



UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
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This document has been electronically
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DATE: September 30, 2015

BALLOT VOTE SHEET:

TO: The Commission
Todd A. Stevenson, Secretary

THROUGH: Stephanie Tsacoumis, General Counsel
Patricia H. Adkins, Executive Director

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

SUBJECT: Proposed Rule: Safety Standard for Children's Folding Chairs and Stools

BALLOT VOTE DUE: October 6, 2015

The Office of the General Counsel is providing for Commission consideration the attached draft notice of proposed rulemaking for publication in the *Federal Register*. The proposed rule would establish a safety standard for children's folding chairs and stools under the Danny Keysar Child Product Safety Notification Act, section 104 of the Consumer Product Safety Improvement Act of 2008. CPSC staff recommends that the Commission propose adoption of the voluntary standard, with several modifications, including changes to limit the scope of the standard to cover children's folding chairs and folding stools, and revisions to the stability testing method and required warning labels.

Please indicate your vote on the following options:

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

II. Approve publication of the attached document in the *Federal Register*, with changes. (Please specify.)

(Signature)

(Date)

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

(Signature)

(Date)

IV. Take other action. (Please specify.)

(Signature)

(Date)

Attachment: Draft *Federal Register* Notice: Proposed Rule to Establish a Safety Standard for Children’s Folding Chairs and Stools

Billing Code 6355-01-P

CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Parts 1112, 1130, and 1232

[CPSC Docket No. 2015-[INSERT]]

Safety Standard for Children’s Folding Chairs and Stools

AGENCY: Consumer Product Safety Commission.

ACTION: Notice of proposed rulemaking.

SUMMARY: The Danny Keysar Child Product Safety Notification Act, Section 104 of 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. These standards are to be “substantially the same as” applicable voluntary standards 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. The Commission is proposing a safety standard for children’s folding chairs and stools in response to the direction under Section 104(b) of the CPSIA. In addition, the Commission is proposing an amendment to 16 CFR part 1112 to include 16 CFR part 1232 in the list of notice of requirements (“NORs”) issued by the Commission and an amendment to 16 CFR part 1130 to identify children’s folding stools as a durable infant or toddler product.

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 requirements of the proposed mandatory standard for

children's folding chairs and stools should be directed to the Office of Information and Regulatory Affairs, the Office of Management and Budget, Attn: CPSC Desk Officer, FAX: 202-395-6974, or e-mailed to oir_submission@omb.eop.gov.

Other comments, identified by Docket No. CPSC 2015-[INSERT], 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 Commission does not accept comments submitted by electronic mail (e-mail), except through www.regulations.gov. The Commission encourages you to submit electronic comments by using the Federal eRulemaking Portal, as described above.

Written Submissions: Submit written submissions by mail/hand delivery/courier to: Office of the Secretary, 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-2015-[INSERT], into the "Search" box, and follow the prompts.

FOR FURTHER INFORMATION CONTACT: Patricia Edwards, Project Manager, Directorate for Engineering Sciences, U.S. Consumer Product Safety Commission, 5 Research Place, Rockville, MD 20850; email: pedwards@cpsc.gov; telephone: (301) 987-2224.

SUPPLEMENTARY INFORMATION:

I. Background and Statutory Authority

The CPSIA was enacted on August 14, 2008. 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. Standards issued under section 104 are to be “substantially the same as” the applicable voluntary standards 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.

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.” Although section 104(f)(2) does not specifically identify children’s folding chairs, high chairs, booster chairs and hook-on chairs are explicitly deemed to be “durable infant or toddler products.” Because folding chairs and folding stools serve functions and have characteristics similar to the listed types of chairs, folding chairs and folding stools likewise should be considered to be “durable infant or toddler products.” This conclusion is consistent with the Commission’s prior determination that “children’s folding chairs” fall

within the definition of a “durable infant or toddler product” and are covered by product registration card rule promulgated under CPSIA section 104(d).¹

Although the product registration card rule does not specifically mention children’s folding stools, the Commission considers folding stools to be a subset of folding chairs. Thus, the Commission proposes to include children’s folding stools within the scope of the proposed standard. The Commission proposes to amend the product registration card rule so the scope of that rule will be clear that children’s folding chairs and folding stools are identified as durable infant or toddler products for purposes of registration card requirements.

As required by 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 notice of proposed rulemaking (“NPR”), largely through the standards development process of ASTM International (formerly the American Society for Testing and Materials) (“ASTM”). The proposed rule is based on the current voluntary standard developed by ASTM, ASTM F2613-14, *Standard Consumer Safety Specification for Children’s Chairs and Stools* (“ASTM F2613-14”), with several modifications.

The testing and certification requirements of section 14(a) of the Consumer Product Safety Act (“CPSA”) apply to product safety standards promulgated under section 104 of the CPSIA. Section 14(a)(3) of the CPSA requires the Commission to publish an NOR for the accreditation of third party conformity assessment bodies (test laboratories) to assess conformity with a children's product safety rule to which a children's product is subject. The children’s folding chairs and stools standard, if issued as a final rule, will be a children's product safety rule that requires the issuance of an NOR. To meet the requirement that the Commission issue an

¹ Requirements for Consumer Registration of Durable Infant or Toddler Products; Final Rule, 74 Fed. Reg. 68668 (Dec. 29, 2009); 16 CFR 1130.2(a)(13).

NOR for the children's folding chairs and stools standard, this NPR proposes to amend 16 CFR part 1112 to include 16 CFR part 1232, the CFR section where the children's folding chairs and stools standard will be codified, if the standard becomes final.

II. Product Description

ASTM F2613-14 defines a "children's chair" as "seating furniture with a rigid frame that is intended to be used as a support for the body, limbs, or feet of a child when sitting or resting in an upright or reclining position." A "children's stool" is defined as a "children's chair without back, or armrest." ASTM further defines "folding chair" and "folding stool" as "a children's chair or stool which can be folded for transport or storage." ASTM F2613-14, Section 3. The standard covers a chair or stool intended to be used by a single child who can get in and get out of the product unassisted and with a seat height 15 inches or less, with or without a rocking base. The Commission proposes to limit the scope of the mandatory standard to folding chairs and folding stools because the hazards presented by folding chairs and folding stools are different from non-folding chairs and stools, as discussed further in section V of the preamble.

There are two primary designs associated with children's folding chairs and folding stools: (1) straight tube versions that contact the surface in three or more capped-tube legs, and (2) bent tube versions that contact the ground along a substantial portion of the tubular frame. Although there are a variety of other designs used for children's folding chairs and folding stools, the primary characteristic that applies to all of the products is the folding mechanism of the chair and stool that is used for transport or storage of the product.

III. Incident Data

CPSC staff received reports of 98 injuries, 45 non-injury incidents, and another 39 recall-related complaints associated with children's folding chairs or stools in the Consumer Product

Safety Risk Management System (“CPSRMS”) database for the period January 1, 2003 through December 31, 2014. Only one of the reported incidents involved a folding stool, while the remainder involved folding chairs. There were no fatalities reported in the data. Reporting is ongoing, and thus, the number of reported injury and non-injury incidents from the CPSRMS system may change in the future.

1. Incidents with Injuries

Ninety-eight (98) nonfatal incident injuries were reported, some not medically treated. Injuries involving chairs designed for the under 5 age range (51%) were the most frequently reported incidents. The most frequent injuries (76) involved fingers, thumbs, or other parts of the hand, with most of the remaining incidents (14) affecting the head or face. The youngest injury victim was 12 months old. Some victims exceeded the intended age range of the chair, but their injuries demonstrated hazards with chairs relevant to the standard (*i.e.*, intended for children under 5). Two injured adults were included among the 98 nonfatal incidents, as were several children over 5 years of age. Reports in which the submitter suggested injuries from the same repeating hazard on multiple occasions and/or affecting multiple victims were counted as a single injury incident. These injury counts, therefore, may be considered conservative.

2. Incidents with No Injury Reported

Forty-five (45) incidents did not report an injury. However, these reports illustrate a potential for injuries. These reports included incidents in which the chair was occupied or used by a child, plus incidents in which a parent or submitter detected a malfunction or hazardous issue while the chair was not in use.

3. Non-Incident Complaints

Thirty-nine (39) reports did not describe incidents, but merely reflected concerns regarding recalls. These concerns involved questions about recalled products (*e.g.*, determining whether a product was subject to recall), or concerns regarding apparent similarities in design between recalled and non-recalled products.

4. National Electronic Injury Surveillance System Estimates

CPSC also evaluates data reported through the National Electronic Injury Surveillance System (“NEISS”), which gathers summary injury data from hospital emergency departments selected as a probability sample of all the U.S. hospitals with emergency departments. This surveillance information enables CPSC staff to make timely national estimates of the number of injuries associated with specific consumer products. Based on a review of emergency department visits from January 1, 2003 through December 31, 2014, CPSC staff determined that there were an estimated 17,500 children younger than 5 years of age treated in emergency departments for injuries related to folding chairs and stools.

Information from hospital records, however, does not contain sufficient information to determine which injuries involved chairs specially designed for children under age 5. A known proportion of these injuries may have involved folding chairs or stools designed for children older than 5, or adults. Accordingly, CPSC staff focused on incident reports with specific information (*e.g.*, make and model of the product, photos, or a sufficiently detailed description) that allowed staff to characterize incidents involving chairs specifically intended or reasonably expected to be used by children under age 5. Reports indicating that the product was a folding chair but lacking information necessary for staff to determine the age for which the product is intended were excluded.

A. Hazard Pattern Identification

CPSC staff considered all 182 reports and complaints to identify four different hazard patterns associated with children's folding chairs and stools. One hundred forty-three reports involved incidents, and 39 reports involved complaints (without incident).

1. *Pinch/Shear Hazards* - Ninety (90) incidents demonstrated pinching or shearing hazards (including the possibility of crushing or scissoring when the chair folds or unfolds, regardless of intent). Victims were injured while transitioning the chair between its folded and unfolded states. Victims were also injured following unexpected folding or unfolding of the chair (generally described as "collapse"), or because of some malfunction or issue relevant to these hazards (such as a failed locking mechanism). Although most of these injuries involved pinched/sheared fingers or other body parts, there were two incidents in which the child was injured, but avoided being pinched or sheared. In these two incidents, the injuries resulted when a child's head or face struck the floor as a consequence of the child falling out of the collapsing chair.

Fingers and hands were the body parts most commonly involved in pinching or shearing hazards. In two incidents, other body parts were pinched/sheared from unexpected folding/collapsing (1 neck incident and 1 leg incident). Out of all 90 pinch/shear hazard incidents, including incidents without actual pinch/shear injuries, at least eight incidents involved recalled products (6 injured; 2 without injuries).

2. *Undetermined Hazard Finger Injuries* - Fourteen (14) incidents involved finger injuries that were caused by an undetermined hazard. In seven of these incidents, there was evidence that the victim's finger was caught in a chair mechanism. For these incidents, the hazard likely is either pinch/shear related or entrapment related. In the other seven incidents, the child suffered finger injuries, but there was insufficient information to determine the cause of

injury. In general, these injuries were severe (such as amputation or fracture). Two of the incidents involved recalled chairs.

3. *Stability/Tipover* - Twenty-two (22) incidents involved the chair tipping over without indication of chair collapse. Fifteen (15) of these incidents resulted in injuries. CPSC staff was unable to determine if any of the chairs involved in these stability/tipover incidents were recalled models.

4. *Miscellaneous* - Seventeen (17) incidents related to various other folding chair or stool issues. These incidents included exposures to high levels of lead or other hazardous substances; a collapsing table associated with the chair; or loose parts, sharp points, and seat issues.

C. *Recall Activities*

Since January 1, 1997, there have been 11 children's folding chair or stool recalls involving 10 different firms, and 5,394,600 units of product. The hazards include pinching, bruising, fractures, finger amputations, and lead paint violations.

IV. The ASTM Standard

A. *History of ASTM F2613*

Section 104(b)(1)(A) of the CPSIA requires the Commission to consult representatives of "consumer groups, juvenile product manufacturers, and independent child product engineers and experts" to "examine and assess the effectiveness of any voluntary consumer product safety standards for durable infant or toddler products." As a result of incidents arising from children's folding chairs, CPSC staff requested that ASTM develop voluntary requirements to address the hazard patterns related to the use of folding chairs. Through the ASTM process, CPSC staff consulted with manufacturers, retailers, trade organizations, laboratories, consumer advocacy groups, consultants, and members of the public.

ASTM F2613 was first published in 2007, and since then, the voluntary standard has been revised five times (2009, 2010, 2011, 2013, and 2014). The scope of products covered by the original version, F2613-07, was limited to “children’s folding chairs” with a seat height of 15 inches or less. Significant revisions were made in 2013, in ASTM F2613-13, that were designed to expand the scope of the voluntary standard to all children’s chairs and stools. In addition, the ASTM 2613-13 standard added definitions for “children’s chair” and “children’s stool,” and clarified the definition of a “folding chair” and “folding stool.” Specifically, “stools” were defined as a specific subset of a chair (“a children’s chair without back or armrests”). ASTM 2613-13 also added stability requirements, a test method for stability, and clarified that locking mechanism requirements are applicable only for folding chairs and folding stools.

The current version, ASTM F2613-14, was approved on October 1, 2014, and published in October 2014. ASTM F2613-14 excludes products that do not have a rigid frame (such as bean bag chairs or foam chairs), seats with restraint systems, products intended for use by more than a single child, and products in which the child could not get in and out of the product unassisted. ASTM F2613-14 also includes products “with or without a rocking base” and contains many general requirements that are common to other juvenile product standards, such as requirements for sharp edges or points, small parts, and lead in paint. There are also specific performance requirements to address incidents that may result in lacerations, fractures, pinches, amputations, and other injuries. ASTM F2613-14 also contains requirements for marking and labeling.

B. International Standards for Children’s Folding Chairs and Folding Stools

CPSC staff compared the performance requirements of ASTM F2613-14 to the performance requirements of international standards: FIRA C001:2008 Furniture – Children’s Domestic Furniture –General Safety Requirements and FIRA C002:2008 Furniture – Children’s

Domestic Furniture Seating – Requirements for Strength, Stability, and Durability, which address children’s chairs.

CPSC staff’s review showed that ASTM F2613-14 is the most comprehensive of the standards to address the incident hazards because ASTM F2613-14 includes requirements for labeling, pinch/shear, locking devices, entrapment, stability, strength, and small parts. FIRA C001/C002 standards include some requirements not found in ASTM F2613-14, such as a requirement for materials to be clean and free from infestation, and requirements that deal with corrosion-resistant metals, prohibition of glass and glass mirrors, retention of magnets, partially bound and V-shaped openings above 23.5 inches, moisture content of timber components, and powered-mechanism shear/pinch hazards. However, the hazard patterns identified in CPSC staff’s review of the incident data did not indicate that similar requirements need to be added to ASTM F2613-14. However, CPSC staff will continue to monitor hazard patterns and recommend future changes, if necessary.

V. Assessment of Voluntary Standard ASTM F2163-14

CPSC staff considered the fatalities, injuries, and non-injury incidents associated with children’s folding chairs and folding stools, and evaluated ASTM F2163-14 to determine whether the current ASTM standard adequately addresses the incidents, or whether more stringent standards would further reduce the risk of injury associated with these products. Based on CPSC staff’s assessment, the Commission proposes the following modifications to ASTM F2163-14: (1) limit the scope of the proposed mandatory standard to children’s folding chairs and folding stools; (2) change the stability test method to add a new performance requirement and test method to address sideways stability incidents in addition to rearwards stability incidents; and (3) revise the marking and labeling sections.

A. Scope

ASTM F2613-13 expanded the scope of the standard beyond children's folding chairs to include all children's chairs and stools. CPSC staff conducted a preliminary review of the incident data involving all children's chairs and stools. CPSC staff determined that, based on the total number of incidents, the number of incidents over time (years), the body parts injured, and the incident victim's average age reported, the hazards associated with children's folding chairs or stools are substantially different from the hazards reported for children's non-folding chairs or stools. Accordingly, the NPR encompasses both folding chairs and folding stools, but does not include *all* children's chairs and stools. However, CPSC staff will continue to review incidents from children's non-folding chairs and stools to monitor whether hazards associated with non-folding chairs and stools also need to be addressed.

ASTM defines "children's chair" as "seating furniture with a rigid frame that is intended to be used as a support for the body, limbs, or feet of a child when sitting or resting in an upright or reclining position." A "children's stool" is defined as a "children's chair without back, or armrest." ASTM defines "children's folding chair" and "children's folding stool" as "a children's chair or stool which can be folded for transport or storage." ASTM's definition considers children's folding stools to be a subset of children's folding chairs, albeit without a back or armrest. CPSC staff also agrees that stools are a subset of chairs. Significantly, folding chairs and folding stools have similar configurations, and the same potential hazards are presented in the folding mechanisms. One reported incident in the injury data involved folding stools and a pinching injury to a child's fingers when the stool's locking mechanism failed and caused the stool to fold. This is the same scenario that occurs with folding chairs. The configuration of folding stools is similar to folding chairs, even though stools lack a backrest and

arms. Like folding chairs, folding stools can fold unexpectedly or collapse unexpectedly during use, if there is a faulty locking mechanism—or no locking mechanism at all— and result in serious injuries to fingers if there is a lack of adequate clearance. Although CPSC staff is not aware of any reported stability-related incidents associated with folding stools, ASTM F2613-14 currently requires folding stools to be tested to the same rearward stability test as required for folding chairs. The sideways stability test would be equally applicable to folding stools. CPSC staff's review indicated that the test methods for loading, locking mechanisms, clearances, stability testing, and labeling requirements for folding stools would be the same for folding chairs.

Based on CPSC staff's review of the configurations of children's folding chairs and folding stools and the hazards presented by them, the Commission proposes to include children's folding stools, along with children's folding chairs, in the scope of the proposed rule. However, the Commission seeks public comments regarding the inclusion of children's folding stools in the proposed standard.

B. Hazards

CPSC believes that ASTM F2613-14 adequately addresses many of the general hazards associated with durable nursery products, such as lead in paint and surface coatings, sharp edges/sharp points, small parts, wood part splinters, openings/entrapments, flammable solids, and attached toy accessories. The standard covers specific requirements for folding chairs and stools, including requirements for adequate clearances or locking mechanisms to address pinch/shear hazards related to folding of the chair, load requirements to address structural integrity, stability requirements to address rearward tipover and warning and labeling requirements to inform the user of the hazards associated with children's folding chairs and stools. CPSC believes that these requirements adequately address the majority of incidents

associated with folding chairs and folding stools. However, as discussed below, the Commission proposes to change the stability test method to include a sideways stability test method, as well as changes to the warning and labeling requirements to further reduce the risk of injury associated with folding chairs and stools.

Pinch/Shear Hazards - ASTM F2613-14 includes requirements to prevent injury to the occupant from scissoring, shearing, or pinching when structural members or components rotate about a common axis, slide, pivot, fold, or otherwise move relative to one another. CPSC staff's review concluded that the current mechanical requirements adequately address the pinch and shear hazards in children's folding chairs and stools. The number of reported incidents has continued to decline since ASTM F2613 was first published in 2007, with reported incidents continuing to occur on chairs that are either noncompliant or not readily identifiable as folding chairs or folding stools. Although these injuries and incidents have declined, CPSC believes that strengthening the warning and labeling requirements for finger amputation hazards may make caregivers more aware of the hazard, and possibly reduce the likelihood that these types of incidents will occur in the future.

Undetermined Hazard Finger Injuries – CPSC staff's review of the incident data indicates that some of the undetermined hazard finger injuries are likely due to pinching and shearing issues discussed above in in the hazard patterns and finger entrapments. However, CPSC staff did not obtain enough information in the incident reports to make a definitive determination. Other than pinching/shearing, fingers can be caught between non-moving parts, in circular holes, or in grooves or slots. Finger entrapment in circular holes results in cutting off circulation, which does not generally occur with grooves or slots. The current standard includes requirements to avoid finger entrapment in circular holes by establishing allowable dimensions

for circular holes. At this time, the Commission is not proposing any changes to ASTM F2613-14 to address these undetermined incidents.

Stability/Tipover Hazard - A review of incident data reveals 22 occurrences of chairs tipping over with no evidence of the chair collapsing. The incident descriptions often state that the child was leaning over or reaching to one side when the chair tipped over. ASTM F2613-14 contains a requirement to address the rearward stability of the chair or stool, but sets forth no requirement to address tipovers from lack of sideways stability. The majority of the tipover incidents were due to sideways tipovers. Even though most of the injuries sustained were minor, due to the short height of the chair, there is the potential for more severe injuries to occur, if the child falls onto a nearby object. Accordingly, CPSC staff performed testing to various stability test methods and found that the stability method currently in ASTM F2613-14 could be used to determine both rearward and sideways stability with modifications.

CPSC staff compared the existing ASTM F2613-14 stability test to the stability requirements found in the European standard EN 1022 Domestic Furniture Seating – Determination of Stability. However, the requirements in EN 1022 are applicable to adult-sized furniture, not children’s furniture. Accordingly, CPSC staff reviewed a standard developed by the UK Furniture Industry Research Association (“FIRA”), FIRA C002:2008 Furniture – Children’s Domestic Furniture Seating – Requirements for Strength, Stability, and Durability. FIRA C002 specifies the EN 1022 test method, but adjusts the test loads based on the weight of the intended child occupant. FIRA C002 further references EN 1729-2 Furniture – Chairs and Tables for Educational Institutions Part 2, for determining the loading points for the test loads. After testing both methods (ASTM F2613-14 and EN 1022) for sideways stability on sample children’s folding chairs, CPSC staff determined that both methods were valid and the results

were comparable between the two methods. However, the ASTM F2613-14 test method already is being used to test rearwards stability, and CPSC staff found that the test method could be used also to test sideways stability with modifications, to reduce the incidents of tipovers.

On July 24, 2015, ASTM balloted the sideways stability requirement, which received five negative votes and several comments, most of which contained editorial comments to the ballot. The negatives all pertain to a common style non-folding chair without arms that fails the balloted requirement, but is not associated with any incidents. However, the proposed rule does not include non-folding chairs and stools, and non-folding chairs and stools are outside the scope of the proposed rule. Accordingly, the Commission proposes to change the stability test method in ASTM F2613-14 to include a sideways stability test method, in addition to rearward stability testing, to reduce the number of tip-over-related incidents for folding chairs and folding stools.

Miscellaneous Hazards – CPSC staff’s review of the incident data included 17 incidents involving miscellaneous hazards. Three incidents related to elevated levels of hazardous materials (e.g., lead, bromine, or mercury). One of the incidents appears to be “non-product-related,” and the remaining 13 incidents involved various integrity issues, such as loose screws, loose plastic pieces, or a detached seat pad.

ASTM 2613-14 contains requirements prohibiting certain hazardous substances, including lead and flammable substances. In addition, ASTM 2613-14 also includes requirements for sharp points and edges, which were noted in some incidents. CPSC staff’s review also indicated that the static load and fatigue tests in ASTM 2613-14 also would minimize integrity issues. Accordingly, the Commission is not proposing any changes to the existing ASTM F2613-14 standard to address these miscellaneous incidents at this time.

Marking and Labeling - CPSC staff’s review of the warning labels in ASTM 2613-14

indicates that the existing warning labels found in the 2014 version of the standard can be improved in terms of content and format, by improving three areas: (1) noticing the label; (2) processing the safety message; and (3) motivating behavior changes.

Noticing the Label - Currently, many folding chairs and folding stools place the warning label on the bottom of the seating surface of the chair. CPSC staff believes that consumers are less likely to notice the warnings on the bottom of the chair for several reasons. First, consumers are not likely to notice the warning when the chair is unfolded and in the upright position. Second, a child's folding chair or stool has no obvious hazards. If the perception of hazard associated with a product is low, consumers are less likely to look for a warning. Third, in many instances, even if consumers looked for a warning on a currently-marketed folding chair or stool, the consumer may not notice the warning because the warning is embedded or buried among non-safety messages.

Although CPSC staff believes that the ideal placement of the label is on the front of the chair, such placement may detract from the appearance of the product and make consumers remove the label. Accordingly, CPSC staff looked at other locations for appropriate label placement. For example, one area that may be separate and distinct label on a folding chair is on the back of the chair's back rest away from warnings on the underside of the chair. An example of separate and distinct label on a folding stool is on a visible location such as on the legs in such a way that the label does not wrap around the legs.

Processing the Safety Message - Currently, ASTM2613-14 requires that the warnings be easy to read and understand. However, this requirement is vague and gives no guidance on how to implement these requirements. CPSC staff's research indicates that warnings in a bullet point, outline-type list are rated higher by subjects on perceived effectiveness than when in paragraph

format. Similarly, text arranged in a list format, rather than horizontally, makes instructions easier to follow. Other changes, such as using “white space” to break up text into “chunks” of information, using sans serif typestyle for short word messages, and a mixture of upper and lower case lettering, can be less confusing and easier to read than all uppercase lettering because there is more variation among the letter shapes. CPSC staff’s evaluation indicated that if these elements are included, warning labels will be easier to read and understand.

Motivating Behavioral Change – CPSC staff’s research indicates that if a consumer notices the label, and reads and understands the safety messages, the label should motivate a change in behavior. To motivate consumers to comply with the warning, the warning should tell consumers why they need to comply. Therefore, the way in which the warning describes the hazard, as well as a statement about the consequences of ignoring the warning, may have an influence on compliance rates. Further, the label needs to tell consumers what to do to avoid the hazard.

CPSC staff developed suggested wording and formatting changes for children’s folding chairs and folding stools that CPSC staff believed would improve the warning label sections of the voluntary standard. CPSC staff circulated these proposed wording and formatting changes to the ASTM subcommittee responsible for ASTM F2613-14, and discussed the proposed changes at public ASTM meetings in January and May 2015. In response to feedback received from ASTM and stakeholders, CPSC staff made adjustments to staff’s proposed warning labels.

Based on staff’s evaluation, the Commission now proposes to adopt ASTM F2613-14, with modifications to some of the warning labels for children’s folding chairs and stools, to provide specific guidance for a more consistent and prominent presentation of hazard information through the use of clear and conspicuous text. In addition, the proposed rule

recommends that the warnings be separate and distinct from other written material or graphics, so that the label is clearly visible when consumers approach the folding chair or folding stool.

VI. The Proposed Rule

A. CPSC's Proposed Standard for Children's Folding Chairs and Stools


The Commission is proposing to incorporate by reference ASTM F2613-14, with certain modifications to strengthen the standard. As discussed in the previous section, the Commission concludes that these modifications will further reduce the risk of injury associated with children's folding chairs and stools.

The proposed rule would limit the scope of the rule to children's folding chairs and folding stools under section 1232.1. The definition of "children's folding chair" and "folding stool" is provided in ASTM F2613-14 in section 3.1.4. In addition, section 1232.2(a) would incorporate by reference ASTM F2613-14, with the exception of certain provisions that the Commission proposes to modify. Section 1232.2(b) would detail the changes and modifications to ASTM F2613-14 that the Commission has determined would further reduce the risk of injury from children's folding chairs and folding stools.

In particular, we would revise section 5.13 (Stability), to specify that all products shall not tip over backwards or sideways when tested in accordance with the stability test methods and provide that tip over shall consist of the product moving past equilibrium and begin to overturn. In addition, we propose to revise Section 6.8 (Stability Test Method) to include a test method for sideways stability testing, as well as rearward stability testing. We also propose to add Section 6.8.1 to provide the requirements for the test equipment and preparation, and specify the test surface area, test cylinders, and measurement of product seating surface height.

The proposed rule would add section 6.8.2. to provide the test method for rearward

stability and section 6.8.3 to provide the test method for sideways stability. Those sections would also specify the product orientation, the application of the load, cylinder positioning for folding chairs, and cylinder positioning for folding stools.

We also propose revisions to the marking and labeling section in section 7.2. Specifically, section 7.2 would be changed to state that each folding chair and each folding stool requires warning statements. New proposed requirements would provide specific instructions so that warnings are easier to read and are more conspicuous. Some of these requirements include putting the warnings in the English language, using highly contrasting color(s) in non-condensed sans serif type, text size, and placing the label separate and distinct from any other graphic or written material on the product. Other proposed requirements would provide specific language for the warning statements including the use of the safety alert symbol “

B. Other Provisions of the Proposed Rule

The Commission is also proposing to amend 16 CFR part 1112 to include 16 CFR part 1232 in the list of notice of requirements (“NORs”) issued by the Commission, as discussed in section VIII of the preamble.

In addition, for consistency in deeming both children’s folding chairs and folding stools to be “durable infant or toddler products,” the Commission also is proposing to amend 16 CFR section 1130.2 to make the scope of the registration card rule applicable to both children’s folding chairs and folding stools. As discussed in section V of the preamble, although the registration card rule specifically lists children’s folding chairs, the rule is silent on children’s folding stools (16 CFR 1130.2(a)(13)). The Commission considers folding stools to be a subset of folding chairs, and therefore, proposes to include children’s folding stools within the scope of

the proposed standard. Accordingly, the Commission proposes to amend § 1130.2 by revising paragraph (a)(13) to include both children's folding chairs and folding stools.

