosure. The recalls involving fall, entrapment, tripping, and laceration hazards to children. There were a total of 215 incidents reported of which 13 resulted in injuries.

G. Assessment of Small Business Impact of the Draft Proposed Rule (Tab E)

Staff identified 113 firms supplying gates and enclosures to the U.S. market. The vast majority of suppliers to the U.S. market are domestic (109 firms). Of these, 83 appear to be very small, home-based domestic manufacturers.[13] They typically have no enclosures, but only one or two gates in their product line, and supply few other products. They generally also have low sales volumes. Staff identified another 23 firms that, although not as small as the home-based suppliers, *are* still small domestic entities based on U.S. Small Business Administration (SBA) guidelines for the number of employees in their North American Industry Classification System (NAICS) codes. These firms typically have eight to nine gate models in their product lines and have much larger sales volumes than the home-based suppliers.

The remaining seven firms include three large domestic manufacturers and four foreign manufacturers. Additionally, staff identified numerous foreign gates and enclosures entering the U.S. market via several mechanisms, including: online retailers that operate marketplaces for smaller sellers, online firms acting as brokers between buyers and sellers, and foreign retailers willing to supply foreign-manufactured gates directly to U.S. consumers on their own behalf.

[13] These suppliers were identified online and staff believes that there may be additional home-based suppliers operating in the gates market on a very small scale (possibly including some without an on-line presence).

None of these suppliers specializes in gates and enclosures, each selling a wide variety of products beyond those for children. The large domestic suppliers and foreign suppliers are not considered in the regulatory flexibility analysis because SBA guidelines and definitions pertain to small U.S.-based entities.

As described in Tab E, it is likely that the rule would have a significant economic impact on all 83 of the very small home-based suppliers that were identified, due primarily to the third party testing costs and the necessity of creating warning labels and instructional literature if these have not been provided before. If confronted by these costs, a substantial number of these very small home-based manufacturers would be significantly impacted and in most cases are likely to stop selling gates or go out of business. The only exceptions would be for small home-based suppliers whose gate revenues are not significant relative to total revenue, allowing them to drop the product without a significant impact.

Of the remaining 23 small businesses, it appears unlikely that there would be a significant economic impact on the 17 suppliers (12 manufacturers and 5 importers) of compliant gates and enclosures. However, we could not rule out a significant economic impact on 6 suppliers of noncompliant gates and enclosures (3 manufacturers and 3 importers/wholesalers).

H. Notice of Requirements

Section 14(a) of the CPSA requires that any children's product subject to a consumer product safety rule under the CPSA must be certified as complying with all applicable CPSC-enforced requirements. The children's product certification must be based on testing conducted by a CPSC-accepted third party conformity assessment body (test laboratory). The CPSA requires the Commission to publish a notice of requirements (NOR) for the accreditation of third party test laboratories to determine compliance with a children's product safety rule to which a children's product is subject. A proposed rule for gates and enclosures, if issued as a final rule, would be a children's product safety rule that requires the issuance of an NOR.

The Commission published a final rule, Requirements Pertaining to Third Party Conformity Assessment Bodies. 16 CFR part 1112 (78 Fed. Reg. 15836 (March 12, 2013)) (referred to here as part 1112). This rule took effect on June 10, 2013. Part 1112 establishes the requirements for accreditation of third party testing laboratories to test for compliance with a children's product safety rule. The part 1112 rule also codifies all of the NORs that the CPSC has published to date for children's product safety rules. All new children's product safety rules, such as the proposed gates and other enclosures standard, would require an amendment to Part 1112 to create an NOR. Therefore, staff recommends that the Commission propose to amend Part 1112 to include gates and other enclosures in the list of children's product safety rules for which the CPSC has issued NORs.

I. Effective Date

The Administrative Procedure Act (APA) generally requires that the effective date of a rule be at least 30 days after publication of the final rule (5 U.S.C 553(d)). Staff recommends a 6-month effective date. Barring evidence to the contrary, staff generally considers 6 months sufficient

time for suppliers to come into compliance with a new standard, and this amount of time is typical for other CPSIA section 104 rules. Six months is also the period that the Juvenile Products Manufacturers Association (JPMA) typically allows for products in their certification program to shift to a new standard once that new standard is published. Therefore, juvenile product manufacturers are accustomed to adjusting to new standards within this time. Staff invites comments, particularly from small businesses, regarding the amount of time they will need to come into compliance.

VII. Staff Conclusion and Recommendations

Staff recommends that the Commission issue a proposed rule for gates and other enclosures for confining a child that incorporates by reference ASTM F1004 – 19, *Standard Consumer Safety Specification for Expansion Gates and Expandable Enclosures*. Staff also recommends an effective date of 6 months after publication of the final rule to allow time for gate and enclosure manufacturers to bring their products into compliance and to arrange for third party testing. CPSC staff continues to work with ASTM to further address installation-related hazards related to the placement of a wall cup warning label and visual indicator for pressure gates and requests comments on these issues.

TAB A: Gates and Enclosures-Related Deaths, Injuries, and Potential Injuries

TAB A

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MARYLAND 20814

Memorandum

Date: December 21, 2018

TO : Hope E J. Nesteruk
Gates and Enclosures Project Manager
Division of Mechanical Engineering
Directorate for Engineering Sciences

THROUGH: Stephen Hanway
Associate Executive Director
Directorate for Epidemiology

FROM : Risana Chowdhury
Division of Hazard Analysis
Directorate for Epidemiology

SUBJECT : Gates and Enclosures-Related Deaths, Injuries, and Potential Injuries[14]

Introduction

This memorandum characterizes the number of deaths and injuries and the types of hazards related to children's gates and enclosures over a period of nearly 11 years from January 1, 2008 to October 31, 2018.[15] These characterizations are based on incident reports received by CPSC staff. The memorandum also presents national injury estimates from January 2008 through December 2017.

[14] This analysis was prepared by the Consumer Product Safety Commission (CPSC) staff. It has not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.
[15] Not all of these incidents are addressable by an action the CPSC could take. It is not the purpose of this memorandum, however, to evaluate the addressability of the incidents, but rather, to quantify the number of fatalities and injuries reported to CPSC staff and to provide, when feasible, estimates of emergency department-treated injuries.

The ASTM voluntary standard, F1004, addresses safety issues related to children's expansion gates and expandable enclosures (also referred to as "gates" and "enclosures", respectively, in this memorandum). According to ASTM F1004, an "expansion gate" is defined as a:

> *barrier intended to be erected in an opening, such as a doorway, to prevent the passage of young children, but which can be removed by older persons who are able to operate the locking mechanism.*

According to ASTM F1004, an "expandable enclosure" is defined as a:

> *self-supporting barrier intended to completely surround an area or play-space within which a young child may be confined.*

In both definitions, the age of the intended occupant is between six months through 24 months.

The last major revision of the ASTM standard on gates and enclosures, published in 2007, was based primarily on data provided by CPSC through 2007. The most recent revision of the ASTM standard was published in June 2019. For this memorandum, staff included CPSC data since 2008. Due to the large number of injury reports received through the emergency departments during the ten-year timeframe, the estimates of emergency-treated injuries associated with gates and enclosures are presented separately from the rest of the incident data.

A. Incident Data[16]

CPSC staff is aware of a total of 436 reported incidents related to child gates and enclosures. Of the 436 incidents, 394 were associated with the use of a gate while 42 were associated with an enclosure. Nineteen of the incidents reported a fatality; 108 of the 417 nonfatal incidents reported an injury. These incidents were reported to have occurred between January 1, 2008 and October 31, 2018. Although ASTM F1004 indicates that these products are meant to be used with young children between the ages of six and 24 months, interaction of these gates and enclosures with older siblings and adult caregivers is a foreseeable use pattern. As such, incidents involving older children—five years and above— and adults were considered in-scope for the determination of hazard patterns. *Injuries* sustained by anyone five years or over in age, however, were excluded from this durable infant/toddler product regulatory package.

Because reporting is ongoing, the number of reported fatalities, nonfatal injuries, and non-injury incidents may change in the future. Given that these reports are anecdotal and that reporting is

[16] The CPSC databases searched were the In-Depth Investigation (INDP) file, the Injury or Potential Injury Incident (IPII) file, and the Death Certificates (DTHS) file. These reported deaths and incidents are neither a complete count of all that occurred during this time period nor a sample of known probability of selection. However, they do provide a minimum number of deaths and incidents occurring during this time period and illustrate the circumstances involved in the incidents related to children's gates and enclosures.

Date of extraction for reported incident data was 11/05/18. All data, coded under product code 1506 (*Baby Gates or Barriers*), were extracted. Upon careful joint review with CPSC's Directorates for Engineering Sciences staff, some cases were considered out-of-scope for the purposes of this memorandum. For example, incident reports where products were incorrectly coded as children's safety gates were excluded; a report of an adult tripping on a safety gate which subsequently crashed on a child was also excluded. With the exception of incidents occurring in U.S. military bases, all incidents that occurred outside of the United States have been excluded. To prevent any double-counting, when multiple reports of the same incident were identified, they were consolidated and counted as one incident.

incomplete, CPSC staff strongly discourages drawing of inferences based on the year-to-year increase or decrease shown in the reported data.

Table 1 presents the breakdown of the reported incidents, combined for gates and enclosures, by the incident year. Table 2 provides the age breakdown for the combined data, as well as for gates and enclosures, separately; in Table 2, the "unreported" age category includes the incidents where age was unknown or age was not reported because the incident involved no injury.

Table 1: Reported Gates and Enclosures-Related Incidents
01/01/08 – 10/31/18

Incident Year	***Total Number of Reported Incidents***	***Number of Reported Fatalities***	***Number of Reported Nonfatal Injuries***
2008	31	1	12
2009	85	3	17
2010	97	5	17
2011	43	2	13
2012	32	--	6
2013	13	2	3
2014	30	1	5
2015	29	2	9
2016*	23	--	2
2017*	22	2	11
2018*	31	1	13
Total	***436***	***19***	***108***

Source: CPSC epidemiological databases INDP, IPII, and DTHS.
Note: * indicates data collection is ongoing

Table 2: Age Distribution in Gates and Enclosures-Related Incident Reports
1/01/08 – 10/31/18

Age	***Total***		***Gates***		***Enclosures***	
	Frequency	***Percentage***	***Frequency***	***Percentage***	***Frequency***	***Percentage***
Unreported*	125	29	109	28	16	38
0 – Less Than 1 Year	57	13	47	12	10	24
1 – Less Than 2 Years	141	32	125	32	16	38
2 – 4 Years	90	21	90	23	--	--
5 Years or Older	23	5	23	6	--	--
Total	***436***	***100***	***394***	***100***	***42***	***100***

Source: CPSC epidemiological databases INDP, IPII, and DTHS.
Note: Percentages may not sum to 100 due to rounding.
*In this table, age "unreported" implies age was unknown or age was not reported because the incident involved no injury.

Table 3 presents the age distribution of the children who suffered an injury—fatal or nonfatal. Again, the breakdown is shown for the combined data, as well as for gates and enclosures, separately.

Table 3: Age Distribution in Gates and Enclosures-Related Incidents Reporting Fatalities and Nonfatal Injuries among Children Under 5 Years of Age 01/01/08 – 10/31/18

Age of Child	***Total***		***Gates***		***Enclosures***	
	Frequency	***Percentage***	***Frequency***	***Percentage***	***Frequency***	***Percentage***
Unreported*	13	10	7	6	6	40
0 – Less Than 1 Year	24	19	21	19	3	20
1 – Less Than 2 Years	51	40	45	40	6	40
2 – 4 Years	39	31	39	35	--	--
Total	***127***	***100***	***112***	***100***	***15***	***100***

Source: CPSC epidemiological databases INDP, IPII, and DTHS.
*In this table, age "unreported" implies age was unknown.

a. Fatalities

CPSC staff is aware of 19 deaths that reportedly occurred between January 1, 2008 and October 31, 2018. Seventeen of the deaths were associated with the use of a gate while two were associated with an enclosure.

Fifteen of the 19 decedents drowned, 13 in a backyard pool, one in a backyard hot tub and one in a 5-gallon bucket of water inside the house. In these incidents, the decedents managed to get past the gate/enclosure when it was left open or was opened somehow, unbeknownst to the caregiver (10 incidents); the gate/enclosure was knocked down or pushed out by the decedent due to incorrect or unsecured installation (4 incidents); or the decedent climbed over the gate/enclosure (1 incident). The decedents ranged in age from 9 months to 3 years.

The remaining four of 19 total deaths reported: an 8-month-old was found trapped between a mattress and a gate in a recreational vehicle; a 23-month-old was trapped under a TV that fell on him when he was hanging on the edge of a gate that was secured to the TV stand with a rope; a 20-month-old was entrapped between a wall and a repaired/modified gate when the gate partially detached from the wall; and a 2-year-old got his neck entrapped in between two gates that were set up in a stacked configuration.

b. Nonfatal Incidents

CPSC staff is aware of a total of 417 nonfatal incidents related to gates and enclosures that reportedly occurred between January 1, 2008 and October 31, 2018. Of these, 108 incidents reported an injury to a child (younger than 5 years of age).

Three of the injuries were reported as needing hospitalization and two additional injuries needed overnight observation at a hospital. Among the hospitalized were a 2-year-old and an 18-month-old both of whom suffered a near-drowning episode, and another 2-year-old who ended up in a coma due to a fall when she pushed through a gate at the top of stairs. Of the two children who were held at a hospital for overnight observation, one fell down stairs when a gate collapsed and the other swallowed a bolt or screw that liberated from a gate.

Fifteen additional children were reported to have been treated and released at a hospital emergency department (ED). Their injuries included a) finger fractures, amputations, and/or lacerations usually from a finger getting caught at the hinge, and b) near-drowning, poison ingestion, arm fracture, thermal burn, head injury, or contusions.

Among the remaining injury reports, some specifically mentioned the type of injury, while others only mentioned an injury, but no specifics about the injury. Head injuries, concussions, teeth avulsions, sprains, abrasions, contusions, and lacerations were some of the common injuries reported.

The remaining 309 incidents reported that no injury had occurred or provided no information about any injury. However, many of the descriptions indicated the potential for a serious injury or even death.

B. Hazard Patterns

CPSC staff considered all 436 reported incidents (19 fatal and 417 nonfatal) to identify hazard patterns associated with the use of children's gates and enclosures. The hazard patterns were grouped into three sections: product-related, non-product-related, and undetermined. Most of the reported problems (94%) were product-related. The categories and subcategories (in order of descending frequency) are as follows:

a. Product-Related

- ***Hardware issues:*** One hundred and sixty-three of the 436 incidents (37%) reported some sort of hardware-related problems. These problems were due to:
  - lock/latch hardware (*e.g.,* lock or latch breaking, not latching correctly, opening too easily, or getting stuck)
  - hinge hardware (mostly breaking and causing the gate to fall off)
  - mounting hardware (mostly breaking and causing gate to fall off), or
  - other hardware such as a slide guide or a swing-control clip (breaking or coming loose).

  These hardware failures were associated with 38 injuries such as contusions, lacerations, head injuries, and two fractures; five of the injuries were treated in a hospital ED and one needed overnight observation at a hospital.

- ***Slat problems:*** One hundred and seven of the 436 incidents (25%) reported slats breaking or detaching from the gate or enclosure. Sixteen injuries were reported in this category, resulting in contusions/abrasions or lacerations. Once the slat(s) broke, the child either

got injured on it, fell forward through the gap created, or lost balance and fell backward. One of the injuries was treated at a hospital ED.

