



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

**BALLOT VOTE SHEET**

Date: **AUG 14 2009**

TO : The Commission  
 Todd Stevenson, Secretary

THROUGH: Maruta Budetti, Executive Director *MB*

FROM : Cheryl Falvey, General Counsel *CAF*  
 Philip L. Chao, Assistant General Counsel, RAD *PLC*  
 Patricia M. Pollitzer, Attorney *PP*

SUBJECT : Notice of Proposed Rulemaking for Infant Walkers under Section 104(b) of the  
 Consumer Product Safety Improvement Act

**AUG 20 2009**

Ballot Vote Due: \_\_\_\_\_

Section 104(b) of the Consumer Product Safety Improvement Act ("CPSIA") directs the Commission to issue safety standards for durable infant or toddler products. Attached is a staff briefing memorandum recommending that the Commission issue a notice of proposed rulemaking ("NPR") proposing a rule under section 104(b) of the CPSIA for infant walkers, which is substantially the same as the applicable voluntary standard, ASTM F 977-07, with certain modifications. The Office of the General Counsel is forwarding separately a draft NPR for your consideration.

Please indicate your vote on the following options.

I. Approve the draft NPR proposing a standard for walkers as drafted.

\_\_\_\_\_  
 Signature Date

II. Approve the draft NPR proposing a standard for walkers with changes (please specify changes):

\_\_\_\_\_  
 \_\_\_\_\_

Note: This document has not been reviewed or accepted by the Commission.  
 Initials RH Date 8/14/09

CPSA 6(b)(1) CLEARED for PUBLIC

NO FRGS PRVT LBLR OR PRODUCTS IDENTIFIED *8/14/09*

EXCEPTED BY: PETITION RULEMAKING ADMIN. PRCDG *f*

WITH PORTIONS REMOVED: \_\_\_\_\_

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Signature

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Date

III. Do not approve the draft NPR proposing a standard for walkers.

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Signature

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Date

IV. Take other action (please specify):

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Signature

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Date

**NOTICE OF PROPOSED RULEMAKING  
FOR INFANT WALKERS  
BRIEFING PACKAGE**

August 2009

**For Further Information, Contact:**

**Patricia L. Edwards  
Directorate for Engineering Sciences  
(301) 504-7577**

Note: This document has not been  
reviewed or accepted by the Commission.  
Initials RH Date 8/14/09

~~PREVIOUSLY CLEARED FOR PUBLIC  
AGENCY PARTIALS OR  
PRODUCTS IDENTIFIED~~ *J*

*X* APPROVED BY PETITION  
FOR RULEMAKING ADMIN. PRCDG

EXEMPTIONS REMOVED: \_\_\_\_\_

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### **Table 1: Staff Recommended Changes and Additions to ASTM F 977-07**

#### **ATTACHED STAFF MEMORANDUMS**

- TAB A** CPSC Memorandum from Risana Chowdhury, Division of Hazard Analysis, to Patricia Edwards, Directorate for Engineering Sciences, entitled “Infant Walker-Related Injuries and Deaths Among Children Under 15 Months of Age Calendar Years 2004-2008,” May 26, 2009.
- TAB B** CPSC Memorandum from Han Lim, Directorate for Engineering Sciences, to Patricia Edwards, Directorate for Engineering Sciences, entitled “Assessment of the Voluntary Standard for Infant Walkers - ASTM F 977-07,” July 31, 2009.
- TAB C** CPSC Memorandum from Jill Jenkins, Directorate for Economic Analysis, to Patricia Edwards, Directorate for Engineering Sciences, entitled “Initial Regulatory Flexibility Analysis of Proposed Standard for Baby Walkers,” July 29, 2009.



UNITED STATES  
CONSUMER PRODUCT SAFETY COMMISSION  
WASHINGTON, DC 20207

Memorandum

DATE: **AUG 14 2009**

TO: The Commission  
Todd Stevenson, Secretary

THROUGH: Cheryl Falvey, General Counsel *CAF*  
Maruta Budetti, Executive Director *MB*

FROM: Robert J. Howell, Assistant Executive Director *RJH*  
Office of Hazard Identification and Reduction  
Patricia Edwards, Project Manager *PE*  
Directorate for Engineering Sciences

SUBJECT: Notice of Proposed Rulemaking (NPR) for Infant Walkers

**I. INTRODUCTION**

Section 104 of the Consumer Product Safety Improvement Act (CPSIA), *Standards and Consumer Registration of Durable Nursery Products*, requires the Commission to study and develop safety standards for certain infant and toddler products. The list of products in section 104 includes: full-size and non full-size cribs; toddler beds; high chairs, booster chairs, and hook-on chairs; bath seats; gates and other enclosures for confining a child; play yards; stationary activity centers; infant carriers; strollers; walkers; swings; and bassinets and cradles. The Commission is charged with examining and assessing the effectiveness of any voluntary consumer product safety standards and for promulgating mandatory consumer product safety standards for these products.

Section 104 of the CPSIA also requires the Commission to consult with representatives of consumer groups, juvenile product manufacturers and independent child product engineers and experts to examine and assess the effectiveness of the voluntary standards. This consultation process commenced in October 2008 during the ASTM International (formally known as the American Society for Testing and Materials) subcommittee meeting regarding the ASTM infant walker voluntary standard. Consultations with members of this subcommittee are still ongoing.

This briefing package assesses the effectiveness of the infant walker voluntary standard and recommends that the Commission publish a notice of proposed rulemaking (NPR) as a result.

## II. BACKGROUND

### A. Regulatory Activities

In August of 1994, the Commission published an advance notice of proposed rulemaking (ANPR) under authority of the Federal Hazardous Substances Act (FHSA) stating that it had reason to believe that infant walkers might present an unreasonable risk of injury or death due to walkers falling down stairs. After the publication of the ANPR, CPSC staff worked with ASTM to add new performance requirements to the voluntary standard on infant walkers, ASTM F 977. These new requirements addressed walkers falling down steps or stairs (herein referred to as stair fall requirements or stair fall protection). The revised standard that included the stair fall protection requirements was published in early 1997 as ASTM F 977-97. In May 2002, the Commission voted to terminate the open rulemaking on baby walkers based on a recommendation from staff that the information at that time did not support making the findings necessary under the FHSA to issue a walker stair fall performance mandatory standard.

### B. ASTM Voluntary Standard Overview

The voluntary standard for infant walkers was first approved and published by ASTM in 1986 as ASTM F 977-86 *Standard Consumer Safety Specification for Infant Walkers*. As mentioned previously, the standard was significantly revised in 1997 to include stair fall performance requirements. It has been revised a number of times since then, and the current version, F 977-07, was published in May 2007 and contains requirements to address the following:

- Latching or Locking Mechanisms
- Openings
- Scissoring, Shearing, Pinching
- Exposed Coil Springs
- Labeling
- Protective Components
- Stability
- Structural Integrity
- Occupant Retention
- Prevention of Falls Down Step(s)

The Juvenile Products Manufacturers Association (JPMA) runs a certification program for a variety of juvenile products, including infant walkers. To obtain JPMA certification, manufacturers submit their products to an independent test laboratory for conformance testing to the most current voluntary standard. Currently, walkers made by five manufacturers are JPMA certified to ASTM F 977-07.

### III. DISCUSSION

#### A. Incident Data (Tab A)

##### Injury Estimates<sup>1</sup>

There were an estimated annual average of 3000<sup>2</sup> infant walker-related injuries among children under the age of 15 months that were treated in U.S. hospital emergency departments over the five-year period 2004-2008 as reported through the National Electronic Injury Surveillance System (NEISS). No deaths were reported through the NEISS. For the emergency department treated injuries related to infant walkers, the following characteristics occurred most frequently based on an annual average:

- Hazard – falls either out of the walker or down stairs/to a lower level while in the walker (62%)
- Injured body part – head (45%) and face (27%)
- Injury type – contusions/abrasions (37%) and internal organ injury (28%)
- Disposition – treated and released (90%) and hospitalized (5%).

For approximately 72% of the injuries reported, the product was directly involved in the incident. Examples include walkers falling down stairs, tipping over, collapsing or occupants getting pinched by walker components, among others. Many (nearly 20%) of the emergency department treated injuries were not necessarily caused by failures of the walker. Examples include infants reaching and pulling hot or heavy objects onto themselves while seated in the walker, infants ingesting foreign objects while seated in the walker, and infants getting injured in the process of being taken out of the walker by an adult, among others. The walker's involvement is unclear in the remaining 8% of the incidents due to insufficient information.

##### Fatalities<sup>3</sup>

CPSC staff has reports of eight fatal incidents during the five-year period 2004-2008. Of the eight deaths reported to CPSC staff, one appears to involve a stair fall incident. There were three deaths that resulted from accidental drowning when the child moved in a walker into a residential pool or spa. The circumstances of the remaining four deaths varied and involved non-fall related circumstances such as scalding from contents of a slow cooker when an infant pulled the electrical cord of the cooker; head hematomas when an infant pulled a heavy dining chair onto himself; fatal head injury when an infant walker rolled down the driveway and struck a moving vehicle; and aspiration of an unspecified metal screw by an infant while seated in a walker.

The walker involved in the stair fall death did not conform to the ASTM infant walker standard's stair fall performance requirements, and had been under recall at the time of the death, due to the

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<sup>1</sup> The source of the injury estimates is the National Electronic Injury Surveillance System (NEISS), a statistically valid injury surveillance system. NEISS injury data are gathered from emergency departments of hospitals selected as a probability sample of all the U.S. hospitals with emergency departments. The surveillance data gathered from the sample hospitals enable the CPSC staff to make timely national estimates of the number of injuries associated with specific consumer products.

<sup>2</sup> This estimate has been adjusted to exclude jumpers from the walker code.

<sup>3</sup> The reported fatalities and non-fatal injuries are neither a complete count of all that occurred during this time period nor a sample of known probability of selection. However, they do provide a minimum number of deaths and non-fatal injuries occurring during this time period and illustrate the circumstances involved.

lack of stair fall protection. Two of the three deaths that occurred in a residential pool or spa involved walkers that were certified to the JPMA standard; pictures revealed that one of the JPMA walkers had a missing wheel and the other walker appeared to be in working condition. CPSC staff does not know the physical condition of the third walker or whether or not it was JPMA certified.

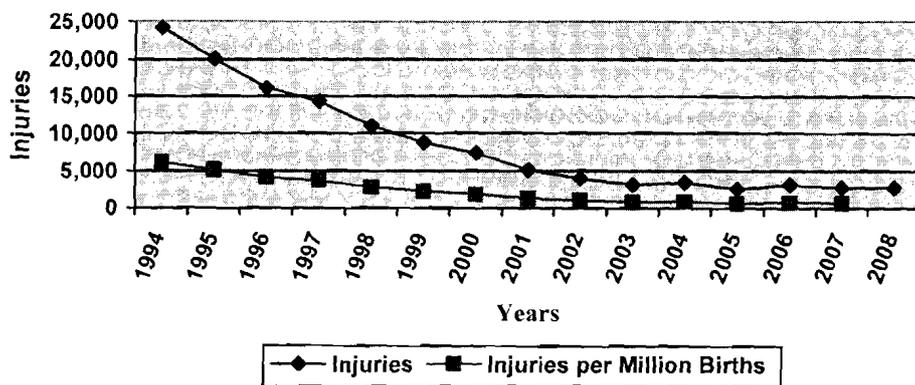
Non-Fatal Injuries

A total of 78 non-fatal injuries were reported to have occurred between 2004 and 2008. All of these injuries occurred when the infant was seated in the walker. The leading cause of injury was falls down steps or stairs. This accounted for about 42% of the injuries. The next major cause of injury was product failure, either structural or mechanical failure of the walker, and these accounted for 37% of the incidents. Examples of such failures included the walker seat giving way causing the infant to fall through or out; the walker tipping or rolling over due to instability; the walker frame completely collapsing; spaces and gaps in the walker pinching or entrapping an infant’s body part; and sharp protruding or broken components of the walker causing laceration injuries. The attached toys, toy bars, or toy trays on the walker caused 17% of the injuries, such as lacerations, abrasions, pinching, etc. Three percent of the non-fatal reported injuries were serious burn injuries resulting from infants pulling cords of small cooking appliances and spilling hot liquids onto themselves. Finally, one percent of the reported incidents did not specify the injury.

Historical Data

In 1995 CPSC staff and industry began revisions to the voluntary standard to address stair falls. The revised voluntary standard, with performance requirements to address stair falls, was approved in October 1996 and published in 1997. For comparison purposes, historical data on infant walker-related estimated injuries for the 15-year period 1994-2008 is illustrated in the chart below.

**Infant Walker-Related Emergency Department Treated Injuries; 1994 - 2008**



From 1994 to 2008, there has been an 88% decrease in the estimated number of walker-related injuries treated at emergency departments, from 24,200 to 2,800. Furthermore, there is a statistically significant downward trend in the injuries over this time period (p-value < 0.0001).

Similarly, from 1994 to 2007, there has been a decrease of over 89% in the estimated rate of walker-related injuries per million live births, from 6,122 to 649. The downward trend for the rates over the 1994-2007 period is also highly significant (p-value < 0.0001). The similarity in the percentage decrease illustrates that the decrease in injuries is not caused by any decrease in the number of children being born.

Despite the significant reduction of injuries associated with walkers, the stair fall hazard is still the most prevalent in reported walker incidents and NEISS data. CPSC staff is not aware of the number of incidents involving walkers that do not meet the current ASTM standard for stair fall protection. Since 2000, the Commission has announced nine different recalls that resulted in over 95,000 infant walkers being recalled due to stair fall hazards. Despite efforts taken by CPSC staff, walkers without stair fall protection continue to periodically be involved in incident reports. In addition to non-compliant walkers, other factors can result in a baby walker falling down a flight of stairs. For instance, a damaged or otherwise badly worn walker could be compromised so that it no longer offers any stair fall protection, or children who are strong enough to lift the walker can defeat the stair fall protection devices on a walker.

### ***B. Testing of Current Product (Tab B)***

To develop and support recommended changes to the ASTM infant walker standard, CPSC staff performed a variety of tests on JPMA certified walkers to assess the following established and new test procedures:

- the current stair fall test procedure as written in the ASTM standard, and
- a stability performance requirement and a parking brake performance requirement, both taken from a European standard on walkers, EN 1273:2005.

#### *Assessment of the Current Stair Fall Requirement in ASTM F 977-07*

The stair fall requirement is the key performance requirement found in the ASTM standard. The stair fall test requires an infant walker that is occupied by an infant dummy<sup>4</sup> (subsequently referred to as “CAMI dummy”) to be propelled at a speed of 4 feet/second, across a hardwood floor surface and over the edge, using hardware consisting of a pulley, weights and ropes. This 4 ft/s velocity was based on the rationale that it is the maximum velocity that can be expected for an infant using a walker (for sideways tests, the maximum expected velocity is 2 ft/s). The test result is either a pass (when the walker stays on the hardwood surface) or a fail (when the walker falls off the edge of the hardwood surface).

Since most of the hardware or test apparatus components are not currently specified in the ASTM standard, the variability in the type and size of pulley, rope type, test table flexure, etc. can all contribute to differences in the test results. Thus, it is possible that two different laboratories could test the same model walker and produce two different sets of results. This is of particular concern if one laboratory passes a walker and another laboratory fails it.

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<sup>4</sup> This Civil Aeromedical Institute (CAMI) Infant Dummy, Mark II, was constructed in accordance with the Department of Transportation Specification dated April 29, 1975.

CPSC staff has participated in various round robin tests and also conducted its own tests where various hardware and test conditions were evaluated, as they relate to the stair fall test requirement. As a result of this testing, CPSC staff is recommending changes to the current ASTM test procedure to reduce test variability *and* develop a safer standard. Specifying requirements for test apparatus components such as the rope and pulley will reduce some test variability.

Additionally, CPSC staff suggests several revisions to the test procedure language such as specifying a tolerance for the term “horizontal” ( $0^\circ \pm 0.5^\circ$ ). The details concerning all of CPSC staff’s recommended changes to the ASTM stair fall performance requirement can be found in Tab B.

The position of the walker at the start of the stair fall test is a predetermined distance away from the edge of the test table. This launching distance was determined based on a number of factors including the weight of the walker and the desired maximum velocity at the edge of the test table (4 ft/sec or 2 ft/sec). Per Section 7.6 of the ASTM walker standard, the forward and rearward test launching distances are specified to be 14.6 inches (with CAMI dummy only) and 21.2 inches (with CAMI dummy wearing an 11 pound vest). These specified launching distances were based on the assumption that the walker weight is 8 pounds.

CPSC staff weighed five different 2008 or 2009 model walkers and found that the weight of these walkers ranged from 11 to 14 lbs, which is greater than the typical 8 pound average weight of earlier models. Therefore, staff recommends that the specified launch distances no longer be used, and instead, the launch distance be calculated based on the actual weight of the walker using the equation that was originally used to calculate the 14.6- and 21.2-inch launching distances.

CPSC staff believes this change is necessary because, if the walker weight is not appropriately accounted for, it is possible the target maximum velocity cannot be achieved during the test. Therefore, staff believes this change may create more stringent performance requirements.

CPSC staff also performed a modified version of the stair fall performance test on the decking of various residential pools. This was done to determine whether a walker that passes the ASTM stair fall requirement might also pass when tested on the decking surface of a pool. These tests were conducted as a result of two different fatal incidents involving children using JPMA certified walkers that fell into residential pools. The testing used two different pool decking surfaces in lieu of the hardwood test floor. One pool deck was level rough concrete all the way up to the edge and another was level rough concrete with brick-like tiles starting one foot from the edge. Testing was done under both dry and wet conditions. The testing results indicated that JPMA certified walkers passed (i.e., did not fall in the pool) when tested to the same conditions as the ASTM standard (4 ft/sec speed, loaded with a CAMI dummy wearing the 11 pound vest).

CPSC staff does not plan to make any recommendations for changes to the ASTM standard as a result of the pool testing. CPSC staff believes that other factors not associated with the performance of the walker likely played a role in the two pool-related fatal incidents.

### New Performance Requirements

CPSC staff evaluated other existing standards related to infant walkers to determine if there are aspects in those standards that should be considered for the future CPSC safety standard. The EN 1273:2005 European Standard contains two performance tests that are currently not in the ASTM F 977-07 standard: a 30° incline plane stability test and a parking device test.

The 30° incline plane test is a standard stability test which is common in several EN children's product safety standards. The walker, occupied by a test cylinder, is placed on a sloping platform inclined at 30° to the horizontal with a stop on the lower edge of the slope. The walker must not tip over. CPSC staff believes that this 30° incline plane test may provide additional safety that may not be covered by the other ASTM F977-07 performance requirements.

The parking device test is only applicable to walkers that are equipped with a parking brake. When applicable, the walker is set up to run the stair fall performance test, but with the parking device activated. If the parking device fails to hold the walker in place, the walker fails the requirement. In addition to a performance test, CPSC staff is also recommending additional warnings for those walkers that are equipped with a parking brake. The recommended warning would read:

#### **WARNING**

*Brake use does not totally prevent walker movement.*

*Always keep child in view when in walker, even when using brake.*

This warning would be required to address the hazard but would not require exact wording. Thus if a manufacturer uses a different name for a brake, they could substitute in that word or phrase.

Staff also recommends additional wording be added to the stair fall warning language. Walkers that have a parking device designed to restrict movement of the walker by the occupant shall replace the last statement in the current stair fall warning language with the following:

*Block stairs/steps securely before using walker, even when using parking device.*

CPSC staff believes that these additional recommended performance and labeling requirements would make the existing ASTM standard more stringent and would further reduce the risk of injury, since these requirements are currently not included.