VII. Incorporation by Reference

Section 1232.2(a) of the proposed rule incorporates by reference ASTM F2670-13. The Office of the Federal Register ("OFR") has regulations concerning incorporation by reference. 1 CFR part 51. The OFR regulations require that, for a proposed rule, agencies must 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 of this preamble summarizes the provisions of ASTM F2613-14 that the Commission proposes to incorporate by reference. ASTM F2613-14 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 F2613-14 from ASTM International, 100 Bar Harbor Drive, P.O. Box 0700, West Conshohocken, PA 19428; <http://www.astm.org>. One may also inspect a copy at CPSC's Office of the Secretary, U.S. Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda, MD 20814, telephone 301-504-7923.

VIII. Amendment of 16 CFR Part 1112 to Include NOR for Children's Folding Chairs and Stools

The CPSA establishes certain requirements for product certification and testing. 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 Commission, must be certified as complying with all applicable CPSC-enforced requirements. 15 U.S.C. 2063(a). Certification of children's products subject to a children's product safety rule must be based on testing conducted by a CPSC-accepted third party conformity assessment body. *Id.* 2063(a)(2). The Commission must publish a NOR for the accreditation of third party conformity assessment bodies to assess conformity with a children's product safety rule to which a children's product is subject. *Id.* 2063(a)(3). Thus, the proposed rule for 16 CFR part 1232, Safety Standard for Children's Folding Chairs and Stools, if issued as a final rule, would be a children's product safety rule requiring the issuance of a NOR.

The Commission published a final rule, *Requirements Pertaining to Third Party Conformity Assessment Bodies*, 78 FR 15836 (March 12, 2013), codified at 16 CFR part 1112 ("part 1112") and effective on June 10, 2013, establishing requirements for CPSC acceptance of third party conformity assessment bodies to test for conformance with a children's product safety rule in accordance with section 14(a)(2) of the CPSA. Part 1112 also codifies all of the NORs previously issued by the Commission.

All new NORs for new children's product safety rules, such as the children's folding chairs and stools standard, require an amendment to part 1112. To meet the requirement that the Commission issue a NOR for the proposed children's folding chairs and stools standard, as part of this NPR, the Commission proposes to amend the existing rule that codifies the list of all NORs issued by the Commission to add children's folding chairs and stools to the list of children's product safety rules for which the CPSC has issued a NOR.

Test laboratories applying for acceptance as a CPSC-accepted third party conformity assessment body to test to the new standard for children's folding chairs and stools 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, the laboratory can apply to the CPSC to have 16 CFR part 1232, *Standard Consumer Safety Specification for Children’s Folding Chairs and Stools*, included in the laboratory's scope of accreditation of CPSC safety rules listed for the laboratory on the CPSC website at: www.cpsc.gov/labsearch.

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 is proposing an effective date of 6 months after publication of the final rule in the Federal Register for products manufactured or imported on or after that date. The proposed rule would require manufacturers to make design or manufacturing changes to address the proposed sideways stability testing requirements. The warning label changes do not affect the design and manufacturing of the folding chairs or folding stools, but rather, require printing new labels. The Commission believes that most firms should be able to comply within the 6-month time frame and allow ample time for manufacturers and importers to arrange for third party testing, consistent with the timeframe adopted in a number of other section 104 rules. However, the Commission seeks comments regarding the economic impact on small manufacturers and importers on meeting the side stability testing requirements as well as meeting the third party testing requirements discussed in section X below. In addition, we ask for comments on the proposed 6-month effective date.

X. Regulatory Flexibility Act

A. Introduction

The Regulatory Flexibility Act (“RFA”) requires agencies to consider the impact of proposed rules on small entities, including small businesses. The RFA generally requires agencies to review proposed rules for their potential impact on small entities and prepare an initial regulatory flexibility analysis (“IRFA”) unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. 5 U.S.C. 603 and 605. Because CPSC staff was unable to estimate precisely all costs of the proposed rule, staff conducted such an analysis. The IRFA must describe the impact of the proposed rule on small entities and identify significant alternatives that accomplish the statutory objectives and minimize any significant economic impact of the proposed rule on small entities. Specifically, the IRFA must contain:

- a description of, and where feasible, an estimate of the number of small entities to which the proposed rule will apply;
- a description of the reasons why action by the agency is being considered;
- a succinct statement of the objectives of, and legal basis for, the proposed rule;
- 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
- identification, to the extent possible, of all relevant federal rules that may duplicate, overlap, or conflict with the proposed rule; and
- a description of any significant alternatives to the proposed rule that accomplish the stated objectives of applicable statutes and minimize the rule’s economic impact on small

entities.

B. Market

CPSC staff is aware of four domestic firms manufacturing and ten domestic firms importing children's folding chairs and/or stools in the United States. Most firms only supply one model of chair; two supply two models, and one supplies five distinct models. All four manufacturers and six importers are categorized as "small firms" under the guidelines of the U.S. Small Business Administration ("SBA"). One importer's size could not be determined.

The Juvenile Products Manufacturers Association ("JPMA") maintains a certification program for children's folding chairs and folding stools but at this time there are no active participants. JPMA does not maintain a list of firms complying with the voluntary standard for children's chairs; compliance of firms with the voluntary standard is self-reported and several firms report compliance with ASTM standards. Some of the firms in the market participate actively in the ASTM standard process and those firms are likely to comply with the voluntary standard.

C. Reason for Agency Action and Legal Basis for Proposed Rule

Section 104(b) of the CPSIA requires the CPSC to promulgate a mandatory standard for children's folding chairs and stools that is substantially the same as, or more stringent than, the voluntary standard if the Commission determines that a more stringent standard would further reduce the risk of injury associated with such products. The Commission is proposing a safety standard for children's folding chairs and stools in response to the requirements of section 104(b).

D. Other Federal Rules

The Commission has not identified any federal or state rule that duplicates, overlaps, or conflicts with the proposed rule.

E. Impact of the New Standards and Testing Requirements on Small Businesses

Under SBA guidelines, a manufacturer of children's folding chairs and stools is categorized as "small" if it has 500 or fewer employees, and importers and wholesalers are considered "small" if they have 100 or fewer employees. Staff has identified four firms currently manufacturing and ten firms importing children's folding chairs and stools in the United States. All four manufacturers and six of the importers are categorized as small businesses. One importer's size could not be determined.

Small Manufacturers.

Of the four identified small manufacturers of children's folding chairs and stools in the United States, two claim compliance with the voluntary standard, and at least one participates in the ASTM process. Of the two remaining manufacturers, one does not comply with warning label requirement and possibly other requirements; the compliance of the other could not be determined. Regardless of conformance to the voluntary standard, the proportion of chairs that might need modifications to comply with side stability requirements could be high. In testing conducted by CPSC Engineering Sciences ("ES") staff, 7 models out of 9 model samples (from both small and large firms) failed the proposed test for side stability.

If a folding chair or a folding stool must be modified to comply with the staff's proposed side-stability requirements, costs will vary with the necessary modification. CPSC ES staff has identified the addition of a small plastic stabilizer to each corner as a possible modification for chairs or stools with rounded tube frames, based on one model tested which passed with these stabilizers and failed the test with them removed. Similarly designed models found in Europe,

where side stability requirements exist for children's folding chairs, also contain these stabilizers. The costs of adding these small pieces of plastic would likely be low, due to the size and material.

For chairs with other frame types and arms that extend farther out from the seating area, for which the plastic stabilizers are either not possible or not sufficient, a redesign may be necessary to eliminate the arms or otherwise modify the chair's design for compliance with the requirements. One manufacturer estimates the costs to redesign a non-compliant chair to be \$10,000, including 9 to 12 months of labor and development time. This cost could be significant for one manufacturer, if a redesign were required for all models. The costs for a non-compliant folding chair that does not require a full redesign would likely be lower. The costs for redesign of warning labels is expected to be 1 hour of labor time at current labor rates, as discussed in section XII below.

At this time, CPSC staff does not have sufficient information to determine what proportion of folding chair or folding stool models currently in the market will be able to meet the side-stability requirements through a simple and inexpensive fix like adding a plastic stabilizer versus the proportion of models that will require a more costly redesign. Without this information, the economic impact that the four small manufacturers will experience due to the proposed side-stability requirements is difficult to assess. Therefore, we cannot rule out a significant economic impact for small folding chair manufacturers.

The Commission seeks information on the modifications that manufacturers expect are needed for existing folding chair or folding stool models to meet the side-stability requirements as well as any data regarding the expected costs of such modifications. In particular, the Commission seeks comments on the likely costs of compliance with the side-stability

requirements and the extent to which the total cost of any necessary modifications might exceed one percent of the manufacturer's gross revenue.

Three of the small manufacturers of children's folding chairs and folding stools have diversified product lines. If the cost of compliance with the proposed rule is too high, these firms might discontinue production, thus avoiding significant economic harm. However, because revenue data for these firms was not sufficiently detailed, CPSC staff cannot determine with any certainty whether exit from the market is an economically viable option. The remaining manufacturer supplies a folding chair as an accessory with its one main product. This manufacturer's folding chair does not currently comply with the voluntary standard. Although the firm might be able to offer its product line without a folding chair, CPSC staff cannot determine whether ceasing the sale of its folding chair would have a significant adverse impact on the firm, and thus, CPSC staff is unable to rule out a significant economic impact based on this manufacturer's ability to exit the market.

To better assess the economic impact on small manufacturers, the Commission is interested in obtaining data on the importance of children's folding chairs and stools relative to a manufacturer's overall product line and gross revenues, and feedback regarding the desirability of exit as a strategy for averting regulatory compliance costs. For example, do sales of children's folding chairs or folding stools constitute a small proportion of a manufacturer's overall revenue (i.e. less than one percent of gross revenue)? Would a typical manufacturer of children's folding chairs or folding stools be able to discontinue production without experiencing significant economic hardship?

Under section 14 of the CPSA, children's folding chairs and stools are subject to third party testing and certification. Once the new requirements become effective, all manufacturers

will be subject to the additional costs associated with the third party testing and certification requirements under the testing rule, Testing and Labeling Pertaining to Product Certification (16 CFR part 1107). Third party testing will include physical and mechanical test requirements specified in the folding chairs final rule; lead testing is already required. Third party testing costs are in addition to the direct costs of meeting the standard.

CPSC staff contacted two small manufacturers regarding testing costs and one firm estimated that chemical and structural testing of one unit of a children's folding chair costs around \$1,000 annually. No other firms were willing or able to supply the requested testing cost information. Estimates provided by suppliers for other section 104 rulemakings indicate that around 40 to 50 percent of testing costs can be attributed to structural requirements, with the remaining 50 to 60 percent resulting from chemical testing (lead testing). CPSC staff estimates that testing to structural components of the ASTM voluntary standard could cost about \$400 to \$500 per sample tested ($\$1,000 \times .4$ to $\$1,000 \times .5$). These costs are consistent with testing cost estimates for products with standards of similar complexity.

CPSC staff's review of the children's folding chairs and folding stools market shows that three small domestic manufacturers supply one model of children's folding chair or folding stool to the U.S. market annually. The fourth small manufacturer supplies five models of children's folding chairs and folding stools. Therefore, if third party testing were conducted every year, third party testing costs for three manufacturers with only one model would be about \$400-\$500 annually per model tested, and \$2,000-\$2,500 for the other manufacturer (\$400-\$500 per model, five models), if only one sample were tested for each model.

The testing and labeling rule (16 CFR part 1107) is not explicit regarding the number of samples firms will need to test to meet the "high degree of assurance" criterion. However, based

on an examination of each small domestic manufacturer's revenues from recent Dun & Bradstreet or Reference USA reports, testing costs are likely to be under one percent of gross revenue for these small manufacturers. Thus, it seems unlikely that testing costs, by themselves, would be economically significant for the small manufacturers unless a very high number of samples per model were needed to meet the "high degree of assurance" criterion. The Commission seeks comments on the typical number of samples that are tested to satisfy third party testing requirements, and whether third party testing would lead to significant economic impact.

Small Domestic Importers. Of the six or seven small importers, only one claims that its products comply with the ASTM standard. The state of compliance for the remainder could not be determined. For the importer or importers currently in compliance with the voluntary standard, if their products pass the sideways stability test, there should be minimal burden associated with compliance. As most of the imported chairs tested by CPSC engineering staff failed the proposed sideways stability test, it is probable that many importers' products would not comply with the proposed rule.

Whether there is a significant economic impact on small importers will depend upon the extent of the changes required to come into compliance and the response of their supplying firms. In general, if the supplying firm comes into compliance, the importer could elect to continue importing the compliant product. Any increase in production costs experienced by suppliers as a result of changes made to meet the mandatory standard could be passed on to the importers. If an importer is unwilling or unable to accept the increased costs, or if the importer's supplier decides not to comply with the mandatory standard, the importer could find another supplier of children's folding chairs and stools or stop importing children's folding chairs and

stools. Because no small importers responded to requests for information, however, staff could not estimate the economic impact on these firms and cannot rule out a significant economic impact.

To assist with further analysis of the impact of the rule on small importers, the Commission seeks information on the degree to which supplying firms tend to pass on increases in production and regulatory costs to importers. To what extent is the ability to pass on these costs limited by the ease with which importers can switch suppliers or substitute an alternative product for children's folding chairs and stools?

As with manufacturers, all importers will be subject to third party testing and certification requirements, and consequently, will be subject to costs similar to those for manufacturers if the importer's supplying foreign firm(s) does not perform third party testing. These testing costs are not likely, by themselves, to exceed one percent of gross revenue for the six small domestic importers for which revenue information is available. The impact on the other importer is unknown. Again, the Commission is interested in the size of the economic impact third party testing poses for importers, and whether testing costs would constitute a small proportion of a manufacturer's overall revenue (i.e. less than one percent of gross revenue).

Alternatives. CPSC staff reviewed the alternatives to the proposed mandatory standard. Adopting ASTM F2613-14 with respect to children's folding chairs and stools, but without any further modifications to the performance requirements is one alternative. This alternative would reduce the impact on all of the known small businesses supplying children's folding chairs and stools to the U.S. market by not including the additional requirements and tests for sideways stability and additional labeling requirements. Another alternative would be to set a later effective date than the 6 month effective date proposed in the NPR. The NPR requests

comments on the economic impacts of the proposed rule, as well as comments on the 6 month effective date.

F. Impact of Proposed 16 CFR Part 1112 Amendment on Small Businesses

As required by the RFA, staff conducted a Final Regulatory Flexibility Analysis (“FRFA”) when the Commission issued the part 1112 rule (78 FR 15836, 15855-58). Briefly, the FRFA concluded that the accreditation requirements would not have a significant adverse impact on a substantial number of small testing laboratories because no requirements were imposed on test laboratories that did not intend to provide third party testing services. The only test 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 16 CFR part 1112 to include the NOR for the children’s folding chair and stool standard will not have a significant adverse impact on small test laboratories. Moreover, based upon the number of test laboratories in the United States that have applied for CPSC acceptance of accreditation to test for conformance to other mandatory juvenile product standards, we expect that only a few test laboratories will seek CPSC acceptance of their accreditation to test for conformance with the children’s folding chair and stool standard. Most of these test laboratories will have already been accredited to test for conformance to other mandatory juvenile product standards, and the only costs to them would be the cost of adding the children’s folding chair and stool standard to their scope of accreditation. As a consequence, the Commission certifies that the NOR amending 16 CFR part 1112 to include the children’s folding chair and stool standard will not have a significant impact on a substantial number of small entities.

XI. Environmental Considerations

The Commission's regulations address whether we are required to prepare an environmental assessment or an environmental impact statement. Under these regulations, a rule that has “little or no potential for affecting the human environment” is categorically exempt from this requirement. 16 CFR 1021.5(c)(1). 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). In this document, pursuant to 44 U.S.C. 3507(a)(1)(D), we set forth:

- 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.

Title: Safety Standard for Children’s Folding Chairs and Stools

Description: The proposed rule would require each folding chair and folding stool to comply with ASTM F2613-14, with the changes proposed in this Notice, which contains requirements

for marking and labeling. 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 children’s folding chairs and folding stools.

Estimated Burden: We estimate the burden of this collection of information as follows:

Table 1 – Estimated Annual Reporting Burden

16 CFR Section	Number of Respondents	Frequency of Responses	Total Annual Responses	Hours per Response	Total Burden Hours
1232.2	14	1.4	20	1	20

Our estimate is based on the following:

There are 14 known firms supplying children’s folding chairs or folding stools to the U.S. market. All firms are assumed to use labels on both their products and their packaging already, but they might need to make some modifications to their existing labels. The estimated time required to make these modifications is about 1 hour per model. Each of these firms supplies an average of 1.4 different models of children’s folding chairs or folding stools; therefore, the estimated burden hours associated with labels is 1 hour x 14 firms x 1.4 models per firm = 20 annual hours.

We estimate that hourly compensation for the time required to create and update labels is \$30.09 (U.S. Bureau of Labor Statistics, “Employer Costs for Employee Compensation,” December 2014, 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 associated with the proposed requirements is \$602 (\$30.09 per hour x 20 hours = \$601.80).

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 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:

- 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.

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 Commission 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.” Therefore, the preemption provision of section 26(a) of the CPSA would apply to a rule issued under section 104.

XIV. Request for Comments

This NPR begins a rulemaking proceeding under section 104(b) of the CPSIA to issue a consumer product safety standard for children’s folding chairs and stools, and to amend part 1112 to add children’s folding chairs and stools to the list of children's product safety rules for which the CPSC has issued an NOR. We invite all interested persons to submit comments on any aspect of the proposed mandatory safety standard for children’s folding chairs and stools and on the proposed amendment to part 1112. Specifically, the Commission requests comments on the costs of compliance with, and testing to, the proposed mandatory children’s folding chairs and stools standard, the proposed 6-month effective date for the new mandatory children’s folding chairs and stools standard, and the amendment to part 1112. In addition, the Commission requests comments on the proposed amendment to part 1130, to include folding stools in 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 1232

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

2. Amend § 1112.15 by adding paragraph (b)(43) 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) * * *

(43) 16 CFR part 1232, Safety Standard for Children’s Folding Chairs and Stools.

* * * * *

3. Amend § 1130.2 by revising paragraph (a)(13) to read as follows:

PART 1130 – REQUIREMENTS FOR CONSUMER REGISTRATION OF DURABLE INFANT OR TODDLER PRODUCTS

§ 1130.2 Definitions.

* * * * *

(a) * * *

(13) Children’s folding chairs and stools;

* * * * *

4. Add part 1232 to read as follows:

**PART 1232—SAFETY STANDARD FOR CHILDREN’S FOLDING CHAIRS AND
STOOLS**

Sec.

1232.1 Scope.

1232.2 Requirements for children’s folding chairs and stools.

Authority: Sec. 104, Public Law No. 110-314, 122 Stat. 3016.

§ 1232.1 Scope.

This part establishes a consumer product safety standard for children’s folding chairs and stools.

§ 1232.2 Requirements for children’s folding chairs and stools.

(a) Except as provided in paragraph (b) of this section, each children’s folding chair and stool shall comply with all applicable provisions of ASTM F2613-14, *Standard Consumer Safety Specification for Children’s Chairs and Stools*, approved October 1, 2014. 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>. You may inspect a copy at the Office of the Secretary, 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.

(b) Comply with ASTM F2613-14 with the following additions or exclusions:

(1) Instead of complying with section 5.13 of ASTM F2613-14, comply with the following:

(i) 5.13 *Stability* All chairs shall not tip over backward or sideways when tested in accordance with 6.8. Tip over shall consist of the product moving past equilibrium and begin to overturn.

(ii) [Reserved]

(2) Instead of complying with section 6.8 of ASTM F2613-14, comply with the following:

(i) 6.8 *Stability Test Method*

(A) 6.8.1 *Test equipment and preparation*

(1) 6.8.1.1 Test surface – any rigid material covered with a high pressure laminate of unspecified color with a smooth matte finish and inclined at an angle of 10° ($\pm 0.5^{\circ}$) to the horizontal plane.

(2) 6.8.1.2 50 lb. test cylinder – cylinder weighing 50.0 \pm 0.5 lbs. (22.7 \pm 0.2 kg) that is 12.0 \pm 0.1 in. (305 \pm 2 mm) high with a diameter of 6.0 \pm 0.1 in. (152 \pm 2 mm) and a center of gravity of 6.0 \pm 0.1 in. (152 \pm 2 mm) from either face (see Fig. 5). This cylinder shall be applied to a product seating surface whose height is 10 in. (254 mm) or less from the floor.

(3) 6.8.1.3 100 lb. test cylinder – cylinder weighing 100.0 \pm 0.5 lbs. (45.4 \pm 0.2 kg) that is 12.0 \pm 0.1 in. (305 \pm 2 mm) high with a diameter of 6.0 \pm 0.1 in. (152 \pm 2 mm) and a center of gravity of 6.0 \pm 0.1 in. (152 \pm 2 mm) from either face (see Fig. 5). This cylinder

shall be applied to a product seating surface whose height is greater than 10 in. (254 mm) above the floor.

(4) 6.8.1.4 Measurement of the product seating surface height – This height shall be measured from the floor to the midpoint on the upper surface of the front edge of the seating surface, when a 2 lb. (0.9 kg) load is applied vertically downward using a ½” (13 mm) diameter disk onto the midpoint on the upper surface of the front edge of the seat (see Fig X).

Note X – Use of stops to prevent sliding: If necessary to prevent the product from sliding down the incline, either by its own weight when initially placed on the incline or during the conduct of the test in the following sections, stops can be placed against the product’s legs. Stops shall be the minimum height required to prevent sliding and shall not inhibit overturning.

(B) 6.8.2 *Rearward stability*

(1) 6.8.2.1 Product orientation: Place the product on the test surface with the front of the product facing the upward slope.

(2) 6.8.2.2 Application of the load: Place the applicable test cylinder so that it is centered side to side on the product seating surface, oriented perpendicular to the plane of this surface, and allow the cylinder to come to rest.

(3) 6.8.2.3 Cylinder Positioning for Chairs: Place the cylinder as far back or downslope on the seating surface as permitted by the seat back or chair frame (see Fig. 4).

(4) 6.8.2.4 Cylinder Positioning for Stools: Place the cylinder as far back or downslope as permitted by the seating surface without allowing any part of the cylinder to extend beyond the rearmost or downslope edge of the stool.

(C) 6.8.3 *Sideways stability*

(1) 6.8.3.1 Product orientation: Place the product on the test surface in the most unfavorable position with a side of the product facing the upward slope.

(2) 6.8.3.2 Application of the load: Place the applicable test cylinder so that it is centered front to back on the product seating surface, oriented perpendicular to the plane of this surface, and allow the cylinder to come to rest.

(3) 6.8.3.3 Cylinder Positioning for Chairs: Place the cylinder as far back or downslope on the seating surface as permitted by the chair frame or arms (see Fig. Y).

(4) 6.8.3.4 Cylinder Positioning for Stools: Place the cylinder as far back or downslope as permitted by the seating surface without allowing for any part of the cylinder to extend beyond the rearmost or downslope edge of the stool.

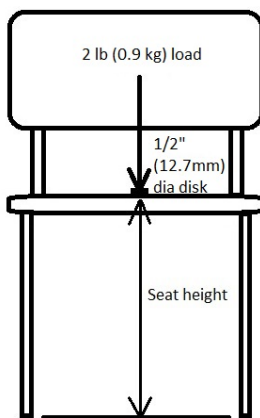


Figure X. Seating Surface
Height Measurement

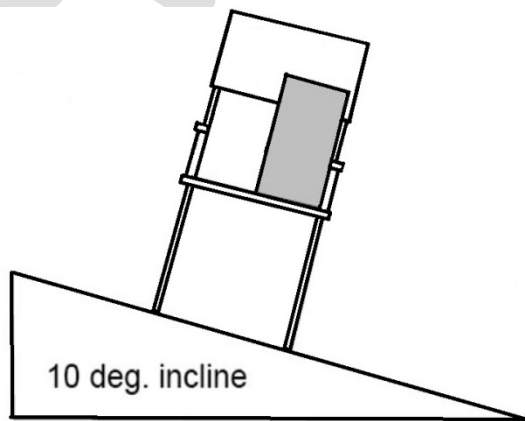


Figure Y. Sideways Stability Test
Showing Orientation of Chair and Test Cylinder

(3) Instead of complying with section 7.2 of ASTM F2613-14, including all subsections of section 7.2, comply with the following:

(i) 7.2 Warning Statements: Each folding chair and each folding stool shall have warning


statements.


(A) 7.2.1 The warnings shall be easy to read and understand and be in the English language at a minimum.

(B) 7.2.2 The warning statements shall be conspicuous in highly contrasting color(s) (e.g., black text on white background), in non-condensed sans serif type, permanent and applied so they are in a prominent location, visible to the caregiver when the product is in the manufacturer's use position.

(C) 7.2.3 The specified warnings shall be separate and distinct from any other graphic or written material on the product and surrounded by a black border. Note: Separate and distinct, for example, on the back of the chair's back rest away from warnings on the underside of the chair so that it is clearly visible to a consumer approaching the chair from the back. For stools, where possible, the label shall be placed in a visible location such as on the legs in such a way that the label does not wrap around the legs.

(D) 7.2.4 Any labels or written instructions provided in addition to those required by this section shall not contradict or confuse the meaning of the required information or be otherwise misleading to the consumer.

(E) 7.2.5 The safety alert symbol “” and, the signal word “WARNING”, and the words “AMPUTATION HAZARD” shall precede the warning statements.

(F) 7.2.6 The safety alert symbol “” and the signal word “WARNING” shall not be less than 0.2-in. (5-mm) high and the remainder of the text shall be in characters whose upper case is at least 0.1-in. (2.5-mm) high except as specified.

(G) 7.2.7 The signal word WARNING shall be in black letters on an orange panel surrounded by a black border.

Note 1- When special circumstances preclude the use of the color orange, yellow or red may be used, whichever contrasts best against the product background.

(H) 7.2.8 The solid triangle portion of the safety alert symbol shall be the same color as the signal word lettering, and the exclamation mark shall be the same color as the signal word panel.

(I) 7.2.9 The words “AMPUTATION HAZARD” shall be in bold black letters.

(J) 7.2.10 The precautionary statements shall be indented from the hazard statements, preceded with bullet points, and appear as shown in Figs. 6 and 7.

(K) 7.2.11 The warning label shall contain sufficient white space as shown as shown in Figs. 1 and 2.

(L) 7.2.12 Overall height and width of the label may be modified as necessary to fit on the product, but still meet requirements for conspicuousness. An example of the warning label format described in this section is shown in Figs. 6 and 7.

(M) 7.2.13 For folding chairs and folding stools with latch(es), warnings shall address the following:

(1) 7.2.13.1 Amputation hazard:

Hazard and Consequence Statement:

AMPUTATION HAZARD

Chair can fold or collapse if lock not fully engaged. Moving parts can amputate child’s fingers if chair folds or collapses.

Precautionary Statements:

- Keep fingers away from moving parts.
- Completely unfold chair and fully engage locks before allowing child to sit in chair.
- Never allow child to fold or unfold chair.

(2) [Reserved]

(N) 7.2.14 For folding chairs and folding stools without latch(es), warnings shall address the following:

(1) 7.2.14.1 Amputation hazard:

Hazard and Consequence Statement

AMPUTATION HAZARD

Moving parts can amputate child's fingers.

Precautionary Statements:

- Keep fingers away from moving parts.
- Completely unfold chair before allowing child to sit in chair.
- Never allow child to fold or unfold chair.