- ***Poor quality material and finish:*** Fifty of the 436 incidents (11%) reported problems with small parts liberating, splintered welding, sharp edges and protrusions, rails bending out of shape, fabric/mesh panels sagging, and poor quality of stitching on fabric panels. Eighteen injuries, mostly lacerations and abrasions, were reported in this category.

- ***Design issues:*** Forty-two of the 436 incident reports (10%) indicated some problems with the design of the gate or enclosure. The reported problems were with:
  - the opening size between slats or enclosure panels that allowed a child to get their limbs or head entrapped;
  - the pinch-point created during the opening and closing action of the door on the gate or enclosure;
  - a specific design, which created a foot-hold that a child could use to climb over the safety gate; or
  - a specific design which posed a trip hazard when the gate was in opened position.

  Nineteen injuries were in this category, including three fractures of the finger and one severed fingertip, all treated at a hospital ED.

- ***Installation problems:*** Twenty of the 436 incident reports (5%) indicated problems with installation due to:
  - unclear installation instructions;
  - mismatched dimensions between the gate and the doorway/hallway opening, or
  - unknown reasons; in these cases, the gate/enclosure was reported to have been installed, but was somehow "pushed out" or "pulled down."

  Four drowning fatalities were reported in this category. In addition, there were four nonfatal injuries: one a hospitalization of a comatose child; another child treated and released from a hospital ED following a near-drowning episode; and the remaining two, relatively minor laceration/contusion injuries.

- ***Miscellaneous other issues and consumer comments:*** Seven of the 436 incident reports (2%) included three complaints about an ineffective recall remedy, one complaint about poor product packaging, and three consumer concerns about the safety of a specific design. There was one unspecified injury in this category.

- ***Instability issues in enclosures:*** Three of the 436 incidents (< 1%) reported problems with flimsy and/or unstable enclosures. Two laceration/contusion injuries were reported in this category.

- ***Multiple problems from among the above:*** Twenty of the 436 incident reports (5%) described two or more problems from the preceding product-related issues. Two minor injuries were reported in this category.[17]

[17] Redistributing these 20 complaints among the other pertinent subcategories within the product-related issues does not alter the relative ranking of the listed subcategories. However, the redistribution would result in the within-subcategory incident numbers adding up to *more* than the total number of incident reports. To prevent that, the 20 incidents were grouped in a separate subcategory.

b. Non-Product-Related

Eleven of the 436 incident reports (3%) described non-product-related issues, such as incorrect use of the product, or the child managing to bypass the barrier altogether. Specifically:

- Four incidents reported the child ***climbing over*** the gate/enclosure;
- Three incidents reported ***caregiver missteps*** leaving the gate/enclosure not secured in place;
- Three incidents reported misuse of gates in a hazardous manner; and
- One report involving a gate previously ***repaired/modified*** and structurally compromised.

Eight deaths are included in this category; four due to drowning, three due to entrapments, and one due to a TV tip over. Among the three injuries, one required hospitalization following a near-drowning episode, and one fractured arm was treated at a hospital ED; the third injury was a concussion of the forehead.

c. Undetermined

Thirteen of the 436 incident reports (3%) fall into the ***undetermined*** category. There was insufficient information on the scenario-specific details for CPSC staff to definitively determine whether the product failed or user error resulted in the incidents. Seven drowning deaths were reported in this category. Among the five nonfatal injuries, one was a hospitalization due to near-drowning, two were treated at a hospital ED for poisonous ingestion and burn, respectively, and two were minor injuries.

The distribution of the 436 incidents by the hazard patterns described in Sections A through C above are shown in Table 4.

Table 4: Distribution of Reported Incidents, Fatalities, and Nonfatal Injuries Associated with Gates and Enclosures by Hazard Patterns
01/01/08 – 10/31/18

Issues	***Total Incidents***		***Fatalities***		***Nonfatal Injuries***	
	Count	*Percentage*	*Count*	*Percentage*	*Count*	*Percentage*
Product-Related	**412**	**94**	**4**	**21**	**100**	**93**
Hardware	*163*	*37*	--	--	*38*	*35*
Slats	*107*	*25*	--	--	*16*	*15*
Material/Finish	*50*	*11*	--	--	*18*	*17*
Design	*42*	*10*	--	--	*19*	*18*
Installation	*20*	*5*	*4*	*21*	*4*	*4*
Misc Other	*7*	*2*	--	--	*1*	*< 1*
Instability	*3*	*< 1*	--	--	*2*	*2*
Multiple	*20*	*5*			*2*	*2*
Non-Product-Related	**11**	**3**	**8**	**42**	**3**	**3**
Climb-over	*4*	*< 1*	*1*	*5*	*3*	*3*
Caregiver Misstep	*3*	*< 1*	*3*	*16*	--	--
Misuse	*3*	*< 1*	*3*	*16*	--	--
Repaired/Modified	*1*	*< 0.5*	*1*	*5*	--	--
Undetermined	**13**	**3**	**7**	**37**	**5**	**5**
Total	***436***	***100***	***19***	***100***	***108***	***100***

Source: CPSC epidemiological databases INDP, IPII, and DTHS.
Note: Row percentages may not add to subtotal percentages and subtotal percentages may not add to100 due to rounding.
Injuries and fatalities shown were sustained by children under 5 years of age.

National Injury Estimates[18]

An estimated total of 22,840 injuries (sample size=820, coefficient of variation=0.10) related to safety gates and enclosures were treated in U.S. hospital emergency departments over the 10-year period 2008-2017. Until NEISS data for 2018 is finalized in spring 2019, partial estimates for 2018 are not available. The injury estimates for individual years are reported in Table 5. Although there was a statistically significant increase observed in the estimated injuries from 2009-2010, there was no statistically significant trend observed over the entire 2008-2017 period.

[18] The source of the injury estimates is the National Electronic Injury Surveillance System (NEISS), a statistically valid injury surveillance system. NEISS injury data are gathered from emergency departments of hospitals selected as a probability sample of all the U.S. hospitals with emergency departments. The surveillance data gathered from the sample hospitals enable CPSC staff to make timely national estimates of the number of injuries associated with specific consumer products.

All data, coded under product code 1506 (*Baby Gates or Barriers*), were extracted on 04/25/18. Victim age was limited to less than 5 years. Certain records were considered out-of-scope for the purposes of this memorandum. For example, all injuries where an older sibling caused injury by pushing victim into a gate/enclosure or by hitting patient with a safety gate were excluded. Another example, an uninstalled safety gate falling on a child, was also excluded. These records were excluded prior to deriving the statistical injury estimates.

Table 5: Safety Gates and Enclosures-Related Injuries
Among Children Under 5 Years of Age Treated in U.S. Hospital Emergency Departments
01/01/08 – 12/31/17

Calendar Year	Estimated Injuries	Sample Size	Coefficient of Variation
2008	1,910	74	0.16
2009	1,360	66	0.18
2010	2,740	91	0.18
2011	2,450	74	0.19
2012	2,220	82	0.22
2013	2,790	82	0.19
2014	2,410	86	0.20
2015	2,010	85	0.19
2016	2,410	81	0.21
2017	2,550	99	0.22
Total	**22,840**	**820**	**0.10**

Source: NEISS, CPSC. Estimates rounded to nearest 10. Estimated injuries from individual years do not sum to estimated total injuries due to rounding.

No fatalities were reported through NEISS. About 19 percent of the injured victims were less than a year old; 40 percent were at least a year old, but less than 2 years of age; and another 41 percent were at least two, but less than 5 years of age. NEISS injury descriptions are brief and focus more on the injury than the scenario-specific details. As such, a hazard pattern characterization, similar to the one provided above for the incident data, is not feasible. Based on the limited information available, some of the most frequent NEISS injury characteristics were as follows:

- Hazard – falls (57%) and impact on gate/enclosure (31%).
  Most of the falls occurred:
  - when a child successfully climbed over the barrier and (usually) fell down a flight of steps; when a child unsuccessfully attempted to climb over the barrier; or a child-carrying-adult tripped on a gate/enclosure and dropped the child;
  - when gates failed to remain upright and locked; or
  - when a child managed to defeat the barrier by crawling/sliding under, or "getting around" the barrier in an unspecified manner.

  Almost 10 percent of the impact injuries occurred when a child fell down a flight of steps and hit a safety gate at the bottom of the stairs.
- Injured body part – head (40%), face (21%), and mouth (10%).
- Injury type – lacerations (28%), internal organ injury (23%), and contusions/abrasions (20%).
- Disposition – treated and released (97%).

TAB B: Engineering Assessment of ASTM F1004 – 19 Requirements for Gates (CPSIA Section 104)

TAB B

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MARYLAND 20814

Memorandum

June11, 2019

TO: Hope E J. Nesteruk, Gates and Enclosures Project Manager

Through: Mark Kumagai, P.E., Director
Division of Mechanical and Combustion Engineering
Directorate for Engineering Sciences

FROM: Carlos Torres, Mechanical Engineer
Division of Mechanical and Combustion Engineering
Directorate for Engineering Sciences

SUBJECT: ESMC Staff's Review and Evaluation of ASTM F1004-19, *Standard Consumer Safety Specification for Expansion Gates and Expandable Enclosures*

INTRODUCTION

CPSC's Directorate for Engineering Sciences' Division of Mechanical and Combustion Engineering (ESMC) staff reviewed the effectiveness of ASTM F1004-19, *Standard Consumer Safety Specification for Expansion Gates and Expandable Enclosures* for the notice of proposed rulemaking (NPR) under section 104 of the Consumer Product Safety Improvement Act. We examined the evolution of the F1004 standard, and other international children's gate and enclosure standards, and assessed whether ASTM F1004-19 addresses common hazard patterns found in reported incident data. Staff recommends adopting the ASTM F1004-19, without change, in the proposed rule. However, staff has identified several areas for further collaboration with the ASTM subcommittee.

PRODUCTS

Figures 1 and 2 show typical gates and enclosures on the market. Currently available gates and enclosures are constructed of wood, plastic, metal, mesh, fabric, or a combination of any and all of these materials.

(a)

(b)

(c)

(d)

Figure 1: Gate Examples

Figure 2: Enclosure Examples

The products are defined by the ASTM F1004-19 standard as:

> 3.1.7 *expansion gate, n*—barrier intended to be erected in an opening, such as a doorway, to prevent the passage of young children, but which can be removed by older persons who are able to operate the locking mechanism.
> 3.1.7.1 *Discussion*—Such gates are available in a number of different styles of construction and are manufactured from a variety of different materials.
>
> 3.1.6 *expandable enclosures, n*—self-supporting barrier intended to completely surround an area or play-space within which a young child may be confined.
> 3.1.6.1 *Discussion*—Enclosures may be marketed for indoor or outdoor use, or both. Expandable enclosures do not include an attached floor.

Gates

Manufacturers of gates may offer additional extension panels or the ability to widen gate panels to fit the width consumers need to block off an area. In general, gates can be separated into two main categories based on the method by which they are installed: hardware-mounted gates or pressure-mounted gates. Hardware-mounted gates are screwed into anchors or holes in the mounting surfaces and require tools for their semi-permanent installation into walls or doorways. These gates employ an egress panel that retracts (Figure 1a) or swings open (Figure 1b) to allow passage. Pressure-mounted gates require no tools, as their installation is based entirely on the pressure exerted when panels or mounting pins are expanded to fit into the area being obstructed. In some cases, pressure-mounted gates may be installed without damaging the mounting surface. Pressure-mounted gates may also have egress panels to allow passage (Figure 1c), or they may allow passage by retracting and removing the expansion panel entirely (Figure 1d). Some manufacturers of pressure-mounted gates also include wall cups that can be attached to the side-mounting surface (*e.g.*, screws or double-sided tape). Once installed, the pressure pads sit inside the wall mounted cups to securely hold the gate more securely in position (Figure 3).

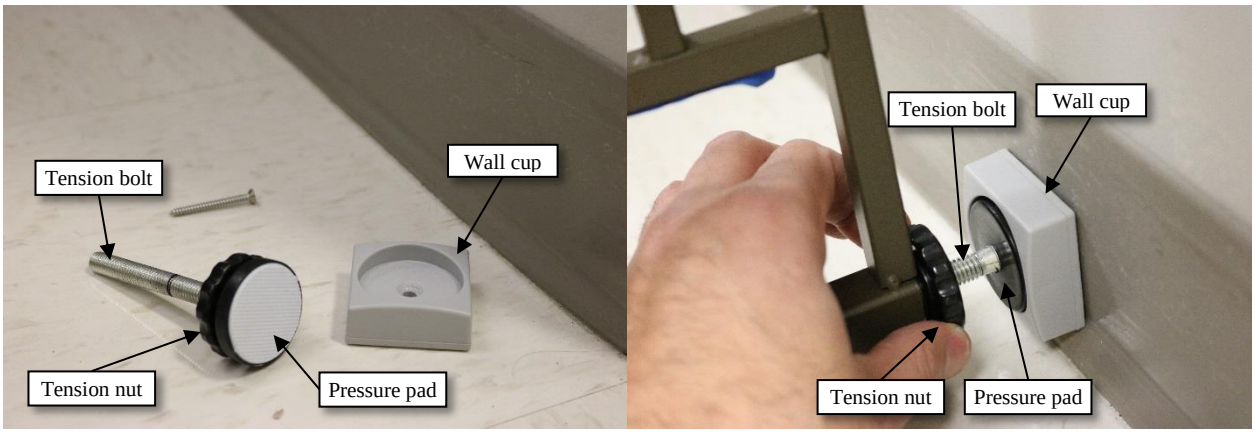


Figure 3: Wall Mounting Cups For Pressure Mounted Gates

Manufacturers have devised a variety of locking and latching mechanisms to prevent children from passing through the barriers: some are single-action lever arms that simply scissor

and hold the barriers in their mounted position, while others are more complex double-action release mechanisms that retain swinging "door" (or egress) panels in their closed position.

Enclosures

Enclosures usually come with four or more panels that can be interlocked to enclose a desired amount of space. One of the panels may be hinged to provide ease of entry/exit using a locking or latching mechanism. Additional panels may be available to purchase separately to expand the contained space even further to allow children to play safely. Several currently marketed enclosures also include toys or other entertainment features on the child's side of the enclosure panels. Enclosures do not have floors or bottom surfaces attached. Rather, the child stands freely on whatever surface on which the enclosure is set on. See Figure 2 for examples of currently available enclosures.

ASTM F1004-19

ASTM F1004-19 addresses numerous hazards with several general requirements most that are also found in the other ASTM juvenile product standards. The following are the general requirements contained in ASTM F1004-19:

- **Wood parts:** Exposed wood parts shall be smooth and free from splinters. Slats are not permitted to contain any lateral/transverse joints, such as finger-joints, or any other means of joining pieces of lumber end-to-end.
- **Threaded fasteners:** Threaded fasteners may not be used on components intended to be removed by the consumer for daily operations.
- **Sharp points:** There shall be no hazardous sharp edges or points as defined by 16 CFR § 1500.48 and 16 CFR § 1500.49.
- **Small parts:** There shall be no small parts as defined by 16 CFR part 1501.
- **Openings:** Holes and/or slots created by wall sections of any rigid material shall be designed to prevent potential entrapment hazard for small fingers.
- **Exposed coil springs:** Exposed coil springs that generate a specified space between the coils shall be covered or designed to prevent injury from entrapment.
- **Scissoring, shearing, and pinching:** Prevent injury to the child from any scissoring, shearing, or pinching when members or components rotate about a common axis or fastening point, slide, pivot, fold, or otherwise move relative to one another.
- **Labeling:** Warning labels shall be permanent and not liberate.
- **Lead paint:** Paint and surface coating on the product shall comply with 16 CFR part 1303.
- **Protective components:** Prevent the removal of caps, sleeves, or plugs used for protection from sharp edges, points, or entrapment hazards by children.