CPSC staff tested various walkers that currently pass the ASTM standard to these two additional recommended performance tests. The walkers passed these tests.

### ***C. Recommended Changes to ASTM F 977-07***

While the current ASTM voluntary standard is an improvement over the pre-1997 versions of the standard, there are areas that could be improved possibly resulting in further reductions of injuries associated with infant walkers. CPSC staff believes that most of the ASTM F 977-07

standard should be adopted as the safety standard for infant walkers with the following additions:

- Stair Fall Performance Test – CPSC staff recommends more specificity of the stair step test procedures as outlined in Table 1 at the end of this memo and detailed in Tab B of this briefing package;
- Inclined Stability Performance Test – CPSC staff recommends inclusion of this additional performance test from the European Standard for Baby Walking Frames EN 1273:2005 as outlined in Table 1 at the end of this memo and detailed in Tab B of this briefing package;
- Parking Device Performance Test – CPSC staff recommends inclusion of this additional performance test from the European Standard for Baby Walking Frames EN 1273:2005 as outlined in Table 1 at the end of this memo and detailed in Tab B of this briefing package. Staff also recommends that relevant parking brake warning label requirements be included.

Lastly, CPSC staff recommends editorial changes to F 977-07 including: 1) add another figure to illustrate an open back type of walker that is commonly found on the market today, and 2) change the equipment requirements so that the standard does not specify the brand/model of the force gage, but only lists performance specifications for the required equipment. This is recommended because the model currently specified in the ASTM standard is no longer being made. All recommended editorial changes are outlined in Table 1 at the end of this memo and discussed in Tab B of this briefing package.

#### ***D. Potential Small Business Impact (Tab C)***

There are seven firms currently known to be marketing baby walkers in the United States. Two are large domestic manufacturers and two are foreign manufacturers with U.S. divisions. Based on Small Business Administration definitions, there are three small firms (two small domestic manufacturers and a small domestic importer) likely to be affected by the proposed standard. The impact on these three small firms is the focus of the Directorate for Economic Analysis memo.

##### *Small Manufacturers*

The two small domestic manufacturers are JPMA certified as compliant with the voluntary standard and thus may not need to make product modifications. If they do, it will most likely be due to changes needed to comply with the modified stair fall requirements. The costs to these manufacturers are not likely to be substantial, but may increase by as much as several dollars per unit.

##### *Small Importer*

The walker model imported by the small importer company is not believed to be compliant with the current voluntary standard; therefore, at least some product modifications would be necessary. The impact of the draft proposed infant walker requirements on this importer is unclear, because little is known about the walkers sold by this company. However, the impact is unlikely to be large. Even if they responded to the rule by discontinuing the import of their non-

complying walkers, either replacing them with a complying product or another juvenile product, deciding to import an alternative product would be a reasonable and realistic way to offset any lost revenue from walker sales.

There may also be additional small importers of walkers that we have been unable to identify. However, the impacts of the proposed rule on these firms, if any, are unknown.

#### **IV. RECOMMENDATIONS**

CPSC staff recommends that the Commission proceed with the rulemaking process for infant walkers by publishing an NPR as drafted by the Office of General Counsel and submitted separately from this briefing package. CPSC staff also recommends an effective date of six months after publication of the final rule.

In essence, CPSC staff recommends adopting the requirements specified in ASTM F 977-07 as the CPSC mandatory standard for infant walkers with several modifications and edits that would reduce testing variability and potentially produce safer walkers. In addition, staff recommends two performance requirements and one labeling requirement not currently found in the ASTM standard. The recommended new requirements include two performance tests from the European Standard EN 1273:2005. All of the recommended changes are outlined in Table 1, attached to this memo and detailed in Tab B of this briefing package.

Table 1: Staff Recommended Changes and Additions to F 977-07

ASTM F 977-07 Section No., Pg. No.	Suggested Change																																										
7.6.1.2, pg. 8	<i>In the last sentence the recommended change is "...performance of the test and position using a non-elastic means the rope specified in Figure 10."</i>																																										
7.6.3.1, pg. 8	<p><i>Instead of specifying launching distance d based on the assumption that a walker is 8 lbs, an equation is recommended to compute the appropriate d value for each walker. The recommended change is "...edge of the test platform, d=14.6 in (371 mm).</i></p> $d_{CAMI} = \frac{(V_f^2 - V_o^2) * (W_{CAMI} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI})}$ <p><b>where:</b>  <math>V_f</math> = Maximum velocity of walker at edge of platform = 4 ft/sec  <math>V_o</math> = Initial velocity = 0  <math>W_{CAMI}</math> = Weight of CAMI dummy = 17 lb  <math>W_{walker}</math> = Weight of the walker  <math>W_{drop\ weight}</math> = Drop weight = 8 lb  <math>\mu_k</math> = Dynamic coefficient of friction = 0.05  <math>N_{CAMI}</math> = Normal force (for CAMI dummy scenario) = weight of CAMI dummy and walker  <math>g</math> = acceleration of gravity = 32.2 ft/sec<sup>2</sup></p>																																										
7.6.3.1, pg. 8	<i>In the last sentence, the recommended change is "...Position the swivel wheels in such a way that the as they would be if the walker was moving moves forward in a straight line parallel to Plane A."</i>																																										
7.6 Table 1 Summary of Step(s) Tests, pg. 8	<p><i>Since distance d will vary with the mass of the infant walker, the recommended change is to delete the specific values for d.</i></p> <p style="text-align: center;">□ <u>TABLE 1 Summary of Step(s) Tests</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Section Number</th> <th>Facing Direction of walker</th> <th>Weight of CAMI Dummy, lb</th> <th>Distance d from Platform Edge, in</th> <th>Simulated Speed, ft/s</th> <th>Apply Tipover Test</th> </tr> </thead> <tbody> <tr> <td>7.6.3</td> <td>forward</td> <td>17</td> <td>14.6</td> <td>4</td> <td>yes</td> </tr> <tr> <td>7.6.3.6</td> <td>forward</td> <td>28 (vest)</td> <td>21.2</td> <td>4</td> <td>yes</td> </tr> <tr> <td>7.6.4</td> <td>sideward</td> <td>17</td> <td>3.6</td> <td>2</td> <td>yes</td> </tr> <tr> <td>7.6.4.6</td> <td>sideward</td> <td>28 (vest)</td> <td>5.3</td> <td>2</td> <td>yes</td> </tr> <tr> <td>7.6.5</td> <td>rearward</td> <td>17</td> <td>14.6</td> <td>4</td> <td>no</td> </tr> <tr> <td>7.6.5.5</td> <td>rearward</td> <td>28 (vest)</td> <td>21.2</td> <td>4</td> <td>no</td> </tr> </tbody> </table>	Section Number	Facing Direction of walker	Weight of CAMI Dummy, lb	Distance d from Platform Edge, in	Simulated Speed, ft/s	Apply Tipover Test	7.6.3	forward	17	14.6	4	yes	7.6.3.6	forward	28 (vest)	21.2	4	yes	7.6.4	sideward	17	3.6	2	yes	7.6.4.6	sideward	28 (vest)	5.3	2	yes	7.6.5	rearward	17	14.6	4	no	7.6.5.5	rearward	28 (vest)	21.2	4	no
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7.6.4	sideward	17	3.6	2	yes																																						
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7.6.5.5	rearward	28 (vest)	21.2	4	no																																						

Table 1: Staff Recommended Changes and Additions to F 977-07

ASTM F 977-07 Section No., Pg. No.	Suggested Change
7.6.3.2, pg. 8	<i>Recommended change:</i> “Place a CAMI infant dummy Mark II in the walker and position it as shown in Fig.11 with the torso contacting the front of the occupant seating area and arms placed on the walker tray.”
7.6.3.3, pg. 8	<i>The recommended change is</i> “...means of a 7-strand military rope with a 550 lb tensile strength (e.g., paracord 550) and a stainless steel ball bearing pulley with an outside diameter of 1.25 in and adjust the pulley so that the force is applied horizontally ( $0 \pm 0.5^\circ$ with respect to the table surface).”
7.6.3.6, pg. 8	<p><i>The recommended change is</i> “Repeat 7.6.3.1-7.6.3.5 using the CAMI dummy with the weighted vest (see Fig. 12) and with distance <math>d</math>, =21.2 in. (538 mm) computed using the following equation:</p> $d_{CAMI\ w/vest} = \frac{(V_f^2 - V_o^2) * (W_{CAMI\ w/vest} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI\ w/vest})}$ <p>where:  <math>V_f</math> = Maximum velocity of walker at edge of platform = 4 ft/sec  <math>V_o</math> = Initial velocity = 0  <math>W_{CAMI\ w/vest}</math> = Weight of CAMI dummy with 11 lb vest = 28 lbs  <math>W_{walker}</math> = Weight of the walker  <math>W_{drop\ weight}</math> = Drop weight = 8 lb  <math>\mu_k</math> = Dynamic coefficient of friction = 0.05  <math>N_{CAMI\ w/vest}</math> = Normal force (for CAMI dummy fitted with 11 lb vest scenario) = weight of CAMI dummy + vest weight + walker weight  <math>g</math> = acceleration of gravity = 32.2 ft/sec<sup>2</sup></p>
Recommended new step	<i>Recommended addition:</i> “Repeat tests in the following sequence: Section 7.6.3.4, Section 7.6.3.5, and Section 7.6.3.6 two additional times.” <i>The reason for three test runs is to have parity with the European Standard EN 1273:2005 which requires three test runs.</i>
7.6.4.1, pg. 8	<p><i>Similar to the recommended changes in Section 7.6.3, the recommended change is</i> “...edge of the test platform, <math>d</math> =3.6 in (91 mm).</p> $d_{CAMI} = \frac{(V_f^2 - V_o^2) * (W_{CAMI} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI})}$ <p>where:  <math>V_f</math> = Maximum velocity of walker at edge of platform = 2 ft/sec  <math>V_o</math> = Initial velocity = 0  <math>W_{CAMI}</math> = Weight of CAMI dummy =17 lb  <math>W_{walker}</math> = Weight of the walker  <math>W_{drop\ weight}</math> = Drop weight = 8 lb</p>

Table 1: Staff Recommended Changes and Additions to F 977-07

ASTM F 977-07 Section No., Pg. No.	Suggested Change
7.6.4.1, pg. 8, continued	$\mu_k$ = Dynamic coefficient of friction = 0.05 $N_{\text{CAMI}}$ = Normal force (for CAMI dummy scenario) = weight of CAMI dummy and walker $g$ = acceleration of gravity = 32.2 ft/sec <sup>2</sup>
7.6.4.1, pg. 8	<i>In the last sentence, the recommended change is</i> “Position the swivel wheels in such a way that the <del>as they would be if the walker moves</del> sideward in a straight line parallel to Plane A.”
7.6.4.3, pg. 8	<i>The recommended change is</i> “...means of a rope (as specified in 7.6.3.3) and a pulley (as specified in 7.6.3.3) and adjust the pulley so that the force is applied horizontally ( $0 \pm 0.5^\circ$ with respect to the table surface).”
7.6.4.6, pg. 10	<i>The recommended change is</i> “Repeat 7.6.4.1-7.6.4.5 using the CAMI dummy with the weighted vest (see Fig. 12) and with distance $d$ , = <del>5.3 in.</del> (130 mm) computed using the following equation: $d_{\text{CAMI w/vest}} = \frac{(V_f^2 - V_o^2) * (W_{\text{CAMI w/vest}} + W_{\text{walker}} + W_{\text{drop weight}})}{2g(W_{\text{drop weight}} - \mu_k N_{\text{CAMI w/vest}})}$ where $V_f$ = Maximum velocity of walker at edge of platform = 2 ft/sec $V_o$ = Initial velocity = 0 $W_{\text{CAMI w/vest}}$ = Weight of CAMI dummy with 11 lb vest = 28 lbs $W_{\text{walker}}$ = Weight of the walker $W_{\text{drop weight}}$ = Drop weight = 8 lb $\mu_k$ = Dynamic coefficient of friction = 0.05 $N_{\text{CAMI w/vest}}$ = Normal force (for CAMI dummy fitted with 11 lb vest scenario) = weight of CAMI dummy + vest weight + walker weight $g$ = acceleration of gravity = 32.2 ft/sec <sup>2</sup>
Recommended new step	<i>Recommended addition:</i> “Repeat tests in the following sequence: Section 7.6.4.4, Section 7.6.4.5, and Section 7.6.4.6 two additional times.” <i>The reason for three test runs is to have parity with the European Standard EN 1273:2005 which requires three test runs.</i>
Figure 10, pg. 9	<i>In the top graphic, to be clear, the recommended change to the caption is</i> “Oak hardwood flooring pre-finished with polyurethane varnish. <b>Wood grain shall be parallel to plane A.</b> ” <i>The specifications for the rope and pulley per the Suggested Change for Section 7.6.3.3 shall be included in Figure 10. In the bottom graphic, update the caption to read</i> “use the military rope (as specified in Section 7.6.3.3) for leg positioning support.” <i>Add the sentence:</i> “The test table apparatus shall be rigid with minimal flexure. The spring rate for the pulley bracket shall be $\geq 100$ lb/in in the horizontal and vertical directions.” <i>[This sentence is currently not in the graphic but staff recommends its addition]</i>

Table 1: Staff Recommended Changes and Additions to F 977-07

ASTM F 977-07 Section No., Pg. No.	Suggested Change
7.6.5.1, pg. 10	<p>Similar to the recommended changes in Section 7.6.3, the recommended change is "...edge of the test platform, <math>d = 14.6</math> in (371 mm).</p> $d_{CAMI} = \frac{(V_f^2 - V_o^2) * (W_{CAMI} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI})}$ <p>where:  <math>V_f</math> = Maximum velocity of walker at edge of platform = 4 ft/sec  <math>V_o</math> = Initial velocity = 0  <math>W_{CAMI}</math> = Weight of CAMI dummy = 17 lb  <math>W_{walker}</math> = Weight of the walker  <math>W_{drop\ weight}</math> = Drop weight = 8 lb  <math>\mu_k</math> = Dynamic coefficient of friction = 0.05  <math>N_{CAMI}</math> = Normal force (for CAMI dummy scenario) = weight of CAMI dummy and walker  <math>g</math> = acceleration of gravity = 32.2 ft/sec<sup>2</sup></p>
7.6.5.1, pg. 10	<p>In the last sentence, the recommended change is "...Position the swivel wheels in such a way that the as they would be if the walker moves rearward in a straight line parallel to Plane A. If the walker has an open back base design, attach the 1 in aluminum angle used in Section 7.3.4 to span the back frame."</p>
7.6.5.3, pg. 10	<p>The recommended change is "...means of a rope (as specified in 7.6.3.3) and a pulley (as specified in Section 7.6.3.3) and adjust the pulley so that the force is applied horizontally (<math>0 \pm 0.5^\circ</math> with respect to the table surface).</p>
7.6.5.5, pg. 10	<p>The recommended change is "Repeat 7.6.5.1-7.6.5.4 using the CAMI dummy with the weighted vest (see Fig. 12) and with distance <math>d = 21.2</math> in (538 mm) computed using the following equation:</p> $d_{CAMI\ w/vest} = \frac{(V_f^2 - V_o^2) * (W_{CAMI\ w/vest} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI\ w/vest})}$ <p>where:  <math>V_f</math> = Maximum velocity of walker at edge of platform = 4 ft/sec  <math>V_o</math> = Initial velocity = 0  <math>W_{CAMI\ w/vest}</math> = Weight of CAMI dummy with 11 lb vest = 28 lbs  <math>W_{walker}</math> = Weight of the walker  <math>W_{drop\ weight}</math> = Drop weight = 8 lb  <math>\mu_k</math> = Dynamic coefficient of friction = 0.05  <math>N_{CAMI\ w/vest}</math> = Normal force (for CAMI dummy fitted with 11 lb vest scenario) = weight of CAMI dummy + vest weight + walker weight  <math>g</math> = acceleration of gravity = 32.2 ft/sec<sup>2</sup></p>

Table 1: Staff Recommended Changes and Additions to F 977-07

ASTM F 977-07 Section No., Pg. No.	Suggested Change
Recommended new step	<i>Recommended addition: “Repeat tests in the following sequence: Section 7.6.5.4 and Section 7.6.5.5 two additional times.” The rationale for three test runs is to have parity with the European Standard EN 1273:2005 which requires three test runs.</i>
Figure 10 (italics indicates recommended changes)	
3.1.8, pg. 2	Figure 1 - Update model type(s). <i>There should be a category for the open back base design, as there appear to be several in the marketplace, yet they do not necessarily fit into any of the four types described in Figure 1. Keep the other 4 types in Fig 1, and add other types as needed. Suggested [updated] Figure C below shows a fifth walker type.</i>
4.6.1 through 4.6.8, pg. 2	<p><i>Specific brands and models of force gauges are not recommended. Only the performance specification of the force gauges shall be listed:</i></p> <p><i>“4.6.1 Equipment – Force gauge with a range of 0 to 25 lbf (110N), tolerance of ± 1 Div., and a calibration interval of 1 year.” Sections 4.6.2 through 4.6.4 do not need to be included.</i></p> <p><i>“4.6.5 Equipment – Force gauge with a range of 0 to 100 lbf (500 N) tolerance of ± 1 Div., and a calibration interval of 1 year.” Sections 4.6.6 through 4.6.8 do not need to be included.</i></p>

Table 1: Staff Recommended Changes and Additions to F 977-07

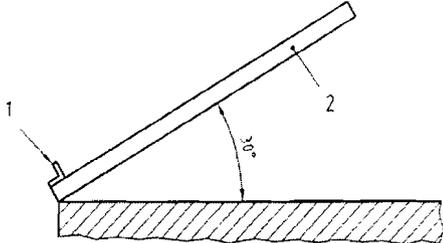
ASTM F 977-07 Section No., Pg. No.	Suggested Change
Recommended requirement; currently doesn't exist in ASTM; suggested Section Number 8.2.3.3	<p>Since a parking device performance test was proposed, ESME staff consulted ESHF staff for a written warning to alert the caregiver that the child in the walker must be in view, even when the parking device is engaged. Recommended addition: <b>“WARNING: Parking brake use does not totally prevent walker movement. Always keep child in view when in the walker, even when using the parking brakes.”</b></p>
8.2.4.2, pg. 11	<p>Recommended revision to 8.2.4.2 to account for the proposed parking device performance test: <b>“...Block stairs/steps securely before using walker, even when using parking brake.”</b></p>
Recommended requirement; currently doesn't exist in ASTM; suggested Section Number 8.2.3.3	<p><b>1) Recommended Text for the Static Stability 30° Incline Plane Test</b>            Requirement:            When tested to the following procedure, the infant walker shall not overturn.            Test Equipment:            • A sloping platform inclined at 30° to the horizontal with a stop fitted to the lower edge of the slope. The height of the stop shall be 3.94 in (100 mm). See Figure B.            • Test Mass A: A rigid cylinder 6.30 in ± 0.04 in (160 mm ± 1 mm) in diameter, 11.02 in ± 0.04 in (280 mm ± 1 mm) in height with a mass of 26.4 lb (12 kg), with its center of gravity in the center of the cylinder. All edges shall have a radius of 0.79 in ± 0.04 in (20 mm ± 1mm).            • Test Mass B: A rigid cylinder 6.30 in ± 0.04 in (160 mm ± 1 mm) in diameter, 11.02 in ± 0.04 in (280 mm ± 1 mm) in height with a mass of 16.8 lb (12 kg), with its center of gravity in the center of the cylinder.            Test Method:            Adjustable seats shall be adjusted to their highest position. Place Test Mass A vertically in the center of the walker seat. To restrict movement of the test mass, packing of negligible mass may be used. Position the castors or wheels in their most onerous position. Place the walker on the slope against the stop. Carry out the test in the forward, sideward, and rearward directions.</p>
New Figure: Figure B for the Static Stability 30° Incline Plane Test	