(2) [Reserved]

(4) In addition to the figures in ASTM F2613-14, use the following figure 6:

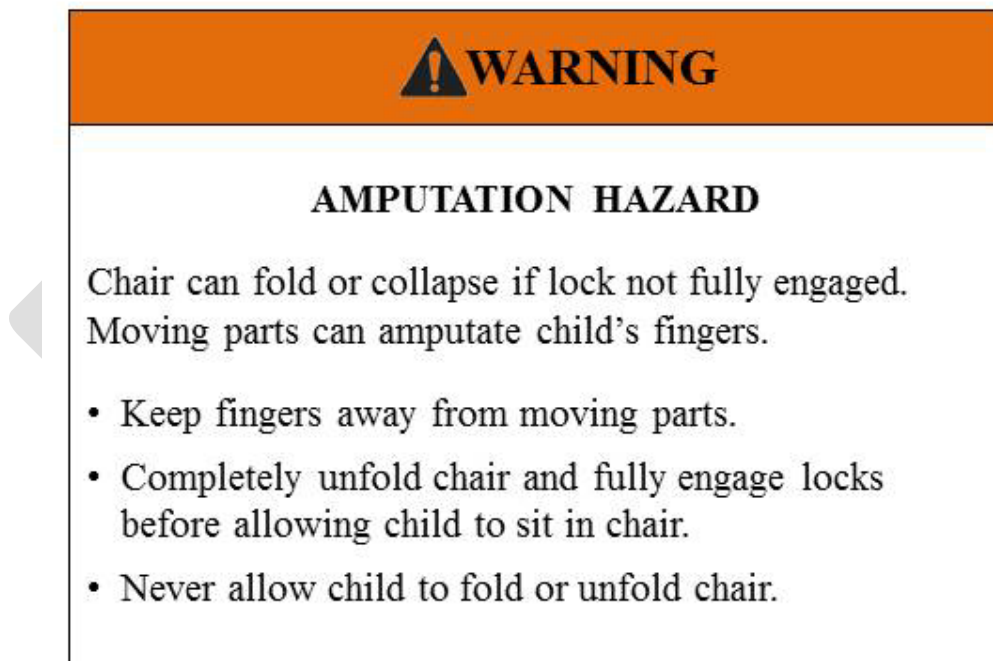


Figure 6 Recommended Label for Chairs (Stools) with Lock(s)

(5) In addition to the figures in ASTM F2613-14, use the following figure 7:

 **WARNING**

AMPUTATION HAZARD

Moving parts can amputate child's fingers if chair folds or collapses.

- Keep fingers away from moving parts.
- Completely unfold chair before allowing child to sit in chair.
- Never allow child to fold or unfold chair.

Figure 7 Recommended Label for Chairs (Stools) without Latch(es)

Dated: _____

Todd A. Stevenson,
Secretary, Consumer Product Safety Commission



Staff Briefing Package

Notice of Proposed Rulemaking for
Children's Folding Chairs and Stools

Sept 18, 2015

CPSC Hotline: 1-800-638-CPSC(2772) CPSC's Web Site: <http://www.cpsc.gov>

Table of Contents

Briefing Memorandum.....	iii
TAB A: Staff’s Review of Children’s Folding Chairs and Stools Standards.....	21
TAB B: Children’s Folding Chair and Folding Stool-Related Injuries and Potential Injuries.....	40
TAB C: Health Sciences Analysis of Injuries Associated with Children’s Folding Chairs and Stools.....	51
TAB D: Human Factors Assessment of ASTM F2613 – 14 Requirements for Children’s Folding Chairs and Stools.....	57
TAB E: Durable Nursery Products: Summary of Children’s Folding Chairs and Stools Recalls from January 1, 1997 to July 1, 2015.....	79
TAB F: Initial Regulatory Flexibility Analysis of Staff-Recommended Proposed Standard for Children’s Folding Chairs and Stools (ASTM F2613).....	85

Briefing Memorandum



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

This document has been electronically
approved and signed.

Memorandum

September 18, 2015

TO: The Commission
Todd Stevenson, Secretary

THROUGH: Stephanie Tsacoumis, General Counsel
Patricia H. Adkins, Executive Director
Robert J. Howell, Deputy Executive Director for Safety Operations

FROM: George A. Borlase, Assistant Executive Director
Office of Hazard Identification and Reduction

Patricia Edwards and Vince Amodeo, Project Manager
Directorate for Engineering Sciences

SUBJECT: Notice of Proposed Rulemaking for Children's Folding Chairs and Stools
and Related Notice of Requirements

I INTRODUCTION

Section 104 of the Consumer Product Safety Improvement Act of 2008 ("CPSIA") is the Danny Keysar Child Product Safety Notification Act. This Act requires the U.S. Consumer Product Safety Commission ("CPSC" or "Commission") 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 the voluntary standards 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 children's folding chair category covers a variety of products, and many are designed for children under age 5. Although the list of products in section 104 does not include children's folding chairs, the Commission specifically identified children's folding chairs as a "durable infant or toddler product" in the Commission's product registration card rule under section 104(d).¹ In addition, as discussed below, CPSC staff finds that folding stools are a subset of

¹74 Fed. Reg. 68668 (December 29, 2009) (16 C.F.R. § 1130.2(a)(13)).

folding chairs, and therefore, included them in the scope of the draft notice of proposed rulemaking (“NPR”).

Section 104 of the CPSIA 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. This consultation process has been ongoing with staff’s participation in the juvenile products subcommittee meetings of ASTM International (“ASTM”). ASTM subcommittees consist of members who represent producers, users, consumers, government, and academia.² This consultation process for children’s folding chairs and stools commenced in April 2013, with staff participation in a task group within ASTM Subcommittee F15.59 – Children’s Folding Chairs.

This briefing package pertains to certain products that are included within the scope of the current voluntary standard, ASTM F2613-14, *Standard Consumer Safety Specification for Children’s Chairs and Stools*. The briefing package also reviews the relevant incident data and assesses the standard’s effectiveness. In addition, the briefing package discusses the potential impact of staff’s recommendations on small businesses, reviews recent recalls associated with children’s folding chairs/stools, and recommends that the Commission publish an NPR that incorporates by reference, the voluntary standard ASTM F2613-14, with certain modifications, to be the consumer product safety standard for children’s folding chairs and stools. Additionally, the draft NPR includes a notice of requirements (“NOR”), which explains how test laboratories could become CPSC-accepted third party conformity assessment bodies to test children’s folding chairs and folding stools to the new safety standard.

II BACKGROUND

A. Products

Representative examples of children’s folding chairs and folding stools can be seen in Figures 1 through 3 below. There are two primary designs associated with children’s folding chairs: straight tube versions that contact the surface in three or more capped-tube legs (the first two chairs shown in Figure 1), and bent tube versions that contact the ground along a substantial portion of the tubular frame (the last two chairs shown in Figure 1). There are also other designs that tend to be variants, as shown in Figure 2.

²ASTM International website: www.astm.org, About ASTM International.



Figure 1: Examples of Typical Children's Folding Chairs



Figure 2: Other Examples of Children's Folding Chairs

Children's folding stools also have a variety of designs. Figure 3 below shows metal or plastic X-frame stools with fabric seats and all-plastic stools.



Figure 3: Examples of Children's Folding Stools

A variety of hybrid products, such as folding step ladders, step stool ladders, step stools, step folding chair ladders, step folding chairs, folding chair tables, folding chair desks, and folding wall-mountable chairs and stools were not considered in this project because they are outside the scope of ASTM F2613-14. The scope of the CPSC's standard would be narrower than the voluntary standard. The ASTM standard covers all children's chairs and stools, but the CPSC

standard would cover only folding chairs and stools that are intended for use, or that may be reasonably expected to be used, by children under 5.

B. F2613 Standard and Product Review

In response to incidents and recalls of children's folding chairs in 2004 and 2005, CPSC staff requested ASTM to develop voluntary requirements to address the hazards associated with children's folding chairs that unexpectedly folded or collapsed during setup, use, takedown, and handling. CPSC staff participated in ASTM subcommittee meetings and testing programs in developing draft requirements for the voluntary standard. ASTM F2613 was first published in 2007, and since then, the voluntary standard has been revised five times (2009, 2010, 2011, 2013, and 2014). Details of the specific requirements in each version of the standard can be found in section A of the memorandum from the Directorate for Engineering Sciences (Tab A).

The scope of products covered by the original version, F2613-07, was limited to "children's folding chairs" with a seat height of 15 inches or less. The scope of products was expanded in the 2013 version to include "children's chairs and stools" not used in a commercial setting. This included both folding and non-folding children's chairs and stools. Stools were defined as a specific subset of a chair ("a children's chair without back or armrests"). The latest standard, F2613-14, excludes products that do not have a *rigid frame* (such as bean bag chairs or foam chairs), seats with restraint systems, products intended for use by more than a single child, and products in which the child could not get in and out of the product unassisted. The latest specification also includes products "with or without a rocking base."

The current standard, ASTM F2613-14 *Standard Consumer Safety Specification for Children's Chairs and Stools*, contains many general requirements that are common to other juvenile product standards, such as requirements for sharp edges or points, small parts, and lead in paint. There are also specific performance requirements to address incidents that may result in lacerations, fractures, pinches, amputations, and other injuries. In addition, ASTM F2613-14 contains requirements for marking and labeling.

C. Scope of the NPR

Section 104 of the CPSIA defines a "durable infant or toddler product" as one that is reasonably expected to be used by children under the age of 5 years, and includes 12 specific product categories (section 104(f)(2)(A) through (L)). On December 29, 2009, the Commission expanded this list to include children's folding chairs, changing tables, bouncers, infant bath tubs, bed rails, and infant slings in its rule on requirements for consumer registration of durable infant or toddler products (74 FR 68668). The Commission stated that the agency could add other products in the future through notice and comment rulemaking. At that time, the voluntary standard for

children's folding chairs, ASTM F2613-09, was limited in scope to only children's folding chairs, but included commercial chairs. As discussed above, ASTM Standard F2613 was revised in 2013 to expand the scope of the standard beyond children's folding chairs to include all children's chairs and stools. The ASTM F2613-14 standard was revised further to remove certain products from the standard, including chairs that do not have a rigid frame, seats with restraint systems, products intended for use by more than a single child, and products in which the child could not get in and out of the product unassisted.

Because the ASTM F2613-14 expanded the scope to *all* children's chairs and stools, on October 18, 2013, staff wrote a memorandum to Robert J. Howell, CPSC's Deputy Executive Director for Safety Operations, recommending that the scope of the CPSIA Section 104 rulemaking be limited to children's folding chairs because children's folding chairs are among the products covered specifically in the "Requirement for Consumer Registration of Durable Infant or Toddler Products, Final Rule" (16 C.F.R. part 1130). The staff also noted that, based on a preliminary review of the incident data, the total number of incidents, the number of incidents over time (years), the body parts injured, and the incident victim's average age reported for children's folding chairs and stools are substantially different from what is reported for children's non-folding chairs or stools.

The statutory list of durable infant and toddler products includes folding chairs, but does not reference folding stools. ASTM defines a "stool" as a "children's chair without back, or armrest," and considers stools to be a subset of chairs. CPSC staff agrees that stools are chairs, albeit without a back or armrest, and therefore, a subset of chairs. Significantly, folding chairs and folding stools have similar configurations and the same potential hazards that are presented. There is one reported incident involving folding stools in the injury data related to a pinching injury to a child's fingers when the stool folded because the locking mechanism failed. This is the same scenario that occurs with folding chairs. The configuration of folding stools is similar to folding chairs, other than the lack of backrest and arms. Folding stools can unexpectedly fold or collapse during use, if there is a faulty locking mechanism— or no locking mechanism at all— and result in serious injuries to fingers, if there is a lack of adequate clearance. As such, the test methods for loading, locking mechanisms, clearances, and labeling requirements for folding stools would be the same as for folding chairs. As for stool stability, there are no reported stability-related incidents associated with stools. However, the ASTM standard currently requires stools to be tested to the existing rearward stability test. Therefore, staff recommends including children's folding stools in the scope of the NPR, and staff is also seeking comment relating specifically to the inclusion of folding stools for the final rule. Because the registration card rule does not explicitly mention folding stools, the draft NPR proposes to amend that rule to add folding stools to clarify that both folding chairs and folding stools are identified as a durable infant or toddler product for purposes of registration cards.

Regarding the other products included in the ASTM scope, such as non-folding chairs and stools, if the Commission determines that hazards associated with non-folding chairs and stools need to be addressed, staff recommends that those products be considered in a separate proceeding to address the unique hazards presented by those products. Therefore, the scope of this briefing package and staff's recommendations pertain only to children's folding chairs and stools and does not address the other children's chairs included in the scope of ASTM F2613-14.

D. Incident Data

According to the Directorate for Epidemiology staff's memorandum (Tab B), CPSC received reports of 98 injuries, 45 non-injury incidents, and another 39 recall-related complaints associated with children's folding chairs or stools in the Consumer Product Safety Risk Management System ("CPSRMS") database for the period January 1, 2003 through December 31, 2014.³ There were no fatalities reported in the data. Reporting is ongoing, and thus, the number of reported injury and non-injury incidents from the CPSRMS system may change in the future.

1. Incidents with Injuries

Ninety-eight (98) nonfatal incident injuries were reported, some not medically treated. Injuries involving chairs designed for the under 5 age range (51%) were the most frequently reported incidents. The most frequent injuries (76) involved fingers, thumbs, or other parts of the hand, with most of the remaining complaints (14) affecting the head or face. The youngest injury victim was 12 months old. Some victims exceeded the intended age range of the chair, but their injuries demonstrated hazards with chairs relevant to the standard (*i.e.*, intended for children under 5). Two injured adults were included among the 98 nonfatal incidents, as were several children over 5 years of age. Reports in which the submitter suggested injuries from the same repeating hazard on multiple occasions and/or affecting multiple victims were counted as just a single injury incident. These injury counts, therefore, may be considered conservative.

2. Incidents with No Injury Reported

Forty-five (45) incidents did not report an injury. However, these reports illustrate a potential for injuries. These include incidents in which the chair was occupied or used by a child and incidents in which a parent or submitter detected a malfunction or hazardous issue while the chair was not in use.

³ Only one of the reported incidents involved a folding stool, and the remainder involved folding chairs that are not stools.

3. *Non-Incident Complaints*

Thirty-nine (39) reports did not describe incidents, but merely reflected concerns regarding recalls. These concerns involved questions about recalled products (*e.g.*, determining whether a product was subject to recall), or concerns regarding apparent similarities in design between recalled and non-recalled products.

4. *National Injury Estimates*

From January 1, 2003 through December 31, 2014, there were an estimated 17,500 children younger than 5 years of age treated in emergency departments for injuries related to folding chairs and stools. Information from hospital records, however, does not contain sufficient information to determine which injuries involved chairs specially designed for children under age 5. A known proportion of these injuries may have involved folding chairs or stools designed for children older than 5, or adults. Accordingly, staff focused on incident reports with specific information (*e.g.*, make and model of the product, photos, or a sufficiently detailed description) that allowed staff to characterize incidents involving chairs specifically intended or reasonably expected to be used by children under 5. Reports indicating that the product was a folding chair, but lacking information necessary for staff to determine the age, for which the product is intended, were excluded.

E. Hazard Pattern Identification

CPSC staff considered all 182 reports and complaints to identify four different hazard patterns associated with children's folding chairs and stools. One hundred forty-three reports involved incidents, and 39 reports involved complaints (without incident).

A. *Pinch/Shear Hazards*

Ninety (90) incidents demonstrated pinching or shearing hazards (including the possibility of crushing or scissoring when the chair folds or unfolds, regardless of intent). Victims were injured while transitioning the chair between its folded and unfolded states. Victims were also injured following unexpected folding or unfolding of the chair (generally described as "collapse"), or because of some malfunction or issue relevant to these hazards (such as a failed locking mechanism).

While most of these injuries involved pinched/sheared fingers or other body parts, there were two incidents in which the child was injured, but avoided being pinched or sheared. In these two

incidents, the injuries resulted when a child's head or face struck the floor as a consequence of the child falling out of the collapsing chair.

Fingers and hands were the body parts most commonly involved in pinching or shearing hazards. In two incidents, other body parts were pinched/sheared from unexpected folding/collapsing (1 neck incident and 1 leg incident). Out of all 90 pinch/shear hazard incidents, including incidents without actual pinch/shear injuries, at least eight incidents involved recalled products (6 injured; 2 without injuries).

B. Undetermined Hazard Finger Injuries

Fourteen (14) incidents involved finger injuries that were caused by an undetermined hazard. In seven of these incidents, there was evidence that the victim's finger was caught in a chair mechanism. For these incidents, it seems likely that the hazard is either pinch/shear-related or entrapment-related. In the other seven incidents, the child suffered finger injuries, but there was insufficient information to determine the cause of injury. In general, these injuries were severe (such as amputation or fracture). Two of the incidents involved recalled chairs.

C. Stability/Tipover

Twenty-two (22) incidents involved the chair tipping over without indication of chair collapse. Fifteen (15) of these incidents resulted in injuries. Staff was unable to determine if any of the chairs involved in these stability/tipover incidents were recalled models.

D. Miscellaneous

Seventeen (17) incidents related to various other folding chair or stool issues. These incidents included exposures to high levels of lead or other hazardous substances, a collapsing table associated with the chair, loose parts, sharp points, and seat issues.

E. Health Sciences Summary

According to the memorandum from the Directorate for Health Sciences ("HS") (Tab C), HS staff reviewed and analyzed the incident data from 2003 to 2014, and determined that when the incidents were grouped by body part, some hazard patterns were more prevalent than others. Of the four hazard patterns identified, there are two that are considered major hazard patterns associated with children's folding chairs: (1) pinching and shearing hazards, resulting in severe finger injuries (including fingertip amputations), and (2) tipover and fall hazards, resulting in head and face injuries. Fingertip amputations could have long-term effects on children's dexterity and limit their ability to write, play a musical instrument, or play sports, all of which could affect their overall quality of life.

III. ADEQUACY OF THE CURRENT ASTM F2613-14 REQUIREMENTS

This section discusses how each hazard pattern identified in section II relates to the current voluntary standard ASTM F2613-14.

ESME staff believes that ASTM F2613-14 adequately addresses many of the general hazards associated with durable nursery products, such as lead in paint and surface coatings, sharp edges/sharp points, small parts, wood part splinters, openings/entrapments, flammable solids, and attached toy accessories. The standard covers specific requirements for folding chairs, including requirements for adequate clearances or locking mechanisms to address pinch/shear hazards related to folding of the chair, load requirements to address structural integrity, stability requirements to address rearward tipover, and warning/labeling requirements to inform the user of the hazards associated with children's folding chairs and stools. Staff believes these performance requirements adequately address the majority of incidents associated with folding chairs and stools. However, as discussed below, staff is recommending the addition of a sideways stability test, as well as improvements to the warning labels that staff believes would further reduce the risk of injury associated with folding chairs.

A. Pinch/Shear Hazards

In 2004/2005, several brands of children's folding chairs with similar features were available for purchase. . The chairs were constructed of steel tubing with firm, padded seats and rigid backrests. Most of these product models came with spring-loaded locking mechanisms located under the seating area. Incidents of finger pinches and lacerations were typical with these chairs. A CPSC staff review of incidents showed that, while locking mechanisms were often present, the mechanisms typically did not work or were easily circumvented. As a result, in 2006, CPSC staff requested that ASTM look into developing a voluntary standard to address pinch and shear hazards with children's folding chairs. ASTM F2613 was first published in 2007 to address these hazards. The requirements for pinch and shear hazards have not changed in the various revisions of the standard.

The current standard includes requirements to prevent injury to the occupant from scissoring, shearing, or pinching when structural members or components rotate about a common axis, slide, pivot, fold, or otherwise move relative to one another. Tab A provides additional details regarding the requirements for this hazard. Staff believes that the current mechanical requirements adequately address the pinch and shear hazards in children's folding chairs and stools. The number of reported incidents has continued to decline since ASTM F2613 was first published⁴, with reported incidents continuing to occur on chairs that are either noncompliant or

⁴ See Tab B, Table 1: "Children's Folding Chairs and Folding Stool-Related Injuries and Potential Injuries; 2003-2014," John Topping, June 1, 2015

not identifiable regarding compliance or scope (*e.g.*, not folding chairs). Although these injuries and incidents have declined, HS staff believes that strengthening the warning statements for the finger amputation hazard, as recommended in the Human Factors staff's memorandum (Tab D), may make caregivers more aware of the hazard, and possibly reduce the likelihood that these types of incidents will occur in the future.

B. Undetermined Hazard Finger Injuries

Staff believes that some of the undetermined hazard finger injuries are likely due to pinching and shearing issues discussed in the above hazard pattern or finger entrapments. However, staff did not obtain enough information in the incident reports to make a definitive determination. Other than pinching/shearing, fingers can be caught between non-moving parts, in circular holes, or in grooves or slots. Finger entrapment in circular holes results in cutting off circulation, which does not generally occur with grooves or slots. The current standard includes requirements to avoid finger entrapment in circular holes by establishing allowable dimensions for circular holes. At this time, staff is not recommending any changes to ASTM F2613-14 to address these undetermined incidents.

C. Stability/Tipover Hazard

A review of recent incident data reveals 22 occurrences of chairs tipping over with no evidence of the chair collapsing. The incident descriptions often state that the child was leaning over or reaching to one side when the chair tipped over. ASTM F2613-14 contains a requirement to address the rearward stability of the chair/stool, but sets forth no requirement for sideways stability.

The majority of the tipover incidents were due to sideways tipovers. Even though most of the injuries sustained were minor, due to the short height of the chair, there is a potential for more severe injuries to occur if the child falls onto a nearby object.

CPSC staff presented the tip-over incident data to ASTM, and ASTM formed a task group to address the issue. The task group subsequently concluded that a sideways stability test was warranted. To assist in the task group deliberations, CPSC staff conducted stability testing on chairs currently on the market to determine whether the existing rearward stability test could be modified to address sideways stability.

The current rearward stability test in ASTM F2613-14 is conducted on a 10-degree ramp with a cylindrical weight used to simulate the weight of the child. During the test, the 6-inch diameter by 12-inch high cylindrical weight is placed as far back or downslope as permitted by the seat back, chair frame, or arms. Once the weight is placed on the chair or stool, the chair/stool must not tip over.

Staff performed testing to compare the ASTM F2613-14 stability test discussed above to stability tests found in other chair standards. Although the test procedures in the ASTM standard and in the other standards are quite different, ES staff determined that the results were comparable among the various methods and concluded that for simplicity, the stability method currently in ASTM F2613-14 could be used to determine both rearward and sideways stability. Staff shared with the ASTM task group the testing results, and the task group drafted a revised stability requirement to include sideways stability.

On July 24, 2015, ASTM balloted the sideways stability requirement, which received five negative votes and several comments, most of which contained editorial comments to the ballot. The negatives all pertained to a common style non-folding chair without arms that fails the balloted requirement, but reportedly is not associated with any stability incidents. Because the ASTM standard covers both folding and non-folding chairs in the scope, the ASTM subcommittee chairman asked the task group to evaluate the performance requirement further. The task group met on August 27, 2015, and deemed the negatives to be persuasive. The task group will look at limiting the scope of the new requirement and then re-balloting the requirement, after the subcommittee reviews the issue in October 2015.

Staff also reviewed the ballot comments, and as a result, made editorial changes to the sideways stability requirement for clarification purposes. Because the negatives pertained to non-folding chairs, which the mandatory rule would not cover, staff believes that the sideways stability performance requirement, as recommended, is still adequate to address the incidents associated with folding chairs. Staff's recommended language for this requirement, containing the editorial changes from the ASTM ballot results, is shown below (additions to the current text in ASTM F2613-14 are shown in underline, and deletions are shown in strikeout):

5.13 *Stability*—All products shall not tip over backwards or sideways when tested in accordance with 6.8. Tip over shall consist of the product moving past equilibrium and begin to overturn.

6.8 *Stability Test Method*— ~~The product shall be placed on the slope of a surface inclined 10° (60.5°) to the horizontal plane with the front of the chair facing the upward slope. Blocks or a 1/2 in. (13 mm) high angle iron shall be placed against the product legs to prevent movement during the test. For chairs with a seating surface that is 10 in. or less from the floor, apply a test cylinder with a weight of 50 lb (22.7 kg) to the seating surface. For chairs with a seating surface that is greater than 10 in. above the floor, apply a test cylinder with a weight of 100 lb (45.4 kg) to the seating surface. The cylinder shall be placed so that it is centered on the seating surface and oriented perpendicular to the plane of the seating surface as shown in Fig. 4. For chairs, the cylinder shall be~~

~~positioned as far back on the seating surface as permitted by the seat back. For stools, place the cylinder as far back as permitted by the seating surface without allowing for any part of the cylinder to extend beyond the rearmost edge of the stool. The dimensions of the test cylinder shall be 12 in. (30.5 cm) high with a diameter of 6 in. (15.2 cm) and a center of gravity of 6 in. (15.2 cm) from either face (see Fig. 5). For chairs with soft seating surfaces replace the test cylinder with a weighted bag 6 to 8 in. (15.2 to 20.3 cm) in diameter filled with steel shot.~~

6.8.1 Test equipment and preparation

6.8.1.1 Test surface – any rigid material covered with a high pressure laminate of unspecified color with a smooth matte finish and inclined at an angle of 10° (+/- 0.5°) to the horizontal plane.

6.8.1.2 50 lb. test cylinder – cylinder weighing 50.0 +/- 0.5 lbs. (22.7 +/- 0.2 kg) that is 12.0 +/- 0.1 in. (305 +/- 2 mm) high with a diameter of 6.0 +/- 0.1 in. (152 +/- 2 mm) and a center of gravity of 6.0 +/- 0.1 in. (152 +/- 2 mm) from either face (see Fig. 5). This cylinder shall be applied to a product seating surface whose height is 10 in. (254 mm) or less from the floor.

6.8.1.3 100 lb. test cylinder – cylinder weighing 100.0 +/- 0.5 lbs. (45.4 +/- 0.2 kg) that is 12.0 +/- 0.1 in. (305 +/- 2 mm) high with a diameter of 6.0 +/- 0.1 in. (152 +/- 2 mm) and a center of gravity of 6.0 +/- 0.1 in. (152 +/- 2 mm) from either face (see Fig. 5). This cylinder shall be applied to a product seating surface whose height is greater than 10 in. (254 mm) above the floor.

6.8.1.4 Measurement of the product seating surface height – This height shall be measured from the floor to the midpoint on the upper surface of the front edge of the seating surface, when a 2 lb. (0.9 kg) load is applied vertically downward using a ½” (13 mm) diameter disk onto the midpoint on the upper surface of the front edge of the seat (see Fig X).

Note X – Use of stops to prevent sliding: If necessary to prevent the product from sliding down the incline, either by its own weight when initially placed on the incline or during the conduct of the test in the following sections, stops can be placed against the product’s legs. Stops shall be the minimum height required to prevent sliding and shall not inhibit overturning.

6.8.2 Rearward stability

6.8.2.1 Product orientation: Place the product on the test surface with the front of the product facing the upward slope.

6.8.2.2 Application of the load: Place the applicable test cylinder so that it is centered side to side on the product seating surface, oriented perpendicular to the plane of this surface, and allow the cylinder to come to rest.

6.8.2.3 Cylinder Positioning For Chairs: Place the cylinder as far back or downslope on the seating surface as permitted by the seat back or chair frame (see Fig. 4).

6.8.2.4 Cylinder Positioning For Stools: Place the cylinder as far back or downslope as permitted by the seating surface without allowing any part of the cylinder to extend beyond the rearmost or downslope edge of the stool.

6.8.3 Sideways stability

6.8.3.1 Product orientation: Place the product on the test surface in the most unfavorable position with a side of the product facing the upward slope.

6.8.3.2 Application of the load: Place the applicable test cylinder so that it is centered front to back on the product seating surface, oriented perpendicular to the plane of this surface, and allow the cylinder to come to rest.

6.8.3.3 Cylinder Positioning for Chairs: Place the cylinder as far back or downslope on the seating surface as permitted by the chair frame or arms (see Fig. Y).

6.8.3.4 Cylinder Positioning for Stools: Place the cylinder as far back or downslope as permitted by the seating surface without allowing for any part of the cylinder to extend beyond the rearmost or downslope edge of the stool.

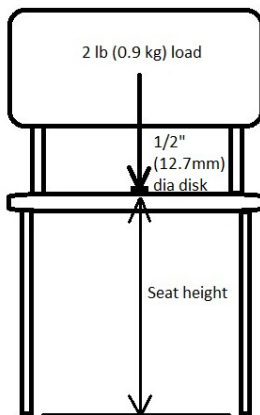


Figure X. Seating Surface Height Measurement

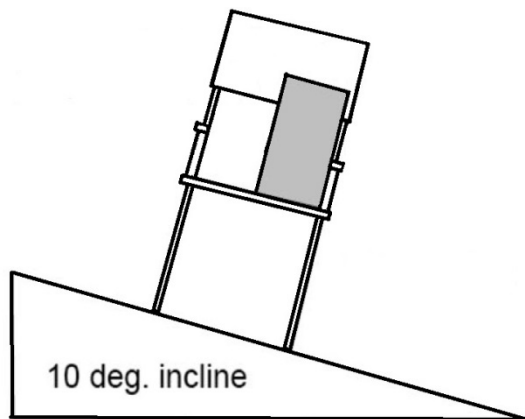


Figure Y. Sideways Stability Test Showing Orientation of Chair and Test Cylinder

D. Miscellaneous Hazards

Seventeen incidents are included as miscellaneous hazards. Three incidents relate to elevated levels of hazardous materials (*e.g.*, lead, bromine, or mercury). The standard already includes requirements prohibiting some dangerous materials. One of the incidents appears to be “non-product-related,” and the remaining 13 incidents involve various integrity issues such as loose screws, loose plastic pieces, or a detached seat pad.

