



# Standard Consumer Safety Specification for Crib Mattresses<sup>1</sup>

This standard is issued under the fixed designation F2933; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

## 1. Scope

1.1 This consumer safety specification establishes design requirements, testing requirements and methods, and requirements for labeling for full-size and non-full-size crib mattresses.

1.2 No crib mattress produced after the approval date of this consumer safety specification shall, either by label or other means, indicate compliance with this specification unless it conforms to all requirements contained herein.

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

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

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

- D3359 Test Methods for Measuring Adhesion by Tape Test
- F406 Consumer Safety Specification for Non-Full-Size Baby Cribs/Play Yards
- F1169 Consumer Safety Specification for Full-Size Baby Cribs

### 2.2 Federal Standards:<sup>3</sup>

- 16 CFR 1303 Ban of Lead-Containing Paint and Certain Consumer Products Bearing Lead-Containing Paint
- 16 CFR 1500.48 Technical Requirements for Determining a Sharp Point in Toys and Other Articles for Use by Children Under Eight Years of Age

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from the U.S. Government Printing Office, Superintendent of Documents, 732 N. Capital St., NW, Washington, DC 20402-0001.

- 16 CFR 1500.49 Technical Requirements for Determining a Sharp Metal or Glass Edge in Toys or Other Articles Intended for Use by Children Under Eight Years of Age
- 16 CFR 1501 Method for Identifying Toys and Other Articles Intended for Use by Children Under Three Years of Age Which Present Choking, Aspiration or Ingestion Hazards Because of Small Parts
- 16 CFR 1219 Requirements for Full-Size Baby Cribs
- 16 CFR 1220 Requirements for Non-Full-Size Baby Cribs
- 16 CFR 1632 Standard for the Flammability of Mattresses and Mattress Pads
- 16 CFR 1633 Standard for the Flammability (Open Flame) of Mattress Sets
- Consumer Product Safety Improvement Act of 2008 (CPSIA)

## 3. Terminology

### 3.1 Definitions:

3.1.1 *conspicuous, adv*—label that is visible when the mattress is being handled by a consumer.

3.1.2 *core, n*—main support system that may be present in a mattress, such as springs, foam, hair block, or resilient filling.

3.1.3 *crib, n*—bed that is designed to provide sleeping accommodations for an infant which have specific interior dimensions as determined by it being either a full size or non-full size crib:

3.1.3.1 *full size crib, n*— $52\frac{3}{8} \pm \frac{5}{8}$  in. ( $1330 \pm 16$  mm); Width  $28 \pm \frac{5}{8}$  in. ( $711 \pm 16$  mm) (as defined in 16 CFR 1219 and Consumer Safety Specification F1169).

3.1.3.2 *non-full size crib, n*—interior length dimension either greater than 55 in. (1397 mm) or smaller than  $49\frac{3}{4}$  in. (1264 mm) or an interior width dimension either greater than  $30\frac{5}{8}$  in. (778 mm) or smaller than  $25\frac{3}{8}$  in. (645 mm) or both (as defined in 16 CFR 1220 and ASTM F406).

3.1.4 *mattress, n*—ticking filled with a resilient material used alone or in combination with other products intended or promoted for sleeping on it.

3.1.4.1 *Discussion*—For the purpose of this consumer safety specification, this term includes crib mattresses and non-full-size crib mattresses.

3.1.5 *non-paper label, n*—any label material (such as plastic or metal) that either will not tear without the aid of tools or tears leaving a sharply defined edge.

3.1.6 *paper label, n*—any label material that tears without the aid of tools and leaves a fibrous edge.

3.1.7 *surface, n*—side of a mattress that is intended for sleeping on it and can be tested.

3.1.8 *ticking, n*—outermost layer of fabric or related material that encloses the core and upholstery materials of a mattress.

3.1.8.1 *Discussion*—A mattress ticking may consist of several layers of fabric or related materials quilted together.