Table 1: Staff Recommended Changes and Additions to F 977-07

ASTM F 977-07 Section No., Pg. No.	Suggested Change
<p>Recommended requirement; currently doesn't exist in ASTM (Static Stability 30° Incline Plane Test)</p>	<p>This test is only applicable to those walkers equipped with parking devices.                      Requirement: When tested to the procedures below, the infant walker shall have a maximum displacement of 1.97 inches (50 mm) for each test in each direction (forward, rearward, and sideward).                      Test Equipment: • A test platform as specified in Figure A with a hardwood floor pre-finished with polyurethane. • Test Mass A and Test Mass B per the Static Stability 30° Incline Plane Test Procedure                      Test Method: Adjust the walker seat to the highest position (if applicable). Place Test Mass A in the walker seat and position it as shown in Figure A with the torso contacting the front of the occupant seating area and arms placed on the walker tray (for the forward and rearward directions). Set any manual speed control to the fastest position (if applicable). Establish a vertical plane A that passes through the center of the seating area and is parallel to the direction the child faces. Establish a vertical plane B that is perpendicular to plane A and passes through the center of the seating area.                      Perform the parking devices test in the forward, sideward, and rearward directions.                      Forward facing test of parking devices: Position the walker including Test Mass B facing forward so that plane A is perpendicular to the front edge of the platform and passes through the center of the pulley. Engage all parking devices in accordance with the manufacturers' instructions. Within one minute of placing the walker with Test Mass B on the platform, attach an 8 lb weight gradually within 5 seconds to the walker frame base at plane A by means of a rope and a pulley per the test apparatus specifications in the step test procedure, adjusted so that the force is applied horizontally (rope angle shall be <math>0 \pm 0.5^\circ</math>). Remove the 8 lb weight after 1 minute. Measure the displacement.                      Sideward facing test of parking devices: Position the walker including Test Mass B facing sideward so that plane B is perpendicular to the front edge of the platform and passes through the center of the pulley. Engage all parking devices in accordance with the manufacturers' instructions. Within one minute of placing the walker with Test Mass B on the platform, attach an 8 lb weight gradually within 5 seconds to the walker frame base at plane B by means of a rope and a pulley per the test apparatus specifications in the step test procedure, adjusted so that the force is applied horizontally (rope angle shall be <math>0 \pm 0.5^\circ</math>). Remove the 8 lb weight after 1 minute. Measure the displacement.                      Rearward facing test of parking devices: Position the walker including Test Mass B facing rearward so that plane A is perpendicular to the front edge of the platform and passes through the center of the pulley. Engage all parking devices in accordance with the manufacturers' instructions. Within one minute of placing the walker with Test Mass B on the platform, attach an 8 lb weight gradually within 5 seconds to the walker frame base at plane A by means of a rope and a pulley per the test apparatus specifications in the step test procedure, adjusted so that the force is applied horizontally (rope angle shall be <math>0 \pm 0.5^\circ</math>). Remove the 8 lb weight after 1 minute. Measure the displacement.</p>



UNITED STATES  
CONSUMER PRODUCT SAFETY COMMISSION  
WASHINGTON, DC 20207

**Memorandum**

Date: May 26, 2009

TO : Patricia Edwards  
Division of Mechanical Engineering  
Directorate for Engineering Sciences

THROUGH: Russell Roegner, Ph.D. *RR*  
Associate Executive Director  
Directorate for Epidemiology

Kathleen Stralka  
Director, Division of Hazard Analysis *KS*  
Directorate for Epidemiology

FROM : Risana Chowdhury *R.C.*  
Division of Hazard Analysis

SUBJECT : Infant Walker-Related Injuries and Deaths Among Children Under 15 Months of Age  
Calendar Years 2004 – 2008

**Introduction**

This memorandum characterizes the number of deaths and injuries and the types of hazards related to infant walkers during the five-year time period 2004-2008<sup>1</sup>. These characterizations are based on reports received by CPSC staff. It also presents historical injury estimates from 1994 through 2008 for comparison purposes. The focus of the analysis is strictly on children under 15 months of age.

**Incident Data<sup>2</sup>**

CPSC staff is aware of a total of eight death incidents and 78 injury incidents that have been reported to have occurred while the infant was in a walker during the five-year period 2004-2008.

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<sup>1</sup> Not all of these incidents are addressable by an action the CPSC could take; however, it was not the purpose of this report to evaluate the addressability of the incidents, but rather to quantify the number of fatalities and injuries reported to CPSC staff and to update estimates of emergency department treated injuries.

<sup>2</sup> The databases searched were the In-Depth Investigation (INDP) file, the Injury or Potential Injury Incident (IPII) file, and the Death Certificate (DTHS) file. These deaths and incidents are neither a complete count of all that occurred during this time period nor a sample of known probability of selection. However, they do provide a minimum number of deaths and incidents occurring during this time period and illustrate the circumstances involved in the incidents involving infant walkers.

## ***Fatalities***

Of the eight deaths reported to CPSC staff, there were three deaths that resulted from accidental drowning when a child moved in a walker into a residential pool or spa. Two of these incidents occurred in in-ground residential pools, while the third was in an in-ground spa that was built into an in-ground residential pool. The circumstances of the remaining five deaths varied. They resulted from: scalding from contents of a slow cooker when an infant pulled the electrical cord of the cooker; multiple subdural hematomas to the head when an infant pulled a heavy dining chair onto himself; fatal head injury when an infant walker rolled down the driveway and struck a moving vehicle; multiple skull fractures when an infant fell down a stairway; and aspiration of an unspecified metal screw by an infant while seated in a walker.

## ***Non-Fatal Injuries***

A total of 78 non-fatal injuries have been reported to have occurred between 2004 and 2008. All of these injuries occurred when the infant was seated in a walker. The leading cause of injury was falls down stairs or to a lower level. This accounted for about 42% of the injuries. The next major cause of injury was product failure, either structural or mechanical failure of the walker, and these accounted for 37% of the incidents. Examples of such failures include: the walker seat giving way causing the infant to fall through or out; the walker tipping or rolling over due to instability; the walker frame completely collapsing; undesirable spaces or gaps in the walker pinching or catching the infant; and sharp, protruding or broken components of the walker causing laceration injuries. The attached toys, toy bars, or toy trays on the walker caused 17% of the injuries, such as lacerations, abrasions, pinching, etc. Three percent of the non-fatal reported injuries were serious burn injuries resulting from infants pulling cords of small cooking appliances and spilling hot liquids onto themselves. Finally, one percent of the reported incidents did not specify the injury.

Many of the deaths and some of the injuries reported were directly related to the hazardous environment surrounding the walker and not necessarily caused by failures of the walker itself. Fifty-four percent of the non-fatal reported injuries clearly were attributed to the product.

## **Injury Estimates<sup>3</sup>**

There were an estimated total of 14,900<sup>4</sup> (an annual average of 3,000) infant walker-related injuries among children under the age of 15 months that were treated in U.S. hospital emergency departments over the five-year period 2004-2008. Table 1 shows the estimated injuries for each of the five years as well as the annual average for the five-year period. There was no statistically significant increase or decrease observed in the estimated injuries from one year to the next, nor was there any statistically significant trend observed over the 2004-2008 period.

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<sup>3</sup> The source of the injury estimates is the National Electronic Injury Surveillance System (NEISS), a statistically valid injury surveillance system. NEISS injury data are gathered from emergency departments of hospitals selected as a probability sample of all the U.S. hospitals with emergency departments. The surveillance data gathered from the sample hospitals enable the CPSC staff to make timely national estimates of the number of injuries associated with specific consumer products.

<sup>4</sup> This estimate has been adjusted to exclude jumpers from the walker code.

**Table 1: Infant Walker-Related Estimated Injuries to Children under 15 Months of Age  
Calendar Years 2004-2008**

Calendar Year	Estimated Injuries
2004	3,500
2005	2,600
2006	3,200
2007	2,800
2008	2,800
2004-2008 Average	3,000

Source: NEISS, U.S. Consumer Product Safety Commission (CPSC).

No deaths were reported through the NEISS. For the emergency department treated injuries related to infant walkers, the following characteristics occurred most frequently based on an annual average:

- Hazard – falls either out of the walker or down stairs/to a lower level while in the walker (62%)
- Injured body part – head (45%) and face (27%)
- Injury type – contusions/abrasions (37%) and internal organ injury (28%)
- Disposition – treated and released (90%) and hospitalized (5%).

As noted for the incident data, while the product associated with all of the emergency department treated injuries discussed above was coded as infant walkers, many of the injuries were not necessarily caused by failures of the walker. Based on an evaluation by engineering staff, the product was considered to be directly involved in approximately 72% of the injuries. Incident examples include walkers falling down stairs, tipping over, or collapsing, and infants in the walker getting pinched by walker components, among others. About 20% of the injuries were not caused by failures of the walker. Incident examples include infants reaching and pulling hot or heavy objects onto themselves while seated in the walker, infants ingesting foreign objects while seated in the walker, and infants getting injured in the process of being taken out of the walker by an adult, among others. The walker's involvement was unclear in the remaining 8% of the incidents due to insufficient information.

### ***Historical Data***

For comparison purposes, historical data on infant walker-related injury estimates for the 15-year period 1994-2008 is presented in Table 2. 1995 was the first full year after the CPSC staff and industry began revisions to the voluntary standard which addressed stair falls. The revised voluntary standard, with performance requirements to address stair falls, was approved in October 1996 and published in 1997.

Table 2 also presents the number of U.S. live births as reported by the National Vital Statistics Systems (NVSS) of the National Center for Health Statistics (NCHS). This allows for the computation of the estimated injuries per million live births, a surrogate measure for an injury rate, in the absence of appropriate denominator data for walker usage among infants under 15 months of age<sup>5</sup>. As of this date, the 2008 data for U.S. live births has not been published.

<sup>5</sup> Communication with CPSC staff in the Economic Analysis directorate indicates that data on walker sales or usage is either very approximate or unavailable for the time period 1994-2008; as such, sales or usage data was not used in this analysis.

From 1994 to 2008, there has been an 88% decrease in the estimated number of walker-related injuries treated at emergency departments, from 24,200 to 2,800. Furthermore, there is a highly statistically significant downward trend in the injuries over this time period (p-value < 0.0001). Similarly, from 1994 to 2007, there has been a decrease of over 89% in the estimated rate of walker-related injuries per million live births, from 6,122 to 649. The downward trend for the rates over the 1994-2007 period is also highly significant (p-value < 0.0001). The similarity in the percentage decreases illustrates that the decrease in injuries is not caused by any decrease in the number of children being born.

The trends in the walker-related injuries and the injuries per million births are illustrated in the chart that follows.

**Table 2: Infant Walker-Related Emergency Department Treated Injury Estimates: 1994- 2008**

Calendar Year	Estimated Injuries Among Infants Under 15 Months <sup>6</sup>	U.S. Live Births <sup>7</sup>	Injuries per Million Live Births
1994	24,200	3,952,767	6,122.3
1995	20,100	3,899,589	5,154.4
1996	16,100	3,891,494	4,137.2
1997	14,300	3,880,894	3,684.7
1998	11,000	3,941,553	2,790.8
1999	8,800	3,959,417	2,222.6
2000	7,400	4,058,814	1,823.2
2001	5,100	4,025,933	1,266.8
2002	4,000	4,021,726	994.6
2003	3,200	4,089,950	782.4
2004	3,500	4,112,052	851.2
2005	2,600	4,138,349	628.3
2006	3,200	4,265,555	750.2
2007	2,800	4,317,119 <sup>8</sup>	648.6
2008	2,800	---	---

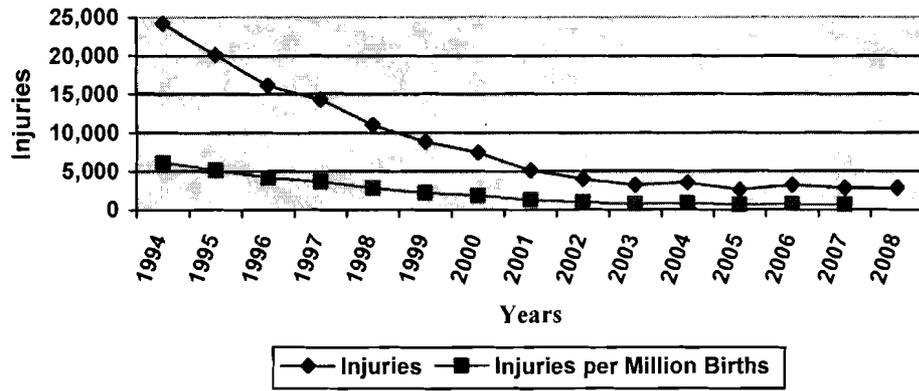
Source: NEISS, CPSC, and NVSS, NCHS. NEISS estimates are rounded to nearest 100.

<sup>6</sup> The estimates for 1994, 1995, and 1996 have been adjusted for 1997 changes in the NEISS sampling frame.

<sup>7</sup> Data from National Center for Health Statistics; data is not yet published for 2008.

<sup>8</sup> Preliminary data.

**Infant Walker-Related Emergency Department Treated  
Injuries: 1994 - 2008**





UNITED STATES  
CONSUMER PRODUCT SAFETY COMMISSION  
WASHINGTON, DC 20207

## Memorandum

Date: July 31, 2009

TO : Patricia Edwards, Division of Mechanical Engineering, Directorate for Engineering Sciences (ESME)

THROUGH: Mark Kumagai, Division Director, ESME *MK*  
Hugh McLaurin, Associate Executive Director, Directorate for Engineering Sciences *HLM*

FROM : Han Lim, ESME *HL*

SUBJECT : Proposed changes to the Voluntary Standard for Infant Walkers (ASTM F 977-07) – Segue to a mandatory CPSC Standard for Infant Walkers

### **I BACKGROUND / OVERVIEW**

Section 104 of the Consumer Product Safety Improvement Act (CPSIA), *Standards and Consumer Registration of Durable Nursery Products*, requires CPSC staff to assess the effectiveness of voluntary consumer product safety standards for durable infant and toddler products in an effort to promulgate mandatory safety standards. Section 104 (b)(1)(B) states that – “The Commission shall...promulgate consumer product safety standards that -- (i) are substantially the same as voluntary standards; or (ii) are more stringent than such voluntary standards if the Commission determines that more stringent standards would further reduce the risk of injury associated with such products.” ESME staff believes that more stringent standards can further reduce the risk of injury associated with infant walkers. ESME staff recommends several changes to ASTM F 977-07 that should reduce testing variability and potentially result in safer walkers.

The ASTM International<sup>1</sup> voluntary standard for infant walkers, ASTM F 977, has been in existence since 1986. While the earlier versions of the infant walker standard (1986-1996) addressed various safety aspects of infant walkers, a performance test to evaluate the walkers’ ability to resist falling down a set of stairs did not exist. In 1997, ASTM added a dynamic performance test to address stair falls. The walker industry responded to this change by providing a means of braking or stopping to help prevent walkers from falling down stairs. The majority of the brakes used by the industry were rubberized “friction strips” that activated when a subset of a walker’s wheels fell down a step or stair<sup>2</sup>. A number of editorial updates were

<sup>1</sup> Prior to 2001, ASTM International was known as American Society for Testing and Materials.

<sup>2</sup> Memo from Mark Kumagai to Barbara Jacobson titled “ASTM F 977 Voluntary Standard for Baby Walkers Description and Rationale,” March 14, 2002.

made from 1997 to 2007, but no substantive requirements or performance tests have been added to ASTM F 977 since 1997. The current version of the voluntary standard is ASTM F 977-07 which was approved on April 1, 2007. This memo assesses the effectiveness of the ASTM voluntary walker standard and recommends changes to be considered for the mandatory rule on infant walkers.

#### **A) Incident Hazard Review**

The Directorate for Epidemiology reports that from 2004 to 2008, there were 86 incidents reported to CPSC, in which eight deaths and 78 non-fatal injuries were reported to have occurred while infants were in walkers<sup>3</sup>. One of the eight deaths was associated with an infant who suffered multiple skull fractures when the walker fell down a stairway. Approximately 42% of the 78 non-fatal injuries involved falling down a set of stairs. A substantial number of stair falls have been reported, so investigating the adequacy of the ASTM standard with respect to stair fall performance testing may help identify ways to reduce these incidents.

#### **B) Adequacy of the Current ASTM F 977-07 Requirements**

ASTM F 977-07 contains several labeling and performance criteria. In addition to the aforementioned stair step performance test, the ASTM standard requires two stability tests (tipping resistance against an immovable object and occupant leaning over edge), and two structural integrity tests (dynamic loading of the seat and static loading of the seat). It is ESME staff's opinion that these performance tests are adequate for evaluating the stability and structural integrity of infant walkers. However, ESME staff believes that changes to the stair fall requirement are needed to better control testing variability and consistency. In addition, ESME staff recommends other changes to the voluntary standard in developing a mandatory standard, as described below.

## **II PROPOSED SAFETY STANDARD FOR INFANT WALKERS**

While the current voluntary standard is an improvement over the pre-1997 versions of the standard, there are additional areas that could be improved and may result in further reduction of injuries associated with infant walkers. ESME staff recommends that ASTM F 977-07 can be adopted as the mandatory safety standard for infant walkers with the following additions:

- Specificity of the stair step test procedures;
- Inclusion of two additional performance tests from the European Standard for Baby Walking Frames EN 1273:2005; and
- General editorial text changes to various sections of ASTM F 977-07.

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<sup>3</sup> Memo from Risana Chowdhury to Patricia Edwards titled "Infant Walker-Related Injuries and Deaths Among Children Under 15 Months of Age Calendar Years 2004 – 2008," May 26, 2009.

## A) Overview of the Stair Step Fall Test

In order to conduct a stair fall test, a walker with a CAMI infant dummy (Mark II)<sup>4</sup> (subsequently referred to as “CAMI dummy”) occupying the walker’s seat is placed on the hardwood floor test table at a specified position (launching distance) from the edge of the table. The walker and CAMI dummy are then propelled towards the edge of the table with a horizontal dynamic force by means of a pulley, rope, and a falling 8 lb weight. The goal of the test is to propel the walkers to a velocity of 4 ft/s (for forward and rearward tests) as it reaches the edge of the table. This 4 ft/s velocity was based on the rationale that it is the maximum velocity that can be expected for an infant using a walker. For sideward tests, the maximum expected velocity is 2 ft/s. The test result is either a pass (the walker stays on the hardwood floor table surface) or fail (walker completely falls off the table surface).

It is possible that depending on the type and the brand of hardware used in the test apparatus, two different laboratories could test the same model walker and produce two different sets of results. This is of particular concern if one laboratory passes a walker and another laboratory fails it. Consequently, specifying much of the test apparatus (such as the type and size of the pulley, rope, etc.) would reduce laboratory-to-laboratory variability.

For this reason, ESME staff is recommending that specific test apparatus components be added to the current ASTM test procedure to reduce test variability. Additionally, ESME staff suggests updates to the test procedure language such as specifying a tolerance for the term “horizontal” ( $0^\circ \pm 0.5^\circ$ ). ESME staff believes that minimizing friction in the test apparatus and flexure in the test table would *maximize* the transfer of dynamic energy to the walker and CAMI dummy, hence creating more stringent performance requirements.