In addition to the general requirements listed above, ASTM F1004-19 contains several performance requirements and test methods specific to gates and enclosures. We discuss each performance requirement below:

- **Completely bounded openings:** Openings within the gate or enclosure, and completely bounded openings between the gate and the test fixture, shall not permit the complete passage of the small torso probe when it is pushed into the opening with a 25-pound force

(Figure 4). This performance requirement addresses incidents where children were found with their heads entrapped after having pushed their way into gaps created between soft or flexible gate and enclosure components, and between the gate and the sides of passageway to be blocked off, *e.g.*, door frame or wall.

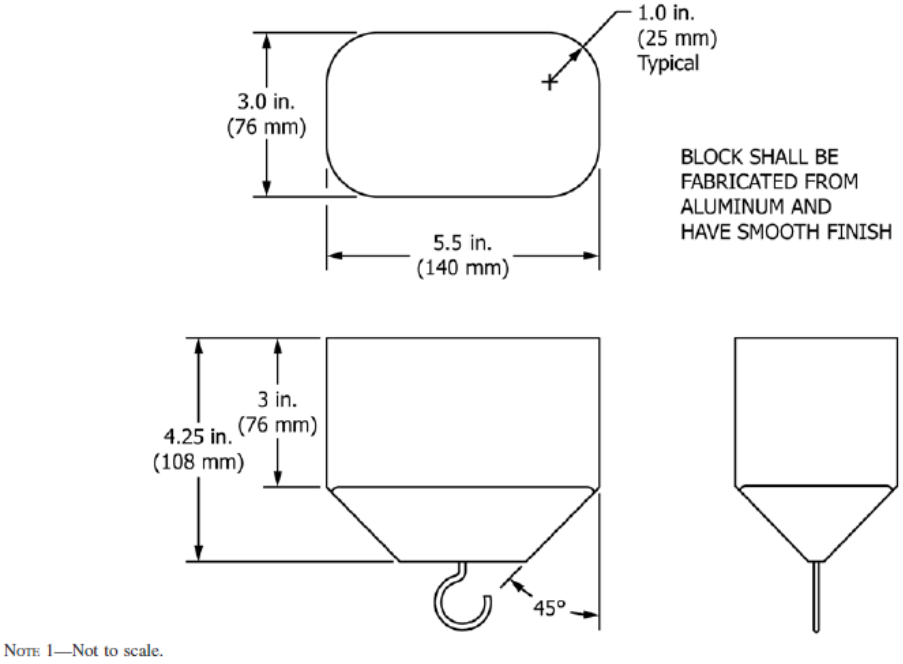


Figure 4: Small Torso Probe

- **Height of sides:** The vertical distance from the floor to the lowest point of the uppermost surface shall not be less than 22 inches when measured from the floor. The purpose of this requirement is to prevent the intended occupant from being able to lean over, and then tumble all the way over the top of the gate.[19]

- **Vertical strength:** After a 45 pound force is exerted downward along the uppermost top rail, edge, or framing component, gates and enclosures must not fracture, disengage, fold nor have a deflection that leaves the lowest point of the top rail below 22 inches from the ground. For gates, the 45 pound vertical test force is applied five times to the mid-point of the horizontal top rail, surface or edge of each gate (or each of the top points of a gate that doesn't have a horizontal top edge). This test is carried out with the gate installed at both the maximum and minimum opening widths recommended by the manufacturer. For enclosures, the 45 pound force is applied to every other uppermost rail, surface, or edge and every other top joint of the enclosure. The purpose of this performance

[19] According to Rationale X1.2.5.2 included in F1004-19, the minimum height of a panel should be about 80% of the height of the maximum aged child in order to retain children of that specified age group (<24 months).

requirement is to ensure gates and enclosures retain their intended occupants even when children hang from or attempt to climb up the gates.[20]

- **Bottom spacing:** The space between the floor and the bottom edge of an enclosure or gate shall not permit the complete passage of the small torso probe when it is pushed into the opening with a 25 pound force. This requirement addresses incidents where children were found with their heads entrapped after having pushed their way, feet first, into gaps created between the gate and the floor.

- **Configuration of uppermost edge:** Partially bounded openings at any point in the uppermost edge of a gate or enclosure that is greater than 1.5 inches in width and more than 0.64 inches in depth must not allow simultaneous contact between more than one surface on opposite sides of the Test Template B (Figure 5). This requirement was intended to address head/neck entrapment incidents reported in the "V" shaped openings common in older, "accordion style" gates such as that shown in Figure 6. The template was dimensioned so as to screen out non-hazardous openings with angles that are either too narrow to admit the smallest user's neck, or too wide to entrap the largest user's head.

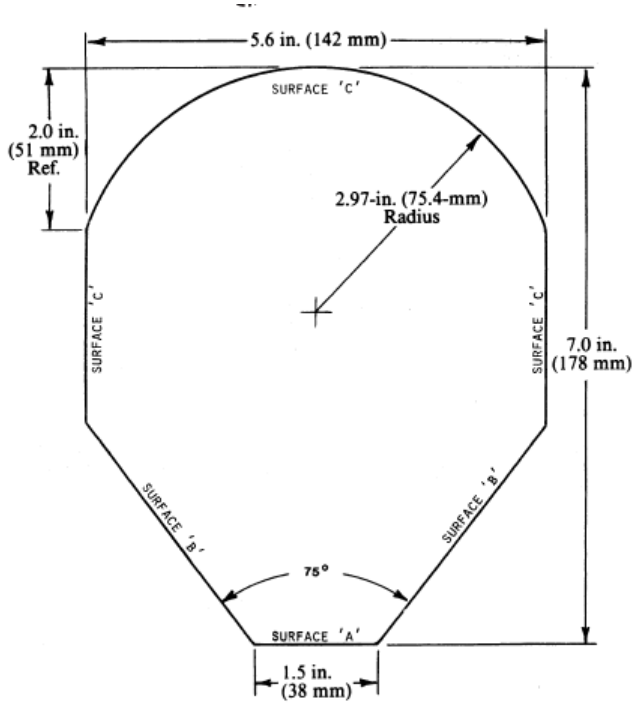


Figure 5: Test Template B

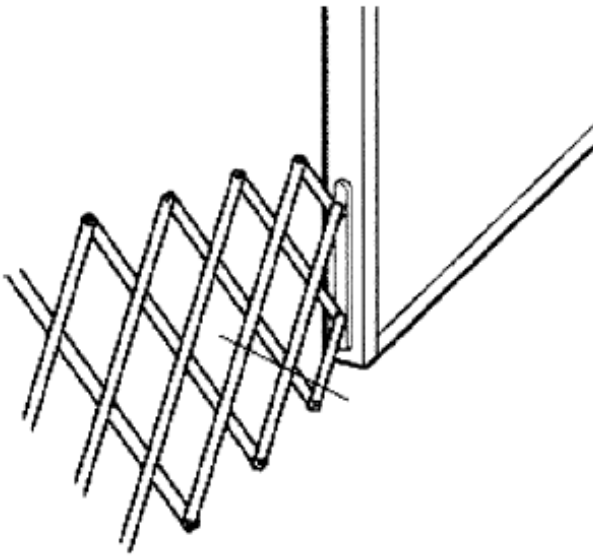


Figure 6: "V" Shaped Openings Along Top of Gates

- **Latching/locking and hinge mechanisms:** This hardware durability test requires egress panels on gates and enclosures to be cycled through their fully open and closed positions

[20] According to Rationale X1.2.6.1, included in F1004-19, the 45-lb. load was selected as the test force because it is considered to be somewhat greater than the force that can be applied by a child of the maximum intended user age.

2,000 times. Pressure gates without egress panels are cycled through installation and removal 550 times. This pre-conditioning test was added to address incidents involving failures of latches, hinges, and hardware. The 2,000 cycles tests the durability of gates or enclosures having egress panels which are expected to be operated twice a day through the lifetime of the product. Pressure gates without egress panels are intended to be installed in locations not accessed as frequently, and thus are durability tested through a reduced 550 cycle test.

- **Automatic closing system:** Immediately following the cyclic preconditioning test, an egress panel marketed to have an automatic closing feature must continue to automatically close when opened to a width of 8 inches as well as when it is opened to its maximum opening width. The purpose of this provision is to ensure that a gate fully closes and locks as it is expected and advertised to do, thereby reducing the likelihood of an occupant accessing potentially hazardous conditions on the other side of an unintentionally unsecured gate.

- **Push-out strength:** Five test locations are specified for this test: the four corners of the gate as well as the center. A horizontal push-out force is applied five times to each of the test locations and the maximum force applied before the gate pushes out of the test fixture is recorded and averaged for each test location (up to a maximum of 45 lb). The average push-out force shall exceed 30 lb in all five test locations (and no individual force less than 20 lb.) The purpose of this requirement is to prevent the intended occupant from being able to dislodge the gate and gain access to a hazardous area the gate was meant to protect them from. The maximum force of 45 lb was selected because it simulates the effects of the largest intended occupant's weight.

- **Locking Devices:** Locking devices shall meet one of two conditions: 1) if the lock is a single-action latching device, the release mechanism must require a minimum force of 10 lb to activate and open the gate, or else 2) the lock must have a double action release mechanism. The purpose of this provision is to prevent the intended occupant being contained by the gate from being able to operate the locking mechanism.

- **Toys:** Toy accessories shall not be attached to, or sold with, a gate. Toy accessories attached to, removable from, or sold with an enclosure, shall meet applicable requirements of specification ASTM F963 *"Consumer Safety Specification for Toy Safety."*

- **Slat Strength:** This test verifies that no wood or metal vertical members (slats) completely break or either end of the slats completely separate from the gate or enclosure

when a force of 45 pounds is applied horizontally.[21] The test is conducted on 25 percent of all gate slats, excluding adjacent slats. The purpose of this performance requirement is to ensure gates and enclosures retain their structural integrity when children push or pull on the gates' slats.

- **Label testing:** Paper and non-paper labels (excluding labels attached by a seam) shall not liberate without the aid of tools or solvents. Paper or non-paper attached by a seam shall not liberate when subjected to a 15-lb pull force.

- **Warning, Labeling and Instructions:** Specifies the marking, labeling and instructional literature requirements that must appear on each gate or enclosure.[22]

HISTORY OF ASTM F1004

Summary of Significant Revisions 1986-2013

The voluntary standard for gates and enclosures was first approved and published in 1986 (ASTM F1004-86, Standard *Consumer Safety Specification for First-Generation Standard Expansion Gates and Expandable Enclosures*.) Between 1986 and 2013, ASTM F1004 underwent a series of revisions to improve the safety of gates and enclosures and the clarity of the standard. Nine of these revisions occurred between 2000 and 2013. Revisions during this time period including provisions to address head and neck entrapments, foot-pedal actuated opening systems, warnings, evaluation of all manufacturer's recommended use positions, test fixture improvements, entrapment in openings along the side of the gate, lead-containing substances in surface, along with other minor clarifications and editorial corrections.

Throughout the development of ASTM F1004, beginning in 1986, the subcommittee members, including CPSC staff, considered requirements for a push-out force for gates. However due to technical difficulties, they were not able to develop repeatable test methods.

In 1997, ASTM formed a task group to revisit push-out tests and requirements in ASTM F1004. The task group began to develop the 30 lb requirement for top of stairs gates, resulting in a 2000 revision that included a pushout test requirements for gates to address stair falls. Gates intended for top of stair use were required to withstand a 30 lb average push force when mounted in a test frame. Gates that could not meet the 30 lb push-out force were required to have the following warning: *To prevent falls, never use at top of stairs.* Most pressure gates were not able to meet the 30 lb push-out force and were required to use that label.

In 2004, ASTM revised the standard to include a minimum average push-out force of 10 lb for all gates. This requirement provided a minimum push-out force for gates that are not

[21] According to Rationale X1.2.6.6 included in F1004-19, the 45 lb force was selected as the test force (with added 15% as a margin of safety) based on the 95th percentile *"pull"* force of 2-year-old males (38.5 lb) found in study titled, "A Study of the Strength Capabilities of Children Ages Two through Six," by Brown & Buchanan, 1973.
[22] Refer to Tab C for Division of Human Factors memorandum for discussion.

intended for use at the top of the stairs. The provision established earlier in the 2000 revision of the standard for top of stair gates, remained in effect.

Summary of Significant Revisions 2014-present

The history of the more recent revisions are detailed below, beginning with F1004-15 (approved May 2015) through the most recently approved version, F1004-19. These revisions were:

ASTM F1004-15 (approved on May 15, 2015) included minor editorial revisions and the following new requirement:

- Packaging must indicate the range of operating widths for which the gate is designed.

ASTM F1004-15a (approved on July 15, 2015) included the following revisions and additions:

- A revision to the double action release mechanism definition
- A minor revision to the enclosure definition
- A new definition for "extension panels"
- A revision to the definition of the manufacturer's recommended use position
- A revision to specify that products must comply with all requirements with and without the use of any and all extension panels
- An additional requirement prohibiting the use of lateral/transverse joints on wood slats
- A new requirement that locks must either have double action release mechanism or else they must pass a minimum operation force requirement test (to help prevent gates from being unlocked by their intended young occupants)
- A revision clarifying that gates/enclosures must pass performance requirements when installed in any of the manufacturer's recommended use positions

ASTM F1004-16 (approved on January 1, 2016) included minor editorial revisions as well as a clarification to the definition that:

- Enclosures do not include an attached floor.

ASTM F1004-16a (approved on July 1, 2016) included the following revisions and additions:

- A definition for "automatic closing system"
- A definition for "egress panel" and clarification that pressure mounted gates that require the pressure to be released in order to allow passage, are not considered to contain an egress panel.
- A definition for "hold open mechanism" (an override mechanism as it relates to automatic closing system)
- A definition for "pressure mounted gate"
- A new requirement that prohibits toys from being attached to or sold with gates, but that allows toys to come with enclosures as long as they meet the applicable requirements of ASTM F963 "Consumer Safety Specification for Toy Safety."

- A clarification that the openings in the "Completely-Bounded Openings" performance requirement are the ones contained within the gate or enclosure, and created between the gate and test fixture.
- A revision to the vertical strength requirement that the unit must remain in its manufacturer's recommended use position and all locks/latches must function as normal upon completion of testing. Furthermore, a revision was made to expand this requirement for enclosures to test not only every other joint between enclosure panels, but also the top rail of every other enclosure panel.
- A revision to the completely bounded openings test which requires openings to be tested by a probe in combination with a 25 lb (rather than the previous test, which called for simply checking opening dimensions against a template)
- A new hardware durability test that will cycle egress panels through the full opening and closing motion 2,000 times and pressure gates without egress panels will be cycled 550 times through installation/removal
- A new requirement for automatic closing systems to continue to operate as advertised after the hardware cycle test is complete (the automatic closing action should function from the maximum and minimum opening widths)
- A revision to the test fixture specification to designate for use with a variety of the test methods (not only the push-out test it was previously specifically for)
- A revision to the installation instruction requirement to provide information regarding where to install the gate, relative to the floor.

ASTM F1004-16b (approved on July 15, 2016) included editorial revisions, updated warning labels, as well as:

- An addition of testing guidelines to specify the order in which the tests should be conducted.