3.1.9 *upholstery material, n*—all material, either loose or attached, between the mattress ticking and the core of a mattress, if a core is present.

#### 4. Calibration and Standardization

4.1 All testing shall be conducted on a rigid and level surface unless the test instructions are different.

4.2 The product shall be completely assembled, unless otherwise noted, in accordance with the manufacturer's instructions.

4.3 The product to be tested shall be in a room with an ambient temperature of  $73 \pm 9^\circ\text{F}$  ( $23 \pm 5^\circ\text{C}$ ) for at least 8 hours before testing. Testing shall then be conducted within this temperature range.

4.4 All testing required by this specification shall be conducted on the same product unless otherwise specified.

#### 5. General Requirements

5.1 Any product under this consumer safety specification shall comply with all other applicable mandatory federal statutes and regulations (for example, CPSIA, 16 CFR 1632, 16 CFR 1633, and so forth).

5.2 There shall be no hazardous points or edges as defined by 16 CFR 1500.48 and 16 CFR 1500.49 before and after testing to this consumer safety specification.

NOTE 1—Mattresses that do not have any exterior components other than ticking (for example, vents, vibrating motors, zippers, and so forth) or any protruding components are considered exempt from these requirements.

5.3 There shall be no small parts as defined by 16 CFR 1501 before testing or liberated as a result of testing to this consumer safety specification.

5.4 Any paint and surface coatings on the product shall comply with 16 CFR 1303.

5.5 *Openings*—Holes or slots that extend entirely through a wall section of any rigid material less than 0.375 in. (9.53 mm) thick and admit a 0.210-in. (5.33-mm) diameter rod shall also admit a 0.375-in. (9.53-mm) diameter rod. Holes or slots that are between 0.210 and 0.375 in. (5.33 and 9.53 mm) and have a wall thickness less than 0.375 in. (9.53 mm), but are limited in depth to 0.375 in. (9.53 mm) maximum by another rigid surface, shall be permissible. The product shall be evaluated in all the manufacturer's recommended use positions.

5.5.1 This requirement applies to vents, zipper tabs, and any other rigid components that may be designed into a mattress.

5.6 *Labeling*:

5.6.1 Warning labels (whether paper or non-paper) shall be permanent when tested in accordance with 6.1. Non-coated paper warning label shall not be applied on either side of sleeping surface.

NOTE 2—Non-coated paper label may absorb water and can deteriorate.

5.6.2 Warning statements applied directly onto the surface of the mattress by hot stamping, heat transfer, printing, and so forth shall be permanent when tested in accordance with 6.1.4.

5.6.3 Non-paper labels shall not liberate small parts when tested in accordance with 6.1.5.

5.7 *Mattress Dimensions*:

5.7.1 *Full-Size Crib Mattresses*:

5.7.1.1 *Mattress Size*—The dimensions of a full-size crib mattress shall measure at least 27¼ in. (690 mm) wide and 51⅝ in. (1310 mm) long when tested in accordance with 6.2.

5.7.2 *Non-Full-Size Crib Mattresses*:

5.7.2.1 *Mattress Size*—The dimensions of a mattress supplied with a non-full-size baby crib shall be such that the mattress, when inserted in the center of the crib, in a noncompressed state at any of the adjustable positions of the mattress support, shall not leave a gap of more than ½ in. (12.7 mm) at any point between the perimeter of the mattress and the perimeter of the crib. When the mattress is placed against the perimeter of the crib, the resulting gap shall not exceed 1.0 in. (25.4 mm).

5.7.2.2 *Mattress Thickness*:

(1) A mattress supplied with a non-full-size crib shall, in a noncompressed state, have a thickness that will provide a minimum effective crib-side height dimension of at least 20 in. (508 mm) as measured from the upper surface of the crib side or end panel. For this measurement, the crib side shall be in its highest adjustable position and the mattress support in its lowest adjustable position.