The launching distance “d” as specified in Section 7.6 of ASTM F 977-07 was determined based on a number of factors including: the weight of the walker, the weight of the CAMI dummy, the weight of the CAMI vest, the coefficient of friction between the walker wheels and the test table surface, and the desired maximum velocity at the edge of the test table (4 ft/sec or 2 ft/sec). Per Section 7.6, the “d” value for the forward and rearward directions with the CAMI dummy seated in the walker is specified to be 14.6 inches. The “d” value for the forward and rearward directions with the CAMI dummy fitted with the 11 lb vest seated in the walker is specified at 21.2 inches. These specified launching distance values of 14.6 and 21.2 inches were based on the assumption that the walker weight is 8 pounds.

ESME staff weighed five different 2008 or 2009 model walkers and found that the weight of these walkers ranged from 11 to 14 lbs, which is greater than the typical 8 pound average weight of earlier models. Therefore, ESME staff recommends that the specified launch distances no longer be used, and instead, the launch distance be calculated based on the actual weight of the walker using the equations<sup>5</sup> below.

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<sup>4</sup> This Civil Aeromedical Institute (CAMI) Infant Dummy, Mark II, was constructed in accordance with the Department of Transportation Specification dated April 29, 1975.

<sup>5</sup> Appendix of memo from Mark Kumagai to Barbara Jacobson titled “ASTM F 977 Voluntary Standard for Baby Walkers Description and Rationale,” March 14, 2002. Calculations based on ASTM walker working group notes from June 2, 1995 and January 12, 1996.

$$d_{CAMI} = \frac{(V_f^2 - V_o^2) * (W_{CAMI} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI})}$$

$$d_{CAMI\ w/vest} = \frac{(V_f^2 - V_o^2) * (W_{CAMI\ w/vest} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI\ w/vest})}$$

where

$V_f$  = Maximum velocity of walker at edge of platform = 4 ft/sec (for forward and rearward directions); 2 ft/sec (for sideward direction)

$V_o$  = Initial velocity = 0

$W_{CAMI}$  = Weight of CAMI dummy = 17 lb

$W_{CAMI\ w/vest}$  = Weight of CAMI dummy with 11 lb vest = 28 lbs

$W_{walker}$  = Weight of the walker

$W_{drop\ weight}$  = 8 lb

$\mu_k$  = Dynamic coefficient of friction = 0.05

$N_{CAMI}$  = Normal force (for CAMI dummy scenario) = weight of CAMI dummy and walker

$N_{CAMI\ w/vest}$  = Normal force (for CAMI dummy fitted with 11 lb vest scenario) = weight of CAMI dummy + vest + walker

$g$  = Acceleration of gravity = 32.2 ft/sec<sup>2</sup>

By making this recommended change, the launch distances may vary depending on the weight of the walker and the maximum velocity of the walker at the edge of the platform (4 ft/sec or 2 ft/sec). The appropriate launch distances need to be computed for each walker model, in each direction, with and without the 11 lb vest.

ESME staff believes this change is necessary because if the walker weight is not appropriately accounted for, then it is possible the target maximum velocity cannot be achieved during the test. For example, with a 14 pound walker tested in the forward direction with the CAMI dummy, distance “d” would equal 18.0 inches (instead of 14.6 inches as specified in the current ASTM standard). Because the walker used in this example is heavier than the 8 pound average used to first develop the launching distances, this extra 3.4 inch distance is needed to achieve the target velocity of 4 ft/sec. If this 14 pound walker is launched from only 14.6 inches, the walker will likely not achieve the 4 ft/sec velocity specified in the standard. ESME staff believes that a level playing field is necessary for all walkers of various weights so that each walker will be subjected to the same target maximum velocity. ESME staff believes this change should create more stringent performance requirements.

CPSC staff also performed a modified version of the stair fall performance test on the decking of various residential pools. This was done to determine whether a walker that passes the ASTM stair fall requirement might also pass when tested on the decking surface of a pool. These tests were conducted as a result of two different fatalities involving children using JPMA-certified

walkers that fell into residential pools<sup>6</sup>. Two different pool decking surfaces were used in lieu of the hardwood test floor. One deck was level rough concrete all the way up to the pool edge and another was level rough concrete with brick-like tiles starting one foot from the edge. Testing was done under both dry and wet conditions. The test results indicated that JPMA-certified walkers passed (i.e., did not fall in the pool) when tested to the same conditions as the ASTM standard (terminal velocity of 4 ft/sec, CAMI dummy fitted with the 11 pound vest seated in the walker). The tests were conducted without ropes and pulleys. CPSC staff pushed the walker and CAMI dummy toward the edge of the pool and the terminal velocity was calculated by measuring the time it took to travel the final 12 inches (the width of the brick tiles) using video slow motion analysis. CPSC staff does not recommend any changes to the ASTM standard as a result of the pool testing. CPSC staff believes that other factors not associated with the performance of the walker may have played a key role in the two pool-related fatal incidents.

**B) Specificity of Stair Step Test Procedures**

Section 7.6 of ASTM F 977-07 describes the stair step test procedure. Table 1 below shows the recommended changes that would specify the test apparatus components and reduce the ambiguity of terms, such as “horizontal.”

TABLE 1

ASTM F 977-07 Section No., Pg. No.	Suggested Change
7.6.1.2, pg. 8	<i>In the last sentence the recommended change is “...performance of the test and position using a <del>non-elastic means</del> <b>the rope specified in Figure 10.</b>”</i>
7.6.3.1, pg. 8	<i>Instead of specifying launching distance <math>d</math> based on the assumption that a walker is 8 lbs, an equation is recommended to compute the appropriate <math>d</math> value for each walker. The recommended change is “...edge of the test platform, <math>d=14.6</math> in (371 mm).”</i>

<sup>6</sup> Memo from Risana Chowdhury to Patricia Edwards titled “Infant Walker-Related Injuries and Deaths Among Children Under 15 Months of Age Calendar Years 2004 – 2008,” May 26, 2009.

ASTM F 977-07 Section No., Pg No.	Suggested Change																																										
7.6.3.1, pg. 8 (continued)	$d_{CAMI} = \frac{(V_f^2 - V_o^2) * (W_{CAMI} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI})}$ <p>where</p> <p><math>V_f</math> = Maximum velocity of walker at edge of platform = 4 ft/sec  <math>V_o</math> = Initial velocity = 0  <math>W_{CAMI}</math> = Weight of CAMI dummy = 17 lb  <math>W_{walker}</math> = Weight of the walker  <math>W_{drop\ weight}</math> = Drop weight = 8 lb  <math>\mu_k</math> = Dynamic coefficient of friction = 0.05  <math>N_{CAMI}</math> = Normal force (for CAMI dummy scenario) = weight of CAMI dummy and walker  <math>g</math> = acceleration of gravity = 32.2 ft/sec<sup>2</sup></p>																																										
7.6.3.1, pg. 8	<p><i>In the last sentence, the recommended change is “...Position <b>the</b> swivel wheels <b>in such a way that the</b> as they would be if the walker was moving <b>moves forward in a straight line parallel to Plane A.</b>”</i></p>																																										
7.6 Table 1 Summary of Step(s) Tests, pg. 8	<p><i>Since distance d will vary with the mass of the infant walker, the recommended change is to delete the specific values for d.</i></p> <p><u>TABLE 1 Summary of Step(s) Tests</u></p> <table border="1"> <thead> <tr> <th>Section Number</th> <th>Facing Direction of walker</th> <th>Weight of CAMI Dummy, lb</th> <th>Distance d from Platform Edge, in</th> <th>Simulated Speed, ft/s</th> <th>Apply Tipover Test</th> </tr> </thead> <tbody> <tr> <td>7.6.3</td> <td>forward</td> <td>17</td> <td>14.6</td> <td>4</td> <td>yes</td> </tr> <tr> <td>7.6.3.6</td> <td>forward</td> <td>28 (vest)</td> <td>21.2</td> <td>4</td> <td>yes</td> </tr> <tr> <td>7.6.4</td> <td>sideward</td> <td>17</td> <td>3.6</td> <td>2</td> <td>yes</td> </tr> <tr> <td>7.6.4.6</td> <td>sideward</td> <td>28 (vest)</td> <td>5.3</td> <td>2</td> <td>yes</td> </tr> <tr> <td>7.6.5</td> <td>rearward</td> <td>17</td> <td>14.6</td> <td>4</td> <td>no</td> </tr> <tr> <td>7.6.5.5</td> <td>rearward</td> <td>28 (vest)</td> <td>21.2</td> <td>4</td> <td>no</td> </tr> </tbody> </table>	Section Number	Facing Direction of walker	Weight of CAMI Dummy, lb	Distance d from Platform Edge, in	Simulated Speed, ft/s	Apply Tipover Test	7.6.3	forward	17	14.6	4	yes	7.6.3.6	forward	28 (vest)	21.2	4	yes	7.6.4	sideward	17	3.6	2	yes	7.6.4.6	sideward	28 (vest)	5.3	2	yes	7.6.5	rearward	17	14.6	4	no	7.6.5.5	rearward	28 (vest)	21.2	4	no
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7.6.5	rearward	17	14.6	4	no																																						
7.6.5.5	rearward	28 (vest)	21.2	4	no																																						
7.6.3.2, pg. 8	<p><i>Recommended change:</i> “Place a CAMI infant dummy Mark II in the walker and position it as shown in Fig. 11 with the torso contacting the front of the occupant seating area <b>and arms placed on the walker tray.</b>”</p>																																										
7.6.3.3, pg. 8	<p><i>The recommended change is</i> “...means of a <b>7-strand military rope with 550 lb tensile strength and a stainless steel ball bearing pulley with an outside diameter of 1.25 in (32 mm)</b> and adjust the pulley so that the force is applied horizontally (<b>0 ± 0.5° with respect to the table surface.</b>)”</p>																																										

ASTM F 977-07 Section No., Pg. No.	Suggested Change
7.6.3.6, pg. 8	<p>The recommended change is “Repeat 7.6.3.1-7.6.3.5 using the CAMI dummy with the weighted vest (see Fig. 12) and with distance <math>d</math>, =<del>21.2 in.</del> (538 mm) <b>computed using the following equation:</b></p> $d_{CAMI\ w/vest} = \frac{(V_f^2 - V_o^2) * (W_{CAMI\ w/vest} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI\ w/vest})}$ <p>where</p> <p><math>V_f</math> = Maximum velocity of walker at edge of platform = 4 ft/sec  <math>V_o</math> = Initial velocity = 0  <math>W_{CAMI\ w/vest}</math> = Weight of CAMI dummy with 11 lb vest = 28 lbs  <math>W_{walker}</math> = Weight of the walker  <math>W_{drop\ weight}</math> = Drop weight = 8 lb  <math>\mu_k</math> = Dynamic coefficient of friction = 0.05  <math>N_{CAMI\ w/vest}</math> = Normal force (for CAMI dummy fitted with 11 lb vest scenario) = weight of CAMI dummy + vest weight + walker weight  <math>g</math> = acceleration of gravity = 32.2 ft/sec<sup>2</sup></p>
Recommended requirement; currently doesn't exist in ASTM	<p><i>Recommended addition:</i> “Repeat tests in the following sequence: <b>Section 7.6.3.4, Section 7.6.3.5, and Section 7.6.3.6 two additional times.</b>” <i>The reason for three test runs is to have parity with the European Standard EN 1273:2005 which requires three test runs.</i></p>
7.6.4.1, pg. 8	<p>Similar to the recommended changes in Section 7.6.3, the recommended change is “...edge of the test platform, <math>d</math> = <del>3.6 in</del> (91 mm).</p> $d_{CAMI} = \frac{(V_f^2 - V_o^2) * (W_{CAMI} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI})}$ <p>where</p> <p><math>V_f</math> = Maximum velocity of walker at edge of platform = 2 ft/sec  <math>V_o</math> = Initial velocity = 0  <math>W_{CAMI}</math> = Weight of CAMI dummy = 17 lb  <math>W_{walker}</math> = Weight of the walker  <math>W_{drop\ weight}</math> = Drop weight = 8 lb  <math>\mu_k</math> = Dynamic coefficient of friction = 0.05  <math>N_{CAMI}</math> = Normal force (for CAMI dummy scenario) = weight of CAMI dummy and walker  <math>g</math> = acceleration of gravity = 32.2 ft/sec<sup>2</sup></p>

ASTM F 977-07 Section No., Pg. No.	Suggested Change
7.6.4.1, pg. 8	<i>In the last sentence, the recommended change is “Position <b>the</b> swivel wheels <b>in such a way that the</b> as they would be if the walker moves sideward in a straight line parallel to Plane A.”</i>
7.6.4.3, pg. 8	<i>The recommended change is “...means of a rope (as specified in <b>7.6.3.3</b>) and a pulley (as specified in <b>7.6.3.3</b>) and adjust the pulley so that the force is applied horizontally (<b>0 ± 0.5° with respect to the table surface</b>).”</i>
7.6.4.6, pg. 10	<p><i>The recommended change is “Repeat 7.6.4.1-7.6.4.5 using the CAMI dummy with the weighted vest (see Fig. 12) and with distance d, =<del>5.3 in. (130 mm)</del> <b>computed using the following equation:</b></i></p> $d_{CAMI\ w/vest} = \frac{(V_f^2 - V_o^2) * (W_{CAMI\ w/vest} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI\ w/vest})}$ <p><i>where</i></p> <p><math>V_f</math> = Maximum velocity of walker at edge of platform = 2 ft/sec  <math>V_o</math> = Initial velocity = 0  <math>W_{CAMI\ w/vest}</math> = Weight of CAMI dummy with 11 lb vest = 28 lbs  <math>W_{walker}</math> = Weight of the walker  <math>W_{drop\ weight}</math> = Drop weight = 8 lb  <math>\mu_k</math> = Dynamic coefficient of friction = 0.05  <math>N_{CAMI\ w/vest}</math> = Normal force (for CAMI dummy fitted with 11 lb vest scenario) = weight of CAMI dummy + vest weight + walker weight  <math>g</math> = acceleration of gravity = 32.2 ft/sec<sup>2</sup></p>
Recommended requirement; currently doesn't exist in ASTM	<i>Recommended addition: “Repeat tests in the following sequence: <b>Section 7.6.4.4, Section 7.6.4.5, and Section 7.6.4.6 two additional times.</b>” The reason for three test runs is to have parity with the European Standard EN 1273:2005 which requires three test runs.</i>
Figure 10, pg. 9	<i>In the top graphic, to be clear, the recommended change to the caption is “Oak hardwood flooring pre-finished with polyurethane varnish. <b>Wood grain pattern shall be parallel to plane A.</b>” The specifications for the rope and pulley per the Suggested Change for Section 7.6.3.3 shall be included in Figure 10. In the bottom graphic, update the caption to read “Use the military rope (as specified in Section</i>

ASTM F 977-07 Section No., Pg. No.	Suggested Change
Figure 10, pg. 9 (continued)	<p><b>7.6.3.3) for leg positioning support.” Add the sentence: “The test table apparatus shall be rigid with minimal flexure. The spring rate for the pulley bracket shall be <math>\geq 100</math> lb/in in the horizontal and vertical directions.” [This sentence is currently not in the graphic but staff recommends its addition]</b></p>
7.6.5.1, pg. 10	<p>Similar to the recommended changes in Section 7.6.3, the recommended change is “...edge of the test platform, <math>d = 14.6</math> in (371 mm).”</p> $d_{CAMI} = \frac{(V_f^2 - V_o^2) * (W_{CAMI} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI})}$ <p>where</p> <p><math>V_f</math> = Maximum velocity of walker at edge of platform = 4 ft/sec  <math>V_o</math> = Initial velocity = 0  <math>W_{CAMI}</math> = Weight of CAMI dummy = 17 lb  <math>W_{walker}</math> = Weight of the walker  <math>W_{drop\ weight}</math> = Drop weight = 8 lb  <math>\mu_k</math> = Dynamic coefficient of friction = 0.05  <math>N_{CAMI}</math> = Normal force (for CAMI dummy scenario) = weight of CAMI dummy and walker  <math>g</math> = acceleration of gravity = 32.2 ft/sec<sup>2</sup></p>
7.6.5.1, pg. 10	<p>In the last sentence, the recommended change is “...Position the swivel wheels in such a way that the <del>as they would be if the walker moves rearward in a straight line parallel to Plane A.</del> <b>If the walker has an open back base design, attach the 1 in aluminum angle used in Section 7.3.4 to span the back frame.</b>”</p>
7.6.5.3, pg. 10	<p>The recommended change is “...means of a rope (as specified in <b>7.6.3.3)</b> and a pulley (as specified in <b>Section 7.6.3.3)</b> and adjust the pulley so that the force is applied horizontally (<b><math>0 \pm 0.5^\circ</math> with respect to the table surface</b>).</p>

ASTM F 977-07 Section No., Pg. No.	Suggested Change
7.6.5.5, pg. 10	<p><i>The recommended change is</i> “Repeat 7.6.5.1-7.6.5.4 using the CAMI dummy with the weighted vest (see Fig. 12) and with distance <math>d</math>, =21.2 in. (538 mm) <b>computed using the following equation:</b></p> $d_{CAMI\ w/vest} = \frac{(V_f^2 - V_o^2) * (W_{CAMI\ w/vest} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI\ w/vest})}$ <p>where</p> <p><math>V_f</math> = Maximum velocity of walker at edge of platform = 4 ft/sec  <math>V_o</math> = Initial velocity = 0  <math>W_{CAMI\ w/vest}</math> = Weight of CAMI dummy with 11 lb vest = 28 lbs  <math>W_{walker}</math> = Weight of the walker  <math>W_{drop\ weight}</math> = Drop weight = 8 lb  <math>\mu_k</math> = Dynamic coefficient of friction = 0.05  <math>N_{CAMI\ w/vest}</math> = Normal force (for CAMI dummy fitted with 11 lb vest scenario) = weight of CAMI dummy + vest weight + walker weight  <math>g</math> = acceleration of gravity = 32.2 ft/sec<sup>2</sup></p>
Recommended requirement; currently doesn't exist in ASTM	<p><i>Recommended addition:</i> “<b>Repeat tests in the following sequence: Section 7.6.5.4 and Section 7.6.5.5 two additional times.</b>” <i>The rationale for three test runs is to have parity with the European Standard EN 1273:2005 which requires three test runs.</i></p>

Text edits to Figure 10 of ASTM F 977-07 are shown in Figure A. Added text recommendations are shown in italics.