ASTM F1004-18 (approved on May 15, 2018) included the following revisions and additions:

- A revision to the latching/locking and hinge mechanism requirement that the device must remain engaged and operational during and upon completion of testing.
- A new requirement that will test the strength of wood and metal slats.
- A revision to the test fixture construction and setup.
- A revision to the procedures of completely bounded openings and bottom spacing test, and push-out tests to improve repeatability and reliability of results.
- A revision to the marking and labeling requirements affixed to gates and enclosures to include, among other things, manufacturer's information, unit's manufacturing date, and warnings format similar to ANSI Z535.4, *American National Standard for Product Safety Signs and Labels*. This revision also expands the requirement to retail packaging.
- A revision to the installation instruction requirement to specify the minimum distance to the first step of the stairs for gates that are recommended for use at the top of stairs.

ASTM F1004-19 (approved on June 1, 2019) included the following revisions and additions:

- All gates will meet 30 pounds of push-out force with provisions which allow the use of wall cups to meet this requirement.
- Gates that use wall cups will require consumer interaction because the wall cups must:
  - be attached to the main panel of the gate,
  - be attached to the tension bolt pressure pads, or
  - be designed to be so integral to the gate that the gate cannot be used without wall cups.
- The packaging for wall cups must include a warning about wall cup use.
- Gates that use wall cups must include the warning language *"You MUST install wall cups to keep gate in place. Without wall cups, child can push-out and escape."*

OTHER RELEVANT STANDARDS:

Staff reviewed two international standards which address gates and enclosures:

- The European Standard, EN 1930:2011/A1 Child use and care articles – Safety barriers – Safety requirements and test methods
- The Canadian regulation, SOR/2016-179 Expansion Gates and Expandable Enclosures Regulations (the Canadian regulation refers to an outdated 1986 version of ASTM F1004 which has been superseded by recent versions.)

ESMC staff concludes the ASTM standard is equivalent to, or more stringent than, other international standards in most areas and addresses the hazard patterns seen in the incident data reported to the CPSC. Table 1 summarizes the relevant differences for each standard with further discussion below.

Table 1. International Standards Comparison

Requirement	ASTM F1004	EN 1930	SOR/2016-179	Comments
Side Height and Vertical Load	22 inches[23] with 45 lb vertical load.	25.5 inches with 56 lb vertical load.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM is adequate
Foot hold	Label – stop using when child can climb over gate.	Foot probe test	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM is adequate

[23] The ASTM subcommittee concluded that 22 in. is a sufficient height to retain a child of the specified age group.

Table 1. International Standards Comparison				
Requirement	**ASTM F1004**	**EN 1930**	**SOR/2016-179**	**Comments**
Head entrapment	Torso probe (3 x 5.5 inches[24] with 25 lb push force)	Torso probe (2.5 x 4.1 inches with a 6.75 lb push force)	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM more stringent
Latch/Lock	Double action release mechanism or single action mechanism with a minimum 10 lb force. Foot-operated release mechanism with a minimum 35 lb force. Shall function after 2,000 cycles	Double-action release mechanism or two separate but consecutive release actions. Shall function after 300 cycles.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM more stringent
Automatic Closing system	Maximum and minimum opening width of 8 inches (the minimum hip breadth of an adult caregiver)[25] Shall operate after 2,000 cycles of latch/lock conditioning test.	Maximum and minimum opening width. Requires audible or visual means of indicating whether the barrier has closed or remains open. Shall operate 10 times after 300 cycles of latch/lock conditioning test.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM more stringent

[24] Per the 1975 SAE Anthropometry of U.S. Infants and Children, the 5th percentile 5 to 6 month old's buttocks depth is 3.0 in. (actually reported as 2.99 in.). Per the 1977 University of Michigan Anthropometry of Infants, Children, and Youths, the 5th percentile 6 to 8 month old's hip breadth is 5.5 in.

[25] According to current anthropometric data, 8 inches is the minimum width a gate would need to open to allow passage based on a small female of child-bearing age. (Source: PeopleSize Pro v 2.02).

Table 1. International Standards Comparison				
Requirement	**ASTM F1004**	**EN 1930**	**SOR/2016-179**	**Comments**
Scissoring shearing, pinching	Dimensional tolerances provisions for the complete gate/enclosure design that address scissoring, shearing, and pinching.	Specific dimensional tolerances for the gap created between the frame and the egress panel on pressure mounted gates (Figure 8). The gap is evaluated with a 56 lb vertical load on top center of the barrier.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM is adequate
Entanglement by protruding parts	No requirement exists.	Ball chain loop test.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM is adequate
Entrapment in V shaped opening	Test Template B (Figure 5)	No requirement exists.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM more stringent
Plastic bag in packaging	No requirement exists.	Several plastic bag dimensional and tolerance provisions.	No requirement exists.	ASTM is adequate
Construction – structural integrity	No wood screws. Slat strength test with 45 lb force application on 25% of all slats. 2,000 cycles of latch/lock conditioning test.	No staples. Rattle test at top edge for 1,000 cycles. Push-pull test with 31.5-lb force for 10,000 cycles.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM is adequate

Table 1. International Standards Comparison				
Requirement	**ASTM F1004**	**EN 1930**	**SOR/2016-179**	**Comments**
Push-out - Security	30 lb push out test in 5 gate locations.	22-lb force impact test in 6 gate locations.	No requirement exists. Regulation refers to a 1986 version of ASTM F1004 standard already superseded by recent versions.	ASTM is adequate
Chemical	16 CFR part 1303 Ban of Lead-Containing Paint 16 CFR part 1500 Hazardous Substances Act Regulations	Provision for specific controlled toxic substances	Provision for specific controlled toxic substances	ASTM is adequate
Flammability	No requirement exists.	Provision for textile flame resistance (if textile covers 5% of total barrier area)	Flame spread time greater than 7 sec per CAN/CGSB-4.2 No. 27.5, Textile Test Methods: Flame Resistance - 45° Angle Test - One-Second Flame Impingement	ASTM is adequate
Protective Components	15-lb pull force in the direction associated with removal. 3 lb-in torque in counter and clockwise direction until an 180° rotation is attained.	20-lb pull force in any direction 3 lb-in torque in counter and clockwise until an 180° rotation is attained.	20-lb pull force in any direction	ASTM is adequate

Side Height and Vertical Load

The EN and ASTM standards address the scenario of a child leaning over the top edge by specifying a minimum side height and vertical load requirement (see Table 1). The EN standard height and load are slightly higher than the ASTM standard, however a lack of related incident reports of children falling over the top edge, when leaning against a gate/enclosure, suggests that the ASTM standard height and vertical load requirements adequately provides an equivalent level of safety.

Foothold

The EN standard includes requirements that define and prohibit features that could be used as footholds (*e.g.*, horizontal bars/slats, wires, intersection or adjacent structures.) ASTM does not include performance provisions that address footholds; however, it is addressed by warning labels instructing caregivers to stop using when child can climb over gate. The incident data suggest less than 1 percent of reported incidents and approximately 33 percent (weighted frequency distribution for the years 2008-2017) of NEISS incidents were climb over. Although

the EN standard does prohibit certain footholds, CPSC staff are unable to show that all the reported climb over incidents are directly related to footholds. In addition, other product standards, such as full-size cribs, include provisions to limit footholds, but incident data still show a number of climb out incidents, suggesting that prohibiting footholds does not prohibit climbing. Finally, Figure 7 is a screen shot from a "viral video" that made rounds on social media several years ago. The baby gate in the photo appears to follow the EN prohibition on horizontal foot holds; however, the young child is able to climb the gate. For the reasons above, ESMC staff cannot conclude that the prevention of footholds in the EN standard would improve the safety of baby gates.

Source: https://www.youtube.com/watch?v=DZt4n3lh8lQ

Figure 7. Child climbing European-style vertical-bar gate

Head Entrapment

The ASTM test probe dimensions are based on the smallest dimensions of a mobile occupant (5^{th} percentile 6-month-old), so staff does not believe reducing the size of the probe, as with the EN standard, would have any beneficial effect on the number of incidents being reported. Therefore, staff considers the ASTM standard the more stringent standard given the stronger force behind the probe test.

Latch/Lock

Staff considers the ASTM standard a more robust requirement than EN standard since it requires a 2,000 cycle endurance test versus the 300 cycle EN endurance test. Additionally, ASTM requires a minimum release force for single hand- or foot-operated latch/lock.

Automatic Closing System

Staff considers the ASTM requirement more stringent, because the test is carried out after the system has been operated a total of 2,000 cycles rather than 300 cycle per the EN standard.

Scissoring, Shearing, and Pinching

The EN standard has requirements for the gap created between the frame and the egress panel on pressure mounted gates (Figure 8) to prevent crushing limbs. The gap is also evaluated while a 56 pound load is applied to the top center of the barrier. The incident data collected by the CPSC do not indicate a pattern of injuries associated with limbs being crushed in this gap

with or without a load being simultaneously applied to gates. Therefore, staff considers the existing ASTM standard adequate.

Figure 8: Pressure Mounted Gate with Gap Under Egress Panel

Protruding Part Test

The EN standard assesses the configuration of the top edge of a barrier by running a ball chain loop along the top surface in order to prevent children who are wearing necklaces or other items around their necks from being hanged from the top edge of the gate. The incident data collected by the CPSC do not indicate a hazard pattern associated with children being hanged by their necks when something they were wearing snagged on protrusions along the top of gates/enclosures. Therefore, staff considers the existing ASTM standard adequate.

Neck Entrapment in V Shaped Opening

The EN standard does not have a requirement to prevent neck entrapments. The foothold requirements may indirectly address this hazard. Since the EN foot probe is substantially different than the ASTM Test Template B (for addressing head entrapment in "V" shape openings), a direct comparison of the two tests would require extensive analysis. The ASTM standard evaluates the uppermost edge with the goal being to eliminate entrapments and suffocation directly in any "V" shaped openings such as those found in the older, accordion style gates (Figure 6). While these tests are too dissimilar to provide a basis for comparison, historical data indicate that entrapments and deaths in "V" shaped openings were common. Based on the effectiveness of the ASTM standard to directly address the strangulation hazard associated with V-shaped opening, staff considers the ASTM standard to be more stringent than the EN standard.

Plastic bag in packaging

The EN standard contains a requirement specifically to address plastic bags used in packaging. The ASTM standard requires no such provision, and the data reveal no evidence to indicate such requirements are needed. Therefore, staff considers the existing ASTM standard adequate.

Construction and Structural Integrity

The EN standard includes a rattle test to evaluate the durability of gate hardware. Gates are shaken back and forth by their top edge 1,000 times and, at the conclusion of the test, all mounting hardware, opening systems, locks, and latches must remain engaged, and continue to be operable. The EN standard also requires hardware to hold up to a second "push-pull" cyclic test which applies a 31.5 pound force back and forth for a total of 10,000 cycles. CPSC staff conducted a comprehensive test of 30 gates to evaluate adoption of a similar EN durability test. Ten gates (known to have issues) were shaken back and forth with a 27-pound force a total of 9,000 cycles. A second set of the same ten variety models gates was subjected to an "accelerated aging" rattle test which cycled the gates back and forth using a 45 pound force for a total of 3,000 cycles. A third set of the same ten models gates ("controlled gates") were not subjected to these rattle tests. All three sets were then sent through the relevant existing ASTM tests. At the conclusion of this comparison test, "rattled" versus "un-rattled," there was no clear evidence that the pre-conditioning rattle test caused gates to fail any more frequently than the un-rattled "control" gates. Given the lack of evidence that a cyclic pre-conditioning test might identify low quality gates, staff and the ASTM subcommittee determined adding this type of testing would be of no value. The subcommittee determined the 2,000 cycle locking/latching test was adequate for identifying/eliminating poor quality products known to have hardware issues. Additionally, structural integrity requirements in ASTM such as slat strength address fasteners such as staples, glue joints or welds.

Push-out - Security

The EN standard includes an impact test which calls for a 22 pound impactor to swing into the gate five times in six different locations of a barrier (the four corners, the center, and the middle of the top rail). The relative swing heights for each location are: 3 inches for each of the four corners, 6 inches for the center, and 5 inches for the middle of top rail. At the end of each of these tests, barriers shall not have shifted more than one inch from their initial mounting position. The ASTM requirement calls for a 45-pound force to be pushed five times into five different locations of each gate (four corners and the center), and the maximum force achieved before the gate is dislodged is recorded. The average force at each location shall be greater than 30 pounds. Direct comparison between the EN impact requirements and the ASTM 30 lb average push out force requirement is difficult since these are different physical measurements. The 30 lb push out force was based on European standards, and limited child strength data. Staff agrees with the ASTM rationale for a 30 lb push out force and finds the ASTM standard adequate, when the gate is installed correctly. Staff believes that additional collaboration with ASTM is necessary to develop a performance requirement that will inform consumers when pressure mounted gates are not properly installed.

Hazardous Material

The EN standard and Canadian regulation contain a comprehensive list of specific controlled toxic substances. The ASTM standard contains a requirement for compliance with 16 CFR part 1303 (lead content) and references 16 CFR part 1500 (hazardous substances). The incident data reported to the CPSC do not indicate these other EN standard and Canadian regulation substances are a common cause of injury or hazard. Therefore, staff considers the

ASTM standard adequate, despite having no specific limitations on the use of these various substances.

Flammability

If a textile covers more than 5 percent of the total barrier area, the EN standard requires textile components to have a specified flame resistance. The Canadian regulation requires the flame spread time to be greater than 7 seconds. While the ASTM standard includes no similar provisions, incident data does not indicate a pattern of hazards associated with flammability; therefore, staff finds the ASTM standard to be adequate.

Protective components

The EN, Canadian and ASTM standards call for protective caps to cover the ends of cut metal tubing or any points or corners. The EN and Canadian standards require that the component remains in place when pulled by a 20 pound force in any direction, whereas the ASTM requires a 15-pound pull force in the direction associated with its removal. The EN and ASTM include an additional test of applying 3 lb-in torque in both counter and clockwise directions until an 180^{o} rotation is attained. A lack of related incident reports suggests the ASTM standard has been adequate in addressing removal of protective components and small parts hazards.

ADEQUACY OF ASTM F1004-19 REQUIREMENTS

CPSC staff is aware of a total of 436 reported incidents related to gates and enclosures. Of the 436 incidents, 394 were associated with the use of a gate while 42 were associated with an enclosure. Nineteen of the incidents reported a fatality; 108 of the 417 nonfatal incidents reported an injury. These incidents were reported to have occurred between January 1, 2008, and October 31, 2018. Staff categorized the 436 incidents into the following hazard patterns[26]:

Staff considered each hazard pattern to assess the adequacy of ASTM F1004-19.

Hardware Issues: More than a third of the incident reports (37 %) that CPSC collected involved hardware failures: broken hinges, locks, mounting brackets, etc. led to contusions, lacerations, head injuries, and two fractures. In July 2016, the ASTM subcommittee added a new hardware durability requirement to ASTM F1004-16a (section 6.2), to address exactly these types of problems. After comprehensive lab testing, CPSC staff recommended including a latching/locking and hinge performance test which cycles gates through 2,000 complete "open and closing" cycles (550 installation/ removal cycles for pressure gates without egress panels). This test identified gates known to have hardware issues such as those found in the incident data. Directorate for Engineering Sciences, Division of Mechanical and Combustion Engineering (ESMC) staff considers this performance requirement adequately addresses the hardware failures hazard pattern.

[26] Tab A: Gates and Enclosures-Related Deaths, Injuries, and Potential Injuries.

