Designation: F406 – 19

Standard Consumer Safety Specification for Non-Full-Size Baby Cribs/Play Yards[1]

This standard is issued under the fixed designation F406; 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 reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

This consumer safety specification addresses incidents associated with non-full-size cribs/play yards that were identified by the U.S. Consumer Product Safety Commission (CPSC).

Incidents identified by the CPSC and addressed in this standard include asphyxiation due to entrapment in mesh drop side units left with a side down, strangulation by entanglement on protruding hardware, strangulation by button entrapment in mesh openings, strangulation due to failure of the center hinge on a top rail, collapse or failure of the locking devices, collapse of the floor or sides, and choking on vinyl bitten from the top rail. This specification also addresses wooden non-full-size crib injuries or deaths due to entanglement on corner post extensions, dislodgment of slats resulting from breakage or failure of glue joints, collapse of mattress support, detachment of screws, dislodgement of teething rails, and entanglement on cords or strings.

This specification is not intended to cover non-full-size cribs/play yards that are either blatantly misused or abused. This specification is written within current state-of-the-art of non-full-size crib/play yard technology and is intended to be updated if substantive information becomes available that necessitates additional requirements or justifies revision of existing requirements.

1. Scope

1.1 This consumer safety specification establishes testing requirements for structural integrity and performance requirements for non-full-size cribs/play yards, both rigid sided and mesh/fabric assemblies. It also provides requirements for labeling and instructional material. The term unit or product will refer to a non-full-size crib/play yard.

1.2 This specification covers a framed enclosure with a floor made for the purpose of providing sleeping and playing accommodations for a child who cannot climb out and is less than 35 in. (890 mm) in height. It also covers bassinet, changing table, or similar accessories to a non-full size crib/play yard. These accessories shall also comply with the applicable requirements of ASTM standards addressing those accessories. For example, a changing table that attaches to a play yard shall also comply with the applicable requirements in Specification F2388. This specification does not cover inflatable products.

1.3 No product 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 applicable requirements contained herein, before and after all testing.

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

1.5 The following safety hazards caveat pertains only to the test method portion, Section 8, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—This consumer safety specification includes the following sections:

[1] This consumer safety specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.18 on Cribs, Toddler Beds, Play Yards, Bassinets, Cradles and Changing Tables.

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1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the*

Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1424 Test Method for Tearing Strength of Fabrics by Falling-Pendulum (Elmendorf-Type) Apparatus

D1683/D1683M Test Method for Failure in Sewn Seams of Woven Fabrics

D3359 Test Methods for Rating Adhesion by Tape Test

D5034 Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)

F963 Consumer Safety Specification for Toy Safety

F1004 Consumer Safety Specification for Expansion Gates and Expandable Enclosures

F1487 Consumer Safety Performance Specification for Playground Equipment for Public Use

F2388 Consumer Safety Specification for Baby Changing Products for Domestic Use

2.2 *EN Standards:*[3]

EN 716–1:1995 Cots and Folding Cots for Domestic Use

EN 12227–1:1999 Playpens for Domestic Use

2.3 *ISO Standard:*[4]

IS0 8124-1:2000 Safety Aspects Related to Mechanical and Physical Properties

2.4 *Federal Regulations:*[5]

16 CFR 1303 Ban of Lead-Containing Paint and Certain Consumer Products Bearing Lead-Containing Paint

16 CFR 1500 Hazardous Substances Act Regulations including sections:

1500.3 (c) (6) (vi) Definition of "Flammable Solid"

1500.44 Method for Determining Extremely Flammable and Flammable Solids

1500.48 Technical Requirements for Determining a Sharp Point In Toys and Other Articles Intended for Use By Children Under Eight Years of Age

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

1500.50-.52 Test Methods for Simulating Use and Abuse of Toys and Other Articles Intended for Use By Children

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 1509 Requirements for Non-Full-Size Baby Cribs

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

[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

[4] Available from International Organization for Standardization (ISO), 1 rue de Varembé, Case postale 56, CH-1211, Geneva 20, Switzerland.