(2) A mattress supplied with a non-full-size crib shall, in a noncompressed state, have a thickness that will provide a minimum effective crib-side height dimension of at least 3 in. (76 mm) as measured from the upper surface of the mattress to the upper surface of the crib side or end panel. For this measurement, the crib side shall be in its lowest adjustable position and the mattress support in its highest adjustable position.

#### 6. Test Methods

6.1 *Permanency of Labels and Warnings*:

6.1.1 A paper label (excluding labels attached by a seam) shall be considered permanent if, during an attempt to remove it without the aid of tools or solvents, it cannot be removed, it tears upon removal, or such action damages the surface to which it is attached.

6.1.2 A non-paper label (excluding labels attached by a seam) shall be considered permanent if, during an attempt to remove it without the aid of tools or solvents, it cannot be removed or such action damages the surface to which it is attached.

6.1.3 A warning label attached by a seam shall be considered permanent if it does not detach when subjected to a 15 lbf (67 N) pull force applied in any direction most likely to cause

failure using a clamp with a 3/4-in. (19-mm) diameter clamping surface. Apply the force evenly over 5 s and maintain for an additional 10 s.

6.1.4 *Adhesion Test for Warnings Applied Directly onto the Surface of the Product:*

6.1.4.1 Apply the tape test defined in Test Method B, Cross-Cut Tape Test, of Test Methods D3359, eliminating the parallel cuts.

6.1.4.2 Perform this test once in each different location where warnings are applied.

6.1.4.3 The warning statements will be considered permanent if the printing in the area tested is still legible and attached after being subjected to this test.

6.1.5 A non-paper label, during an attempt to remove it without the aid of tools or solvents, shall not be removed nor shall not fit entirely within the small parts cylinder defined in 16 CFR 1501 if it can be removed.

6.2 *Mattress Dimensional Measurements for Full-Size Crib Mattress:*

6.2.1 *Test Equipment—Mattress Measuring Box:*

6.2.1.1 The mattress measuring box is a rectangular box with rigid walls having interior dimensions at least 29½ by 54 in. (749 by 1372 mm) with walls at least 8 in. (203 mm) high that are perpendicular to the floor. The wall and floor thicknesses should be sufficient to avoid warping or deformation during testing. See Fig. 1 for example.

6.2.1.2 The interior floor of the box should be made of or covered with a material that provides a smooth surface that allows the mattress to slide freely.

6.2.1.3 One short side of the box should have a sliding panel measuring 26⅞ ± ½ in. (664 ± 12.7 mm) with its end located ½ ± ¼ in. (12.7 ± 6.3 mm) from the inside surface of Wall D in Fig. 1. This panel will be called Panel A.

6.2.1.4 One long side of the box should have a sliding panel measuring 50½ ± ½ in. (1283 ± 12.7 mm) with its end located ½ ± ¼ in. (12.7 ± 6.3 mm) from the inside surface of Wall C in Fig. 1. This panel will be called Panel B.

6.2.2 *Test Method:*

6.2.2.1 Place the mattress into the mattress measuring box so it is touching Walls C and D.

6.2.2.2 To position the mattress in the measuring box, gradually apply a 7 lbf (31.1 N) force to Panel A. Release this force. Then gradually apply a 14 lbf (62.3 N) force to Panel B. Release this force.

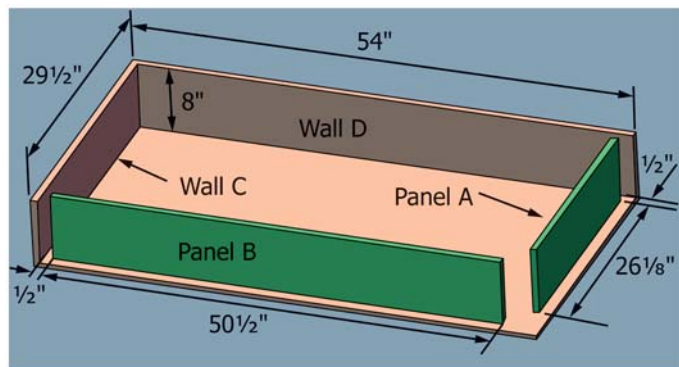


FIG. 1 Crib Mattress Measuring Box (1 in. = 2.54 cm)