Staff believes that the static load and fatigue tests in the current standard minimize integrity issues. The standard includes requirements for sharp points and edges, which were noted in some incidents. Staff is not recommending any changes to the existing ASTM F2613-14 standard to address these miscellaneous incidents at this time.

E. Warnings/Labeling

Requirements for warning labels were included in the original standard to emphasize the possible crush and amputation hazards of folding chairs/stools. These labeling requirements are also in the current version.

As presented in the Human Factors memorandum (Tab D), staff believes that the existing warning labels found in the 2014 version of the standard can be improved in terms of content and format. At the October 2, 2014 ASTM subcommittee meeting, CPSC staff questioned the adequacy of the warning label requirements, and the subcommittee established a task group to work on the issue. Following the October 2014 subcommittee meeting, there were two more subcommittee meetings (January and May 2015) and one task group meeting (March 2015), where staff's recommendations for warning label changes were discussed.

Staff addressed all of the concerns raised by the task group and subcommittee during these meetings and sent the revised recommendations to the task group following the May 2015 subcommittee meeting. Subsequently, ASTM sent a meeting request to the task group to meet during the week of July 27, but that meeting did not occur. A task group conference call has been scheduled to occur in late September, following the completion of this briefing memorandum. In addition, a subcommittee meeting has been set for the first week of October, 2015.

Staff's recommendations regarding warning labels pertain to three issues: noticing the label, processing the safety message, and motivating behavior changes.

Noticing the Label

Currently, many folding chairs place the warning label underneath the seat of the chair. Staff believes that consumers are less likely to notice the warnings underneath the chair for several reasons. First, consumers are not likely to notice the warning label underneath the seat of the chair, when the chair is unfolded and in the upright position. Second, a child's folding chair has no obvious hazards. Research suggests that if the perception of hazard associated with a product is low, consumers are less likely to look for a warning.⁵ Even if consumers looked for a warning, they may not notice the warning because the warning is embedded and buried among non-safety messages. Although the ideal placement of the label is on the front of the chair, this may detract

⁵ See Tab D, Human Factors memorandum for all research references.

from the appearance of the product and make consumers remove the label. Therefore, staff recommends placing the warning on the back of the chair's backrest. Staff also recommends placing a black border around the warning and separating the warning label from other written material, so that the label is clearly visible when consumers approach the chair from the back. Staff believes that this location is superior to the current practice of placing the warning on the bottom of the chair. For stools, where possible, staff recommends that the label be placed in a visible location such as a on the legs in such a way that the label does not wrap around the legs. A label wrapped around the legs may increase the likelihood that consumers will not read the warning since it may be physically difficult to do so.

Processing the Safety Message

Currently, the standard requires that the warnings be easy to read and understand. However, this requirement is vague and gives no guidance on how to implement these requirements. Research indicates that warnings in a bullet point, outline-type list are rated higher by experimental subjects on perceived effectiveness than paragraph format. Similarly, text arranged in a list format rather than horizontally makes instructions easier to follow. Additionally using "white space" to break up the text into "chunks" of information can make the text easier to read. In addition, using sans serif type or font for short word messages, as well as a mixture of upper and lower case lettering can be less confusing and easier to read than all uppercase lettering because there is more variation among the letter shapes. Staff's recommendations include these elements to help make the warning labels easier to read and understand.

Motivating Behavioral Change

Assuming that a consumer notices the label and reads and understands the safety messages, the final goal is for the label to motivate a change in behavior. To motivate consumers to comply with the warning, the warning should tell consumers why they need to comply. Therefore, the way the warning describes the hazard, coupled with a statement about the consequences of ignoring the warning may influence compliance rates. Furthermore, the label needs to tell consumers what to do to avoid the hazard. Therefore, staff's recommendations include several changes to the warning statements.

Below are staff's recommendations for labeling children's folding chairs, presented in an ASTM ballot format. Staff submitted these recommendations to the ASTM task group following the May 2015 subcommittee meeting.

7. Marking and Labeling


7.2 Warning Statements: Each folding chairs and folding stools shall have warning statements


7.2.1_The warnings shall be easy to read and understand and be in the English language at a minimum.

7.2.2 The warning statements shall be conspicuous in highly contrasting color(s) (e.g., black text on white background), in non-condensed sans serif type, permanent and applied so they are in a prominent location, visible to the caregiver when the product is in the manufacturer's use position.

7.2.3 The specified warnings shall be separate and distinct from any other written material on the product and surrounded by a black border. Note: Separate and distinct, for example, on the back of the chair's back rest away from warnings on the underside of the chair so that it is clearly visible to a consumer approaching the chair from the back. For stools, where possible, the label shall be placed in a visible location such as on the legs in such a way that the label does not wrap around the legs.

7.2.4 Any labels or written instructions provided in addition to those required by this section shall not contradict or confuse the meaning of the required information or be otherwise misleading to the consumer.

7.2.5 The safety alert symbol “”⁶ the signal word “WARNING”, and the words “AMPUTATION HAZARD” shall precede the warning statements.

7.2.6 The safety alert symbol “” and the signal word “WARNING” shall not be less than 0.2- in. (5-mm) high and the remainder of the text shall be in characters whose upper case is at least 0.1-in. (2.5-mm) high except as specified.

7.2.7 The signal word WARNING shall be in black letters on an orange panel surrounded by a black border.

Note 1- When special circumstances preclude the use of the color orange, yellow or red may be used, whichever contrasts best against the product background.

7.2.8 The solid triangle portion of the safety alert symbol shall be the same color as the signal word lettering, and the exclamation mark shall be the same color as the signal word panel.

7.2.9 The words “AMPUTATION HAZARD” shall be in bold black letters.

7.2.10 The precautionary statements shall be indented from the hazard statements, preceded with bullet points, and appear as shown in Figs. 3 and 4⁷.

7.2.11 The warning label shall contain sufficient white space as shown as shown in Figs. 3 and 4.

7.2.12 Overall height and width of the label may be modified as necessary to fit on the product, but still meet requirements for conspicuousness. An example of the warning label format described in this section is shown in Figs. 3 and 4.

⁶ The version of the safety alert symbol shown here is based on the default symbol used in the ANSI Z535 series of standards. For consistency, CPSC staff uses this version throughout the memorandum for all instances of the safety alert symbol.

⁷ See Tab D, Human Factors Memorandum for the label examples.

7.2.13 For *folding chairs and folding stools* with latch(es), warnings shall address the following:

7.2.13.1 Amputation hazard:

1. Hazard and Consequence Statement

a. AMPUTATION HAZARD

b. Chair can fold or collapse if lock not fully engaged. Moving parts can amputate child's fingers if chair folds or collapses.

2. Precautionary Statements:

a. Keep fingers away from moving parts.

b. Completely unfold chair and fully engage locks before allowing child to sit in chair.

c. Never allow child to fold or unfold chair.

7.2.14 For *folding chairs and folding stools* without latch(es), warnings shall address the following:

7.2.14.1 Amputation hazard:

1. Hazard and Consequence Statement

a. AMPUTATION HAZARD

b. Moving parts can amputate child's fingers.

2. Precautionary Statements:

a. Keep fingers away from moving parts.

b. Completely unfold chair before allowing child to sit in chair.

c. Never allow child to fold or unfold chair.

The recommended revisions to the labeling requirements are discussed in more detail in the CPSC Human Factors memorandum, Tab D.

IV. COMPLIANCE ACTIVITIES

Tab E, memorandum from the Office of Compliance, discusses the recalls related to children's folding chairs/stools since January 1, 1997. During that time-frame, there have been 11 children's folding chair or stool recalls involving 10 different firms and 5,394,600 units of product. The hazards include pinching, bruising, fractures, finger amputations, and lead paint violations. The table below outlines the 11 recalls. Tab E provides additional details.

Children's Folding Chair and Stool Recalls - January 1, 1997 to July 1, 2015

Recall Date	Firm	Reason	# Products Recalled	Press Release #
3/25/1997	Keysheen International Corp.	When support leg of the chair's footrest is not fully extended when a child sits down, a child's fingers can get trapped between the	38,300	PR-97-090

		support leg and the metal frame, causing a pinching or amputation injury.		
7/18/2002	Hilton Hotel Corp.	Stool collapsed resulting in finger amputation and laceration.	27,000	PR-02-202
4/29/2005	Atico International USA Inc.	Safety lock failure and the subsequent chair collapse resulting in finger amputation and laceration.	1.5 million	PR05-163
5/24/2005	Summit Marketing International LLC	Safety lock failure and the subsequent chair collapse resulting in finger amputations, laceration, and bruises.	2 million	PR05-181
7/27/2005	Idea Nuova Inc.	Safety lock failure and the subsequent chair collapse resulting in finger amputation, laceration, and fracture.	1.1 million	PR05-233
7/27/2005	Fourstar Group Inc.	Safety lock failure and the subsequent chair collapse resulting in finger laceration and fracture, and pinched fingers.	522,000	PR05-234
8/19/2004 and 7/27/2005	Meco Corp	Excessive levels of lead on surface paint. Children's fingers caught or entrapped in the hinged and slot area of the chair, resulting in laceration and pinched finger.	175,000	PR04-202 and PR05-232
1/5/2012	Elegant Gifts Mart Inc.	Excessive levels of lead on surface paint.	2,900	PR12-081
7/19/2012	Downeast Concepts Inc.	Girl fell on chair's metal rivets and cut her forehead.	15,400	PR12-229
7/31/2013	Far East Brokers and Consultants Inc.	Excessive levels of lead on surface paint.	14,000	PR 13-255

V. POTENTIAL IMPACT ON SMALL BUSINESSES

Staff has identified 14 domestic firms known to be supplying children's folding chairs and stools to the market. Four manufacturers and six importers are categorized as small businesses according to the Small Business Administration guidelines. Staff could not rule out a significant

economic impact for any of the small firms operating in the U.S. market for children's folding chairs, and accordingly, has prepared an Initial Regulatory Flexibility Analysis ("IRFA").

As described in the Directorate for Economic Analysis memorandum (Tab F), all suppliers of children's folding chairs and stools will need to make some modifications to their products to be in compliance with the proposed rule and will be required to submit products to third party testing for compliance. For some firms, the modifications will be minor, limited only to adjustments to the warning labels on the products. For other firms, modifications may be significant and more costly, as a redesign of some or all elements of their products may be necessary to bring them into compliance. The impact of these modifications is expected to be small compared to the revenues of the affected firms, as are the costs associated with third party testing. However, because staff was unable to generate precise estimates of the cost burden to suppliers, we were unable to conclude that the impacts would not be economically significant.

VI. 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 children's folding chairs and stools, if issued as a final rule, would be a children's product safety rule that requires issuing an NOR.

The Commission published a final rule, *Requirements Pertaining to Third Party Conformity Assessment Bodies*. 16 C.F.R. part 1112 (78 Fed. Reg. 15836 (March 12, 2013)) (referred to here as "part 1112"). This rule became effective 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 final 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 children's folding chairs and stools 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 children's folding chairs and stools in the list of children's product safety rules for which the CPSC has issued NORs.

VII. EFFECTIVE DATE

To allow time for manufacturers to bring their products into compliance after a final rule is issued, the staff recommends an effective date of 6 months after publication of a final rule for products manufactured or imported on or after that date. Although staff has recommended

modifications to the ASTM warning labels and stability testing procedures, most firms should be able to comply within the 6-month timeframe. The chairs that are noncompliant with the sideways stability requirement will require some modifications; but staff believes the changes required for many of the noncompliant products are fairly simple. One manufacturer stated that it might require up to a year to make manufacturing changes if a whole redesign is necessary. However, this is the longest estimate given to staff.

The warning label changes do not affect the design and manufacturing of the chairs, but rather, require printing new labels. A 6-month effective date is consistent with the timeframe adopted in a number of other section 104 rules. The 6-month period will allow time for manufacturers and importers to arrange for third party testing.

Staff requests specific comments relating to effective date from manufacturers and importers.

VIII. STAFF RECOMMENDATIONS

Staff recommends that the Commission publish an NPR for children's folding chairs and stools that incorporates by reference the voluntary standard, ASTM F2613-14 *Standard Consumer Safety Specification for Children's Chairs and Stools*, with modifications to:

- Limit the scope to folding chairs and folding stools;
- Add a new performance requirement to address sideways stability incidents as described in this memorandum and in Appendix A of Tab A; and
- Revise the section on the warning label requirements as described in this memorandum and in the Human Factors Staff memorandum, Tab D.

Staff also recommends an effective date of 6 months after publication of the final rule, and staff is specifically asking for comments pertaining to the effective date.

TAB A: Staff's Review of Children's Folding Chairs and Stools Standards

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

Memorandum

Date: August 29, 2015

TO: Patricia L. Edwards
Project Manager, Children's Folding Chairs and Stools
Directorate for Engineering Sciences

THROUGH: Joel R. Recht, Ph.D.
Associate Executive Director
Directorate for Engineering Sciences

Mark E. Kumagai, P.E.
Director, Division of Mechanical Engineering
Directorate for Engineering Sciences

FROM: Vincent J. Amodeo
Mechanical Engineer
Directorate for Engineering Sciences

SUBJECT: Staff's Review of Children's Folding Chairs and Stools Standards

I. INTRODUCTION

CPSC's Directorate for Engineering Sciences' Division of Mechanical Engineering ("ESME") staff was asked to assess the effectiveness of requirements within ASTM F2613-14, *Standard Consumer Safety Specification for Children's Chairs and Stools*, for addressing certain hazard patterns. This request responds to rulemaking activity under Section 104 of the Consumer Product Safety Improvement Act. This evaluation covers the evolution of the F2613 standard and how effectively the current edition addresses common hazard patterns found in the reported incident data. The assessment also compares the ASTM standard to international children's chairs and stools standards.

At the time the Commission added children's folding chairs to the group of durable infant and toddler products in the product registration card rule, the relevant ASTM standard, F2613-09 *Standard Consumer Safety Specification for Children's Folding Chairs*, was limited in scope to children's folding chairs. The standard remained limited to children's folding chairs for the 2010 and 2011 revisions. The 2013 revision, F2613-13 *Standard Consumer Safety Specification for Children's Chairs and Stools*, expanded the scope to include all children's chairs, not just children's folding chairs. This revision also cited children's stools as a specific subset of children's chairs. The current standard is F2613-14, and the scope of this standard covers "a

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chair or stool intended to be used by a single child who can get in and get out of the product unassisted and with a seat height 15 in. or less, with or without a rocking base.”

Because the registration card rule does not explicitly mention folding stools, the draft NPR proposes to amend that rule to add folding stools to clarify that both folding chairs and folding stools are identified as a durable infant or toddler product. Accordingly, staff recommends that the scope of the proposed rule be limited to children’s folding chairs and stools.

In addition to assessing the effectiveness of ASTM F2613-14 for children’s folding chairs and stools, this memorandum outlines staff’s recommendations for the proposed mandatory standard. This review covers only folding chairs and stools intended for use, or that are reasonably expected to be used, by children under the age of 5 years.

ASTM F2613-14 includes the following definitions:

- *children’s chair* - seating furniture that is intended to be used as a support for the body, limbs, or feet of a child when sitting or resting in an upright or reclining position
- *children’s stool* - children’s chair without back or armrests
- *folding chair, folding stool* – chair or stool which can be folded for transport or storage

Figure 1 shows a typical children’s folding chair.



Figure 1. Children’s Folding Chair

A) History of ASTM F2613, *Standard Consumer Safety Specification for Children’s Chairs and Stools*

In response to incidents and recalls of children’s folding chairs in 2004 and 2005, CPSC staff requested ASTM to develop voluntary requirements to address the hazards associated with children’s folding chairs unexpected folding or collapse during setup, use, takedown, and handling. CPSC staff participated in ASTM subcommittee meetings and testing programs in developing draft requirements for the draft standard. The voluntary standard for children’s

folding chairs was first approved in February 2007, and published in March 2007, as ASTM F2613-07, *Standard Consumer Safety Specification for Children's Folding Chairs*. The voluntary standard has been revised four times since then. The current version, ASTM F2613-14, was approved on October 1, 2014.

ASTM F2613-07 included requirements to address the following issues:

- Wood parts
- Sharp points and edges
- Small parts
- Paint and surface coatings
- Flammable solids
- Toy accessories
- Scissoring, shearing, and pinching
- Crushing, laceration, or pinching from folding mechanisms and hinges
- Locking devices or other means to prevent collapse
- Automatic engagement and release of locking devices
- Entrapment
- Labeling

Subsequent revisions are listed below, along with the changes made to each revision:

ASTM F2613-09 (approved on April 1, 2009):

- Clarified requirements for scissoring, shearing, and pinching
- Clarified test procedures for locking mechanisms

ASTM F2613-10 (approved on December 1, 2010):

- Added strength test requirements
- Added static load and fatigue test requirements

ASTM F2613-11 (approved on October 15, 2011):

- Modified test load for strength test

ASTM F2613-13 (approved on May 1, 2013):

- Expanded scope to include all children's chairs and stools and modified title to *Standard Consumer Safety Specification for Children's Chairs and Stools*
- Clarified seat height for children's chairs and stools to 15 inches or less
- Added definitions for children's chair and children's stool, and clarified definition of folding chair and stool
- Added stability requirements and test method and stability test figure
- Clarified locking mechanism requirements are only for folding chairs and stools

ASTM F2613-14 (approved on October 1, 2014):

- Clarified the scope to exclude chairs that do not have a rigid frame (such as bean bag or foam chairs) and those that have restraint systems.
- Clarified the scope to cover only chairs and stools intended for a single child who can get in and out of the product unassisted, with or without a rocking base.
- Changed the term “chair” to “product” where appropriate in the test requirements, to cover both chairs and stools.

II. INCIDENT HAZARD REVIEW

According to the Directorate for Epidemiology,⁸ the following hazard patterns were identified in incident reports:

1. Pinch/Shear Hazards

The majority of reported injury and non-injury incidents (90 out of 143) relate to pinching or shearing, generally of the fingers. This type of injury occurs when the chair/stool is being folded or unfolded (either intentionally or unintentionally) or the chair/stool unexpectedly collapses when sat on, leaned on, or bumped into. The primary cause of pinching or shearing injuries is a lack of adequate clearance between moving parts of the chair/stool. The lack of clearance results in a finger or other appendage (*e.g.*, leg or neck) becoming trapped, crushed, or lacerated between the moving parts. This pattern can occur with chairs/stools that do or do not feature a locking mechanism that is intended to prevent the chair from folding once the chair is in the open and ready-for-use position. In some cases, a locking mechanism may be broken or easily circumvented by the child; in other cases, the chair may not been fully opened to engage the locking mechanism prior to use.

2. Undetermined Hazard Finger Injuries

Fourteen incidents involved injury to fingers. In these cases, the information provided was insufficient to determine a specific cause.

3. Stability/Tipover

Tipover occurs when the chair/stool becomes unstable, generally when the user sits too far back, too far forward, or is leaning or reaching to one side. There were 22 tip-over incidents in the data where there was no indication of chair collapse. Tip-over incidents typically resulted in injuries to the head, face, or shoulder.

4. Miscellaneous

⁸See Tab B: “Children’s Folding Chairs and Folding Stool-Related Injuries and Potential Injuries; 2003-2014,” John Topping, June 1, 2015.

Seventeen incidents were not related to pinching, shearing, or tip-over hazards. There were three reports of chemical hazards (two with high lead content, one with high bromine and mercury). The remaining incidents involved mechanical integrity, such as loose screws or protective caps, sharp edges, or frayed fabric seams.

III. ADEQUACY OF THE CURRENT ASTM F2613-14 REQUIREMENTS

This section discusses how each hazard pattern identified in section II relates to the current voluntary standard F2613-14.

ESME staff believes that F2613-14 adequately addresses many of the general hazards associated with durable nursery products, such as lead in paints and surface coatings, sharp edges/sharp points, small parts, wood part splinters, openings/entrapments, flammable solids, and attached toy accessories. The standard covers specific requirements for folding chairs, including requirements for adequate clearances or locking mechanisms to address pinch/shear hazards related to folding of the chair, load requirements to address structural integrity, stability requirements to address rearward tipover, and warning/labeling requirements to inform the user of the dangers associated with improper use. Staff believes these requirements adequately address the majority of incidents associated with folding chairs and stools. However, staff finds that the addition of a sideways stability requirement could reduce the risk of injury associated with folding chairs and stools tip-over incidents.

Hazard pattern 1- Pinch/Shear Hazards

In 2004/2005, several brands of children's folding chairs with similar features were available for purchase. . The chairs were constructed of steel tubing with firm, padded seats and rigid backrests. Most of these product models came with spring-loaded locking mechanisms located under the seating area. Incidents of finger pinching and lacerations were typical with these chairs. A CPSC staff review of incidents showed that, while locking mechanisms were often present, they typically did not work, or were easily circumvented. As a result, in 2006, CPSC staff requested that ASTM look into developing a voluntary standard to address pinch and shear hazards associated with children's folding chairs. ASTM F2613 was first published in 2007 to address these hazards. The requirements for pinch and shear hazards have not changed in the various revisions of the standard.

The current standard includes requirements to prevent injury to the occupant from scissoring, shearing, or pinching when structural members or components rotate about common axis, slide, pivot, fold or otherwise move relative to one another. One way to satisfy the requirement is to ensure that all parts moving relative to each other maintain specified clearances throughout their full range of movement. Manufacturers may alternately choose to provide locking mechanisms instead of appropriate clearances to prevent rotation/movement by the child once the chair/stool is set in its recommended-use position. The locking device must engage automatically. A single-action locking mechanism requires a minimum force of 10 lbf to release, while double action locking mechanisms require two consecutive or two separate actions to release. Additionally, for chairs/stools with locking mechanisms, the product must not give the appearance of being in any recommended-use position, unless the locking mechanism is fully engaged.

Staff believes that the current mechanical requirements adequately address the pinch and shear hazards presented by children’s folding chairs and stools. The number of reported incidents has continued to decline since ASTM F2613 was first published⁹, with reported incidents continuing to occur on chairs that are either noncompliant or not identifiable as to compliance or scope (*e.g.*, not folding chairs).

Requirements for labels and warnings were also included in the original standard to emphasize the possible crush and amputation hazards of folding chairs/stools.

Staff believes that the existing warning labels found in the 2014 version of the standard can be strengthened. Staff has been working with the ASTM task group to modify the labeling requirements in ASTM F2613 to improve caregiver awareness of the dangers that folding chairs can present. The recommended revisions to the labeling and instructions requirements are discussed in more detail in the CPSC Human Factors Memorandum, Tab D.

Hazard pattern 2 – Undetermined Hazard Finger Injuries

Staff believes that some of the 14 undetermined hazard finger injuries are likely due to pinching and shearing issues discussed in hazard pattern 1. However, the incident reports did not provide enough information to make a definitive determination. Some descriptions indicate that a finger was “caught” or “entrapped,” but no suggestion of relative motion of chair parts was stated. Other than pinching/shearing, fingers can be caught between non-moving parts, in circular holes, or in grooves or slots. Finger entrapment in circular holes results in cutting off circulation, which does not generally occur with grooves or slots. The current standard includes requirements for finger entrapment in circular holes by establishing allowable dimensions for circular holes.

At this time, staff is not recommending any changes to the existing ASTM F2613 standard to address these undetermined incidents.

Hazard pattern 3 – Stability/Tipover

A review of recent incident data reveals 22 occurrences of chairs/stools exhibiting sideways tipover with no evidence of the chair collapsing. The incident descriptions often state that the child was leaning over or reaching to one side when the chair tipped over. The 2013 revision of the standard added requirements to address the rearward stability of the chair/stool, but not sideways stability. There were no changes made to the stability requirement in the 2014 version.

Incident data showed that many of the sideways tip-over incidents involved folding chairs with metal tubing that is rounded on the sides (See Figure 2). Staff believes that this profile shape increases the likelihood of sideways tipover. The data also showed several incidents with “saucer” style chairs, such as the one on the right in Figure 2.

⁹ See Tab B, Table 1: “Children’s Folding Chairs and Folding Stool-Related Injuries and Potential Injuries; 2003-2014,” John Topping, June 1, 2015.



Figure 2. Examples of Children's Folding Chairs Using Rounded Tubing

CPSC staff presented folding chair/stool tip-over incident data obtained from CPSRMS and NEISS¹⁰ to ASTM, and ASTM formed a task group to address the issue. The task group subsequently concluded that a sideways stability test was warranted. To assist in the task group deliberations, CPSC staff conducted sideways stability tests of chairs currently on the market.

The rearward stability test in ASTM F2613-14 is conducted on a 10-degree ramp with a 6-inch diameter, 12-inch-high cylindrical test weight used to simulate the weight of the child. The test weight is either 50 pounds or 100 pounds, which, respectively, roughly represent the 95th percentile weight of the oldest intended occupant. The 50-pound cylinder is used for chairs/stools with a seat height of 10 inches or less, which are likely to be used by children age 5 or younger. The 100-pound cylinder is used for chairs/stools with a seat height over 10 inches and up to 15 inches (the maximum seat height that the standard covers), which are likely to be used by children up to 9 years of age.¹¹

A diagram of the stability test setup is shown in Figure 3. During the test, the cylindrical weight is placed as far back or downslope as permitted by the seat back, chair frame, or arms. Once the weight is placed on the chair or stool, the chair/stool must not tip over. CPSC staff used the same method to conduct sideways stability tests to determine whether the existing rearward stability test could also address sideways stability. CPSC staff believes that the test results validate the method for determining which children's folding chairs have potential for sideways tipover.

¹⁰ CPSRMS stands for Consumer Product Safety Risk Management System. NEISS stands for National Electronic Injury Surveillance System. See EPI Memo, Tab B, for further details on incident data.

¹¹ Based on informal memorandum from HF staff to ESME staff dated 2/23/15, the oldest age that is likely to include children whose popliteal height (vertical distance from the floor to the back of the knee) is close to the 10-inch seat height is a small, 5-year-old child (5-year-old male 5th percentile seated popliteal height is 9.45 inches) and the 95th percentile weight of a 5-year-old child is 47.6 pounds. The oldest age that is likely to include children whose popliteal height is close to the 15-inch seat height is a 9-year-old child and the 95th percentile weight of a 9-year-old child is 82 pounds.

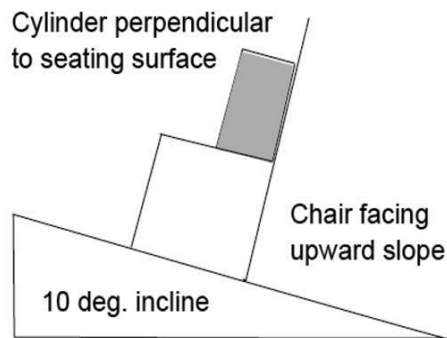


Figure 3. ASTM F2613 Stability Test

Staff compared the existing ASTM F2613 stability test discussed above to the stability requirements found in the European standard, EN 1022 *Domestic Furniture Seating – Determination of Stability*. The requirements in EN 1022 are for adult-sized furniture. However, staff found a standard developed by the UK Furniture Industry Research Association (“FIRA”), FIRA C002:2008 *Furniture – Children’s Domestic Furniture Seating – Requirements for Strength, Stability, and Durability*. FIRA C002 specifies the EN 1022 test method, but adjusts the test loads based on the weight of the intended child occupant. FIRA C002 additionally references EN 1729-2, *Furniture – Chairs and Tables for Educational Institutions Part 2*, for determining the loading points for the test loads. The EN 1022 stability test is conducted on a level surface, and the test loads are placed in the seating surface and arms (if present) to simulate the weight of the child. The test loads specified in FIRA C002 are based on seating suitable for children ages 3-6 or 7-12 years of age. Once the test loads are placed, a lateral force is then applied to the chair/stool to induce tipover. If the lateral load at tipover is less than the minimum specified value, the chair fails the requirement.

While conducting the EN 1022/FIRA C002 stability tests on the sample folding chairs, ES staff adjusted the specified test loads to be consistent with the loads used in ASTM F2613 for chairs seat heights of under 10 inches and 10 inches to 15 inches. CPSC staff believes that the test results for this method are also valid for determining which children’s folding chairs have potential for sideways tipover.

Staff tested eight children’s folding chairs for sideways stability; all had under 10-inch seat height. Figure 4 shows chairs that failed both the ASTM F2613 and EN 1022 sideways stability requirements. All folding chairs that failed sideways stability had arms or a place to rest arms (saucer chair). Four of the six failing chairs are constructed of tubing with a rounded profile at the base and the arm rest areas are outside of the feet. Both of these design features make the chairs less stable in the sideways direction, especially when leaning on the arms of the chair. The other two chair failures have arms that are well outside of the feet, which similarly increases sideways instability when resting on the arms. Figure 5 shows chairs that passed both the ASTM F2613 and EN1022 sideways stability requirements. One of the passing chairs was constructed of tubing with a rounded profile, similar to several of the chairs that failed, but the chair that passed the test had added stabilizers at each corner that snapped onto the tubing, and which effectively widened the base of the chair.