Slat Problems: A quarter of the incident reports (25%) involved slats breaking or detaching from gates or enclosures resulting in contusions and lacerations. The ASTM F1004-18 standard included a performance requirement (section 6.6) that slats must withstand a 45 pound force, which is the pulling force of the largest intended occupant.[27] ESMC staff considers this performance requirement, adequately addresses the slat failure hazard pattern.

Poor Quality Material and Finish: The incident reports (11%) captured in this category included problems with small parts breaking free to become potential choking hazards, splintering wood or welding, sharp edges, protrusions, rails bending out of shape, fabric/mesh panels sagging, and poor quality of stitching on fabric panels. ASTM F1004-19 contains many general requirements which address these issues (sections 5.1 through 5.10). In 2015, the standard expanded the wood parts provision to ban the use of transverse/lateral joints in all wood components. The 2016 and 2018 updates to the completely bounded openings and bottom spacing test, which now simulates a child pressing through openings (versus the previous, basic template evaluation) will also help reduce issues with rails or flexible barrier materials bending out of shape. ESMC staff considers these performance requirements, along with the recent revisions, effectively address breaking gates creating choking and or laceration hazards.

Design Issues: Approximately ten percent of the incident reports involved problems with some aspect of the design of gates or enclosures, such as the opening size between slats or panels that allowed for entrapments, moving gate components causing scissoring or pinching issues, features that were able to be used as footholds, or sections that posed a trip hazard when the gate was in an opened position. ASTM F1004-19 contains several performance tests (sections 7.10 and 7.11) that specifically address entrapments in openings, including the 2016 and 2018 updates to the completely bounded openings and bottom spacing tests which replaced simplistic evaluations of openings using a template with more stringent probe tests. The general openings and scissoring, shearing, and pinching performance requirements also help address reports captured in this category (sections 5.5 and 5.7, respectively). ESMC staff assess the latest version of the standard, including the revised performance requirements, adequately addresses this hazard pattern.

Installation Problems: Five percent of the incidents fall into this hazard pattern. Some of these incident reports identify problems with unclear instructions, mismatched dimensions between gates and the openings they were meant to fit into, and failure of the gate to remain upright in the opening. ASTM F1004-19 includes several warning, labeling, and instructional provisions and revisions (sections 8 and 9) that require gates to clarify proper installation. Refer to Tab C for Division of Human Factors memorandum for discussion.

Miscellaneous: Miscellaneous issues found in the incident reports (2%) include three complaints about an ineffective recall remedy, one complaint about poor product packaging, and three

[27] The 45-lb force used in the Slat Strength test was based on the 95th percentile "pull" force of 2-year-old males (38.5 lb). The "pull" force is found in a study titled, "A Study of the Strength Capabilities of Children Ages Two through Six by Brown & Buchanan, 1973. The "pull" force value was used since it was larger than the push force found in the study, and children may both push and pull on gates. The forces for a 2-year-old child were used, recognizing that this child is between the ages of 2 and 3, and larger than the recommended age for a gate or enclosure, a 15 percent safety factor was added, and then rounded up to 45 lbs.

consumer concerns about the safety of a specific design. At this time, no provisions in the ASTM standard addresses the various incidents falling into this miscellaneous category. Because these miscellaneous issues are not widespread, and most of them do not relate directly to the safety of the gate or enclosure itself, ESMC staff considers the existing ASTM standard adequate.

Enclosure Instability: A few incident reports (< 1%) came from consumers who described problems with flimsy or unstable enclosures. ASTM F1004-19 contains a couple requirements which help address the product durability issues reported in these enclosure incidents. The vertical strength requirement (section 6.1.3) was expanded to test not only the joints between the enclosure panels, but also to test the top rails of the panels themselves. Additionally, the cyclic locking/latching test (section 6.2) will help ensure that the hardware in these products is durable and capable of withstanding regular use. Many of the general requirements, such as those concerning sharp edges, small parts, wood parts, and protective components (sections 5.1 through 5.10) also help to address issues captured in this category. ESMC staff considers these performance requirements, along with the recent revisions, effectively address this hazard pattern.

Multiple: Twenty reports (5%) described two or more problems from the preceding product-related issues. Given the assessment of the performance requirements to address these issues as described above, ESMC staff considers the existing ASTM standard adequate.

Climb Over[28]: ASTM does not include performance provisions that address climb over. However, this hazard is addressed by warning labels instructing caregivers to stop using the gate when the child can climb over it. As discussed in the previous section (Footholds) of this memorandum, staff is not aware of an effective and reasonable performance requirement to address climb over. For this reason, ESMC considers the existing ASTM standard adequate.

[28] Climb Over was categorized as non-product related hazard in Tab A. Since ASTM and EN standards have provisions to address this issue, the climb over hazard was considered in the evaluation of the adequacy of the ASTM standard.

FUTURE COLLABORATION WITH ASTM

Visual Side-pressure Indicators (for pressure-mounted gates without wall cups)

Twenty of the push-out hazards in the incident data[29] are attributed to installation issues. In January 2018, staff presented to the F15.16 subcommittee a performance requirement to improve the installation of pressure-mounted gates; which consisted of the use of visual side-pressure indicators. Because pressure-mounted gates rely on friction force to resist a push out force applied to the gate, side pressure force (i.e., the normal force) is a key component to the gate performance. The more side pressure force exerted by the gate to the wall/door opening, the more resistance to push-out forces.

Currently, the ASTM standard does not require pressure-mounted gates to provide the consumer with a reliable feedback that the gate has been installed correctly with enough side pressure to prevent a child from knocking it over. Some of the designs require the user to push or pull on the gate to have a *feel* that the gate is properly installed (e.g. *"turn the nut…until the gate is snug", "turn the hand wheels until firm tension is achieved"*) or to make precise measurements (e.g. the distance between the gate frame and the wall to ensure both sides are equally spaced, or the gap within the latch/lock mechanism). These tasks are often subjective in nature or cumbersome to achieve to guarantee a proper installation.[30]

Staff observed that even when following the manufacturer's instructions, the push-out force varied each time the gate was re-installed and tested. Staff also observed that with a metal gate tested, where tension bolts and nuts are used to secure it in place, only a half rotation of the tension nuts would change the distance between the gate and the test fixture by 0.032 inches and result in a gate meeting or not meeting the 30 pound push-out force requirement, Figure 9. These adjustments are barely noticeable to the average consumer, which rely only on *feel* or precise measurements, and no other feedback. Staff believes that visual side pressure indicators could improve installation and the security performance of the gate. Such a requirement would also allow consumers to receive confirmation that a gate was installed with at least as much pressure as when it was tested.

[29] Refer to Tab A for Division of Hazard Analysis memorandum for discussion.
[30] Refer to Tab C for Division of Human Factors memorandum for discussion.

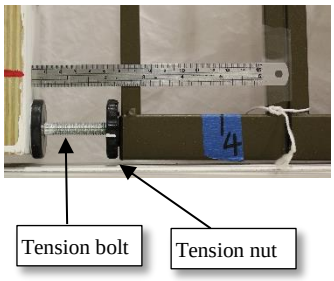
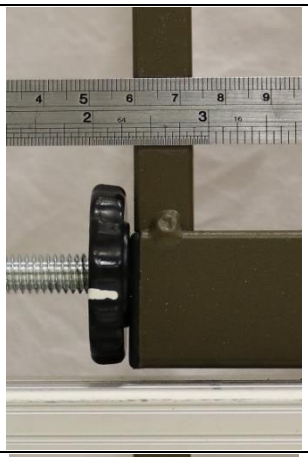
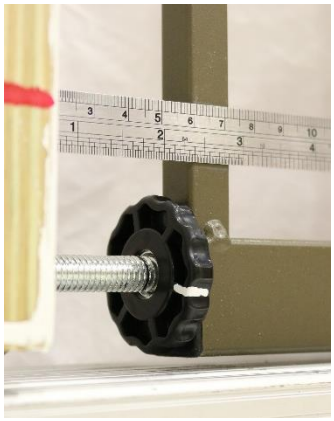
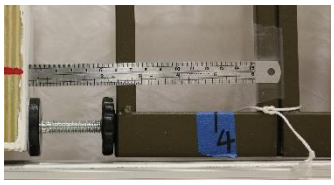
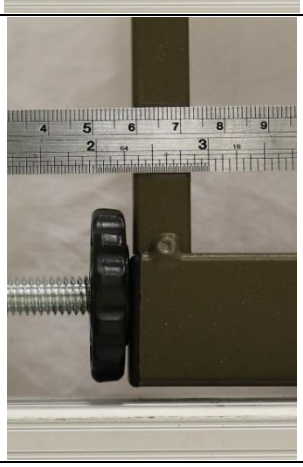
			35.2 lb of push-out force. Met 30 lb requirement.
			28.7 lb of push-out force. Did not meet 30 lb requirement.
View from user's perspective.	Close-up	Tension nut half rotation.	

Figure 9. Result of Half-Rotation of Tension Nut
(the white mark on tension nut was added for ease of visualization)

Staff became aware of four gates on the market with integrated side pressure indicators shown in Figure 10.

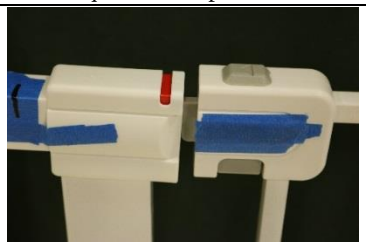
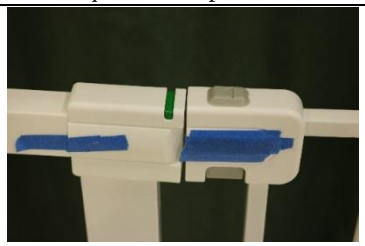
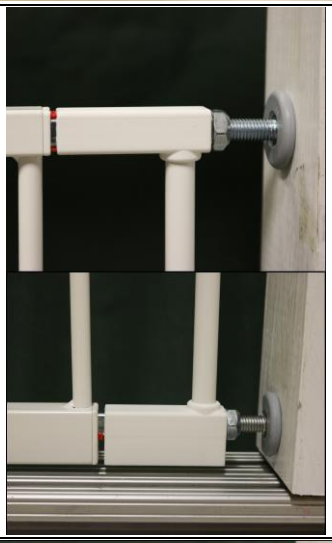
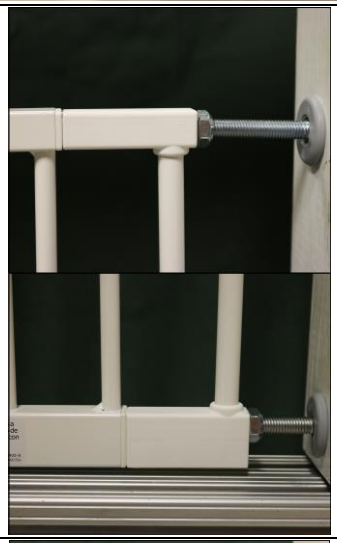
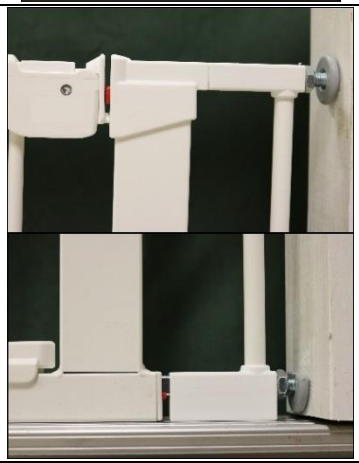
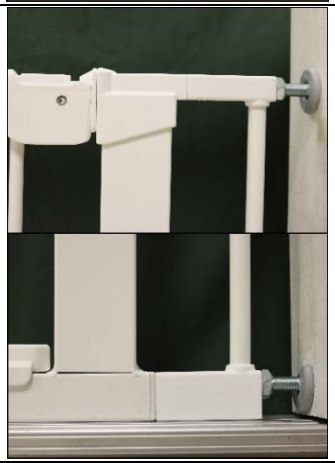
	Indicator not yet engaged. Corresponding rail has not yet reached required side pressure.	Indicator engaged. Corresponding rail has reached required side pressure.
Gate "I" (Visual pressure indicator in top rail.)		
Gate "J" (Visual pressure indicator in bottom rail.)		
Gate "K" (Visual pressure indicators in both the top and bottom rails)		
Gate "L" (Visual pressure indicators in both the top and bottom rails)		

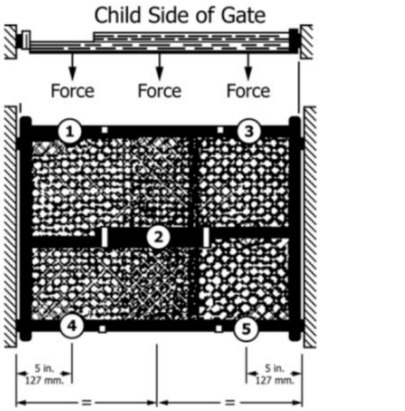
Figure 10. Gates with Integrated Visual Side Pressure Indicator

Each gate was tested to the ASTM push-out requirements, Table 2

Table 2. Visual Side Pressure Indicator Effectiveness Comparison

	Gate ID	Average Push-out Force [1] [2] [3] [4] [lb]					
		Location #1	Location #2	Location #3	Location #4	Location #5	Result [5]
Without indicator [6]	**A**	29.1	27.8	21.7	23.2	16.8	**FAIL**
	D	21.0	18.1	8.4	17.8	11.0	**FAIL**
	F	33.7	41.2	28.8	36.4	33.0	**FAIL**
	H	28.7	45.0	44.5	29.8	45.0	**FAIL**
With indicator	**I** (Visual pressure indicator in top rail.)	38.2	45.0	33.9	29.9	28.4	**FAIL**
	J (Visual pressure indicator in bottom rail.)	26.3	23.7	29.6	45.0	45.0	**FAIL**
	K (Visual pressure indicators in both the top and bottom rails)	45.0	45.0	45.0	45.0	45.0	**PASS**
	L (Visual pressure indicators in both the top and bottom rails)	45.0	45.0	45.0	45.0	45.0	**PASS**

Note: (1) Average push-out force refers to the average of 5 individual push-out readings per test method in ASTM standard, F1004-19.
(2) The maximum applied force is 45 lb per ASTM F1004-19 standard.
(3) Test location refers to the four corners and the center of the gate per notation in ASTM standard, F1004-19 shown below.



NOTE 1—For Locations 1 and 3, force is applied at the top edge.
FIG. 7 Location of Force Application

(4) Values is **red** indicate that the location did not meet the average 30 lb push-out force requirement.
(5) "PASS" refers to all five locations meeting the 30 lb push-out force requirement.
(6) Additional data was provided to the ASTM subcommittee in January 2018.

Test data demonstrated that those gates with incorporated side-pressure indicator performed better, for the corresponding rail, than those gates that did not include any indicator. Furthermore, gates that incorporated an indicator for both the top and bottom rails, met the 30 lb

push-out force requirement in all five locations. Staff's testing showed that indicators on the top and bottom of the gate performed better and more consistently than gates with indicator only on the top or bottom.

The indicators' design consisted generally of a compression spring located in either the lock/latch mechanism or in the frame housing behind the adjustment bolts, so when the gate is installed, the gate's contacting pads exert a force against the wall/door opening. These designs were coupled with a colored plastic marker or paint on the frame so when the required side pressure is attained, these will either change color or be completely obscured by a component of the gate. Staff's evaluation of four gates manufactured with pressure indicators showed that this feature is feasible to incorporate into a gate.

Visual side pressure indicators proved to be a viable component to improve proper installation.