6.2.2.3 Apply a 7 ± 1 lbf (31.1 ± 4.4 N) force to Panel A within a period of 5 s. Within 30 s of application of the force to Panel A, and while maintaining this force, apply a 14 ± 1 lbf (62.3 ± 4.4 N) force to Panel B within a period of 5 s.

6.2.2.4 Apply the forces from 6.2.2.3 for 60 s. With forces still applied, measure the length and width of the interior dimension measured from the horizontal midpoints of Panel A to Wall C (length) and Panel B to Wall D (width). These measurements are to be considered the mattress dimensions.

7. **Marking and Labeling**

7.1 The warning statements in this consumer safety specification cannot be placed on any other labels required by law (for example, 16 CFR 1633 label or state law labels).

7.2 Warning statements shall be easy to read and understand. The warning statements shall be conspicuous, permanent (as defined in 6.1), and in sans serif type.

7.2.1 The warning label shall include a delineated signal word panel containing the safety alert symbol followed by the signal word “WARNING” on a contrasting background. The letters and safety alert symbol shall not be less than 0.2 in. (5 mm) high. The remaining text shall be in characters whose upper case is at least 0.1 in. (2.5 mm) high.

7.2.2 The warning label shall meet one of the following conditions:

7.2.2.1 The safety alert symbol shall be an orange filled triangle on a contrasting background.

7.2.2.2 The signal word panel containing both the safety alert symbol and signal word shall be orange in color on a contrasting label (for example, orange background on white label).

7.2.2.3 The entire warning label shall be orange with the warning text and symbols in contrasting color (for example, orange label with black text and symbols).

7.3 The following warning statements shall be included exactly as stated below:



Failure to follow these warnings could result in serious injury or death.

To prevent deaths, the U.S. Consumer Product Safety Commission (CPSC), the American Academy of Pediatrics (AAP), and the National Institute of Child Health and Human Development (NICHD) recommend the following:

To reduce the risk of Sudden Infant Death Syndrome (SIDS) and suffocation, pediatricians recommend healthy infants be placed on their backs to sleep, unless otherwise advised by your physician.

- Infants can suffocate on soft bedding. Never place a pillow or comforter under sleeping infant for additional padding or as a mattress substitute.

- Do not cover the heads of babies with a blanket or over bundle them in clothing and blankets. Overheating can lead to SIDS.

7.3.1 For full-size crib mattresses, the following warning statement shall be included with the warnings from 7.3 exactly as stated below:

- Do not use this mattress in a crib having interior dimensions that exceed 28<sup>5</sup>/<sub>8</sub> by 53 in. (75 by 135 cm) as measured from the innermost surfaces of the crib.

- Only use sheets and mattress pads designed specifically for crib mattresses.

7.3.2 For non-full-size crib mattresses, the following warning statement shall be included with the warnings from 7.3 exactly as stated below:

- Only use sheets and mattress pads designed specifically for this mattress size.

7.3.3 Additional manufacturer warnings may be included between the warnings specified in 7.3 and 7.4 if desired.

7.4 The following warning statement shall be included exactly as stated below:

DO NOT remove these important safety instructions.

7.4.1 This warning shall be located at the bottom of the label that contains the warnings from 7.3.

## 8. Keywords

8.1 crib mattress; safety requirements

## APPENDIX

### (Nonmandatory Information)

#### X1. RATIONALE

##### X1.1 *Discussion of Items in This Consumer Safety Specification:*

X1.1.1 *Section 3*—Most of the terminology used in this section has been taken from other sources (for example, 16 CFR 1632 and 1633, other ASTM standards, and so forth). Any proposals to change these definitions should keep in mind confusion that could be caused by using multiple definitions for the same products.