Figure 4. Examples of Children’s Folding Chairs that Failed Sideways Stability



Figure 5. Examples of Children’s Folding Chair that Passed Sideways Stability

After conducting tests using both methods (ASTM F2613 and EN 1022) for sideways stability on sample children's folding chairs, ES staff determined that both methods were valid and the results were comparable between the two methods. Staff concluded that for simplicity, the stability method currently found in F2613 could be used for determination of sideways stability, in addition to rearwards stability. Staff has shared with the ASTM task group all testing results and has participated in drafting a revised stability requirement to include sideways stability. The draft requirement uses the same method for both rearward and sideways stability.

On July 24, 2015, ASTM balloted the sideways stability requirement, which received five negative votes and several comments, most of which contained editorial comments about the ballot. The negatives all pertained to a common style non-folding chair without arms that failed the balloted requirement, but reportedly is not associated with any incidents (Figure 6). This chair is not a folding chair, but because the ASTM standard covers both folding and non-folding chairs in the scope, the ASTM subcommittee chairman asked the task group to evaluate the performance requirement further.

The task group met on August 12, and August 27, 2015, and discussed the ballot negatives. The task group deemed the negatives to be persuasive. At the August 12 meeting, ASTM tasked staff with reviewing the incident data to determine whether the scope of the sideways stability requirement should be narrowed because the data focused on folding chair incidents. At the August 27 meeting, staff confirmed the incidents only involve folding chairs that have arms or side support. The task group concluded that the sideways stability test requirement was still warranted, but the scope needed to be limited to address the ballot negatives and the test method revised editorially to address the ballot comments. The task group determined that the standard needed a definition for "arms" because many of the incidents included "saucer" chairs, which do not have definitive arms. ASTM formed a sub-task group to revise the scope of the sideways stability requirement and develop definitions, as needed, for "arms" and "saucer" chairs. ASTM will reballot the revision after a subcommittee review in October 2015.

Staff also reviewed the ballot comments, which focused on editorial changes to clarify the sideways stability test method. As a result, for both ASTM F2613 and the proposed rule, staff has proposed editorial changes to the balloted sideways stability requirement. Because the negative votes pertained to non-folding chairs, and the mandatory rule would apply only to folding chairs, staff believes that the side stability performance requirement, as recommended for the proposed rule, would adequately address the incidents associated with folding chairs.

Staff believes that inclusion of a sideways stability test will reduce the number of tip-over-related incidents involving folding chairs. Staff's recommended language for this requirement, which is identical to what ASTM balloted, is shown in Appendix A of this memorandum.



Figure 6. Example of a Non-Folding Chair Design that Fails the ASTM Balloted Sideways Stability Test

Hazard pattern 4 - Miscellaneous

Seventeen incidents are included as miscellaneous hazards. Three incidents are related to elevated levels of hazardous materials (lead, bromine, mercury). The standard already includes requirements prohibiting some dangerous materials. One of the incidents appears to be a “non-product-related” issue because the incident involved a potentially hazardous product being placed near the chair. The remaining 13 incidents involved various integrity issues, such as loose screws, loose plastic pieces, or a detached seat pad.

ASTM improved the standard in the 2010 revision by adding strength requirements for the chair/stool. The standard requires the product to meet a static seat load of three times the rated load and to be fatigue-tested for 500 cycles at the rated load. ASTM added these tests to ensure that the chair/stool does not unexpectedly collapse or otherwise fail from normal use and the structural parts of the product remain intact over its life.

Staff believes that the static load and fatigue tests in the current standard minimize integrity issues. The standard includes requirements for sharp points and edges, which were noted in some incidents. At this time, staff is not recommending any changes to the existing ASTM F2613 standard to address these miscellaneous incidents.

IV. OTHER STANDARDS

ESME staff compared the performance requirements of ASTM F2613-14 to the performance requirements of other standards. ES staff found two international standards: FIRA C001:2008 *Furniture – Children’s Domestic Furniture –General Safety Requirements* and FIRA C002:2008 *Furniture – Children’s Domestic Furniture Seating – Requirements for Strength, Stability, and Durability*, which address children’s chairs in a fashion similar to ASTM F2613.

Staff believes that ASTM F2613-14 is the most comprehensive of the standards to address the incident hazards because ASTM F2613-14 includes requirements for labeling, pinch/shear, locking devices, entrapment, stability, strength, and small parts. FIRA C001/C002 standards include some requirements not found in ASTM F2613-14, such as a requirement for materials to be clean and free from infestation, and requirements dealing with corrosion-resistant metals, prohibition of glass and glass mirrors, retention of magnets, partially bound and V-shaped opening above 23.5 inches, moisture content of timber components, and powered-mechanism shear/pinch hazards. The hazard patterns noted in the incident data do not necessitate adding similar requirements to ASTM F2613-14. However, staff will continue to monitor hazard patterns and recommend future changes, if necessary.

Appendix B summarizes and compares the requirements of FIRA C001 and C002 to the requirements in ASTM F2613-14.

V. RECOMMENATIONS FOR PROPOSED SAFETY STANDARD FOR CHILDREN’S FOLDING CHAIRS AND STOOLS

ESME staff recommends that the Commission publish a notice of proposed rulemaking for children’s folding chairs and stools that incorporates by reference the voluntary standard, ASTM F2613-14, *Standard Consumer Safety Specification for Children’s Chairs and Stools*, with modifications to:

- add a new performance requirement to address sideways stability incidents as outlined in Appendix A and,
- revise the marking/labeling sections as described in the CPSC Human Factors Staff memo, Tab D.

Appendix A

Additions to the current text are in underline, and deletions are shown in strikethrough.

5.13 *Stability*—All products shall not tip over backwards or sideways when tested in accordance with 6.8. Tip over shall consist of the product moving past equilibrium and begin to overturn.

6.8 *Stability Test Method*— ~~The product shall be placed on the slope of a surface inclined 10° (60.5°) to the horizontal plane with the front of the chair facing the upward slope. Blocks or a 1/2 in. (13 mm) high angle iron shall be placed against the product legs to prevent movement during the test. For chairs with a seating surface that is 10 in. or less from the floor, apply a test cylinder with a weight of 50 lb (22.7 kg) to the seating surface. For chairs with a seating surface that is greater than 10 in. above the floor, apply a test cylinder with a weight of 100 lb (45.4 kg) to the seating surface. The cylinder shall be placed so that it is centered on the seating surface and oriented perpendicular to the plane of the seating surface as shown in Fig. 4. For chairs, the cylinder shall be positioned as far back on the seating surface as permitted by the seat back. For stools, place the cylinder as far back as permitted by the seating surface without allowing for any part of the cylinder to extend beyond the rearmost edge of the stool. The dimensions of the test cylinder shall be 12 in. (30.5 cm) high with a diameter of 6 in. (15.2 cm) and a center of gravity of 6 in. (15.2 cm) from either face (see Fig. 5). For chairs with soft seating surfaces replace the test cylinder with a weighted bag 6 to 8 in. (15.2 to 20.3 cm) in diameter filled with steel shot.~~

6.8.1 Test equipment and preparation

6.8.1.1 Test surface – any rigid material covered with a high pressure laminate of unspecified color with a smooth matte finish and inclined at an angle of 10° (+/- 0.5°) to the horizontal plane.

6.8.1.2 50 lb. test cylinder – cylinder weighing 50.0 +/- 0.5 lbs. (22.7 +/- 0.2 kg) that is 12.0 +/- 0.1 in. (305 +/- 2 mm) high with a diameter of 6.0 +/- 0.1 in. (152 +/- 2 mm) and a center of gravity of 6.0 +/- 0.1 in. (152 +/- 2 mm) from either face (see Fig. 5). This cylinder shall be applied to a product seating surface whose height is 10 in. (254 mm) or less from the floor.

6.8.1.3 100 lb. test cylinder – cylinder weighing 100.0 +/- 0.5 lbs. (45.4 +/- 0.2 kg) that is 12.0 +/- 0.1 in. (305 +/- 2 mm) high with a diameter of 6.0 +/- 0.1 in. (152 +/- 2 mm) and a center of gravity of 6.0 +/- 0.1 in. (152 +/- 2 mm) from either face (see Fig. 5). This cylinder shall be applied to a product seating surface whose height is greater than 10 in. (254 mm) above the floor.

6.8.1.4 Measurement of the product seating surface height – This height shall be measured from the floor to the midpoint on the upper surface of the front edge of the seating surface, when a 2 lb. (0.9 kg) load is applied vertically downward using a 1/2" (13 mm) diameter disk onto the midpoint on the upper surface of the front edge of the seat (see Fig X).

Note X – Use of stops to prevent sliding: If necessary to prevent the product from sliding down the incline, either by its own weight when initially placed on the incline or during the conduct of the test in the following sections, stops can be placed against the product’s legs. Stops shall be the minimum height required to prevent sliding and shall not inhibit overturning.

6.8.2 Rearward stability

6.8.2.1 Product orientation: Place the product on the test surface with the front of the product facing the upward slope.

6.8.2.2 Application of the load: Place the applicable test cylinder so that it is centered side to side on the product seating surface, oriented perpendicular to the plane of this surface, and allow the cylinder to come to rest.

6.8.2.3 Cylinder Positioning For Chairs: Place the cylinder as far back or downslope on the seating surface as permitted by the seat back or chair frame (see Fig. 4).

6.8.2.4 Cylinder Positioning For Stools: Place the cylinder as far back or downslope as permitted by the seating surface without allowing any part of the cylinder to extend beyond the rearmost or downslope edge of the stool.

6.8.3 Sideways stability

6.8.3.1 Product orientation: Place the product on the test surface in the most unfavorable position with a side of the product facing the upward slope.

6.8.3.2 Application of the load: Place the applicable test cylinder so that it is centered front to back on the product seating surface, oriented perpendicular to the plane of this surface, and allow the cylinder to come to rest.

6.8.3.3 Cylinder Positioning for Chairs: Place the cylinder as far back or downslope on the seating surface as permitted by the chair frame or arms (see Fig. Y).

6.8.3.4 Cylinder Positioning for Stools: Place the cylinder as far back or downslope as permitted by the seating surface without allowing for any part of the cylinder to extend beyond the rearmost or downslope edge of the stool.

Figure X. Seating Surface Height Measurement

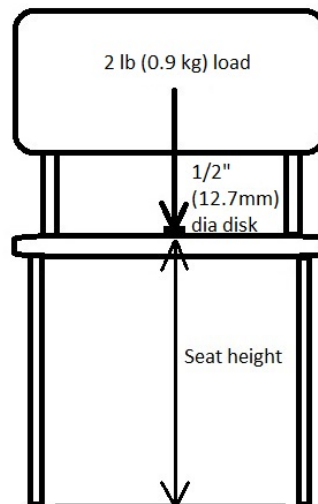
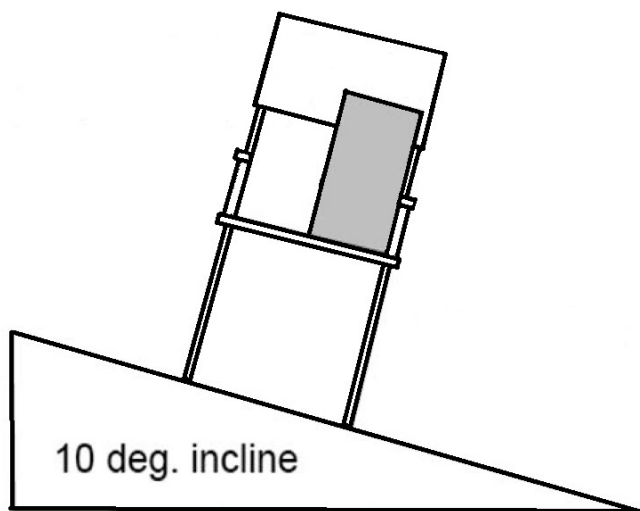


Figure Y. Sideways Stability Test Showing Orientation of Chair and Test Cylinder



Appendix B

Comparison of ASTM F2613 Standard Consumer Safety Performance Specification for Children's Chairs and Stools to FIRA C001/C002 British Standard for Children's Furniture

Para	F2613-14		Para	FIRA C001/C002	Comment
Title	Standard Consumer Safety Specification for Children's Chairs and Stools			Children's Domestic Furniture- General Safety Requirements and Seating - Requirements for Strength, Stability, and Durability	
1.1	Scope - Test requirements for structural integrity, performance requirements, and labeling requirements for children's chairs and stools.		1	General safety requirements for children's furniture for domestic indoor, outdoor and camping use	
1.2	Covers chairs and stools intended to be used by a child with a seat height of 15 inches or less.			Applicable to all types of domestic seating, tables, and storage furniture for use by children' from 3 years old to 12 years old	
5	General Requirements				
5.1	Wood parts smooth & free of splinters		C001 6.1.1	Similar	
	Requirement not in standard		C001 6.1.2	Materials clean and free from infestation	See Note 1
	Requirement not in standard		C001 6.1.4	Metals corrosion resistant	See Note 1
	Requirement not in standard		C001 6.6	Magnets must not become detached	See Note 1
	Requirement not in standard		C001 6.5	Head and neck entrapment in partially bound and V-shaped openings	See Note 1
	Requirement not in standard		C002 4.1	Moisture content of timber components between 8 and 12 percent	See Note 1
5.2	No hazardous sharp points or edges		C002 6.2	Similar	
5.3	No small parts prior to or as a result of testing.			Requirement not in standard	
5.4	Paint and surface coatings comply with 16 CFR 1303		C001 6.1.3	Same (must meet EN 71-3)	
5.5	No flammable solids as defined in 16 CFR 1500.3 (c) (6)(vi)		C001 6.1.8	Same (must meet EN 1103)	
5.6	Toy accessories must meet F963			Requirement not in standard	

5.7	Scissoring, shearing, or pinching that may cause injury shall not be permissible when the edges of any rigid parts admit a probe greater than 0.210 in. (5.30 mm) and less than 0.375 in. (9.50 mm) in diameter at any accessible point throughout the range of motion of such parts.	C001 6.4.1	Similar	
	Requirement not in standard	C001 6.4.2	No shear / pinch points created by powered mechanisms	See Note 1
5.7.1	Products with locking mechanisms meeting 5.8.3 shall only be evaluated in the manufacturer's recommended use position		Not specified	
5.8	Folding mechanisms and hinges - requirements intended to eliminate crushing, laceration or pinching from folding mechanisms and hinges.	C001 6.4.3	Similar	
5.8.1	Folding mechanisms shall have a locking device or other means to prevent unexpected collapse or have adequate clearance	C001 6.4.3	Similar	
5.8.2	Locking devices shall engage automatically when product is placed in any manufacturer's use position	C001 6.4.3	Similar	
5.8.3	Units designed with locking device			
5.8.3.1	Each single action device shall require 10 lbf to activate release mechanism	C001 6.4.3	Similar	
5.8.3.2	Each double action locking device shall require two consecutive concurrent actions or two separate and independent single action locking mechanisms that must be activated simultaneously. No force requirements for double action.		Not specified	
5.8.4	Hinge line clearance - products having a gap or clearance along hinge line if admit 3/16 in dia rod shall also admit 1/2 in dia rod at all position.	C001 6.4.1	Similar	

5.8.5	No product shall appear to be in recommended use position unless locking device is fully engaged			Not specified	
5.9	Circular holes in rigid material - to prevent finger entrapment if an accessible circular hole in any rigid material less than 0.62 in in thickness can admit 1/4 in dia rod, shall also admit 1/2 in dia rod		C001 6.3	Similar	
5.10.1	Labeling - Warning Labels permanent			Not specified	
5.11	Protective components shall not be removable			Not specified	
5.12	Strength test requirements: Chair must remain functional after static and fatigue testing		C002 4.3.3	Similar	
5.13	Stability test		C002 4.3.2	Similar	
7	Marking and labeling		C001 7.0	Similar	
7.1	Labels		C001 7.1, 7.2	Similar	
7.2	Warnings		C001 7.2	Similar	

Both standards address many of the general hazards associated with durable nursery products, such as lead in paints, sharp edges/sharp points, small parts, and warning labels.

Note 1. FIRA C001/C002 includes requirements for: materials clean and free from infestation, corrosion-resistant metals, retention of magnets, head and neck entrapment, moisture content of timber components, and powered-mechanism shear/pinch point. There were no hazard patterns noted in the incidents that necessitated adding similar requirements to ASTM F2613-14. However, staff will continue to monitor these hazard patterns and recommend future changes, if necessary.

TAB B: Children’s Folding Chair and Folding Stool-Related Injuries and Potential Injuries; 2003–2014

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

Memorandum

Date: August 27, 2015

TO : Patricia L. Edwards and Vince Amodeo
Project Manager, Children's Folding Chairs and Stools
Directorate for Engineering Sciences

THROUGH: Kathleen Stralka
Associate Executive Director
Directorate for Epidemiology

Stephen Hanway
Director, Division of Hazard Analysis
Directorate for Epidemiology

FROM : John Topping
Mathematical Statistician, Division of Hazard Analysis
Directorate for Epidemiology

SUBJECT : Children's Folding Chair and Folding Stool-Related Injuries and Potential
Injuries; 2003 –2014¹²

I. Introduction

This memorandum provides the number of reported deaths and injuries and the types of hazards associated with children's folding chairs and stools. The incidents occurred from the years 2003 through 2014.¹³ For this same period, the memorandum presents an estimate of emergency department-treated injuries to children under age 5 who interacted with a folding chair or stool. Incident counts and injury estimates are based on reports received by Consumer Product Safety Commission ("CPSC") staff.

The first iterations of the ASTM voluntary standard F2613, then named, *Standard Consumer Safety Specification for Children's Folding Chairs*, were intended to address safety issues associated with "folding chairs," defined as "seating furniture that is intended to be used as a support for the body, limbs, or feet when sitting or resting in an upright or reclining position and

¹² This analysis was prepared by CPSC staff. It has not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.

¹³ Not all of these incidents are addressable by an action the CPSC could take; however, it was not the purpose of this memorandum to evaluate the addressability of the incidents, but rather to quantify the number of fatalities and non-fatalities reported to CPSC staff.

which can be folded for transport or storage.” Moreover, these chairs were “intended to be used by child with a seat height 15 in. or less.” This definition and the related specifications were first approved in 2007, with the designation, ASTM F2613-07. Subsequent iterations of the standard maintained generally consistent definitions and specifications until 2013, when ASTM F2613-13 was expanded to include all children’s chairs and stools (a “children’s chair without back or armrests”). This iteration of the standard was renamed the *Standard Consumer Safety Specification for Children’s Chairs and Stools*.

The most recently approved edition (F2613-14) continues to include children’s chairs and stools (including folding products), adding that “This specification covers a chair or stool intended to be used by a single child who can get in and get out of the product unassisted and with a seat height 15 in. or less, with or without a rocking base.” Additional specifications state that the “standard does not apply to products used in a commercial setting or to products that do not have a *rigid frame* such as bean bag chairs or foam chairs. This standard does not apply to seats with restraint systems.”

The staff review covers children’s folding chairs and stools that are intended or reasonably expected to be used by children under the age of 5 years.¹⁴ The review does not cover product types excluded in the current standard, such as folding products that have a ladder-like function. Furthermore, this review does not cover all product types included in the current standard (*i.e.*, children’s chairs and stools that do not fold). For this analysis, CPSC staff reviewed data from the years 2003 through 2014. This analysis, therefore, includes a combination of incidents from before and after creation of the standard.

Folding chairs are generally categorized within CPSC data using the product code 4016 (*Beach chairs or folding chairs*). This product code also includes chairs designed for a variety of age groups and non-folding beach chairs, some of which are outside the scope of this review. CPSC staff also searched reports categorized under other product codes for indications that the chair may actually have been a folding chair.¹⁵

This memorandum focuses on incident reports with specific information (*e.g.*, make and model of the product, photos, or a sufficiently detailed description) that allow staff to characterize incidents involving chairs specifically intended or reasonably expected to be used by children under age 5 years. Reports indicating that the product was a folding chair but lacking information necessary for staff to determine the age for which the product is intended are excluded from this analysis.

¹⁴ 16 C.F.R. § 1130.2(a)(13) provides that children’s folding chairs are among the specific product categories that are considered to be durable infant or toddler products under section 104 of the Consumer Product Safety Improvement Act (“CPSIA”).

¹⁵ CPSC staff extracted incident data received through December 31, 2014, excluding any reports of incidents occurring earlier than January 1, 2003. Staff examined all data coded under product code 4016 to identify potentially in-scope cases. As a secondary measure, CPSC staff searched for keywords suggestive of folding chairs (“fold”, “collaps,” or “colaps”) from product codes 4074 (chairs, other or not specified). And in the interest of giving consideration to folding stools, CPSC staff searched for the same keywords from product codes 0620 (Step stools), 4079 (Footstools, ottomans or hassocks), 4080 (Stools, other or not specified), and 4025 (Barstools or kitchen stools).

II. Incident Data¹⁶

CPSC received reports of 98 injuries, 45 non-injury incidents, and another 39 recall-related complaints associated with children’s folding chairs or stools in the Consumer Product Safety Risk Management System (“CPSRMS”) database for the period January 1, 2003 through December 31, 2014.¹⁷ Reporting is ongoing, and thus, the number of reported injury and non-injury incidents from the CPSRMS system may change in the future. Given that the reports in CPSRMS are anecdotal and that reporting is incomplete, the reader should refrain from making conclusions about year-to-year increases or decreases that may be suggested by the reported data. The number of reported incidents and complaints are presented by year in Table 1. The 98 incidents with injuries are characterized by child’s age in Table 2 and by body part in Table 3.

Table 1: Reported Children’s Folding Chair and Stool Incidents 2003 -2014

<i>Year</i>	<i>Number of Reports</i>			<i>Total Reports</i>
	<i>Incidents with Injuries</i>	<i>Incidents with No Injuries</i>	<i>Complaints with No Incident</i>	
2003	4	-	-	4
2004	11	4	1	16
2005	36	21	37	94
2006	9	-	1	10
2007	10	8	-	18
2008	5	1	-	6
2009	5	1	-	6
2010	3	3	-	6
2011	4	4	-	8
2012	6	-	-	6
2013*	-	2	-	2
2014*	5	1	-	6
Total	98	45	39	182

Source: Consumer Product Safety Commission’s CPSRMS database.¹⁸

Note: Most of the complaints without an incident were reported in the year 2005 when CPSC issued five recalls for various children’s folding chairs.

¹⁶ For this memorandum, CPSC staff searched the Consumer Product Safety Risk Management System (“CPSRMS”) and the National Electronic Injury Surveillance System (“NEISS”). The CPSRMS or “Non-NEISS” system includes historical data from the In-Depth Investigation (“INDP”) file, the Injury or Potential Injury Incident (“IPII”) file, and the Death Certificate (“DTHS”) file. These reported incidents are neither a complete count of all that occurred during this time period, nor a sample of known probability of selection. However, the incident reports 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 folding chairs and stools.

¹⁷ Only one of the reported incidents involves a stool, while the remainder involve folding chairs that are not stools. Step stools are not within the scope of this discussion.

¹⁸ Staff is not aware of any deaths during this period. Data collection is not complete for the 2 years 2013-2014. Counts in italics may change in the future due to ongoing reporting for these years. Although some victims were over 5 years of age, the chairs involved in all of the incidents were presented as appropriate for children in the under 5 years age range. NEISS data did not provide sufficient information to determine the age for which the product was intended, and therefore, NEISS cases were not included.

**Table 2: Reported Injuries Associated with Children’s Folding Chairs and Stools
By Victim Age Group
2003-2014**

<i>Age Group</i>	<i>Injuries</i>
Under 12 months	0
12-17 months	2
18-23 months	8
2 Years	27
3 Years	23
4 Years	15
5 Years	3
6-11 Years*	5
Adult*	2
Unknown	13
Total	98

Source: Consumer Product Safety Commission’s CPSRMS database.

*Some victims are older than the chair’s intended age range.

**Table 3: Reported Injuries Associated with Children’s Folding Chairs and Stools
by Primary Body Part(s)
2003-2014**

<i>Primary Body Part(s)</i>	<i>Injuries</i>
<i>Hands and Fingers</i>	76
<i>Head and Face (including mouth, eyebrows, etc.)</i>	14
<i>Neck</i>	1
<i>Shoulder</i>	1
<i>Leg</i>	1
<i>Undetermined</i>	5
Total	98

Source: Consumer Product Safety Commission’s CPSRMS database.⁷

A. Fatalities

No fatalities were reported from 2003 through 2014 for children’s folding chairs and stools that were intended for use by children under 5 years old.

B. Incidents with Injuries

Ninety-eight (98) nonfatal incident injuries were reported, some of which were not medically treated. Injuries to children ages 2 and 3 years old were the most frequently reported incidents involving chairs intended for the under 5 year age range (51%). The most frequent injuries (76) involved fingers, thumbs, or other parts of the hand, with most of the remainder (14) affecting the head or face. The youngest injury victim was 12 months old. Some victims exceed the intended age range of the chair, but their injuries demonstrate hazards with chairs relevant to

children under the age of 5. Two injured adults were included among the 98 nonfatal incidents as were several children over 5 years of age. Reports in which the submitter suggested injuries from the same repeating hazard on multiple occasions and/or affecting multiple victims were counted as just a single injury incident. These injury counts, therefore, may be considered conservative.

C. Incidents with No Injury Reported

Forty-five (45) incidents did not report an injury. However, these reports illustrate a potential for injuries. These include incidents in which the chair was occupied or used by a child and those in which a parent or submitter detected a malfunction or hazardous issue while the chair was not in use.

D. Non-incident Complaints

Thirty-nine (39) reports did not describe incidents, but merely reflected concerns regarding recalls. These concerns involved questions about recalled products (*e.g.*, determining whether a product was subject to recall), or concerns regarding apparent similarities in design between recalled and non-recalled products.

III. Hazard Pattern Identification

CPSC staff considered 182 reports to identify hazard patterns associated with children's folding chairs and stools. One hundred forty-three reports involved incidents and 39 reports involved complaints (without incident). The most common hazards involved the chair unexpectedly collapsing or folding. This could have or did result in pinching or shearing of the victim's fingers. Additional incident reports pertain to tipover hazards, hazards from the seatback, or hazards from other components coming off of the chair.

Staff determined the primary hazard pattern for each incident. Although in reality these hazards may interact with or initiate other hazards, staff counted each reported incident under only one of the four main hazard categories included in Table 4 (*Pinch/Shear Hazards, Undetermined Hazard Finger Injuries, Stability/Tipover, and Miscellaneous*).¹⁹

Although several incident reports contained information consistent with the possibility of finger entrapment (without any pinching or shearing), the overall information was conflicting or insufficient. Although staff could not collectively agree to classify any particular incident as an

¹⁹ Note that many of the reports from consumers suggested multiple instances and/or injuries involving chair(s) in their possession. In some instances, the submitter vaguely alluded to multiple occurrences or affected children. This analysis conservatively counts repeating instances involving the same hazard reported by the same consumer as only a single incident with, at most, one injury (even if there may have been multiple injured victims due to the same chair exhibiting the same hazard). However, three reports described distinct instances involving separate hazards. Because each of these submitters described two different types of hazards, with one hazard occurring in the first instance, and another hazard occurring in the second instance, for analytical purposes, these were counted as distinct incidents (two per submitter for a total of six incidents). Another submission reported just one incident involving a combination of hazards, with the chair collapsing upon a child's leg/thigh while also apparently tipping over due to instability of the chair. Because the two hazards occurred in a single incident, staff counted the incident as only a pinch/shear hazard incident and did not the incident among the set of tipover incidents.

“entrapment,” staff believes that some of the incidents classified as “Undermined Hazard Finger Injuries,” in actuality, may have involved entrapment.

A. Pinch/Shear Hazards

Ninety (90) incidents demonstrated pinching or shearing hazards (including the possibility of crushing or scissoring when the chair folds or unfolds, regardless of intent). In 12 incidents, victims were injured while intending to transition the chair between its folded and unfolded states. In 62 incidents, victims were injured following unexpected folding or unfolding of the chair or stool²⁰ (generally described as “collapse”). These incidents resulted in 53 injuries. Another 16 incidents demonstrated some malfunction or issue relevant to these hazards (such as a failing locking mechanism), but did not result in folding or unfolding of the chair.

While most of these injuries involved pinched/sheared fingers or other body parts, there were two chair collapse incidents in which the child was injured but avoided being pinched or sheared. In these two incidents, the injuries resulted when a head or face struck the floor as a consequence of the child falling out of the collapsing chair. Nine (9) incidents of unexpected folding movement did not appear to result in any pinched/sheared body parts or any other kind of injury.