CONCLUSION

ESMC concludes that the ASTM F1004 – 19, which was developed through consultations and collaborations with CPSC staff, addresses the majority of the identified hazard patterns associated with gates and enclosures. Staff also concludes that ASTM standard is equivalent to, or more stringent than, other international standards in most areas and addresses the hazard patterns seen in the incident data reported to the CPSC. Therefore, staff recommends proposing ASTM F1004-19 as the CPSC safety standard for gates and enclosures.

In addition, staff recommends working with ASTM to continue to improve the safety of gate installation through the potential use of visual indicators. Staff's testing has shown that visual indicators are both feasible for some pressure mount gate designs and can be effective to assure the proper installation of pressures gates that do not use wall cups.

TAB C

TAB C: Human Factors Assessment of ASTM F1004-19 Requirements for Gates and Enclosures

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
ROCKVILLE, MD 20850

MEMORANDUM

Date: June 11, 2019

To: Hope E J. Nesteruk, Gates and Enclosures Project Manager
Division of Mechanical and Combustion Engineering, Directorate for Engineering Sciences

Through: Rana Balci-Sinha, Director,
Division of Human Factors, Directorate for Engineering Sciences

Mark Kumagai, Director,
Division of Mechanical and Combustion Engineering, Directorate for Engineering Sciences

From: Jill Hurley, Engineering Psychologist,
Division of Human Factors, Directorate for Engineering Sciences

Subject: Human Factors Assessment of ASTM F1004-19 Requirements for Expansion Gates and Expandable Enclosures

I. BACKGROUND

The ASTM International voluntary standard ASTM F1004, *Standard Consumer Safety Specification for Expansion Gates and Expandable Enclosures*, establishes requirements for gates and enclosures in the United States, and is intended to minimize the hazards associated with the reasonably foreseeable use and misuse, or abuse, of these products. ASTM developed this voluntary standard in response to incident data supplied by staff of the U.S. Consumer Product Safety Commission (CPSC). The most current, published version of the voluntary standard is ASTM F1004–19.

Section 8 of the voluntary standard specifies marking and labeling requirements, which include warning statements that must appear on each gate or enclosure. Section 9 specifies the instructional literature that must be provided with each gate or enclosure. This memorandum, prepared by staff of CPSC's Directorate for Engineering Sciences, Division of Human Factors (ESHF), assesses the adequacy of these sections of the voluntary standard in addressing the risk of injuries and deaths associated with the use of gates and enclosures. Staff also discusses additional human interaction issues associated with gate installation and use.

II. DISCUSSION

A. ESHF Staff Review of Incident Data

1) REPORTED INCIDENTS

As staff of CPSC's Directorate for Epidemiology, Division of Hazard Analysis (EPHA) discusses in Tab A, staff has identified 436 reported incidents related to gates and enclosures occurring from January 1, 2008 through October 31, 2018. These incidents consist of 19 fatalities, 108 injuries, and 309 non-injury incidents.
Five percent (20 incidents) related to issues with installation, such as unclear instructions, unclear dimensions, and gates that somehow "pushed out" or pulled down. Fifteen of the 19 fatal incidents involved drowning, 13 involved a child drowning in a backyard pool, one in a backyard hot tub and one in a 5-gallon bucket inside the house. In these 15 incidents, children were able to get past the gate/enclosure when it was left open or was accidentally opened; knocked down or pushed the gate out due to incorrect or unsecured installation; or climbed over the gate/enclosure.

2) NEISS INCIDENTS

Falls were the largest hazard pattern, accounting for 57% of emergency department treated injuries. EPHA was able to determine that most fall incidents were related to children climbing over the gate or enclosure, gates failing to remain upright and locked, children otherwise defeating the gate or enclosure, or when a caregiver tripped on a gate while carrying a child.

B. Current ASTM Warning and Instructional Requirements

1) ON-PRODUCT WARNING REQUIREMENTS

a) Content

Section 8 of ASTM F1004-19 specifies labeling and warning requirements for gates and enclosures. All gates and enclosures must include warnings on the product about the risk of serious injury or death when a product is not securely installed, must warn the consumer to never use the gate with a child who is able to climb over or dislodge the gate, and to never use the gate to prevent access to a pool. Pressure mounted gates, gates with locking mechanisms, and enclosures require other warning messages specific to the hazards posed by these different types of gates or enclosures, with as many as six different messages required.
Specifically, the warnings required for all gates and enclosures are:

> Children have died or been seriously injured when [gates/enclosures] are not securely installed. (§ 8.5.1)
>
> ALWAYS install and use [gate/enclosure] as directed using all required parts. (§ 8.5.2)
>
> STOP using when a child can climb over or dislodge the [gate/enclosure]. (§ 8.5.4)
>
> NEVER use to keep child away from pool. (§ 8.5.7)

Pressure-mounted gates with a single-action locking mechanism on one side of the gate must include the following warning:

> Install with this side AWAY from child. (§ 8.5.5)

Enclosures with locking or latching mechanisms must include the following warnings:

Use only with the [locking/latching] mechanism securely engaged. (§8.5.6)

Gates that do not pass the push-out test requirements in §6.3.1 must include the following warning on the product.

You MUST install [wall cups] to keep gate in place. Without [wall cups] child can push out and escape. (§8.5.3)

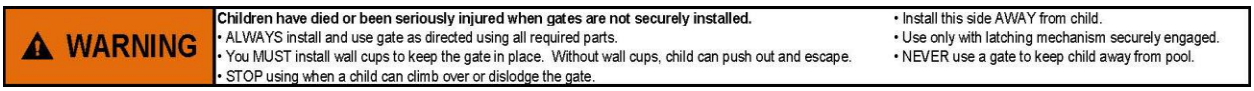
These warnings are also required on the retail packaging unless they are visible in their entirety to consumers on the gate at point of purchase.

b) Format

The 2019 version of the ASTM standard includes updated warning format requirements to align with the ASTM Ad Hoc Wording Task Group (Ad Hoc TG) recommendations.[1] The Ad Hoc TG recommends permanent, conspicuous, and consistently formatted on-product warning labels across juvenile products. On-product warning labels that align with the task group recommendations address numerous warning format issues and improve the label's attention-getting features and readability.

Figure 4 illustrates the warning label formatting that is required in the current version of the standard. Figure 5 and Figure 6 represent best practice examples for a horizontal list and paragraph format. Note these labels are not to scale.

Figure 4. Required warning label



[1] Ad Hoc TG harmonized the wording and language used across nursery product standards. This task group also developed recommendations for harmonizing warning format across standards. CPSC staff has worked closely with this group to develop ad hoc recommendations that are based largely on the requirements of the ANSI Z535.4, *American National Standard for Product Safety Signs and Labels* and other considerations. Ad Hoc TG contains members of the various standards affected by the durable nursery products rules as well as the Human Factors Division hazard communication subject matter expert and CPSC representative on the ANSI Z535 committee, Timothy P. Smith.

Figure 5. Horizontal warning using list format.

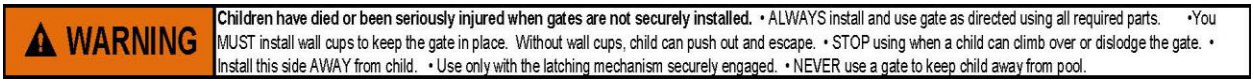


Figure 6. Horizontal warning using paragraph format.

c) Placement

The warning label is required to be in contrasting color(s), permanent, and conspicuous, which is defined in § 3.1.3 as a "label which is visible, when the gate/expandable enclosures is in the manufacturer's recommended use position, to a person standing near the gate/expandable enclosure at any one position around the gate/expandable enclosure, but not necessarily visible from all positions."

2) INSTRUCTIONAL REQUIREMENTS

Section 9 of ASTM F1004-19 specifies the instructional literature that must be provided with the gate or enclosures. The recently balloted F15 (18-06) Item 3 (passed with editorial changes) aligns Section 9 of the standard with Ad Hoc wording design or form requirements for the required warning statements in the instructions.

C. Adequacy of the Current Voluntary Standard and Recommendations for Revisions

1) LABELS

The 2019 version of the ASTM standard requires the on-product warning label to have a format that aligns with Ad Hoc TG recommendations, which should address the label's noticeability and readability. Therefore, ESHF staff agrees that these formatting requirements will reduce inconsistencies seen on current gates and enclosures, and will address numerous warning format issues related to capturing consumer attention, improving readability, and increasing hazard perception and avoidance behavior. According to the placement requirements in ASTM F1004 – 19, a single warning label that includes all of the warnings shown in Figure 2 has to be conspicuous, which is defined as "label which is visible, when the gate/expandable enclosure is in a manufacturer's recommended use position, to a person standing near the gate/ expandable enclosure at any one position around the gate/expandable enclosure, but not necessarily visible from all positions." Staff is satisfied with the generic warning label requirements; however, suggests further exploration of a warning label specific to wall cups as explained below.

2) PUSH-OUT REQUIREMENTS

Staff considers the push-out hazard to potentially lead to severe injury due to scenarios such as a fall down the stairs or access to a hot oven. Staff appreciates the collaborative efforts conducted with the ASTM subcommittee to develop a potential solution to the push-out hazards, thus staff is pleased that all gates are now required to meet the 30 pound push-out force. This will provide consumers assurance that the gate they purchase will protect their child from an unsafe environment regardless of the installation location, assuming the product is installed correctly. In addition, the F1004-19 standard allows for the use of wall-cups or other mounting hardware to

meet the 30 pound-force requirement. However, staff is concerned with consumer awareness as to the importance to always install wall cups as discussed below.

a) Use of wall cups

For certain pressure mounted gates, consumers have usually been instructed to use wall cups if they need to install the gate at the top of the stairs. However, it is not clear how frequently manufacturers instruct that the wall cups may be needed in locations other than the top of stairs. Therefore, consumers may not be aware of the importance of wall cups at other locations. Given that a child can be exposed to hazardous environments even when not on top of the stairs, beginning with the 2019 version of the standard, all gates are required to meet the higher push out force requirements regardless of installation location to reduce the likelihood that the child can push out the gate. The current standard allows using wall cups or other mounting hardware during installation so that it can meet the 30-lb push-out requirement.
Changing consumer behavior to install a pressure mounted gate using wall cups *at all times* will require overcoming consumer's perceptions and habit of using that gate without wall cups, especially if the gate seems to be securely installed. Based on the safety hierarchy, pressure mounted gates should ideally be designed so that in order to meet the 30-lb push-out force, the gate either does not require wall cups or cannot be installed without the wall cups, thus reducing the potential for consumers not installing the wall cups. However, staff understands from discussions with manufacturers involved in the ASTM process that integrating wall cups to the design of the product to ensure that the gate cannot be installed without wall cups is challenging. For this reason, the 2019 version of the ASTM F1004 standard attempts to inform consumers by adding a warning statement about the hazard if wall cups are not used and instruct them to use the wall cups. This warning statement is included within the general warning label, a label with as many as six different required messages.

Warnings, if well-designed, can influence consumers' behavior by arming them with required information to make informed decisions and overcome inaccurate perceptions of safe product use. For warnings to be effective, consumers must first notice the label, then read and comprehend the label, and finally be motivated enough to comply with the warning. Placement of the warning label is critical so that consumers are likely to see the label, read, and heed the label. Warning label research suggests labels with prominent placement increases the likelihood of being noticed (Rogers, Lamson, & Rousseau, 2000). For this reason, if the wall cup warning statement is separate and distinct from the general warning label and conspicuously placed on the top rail of the gate, it is more likely to get consumer's attention. Figure 4 shows an example label. Staff would like to further explore the potential location and wording requirements of such a label with ASTM.

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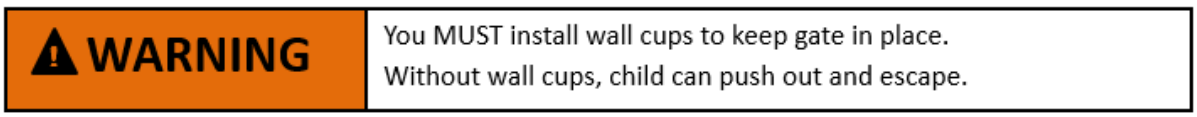

Figure 4. An example label that is dedicated to wall cup use. This label is not to scale.

b) Visual Side Pressure Indicators to Ensure that the Gate is Installed Correctly

The 2019 version of the standard has considerable improvements in the repeatability and reliability of test methods between test labs. As a result of additional testing, ESMC staff identified that during the installation of certain pressure mounted gates, the side force exerted was very sensitive and could substantially affect test results. For example staff commented that, one gate using a bolt with a large wheel/nut to adjust the pressure, one-half rotation of the nut could increase the (installation) side pressure enough to result in a gate meeting or not meeting the 30 lb. push-out force requirement. [2] See Figure 5 below for an example of a wheel/nut mechanism used on some pressure mounted gates.

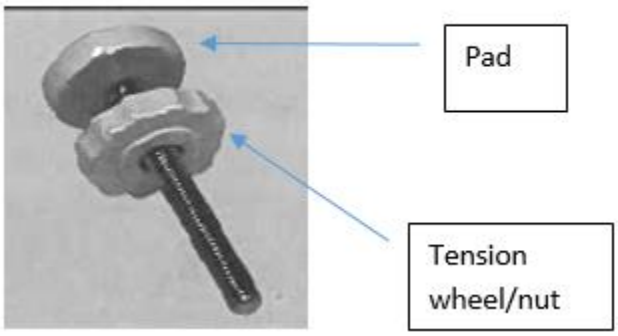

Figure 5. Example of a pressure mounted wheel/nut.

If this slight adjustment makes the difference between a pass and fail, staff questions the standard's ability to address variability of gate installation among test laboratories and technicians. Currently, the standard attempts to address this issue with certain types of pressure mounted gates, those with hand operated locking arms or those with foot pedal locks. Section 7.9.1.2 instructs the test technician to measure the locking force during installation so as not to exceed 25 lbs. or 35 lbs, by hand or feet, respectively. However there are some mounting styles used in gates, such as the one with a wheel/nut described above (Figure 5), where the locking force is not measured and varies based on the installer. The current standard does not require these gates to provide the consumer a way to objectively confirm that the gate has been securely installed.

Manufacturers' instructions for some pressure mounted gates provide little or no clear direction for consumer to know when the gate is installed correctly or stays in place after several uses. Examples of instructions for gates currently on the market may instruct the consumer to adjust until secure, or to push or pull on the gate to *feel* if secure. One set of instructions found online advises the consumer to ensure that the gate is properly fixed and secured, however provides no information on how the consumer should do this. Another set of instructions states that the gate is installed safely when the distance between the gate frame and the wall are equally spaced. [3] A consumer's visual inspection or subjectively feeling of a secure gate is not likely to be an

[2] Refer to TAB B for Division of Mechanical and Combustion Engineering memorandum for discussion.
[3] Refer to TAB B for Division of Mechanical and Combustion Engineering memorandum for discussion

effective method. Incorporating visual side pressure indicators would be beneficial for the installer to confirm that the correct amount of side pressure is applied during installation.

Effective visual side pressure indicators would make it more likely that test technicians install the gate with sufficient side force pressure and could provide consistency and validity to the test results. Equally important, visual side pressure indicators could provide a way for consumers to know when their gate is installed with sufficient side pressure, particularly as they are not expected to have or use force gauges during installation. Visual indicators may also help inform consumers during the lifecycle of the product when readjustment is necessary.

III. CONCLUSION

Staff has reviewed the warnings and instructional requirements specified in sections 8 and 9 of ASTM F1004-19. Staff agrees that the Ad Hoc revisions to the warning label section will improve the label's visibility, readability, and hazard communication ability in a more consistent presentation.