X1.1.2 *Paragraph 5.2*—The exemption suggested in this paragraph came from a discussion held with the CPSC in early 2009 regarding General Certificates of Compliance (GCCs). The CPSC acknowledged that if a product does not have any characteristics that could cause a specific hazard, there was no reason to test. A conference call was held with their Director of Regulatory Compliance and her team in which they expressed that it would not make any sense to require a soft mattress with no exterior components to be tested for sharp edges, sharp points, and small parts.

X1.1.3 *Paragraphs 5.5 and 5.5.1*—The original industry working group decided to deviate from the standard openings requirement found in many of the ASTM Committee F15 standards because the figure used in those standards is not relevant to this product type. Instead, these paragraphs were modified to remove the standard figure and include a description of components to which this requirement may be applied.

X1.1.4 *Paragraph 5.7.2*—The requirement listed in this paragraph was taken directly from 16 CFR 1220 and is being used unchanged.

X1.1.5 *Paragraph 6.2.1*—Before the development of this consumer safety specification, there was not a consistent method used to measure crib mattresses. Static measuring boxes were sometimes built to mimic the interior dimensions of a full-size crib to verify the size of a crib mattress. This box would serve as a “Go/No-Go” gauge to ensure a mattress was correctly sized. However, the soft materials used in crib mattresses could potentially provide false readings if the materials only filled out a portion of the mattress, which required manufacturers to make judgment calls as to what was

a failure. Tape measures were also used to verify dimensions, but measurement locations and the soft materials also created several measurement methods that were not repeatable. A dynamic measuring box was selected to provide a more repeatable measurement that would take away the variability caused by soft materials.

X1.1.5.1 The dimensions of the sliding panels were selected after significant testing to determine appropriate lengths. Short panels were originally selected but were found to create a large degree of variability in measurements depending on the internal structure of the mattresses. Considering this portion of the consumer safety specification is meant to measure the mattress size (and not assess for gaps), the longer panels were selected because of the repeatability of the measurements. The final dimensions and offsets were also selected to minimize the chance of interference between the two sliding panels.

X1.1.6 *Paragraph 6.2.2*—The forces selected for this test method were determined by trial and error using a range of forces for experimentation. The reason for applying a force is to provide a certain amount of pressure along the edge of the mattress to account for soft materials inside the crib mattress creating an artificial measurement (see X1.1.5). Lighter forces of 1 to 2 lbf (4.4 to 8.8 N) were initially used but were not strong enough to overcome the weight of the test equipment and resistance of the mattress materials. When higher forces of 15 to 20 lbf (66 to 88 N) were used, some crib mattresses would start to buckle inward providing a false reading. The selected forces were found to provide repeatable results with no or limited adverse effects with the crib mattresses tested.

X1.1.7 *Paragraph 7.2.2*—The original industry working group decided to use a signal color as part of the warning label to draw more attention to the warning label. It was decided to allow flexibility in how this signal color could be applied to allow manufacturers the most flexibility in finding a cost-effective solution that still meets the intent of this consumer safety specification.

X1.1.8 *Paragraph 7.3*—The warning statements in this paragraph were selected after reviewing several websites that focus on child sleep safety (AAP, CPSC Safe Sleep, First

Candle, Kids in Danger, and so forth). All of the warnings on these websites were reviewed and the statements that had the most relevance to mattresses and sleep surfaces were selected for this consumer safety specification. While there are many more warnings that could be considered, the original industry working group wanted to keep the warnings very focused and concise to not overload the parent with information. The

original group wanted to only provide the most important warnings that may not be covered on the crib or other associated products. The introductory statement was included in order to provide more credibility to these warnings so parents recognize this is not just a manufacturer's suggestion, but is instead recommended by leading safety organizations.

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