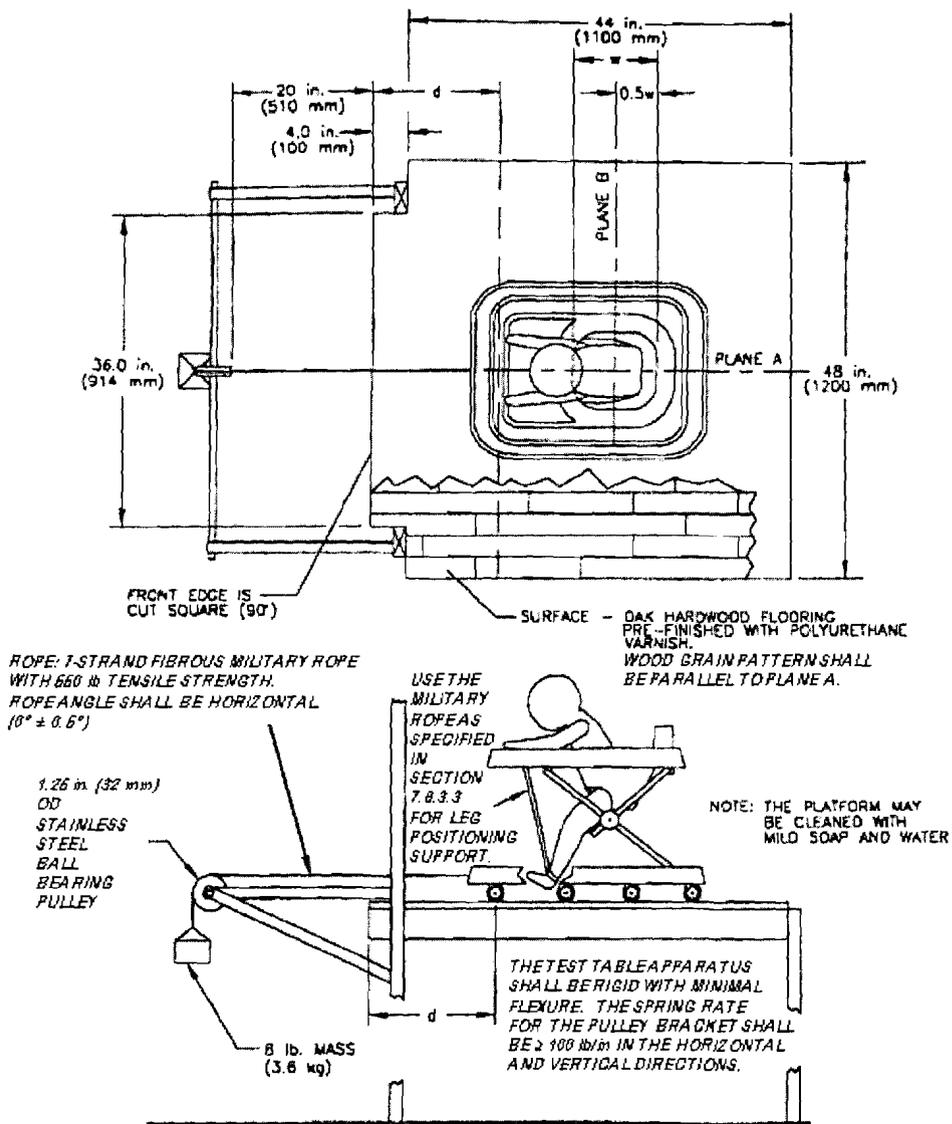


FIG. 10 Test Platform

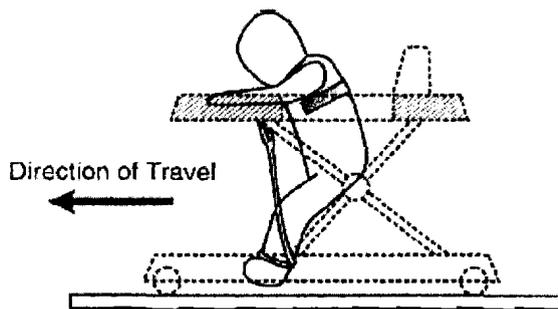


FIG. 11 Dummy Position for Forward Facing Test

FIGURE A

### **C) European Standard for Baby Walking Frames EN 1273:2005 Requirements**

ESME staff evaluated another existing standard related to infant walkers to determine if there are aspects of that standard that should be considered for the future CPSC safety standard. The EN 1273:2005 European Standard contained two performance tests that are currently not in the ASTM F 977-07: the Static Stability 30° Incline Plane Stability test and the Parking Devices Test.

European Commission DG Health and Consumers states that the 30° incline plane test is a standard stability test which is common in several EN children's product safety standards<sup>7</sup>. While there was some discussion of whether the 30° incline test is equivalent or comparable to the "Occupant Leaning Outward Over Edge Test" per Section 7.3.4 of ASTM F 977-07 during the March 18, 2009 ASTM Infant Walker Subcommittee meeting, no conclusion was reached. ESME staff believes that the CPSC mandatory standard should include the 30° incline plane test and the Parking Devices Test. Based on the technical support document for the EN 1273:2005 standard<sup>8</sup>, ESME staff believes that the 30° incline plane test may provide additional safety that may not be covered by the Occupant Leaning Outward Over Edge Test. ESME staff believes that the Parking Devices Test should be included for walkers equipped with parking devices because it is relevant and reasonable to ensure that the walker does not move once the parking device is engaged.

It is not clear whether incident data is available that was the basis for the inclusion of these two performance tests in the European Standard. Nevertheless, ESME staff believes that these additional performance tests would make the existing ASTM standard more stringent.

#### **1) Recommended Text for the Static Stability 30° Incline Plane Test**

Requirement:

When tested to the following procedure, the infant walker shall not overturn.

Test Equipment:

- A sloping platform inclined at 30° to the horizontal with a stop fitted to the lower edge of the slope. The height of the stop shall be 3.94 in (100 mm). See Figure B.
- Test Mass A: A rigid cylinder 6.30 in ± 0.04 in (160 mm ± 1 mm) in diameter, 11.02 in ± 0.04 in (280 mm ± 1 mm) in height with a mass of 26.4 lb (12 kg), with its center of gravity in the center of the cylinder. All edges shall have a radius of 0.79 in ± 0.04 in (20 mm ± 1mm).

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<sup>7</sup> Email from Antonella Corerra of European Commission DG Health and Consumers to Han Lim of CPSC/ESME, February 10, 2009.

<sup>8</sup> "Baby Walking Frames – Final Report," Consumer Council Austrian Standards Institute in co-operation with Association for Consumer Information, European Committee For Standardization, CEN/TC 252/WG 1 N. 255 February 2001.

- Test Mass B: A rigid cylinder 6.30 in  $\pm$  0.04 in (160 mm  $\pm$  1 mm) in diameter, 11.02 in  $\pm$  0.04 in (280 mm  $\pm$  1 mm) in height with a mass of 16.8 lb (12 kg), with its center of gravity in the center of the cylinder.

Test Method:

Adjustable seats shall be adjusted to their highest position. Place Test Mass A vertically in the center of the walker seat. To restrict movement of the test mass, packing of negligible mass may be used. Position the castors or wheels in their most onerous position. Place the walker on the slope against the stop. Carry out the test in the forward, sideward, and rearward directions.

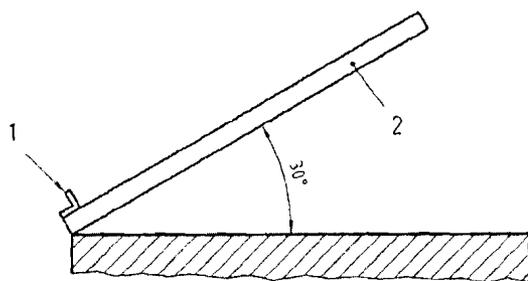


FIGURE B

2) Recommended Text for the Parking Devices Test

This test is only applicable to those walkers equipped with parking devices.

Requirement:

When tested to the procedures below, the infant walker shall have a maximum displacement of 1.97 inches (50 mm) for each test in each direction (forward, rearward, and sideward).

Test Equipment:

- A test platform as specified in Figure A with a hardwood floor pre-finished with polyurethane.
- Test Mass A and Test Mass B per the Static Stability 30° Incline Plane Test Procedure

Test Method:

Adjust the walker seat to the highest position (if applicable). Place Test Mass A in the walker seat. Set any manual speed control to the fastest position (if applicable). Establish a vertical Plane A that passes through the center of the seating area and is parallel to the direction the child faces. Establish a vertical plane B that is perpendicular to plane A and passes through the center of the seating area.

Perform the Parking Devices Test in the forward, sideward, and rearward directions.

*Forward facing test of parking devices*

Position the walker including Test Mass B facing forward so that plane A is perpendicular to the front edge of the platform and passes through the center of the pulley. Engage all parking devices in accordance with the manufacturers' instructions.

Within 1 minute of placing the walker with Test Mass B on the platform, attach an 8 lb weight gradually within 5 seconds to the walker frame base at plane A by means of a rope and a pulley per the test apparatus specifications in the step test procedure, adjusted so that the force is applied horizontally (rope angle shall be  $0 \pm 0.5^\circ$ ). Remove the 8 lb weight after 1 minute. Measure the displacement.

#### *Sideward facing test of parking devices*

Position the walker including Test Mass B facing sideward so that plane B is perpendicular to the front edge of the platform and passes through the center of the pulley. Engage all parking devices in accordance with the manufacturers' instructions.

Within 1 minute of placing the walker with Test Mass B on the platform, attach an 8 lb weight gradually within 5 seconds to the walker frame base at plane B by means of a rope and a pulley per the test apparatus specifications in the step test procedure, adjusted so that the force is applied horizontally (rope angle shall be  $0 \pm 0.5^\circ$ ). Remove the 8 lb weight after 1 minute. Measure the displacement.

#### *Rearward facing test of parking devices*

Position the walker including Test Mass B facing rearward so that plane A is perpendicular to the front edge of the platform and passes through the center of the pulley. Engage all parking devices in accordance with the manufacturers' instructions.

Within 1 minute of placing the walker with Test Mass B on the platform, attach an 8 lb weight gradually within 5 seconds to the walker frame base at plane A by means of a rope and a pulley per the test apparatus specifications in the step test procedure, adjusted so that the force is applied horizontally (rope angle shall be  $0 \pm 0.5^\circ$ ). Remove the 8 lb weight after 1 minute. Measure the displacement.

### **D) General Text Updates**

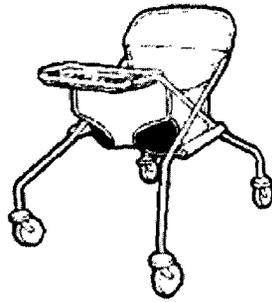
Table 2 below shows the recommended changes and the corresponding section number in the current ASTM F 977-07 standard.

TABLE 2

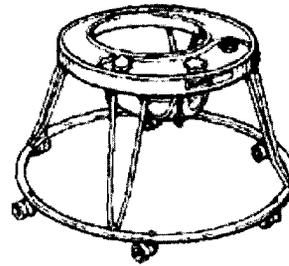
ASTM F 977-07 Section No., Pg No.	Suggested Change
3.1.8, pg. 2	Figure 1 - Update model type(s). <i>There should be a category for the open back base design, as there appear to be several in the marketplace, yet they do not necessarily fit into any of the four types described in Figure 1. Keep the other 4 types in Fig 1, and add other types as needed. Suggested [updated] Figure C below shows a fifth walker type.</i>
4.6.1 through 4.6.8, pg. 2	<i>Specific brands and models of force gauges are not recommended. Only the performance specification of the force gauges shall be listed: "4.6.1 Equipment – Force gauge with a range of 0 to 25 lbf (110N), tolerance of ± 1 Div., and a calibration interval of 1 year." Sections 4.6.2 through 4.6.4 do not need to be included. "4.6.5 Equipment – Force gauge with a range of 0 to 100 lbf (500 N) tolerance of ± 1 Div., and a calibration interval of 1 year." Sections 4.6.6 through 4.6.8 do not need to be included.</i>
Recommended requirement; currently doesn't exist in ASTM; suggested Section Number 8.2.3.3	<i>Since a parking device performance test was proposed, ESME staff consulted Division of Human Factors, Directorate for Engineering Sciences (ESHF) staff for a written warning to alert the caregiver that the child in the walker must be in view, even when the parking device is engaged. Recommended addition: <b>"WARNING: Parking brake use does not totally prevent walker movement. Always keep child in view when in the walker, even when using the parking brake."</b></i>
8.2.4.2, pg. 11	<i>Recommended revision to 8.2.4.2 to account for the proposed parking device performance test: "...Block stairs/steps securely before using walker, <b>even when using the parking brake.</b>"</i>

### III CONCLUSIONS

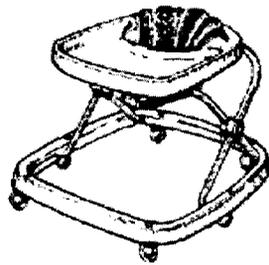
ESME staff recommends adopting the requirements specified in ASTM F 977-07 as the CPSC mandatory standard for infant walkers with several edits along with two additional requirements not currently found in the ASTM standard. These additions and edits would reduce testing variability and potentially result in safer walkers. The edits include adding specificity to the stair step test procedure and various editorial text changes. The recommended new requirements are the two performance tests from the European Standard EN 1273:2005 with some minor modifications.



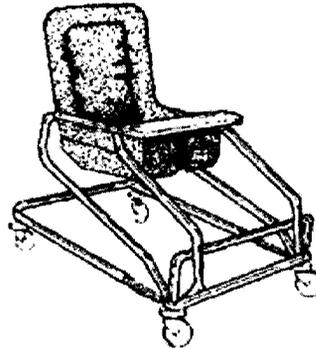
X - Frame



Circular



Adjustable Height



Bouncer - Walker



Open Back

FIGURE C



UNITED STATES  
CONSUMER PRODUCT SAFETY COMMISSION  
WASHINGTON, DC 20207

**Memorandum**

Date: July 29, 2009

TO : Patricia L. Edwards  
Project Manager for Infant Walkers

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

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

SUBJECT : Initial Regulatory Flexibility Analysis of Proposed Standard for Infant Walkers

**Introduction**

On August 14, 2008, the Consumer Product Safety Improvement Act (CPSIA) was enacted. Among its provisions, section 104 requires that Consumer Product Safety Commission (CPSC) evaluate the currently existing voluntary standards for durable infant or toddler products and promulgate a mandatory standard substantially the same as, or more stringent than, the applicable voluntary standard. Walkers, also known as infant or baby walkers, are among the durable products specifically named in section 104.

Upon review, CPSC staff proposes adopting the voluntary ASTM International (formerly known as the American Society for Testing and Materials) standard for infant walkers (F 977 – 07) with a few modifications. The main provisions of the proposed standard include: 1) requirements that walkers pass a series of step tests intended to prevent babies from falling down stairs in their walkers, which would be updated to ensure uniformity in testing equipment and account for heavier walkers; 2) stability requirements, which are designed to prevent product tip-over; 3) structural integrity requirements, including both dynamic and static load tests, and a leg opening requirement intended to prevent entrapment; and 4) torque and tension tests intended to prevent product components from being removable. The standard also includes various general requirements, including the permanency and adhesion of labels, latching and locking mechanisms, warning statements in instructional literature, minimum and maximum opening size requirements, and bans on scissoring, shearing, or pinching. Additionally, CPSC staff recommends including tests for parking brakes (for walkers that have them) and incline plane tests based on similar requirements in European standards.

The Regulatory Flexibility Act (RFA) requires that proposed rules be reviewed for their potential economic impact on small entities, including small businesses. Section 603 of the RFA requires that CPSC staff prepare an initial regulatory flexibility analysis and make it available to

the public for comment when the general notice of proposed rulemaking is published. The initial regulatory flexibility analysis must describe the impact of the proposed rule on small entities and identify any alternatives that may reduce the impact. Specifically, the initial regulatory flexibility analysis 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.

Additionally, the initial regulatory flexibility analysis must contain a description of any significant alternatives to the proposed rule which accomplish the stated objectives of the proposed rule while minimizing the economic impact on small entities.

## **The Product**

Infant walkers are products that support very young preambulatory children (usually 6 to 15 months old). Children may use walkers to sit, recline, bounce, jump, and, most importantly, use their feet to move around. Infant walkers typically consist of fabric seats attached to rigid trays. The trays are fastened to bases that have wheels or casters to make them mobile.<sup>1</sup> For over a century, parents have used infant walker type products in child rearing, with their use increasing in the 1940s.<sup>2</sup> Focus group studies have found that parents believe walkers provide a way for children to explore the environment in a controlled manner, as well as preventing children from ingesting foreign objects that might otherwise be within reach.<sup>3</sup> Walkers are considered unique in their mobility (babies can move from one physical location to another) and portability (some can be easily packed, folded, and carried from one location to another).

## **The Market for Walkers**

Infant walkers are produced and/or marketed by juvenile product manufacturers and distributors. CPSC staff believes that there are currently at least seven manufacturers or importers supplying infant walkers to the U.S. market. There are four domestic manufacturers,

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<sup>1</sup> Rodgers and Leland, "A retrospective benefit-cost analysis of the 1997 stair-fall requirements for baby walkers," *Accident Analysis and Prevention* 40 (2008): 61-68 and Rodgers and Leland, "An evaluation of the effectiveness of a baby walker safety standard to prevent stair-fall injuries," *Journal of Safety Research* 36 (2005): 327-332.

<sup>2</sup> Graco Children's Products, Inc. "Address to the Commission: Comments Opposing the Petition of the Consumer Federation of America et al. to Ban Baby Walkers" December 4, 1992.

<sup>3</sup> See, for example, Shugoll Research for Abt Associates on behalf of U.S. Consumer Product Safety Commission, "Qualitative Research to Examine Perceptions of Baby Walkers and Evaluate Alternative Products," March 1995.

two foreign manufacturers with U.S. divisions, and one domestic importer. Under Small Business Administration (SBA) guidelines, a manufacturer of infant walkers is small if they have 500 or fewer employees and importers are considered small if they have 100 or fewer employees. Based on these guidelines, of the seven firms, there are two small domestic manufacturers<sup>4</sup> and one small domestic importer known to be supplying the U.S. market. However, CPSC staff believes that there are probably other unknown small importers operating in the U.S. market as well.

All known suppliers are members of the Juvenile Products Manufacturers Association (JPMA), the major U.S. trade association that represents juvenile product manufacturers and importers. Each supplies a variety of children's products, of which walkers are only a small proportion. Infant walkers are available in many countries besides the U.S., including China, the U.K., and Australia. Therefore, any foreign manufacturer is a potential supplier to the U.S. market, either directly or indirectly through an importer.

All domestic manufacturers, both small and large, supplying infant walkers to the U.S. market are JPMA certified<sup>5</sup> as compliant with the current ASTM voluntary standard. Based on limited CPSC staff testing, the two foreign manufacturers and the domestic importer are not believed to be compliant with the current voluntary standard.

Sales of infant walkers peaked in the early 1990s at under 2 million annually. By 2005, however, annual walker sales had fallen to around 600,000. Following a similar pattern, walkers in use (the number of walkers estimated to still be in use, regardless of when sold) peaked in the mid-1990s, but have since fallen sharply as well (by 55 percent between 1996 and 2005). As of 2005, the estimated number of walkers in use was probably less than 2 million.<sup>6</sup>

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

Section 104 of the CPSIA requires CPSC to promulgate a mandatory standard for infant walkers that is substantially the same as, or more stringent than, the voluntary standard. In order to assure that walkers are less likely to fall over stairs or tip over, CPSC staff is recommending one modification and two additions to the current ASTM standard. CPSC staff believes that the more stringent standard recommended would reduce the risk of injury associated with infant walkers.<sup>7</sup>

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<sup>4</sup> A third small manufacturer also sells infant walkers, but (based on their current product list) is no longer manufacturing them.

<sup>5</sup> Since 1976, JPMA has run a voluntary Certification Program for several juvenile products, beginning with high chairs. Products voluntarily submitted by manufacturers are tested against the appropriate ASTM standard and only passing products are allowed to display JPMA's Certification Seal. See <http://www.jpma.org/pdfs/certfacts08.pdf> for more information.

<sup>6</sup> Rodgers and Leland, "A retrospective benefit-cost analysis of the 1997 stair-fall requirements for baby walkers," *Accident Analysis and Prevention* 40 (2008): 61-68.