Fingers and hands were the body parts most commonly involved in pinching or shearing hazards (61). This included all (12) reported incidents in which the folding or unfolding was intentional, and most (49) of the incidents involving collapse or unexpected folding movement. In two other incidents, other body parts were pinched/sheared from unexpected folding/collapse (1 neck incident, and 1 leg incident). The incident involving the neck resulted from unexpected chair folding. The child subsequently fell with the chair and ended up in a position where his neck was squeezed inside an opening (which staff believes was between the seat back and the seating surface), due to the pinching/shearing motion of the chair. The 4-year-old boy’s airway was temporarily cut off, but he ultimately suffered only bruises and scrapes to his neck. The incident involving the leg appears to be a combination of both pinching/shearing motion, as well as general chair instability (tipover). In this incident, the child’s thigh was caught in a pinching/shearing action of the chair before receiving scrapes and bruises from the fall. Out of all 90 pinch/shear hazard incidents (including incidents without actual pinch/shear injuries), at least eight involved recalled products (6 injured; 2 without injuries).

B. Undetermined Hazard Finger Injuries

Fourteen (14) incidents involved finger injuries that were caused by an undetermined hazard. In seven of these incidents, there was evidence that the finger was caught in a chair mechanism. For these, it seems most likely that the hazard would be either pinch/shear-related or entrapment-related, even though staff cannot discern which, in particular. In the other seven incidents, there was insufficient information to rule out other possible causes of the child’s finger injury. In general, these injuries were severe (such as amputation or fracture). Two of the incidents involved recalled chairs. Although staff does not know what occurred in these particular

²⁰ The one incident involving a stool rather than a chair with a seat back resulted in fingers caught under the stool after the malfunctioning safety latch locking mechanism allowed the stool to lift from its base

incidents, staff knows that both chairs were recalled due to the possibility of unexpected collapse (*i.e.*, a pinch/shear hazard).

C. Stability/Tipover

Twenty-two (22) incidents involved the chair tipping over without indication of chair collapse.²¹ Fifteen (15) of these incidents resulted in injuries (14 falls onto the head or face, 1 onto the shoulder/clavicle). Staff was unable to determine if any of the chairs involved in these stability/tipover incidents were recalled models.

D. Miscellaneous

Seventeen (17) incidents related to other issues with folding chairs. Two (2) incidents reported that the product tested positive for elevated levels of lead content (no injuries), while another (1) described high levels of bromine and mercury and a “horrendous smell” resulting in headaches (counted as a single injury). One (1) incident did not involve a hazard related to the folding chair, but was clearly related to the folding table that came as part of a folding chair and table set. In this incident, the table folded unexpectedly, dropping a 3-year-old child off the table and then onto a folding chair that came with the table. Staff could not determine whether injury resulted, and therefore, the incident is not counted as an injury. Six (6) incidents involved loose small parts (including one about an easily removed protective cap), one involved loose plastic “pieces,” and four involved loose screws. Five (5) incidents involved sharp points resulting from detachment of the seat/pad from the frame. In two other instances, a child experienced minor fall injuries when the integrity of the seat failed (it was noted that the child fell as the seat “broke”). In the other instance, the fabric “frayed apart at the seam,” resulting in the child falling backwards.

²¹ These 22 incidents do not include the previously discussed incident involving a chair that tipped over while collapsing onto the occupant’s thigh.

**Table 4: Distribution of Reported Children’s Folding Chair and Stool Incidents
By Product-Related Hazard Patterns
Date of Incident: 2003–2014**

Product-Related Hazard Patterns	Total Reported Incidents		Reported Nonfatal Injuries		Recalled Product Incidents	
	<i>Count</i>	<i>Percentage</i>	<i>Count</i>	<i>Percentage</i>	<i>Count</i>	<i>Percentage</i>
Pinch/Shear Hazard	90	63%	65	66%	8	80%
<i>(intending to fold/unfold, but injured finger)</i>	<i>(12)</i>		<i>(12)</i>			
<i>(hazard detected without resulting in actual folding/unfolding motion)</i>	<i>(16)</i>					
<i>(collapse or unintended folding motion)</i>	<i>(62)</i>		<i>(53)</i>			
<i>(... no resulting pinch/shear or fall)</i>	<i>(9)</i>					
<i>(...ejection without pinch/shear)</i>	<i>(2)</i>		<i>(2)</i>			
<i>(...hands or fingers pinched or sheared regardless of fall)</i>	<i>(49)</i>		<i>(49)</i>			
<i>(...neck caught in collapsed chair, temporarily obstructing airway)</i>	<i>(1)</i>		<i>(1)</i>			
<i>(...combination of chair collapsing upon leg/thigh with tipover)</i>	<i>(1)</i>		<i>(1)</i>			
Undetermined Hazard Finger Injury	14	10%	14	14%	2	20%
<i>(caught finger(s), but undetermined whether pinch/shear or entrapment without movement of chair)</i>	<i>(7)</i>		<i>(7)</i>		<i>(2)</i>	
<i>(fully undetermined)</i>	<i>(7)</i>		<i>(7)</i>			
Tipover (excludes incident involving pinch/shear of leg)	22	15%	15	15%	0	
Miscellaneous	17	12%	4	4%	0	
<i>(chemical hazards detected)</i>	<i>(3)</i>		<i>(1)</i>			
<i>(easily detached protective cap)</i>	<i>(1)</i>					
<i>(loose plastic pieces)</i>	<i>(1)</i>					
<i>(loose screws)</i>	<i>(4)</i>					
<i>(sharp points exposed from seat back coming off)</i>	<i>(5)</i>		<i>(1)</i>			
<i>(fall associated with failing integrity of seat including the seat back)</i>	<i>(1)</i>		<i>(1)</i>			
<i>(fall associated with failing integrity of fabric)</i>	<i>(1)</i>		<i>(1)</i>			
<i>(collapsed table that came with folding chair set leading to fall onto chair)</i>	<i>(1)</i>					
Total Incidents	143	100%	98	100%	10	100%

Source: Consumer Product Safety Commission’s CPSRMS database.

Note: The percentages have been rounded to the nearest integer and shown for totals and subtotals only. Subtotals do not necessarily add to heading totals. The count of recalled product incidents may be conservative because the count includes only incidents for which there was sufficient information to conclude the product in the incident was a recalled model and not merely a similar design.

IV. Chair/Stool Component Issues

This section summarizes the incidents in a different manner than the categories presented in Section III. The four hazard categories in Section III report all relevant incidents by the primary hazard pattern. In many of those incidents, the hazard was described without any indication of what may have happened with various component(s) to produce that hazard. Some reports, however, did identify problems with specific components that may have failed or interacted in such a way to contribute to the hazard. Although there is not sufficient information for staff to characterize all of the relationships between various components issues and potentially resulting hazard, the frequency of three commonly reported component issues is presented in Table 5.

A. Structural Integrity

Twenty-nine (29) incidents (associated with 11 injuries) described issues with folding chair structural integrity. These issues are identified among incidents counted in Section III as Pinch/Shear Hazards (15), Miscellaneous (13), and Undetermined Hazard Finger Injuries (1).

The undetermined hazard incident involved a compound fracture of the finger that could have been associated with multiple possible hazards. Although the chair had clearly exhibited an issue with structural integrity, it is not clear that this contributed to the injury incident. The seat back was observed to be coming off, and thus, posed a laceration hazard (similar to several incidents noted under Miscellaneous in Section III). However, the actual injury could be related to other factors besides the exposed sharp points from the seat back coming off. The chair involved in the incident was recalled for pinch/shear hazards from unexpected folding due to the locking mechanism.

Two of the 29 incidents that had structural integrity issues involved recalled chairs. Some of the other chairs with structural integrity issues were of similar design to recalled products. Twelve incidents involving structural integrity issues with the locking mechanisms (*i.e.*, loose screws, physically broken, or otherwise) are also included in the category below.

B. Locking Mechanism

Forty-five (45) incidents involved issues with the locking mechanism. Fifteen (15) of these instances included the locking mechanism malfunctioning or breaking without an actual occurrence of collapse, folding, or unfolding. Four (4) incidents reported collapses without any injuries. The remaining 26 incidents were associated with various injuries.

Injuries associated with failures of the locking mechanism varied. Two children were injured when their head and/or face fell against the floor. One pinch/shear injury involved a child's entire hand (not just a finger) caught between the pinch point. The remaining 23 injuries involved fingers and ranged in severity from a minor pinch to severed fingertips or amputation (at least 22 related to a pinch/shear hazard and one was a finger injury of undetermined hazard).

Four of the incidents exhibiting locking mechanism failures involved recalled products (one without injury, one finger laceration requiring stitches, and two finger amputations).

C. Hinges

Twenty-three (23) incidents were reported with specific issues involving the hinges, all resulting in injuries. Note that five involved both the hinge and the locking mechanism and were therefore also counted in the category above. Eight (8) of the hinge reported injuries occurred while the victim was intentionally folding or unfolding the chair. Eleven (11) of the injuries resulted from the chair folding unexpectedly. For the remaining four (4) injuries, the fingers were somehow caught, but staff could not determine whether the fingers may have been pinched/sheared or instead entrapped without any pinching/shearing motion.

At least two of these hinge-related incidents involved recalled products (both collapsed onto fingers resulting in injuries). One incident involved a finger laceration requiring stitches. This was also noted above in the locking mechanism section (both components were identified). For the other recalled chair, there were no locking mechanism or other component issues reported. This incident involved a finger pinch/shear in the hinge, resulting in an injury of unspecified severity.

**Table 5: Distribution of Reported Children’s Folding Chair and Stool Incidents
By Component Issues Identified
Date of Incident: 2003–2014**

<i>Component Issue</i>	<i>Reported Incidents</i>	<i>Reported Injuries</i>
Structural Integrity	29	11
Locking Mechanism	45	26
Hinges	23	23
No Component Issue Identified	63	49

Source: Consumer Product Safety Commission’s CPSRMS database.

Note: A single incident may involve multiple chair Component Issues; therefore, these are not mutually exclusive categories. Twelve (12) incidents indicated both structural integrity and the locking mechanism. Another five (5) incidents involved both the hinge and the locking mechanism, but not necessarily structural integrity.

V. National Injury Estimates

The National Electronic Injury Surveillance System (“NEISS”) is a probability sample of hospitals in the United States and its territories, from which the total number of injuries in hospital emergency departments nationwide can be estimated for various products. From January 1, 2003 through December 31, 2014, there were an estimated 17,500 children younger than 5 years of age treated in emergency departments for injuries related to folding chairs and stools. Information from hospital records, however, is not sufficient to determine which injuries involved chairs specially designed for children. Because an unknown proportion of these injuries may have involved folding chairs or stools with a seat height of 15 inches or less, staff cannot provide estimates specific to folding chairs or stools that would be within the scope of this standard.

TAB C: Health Sciences Analysis of Injuries Associated with Children's Folding Chairs and Stools

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

Memorandum

Date: August 31, 2015

TO : Patricia Edwards
Vincent Amodeo
Directorate for Engineering Sciences
Project Managers, Children's Folding Chairs and Stools

THROUGH: Alice M. Thaler, D.V.M., MS Bioethics
Associate Executive Director
Directorate for Health Sciences

Jacque N. Ferrante, Ph.D.
Director, Division of Pharmacology and Physiology
Directorate for Health Sciences

FROM : Stefanie C. Marques, Ph.D.
Physiologist
Directorate for Health Sciences

SUBJECT : Health Sciences Analysis of Injuries Associated with Children's Folding Chairs and Stools

Introduction

Health Sciences ("HS") staff reviewed and analyzed incident data associated with children's folding chairs and stools (referred to in this memorandum as "chairs") to determine whether the current ASTM voluntary standard F2613-14, *Standard Consumer Safety Specification for Children's Chairs and Stools*, sufficiently addresses potential hazards associated with these products.

The ASTM standard for children's folding chairs applies to chairs with a seat height of 15 inches or less that are designed to be used by a child. Based on Epidemiology staff's review of 182 incidents that occurred from 2003 to 2014 (Tab A), there were four major hazard patterns associated with children's folding chairs: pinch/shear, undetermined finger injuries, stability/tipover and a miscellaneous hazard pattern that involved incidents relating to various product issues, such chemical hazards and small parts. Epidemiology staff determined that out of 182 incidents, there were 98 injuries and the majority of the injuries (76%) sustained by children interacting with children's folding chairs and stools were to the child's hands and fingers,

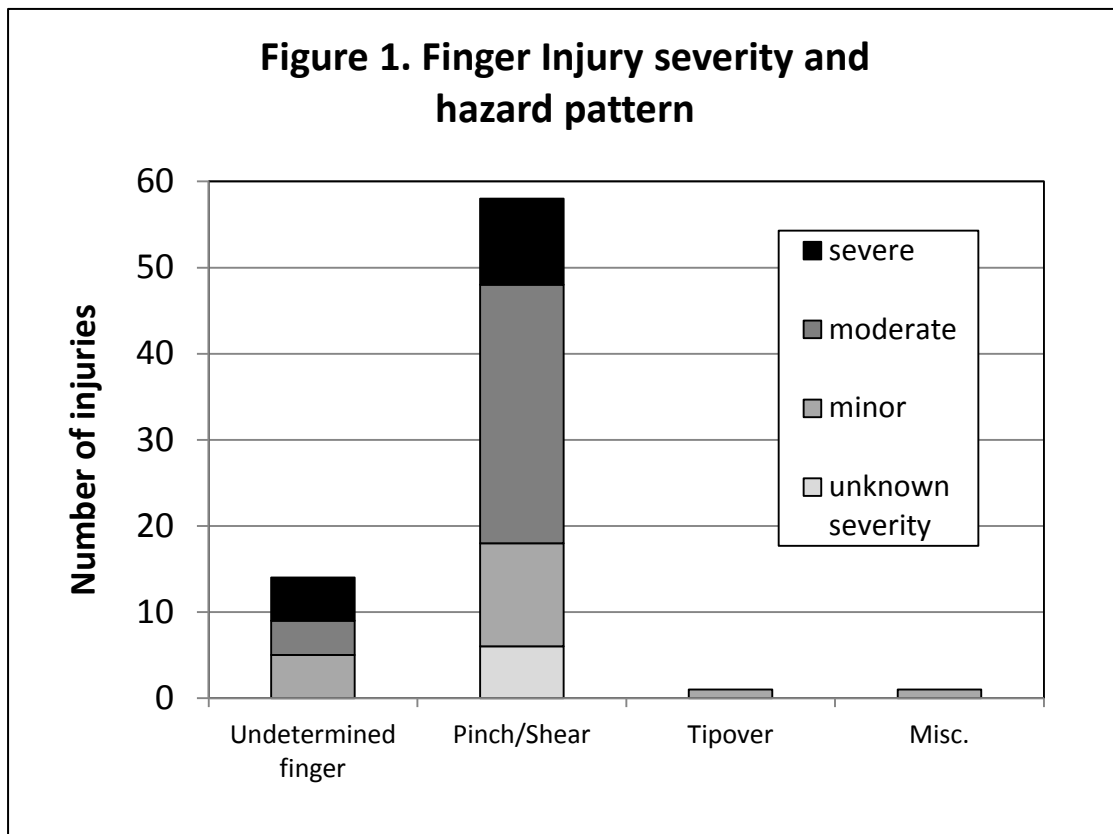
CPSC Hotline: 1-800-638-CPSC(2772) CPSC's Web Site: <http://www.cpsc.gov>

followed by the head and face (14%); the remaining injuries were to the neck (1%), shoulder (1%), and leg (1%).

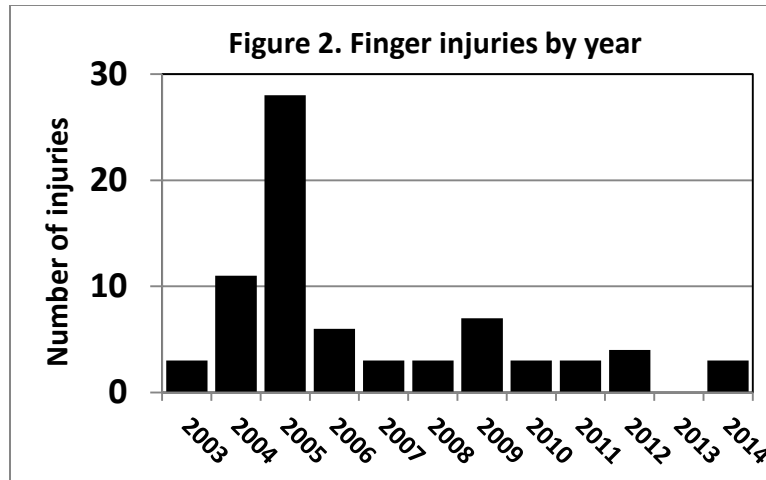
Health Sciences Analysis of Reported injuries

HS staff reviewed and analyzed the incident data from 2003 to 2014, and determined that when the incidents were grouped by body part, some hazard patterns were more prevalent than others (Figure 1 and Figure 3).

Finger/hand injuries



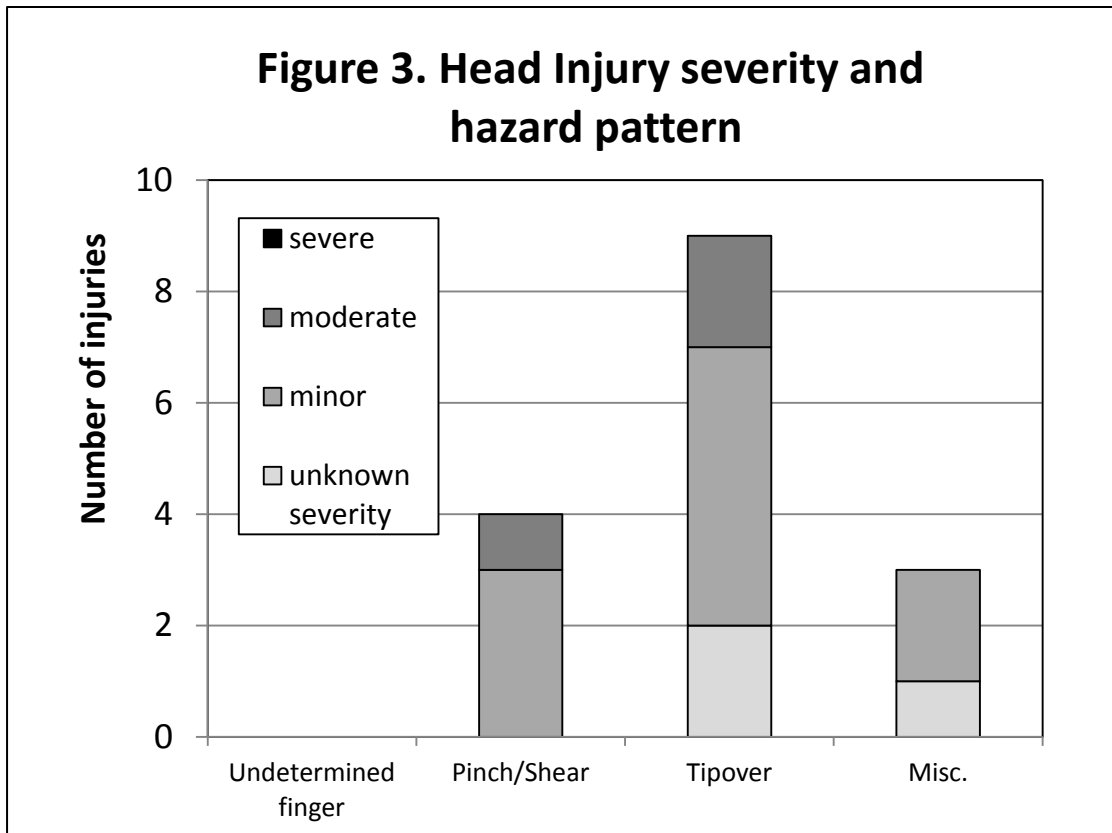
The majority (78%) of the finger/hand injuries were due to the pinch/shear hazard pattern (Figure 1). The pinch/shear hazard pattern accounted for more than half (54%) of the moderate and severe finger/hand injuries. Finger injuries from either the pinch/shear hazard pattern or an undetermined hazard pattern accounted for all of the severe injury incidents out of the 98 injuries determined. Most of the severe finger injury incidents were fingertip amputations that were sustained when the child caught a finger or fingers in the chair during normal use, *i.e.*, while the child was sitting in the chair or attempting to fold the chair.



A review of the reported finger injury incidents over time reveals that there was a peak of reported incidents in 2005 (Figure 2). At that time, CPSC staff requested that ASTM develop a standard for children’s folding chairs to address the hazards associated with the products during normal use. The voluntary standard was first published in 2007. The voluntary standard had requirements designed to mitigate injuries from scissoring, shearing, and pinching from folding mechanisms and hinges. Since 2005, the number of reported finger injury incidents has declined. In 2012, there were only four (4) finger injuries sustained, reflecting a decrease of 86 percent compared with 2005 (data collection is ongoing for the more recent years 2013 and 2014). However, because reports from non-NEISS sources are anecdotal, it is difficult to determine whether the decrease in the number of reported incidents represents an actual decrease in incidents due to improvements in, and/or compliance with, the voluntary standard.

Head/face injuries

The majority (56%) of the head/face injuries were due to the tipover hazard (Figure 3); 41 percent of the tipovers were to the side; 9 percent were forward tipovers; 9 percent were rearward tipovers; and in the remaining 41 percent, the direction of the tipover could not be determined. Most of the tip-over incidents occurred when children shifted their weight (*i.e.*, leaned over, or turned their head) while they were in the chair or when they attempted to sit in the chair. None of the tip-over incidents resulted in a severe head injury, most likely because the falls from the tipovers are from chairs with a seat height of 15 inches or less. The most serious injury from a tip-over fall to the floor occurred when a 19-month-old child fell on her shoulder and fractured her clavicle requiring her to use a brace for 2 weeks. Despite the low height of the folding chairs, there is a potential for more serious injuries to occur, if a child falls on an object near the chair. Four tip-over incidents involved the child falling and hitting a nearby table, bookcase, or glass cabinet; the most serious type of this incident involved a child falling onto a nearby coffee table and knocking out a front tooth.



Health Sciences analysis of the NEISS injuries

Due to the limited information in the NEISS reports, there were only 20 NEISS incidents that staff could determine occurred while children under 5 were using a children’s folding chair. HS staff’s analysis of the 20 NEISS reports determined that 15 of them involved an injury to the head or face; the majority of these injuries appear to be the result of children falling from the chair and not due to the chair tipping over. Nine of these head injury reports resulted in a minor injury, such as bruises, bumps, and lacerations; three involved the child hitting a nearby object. Four of the head injury NEISS reports were moderate (such as a closed head injury or a dental injury,) and in the remaining two head injury NEISS reports, the injury severity could not be determined due to limited information in the NEISS reports.

Four of the NEISS reports involved a finger injury sustained during normal use of the product. Two of the finger injuries were minor, such as bruises, redness, swelling, and lacerations. There was one partial fingertip amputation, and one complete fingertip amputation.

The remaining NEISS children’s folding chair report was a bruise to a child’s foot sustained when a children’s folding chair fell on him.

Health Sciences conclusions

Review and analysis of the non-NEISS and NEISS data reveal that there are two major hazard patterns associated with children's folding chairs: (1) a pinch and shearing hazard resulting in severe fingertip injuries, such as amputations, and (2) a tipover and fall hazard resulting in head and face injuries.

Severe fingertip injuries, such as amputations, could have long-term effects on children's dexterity and limit their ability to write, play a musical instrument, and play sports, which could affect their overall quality of life. Although establishment of the standard in 2007 and subsequent improvements to the standard through 2014 seem to have resulted in a downward trend in severe finger injuries, Staff (Tab D) recommends strengthening the warning statements for the finger amputation hazard to make caregivers more aware of the hazard and possibly reduce the likelihood that these types of incidents will occur in the future.

The majority of the tip-over incidents were due to sideways tipovers. Even though most of the injuries sustained were minor due to the short height of the chair, there is a potential for more severe injuries to occur if the child falls onto a nearby object. The current standard only provides a rearward stability test. Because sideways tipovers also can result in injuries, HS staff believes that the addition of the sideways stability test recommended by Engineering staff (Tab B) would further reduce the risk of injury associated with such products in the future.

**TAB D: Human Factors Assessment of ASTM F2613 – 14
Requirements for Children Folding Chairs and Stools**

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

Memorandum

Date: August 30, 2015

TO : Vince Amodeo
Patricia Edwards
Project Managers, Children's Folding Chairs and Stools
Directorate for Engineering Sciences

THROUGH: Joel R. Recht, Ph.D.
Associate Executive Director
Directorate for Engineering Sciences

Bonnie B. Novak
Director, Division of Human Factors
Directorate for Engineering Sciences

FROM : Sharon R. White
Engineering Psychologist
Directorate for Engineering Sciences

SUBJECT : Human Factors Assessment of ASTM F2613 – 14 Requirements for Children
Folding Chairs and Stools

BACKGROUND

The current voluntary standard, ASTM F2613 - 14, *Standard Consumer Safety Specification for Children's Chairs and Stools*, establishes performance requirements, labeling requirements, and other requirements to promote the safe use of children's chairs and stools. Children's folding chairs and stools are a subset of products covered under this standard. This standard was approved originally in 2007, and the most recent version was approved and published in 2014.

ASTM developed this voluntary standard in response to incident data provided by the U.S. Consumer Product Safety Commission's ("CPSC" or "Commission") staff. The standard was developed to address injuries, including, but not limited to, lacerations, fractures, pinches and amputations of children's fingers in folding mechanisms. Section 7 specifies the marking and labeling requirements, developed primarily to address crushing and amputation of fingers. In response to rulemaking activity under Section 104 of the Consumer Product Safety Improvement Act ("CPSIA"), this memorandum assesses the adequacy of the warning statement requirements

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for children's folding chairs in addressing the risk of injuries and deaths associated with children's folding chairs and stools.

Recent ASTM Activity on Warning Labels

At the October 2, 2014 ASTM subcommittee meeting, CPSC staff raised concerns about the adequacy of the warning labeling requirements and, at the request of staff, an ASTM task group was established to work on the issue. Subsequently, at the January 22, 2015 subcommittee meeting, CPSC staff presented recommendations and guidance to improve the content and format of the warnings. Following that meeting, the task group met on March 17, 2015. Staff presented revised recommendations based on comments received at the January meeting. Furthermore, the task group suggested changes to staff's recommendations, and staff provided feedback and modifications to address the concerns. Finally, staff met with the ASTM subcommittee again on May 5, 2015, where staff presented labeling recommendations that addressed comments made at the March, 2015 task group meeting. Since then, CPSC staff has sent the most recent recommendations on the warning labeling requirements to the task group. These recommendations address all the concerns raised at the May 5 subcommittee meeting.²² However, a meeting has yet to take place to discuss staff's revised recommendations.

DISCUSSION

The *Standard Consumer Safety Specification for Children's Chairs and Stools*, F2613-14, defines children's chairs as "seating furniture with a rigid frame that is intended to be used as a support for the body, limbs, or feet of a child when sitting or resting in an upright or reclining position." Also, the standard defines children's stools as "children's chair without back or armrests." Additionally, the standard defines "folding chair" and "folding stool" as "children's chair or stool which can be folded for transport or storage."

Products covered under the standard are intended to be used by a child who can get in and out of the product unassisted and are those products with a seat height of 15 inches or less. Based on *Childdata Handbook of Child Measurements and Capabilities*, the 95th percentile popliteal (the underside of the knee where the tendon of the biceps femoris muscle inserts into the lower leg) height of a 9-year-old child is 14.96 inches. The F2613 standard recognizes this and notes this in the Appendix. This means that a large 9-year-old would fit in the chair. The 15-inch seat height is also suitable for a smaller child who is older. For example, the 5th percentile popliteal height of children as old as 14 would fit in a chair with a seat height of 15 inches (5th percentile popliteal height of a 14-year-old male is 14.96 inches). Even the 5th percentile popliteal height of an 18-year-old girl could fit in such a chair (5th percentile popliteal height of an 18 year old girl is 14.37 inches). Although some children older than age 9 could fit in the chair, the data suggest that children age 9 years and younger are at greatest risk of injury, and are the most likely users of children's chairs and stools with a seat height of 15 inches or less.

Section 104 of the CPSIA requires the Commission to examine and assess voluntary safety standards for durable infant or toddler products. A "durable infant or toddler product" is defined

²² Staff's recommendations are discussed later in this memo.

as a durable product intended for use, or that may be reasonably expected to be used, by children under the age of 5 years. Therefore, HF staff's assessment will be limited to children's folding chairs and stools²³ intended for use by children under age 5. This effectively excludes some products from CPSC analysis that older children use and that are covered under the F2613 standard.