In the technical opinions of HF staff, for pressure mounted gates that require wall cups to comply with the 30 lbf push-out test, a separate and distinct warning label that is located on the top rail of the gate and briefly explains the hazard and what to do to avoid the hazard should increase its noticeability, readability, and hazard communication. The addition of effective visual side pressure indicators would also be beneficial to inform both lab technicians and consumers alike when sufficient installation force has been reached during gate installation and alert the consumer if the gate requires readjustment after continual use. Accordingly, further collaboration with ASTM is necessary and staff is requesting public comments to address these additional issues.

REFERENCES

American National Standards Institute. (2011). *ANSI Z535.4. American national standard: Product safety signs and labels*. Rosslyn, VA: National Electrical Manufacturers Association.

American National Standards Institute. (2011). *ANSI Z535.6. American national standard: Product safety information in product manuals, instructions, and other collateral materials*. Rosslyn, VA: National Electrical Manufacturers Association.

Rogers, W. A., Lamson, N., & Rousseau, G. K. (2000). Warning Research: An Integrative Perspective. *Human Factors, 42*(1). 102-139

TAB D: Summary of Recalls Related to Gates and Enclosures January 2008 through December 2018

TAB D

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MARYLAND 20814

Memorandum

DATE: June 11, 2019

TO: Hope E J. Nesteruk,
Project Manager for Gates and Enclosures
Directorate of Engineering Sciences

THROUGH: Robert Kaye, Director
Office of Compliance and Field Operations
Jennifer Timian, Director,
Regulatory Enforcement Division
Carolyn Manley, Assistant Division Director,
Regulatory Enforcement Division

FROM: Keysha L. Walker, Compliance Officer
Regulatory Enforcement Division

SUBJECT: Gates and Enclosures: Summary of recalls from January 2008 through December 2018

This summary is being provided at the request of the project manager referenced above in support of the notice of proposed rulemaking for gates and enclosures.

Since January 2008, there were five recalls involving baby gates and one recall involving an enclosure. The recalls involved risks of falling, entrapment, tripping, and lacerations. The recalling firms reported 215 incidents which 13 resulted in injuries, linked to the recalled products. Refer to Table I below for more details.

TABLE I – Summary of Gates and Enclosure Recalls					
Recall Date	**Firm**	**Hazard**	**Number of Recalled Units**	**Number of Incidents Reported (Injuries Reported)**	**Press Release Number**
February 4, 2009	Dorel Juvenile Group USA	Fall Hazard	100,000 (Gates)	No Incidents/ Injuries Reported	09-117[34]
March 25, 2010	Evenflo Co. Inc.	Fall Hazard	150,000 (Gates)	142 Incidents Reported/ 11 Injuries Reported	10-181[35]
March 3, 2011	AOSOM LLC	Choking, Laceration, and Entrapment Hazards	5,000 (Enclosures)	69 Incidents Reported/ No Injuries Reported	11-155[36]
March 12, 2015	IKEA North America Services LLC	Fall and Tripping Hazards	58,000 (Gates)	No Incidents/Injuries Reported	15-133[37]
July 14, 2016	IKEA North America Services LLC	Fall Hazard	80,000 (Gates)	4 Incidents Reported/ 2 Injuries Reported	16-226[38]
June 7, 2017	Madison Mill Inc.	Entrapment and Strangulation Hazards	25,180 (Gates)	No Injuries Reported	17-173[39]
Total	**5**		**1,318,180**	**215 Incidents/ 13 Injuries**	

[34] https://www.cpsc.gov/Recalls/2009/Dorel-Juvenile-Group-Recalls-Safety-1st-Stair-Gates-Due-to-Fall-Hazard

[35] https://www.cpsc.gov/Recalls/2010/Evenflo-Recalls-Top-of-Stair-Plus-Wood-Gates-Due-to-F all-Hazard

[36] https://www.cpsc.gov/Recalls/2011/AOSOM-Recalls-Wooden-Playpens-Due-to-Choking-and-Laceration-Hazards

[37] https://www.cpsc.gov/Recalls/2015/IKEA-Recalls-Pressure-Mounted-Safety-Gates

[38] https://www.cpsc.gov/Recalls/2016/IKEA-Recalls-Safety-Gates-and-Safety-Gate-Extensions

[39] https://www.cpsc.gov/Recalls/2017/Madison-Mill-Recalls-Safety-Gates

TAB E: Initial Regulatory Flexibility Analysis of the Draft Proposed Rule for Gates and Enclosures and the Accreditation Requirements for Conformity Assessment Bodies for Testing Conformance to the Gates and Enclosures Standard

TAB E

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

Memorandum

Date: June 11, 2019

TO : Hope E J. Nesteruk
Project Manager, Gates and Enclosures
Children's Program Manager
Division of Mechanical Engineering
Directorate for Engineering Sciences

THROUGH: Gregory B. Rodgers, Ph.D.
Associate Executive Director
Directorate for Economic Analysis

Robert L. Franklin
Senior Staff Coordinator
Directorate for Economic Analysis

FROM : Jill L. Jenkins, Ph.D.
Economist
Directorate for Economic Analysis

SUBJECT : Initial Regulatory Flexibility Analysis of the Draft Proposed Rule for Gates and Enclosures and the Accreditation Requirements for Conformity Assessment Bodies for Testing Conformance to the Gates and Enclosures Standard[40]

I. Introduction

ASTM F1004-19, *Standard Consumer Safety Specification for Expansion Gates and Expandable Enclosures*, is the current ASTM International (ASTM) standard for expansion gates (gates) and expandable enclosures (enclosures). Staff recommends that the U.S. Consumer Product Safety Commission (CPSC) issue a proposed rule under the requirements of the Danny Keysar Child Product Safety Notification Act (section 104) of the Consumer Product Safety Improvement Act (CPSIA) that incorporates by reference the most recent ASTM standard for gates and enclosures, with no modifications.

[40] Industrial Economics, Incorporated (IEc) served as a consultant on this project, performing research and analysis to support Directorate for Economic Analysis (EC) staff.

As required by the Regulatory Flexibility Act (RFA), this memorandum evaluates the potential economic impact on small entities, including small businesses, which would result from the draft proposed rule for gates and enclosures.[41] Section 603 of the RFA requires that agencies prepare an initial regulatory flexibility analysis (IRFA) and make it available to the public for comment when the general notice of proposed rulemaking (NPR) is published, unless the head of the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities.

As explained below, staff has identified 83 very small home-based manufacturers that will likely be significantly impacted by the draft proposed rule, due primarily to the third party testing requirements and the need to create warning labels and instructional material for the small number of products produced that have not been provided before. Additionally, staff identified another 23 small producers that are not as small as the home-based suppliers, but would be considered small by SBA guidelines. There is unlikely to be a significant economic impact on 17 of the 23 small domestic firms which sell compliant gates and enclosures on the U.S. market. However, staff cannot rule out a significant economic impact for the remaining six small domestic firms currently selling noncompliant gates and enclosures.

The IRFA must describe the impact of the proposed rule on small entities and identify significant alternatives that accomplish the statutory objective and minimize any significant economic impact. Specifically, the IRFA must contain:

1. a description of the reasons why action by the agency is being considered;
2. a succinct statement of the objectives of, and legal basis for, the proposed rule;
3. a description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;
4. a description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities subject to the requirements and the type of professional skills necessary for the preparation of reports or records; and
5. an identification, to the extent practicable, of all relevant federal rules which may duplicate, overlap, or conflict with the proposed rule.

II. The Product

ASTM F1004-19 defines gates and enclosures as types of barriers for domestic use. Gates (Figure 1) are "intended to be erected in an opening, such as a doorway, to prevent the passage of young children," but can be opened by older persons able to "operate the locking mechanism." Enclosures (Figure 2), on the other hand, are "self-supporting" barriers "intended to completely surround an area or play-space within which a young child may be confined." Enclosures may be intended "for indoor or outdoor use, or both" and "do not include an attached floor." Although the title of the standard refers only to "expansion" gates and "expandable" enclosures, the standard also covers "fixed-width" or "fixed-size" gates.

[41] 5 U.S.C. §§ 601-612.

Gates and enclosures vary widely in price. Plastic pressure gates can be purchased for as little as $10, but designer metal gates can cost as much as $430. Retail prices for enclosures and products that can operate either as an enclosure or gate range from $74 to $585, with the less expensive products tending to be made of plastic and the more expensive products tending to be made of wood.[42] Gates supplied by home-based manufacturers average $200, although the fabric gates are much less expensive ($44 on average) and a couple of the wooden gates with iron spindles are much more expensive ($525 on average).

Figure 1. Gate

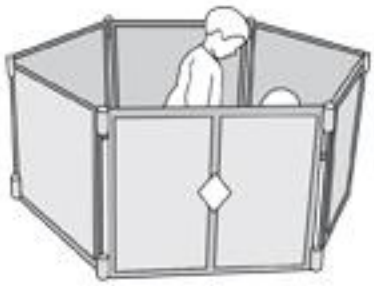

Figure 2. Enclosure

As noted above, gates typically have a means of egress that allow adults to pass through them, as do some enclosures (*i.e.*, some self-supporting barriers have egress panels that resemble gates). Gates may be either hardware-mounted, pressure-mounted, or both. Pressure-mounted gates attach using pressure on each end to hold the gate stable, similar to some curtain or shower curtain rods; they are intended for consumers who prefer to be able to move their gate and who do not want to permanently affix hardware to their walls using screws or similar fasteners. Mounting cups can be attached to one or more locations around the home and the gate can be

[42] Some of the enclosures designed for daycare centers and preschools can run above $1,000 with all the specialty extensions.

removed as needed and even moved to other locations.[43] Hardware-mounted gates generally require the use of screws and cannot be removed without tools.

The most common style of gates offered by home-based manufacturers[44] are hardware-mounted wooden gates, the majority of which are built with no gaps between the boards, often with cross boards supporting the entire structure. Less commonly, some home-based manufacturers offer gates made with fabric that attaches to the wall and/or bannister via a variety of mechanisms, including cable ties, screws and hooks, Velcro, and various combinations of these elements.

All known enclosures are expandable, in that panels can be added or removed. The majority, but not all of, the gates supplied by non-home-based suppliers are also expandable (some stretch accordion style, while others have pieces that can be added to either side of the gate). On the other hand, nearly all of the gates supplied by home-based manufacturers are not expandable, the exception being fabric gates. However, because home-based manufacturers supply gates at very low volumes compared to other gate suppliers, the vast majority of gates on the U.S. market in terms of units sold are expansion gates.

Gates or enclosures for non-domestic use (such as commercial or industrial) and those intended for pets only are not covered under the scope of the voluntary standard or the draft proposed standard.

III. Reason for Agency Action and Legal Basis for the Draft Proposed Rule

The objective of the draft proposed rule is to address the risk of injury associated with gates and enclosures. Section 104 of the CPSIA requires the CPSC to promulgate mandatory standards for durable infant or toddler products that are substantially the same as the voluntary standard or more stringent than the voluntary standard if the Commission determines that more stringent requirements would further reduce the risk of injury associated with the product. Based on 2013 National Electronic Injury Surveillance System (NEISS) injury estimates[45] and data on the number of gates and enclosures in use from CPSC's 2013 Durable Nursery Product Exposure Survey (DNPES),[46] the only year for which exposure data is available, staff found that the risk associated with gates/enclosure use in homes is approximately 2.57 emergency department-treated injuries per 10,000 gates/enclosures in use annually [(2,790 injuries ÷ 10.86 million

[43] A mounting cup is an oversized pad into which a gate's pressure-mounted tension bolts can be seated to spread pressure over a larger area. This helps the gate to resist additional push-out force, as well as protect a consumer's walls from damage.

[44] Home-based suppliers are very small manufacturers. They often have no employees beyond the owner, supply few products typically including only one or two gates, and in general have low sales volumes. In many cases, manufacturing gates may not be the primary occupation of the owner. Additional information on home-based manufacturers can be found in Section VI.

[45] Memorandum from Risana Chowdhury, Division of Hazard Analysis, Directorate for Epidemiology, dated Dec 21, 2018, Subject: Expansion Gates and Expandable Enclosures-Related Deaths, Injuries, and Potential Injuries.

[46] The number of gates/enclosures in use was run from the Durable Nursery Products Exposure Survey (DNPES) on 11/6/18, to exclude households with no children under the age of 5, the relevant age range group for the incident data.

gates/enclosures in use in U.S. households) x 10,000]. CPSC staff believes that the requirements of the draft proposed rule address the hazard patterns identified in the incident data.

IV. Requirements of the Draft Proposed Rule

The draft proposed rule would incorporate by reference the voluntary standard for gates and enclosures (ASTM F1004-19), with no modifications. If adopted by the Commission as a final rule, it would become a mandatory consumer product safety standard under section 104 of the CPSIA. If it becomes a mandatory standard, firms whose gates/enclosures do not comply will need to evaluate their products, determine what changes would be required to meet the standard, and either modify the product so that it complies with the standard or cease supplying the product to the U.S. market. The manufacture or importation of noncompliant products would be prohibited after the effective date of the standard.

This section lays out the requirements for, and considers the implications on, all firms, large and small. Section VI then continues the discussion, focusing exclusively on the small business impacts.

A. ASTM F1004-19

The major requirements from ASTM F1004-19 are presented below.[47]

- Latching/locking and hinge mechanisms—intended to prevent unintentional folding or opening of the gate/enclosure while in use. Also intended to screen for hardware failures, particularly locks, latches, and hinges.
- Push-out test—intended to prevent children from being able to dislodge the gate or creating an opening through which they might pass by pushing or applying a horizontal force on the gate.
- Completely bounded openings—intended to prevent head/neck entrapment in gate openings, such as V- or triangle-shapes in the gate itself.
- Height of sides—intended to retain children the approximate height of the maximum age user (24 months old).
- Vertical strength—intended to prevent children from dislodging a gate or enclosure by hanging on the top of the gate.
- Bottom spacing—intended to prevent children from crawling under a gate or enclosure.
- Configuration of uppermost edge—intended to prevent children from head/neck entrapment in partially bounded openings at the uppermost edge of gates/enclosures, particularly "V"-shaped openings common in older, "accordion-style" gates.
- Locking device—intended to prevent children from unlocking a gate or enclosure.
- Lateral/traverse joints-intended to make wooden slats stronger.
- Slat strength—intended to prevent slat breakage incidents.

[47] For additional details, see Torres 2019.

The voluntary standard also includes various general requirements common to most voluntary children's product standards including: (1) torque and tension tests to ensure that components cannot be removed; (2) requirements to prevent entrapment and cuts (minimum and maximum opening size, coverage of exposed coil springs, small parts, hazardous sharp edges or points, smoothness of wood parts, and edges that can scissor, shear, or pinch); (3) a prohibition on toys being sold with gates and a requirement that toys sold with enclosures meet the ASTM toy standard; (4) marking and labeling requirements, including permanency requirements; and (5) requirements for instructional literature.[48] ASTM F1004-19 itself includes no reporting or recordkeeping requirements. However, if the draft proposed rule is finalized, manufacturers and importers of gates will be subject to the third party testing requirements under the CPSIA, including its recordkeeping requirements.