<sup>7</sup> Memorandum from Han Lim, ESME, Directorate for Engineering Sciences dated July 29, 2009, Subject: Proposed changes to the Voluntary Standard for Infant Walkers. (ASTM F 977 – 07) – Segue to a mandatory CPSC Standard for Infant Walkers.

## Compliance Requirements of the Proposed Rule

CPSC staff recommends adopting the voluntary ASTM standard for infant walkers with four modifications. Key components of the current ASTM standard for infant walkers (F 977 – 07) include:<sup>8</sup>

- Prevention of falls down stairs – intended to ensure that a walker will not fall over when facing front, back, and sideways.
- Tipping resistance – intended to ensure that walkers are stable and do not tip over when on a flat surface; includes tests for forward and rear tip resistance, as well as for the occupant leaning over the front.
- Dynamic and static load testing on seating area – intended to ensure that the child remains fully supported while stationary and while bouncing/jumping.
- Occupant retention – intended to prevent entrapment by setting requirements for leg openings.

The voluntary standard also includes: 1) torque and tension tests to assure that components cannot be removed; 2) requirements for several walker features to prevent entrapment and cuts (minimum and maximum opening size, accessible coil springs, leg openings, and edges that can scissor, shear, or pinch); 3) latching/locking mechanism requirements to assure that walkers do not accidentally fold while in use; 4) requirements for the permanency and adhesion of labels; and 5) requirements for instructional literature.

CPSC staff recommends modifying the existing ASTM stair fall test and adding two new requirements:<sup>9</sup>

- Stair fall test
  - Currently, details of the stair fall test (such as the type of rope and pulley used, as well as the orientation of wood grain in the floor) are left up to the manufacturers/testers. CPSC staff proposes modifying the test requirements to be specific about the equipment used, thereby providing consistency to the test results.<sup>10</sup>
  - The calculation of launching distance has been modified to take into account the actual weight of the walker being tested.
- New requirements
  - A parking brake test similar to that included in the European standard.<sup>11</sup>
  - An incline plane test similar to that included in the European standard.<sup>12</sup>

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<sup>8</sup> JPMA, *ASTM Standards listed in JPMA Directory*, [http://www.jpma.org/pdfs/JPMA\\_Directory\\_Final2008.pdf](http://www.jpma.org/pdfs/JPMA_Directory_Final2008.pdf).

<sup>9</sup> Memorandum from Han Lim, ESME, Directorate for Engineering Sciences dated July 29, 2009, Subject: Proposed changes to the Voluntary Standard for Infant Walkers. (ASTM F 977 -- 07) – Segue to a mandatory CPSC Standard for Infant Walkers.

<sup>10</sup> Specifically, CPSC staff recommends a 1.25” stainless steel ball bearing pulley and a 7-strand fibrous military cord with 550-pound tensile strength. CPSC staff also recommends specifying the direction of the wood grain in the flooring and what is meant by “horizontal,” among other modifications.

<sup>11</sup> EN 1273:2005 European Standard.

<sup>12</sup> EN 1273:2005 European Standard.

As stated above, the recommended changes to the existing stair fall test requirements would provide consistency across manufacturers. Also, because the specific test modifications have been selected to minimize the friction associated with the test procedure, they may effectively add stringency to the tests. It is unknown the extent (if any) to which the modification in the existing stair fall requirements of the voluntary standard will affect walkers that now comply with the current voluntary standard. However, initial testing shows that the recommended requirements impact the test results of a few walkers.<sup>13</sup> Therefore, it is possible that some manufacturers might need to make walker modifications to comply. Based on staff estimates of the costs of complying with the 1997 stair fall requirements,<sup>14</sup> this cost is unlikely to exceed more than several dollars per unit.<sup>15</sup>

Infant walkers are not currently required to have parking brakes, nor would they be required to have them under the proposed standard. However, CPSC staff recommends including a test of parking brakes where they exist to assure that they work properly.<sup>16</sup> Initial testing finds that existing walkers have no difficulty in passing this requirement.<sup>17</sup> Therefore, CPSC staff does not expect it to represent a burden to current manufacturers. However, its inclusion would minimize the risk of walkers with ineffective brakes entering the U.S. market in the future.

The 30° incline plane test that CPSC staff recommends adding to the proposed standard is comparable and may be duplicative to the “Occupant Leaning Outward Over Edge Test” in the current voluntary standard. Like the existing requirement, it tests walker vulnerability to tip-over. The safety impact of this inclusion is unclear, but may provide additional safety to walkers over and above the existing requirement. Based on limited testing, it appears that several walkers would pass these added tests without modifications.<sup>18</sup>

## **Other Federal Rules**

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

## **Impact on Small Businesses**

There are seven firms currently known to be marketing infant walkers in the United States.<sup>19</sup> Two are large domestic manufacturers and two are foreign manufacturers with U.S. divisions.

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<sup>13</sup> Based on discussions with Han Lim, Directorate for Engineering Sciences.

<sup>14</sup> Rodgers and Leland (2008).

<sup>15</sup> Minor design and/or materials changes may also be necessary to accommodate the new method of calculating launching distance. However, the effects are expected to be small both in terms of the number of affected walkers and the modification costs. This is based on discussions with Han Lim, Directorate for Engineering Sciences.

<sup>16</sup> Maximum displacement of 1.97 inches (50 mm) using the recommended test procedure.

<sup>17</sup> Based on discussions with Han Lim, Directorate for Engineering Sciences.

<sup>18</sup> Based on discussions with Han Lim, Directorate for Engineering Sciences. Additional independent lab test results presented by industry at the July 21<sup>st</sup> ASTM meeting support this conclusion.

<sup>19</sup> An eighth is also supplying infant walkers to the U.S. market, but does not appear to be manufacturing them anymore.

The impact on the remaining three small firms—two small domestic manufacturers and a small domestic importer—is the focus of the remainder of this analysis.

### ***Small Manufacturers***

One small domestic manufacturer has annual sales of approximately \$31-72.5 million.<sup>20</sup> It currently produces 7 walker models and approximately 57 other juvenile products, 1 of which is a substitute for infant walkers.<sup>21</sup> The second is a small domestic manufacturer with annual sales of approximately \$2.5-5 million.<sup>22</sup> Although their annual sales are lower, they are currently producing only one infant walker model and approximately 110 other juvenile products.

Based on the information presented above, the two small domestic manufacturers (which are JPMA certified as compliant with the voluntary standard) may not need to make product modifications. If they do, it will most likely be due to changes needed to comply with the modified stair fall requirements. The costs to these manufacturers are not likely to be substantial, but may increase by as much as several dollars per unit.

### ***Small Importers***

The only known small domestic importer has annual sales of approximately \$2.5-5 million.<sup>23</sup> As described above, this importer is not believed to be compliant with the current voluntary standard; therefore, at least some product modifications would be necessary. The impact of the proposed infant walker requirements on this importer is unclear, because little is known about the walkers sold by this company. However, the impact is unlikely to be large. Even if they responded to the rule by discontinuing the import of their non-complying walkers, either replacing them with a complying product or another juvenile product, deciding to import an alternative product would be a reasonable and realistic way to offset any lost revenue from walker sales.

There may also be additional small importers of walkers that we have been unable to identify. However, the impacts of the proposed rule on these firms, if any, are unknown.

### **Alternatives**

Under section 104 of the CPSIA, the primary alternative that would reduce the impact on small entities is to make the voluntary standard mandatory with no modifications. Because the two small domestic manufacturers already meet the requirements of the voluntary standard,

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<sup>20</sup> ReferenceUSAGov.

<sup>21</sup> Typical substitutes for infant walkers are products known as “stationary activity centers” or “walker alternatives.” These products continue to provide portability, as do traditional walkers, but only limited mobility. The baby is seated in the product in a similar orientation as that of an infant walker. However, stationary activity centers have a flooring surface so that the child’s feet do not contact the floor. The baby can bounce up and down or rotate 360° in the seat, but cannot move from one physical location to another.

<sup>22</sup> ReferenceUSAGov.

<sup>23</sup> ReferenceUSAGov.

adopting the standard without modifications may reduce their costs, but only marginally. Similarly, limiting the requirements of the standard to those already contained in the voluntary standard would probably have little beneficial impact on small importers that do not currently meet the requirements of the voluntary standard. This is because, to these firms, most of the infant walker cost increases would be associated with meeting the requirements of the current voluntary standard, rather than the minor add-ons associated with the proposed standard.

## **Conclusion**

It is not expected that the proposed standard will have a substantial effect on a large number of small firms. In some cases, small firms may not need to make *any* product modifications to achieve compliance. Even if they were so required, and the cost of developing a compliant product proved to be a barrier for individual firms, the loss of infant walkers as a product category is expected to be minor and would likely be mitigated by increased sales of competing products, such as activity centers, or entirely different juvenile products.

Draft *Federal Register* Notice  
Safety Standard for Infant Walkers  
Notice of Proposed Rulemaking (NPR)

[Billing Code 6355-01-P]  
CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Part 1216

**Safety Standard for Infant Walkers: Notice of Proposed Rulemaking**

**AGENCY:** Consumer Product Safety Commission.

**ACTION:** Notice of proposed rulemaking.

**SUMMARY:** Section 104(b) of the Consumer Product Safety Improvement Act of 2008 ("CPSIA") requires the United States Consumer Product Safety Commission ("CPSC" or "Commission") 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 concludes that more stringent requirements would further reduce the risk of injury associated with the product. The Commission is proposing a safety standard for infant walkers in response to the direction under section 104(b) of the CPSIA.

**DATES:** Written comments must be received by **[insert date 75 days after publication in *Federal Register*]**.

**ADDRESSES:** You may submit comments, identified by Docket No. [insert CPSC docket number], by any of the following methods:

Electronic Submissions

Submit electronic comments in the following way:

Federal eRulemaking Portal: <http://www.regulations.gov>.

Follow the instructions for submitting comments.

To ensure timely processing of comments, the Commission is no longer accepting comments submitted by electronic mail (e-mail) except through [www.regulations.gov](http://www.regulations.gov).

Written Submissions

Submit written submissions in the following way:

Mail/Hand delivery/Courier (for paper, disk, or CD-ROM submissions), preferably in five copies, to: Office of the Secretary, Consumer Product Safety Commission, Room 502, 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 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 electronically. 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>.

**FOR FURTHER INFORMATION CONTACT:** Patricia Edwards, Project Manager, Directorate for Engineering Sciences, Consumer Product Safety Commission, 4330 East West Highway, Bethesda, MD 20814; telephone (301) 504-7577; [pedwards@cpsc.gov](mailto:pedwards@cpsc.gov).

**SUPPLEMENTARY INFORMATION:**

**A. Background and Statutory Authority**

***1. The Consumer Product Safety Improvement Act***

The Consumer Product Safety Improvement Act of 2008 ("CPSIA", Pub. Law 110-314) was enacted on August 14, 2008. Section 104(b) of the CPSIA requires the Commission 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 concludes that more stringent requirements would further reduce the risk of injury associated with the product. Section 104(b)(2) of the CPSIA directs the Commission to begin rulemaking for two standards by August 14, 2009. In this document, the Commission proposes a safety standard for infant walkers. The proposed standard

is substantially the same as a voluntary standard developed by the American Society for Testing and Materials, ASTM F 977-07 *Standard Consumer Safety Specification for Infant Walkers*, but with several modifications that strengthen the standard.

**2. Existing Mandatory Regulations for Walkers**

The Commission currently has regulations for infant walkers, originally issued in 1971 by the Food and Drug Administration, at 16 CFR 1500.18(a)(6) and 16 CFR 1500.86(a)(4). These regulations apply to items known as baby bouncers, walker-jumpers, and baby walkers. The regulations declare as a banned hazardous substance such an item "which because of its design has any exposed parts capable of causing amputation, crushing, lacerations, fractures, hematomas, bruises, or other injuries to fingers, toes, or other parts of the anatomy of young children." 16 CFR 1500.18(a)(6). The regulations set out mechanical, labeling, and recordkeeping requirements with which such items must comply in order to be exempt from the ban. 16 CFR 1500.86(a)(4). These specifically address such hazards as scissoring, shearing or pinching; exposed coil springs in which a child could become caught; holes in plates or tubes; and accidental collapse of the item.

These regulations do not address hazards associated

with falls down stairs, structural integrity, occupant retention, or loading/stability issues. The ASTM F 977-07 standard contains provisions that the mandatory regulations lack or requirements that are more stringent than the mandatory standard.

Elsewhere in this issue of the FEDERAL REGISTER, the Commission is proposing to revoke the existing CPSC regulations for walkers. As explained in the proposed revocation notice, the existing regulations are based on incomplete and outdated anthropometric data. Revoking the existing regulations will also avoid confusion about what requirements apply to infant walkers. The Commission is concerned, however, that the existing mandatory regulations may cover products not covered by the ASTM F 977-07 standard (or other voluntary standards) and that revocation of the mandatory requirements may leave a gap in regulation. The Commission's proposal to revoke the existing CPSC regulations for walkers invites comments on this issue.

### ***3. Previous Rulemaking Concerning Stair Fall Hazard***

In August 1994 the Commission published an advance notice of proposed rulemaking ("ANPR") in the FEDERAL REGISTER (59 FR 39306) initiating a rulemaking proceeding on infant walkers under the Federal Hazardous Substances

Act ("FHSA"). The Commission stated at that time that it had reason to believe that walkers presented an unreasonable risk of injury due to the hazard of walkers falling down steps or stairs. After the ANPR was published, CPSC staff worked with ASTM to develop new requirements that could be added to the existing voluntary standard to address the stair-fall hazard. A revised ASTM standard including such provisions was published in early 1997 as ASTM F 977-07. In May 2002, the Commission voted to terminate the FHSA walker rulemaking because it could not make the findings necessary to issue a mandatory rule in light of the revised voluntary standard. 67 FR 31165 (May 9, 2002).

**B. The Product**

Infant walkers are used to support very young children before they are walking (usually 6 to 15 months old). ASTM F 977-07 defines "walker" as "a mobile unit that enables a child to move on a horizontal surface when propelled by the child sitting or standing within the walker, and that is in the manufacturer's recommended use position." Children may use walkers to sit, recline, bounce, jump, and use their feet to move around. Walkers typically consist of fabric seats attached to rigid trays. The trays are fastened to bases that have wheels or casters to make them mobile.

Currently, there are at least seven manufacturers or importers supplying walkers to the United States market (four domestic manufacturers, two foreign manufacturers with divisions in the United States, and one domestic importer).

All known suppliers of infant walkers are members of the Juvenile Products Manufacturers Association (JPMA), the major United States trade association that represents juvenile product manufacturers and importers. Each supplies a variety of children's products, of which walkers are only a small proportion. Infant walkers are available in many countries besides the United States, including China, the United Kingdom, and Australia. Therefore, any foreign manufacturer is a potential supplier to the United States market, either directly or indirectly through an importer.

Infant walkers made by all of the domestic manufacturers supplying baby walkers to the United States market are JPMA certified as compliant with the current ASTM voluntary standard. Based on limited CPSC staff testing, CPSC staff does not believe that the two foreign manufacturers and the domestic importer are making walkers that are compliant with the current voluntary standard.

Sales of infant walkers peaked in the early 1990s at less than 2 million annually. By 2005, however, annual walker sales had fallen to around 600,000. Following a similar pattern, walkers in use (the number of walkers estimated to still be in use, regardless of when sold) peaked in the mid-1990s, but have since fallen sharply as well (by 55 percent between 1996 and 2005). As of 2005, the estimated number of walkers in use was probably less than 2 million.

### **C. Incident Data**

#### **1. Injury Estimates**

There were an estimated total of 14,900 (an annual average of 3,000) infant walker-related injuries among children under the age of 15 months that were treated in hospital emergency departments in the United States over the five-year period 2004-2008.<sup>1</sup> (This estimate has been adjusted to exclude jumpers from the walker code.) No deaths were reported through NEISS. There was no statistically significant increase or decrease observed in the estimated injuries from one year to the next, nor was there any statistically significant trend observed over the

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<sup>1</sup>The source of injury estimates is the National Electronic Injury Surveillance System ("NEISS"), a statistically valid injury surveillance system based on data gathered from emergency departments of hospitals selected as a probability sample of all the United States hospitals with emergency departments.

2004-2008 period. For the emergency department-treated injuries related to infant walkers, the following characteristics occurred most frequently based on an annual average:

- Hazard - falls either out of the walker or down stairs/to a lower level while in the walker (62%)
- Injured body part - head (45%) and face (27%)
- Injury type - contusions/abrasions (37%) and internal organ injury (28%)
- Disposition - treated and released (90%) and hospitalized (5%).

For approximately 72 percent of the injuries reported, the walker was directly involved in the incident (such as the walker falling down stairs, tipping over, collapsing).

However, many (nearly 20 percent) of the emergency department-treated injuries were not necessarily caused by failures of the walkers.

The stair-fall protection provisions in the ASTM standard have dramatically affected walker-related incidents. From 1994 to 2008 there has been an 88% decrease in estimated walker-related incidents treated in emergency rooms (from 24,000 to 2,800). Nevertheless, the stair fall hazard is the most prevalent hazard in walker-related incidents. Some of these incidents involve non-compliant walkers, damaged or worn walkers, or children who

are strong enough to lift the walker and defeat the stair-fall protection.

## **2. Fatalities**

CPSC staff has reports of eight fatal incidents involving an infant in a walker during the five year period 2004 to 2008.<sup>2</sup> One of these appears to involve a stair fall incident. The walker involved did not conform to the ASTM walker standard's stair fall performance requirements and had been under recall at the time of the death (due to the lack of stair fall protection). There were three deaths that resulted from accidental drowning when the child moved in a walker into a residential pool or spa. Two of these three deaths involved walkers that were certified to the JPMA standard, though pictures showed that one of the walkers was missing a wheel. The physical condition of the other walker is unknown. The circumstances of the remaining four deaths varied and involved non-fall related circumstances (*i.e.*, a slow cooker overturned on an infant in a walker who pulled the cord of the cooker, an infant pulled a heavy dining chair on himself, an infant rolled down a driveway and struck a moving vehicle, and an infant aspirated a screw while seated in a walker).

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<sup>2</sup>The reported fatalities and non-fatalities are neither a complete count of all incidents that occurred during the period nor a sample of known probability of selection.

### **3. Non-fatal Injuries**

A total of 78 non-fatal injuries were reported to have occurred between 2004 and 2008. All of these injuries occurred when the infant was seated in a walker. The leading cause of injury (about 42% of the injuries) was falls down the stairs or to a lower level. The next major cause of injury was product failure, either structural or mechanical failure of the walker, and these accounted for another 37% of the incidents. The attached toys, toy bars, or toy trays on the walker caused another 17% of the injuries, such as lacerations, abrasions, pinching, etc. Three percent of the non-fatal reported injuries were serious burn injuries resulting from infants pulling cords of small cooking appliances and spilling hot liquids onto themselves. Finally, one percent of the reported incidents did not specify the injury.

#### **D. ASTM Voluntary Standard**

ASTM F 977 *Standard Consumer Safety Specification for Infant Walkers* was first published in 1986. As mentioned above in part A.3 of the preamble, it was revised in 1997 to address the stair-fall hazard.

JPMA provides certification programs for juvenile products, including walkers. Manufacturers submit their products to an independent test laboratory to test the

product for conformance to the ASTM standard. Currently walkers from five manufacturers are JPMA certified as being in compliance with the ASTM standard.