Injury Data for Children's Folding Chairs


Staff of the CPSC's Division of Hazard Analysis, Directorate for Epidemiology ("HA") identified 182 reported incidents related to folding chairs or stools that were appropriate for use by children under 5 years of age (Tab A). These incidents occurred January 1, 2003, through December 31, 2014. Of the 182 incidents, there were 98 injury-related incidents, 45 incidents involving no injuries, and 39 complaints. Where age was reported (87 cases), most involved children ages 4 years and younger.

Based on HA staff's report, there were two commonly reported injuries. These include pinches and amputations of children's fingers in folding mechanisms. The other involved head/face and shoulder injuries due to tip-over incidents.

The primary injury, however, is pinches and amputations of children's fingers in folding mechanisms. There are 90 incidents in this category. These incidents are due primarily to the product unexpectedly collapsing or folding (62 incidents). Half (31 incidents) of these incidents occurred because of failure of the locking mechanism. In the other half, staff was not able to determine whether the chair had a locking mechanism. In 16 other cases, consumers reported that the locking mechanism malfunctioned or broke; however, there were no reports of a collapse in these cases. Despite this, the report emphasizes the potential for injuries involving chairs with locking mechanisms.

The next commonly reported injury was head/face injuries and a shoulder injury due to a tip over hazard. There are 22 cases in this category. Most of the chairs in these incidents involve chairs that have a straight back with armrests, or are saucer-style chairs. Most have U-shaped legs with rounded corners. In 16 of the cases, the chair tipped sideways. In these cases, the child was reportedly leaning or reaching to one side or the other, shifting weight in the chair, turning from one side to the other, or touching an armrest.

Current ASTM Warning Label Requirements

Section 7 of the standard specifies the Marking and Labeling requirements and addresses crushes and amputation of fingers. Section 7.2 contains warning requirements. All warnings must contain a safety alert symbol ²⁴ and the signal word, WARNING. For *folding chairs* and *folding stools* with latches, warnings must address the following:

²³ Referred to in this memorandum as chairs, unless otherwise specified.

²⁴ The version of the safety alert symbol shown here is based on the default symbol used in the ANSI Z535 series of standards. For consistency, CPSC staff uses this version throughout the memorandum for all instances of the safety alert symbol."

- (1) Prevent crushed or amputated fingers.
- (2) Make sure latch is secure.

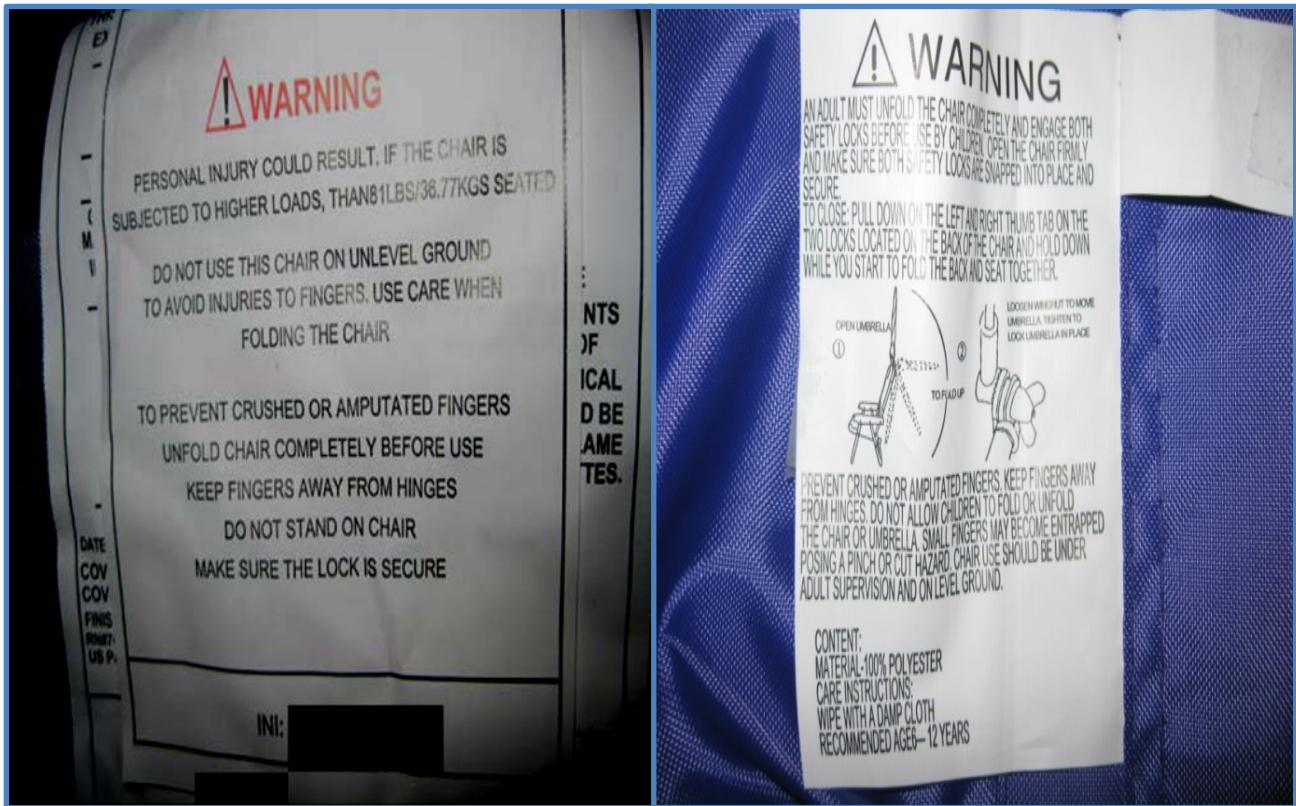
For *folding chairs* and *folding stools* without latches, warnings must address:

- (1) Prevent crushed or amputated fingers.
- (2) Unfold chair completely before use.
- (3) Keep fingers away from hinges.

Examples of Current Warning Labels on Existing Products

HF staff examined actual warning labels on various chair samples provided for this analysis to determine how firms have implemented the labeling requirements. Example labels are provided in Figures 1 and 2.

Figure 1. Examples of Existing Warning Labels on Folding Chairs with Latch(es)





Note: The label on the chair in lower right corner does not mention engaging the latch, but the chair has a latch.



Figure 2. Example of an Existing Warning Label on a Folding Chair Without Latch(es)



Analysis of the ASTM Warning Label Requirements

Researchers maintain that for a warning label to achieve the ultimate goal of inducing safety-related behavior, three factors must be met. These factors are: (1) noticing the label, (2) processing the safety messages, and (3) motivating behavioral change (Barbera and Gill, 1986; Rousseau and Wogalter, 2006). Therefore, HF staff evaluated the current labeling requirements to determine whether the requirements meet these criteria.

Noticing the Label

Warnings must possess characteristics that make them prominent and salient so that they stand out from background clutter and noise (Wogalter, Kalsher, and Racicot, 1993a). Color is one method to achieve salience. The *American National Standard Product Safety Signs and Labels*, 2011 (ANSI Z535.4) is a standard that establishes a uniform system for signs that communicate safety information. In this system, three main colors indicate the hazard level (*e.g.*, red, orange, or yellow). These colors may also assist in making warnings stand out from the environments in which they are placed (Bzostek and Wogalter, 1999). Placement of a label may also influence its prominence. For example, consumers are less likely to notice a warning placed on the bottom of a product than on the top. Separating safety information from non-safety information is another way to increase salience. A warning may be overlooked or the seriousness of its message may be diluted if it is imbedded among non-safety information (Schoff, G. and Robinson, P., 1991).

The current requirements in F2613 state that the warnings must be applied so that they are visible in their entirety when the product is in the manufacturer's recommended use position. One of the use positions of folding chairs is in the folded position for storage and transport. Currently, this requirement is being implemented by placing the warning label primarily on the bottom of the chair. This may be because consumers will interact with the warnings when consumers fold and unfold the chair and notice the warning; its placement does not detract from the product; and the warning meets the standard.

HF staff believes that consumers are less likely to notice the warnings on the bottom of the chair for several reasons. First, consumers are not likely to notice the warning when the chair is unfolded and in the upright position. Second, a child's folding chair has no obvious hazards. Research suggests that if the perception of hazard associated with a product is low, consumers are less likely to look for a warning (Godfrey et al, 1983; Wogalter, et. al, 1991; Lesch, 2006). Third, even if consumers look for a warning, they may not notice the warning because the warning is embedded and buried among non-safety messages. Although the ideal placement of the label is on the front of the chair, this may detract from the appearance of the product and encourage consumers to remove the label. Therefore, HF staff recommends placing the warning on the back side of the chair's backrest. Staff also recommends that the warning be surrounded by a black border and be separate and distinct from other written material so that the label is clearly visible when consumers approach the chair from the back. Staff believes that this location is superior to the current practice of placing the warning on the bottom of the chair. For stools, where possible, staff recommends that the label be placed in a visible location such as on the legs in such a way that the label does not wrap around the legs. A label wrapped around the legs may

increase the likelihood that consumers will not read the warning since it may be physically difficult to do so.

There are no requirements in the standard for warning label color. Therefore, HF staff recommends that to increase the likelihood that consumers will notice the warning, the signal word, “WARNING,” as required by the standard, be surrounded by an orange background. HF staff recognizes that the recommended orange background may not adequately contrast with the background color of the chair if the chair is orange, for example. Therefore, staff also recommends allowing the use of other hazard communication colors—yellow or red— whichever provides the best contrast.

Processing the Safety Messages

Once noticed, consumers must read and understand the warning to make appropriate decisions regarding the hazard and how to avoid the hazard. Research contends that there are a number of ways to increase the likelihood that consumers will process the safety messages. Desaulniers (1987) found that warnings in a bullet point list are rated higher on perceived effectiveness by subjects than paragraph format. Similarly, text arranged in a list format rather than horizontally makes instructions easier to follow (Schoff and Robinson, 1992). Additionally, using “white space” to break up the text into “chunks” of information can make the text easier to read (Schoff and Robinson, 1992). In addition, text in a mixture of upper and lower case lettering can be less confusing and easier to read than all uppercase lettering because there is more variation among the letter shapes (Wogalter and Vigilante, 2006). Additionally, sans serif typestyles are preferred for short word messages. Its simplified letterforms are unencumbered by serifs (*i.e.*, a small decorative stroke that extends from letters), which can impede the readability of characters. Moreover, non-condensed typestyles are preferred to avoid a cramped appearance, making it very hard for consumers to read. Furthermore, any text or graphics in addition to the warning message should not contradict the message, possibly misleading consumers. Manufacturers should consider the native language of the persons exposed to the hazard and include in the label, at a minimum, the English language. Finally, consumers prefer black text on a white background because this combination is most legible when compared to other color combinations (Cooper and Page, 1989).

Currently, the ASTM standard requires that the warnings be easy to read and understand. However, this requirement is vague and gives no guidance on how to implement this direction. Existing warnings on current products demonstrate this. For example, many of the warnings on the samples provided for this analysis are written in all uppercase lettering. Some of the warnings lack sufficient “white space.” Other warnings are presented in a paragraph format. Still other warnings use serif typeface. Some warnings use color combinations other than black text on white background.

Because the current labeling requirements and many current on-product warnings are inadequate, HF staff recommends using improved warning labels to increase the likelihood that consumers will read and understand the safety messages.

Motivating Behavioral Change

Assuming that a consumer notices the label and reads and understands the safety messages, the final goal is for the label to motivate a change in behavior. To motivate consumers to comply with the warning, the warning needs to tell consumers why they need to comply. Therefore, a clearer description of the hazard, as well as a statement about the consequences of ignoring the warning, may influence compliance rates.

Currently, the F2613 standard requires safety messages for two types of chairs and stools, those (1) with locking mechanisms, and (2) those without locking mechanisms. There is no provision in either case for a warning label to contain a hazard statement (*i.e.*, source of injury). The standard does contain language that alludes to the potential consequences for both chair types (*i.e.*, prevent crushed or amputated fingers); however, the standard is not written in a way that would motivate consumer compliance with the warning.

As previously mentioned, the primary injuries posed by children's chairs and stools are pinches and amputations of children's fingers in folding mechanisms, primarily due to the product unexpectedly collapsing or folding. Half of the incidents involving injuries that are reviewed in Tab A resulted from failure of the locking mechanism. In the remaining incidents, staff could not determine whether the chair had a locking mechanism because the reported incident did not specifically state whether the chair had a locking mechanism, except in one case, the report specifically mentioned that the chair involved did not have a locking mechanism. The locking mechanism failed in a number of other cases, as well. No chairs collapsed in these cases. Even so, the fact that the locking mechanism failed in these cases emphasizes the risk of finger injury involving chairs with locking mechanisms.

For the reasons above, HF staff recommends that for chairs with a locking mechanism, the hazard statement read:

AMPUTATION HAZARD

Chair can fold or collapse if lock not fully engaged.

Hazard information and consequence information are closely linked because one leads to the other. Therefore, the statement of consequences should read:

Moving parts can amputate child's fingers.

There is little injury data regarding chairs without locking mechanisms. Even so, HF staff recommends improvements to the labeling requirements. Specifically, HF staff recommends that the hazard and consequence statement read:

AMPUTATION HAZARD

Moving parts can amputate child's fingers if chair folds or collapses.

The standard requires warnings on both product types to contain precautionary statements. However, staff believes that the provisions of the standard should be improved so that the warnings inform consumers explicitly what consumers need to do to avoid the hazard.

Thus, based on the above analysis of the warning label requirements, HF staff recommends the following changes to the standard to increase the likelihood that consumers will notice, read and understand, and comply with the safety messages.²⁵

CPSC Staff-Recommended Revisions to ASTM F2613 - 14 Standard

7. Marking and Labeling


7.2 Warning Statements: Each folding chairs and folding stools shall have warning statements:

7.2.1 The warnings shall be easy to read and understand and be in the English language at a minimum.

7.2.2 The warning statements shall be conspicuous in highly contrasting color(s) (e.g., black text on white background), in non-condensed sans serif type, permanent and applied so they are in a prominent location, visible to the caregiver when the product is in the manufacturer's use position.

7.2.3 The specified warnings shall be separate and distinct from any other written material on the product and surrounded by a black border. Note: Separate and distinct, for example, on the back of the chair's back rest away from warnings on the underside of the chair so that it is clearly visible to a consumer approaching the chair from the back. For stools, where possible, the label shall be placed in a visible location such as on the legs in such a way that the label does not wrap around the legs.

7.2.4 Any labels or written instructions provided in addition to those required by this section shall not contradict or confuse the meaning of the required information or be otherwise misleading to the consumer.

7.2.5 The safety alert symbol “” and, the signal word “WARNING”, and the words “AMPUTATION HAZARD” shall precede the warning statements.

²⁵ To satisfy industry's concerns, language in the standard indicates that Figures 3 and 4 are example labels in format and wording. Although these are presented as example labels that will meet the requirements outlined in the standard, HF staff recommends this exact format and wording. The language and format reflect best practices for labeling design and may increase the likelihood that consumers will notice, understand, and follow the warnings.

7.2.6 The safety alert symbol “▲” and the signal word “WARNING” shall not be less than 0.2-in. (5-mm) high and the remainder of the text shall be in characters whose upper case is at least 0.1-in. (2.5-mm) high except as specified.

7.2.7 The signal word WARNING shall be in black letters on an orange panel surrounded by a black border.

Note 1- When special circumstances preclude the use of the color orange, yellow or red may be used, whichever contrasts best against the product background.

7.2.8 The solid triangle portion of the safety alert symbol shall be the same color as the signal word lettering, and the exclamation mark shall be the same color as the signal word panel.

7.2.9 The words “AMPUTATION HAZARD” shall be in bold black letters.

7.2.10 The precautionary statements shall be indented from the hazard statements, preceded with bullet points, and appear as shown in Figs. 3 and 4.

7.2.11 The warning label shall contain sufficient white space as shown in Figs. 3 and 4.

7.2.12 Overall height and width of the label may be modified as necessary to fit on the product, but still meet requirements for conspicuousness. An example of the warning label format described in this section is shown in Figs. 3 and 4.

7.2.13 For *folding chairs and folding stools* with latch(es), warnings shall address the following:

7.2.13.1 Amputation hazard:

1. Hazard and Consequence Statement

a. AMPUTATION HAZARD

b. Chair can fold or collapse if lock not fully engaged. Moving parts can amputate child’s fingers.

2. Precautionary Statements:

a. Keep fingers away from moving parts.

b. Completely unfold chair and fully engage locks before allowing child to sit in chair.

c. Never allow child to fold or unfold chair.

7.2.14 For *folding chairs and folding stools* without latch(es), warnings shall address the following:

7.2.14.1 Amputation hazard:

1. Hazard and Consequence Statement

a. AMPUTATION HAZARD

b. Moving parts can amputate child’s fingers.

2. Precautionary Statements:

a. Keep fingers away from moving parts.

b. Completely unfold chair before allowing child to sit in chair.

c. Never allow child to fold or unfold chair.

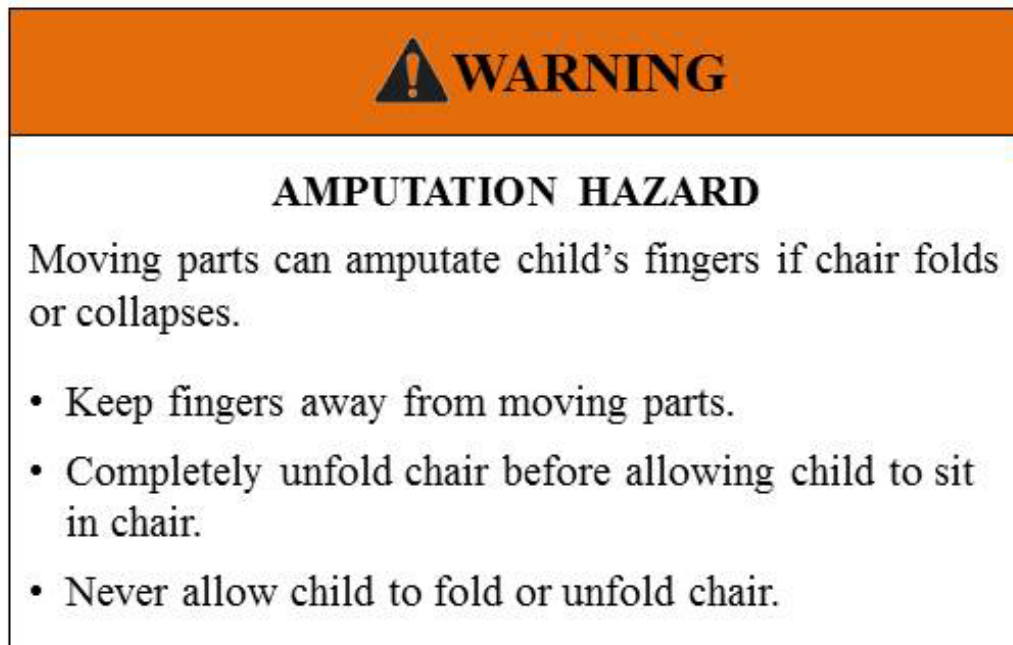
Staff’s recommended changes above reference two example labels (noted as Figures 3 and 4).

These example labels of how to meet the recommended changes are shown below in Figures 3 and 4.

Fig. 3. Recommended Label for Chairs (Stools) with Lock(s)



Figure 4. Recommended Label for Chairs (Stools) without Latch(es)



CONCLUSION

HF staff assessed the adequacy of the warning labeling requirements in the ASTM standard for children's chairs and stools. Staff reviewed the relevant injury data, the current warning labeling requirements, and the existing warning label on various chair samples to make this determination. Based on HF staff's analysis, staff determined that the warning labeling requirements could be improved to make the label more noticeable, to be easier to read and understand, and increase the likelihood that the label would motivate compliance. Staff is recommending specific changes to the warning labels in format and wording that reflect best practices for labeling requirements.

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Table 1. F2613-14 Label Language and Recommended Revisions			
Current Language	Recommended Language	Reason for Change	Standard(s) this Change Consistent With
7.2 Warning Statements—Folding chairs and folding stools shall have warning statements:	7.2 <i>Warning Statement:</i> <u>Each</u> F folding chairs s and folding stools s shall have warning statements s .	consistency	Ad Hoc Task Group latest formatting requirements; Carriages and Strollers, F833-13b; Infant Bath Tubs, F2670 – 13
7.2.1 General Warnings Requirements:			
7.2.1.1 The warnings shall be easy to read and understand. The warning statements shall be in contrasting color(s), permanent, and applied, so they are visible in their entirety when the product is in the manufacturer’s recommended use position.	<u>7.2.1</u> The warnings shall be easy to read and understand <u>and be in the English language at a minimum.</u>	To increase the likelihood that all target audiences will be able to read and understand the safety messages	Ad Hoc Task Group latest formatting requirements; Infant Bath Seats, F1967-13
	<u>7.2.2</u> The warning statements shall be <u>conspicuous</u> in <u>highly</u> contrasting color(s) (<u>e.g., black text on white background</u>), <u>in non-condensed sans serif type</u> , permanent and applied so they are <u>in a prominent location, visible to the caregiver</u> when the product is in the manufacturer’s use position.	To increase the likelihood that consumers will notice the warning	Ad Hoc Task Group latest formatting requirements; Soft Infant and Toddler Carriers, F1235-14

²⁶ Staff prepared a table that provides a side-by-side comparison of the current labeling requirements and the recommended labeling requirements. It also provides the reason for change and the standards with which the changes are consistent.

Table 1. F2613-14 Label Language and Recommended Revisions

Current Language	Recommended Language	Reason for Change	Standard(s) this Change Consistent With
	<p><u>7.2.3 The specified warnings shall be separate and distinct from any other written material on the product and surrounded by a black border. Note: Separate and distinct, for example, on the back of the chair's back rest away from warnings on the underside of the chair so that it is clearly visible to a consumer approaching the chair from the back.</u></p>	<p>Warnings are currently embedded and buried in other non warning-related material on the product. This change assures the warnings will be separate and distinct and visible to the consumer.</p>	<p>Toy Safety Standard, F963-11 (5.3.6); Infant Bath Seats, F1967-13; Infant Bath Tubs, F2670 – 13; Soft Infant and Toddler Carriers, F1235-14; ANSI Z535.4; and only black border language referenced in Hook-on Chairs, F1235-15</p>
	<p><u>For stools, where possible, the label shall be placed in a visible location such as on the legs in such a way that the label does not wrap around the legs.</u></p>		
	<p><u>7.2.4 Any labels or written instructions provided in addition to those required by this section shall not contradict or confuse the meaning of the required information or be otherwise misleading to the consumer.</u></p>	<p>To make sure consumers correctly interpret the message and therefore, improve comprehension of the warning</p>	<p>Ad Hoc Task Group; Infant and Toddler Carriers, F2236-14</p>

Table 1. F2613-14 Label Language and Recommended Revisions

Current Language	Recommended Language	Reason for Change	Standard(s) this Change Consistent With
<p>7.2.1.2 The text shall be sans serif type. The safety alert symbol “▲” and the word “WARNING” shall not be less than 0.2-in. (5-mm) high and the remainder of the text shall be in characters whose upper case shall be at least 0.1-in. (2.5-mm) high except as specified.</p>	<p><u>7.2.5</u> The safety alert symbol “▲” and, the <u>signal</u> word “WARNING”, and <u>the words “AMPUTATION HAZARD” shall precede the warning statements.</u></p>	<p>Since the word “WARNING” is the signal word, the word “signal” should precede the word “word.” Also, using the words AMPUTATION HAZARD up front and in all upper case clearly emphasizes the hazard, attracts attention, and can motivate compliance with the warning.</p>	<p>Ad Hoc Task Group, regarding adding the word "signal" before the word, "word"; Frame Child Carriers, F2549-14a; Soft Infant and Toddler Carriers, F1235-14; Carriages and Strollers, F833-13b; and the Recent Infant Bouncer's ballot</p>
	<p><u>7.2.6</u> The safety alert symbol “▲” and the <u>signal</u> word “WARNING” shall not be less than 0.2 in. (5-mm) high and the remainder of the text shall be in characters whose upper case is at least 0.1 in. (2.5-mm) high except as specified.</p>	<p>Since the word “WARNING” is the signal word, the word “signal” should precede the word “word.”</p>	<p>Soft Infant and Toddler Carriers, F1235-14; Infant Bath Seats, F1967-13</p>
	<p><u>7.2.7</u> The <u>signal word WARNING shall be in black letters on an orange panel surrounded by a black border.</u></p>	<p>The signal word WARNING is commonly associated with the color orange. Specifying the color orange helps attract attention and communicates a hazard message.</p>	<p>Infant Walkers, F977-12 (section 8.2.4.1); ANSI Z535.4</p>

Table 1. F2613-14 Label Language and Recommended Revisions

Current Language	Recommended Language	Reason for Change	Standard(s) this Change Consistent With
	<p><u>Note 1- When special circumstances preclude the use of the color orange, yellow or red may be used, whichever contrasts best against the product background.</u></p>	<p>The orange signal word panel may not provide an adequate contrast against the product background, therefore, yellow or red may be used, whichever provides the best contrast.</p>	<p>Hook-on Chair's, F1235-15; recent Infant Bouncer's ballot, both allow for the option of same alternative color choices.</p>
	<p><u>7.2.8 The solid triangle portion of the safety alert symbol shall be the same color as the signal word lettering, and the exclamation mark shall be the same color as the signal word panel</u></p>	<p>Consistent with ANSI Z535.4</p>	<p>Ad Hoc Task Group latest formatting requirements</p>
	<p><u>7.2.9 The words "AMPUTATION HAZARD" shall be in bold black letters.</u></p>	<p>A bold color can attract attention based on labeling research.</p>	<p>Infant Bath Tubs, F2670-13 (exactly as stated); Bassinets and Cradles, F2194-13a; Hazard statement bolded in recent ballot for Bouncers (all uppercase lettering and bolded)</p>
	<p><u>7.2.10 The precautionary statements shall be indented from the hazard statements, preceded by bullet</u></p>	<p>To make it easy for consumers to read</p>	<p>Soft Infant and Toddler Carriers, F2236 - 14; Hook-on Chairs, F1235-</p>

Table 1. F2613-14 Label Language and Recommended Revisions

Current Language	Recommended Language	Reason for Change	Standard(s) this Change Consistent With
	<u>points, and appear as shown in example Figs. 3 and 4.</u>		15
	<u>7.2.11 The warning label shall contain sufficient white space as shown in Figs. 3 and 4.</u>	To attract attention, make it physically easy to read, and improve comprehension.	Soft Infant and Toddler Carriers, F2236-14, "white space" is specified in the warning requirements
	<u>7.2.12 Overall height and width of the label may be modified as necessary to fit on the product, but still meet requirements for conspicuousness. An example warning label format described in this section is shown in Figs. 3 and 4.</u>	To fit different product sizes	Soft Infant and Toddler Carriers, F2236-14
7.2.1.3 For folding chairs and folding stools with latches, warnings shall address the following:	<u>7.2.13 For folding chairs and folding stools with latch(es), warnings shall address the following:</u>	Format and content needs to be improved to increase the likelihood that consumers will notice, read, and comply with the warning.	Soft Infant and Toddler Carriers, F2236-14; Hook-on Chairs, F1235-15; recent Infant Bouncer Seats ballot
(1) Prevent crushed or amputated fingers.	<u>7.2.13.1 Amputation hazard: 1. Hazard and Consequence Statement a. AMPUTATION HAZARD</u>		
(2) Make sure latch is secure.	<u>b. Chair can fold or collapse if lock not</u>		

Table 1. F2613-14 Label Language and Recommended Revisions

Current Language	Recommended Language	Reason for Change	Standard(s) this Change Consistent With
	<p><u>fully engaged.</u> <u>Moving parts can amputate child's fingers.</u> <u>2. Precautionary Statements:</u> <u>a. Keep fingers away from moving parts.</u> <u>b. Completely unfold chair and fully engage locks before allowing child to sit in chair.</u> <u>c. Never allow child to fold or unfold chair.</u></p>		
<p>7.2.1.4 For folding chairs and folding stools without latches, warnings shall address the following:</p>	<p><i>7.2.14 For folding chairs and folding stools without latch(es), warnings shall address the following:</i></p>	<p>Format and content needs to be improved to increase the likelihood that consumers will notice, read, and comply with the warning</p>	<p>Soft Infant and Toddler Carriers, F2236-14; Hook-on Chairs, F1235-15; recent Infant Bouncer Seats ballot</p>
<p>(1) Prevent crushed or amputated fingers.</p>	<p><u>7.2.14.1 Amputation hazard:</u> <u>1. Hazard and Consequence Statement</u> <u>a.AMPUTATION HAZARD</u></p>		
<p>(2) Unfold chair completely before use.</p>	<p><u>b.Moving parts can amputate child's</u></p>		

Table 1. F2613-14 Label Language and Recommended Revisions

Current Language	Recommended Language	Reason for Change	Standard(s) this Change Consistent With
(3) Keep fingers away from hinges.	<u>fingers if chair folds or collapses.</u> <u>2. Precautionary Statements:</u> <u>a. Keep fingers away from moving parts</u> <u>b. Completely unfold chair before allowing child to sit in chair.</u> <u>c. Never allow child to fold or unfold chair.</u>		

TAB E: Durable Nursery Products: Summary of Children's Folding Chairs and Stools Recalls from January 1, 1997 to July 1, 2015

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UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
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Memorandum

Date: August 26, 2015

TO : Patricia L. Edwards and Vince Amodeo
Project Manager, Children's Folding Chairs and Stools
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THROUGH: Howard N. Tarnoff
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Office of Compliance and Field Operations

Mary F. Toro
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Carolyn Manley
Team Lead, Division of Regulatory Enforcement
Office of Compliance and Field Operations

FROM : Joseph Tsai
Compliance Officer, Division of Regulatory Enforcement
Office of Compliance and Field Operations

SUBJECT : Durable Nursery Products: Summary of Children's Folding Chairs and Stools
Recalls from January 1, 1997 to July 1, 2015

PURPOSE

This memo summarizes the product safety recalls involving children's folding chairs and stools conducted by the Office of Compliance and Field Operations since 1997. This information is being provided to support the CPSC staff in the drafting of a proposed rule for a mandatory children's folding chairs and stools standard for the U.S. Consumer Product Safety Commission's consideration.