B. Third Party Testing

Under section 14 of the CPSA, once the new gate and enclosure requirements become effective, all suppliers will be subject to the third party testing and certification requirements under the CPSA and the Testing and Labeling Pertaining to Product Certification rule (16 CFR part 1107), which requires that manufacturers and importers certify that their products comply with the applicable children's product safety standards, based on third party testing. Third party testing costs are in addition to the costs of modifying the gates/enclosures to meet the standard. Based on six of the seven interviews with suppliers, the third party testing costs for gates and enclosures are expected to range between about $500 to $1,500 per sample tested, depending primarily upon the type of gate (pressure gates require additional testing compared to hardware-mounted gates), and whether the gate comes with extensions (gates must be tested separately and then with each extension, greatly increasing testing costs),[49] as well as whether the testing is conducted in the United States or overseas. These cost estimates are for testing compliance with the physical or mechanical requirements in the standard only. Manufacturers and importers of gates/enclosures are already subject to third party testing requirements with respect to lead content. As allowed by the component part testing rule (16 CFR 1109), importers may rely upon third party tests obtained by their suppliers, which could reduce the impact on importers. The incremental costs of the rule will be lower for suppliers of compliant gates and enclosures if they are already obtaining third party tests to assure conformance with the voluntary standard.

Staff welcomes comments regarding the impact that the draft proposed rule would have on the cost of testing and certifying products, particularly on small manufacturers and importers. Specific information regarding the incremental cost of the testing over and above the testing costs manufacturers and importers are already incurring, including information on the number of samples that must be tested, would be especially helpful.

[48] For additional details on the labeling and instructional literature requirements, see memorandum from Jill Hurley, Division of Human Factors, Directorate for Engineering Sciences, dated June 11, 2019, Subject: Human Factors Assessment of ASTM F1004-19. Requirements for Expansion Gates and Expandable Enclosures (CPSIA Section 104).

[49] Also, multi-mode gate testing (*i.e.*, gates that can also be used as enclosures) would tend to be more expensive, because the gate must be tested in both modes.

V. Other Federal or State Rules

CPSC staff has not identified any federal or state rule that either overlaps or conflicts with the draft proposed rule.

VI. Suppliers of Gates and Enclosures and the Impact on Small Businesses

Staff identified 113 firms supplying gates and enclosures to the U.S. market. The vast majority of suppliers are domestic (109 firms). Of these, 83 appear to be very small home-based domestic manufacturers.[50] They typically have only one or two gates in their product line, and supply few other products. They generally also have low sales volumes. None of the home-based manufacturers appear to supply enclosures.

We identified another 30 firms that supply gates and/or enclosures that are generally larger than the home-based suppliers, 26 of which are domestic. These firms include both manufacturers and importers. Twenty-three of those firms, although not as small as the home-based suppliers, *are* still small domestic entities based on U.S. Small Business Administration (SBA) guidelines for the number of employees in their North American Industry Classification System (NAICS) codes. These firms typically have eight to nine gate models in their product lines and have much larger sales volumes than the home-based suppliers. Of the 23 small domestic suppliers, 13 supply only gates, six supply only enclosures, and four firms supply both gates and enclosures.

The remaining four firms are foreign manufacturers. Additionally, staff identified numerous foreign gates and enclosures entering the U.S. market via several mechanisms, including: online retailers that operate marketplaces for smaller sellers, online firms acting as brokers between buyers and sellers, and foreign retailers willing to supply foreign-manufactured gates directly to U.S. consumers on their own behalf. None of these suppliers specializes in gates and enclosures, each selling a wide variety of products beyond those for children. Foreign suppliers are not considered in the regulatory flexibility analysis because SBA guidelines and definitions pertain to only to U.S.-based entities.

[50] These suppliers were identified online and staff believes that there may be additional home-based suppliers operating in the gates market on a very small scale (possibly including some without an on-line presence).

Table 1. Firms in the U.S. Gate and Enclosure Market[51]

CATEGORY	NUMBER OF FIRMS SUPPLYING GATES AND ENCLOSURES
Total Firms	**113**
Total Domestic Firms	**109**
Very small home-based manufacturers	83*
Small	23
Manufacturers	15
Compliant with ASTM voluntary standard	12
Not compliant with ASTM voluntary standard	3
Importers	8
Compliant with ASTM voluntary standard	5
Not compliant with ASTM voluntary standard	3
Large	3
Total Foreign Firms	**4**

Highlighted categories are the focus of this analysis.
* Staff identified 83 home-based manufacturers selling gates online, but there are likely additional home-based manufacturers that staff was unable to identify (possibly including some without an on-line presence).

A. Very Small Home-Based Manufacturers

We have identified 83 very small home-based manufacturers supplying gates to the U.S. market, none of which are believed to comply with the draft proposed rule. These firms often have no employees beyond the owner, supply few products typically including only one or two gates, and in general have low sales volumes. Five supply fabric gates, all of which are expected to require product modifications to comply with the performance requirements of the draft proposed rule. Most of the remaining 78 firms supply gates made of solid wood, with a few using slats or other decorative touches or metal parts; all are hardware mounted. Allowing for a few exceptions (for example, perhaps a need for better locks, sturdier wood, or less of a gap at the base of the gate), there is no reason to expect that the gates supplied by these 78 home-based firms would *not* meet the performance requirements of the draft proposed rule.

However, the very small home-based firms are unlikely to currently have any warning labels on their gates and most likely have not developed instructional literature that would meet the requirements in the ASTM standard. The costs of developing warning labels and instruction manuals are expected to be greater for firms that do not have experience in developing or designing warning labels and instruction manuals than those that have already developed warning labels and instructional materials. As already noted, all 83 home-based firms are very small and have low sales volumes. The cost of developing warning labels and instruction

[51] Staff made these determinations using information from Dun & Bradstreet and ReferenceUSAGov, as well as firm websites.

manuals is, therefore, more likely to have a *significant economic impact* on these firms, as their resources may be more limited. Several firms noted that the initial cost of developing warning labels and instructional materials can be significant, although the subsequent costs are expected to be lower.

Finally, all 83 of the very small home-based manufacturers are likely to be significantly impacted by the third party testing costs (estimated at about $500 to $1,500 per sample tested), because of their small sales volume and very low revenue.

Based on all of the above factors, the impact of the draft proposed rule is expected to be significant for all 83 firms, regardless of whether they require modifications to meet the performance requirements of the draft proposed rule. Most of these firms are likely to leave the market for gates because their revenue from the sale of gates does not appear to be sufficiently large to justify third party testing and the cost of developing labels and owner's manuals.

We again note that most of these very small manufacturers produce fixed-size gates that are hardware mounted. Many of these firms may not be aware of the voluntary standard; none have participated in its development. Most, if not all, would probably be surprised to learn that their product is covered by a standard that refers to "expansion gates" and "expandable enclosures." Although we expect that most could meet the performance requirements of the standard, all are likely to be significantly impacted by the requirements for instructional literature and warning labels, as well as the third party testing requirements of section 14 of the CPSA.

Staff welcomes comments from individuals/firms familiar with various gates made by home-based suppliers who can provide additional information on differences between styles of gates provided by home-based suppliers and styles provided by non-home-based suppliers. Staff is particularly interested in how these firms will likely respond to the draft proposed rule and the costs and time frame that would be required for any product modifications if applicable. Additionally, staff requests information on the number of home-based suppliers, as well as information specifically from home-based suppliers on the significance of gates sales to their total revenue.

B. Small Manufacturers

1. Small Manufacturers with Compliant Gates and Enclosures

Currently, 12 of the small manufacturers produce gates or enclosures that comply with the ASTM voluntary standard now in effect for testing purposes (ASTM F1004-18).[52] Staff assumes that compliant firms will remain compliant with the voluntary standard as it evolves, because compliance is part of an established business practice. This will include testing all gates to the same push-out force and thereby eliminate the distinction between gates used at the top of the

[52] There is typically a six month delay between the publication of a new ASTM voluntary standard and it adoption for compliance testing. Published in June of 2018, ASTM F1004-18 went into effect for testing purposes in December 2018. ASTM F1004-19 was published in June 2019 and will not be effective for testing purposes until December 2019. The draft proposed rule, if ultimately promulgated as a final rule, is not expected to go into effect until after this date.

stairs and other gates in the current standard. Given that the draft proposed rule would mandate ASTM F1004-19 without modifications and this version of the voluntary standard will be in effect for testing purposes several months before the mandatory rule would become effective, the draft proposed rule is not expected to have a significant economic impact on any of the 12 firms with already compliant gates or enclosures. Additionally, as these firms are already testing to the ASTM standard, any third party testing costs are expected to be minimal.

2. Small Manufacturers with Noncompliant Gates and Enclosures

There are three small domestic manufacturers producing gates and enclosures that do not comply with the voluntary standard. Staff cannot rule out a significant economic impact for these firms due to changes required to bring their products into compliance with the performance requirements of the draft proposed rule. Six of the seven firms interviewed during the development of the draft proposed rule indicated that the cost of a redesign could be between $400,000 and $1 million,[53] depending on the material with which the product is constructed. The changes in the requirements for instruction manuals and labeling are not expected to be significant for these firms, however. These firms have typically already developed and provide warning labels and instruction manuals with their products. Generally, a straightforward modification to an existing label or instruction manual would not generate costs that would be considered significant relative to any of these firm's revenues. This is consistent with the input from the suppliers contacted for this and past rulemakings.

For two of the three small manufacturers of noncompliant gates, third party testing costs are not expected to exceed one percent of revenue because they have high revenue levels and few gate models in their product lines. The revenue level for the third firm is unknown.[54]

Staff welcomes comments on the changes that may be required to meet the voluntary standard ASTM F1004-19, in particular whether redesign would be necessary, as well as the associated costs and the time required to bring the products into compliance.

C. Small Importers

1. Small Importers with Compliant Gates and Enclosures

Staff identified five gate/enclosure importers currently in compliance with the voluntary standard effective for testing purposes (ASTM F1004-18). As with small manufacturers of compliant gates and enclosures, these firms are expected to be in compliance with ASTM F1004-19 before the final gates rule becomes effective. Therefore, under the draft proposed rule, the economic impact is unlikely to be significant for any of the five small importers with compliant gates or enclosures. Any third party testing costs for importers of compliant gates and enclosures

[53] One firm indicated that the cost could be higher in some cases.

[54] Generally, we believe that impacts of less than one percent of a firm's revenue are unlikely to be significant. We cannot rule out the possibility that impacts of greater than one percent of revenue could be significant for some firms in some cases.

would be limited to the incremental costs associated with third party testing over their current testing regime.

2. Small Importers with Noncompliant Gates and Enclosures

Staff identified two small importers and one small wholesaler of noncompliant gates and enclosures. The economic impact to importers and wholesalers are considered together because both rely on outside firms to supply the products that they distribute to the U.S. market. Importers distribute products made by foreign firms, whereas wholesalers supply products that may be supplied by foreign or domestic firms, or both. Staff was unable to determine the supply source for the wholesaler in this case.

The economic impact on importers and wholesalers depends upon the extent of the changes required to come into compliance and the response of their supplying firms, which cannot generally be determined for noncompliant importers and wholesalers. However, two of these firms appear to have wide enough product lines that dropping gates/enclosures might be a viable option, although it is not clear what impact this might have on their revenue.

The remaining small importer of noncompliant enclosures has a low revenue level and is likely to experience a significant economic impact regardless of how their supplying firm responds; it does not appear that they have a subsidiary relationship with their supplier and their supplier might not absorb any of the costs. Finding an alternative supplier might pose significant costs for this firm relative to their revenue level as well. Dropping enclosures from their product line entirely would appear to be an option, but doing so could have a significant impact on its revenue.

Third party certification of compliance with the draft proposed rule could result in significant costs for the three firms with noncompliant gates/enclosures if their supplier does not do the testing for them. For one of these firms, testing costs could exceed one percent of gross revenue if only three units per model required testing for the manufacturer to obtain the required "high degree of assurance" that their gates/enclosures comply with the requirements of the draft proposed rule. No revenue data was available for the remaining two firms and therefore, staff cannot rule out the possibility that there the third party testing costs could be significant.

D. Summary of Impacts

CPSC staff is aware of 106 small domestic firms currently marketing gates and enclosures in the United States. It appears unlikely that there would be a significant economic impact on the 17 suppliers (12 manufacturers and 5 importers) of compliant gates and enclosures. However, we could not rule out a significant economic impact on 6 suppliers of noncompliant gates and enclosures (3 manufacturers and 3 importers/wholesalers).

Additionally, it is likely that all 83 of the very small home-based suppliers identified would be significantly impacted, due primarily to the third party testing requirements and the necessity of creating warning labels and instructional literature if these have not been provided before. If

confronted by these costs, most of these very small home-based manufacturers could stop selling gates or go out of business.

VII. Alternatives that Could Reduce the Significant Economic Impact of the Rule on Small Entities

Section 104 of the CPSIA requires that the Commission promulgate a standard that is either substantially the same as the voluntary standard or more stringent if the Commission determines that more stringent standards would further reduce the risk of injury. Therefore, adopting ASTM F1004-19 with no modifications is the least stringent rule that could be promulgated. There is no rule that staff could recommend proposing that would reduce the impact on small entities without being less stringent.

One way to reduce the economic impact on firms is to extend the effective date beyond six months. Firms would be less likely to experience a lapse in production/importation, which could result if they are unable to comply and conduct third party testing within the required timeframe. Also, firms could spread costs over a longer time period, thereby reducing their annual costs, as well as the present value of their total costs. Suppliers interviewed for the rulemaking indicated that 12–18 months might be necessary if a complete product redesign were required. Additional time might also be necessary for home-based suppliers that currently are not providing warning labels or instructional materials with their products to develop them.

Staff welcomes comments on the impact of the draft proposed rule on small manufacturers and importers in general, as well as alternative effective dates or any other alternatives that could mitigate the impact on small firms. The draft proposed rule asks commenters who are suggesting an alternative to provide specific information on the alternative, and the extent to which it could reduce the impact.

VIII. Small Business Impacts of the Accreditation Requirements for Testing Laboratories

In accordance with section 14 of the CPSA, all children's products that are subject to a children's product safety rule must be tested by a CPSC-accepted third party conformity assessment body (*i.e.*, testing laboratory) for compliance with applicable children's product safety rules. Testing laboratories that want to conduct this testing must meet the NOR pertaining to third party conformity testing. NORs have been codified for existing rules at 16 CFR part 1112. Consequently, staff recommends that the Commission propose an amendment to 16 CFR part 1112 that would establish the NOR for those testing laboratories that want to test for compliance with the gates and enclosures final rule. This section assesses the impact of the amendment on small laboratories.

A final regulatory flexibility analysis (FRFA) was conducted as part of the promulgation of the original 1112 rule (78 FR 15836, 15855-58), as required by the RFA. Briefly, the FRFA concluded that the accreditation requirements would not have a significant economic impact on a

substantial number of small laboratories because no requirements were imposed on laboratories that did not intend to provide third party testing services. The only laboratories that were expected to provide such services were those that anticipated receiving sufficient revenue from the mandated testing to justify accepting the requirements as a business decision.

Based on similar reasoning, amending the rule to include the NOR for the gates and enclosures standard will not have a significant adverse impact on small laboratories. Moreover, based upon the number of laboratories in the United States that have applied for CPSC acceptance of the accreditation to test for conformance to other juvenile product standards, we expect that only a few laboratories will seek CPSC acceptance of their accreditation to test for conformance with the gates and enclosures standard. Most of these laboratories will have already been accredited to test for conformance to other juvenile product standards, and the only costs to them would be the cost of adding the gates and enclosures standard to their scope of accreditation, a cost that test laboratories have indicated is extremely low when they are already accredited for other section 104 rules. As a consequence, the Commission could certify that the NOR for the gates and enclosures standard will not have a significant impact on a substantial number of small entities.