The current ASTM standard includes performance requirements specific to walkers, general performance requirements, and labeling requirements. The key provisions of the current ASTM walker standard include the following:

- Prevention of falls down stairs - intended to ensure that a walker will not fall over when facing front, back, and sideways.
- Tipping resistance - intended to ensure that walkers are stable and do not tip over when on a flat surface; includes tests for forward and rear tip resistance, as well as for the occupant leaning over the front.
- Dynamic and static load testing on seating area - intended to ensure that the child remains fully supported while stationary and while bouncing/jumping.
- Occupant retention - intended to prevent entrapment by setting requirements for leg openings.

The current ASTM standard also includes: 1) torque and tension tests to assure that components cannot be removed;

2) requirements for several walker features to prevent entrapment and cuts (minimum and maximum opening size, accessible coil springs, leg openings, and edges that can scissor, shear, or pinch); 3) latching/locking mechanism requirements to assure that walkers do not accidentally fold while in use; 4) requirements for the permanency and adhesion of labels; and 5) requirements for instructional literature.

The Commission believes that the ASTM standard's performance tests for evaluating the stability and structural integrity of infant walkers are adequate. However, the Commission believes that changes to the stair fall requirement are needed to better control testing variability and consistency. As discussed below, the Commission also is proposing to add a 30° incline plane test and a parking brake test from the European standard for walkers (EN 1273: 2005), and making editorial text changes to ASTM F 977-07 to clarify several provisions.

**E. Assessment of Voluntary Standard ASTM F 977-07**

**1. Section 104(b) of the CPSIA: Consultation and CPSC Staff Review**

Section 104(b) of the CPSIA requires the Commission to assess the effectiveness of the voluntary standard in consultation with representatives of consumer groups,

juvenile product manufacturers, and other experts. This consultation process began in October 2008 during the ASTM subcommittee meeting regarding the ASTM infant walker voluntary standard. Consultations between Commission staff and members of this subcommittee have continued and are still ongoing.

To evaluate the ASTM infant walker standard and develop recommendations for changes to it, CPSC staff conducted testing on JPMA-certified walkers. The testing focused on the stair fall test in the current ASTM standard, a stability performance requirement, and a parking brake requirement (the latter two both taken from a European standard on walkers, EN 1273:2005).

## **2. Current Stair Fall Requirement in ASTM F 977-07**

The stair fall requirement is the key provision in the ASTM standard. For this test, a walker with a Civil Aeromedical Institute infant dummy (Mark II) (subsequently referred to as "CAMI dummy") is placed in the walker's seat which is propelled with a horizontal dynamic force by means of a pulley, rope, and a falling 8 lb weight on a hardwood floor surface. The walker passes the test if it stays on the hardwood floor table surface. It fails the test if the walker completely falls off the table surface.

The current ASTM standard is based on the assumption that an average walker weighs 8 pounds. However, the average weight of recent model walkers is greater than 8 pounds, the typical weight of earlier models. CPSC staff weighed five 2008 to 2009 model walkers. The weight values ranged from 11 to 14 pounds. Computing the launching distance  $d$  as described in section 7.6 of ASTM F 977-07 depends on the weight of the walker, the weight of the CAMI dummy, the weight of the CAMI vest, the coefficient of friction between the walker wheels and the test table surface, and the maximum velocity at the edge of the test table platform (4 ft/sec or 2 ft/sec). According to section 7.6 of ASTM F 977-07, the  $d$  value for the forward and rearward directions with only the CAMI dummy seated in the walker is 14.6 inches. The  $d$  value for the forward and rearward directions with the CAMI dummy fitted with the 11-pound vest seated in the walker is 21.2 inches. The values of 14.6 inches and 21.2 inches were based on the assumption that the walker weight is 8 pounds.

In the current ASTM standard, most of the hardware and test apparatus components are not specified. Variability in the type and size of the pulley, rope type, test table flexure etc. can lead to different test results. Two

different labs could test the same model walker and obtain different results.

CPSC staff participated in various round robin tests and conducted its own tests to evaluate the effects of test apparatus components and test conditions related to the stair fall test requirement. As a result of this testing, the Commission is proposing changes to the current ASTM test procedure to reduce test variability. These proposed changes are discussed in part F of this preamble.

CPSC staff also performed a modified version of the stair fall performance test on the decking of various residential pools to assess if any changes to the ASTM standard were necessary to address the two fatal incidents involving children using JPMA-certified walkers that fell into residential pools. The test results indicated that JPMA-certified walkers passed (i.e., did not fall in the pool) when tested to the same conditions as the ASTM standard (terminal velocity of 4 ft/sec, CAMI dummy fitted with the 11 pound vest seated in the walker). CPSC staff did not recommend any changes to the ASTM standard as a result of this testing at pools, and the Commission is not proposing any.

### **3. European Standard EN 1273:2005**

CPSC staff evaluated another existing standard related to infant walkers to determine if any aspects of that standard should be considered for the future CPSC safety standard. The EN 1273:2005 European Standard contains two performance tests that are currently not in the ASTM F 977-07: the 30° incline plane stability test and the parking devices test.

The 30° incline plane test is a standard stability test which is common in several EN children's product safety standards. The walker, occupied by a 26.4 lb (12 kg) test mass is placed on a sloping platform inclined at 30° to the horizontal with a stop on the lower edge of the slope. The walker must not tip over.

The parking device test is only applicable to walkers that are equipped with a parking brake. It essentially requires conducting a semi-static version of the stair fall test, but with the parking device engaged. The walker must not move more than 1.97 inches (50 mm) in order to pass.

Available incident data does not clearly demonstrate whether inclusion of these two performance tests would improve the safety of walkers. CPSC staff tested selected walkers that currently pass the ASTM standard to these additional tests. The walkers also passed these tests. As discussed further in part F of this preamble, however,

inclusion of these provisions may provide some additional safety.

**F. Description of Proposed Changes to ASTM F 977-07**

As discussed at part E.2 of this preamble, CPSC staff conducted tests and evaluations of infant walkers to determine any modification that might be needed to the ASTM standard. Based on this assessment and consultations with others, the Commission proposes as a consumer product safety standard for infant walkers the ASTM F 977-07 standard with the following modifications.

To best understand the proposed standard it is helpful to view the current ASTM F 977-07 standard for walkers at the same time as the Commission's proposed modifications. The ASTM standard is available for viewing for this purpose during the comment period through a link on the Commission's website at [INSERT LINK].

**1. Changes to the Stair Step Fall Test**

*Specification of equipment and procedures.* Currently, the ASTM stair fall test lacks numerous details. This allows for variability in testing that could result in different test results. The Commission is proposing to specify the equipment and procedure needed for the test (e.g., type of rope and pulley to be used, orientation of wood grain in the floor).

Additionally, the Commission proposes to modify the test procedure language in several provisions, such as specifying a tolerance for the term "horizontal" ( $0^\circ \pm 0.5^\circ$ ). These modifications would make the proposed standard more stringent than the ASTM standard if, due to the lack of clarity in the ASTM standard, some test laboratories are currently passing some walkers that do not in fact comply with the standard. In addition, minimizing friction in the test apparatus and flexure in the test table would *maximize* the transfer of dynamic energy to the walker and CAMI dummy, hence creating more stringent performance requirements.

*Calculation of launching distance.* The Commission is also proposing a change in the calculation of the launching distance used in the stair fall test. The Commission proposes weighing the walker and computing the appropriate launching distances using the equations below.

$$d_{CAMI} = \frac{(V_f^2 - V_o^2) * (W_{CAMI} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI})}$$

$$d_{CAMI\ w/vest} = \frac{(V_f^2 - V_o^2) * (W_{CAMI\ w/vest} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI\ w/vest})}$$

where

$V_f$  = Maximum velocity of walker at edge of platform = 4 ft/sec (for forward and rearward directions); 2 ft/sec (for sideward direction)

$V_o$  = Initial velocity = 0

$W_{CAMI}$  = Weight of CAMI dummy = 17 lb

$W_{CAMI\ w/vest}$  = Weight of CAMI dummy with 11 lb vest = 28 lbs

$W_{walker}$  = Weight of the walker

$W_{drop\ weight}$  = 8 lb

$\mu_k$  = Dynamic coefficient of friction = 0.05

$N_{CAMI}$  = Normal force (for CAMI dummy scenario) = weight of CAMI dummy and walker

$N_{CAMI\ w/vest}$  = Normal force (for CAMI dummy fitted with 11 lb vest scenario) = weight of CAMI dummy + vest + walker

$g$  = Acceleration of gravity = 32.2 ft/sec<sup>2</sup>

The launching distances may vary depending on the weight of the walker and the maximum velocity of the walker at the edge of the platform (4 ft/sec or 2 ft/sec). The appropriate launching distances need to be computed for each walker model, in each direction, with and without the 11 pound vest. CPSC staff believes that if the walker weight is not appropriately accounted for, then it is possible the target maximum velocity cannot be achieved. For example, if the scenario involved computing distance  $d$  where the walker is tested in the forward direction with the CAMI dummy and the walker weight is 14 pounds, distance  $d$  would equal 18.0 inches (instead of 14.6 inches if the walker weight value is 8 pounds). The longer distance is needed to achieve the target velocity of 4 ft/sec. If a 14-pound walker is launched from 14.6 inches, the walker

may not achieve the maximum velocity of 4 ft/sec. The proposed change will mean that each walker will be subjected to the same target maximum velocity even if the weight of the walkers varies. This proposed change may create more stringent performance requirements.

## **2. Addition of 30° Incline Plane Test and Parking**

### **Brake Test**

As discussed above in part E.3 of this preamble, the Commission is proposing to add to the ASTM standard two provisions currently in the European Standard EN 1273:2005 for walkers.

*The 30° incline plane test.* Under this test, as explained above, a walker with a 26.4 pound (12 kg) test mass is placed on a sloping platform that is inclined at 30 degrees to the horizontal with a stop on the lower edge of the slope. In order to pass, the walker must not tip over. The current ASTM standard contains a provision to address children leaning out over the edge of the walker. The ASTM provision concerning leaning over the edge of the walker requires a cantilevered 17-pound force with approximately a 6 to 7 inch moment arm on a level surface. The 30° test uses a 26.4-pound test mass seated on a (up to) 14-pound walker on an incline plane. In certain scenarios, the 30° test may be more stringent.

*The parking brake test.* The parking brake test would apply to walkers that have parking brakes. It would not require walkers to have parking brakes. Under this test, the walker is set up to run a quasi-static version of the stair fall performance test, but with the parking device activated. If the walker moves a distance greater than 1.97 inches (50 mm), the walker fails the requirement. The parking brake test will ensure that, if a walker has a parking brake, it will work effectively. This could affect safety because, if a parking brake is present, caregivers may rely on it to temporarily stop the walker.

### **3. Summary of Proposed Changes to ASTM F 977-07**

The more substantive proposed modifications to the ASTM standard for walkers have been discussed above in parts F.1 and F2 of this preamble. A summary of these proposed changes and the other, more editorial/technical changes the Commission is proposing follows:

- Update the illustration of types of models of walkers in Figure 1 of the ASTM standard to include an open back design (proposed § 1216.2(b)(1)).
- Revise equipment specifications in section 4.6 of ASTM standard to eliminate brand and model of force gauge and provide performance specification instead (proposed § 1216.2(b)(2) through (5)).

- Revise Figure 10 of the ASTM standard to show specific rope, other equipment and procedures for stair step test (proposed § 1216.2(b)(17)).
- In stair step test procedures, add a calculation (discussed above) to determine launching distance rather than assuming an 8-pound walker. (proposed § 1216.2(b)(7), (8), (11), (13), (15), (18), (20)).
- In stair step test procedures, specify the position for walker wheels (proposed § 1216.2(b)(7), (13), (18)).
- In stair step test procedures, specify the position for CAMI dummy. (proposed § 1216.2(b)(9)).
- In stair step test procedures, specify rope type, pulley type, and force to be applied. (proposed § 1216.2(b)(6), (10), (14), (19)).
- In stair step test procedures, require each aspect of test (forward, sideward, and rearward) three times to make it consistent with the European Standard EN 1273:2005 and allow more confidence in the test results. (proposed § 1216.2(b)(12), (16), (21)).
- Add the following warning concerning the parking brake if a walker has a parking brake: "WARNING: Parking brake use does not totally prevent walker movement."

Always keep child in view when in the walker, even when using the parking brakes." (proposed § 1216.2(b)(22)).

- Revise the stair hazard warning to state: "Block stairs/steps securely before using walker, even when using parking brake." (proposed § 1216.2(b)(23)).
- Add 30° incline plane test (proposed § 1216.2(c)).
- Add parking device test (proposed § 1216.2(d)).

#### **G. Request for Comments**

This NPR begins a rulemaking proceeding under section 104(b) of the CPSIA to issue a consumer product safety standard for walkers. All interested persons are invited to submit their comments to the Commission on any aspect of the proposed rule. Comments should be submitted in accordance with the instructions in the ADDRESSES section at the beginning of this notice.

#### **H. 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. Id. 553(d). To allow time for infant walkers to come into compliance the Commission proposes that the standard would become effective 6 months after publication of a final rule.

#### **I. Paperwork Reduction Act**

The Commission is not proposing any collections of information in this regulation. Therefore, the Paperwork Reduction Act, 44 U.S.C. 3501-3520, does not apply.

**J. Regulatory Flexibility Act**

The Regulatory Flexibility Act ("RFA") generally requires that agencies review proposed rules for their potential economic impact on small entities, including small businesses. 5 U.S.C. 603.

*1. The Market*

As mentioned above, there are currently at least seven manufacturers or importers supplying infant walkers to the U.S. market (four domestic manufacturers, two foreign manufacturers with divisions in the United States, and one domestic importer). Under Small Business Administration (SBA) guidelines, a manufacturer of infant walkers is small if it has 500 or fewer employees and an importer is considered small if it has 100 or fewer employees. Two domestic manufacturers (a third small manufacturer also sells baby walkers, but based on their current product list is no longer manufacturing them) and one domestic importer known to be supplying the United States market qualify as small businesses under these guidelines. However, CPSC staff believes that there are probably other unknown small importers operating in the United States market as well.

As noted above, all domestic manufacturers supplying infant walkers to the United States market certify their products as compliant with the current ASTM voluntary standard through the JPMA certification program. Based on limited CPSC staff testing, the two foreign manufacturers and the domestic importer are not believed to be complying with the current voluntary standard.

*2. Impact of the Proposal*

As stated above, the proposed changes to the existing stair fall test requirements would reduce variability across manufacturers. Also, because the specific test modifications have been selected to minimize the friction associated with the test procedure, they may effectively add stringency to the tests. It is unknown the extent (if any) to which the proposed modification in the existing stair fall requirements of the voluntary standard will affect walkers that now comply with the current voluntary standard. However, initial testing shows that the proposed requirements impact the test results of a few walkers. Therefore, it is possible that some manufacturers might need to make walker modifications to comply. Based on staff estimates of the costs of complying with the 1997 stair fall requirements, this cost is unlikely to exceed more than several dollars per unit.

Infant walkers are not currently required to have parking brakes, nor would they be required to have them under the proposed standard. However, the Commission proposes including a test of parking brakes if a walker has them to assure that they work properly. Initial testing finds that existing walkers have no difficulty in passing this requirement. Therefore, the Commission does not expect it to represent a burden to current manufacturers. However, its inclusion would minimize the risk of walkers with ineffective brakes entering the United States market in the future.

The 30° incline plane test that the Commission proposes adding to the ASTM standard is comparable to, and may be duplicative of, the "Occupant Leaning Outward Over Edge Test" in the current voluntary standard. Like the existing requirement, it tests walker vulnerability to tip-over. The safety impact of this inclusion is unclear, but may provide additional safety to walkers over and above the existing requirement. Based on limited testing, it appears that several walkers would pass these added tests without modifications.

As noted before, of the seven firms currently known to be marketing infant walkers in the United States, three are small firms – two small domestic manufacturers and a small

domestic importer. Below is a discussion of the possible impact of the proposal on these entities.

*Small manufacturers.* The two small domestic manufacturers (which are JPMA certified as compliant with the voluntary standard) may not need to make product modifications. If they do, it will most likely be due to changes needed to comply with the proposed modifications to the stair fall requirements. The costs to these manufacturers are not likely to be substantial, but may increase by as much as several dollars per unit.

*Small importers.* The only known small domestic importer is not believed to be compliant with the current voluntary standard; therefore, at least some product modifications would be necessary. The impact of the proposed infant walker requirements on this importer is unclear, because little is known about the walkers sold by this company. However, the impact is unlikely to be large. Even if the company responded to the rule by discontinuing the import of its non-complying walkers, either replacing them with a complying product or another juvenile product, deciding to import an alternative product would be a reasonable and realistic way to offset any lost revenue from walker sales.

There also may be importers of walkers that we have been unable to identify. However, the impacts of the proposed rule on these firms, if any, are unknown.

### *3. Alternatives*

Under section 104 of the CPSIA, the primary alternative that would reduce the impact on small entities is to make the voluntary standard mandatory with no modifications. Because the two small domestic manufacturers already meet the requirements of the voluntary standard, adopting the standard without modifications may reduce their costs, but only marginally. Similarly, limiting the requirements of the standard to those already contained in the voluntary standard would probably have little beneficial impact on small importers that do not currently meet the requirements of the voluntary standard. This is because, to these firms, most of the infant walker cost increases would be associated with meeting the requirements of the current voluntary standard, rather than the minor add-ons associated with the proposed standard.

### *4. Conclusion of initial regulatory flexibility analysis*

It is not expected that the proposed standard will have a substantial effect on a large number of small

firms. In some cases, small firms may not need to make any product modifications to achieve compliance. Even if modifications were necessary, and the cost of developing a compliant product proved to be a barrier for individual firms, the loss of infant walkers as a product category is expected to be minor and would likely be mitigated by increased sales of competing products, such as activity centers, or entirely different juvenile products.

**K. Environmental Considerations**

The Commission's regulations provide a categorical exemption for the Commission's rules from any requirement to prepare an environmental assessment or an environmental impact statement as they "have little or no potential for affecting the human environment." 16 CFR 1021.5(c)(2). This proposed rule falls within the categorical exemption.

**List of Subjects in 16 CFR 1216**

Consumer protection, Imports, infants and children, Labeling, Law enforcement, and Toys.

Therefore, the Commission proposes to amend Title 16 of the Code of Federal Regulations by adding part 1216 to read as follows:

**PART 1216 - SAFETY STANDARD FOR INFANT WALKERS**

Sec.

1216.1 Scope, application and effective date.

1216.2 Requirements for infant walkers.

**AUTHORITY:** The Consumer Product Safety Improvement Act of 2008, Pub. Law 110-314, § 104, 122 Stat. 3016 (August 14, 2008).

**§ 1216.1 Scope, application and effective date.**

This part 1216 establishes a consumer product safety standard for infant walkers manufactured or imported on or after (insert date 6 months after date of publication in a final rule the FEDERAL REGISTER).

**§ 1216.2 Requirements for infant walkers.**

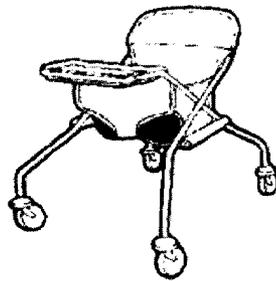
(a) Except as provided in paragraphs (b), (c) and (d) of this section, each infant walker shall comply with all applicable provisions of ASTM F 977-07, Standard Consumer Safety Specification for Infant Walkers, approved April 1, 2007. The Director of the Federal Register approves this incorporation by 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, PO Box 0700, West Conshohocken, PA 19428; [www.astm.org](http://www.astm.org). You may inspect a copy at the Office of the Secretary, U.S. Consumer Product

Safety Commission, Room 502, 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:

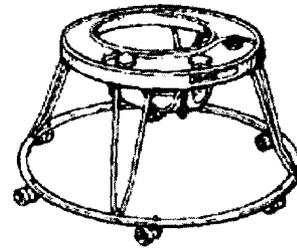
[http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_re  
gulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

(b) The following provisions replace, or are added  
to, the indicated sections of the ASTM F 977-07 standard.