COMPLIANCE RECALL INFORMATION

Since January 1, 1997, there have been eleven children's folding chair or stool recalls involving ten different firms (*see Table 1*) and 5,394,600 units of product. The hazards include pinching, bruising, fractures, finger amputations, and lead paint violations. The first recall was in March 1997. This recall involved Keysheen International Corp.'s children's folding chaise lounge chair.

CPSC Hotline: 1-800-638-CPSC(2772) CPSC's Web Site: <http://www.cpsc.gov>

The products were recalled because if the support leg of the chair's footrest is not fully extended when a child sits down, children's fingers can get trapped between the support leg and the metal frame, causing a pinching or amputation injury. CPSC received one report of fingertip amputation as the child sat down in the folding chaise lounge chair. The recall involved 38,300 units.²⁷

The second recall was in January 2002. This recall involved Hilton Hotel Corporation™ "Vacation Station" children's folding cooler/chairs (stools). The products were recalled because when the stool collapsed, the folding mechanism posed a crushing, cutting or severing hazard to consumers' fingers. The company received one report of a fingertip amputation when the chair collapsed. The recall involved 27,000 units.²⁸

The third recall was in April 2005. This recall involved Atico International USA Inc. children's folding chairs. The products were recalled due to the failure of the safety lock, which resulted in the chair collapsing or folding unexpectedly. In addition, children's fingers could become caught or entrapped in the hinge and slot areas of the chair, posing a pinch or laceration hazard. There were reports of the chairs folding or collapsing unexpectedly, which resulted in four fingertip amputations and seven reports of lacerations to children's fingers. The recall involved 1.5 million units.²⁹

The fourth recall was in May 2005. This recall involved Summit Marketing International LLC children's folding chairs. The products were recalled due to the failure of the safety lock and subsequent chair collapse. In addition, children's fingers could become caught or entrapped in the hinge and slot areas of the chair, posing a pinch or laceration hazard. There were seven reports of the chairs collapsing or folding unexpectedly, which resulted in four fingertip amputations, one laceration, and bruises to children's fingers. The recall involved 2 million units.³⁰

The fifth recall was in July 2005. This recall involved Idea Nuova Inc. children's folding chairs. The products were recalled due to the failure of the safety lock and subsequent chair collapse. In addition, children's fingers could become caught or entrapped in the hinge and slot areas of the chair, posing a pinch or laceration hazard. There were five reports of the chairs collapsing or

²⁷ <http://www.cpsc.gov/en/recalls/1997/cpsc-and-keysheen-international-corp-announce-recall-of-childrens-chaise-lounge-chairs/>

²⁸ <http://www.cpsc.gov/en/Recalls/2002/CPSC-Hilton-Hotels-Corporation-Announce-Recall-of-Vacation-Station-Childrens-CoolerChairs-/>

²⁹ <http://www.cpsc.gov/en/Recalls/2005/CPSC-Atico-International-USA-Announce-Recall-of-Childrens-Folding-Chairs-/>

³⁰ <http://www.cpsc.gov/en/Recalls/2005/CPSC-Summit-Marketing-International-LLC-Announce-Recall-to-Repair-Childrens-Folding-Chairs/>

folding unexpectedly, which resulted in one fingertip amputation, one fingertip amputation and a laceration, and a finger fracture and laceration. The recall involved 1.1 million units.³¹

The sixth recall was in July 2005. This recall involved Fourstar Group Inc. children's folding chairs. The products were recalled due to the failure of safety lock and subsequent chair collapse. In addition, children's fingers could become caught or entrapped in the hinge and slot areas of the chair, posing a pinch or laceration hazard. There were three reports of the chairs collapsing or folding unexpectedly. One resulted in a laceration to a finger and three finger fractures, the second incident resulted in a fracture and laceration to the fingers, and the third incident resulted in a pinched finger. The recall involved 522,000 units.³²

The seventh and the eighth recalls were in August 2004 and July 2005. These recalls involved the Meco Corp. children's folding chair set. The set consisted of four colors, red, yellow, green, and blue. The red chairs were recalled in 2004 because the red paint contained excessive levels of lead posing a lead poisoning hazard to young children. No injuries were reported. The entire set was recalled in 2005 after three reports of children's fingers getting caught or entrapped in the hinged and slot area of the chair. These reports resulted in two incidents of pinched fingers, and one incident of a finger laceration. The recall involved 175,000 units.³³

The ninth recall was in January 2012. This recall involved Elegant Gifts Mart Inc. children's folding chairs and non-folding stools. The products were recalled because the yellow surface paint on the metal frame of the chairs contained excessive levels of lead, a violation of the federal lead paint standard. There were no injuries reported. The recall involved 1,600 units of chairs and 1,300 units of stools.³⁴

The tenth recall was in July 2012. This recall involved Downeast Concepts Inc. children's folding beach chairs. The products were recalled after one report of injury due to a girl that fell on the chair's metal rivets and cut her forehead. The recall involved 15,400 units.³⁵

³¹ <http://www.cpsc.gov/en/Recalls/2005/CPSC-Idea-Nuova-Inc-Announce-Recall-to-Repair-Childrens-Folding-Chairs/>

³² <http://www.cpsc.gov/en/Recalls/2005/CPSC-Fourstar-Group-Announce-Recall-to-Repair-Kids-Folding-Chairs-/>





³³ [http://www.cpsc.gov/en/Recalls/2004/CPSC-Meco-Corp-Announce-Recall-of-Red-Chairs-from-Childrens-Furniture-Sets-/
<http://www.cpsc.gov/en/Recalls/2005/CPSC-Meco-Corp-Announce-Recall-of-Childrens-Folding-Chairs-/>](http://www.cpsc.gov/en/Recalls/2004/CPSC-Meco-Corp-Announce-Recall-of-Red-Chairs-from-Childrens-Furniture-Sets-/)

³⁴ <http://www.cpsc.gov/en/Recalls/2012/Childrens-Chairs-and-Stools-Recalled-by-Elegant-Gifts-Mart-Due-to-Violation-of-Lead-Paint-Standard/>






³⁵ <http://www.cpsc.gov/en/Recalls/2012/Childrens-Beach-Chairs-Recalled-by-Downeast-Concepts-Due-to-Laceration-Hazard/>

The eleventh recall was in July 2013. This recall involved Far East Brokers and Consultants Inc. children’s outdoor folding chairs and other furniture. The products were recalled because the red surface paint on the chairs and the furniture contained excessive levels of lead, a violation of the federal lead paint standard. No injuries were reported. The recall involved 14,000 units.³⁶

Table 1
Children’s Folding Chair and Stool Recalls
January 1, 1997 to July 1, 2015

Recall Date	Firm	Reason	# Products Recalled	Press Release Number and Photo
3/25/1997	Keysheen International Corp.	When support leg of the chair's footrest is not fully extended when a child sits down, a child's fingers can get trapped between the support leg and the metal frame, causing a pinching or amputation injury.	38,300	PR-97-090 
7/18/2002	Hilton Hotel Corp.	Stool collapsed resulting in finger amputation and laceration.	27,000	PR-02-202 
4/29/2005	Atico International USA Inc.	Safety lock failure and the subsequent chair collapse resulting in finger amputation and laceration.	1.5 millions	PR05-163 
5/24/2005	Summit Marketing International LLC	Safety lock failure and the subsequent chair collapse resulting in finger amputations, laceration, and bruises.	2 millions	PR05-181 
7/27/2005	Idea Nuova Inc.	Safety lock failure and the subsequent chair collapse resulting in finger amputation, laceration, and fracture.	1.1 millions	PR05-233 No photo available

³⁶ <http://www.cpsc.gov/en/recalls/2013/far-east-brokers-recalls-ladybug-themed-kids-outdoor-furniture/>

7/27/2005	Fourstar Group Inc.	Safety lock failure and the subsequent chair collapse resulting in finger laceration and fracture, and pinched fingers.	522,000	PR05-234 
8/19/2004 and 7/27/2005	Meco Corp	Excessive levels of lead on surface paint. Children's fingers caught or entrapped in the hinged and slot area of the chair, resulting in laceration and pinched finger.	175,000	PR04-202 and PR05-232 
1/05/2012	Elegant Gifts Mart Inc.	Excessive levels of lead on surface paint.	2,900	PR12-081 
7/19/2012	Downeast Concepts Inc.	Girl fell on chair's metal rivets and cut her forehead.	15,400	PR12-229 
7/31/2013	Far East Brokers and Consultants Inc.	Excessive levels of lead on surface paint.	14,000	PR 13-255 

TAB F: Initial Regulatory Flexibility Analysis of Staff-Recommended Proposed Standard for Children’s Folding Chairs and Stools (ASTM F2613)

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**UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814**

Memorandum

Date: September 1, 2015

TO : Vince Amodeo and Patricia Edwards
Project Manager, Children's Folding Chairs and Stools
Division of Mechanical Engineering
Directorate for Engineering Sciences

THROUGH : Gregory B. Rodgers, Ph.D.
Associate Executive Director
Directorate for Economic Analysis
Deborah V. Aiken, Ph.D.
Senior Staff Coordinator,
Directorate for Economic Analysis

FROM : Robert H. Squibb
Economist
Directorate for Economic Analysis

SUBJECT : Initial Regulatory Flexibility Analysis of Staff-Recommended Proposed Standard for Children's Folding Chairs and Stools (ASTM F2613)

Background

ASTM F2613-14 is the current ASTM International ("ASTM") standard for children's chairs and stools. Staff recommends that the U.S. Consumer Product Safety Commission ("CPSC" or "Commission") 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 children's folding chairs and stools, with modifications to the requirements for warning labels and an additional test for side-stability.

This memorandum evaluates the potential economic impact of the staff-recommended children's folding chairs and stools standard on small entities, including small businesses, as required by the Regulatory Flexibility Act ("RFA"). Given the current state of data and information, we could not rule out a significant economic impact for any of the small firms operating in the U.S. market for children's folding chairs. Accordingly, we have prepared an initial regulatory flexibility analysis ("IRFA"). As part of the IRFA, we ask for public comment and seek specific data to assist in better evaluating the expected economic impact on small businesses at the final rule stage.

Section 603 of the RFA requires that agencies prepare an 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

CPSC Hotline: 1-800-638-CPSC(2772) CPSC's Web Site: <http://www.cpsc.gov>

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

1. a description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;
2. a description of the reasons why action by the agency is being considered;
3. a succinct statement of the objectives of, and legal basis for, the proposed rule;
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 possible, of all relevant federal rules which may duplicate, overlap, or conflict with the proposed rule.

The Product

ASTM F2613-14, *Standard Consumer Safety Specification for Children's Chairs and Stools*, defines a children's chair as "seating furniture that is intended to be used as a support for the body, limbs, or feet of a child when sitting or resting in an upright or reclining position." A folding chair or stool is further defined as "a children's chair or stool which can be folded for transport or storage." A children's stool is defined as a "children's chair without back or armrests." The Standard specifications apply to chairs or stools intended to be used by a single child who can get out of the product unassisted, with a seat height of 15 inches or less and without a rocking base.

Certain product types have been excluded from the ASTM standard. These include: products used in a commercial setting, products without a rigid frame (e.g. bean bag or foam chairs), and seats with restraint systems. Step-stools and other products intended for adults have also been excluded.

CPSC's rule would have a more limited scope than the ASTM F2613-14 standard which covers children's chair or stool products that do not fold for transport. The CPSC standard only includes children's folding chairs and stools intended or expected to be used by children under five years old. As a practical matter, for this memo, staff analyzed the impacts on suppliers of all folding chairs and stools not excluded by the ASTM standard which have seat height 15 inches or less. While children's folding chairs are marketed for use by children, many are used by parents or older siblings at some point. The load-bearing requirements for children's folding chairs are based on the typical size of children who are the target users of the chairs, but many chairs are designed by the manufacturer to support the weight of an adult and are marketed as being able to support as much.

The Market for Folding Chairs and Stools

There are currently four domestic firms manufacturing and ten domestic firms importing children's folding chairs and/or stools in the United States. Most firms only supply one model of chair; two supply two models, and one supplies five distinct models. All four manufacturers and six importers are categorized as small businesses using the Small Business Administration definition of 500 or fewer employees for household furniture manufacturing and 100 or fewer employees for furniture merchant wholesalers. One importer's size could not be determined.

The Juvenile Products Manufacturers Association ("JPMA") maintains a certification program for children's folding chairs and stools but at this time there are no active participants. JPMA does not maintain a list of firms complying with the voluntary standard for children's chairs; compliance of firms with the voluntary standard is self-reported. Some of the firms in the market participate actively in the ASTM standard process and it is expected that the products of those firms comply with the voluntary standard.

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

The Danny Keysar Child Product Safety Notification Act requires the CPSC to promulgate a mandatory standard for children's folding chairs that is substantially the same as, or more stringent than, the voluntary standard. CPSC staff worked closely with ASTM to develop the new requirements and test procedures that have been added to ASTM F2613-14, which forms the basis of the staff-recommended proposed rule.

Requirements of the Proposed Rule

CPSC staff recommends adopting the requirements in F2613-14 with modifications. Most of the requirements of the voluntary standard refer to hinging and locking mechanisms. Some of the major requirements are listed below:

- Scissoring, shearing, and pinching- scissoring, shearing, and pinching that may cause injury shall not be permissible when the edges of the rigid parts admit a probe that is greater than .210-in. and less than .375-in. in diameter at any accessible point throughout the range of motion of such parts.
- Folding Mechanisms and hinges- products shall have a locking device or adequate clearance to provide protection for fingers, hands, and toes from crushing or laceration in the event of sudden movement or collapse.
- Folding Mechanisms- locking devices and other means to prevent unexpected or sudden movement or collapse of the product shall engage automatically in the recommended use position. Latches may be manually activated for placement in the use position but must engage automatically when released.
- Locking devices, single action- single action locking devices shall require a minimum force of 10lbf to activate the release mechanism.
- Locking devices, double action- double action locking devices shall require either two consecutive actions, the first of which must be maintained while the second is carried out, or two separate and independent actions which must be activated simultaneously.

- Hinge line clearance- gaps or clearances along the hinge line between a stationary and movable portion shall be constructed such that, if the accessible gap will admit a 3/16-in. diameter rod, it will also admit a 1/2-in. diameter rod at all positions of the hinge.
- Use position- No product shall give the appearance of being in any manufacturer's recommended use position unless the locking device is fully engaged.
- Circular holes in rigid materials- if an accessible, circular hole can admit a 1/4-in. diameter rod to a depth of 3/8-in. or greater, it shall also admit a 1/2-in. diameter rod.
- Labeling and marking requirements
- Tests for removal of components
- Strength requirements
- Stability requirements (Front to back)
- Toy accessory requirements
- Additional general requirements (wood parts smooth and splinter-free, no sharp points or edges, no small parts, paint and surface coatings that comply with 16 CFR 1303, no flammable solids)

Engineering staff recommends adding a performance requirement and test for stability (side to side) to the standard, which would require the chair to not tip over sideways when tested with a weight in the seat and the chair positioned perpendicularly on an incline. Staff is also recommending changes to the current warning label requirements. Both of these changes have been brought to the ASTM subcommittee, and are currently under consideration for addition to the voluntary standard as well.

Other Federal or State Rules

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

Impact on Small Businesses

There are currently four firms manufacturing and ten firms importing children's folding chairs and stools in the United States. All four manufacturers and six of the importers are categorized as small businesses using the Small Business Administration definition of 500 or fewer employees for household furniture manufacturing and 100 or fewer employees for furniture merchant wholesalers. One importer's size could not be determined.

Staff attempted to contact several of the small suppliers of children's folding chairs and stools to assess the impact of the proposed rule on their firms. Of the suppliers that responded, most are currently in compliance with ASTM F2613-14, but would need to make physical modifications if their chairs did not pass the additional measure of the side stability test. Most of these firms will also need to make modifications to the labeling, based on staff recommendations for the proposed rule. Firms will also be required to use third-party testing to certify they comply with the requirements.

For firms that do not comply with the current voluntary standard, changes ranging from simply updating their labeling to a complete redesign of their chairs may be necessary to achieve compliance. Given current data, we are unable to determine with any precision the exact changes that any of the small producers will need to make to comply with the draft proposed rule and cannot evaluate compliance costs. Because we cannot measure or otherwise specifically quantify the impact, we cannot rule out a significant economic impact for any of the small firms operating in the U.S. children's folding chair market. We ask for public comment and seek specific data to assist in better evaluating the expected economic impact on small businesses at the final rule stage.

A final rule implementing sections 14(a)(2) and 14(i)(2) of the Consumer Product Safety Act ("CPSA"), as amended by the CPSIA, Testing and Labeling Pertaining to Product Certification, 16 C.F.R. part 1107, became effective on February 13, 2013 (the 1107 rule). Section 14(a)(2) of the CPSA requires every manufacturer of a children's product that is subject to a product safety rule to certify, based on third party testing, that the product complies with all applicable safety rules. Section 14(i)(2) of the CPSA requires the Commission to establish protocols and standards (i) for ensuring that a children's product is tested periodically and when there has been a material change in the product, (ii) for the testing of representative samples to ensure continued compliance, (iii) for verifying that a product tested by a conformity assessment body complies with applicable safety rules, and (iv) for safeguarding against the exercise of undue influence on a conformity assessment body by a manufacturer or private labeler.

Because children's folding chairs and stools will be subject to a mandatory children's product safety rule, they will also be subject to the third party testing requirements of section 14(a)(2) of the CPSA and the 1107 rule when the children's folding chair mandatory standard and the notice of requirements become effective. Children's folding chairs and stools are already subject to the lead limit requirements under Section 101(a) of the CPSIA. Section 101(a) limits the amount of lead content in children's products. Because children's folding chairs are not toys or childcare articles, they are not subject to the requirements for phthalates.

Impact on Small Manufacturers

Of the four small manufacturers of children's folding chairs and stools, two claim compliance with the voluntary standard and at least one participates in the ASTM process. Of the two remaining manufacturers, one does not comply with warning label requirement and possibly other requirements; the compliance of the other could not be determined.

Regardless of conformance to the voluntary standard, the proportion of chairs that might need modifications to comply with side stability requirements could be high. In testing conducted by CPSC engineering staff, 7 models out of a 9 model sample (from both small and large firms) failed the proposed test for side stability.

The costs of compliance with the side-stability requirements, if a chair needs to be modified, will vary with the necessary modification. CPSC Engineering Sciences staff has identified the addition of a small plastic stabilizer to each corner as a possible fix for chairs with rounded tube frames based on one model tested which passed with these stabilizers and failed the test with

them removed. Similarly designed models found in Europe, where side stability requirements exist for children's folding chairs, also contain these stabilizers. The costs of adding these small pieces of plastic would likely be low, due to the size and material.

For chairs with other frame types and arms which extend further out from the seating area, for which the plastic stabilizers are either not possible or not sufficient, a redesign may be necessary to eliminate the arms or otherwise modify the chair's design for compliance with the requirements. The costs to redesign a chair, in the event it is non-compliant, are estimated by one manufacturer to be \$10,000, including nine to twelve months of labor and development time. This cost could be significant for one manufacturer, if a redesign were required for all models. The costs for a non-compliant folding chair that does not require a full redesign would likely be lower. Generally, the burden for modifying labelling for nursery products is expected to be one hour of labor time (at a current labor rate).³⁷

At this time, we do not have sufficient information to determine what proportion of folding chair models currently in the market will be able to meet the side-stability requirements via a simple and inexpensive fix like adding a plastic stabilizer versus the proportion of models that will require a more costly redesign. Without this information, we are unable to judge the significance of the economic impact that the four small manufacturers will experience due to the side-stability requirements. Therefore, we cannot rule out a significant economic impact for small folding chair manufacturers.

Staff is seeking information on the modifications manufacturers expect are needed for existing folding chair models to meet the side-stability requirements as well as any data regarding the expected costs of such modifications. In particular, is it reasonable to assume that most folding chairs will only need a relatively inexpensive fix (such as a plastic stabilizer) and that the total cost of this fix will comprise less than one percent of manufacturers' overall revenues?

Three of the small manufacturers of children's folding chairs and stools have diversified product lines. If the cost of compliance with the draft proposed rule is too high, these firms might be able to discontinue production without incurring significant economic harm. However, because revenue data for these firms was not sufficiently detailed, we were not able to determine whether exit from the market is an economically viable option with any certainty. The remaining manufacturer supplies a folding chair as an accessory with its one main product. This manufacturer's folding chair does not currently comply with the voluntary standard. While the firm might be able to offer their product without a folding chair, we cannot determine whether the firm can cease to offer the accessory folding chair and remain economically viable, and are unable to rule out a significant economic impact based on this manufacturer's ability to exit the market.

To better assess the economic impact on small manufacturers at the final rule stage, we are interested in obtaining data on the importance of children's folding chairs relative to a manufacturer's overall product line and feedback regarding the desirability of exit as a strategy for averting regulatory compliance costs. For example, do sales of children's folding chairs

³⁷ See Final Rule for Safety Standard for Bedside Sleepers, 79 FR 2581, or Final Rule for Safety Standard for Frame Child Carriers, 80 FR 11113

constitute a small proportion of a manufacturer's overall revenue (i.e. less than one percent)? Would a typical manufacturer of children's folding chairs be able to discontinue production without experiencing significant economic hardship?

Under section 14 of the CPSA, children's folding chairs are subject to third party testing and certification. Once the new requirements become effective, all manufacturers will be subject to the additional costs associated with the third party testing and certification requirements under the testing rule, *Testing and Labeling Pertaining to Product Certification* (16 CFR part 1107). Third party testing will include physical and mechanical test requirements specified in the folding chairs final rule; lead testing is already required. Third party testing costs are in addition to the direct costs of meeting the standard.

Staff contacted two small manufacturers regarding testing costs and one firm estimated that chemical and structural testing of one unit of a children's folding chair costs around \$1,000 annually. No other firms were willing or able to supply the requested testing cost information. Estimates provided by suppliers for other section 104 rulemakings indicate that around 40 to 50 percent of testing costs can be attributed to structural requirements, with the remaining 50 to 60 percent resulting from chemical testing (lead testing). Staff estimates that testing to structural components of the ASTM voluntary standard could cost about \$400 to \$500 per sample tested (\$1,000 x .4 to \$1,000 x .5). These costs are consistent with testing cost estimates for products with standards of similar complexity.

Staff's review of the children's folding chairs and stools market shows that three small domestic manufacturers supply one model of children's folding chairs and stools to the U.S. market annually. The fourth small manufacturer supplies five models of children's folding chairs and stools. Therefore, if third party testing were conducted every year, third party testing costs for three manufacturers with only one model would be about \$400-\$500 annually per model tested, and \$2,000-\$2,500 for the other manufacturer (\$400-\$500 per model, five models), if only one sample were tested for each model.

The testing and labeling rule (16 C.F.R. part 1107) is not explicit regarding the number of samples firms will need to test to meet the "high degree of assurance" criterion. However, based on an examination of each small domestic manufacturer's revenues from recent Dun & Bradstreet or ReferenceUSA reports, testing costs are likely to be under one percent of gross revenue for these small manufacturers. Thus, it seems unlikely that testing costs, by themselves, would be economically significant for the small manufacturers unless a very high number of samples per model were needed to meet the "high degree of assurance" criterion. We welcome comments on our judgment that third party testing should not lead to significant economic impact, and are interested in information pertaining the typical number of samples tested to satisfy third party testing requirements.

Impact on Small Importers

Of the six or seven small importers, only one claims that their products are compliant with the ASTM standard. The state of compliance for the remainder could not be determined. For the importer or importers currently in compliance with the voluntary standard, if their products pass

the side-stability test, there should be minimal burden associated with compliance. As most imported chairs tested by CPSC engineering staff failed the proposed side-stability test, it is probable that many importers' products would not be compliant with the proposed rule.

Whether there is a significant economic impact on small importers will depend upon the extent of the changes required to come into compliance and the response of their supplying firms. In general, if their supplying firm comes into compliance, the importer could elect to continue importing their product. Any increase in production costs experienced by their suppliers as a result of changes made to meet the mandatory standard could be passed on to the importers. If an importer is unwilling or unable to accept the increased costs, or if the importer's supplier decides not to comply with the mandatory standard, the importer could find another supplier of children's folding chairs and stools or stop importing children's folding chairs and stools. Because no small importers responded to requests for information, however, staff could not estimate the precise economic impact on these firms and cannot rule out a significant economic impact.

In order to assist with further analysis of the impact of the rule on small importers, staff is seeking information on the degree to which supplying firms tend to pass on increases in production and regulatory costs to importers. To what extent is the ability to pass on these costs limited by the ease with which importers can switch suppliers or substitute an alternative product for children's folding chairs and stools?

As with manufacturers, all importers will be subject to third party testing and certification requirements, and consequently, will be subject to costs similar to those for manufacturers if the importer's supplying foreign firm(s) does not perform third party testing. It does not appear likely that these testing costs would, by themselves, exceed one percent of gross revenue for the six small domestic importers for which revenue information is available. The impact on the other importer is unknown. Again staff is interested in the size of the economic impact third party testing poses for importers, and is particularly interested whether our judgment that testing costs themselves should not exceed one percent of gross revenue is accurate.

Alternatives

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. Staff has recommended modifications to the scope by only including children's folding chairs and stools which will reduce the impact of the proposed rule on manufacturers and importers.

Adopting ASTM F2613-14 with respect to children's folding chairs and stools, but without any further modifications to the performance requirements is one alternative. This alternative would reduce the impact on all of the known small businesses supplying children's folding chairs and stools to the U.S. market by not including the additional requirements and tests for sideways stability and additional labeling requirements. It should eliminate any economic impact related directly to complying with a new mandatory standard for the 2 small domestic manufacturers and the small importers/wholesalers with children's folding chairs and stools that are currently compliant with ASTM F2613-14, all of which are expected to maintain compliance with the

voluntary standard at the time the final rule becomes effective. Adopting the standard without the modifications to the labelling or sideways stability requirements would likely have a smaller impact on improving safety than staff's recommended proposal, as described in the Engineering Sciences (Tab A) and Human Factors memos (Tab D).

The Commission could also reduce the staff-recommended proposed rule's impact on small businesses by setting a later effective date. A later effective date would reduce the economic impact on firms in two ways. One, firms would be less likely to experience a lapse in production/importation, which could result if they are unable to comply and third party test within the required timeframe. Two, firms could spread costs over a longer time period, thereby reducing their annual costs, as well as the present value of their total costs. Staff specifically requests comments on the 6 month effective date, as well as feedback on how firms would likely address the proposed rule.

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 C.F.R. part 1112. Consequently, staff recommends that the Commission propose an amendment to 16 C.F.R. part 1112 that would establish the NOR for testing laboratories that want to test children's folding chairs and stools for compliance with the children's folding chair and stool final rule. This section assesses the impact of the amendment on small testing laboratories.

A Final Regulatory Flexibility Analysis ("FRFA") was conducted as part of the promulgation of the original 1112 rule that established requirements for accreditation of third party conformity assessment bodies to test for conformance with a children's product safety rule (Section 14(a)(2) of the CPSA; 78 FR 15836, 15855-58). Briefly, the FRFA concluded that the accreditation requirements would not have a significant adverse 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 16 C.F.R. part 1112 to include the NOR for the children's folding chairs and stools standard would not have a significant economic 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 children's folding chairs and stools 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 children's folding chair standard to their scope of accreditation. As a consequence, the Commission could certify

that the NOR for the children's folding chairs and stools standard will not have a significant impact on a substantial number of small entities.