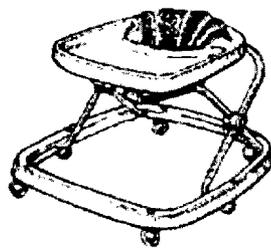
(1) Instead of Figure 1:



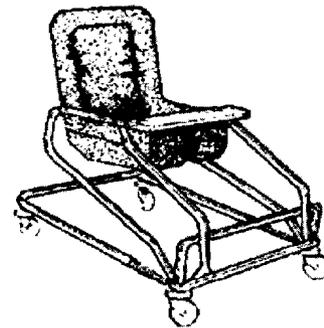
X-Frame



Circular



Adjustable Height



Bouncer-Walker



Open Back

Figure 1 Illustration of Types of Infant Walkers

(2) Instead of section 4.6.1: "Equipment - Force gauge with a range of 0 to 25 lbf (110 N), tolerance of  $\pm 1$  Div., and a calibration interval of 1 year."

(3) Delete sections 4.6.2 through 4.6.4.

(4) Instead of section 4.6.5: "Equipment - Force gauge with a range 0 to 100 lbf (500 N) tolerance of  $\pm 1$  Div., and a calibration interval of 1 year."

(5) Delete sections 4.6.6 through 4.6.8.

(6) Instead of section 7.6.1.2: "The dummy may be secured to the tray to maintain contact during the test. Raise the dummy's legs just enough so its feet do not touch the platform during the performance of the test and position using the rope specified in Figure 10."

(7) Instead of section 7.6.3.1: "Center the walker on the test platform facing forward so that Plane A is perpendicular to the front edge of the platform and the walker is distance  $d$  from the center of the most forward wheel(s) to the edge of the test platform,

$$d_{CAMI} = \frac{(V_f^2 - V_o^2) * (W_{CAMI} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI})}$$

where

$V_f$  = Maximum velocity of walker at edge of platform = 4 ft/sec

$V_o$  = Initial velocity = 0

$W_{CAMI}$  = Weight of CAMI dummy = 17 lb

$W_{walker}$  = Weight of the walker

$W_{drop\ weight}$  = Drop weight = 8 lb

$\mu_k$  = Dynamic coefficient of friction = 0.05  
 $N_{CAMI}$  = Normal force (for CAMI dummy scenario) = weight of CAMI dummy and walker  
 $g$  = acceleration of gravity = 32.2 ft/sec<sup>2</sup>

Position the swivel wheels in such a way that the walker moves forward in a straight line parallel to Plane A."

(8) Instead of Table 1 Summary of Step(s) Tests:

TABLE 1 Summary of Step(s) Tests

Section Number	Facing Direction of walker	Weight of CAMI Dummy, lb	Simulated Speed, ft/s	Apply Tipover Test
7.6.3	forward	17	4	yes
7.6.3.6	forward	28 (vest)	4	yes
7.6.4	sideward	17	2	yes
7.6.4.6	sideward	28 (vest)	2	yes
7.6.5	rearward	17	4	no
7.6.5.5	rearward	28 (vest)	4	no

(9) Instead of section 7.6.3.2: "Place a CAMI infant dummy Mark II in the walker and position it as shown in Fig. 11 with the torso contacting the front of the occupant seating area and arms placed on the walker tray."

(10) Instead of section 7.6.3.3: "While holding the walker stationary, attach an 8 lb (3.6 kg) weight to the front of the walker base at Plane A by means of a 7-strand military rope with 550 lb tensile strength (e.g., paracord 550) and a stainless steel ball bearing pulley with an outside diameter of 1.25 in (32mm) and adjust the pulley so that the force is applied horizontally ( $0 \pm 0.5^\circ$  with respect to the table surface)."

(11) Instead of section 7.6.3.6: "Repeat 7.6.3.1-7.6.3.5 using the CAMI dummy with the weighted vest (see Fig. 12) and with distance  $d$ , computed using the following equation:

$$d_{CAMI\ w/vest} = \frac{(V_f^2 - V_o^2) * (W_{CAMI\ w/vest} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI\ w/vest})}$$

where

$V_f$  = Maximum velocity of walker at edge of platform = 4 ft/sec

$V_o$  = Initial velocity = 0

$W_{CAMI\ w/vest}$  = Weight of CAMI dummy with 11 lb vest = 28 lbs

$W_{walker}$  = Weight of the walker

$W_{drop\ weight}$  = Drop weight = 8 lb

$\mu_k$  = Dynamic coefficient of friction = 0.05

$N_{CAMI\ w/vest}$  = Normal force (for CAMI dummy fitted with 11 lb vest scenario) = weight

of CAMI dummy + vest weight + walker weight

$g$  = acceleration of gravity = 32.2 ft/sec<sup>2</sup>

(12) After section 7.6.3.6, add a new section 7.6.3.7: "Repeat tests in the following sequence: section 7.6.3.4, section 7.6.3.5, and section 7.6.3.6 two additional times."

(13) Instead of 7.6.4.1: "Center the walker on the test platform facing sideways so that Plane B is perpendicular to the front edge of the platform and the walker is distance  $d$  from the center of the most sideward wheel(s) to the edge of the test platform,

$$d_{CAMI} = \frac{(V_f^2 - V_o^2) * (W_{CAMI} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI})}$$

where

$V_f$  = Maximum velocity of walker at edge of platform = 2 ft/sec

$V_o$  = Initial velocity = 0

$W_{CAMI}$  = Weight of CAMI dummy = 17 lb

$W_{walker}$  = Weight of the walker

$W_{drop\ weight}$  = Drop weight = 8 lb

$\mu_k$  = Dynamic coefficient of friction = 0.05

$N_{CAMI}$  = Normal force (for CAMI dummy scenario) = weight of CAMI dummy and walker

$g$  = acceleration of gravity = 32.2 ft/sec<sup>2</sup>

Position the swivel wheels in such a way that the walker moves sideward in a straight line parallel to Plane A."

(14) Instead of section 7.6.4.3: "While holding the walker stationary, attach an 8 lb (3.6 kg) weight to the side of the walker base at Plane B by means of a rope (as specified in 7.6.3.3) and a pulley (as specified in 7.6.3.3) and adjust the pulley so that the force is applied horizontally ( $0 \pm 0.5^\circ$  with respect to the table surface)."

(15) Instead of section 7.6.4.6: "Repeat 7.6.4.1 through 7.6.4.5 using the CAMI dummy with the weighted vest (see Fig. 12) and with distance  $d$ , computed using the following equation:

$$d_{CAMI\ w/vest} = \frac{(V_f^2 - V_o^2) * (W_{CAMI\ w/vest} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI\ w/vest})}$$

where

$V_f$  = Maximum velocity of walker at edge of platform = 2 ft/sec  
 $V_o$  = Initial velocity = 0  
 $W_{\text{CAMI w/vest}}$  = Weight of CAMI dummy with 11 lb vest = 28 lbs  
 $W_{\text{walker}}$  = Weight of the walker  
 $W_{\text{drop weight}}$  = Drop weight = 8 lb  
 $\mu_k$  = Dynamic coefficient of friction = 0.05  
 $N_{\text{CAMI w/vest}}$  = Normal force (for CAMI dummy fitted with 11 lb vest scenario) = weight of CAMI dummy + vest weight + walker weight  
 $g$  = acceleration of gravity = 32.2 ft/sec<sup>2</sup>"

(16) After section 7.6.4.6, add a new section

7.6.4.7: "Repeat tests in the following sequence: section 7.6.4.4, section 7.6.4.5, and section 7.6.4.6 two additional times."

(17) Instead of Figure 10:

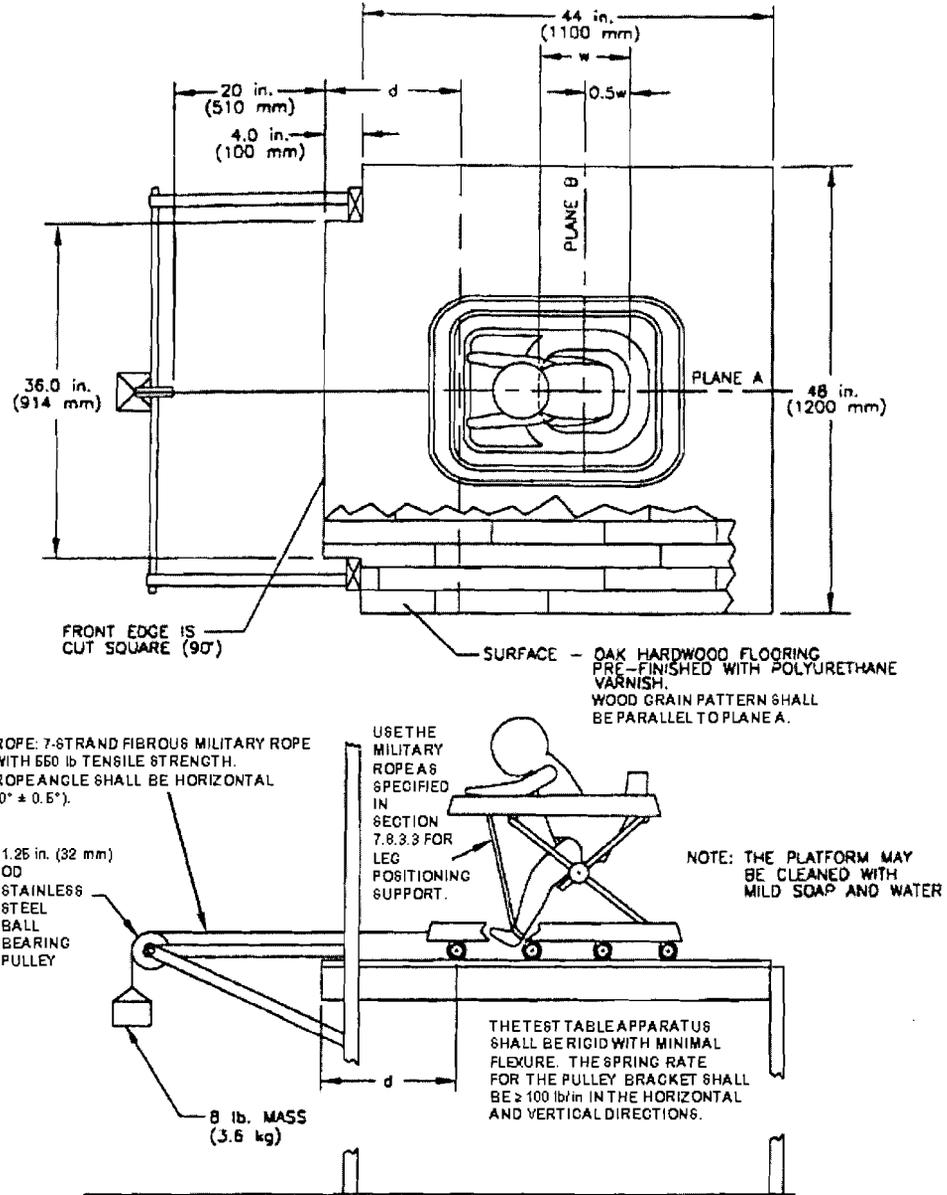


Figure 10 Test Platform Specifications

(18) Instead of section 7.6.5.1: "Center the walker on the test platform facing rearward so that Plane A is perpendicular to the front edge of the platform and the walker is distance  $d$  from the center of the most rearward wheel(s) to the edge of the test platform,

$$d_{CAMI} = \frac{(V_f^2 - V_o^2) * (W_{CAMI} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI})}$$

where

$V_f$  = Maximum velocity of walker at edge of platform = 4 ft/sec

$V_o$  = Initial velocity = 0

$W_{CAMI}$  = Weight of CAMI dummy = 17 lb

$W_{walker}$  = Weight of the walker

$W_{drop\ weight}$  = Drop weight = 8 lb

$\mu_k$  = Dynamic coefficient of friction = 0.05

$N_{CAMI}$  = Normal force (for CAMI dummy scenario) = weight of CAMI dummy and walker

$g$  = acceleration of gravity = 32.2 ft/sec<sup>2</sup>

Position the swivel wheels in such a way that the walker moves rearward in a straight line parallel to Plane A. If the walker has an open back design, attach the 1 in aluminum angle used in 7.3.4 to span the back frame."

(19) Instead of section 7.6.5.3: "While holding the walker stationary, attach an 8 lb (3.6 kg) weight to the rear of the walker base at Plane A by means of a rope (as specified in 7.6.3.3) and a pulley (as specified in 7.6.3.3) and adjust the pulley so that the force is applied horizontally ( $0 \pm 0.5^\circ$  with respect to the table surface)."

(20) Instead of section 7.6.5.5: "Repeat 7.6.5.1 through 7.6.5.4 using the CAMI dummy with the weighted vest (see Fig. 12) and with distance d, computed using the following equation:

$$d_{CAMI\ w/vest} = \frac{(V_f^2 - V_o^2) * (W_{CAMI\ w/vest} + W_{walker} + W_{drop\ weight})}{2g(W_{drop\ weight} - \mu_k N_{CAMI\ w/vest})}$$

where

$V_f$  = Maximum velocity of walker at edge of platform = 4 ft/sec  
 $V_o$  = Initial velocity = 0  
 $W_{CAMI\ w/vest}$  = Weight of CAMI dummy with 11 lb vest = 28 lbs  
 $W_{walker}$  = Weight of the walker  
 $W_{drop\ weight}$  = Drop weight = 8 lb  
 $\mu_k$  = Dynamic coefficient of friction = 0.05  
 $N_{CAMI\ w/vest}$  = Normal force (for CAMI dummy fitted with 11 lb vest scenario) = weight of CAMI dummy + vest weight + walker weight  
 $g$  = acceleration of gravity = 32.2 ft/sec<sup>2</sup>

(21) After section 7.6.5.5, add a new section 7.6.5.6: "Repeat tests in the following sequence: section 7.6.5.3, and section 7.6.5.5 two additional times."

(22) Between section 8.2.3.2 and section 8.2.4, add a new section 8.2.3.3: "A warning statement shall address the following:

WARNING: Parking brake use does not totally prevent walker movement. Always keep child in view when in the walker, even when using the parking brakes."

(23) Instead of section 8.2.4.2: "The stairs warning

shall be stated exactly as follows:

**▲** WARNING - STAIR HAZARD  
Avoid serious injury or death  
Block stairs/steps securely before using walker, even  
when using parking brake."

(c) *Static stability 30° incline plane test.*

(1) *Requirement.* When tested to the procedure described in paragraph (c)(3) of this section, the infant walker shall not overturn.

(2) *Test equipment.* (i) A sloping platform inclined at 30° to the horizontal with a stop fitted to the lower edge of the slope. The height of the stop shall be 3.94 in (100 mm). See Figure 15.

(ii) *Test Mass A:* A rigid cylinder 6.30 in  $\pm$  0.04 in (160 mm  $\pm$  1 mm) in diameter, 11.02 in  $\pm$  0.04 in (280 mm  $\pm$  1 mm) in height with a mass of 26.4 lb (12 kg), with its center of gravity in the center of the cylinder. All edges shall have a radius of 0.79 in  $\pm$  0.04 in (20 mm  $\pm$  1mm).

(iii) *Test Mass B:* A rigid cylinder 6.30 in  $\pm$  0.04 in (160 mm  $\pm$  1 mm) in diameter, 11.02 in  $\pm$  0.04 in (280 mm  $\pm$  1 mm) in height with a mass of 16.8 lb (7.65 kg), with its center of gravity in the center of the cylinder.

(3) *Test method.* (i) Adjustable seats shall be adjusted to their highest position. Place Test Mass A

vertically in the center of the walker seat. To restrict movement of the test mass, packing of negligible mass may be used. Position the castors or wheels in their most onerous position. Place the walker on the slope against the stop. Carry out the test in the forward, sideward, and rearward directions.

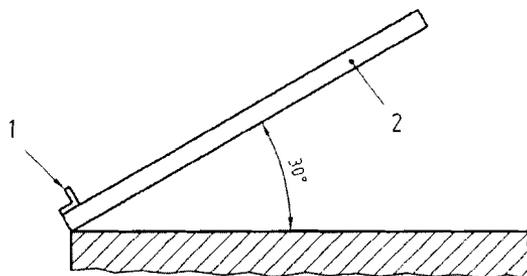


FIGURE 15

(d) *Parking device test (applicable to walkers equipped with parking brakes).*

(1) *Requirement.* When tested to the procedures in paragraph (d) of this section, the infant walker shall have a maximum displacement of 1.97 inches (50 mm) for each test in each direction (forward, rearward, and sideward).

(2) *Test equipment.* (i) A test platform as specified in Figure 10 with a hardwood floor pre-finished with polyurethane.

(ii) Test Mass A and Test Mass B as specified in paragraph (c)(2)(ii) and (iii) of this section.

(3) *Test method. (i) Preparation and procedure.*

(A) Adjust the walker seat to the highest position (if applicable). Place Test Mass A vertically in the walker seat. Set any manual speed control to the fastest position (if applicable). Establish a vertical plane A that passes through the center of the seating area and is parallel to the direction the child faces. Establish a vertical plane B that is perpendicular to plane A and passes through the center of the seating area.

(B) Perform the parking device test in the forward, sideward, and rearward directions.

(ii) *Forward facing test of parking devices.*

(A) Position the walker including Test Mass B facing forward so that plane A is perpendicular to the front edge of the platform and passes through the center of the pulley. Engage all parking devices in accordance with the manufacturer's instructions.

(B) Within one minute of placing the walker with Test Mass B on the platform, attach an 8 lb weight gradually within 5 seconds to the walker frame base at plane A by means of a rope and a pulley per the test apparatus specifications in the step test procedure, adjusted so

that the force is applied horizontally (rope angle shall be  $0 \pm 0.5^\circ$ ). Remove the 8 lb weight after 1 minute. Measure the displacement.

(iii) *Sideward facing test of parking devices.*

(A) Position the walker including Test Mass B facing sideward so that plane B is perpendicular to the front edge of the platform and passes through the center of the pulley. Engage all parking devices in accordance with the manufacturer's instructions.

(B) Within one minute of placing the walker with Test Mass B on the platform, attach an 8 lb weight gradually within 5 seconds to the walker frame base at plane B by means of a rope and a pulley per the test apparatus specifications in the step test procedure, adjusted so that the force is applied horizontally (rope angle shall be  $0 \pm 0.5^\circ$ ). Remove the 8 lb weight after 1 minute. Measure the displacement.

(iv) *Rearward facing test of parking devices.*

(A) Position the walker including Test Mass B facing rearward so that plane A is perpendicular to the front edge of the platform and passes through the center of the pulley. Engage all parking devices in accordance with the manufacturers' instructions.

(B) Within one minute of placing the walker with Test Mass B on the platform, attach an 8 lb weight gradually within 5 seconds to the walker frame base at plane A by means of a rope and a pulley per the test apparatus specifications in the step test procedure, adjusted so that the force is applied horizontally (rope angle shall be  $0 \pm 0.5^\circ$ ). Remove the 8 lb weight after 1 minute. Measure the displacement.

Dated: \_\_\_\_\_

\_\_\_\_\_  
Todd Stevenson, Secretary  
U.S. Consumer Product Safety Commission