[5] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *accessory, n*—component with a rigid frame such as a bassinet or changing table that attaches to a non-full size crib/play yard and that, because of its structure, location, or movement, may expose a non-full size crib/play yard occupant to an opening presenting an entrapment hazard. It does not include: (*1*) items that hang outside the occupant areas, such as organizers and storage bags, (*2*) canopies that have no rigid frame members running alongside any top rail, and (*3*) accessories that attach only to another attachment and not directly to the non-full size crib/play yard.

3.1.1.1 *Discussion*—Rationale: Definition applies only to accessories that attach to non-full size crib/play yard, not accessories that attach to bassinet or changing table. This would exclude a changing table that attaches only to a bassinet, since a bassinet occupant is not able to push up on hands and knees, and therefore is not at risk from an entrapment hazard.

3.1.2 *accessory attachment components, n*—the components that provide the means of attachment for a bassinet/cradle accessory to a play yard. (See Fig. A1.1.)

3.1.3 *bassinet/cradle accessory, n*—an elevated sleep surface that attaches to play yard designed to convert the product into a bassinet/cradle intended to have a horizontal sleep surface while in a rest (non-rocking) position.

3.1.4 *cantilevered accessory, n*—accessory that is supported and attached at only one end of the component to a non-full size crib/play yard (see Fig. A1.2).

3.1.5 *conspicuous, adj*—Describes a label that is visible, when the unit is in a manufacturer's recommended use position, to a person standing near the unit at any one position around the unit but not necessarily visible from all positions.

3.1.6 *cord, n*—length of slender flexible material including monofilaments, rope, woven and twisted cord, plastic and textile tapes, ribbon, and those materials commonly called string.

3.1.7 *corner post, n*—vertical post located at the corner of a product.

3.1.8 *dropgate, n*—side that is intended to pivot with respect to the frame when the product is in the manufacturer's recommended use position to provide easier access to the occupant.

3.1.8.1 *Discussion*—Rationale: The word "telescope" was deleted because telescoping sides are really covered under the definition of movable sides. Dropgates are products that pivot only. For reference, the definition of movable side in Consumer Safety Specification F406 is "top portion of an otherwise stationary side that is intended to move with respect to the frame (other than a foldable side) when the product is in the manufacturer's recommended use position to provide easier access to the occupant.

3.1.9 *dynamic load, n*—application of an impulsive force through free fall of a weight.

3.1.10 *fabric, n*—any woven, knit, coated, laminated, extruded or calendered flexible material that is intended to be sewn, welded, heat sealed, or glued together as an assembly.

3.1.11 *foldable side or end, n*—side or end panel intended to be stationary with respect to the frame when a product is in the manufacturer's recommended use position, but that folds to allow for carrying or storage of the product.

3.1.12 *key structural elements, n*—side assemblies, end assemblies, mattress supports or stabilizing bars which create the occupant retention area.

3.1.13 *manufacturer's recommended use position, n*—any position that is presented by the manufacturer in any descriptive or instructional literature as a normal, allowable, or acceptable configuration for use of the product. This specifically excludes positions that the manufacturer shows in a like manner in its literature to be unacceptable, unsafe, or not recommended.

3.1.14 *mattress, n*—pad with a fabric, vinyl, or other material case filled with resilient material (such as cotton, foam, fiberfill, etc.) used as or on the floor of the unit.

3.1.15 *mattress support surface, n*—the internal surface of the play yard which supports the mattress or mattress assembly.

3.1.16 *mesh, n*—mesh may be either a woven fabric in which the warp and filling yarns are interlaced, a knitted fabric in which the wales and courses yarns are interlocked, or any other type of fabric that may be developed that provides openings therein.

3.1.17 *mesh/fabric unit, n*—unit constructed with a rigid frame assembly and a fabric or mesh assembly, or both, used to function as sides, ends, or floor, or a combination thereof.

3.1.18 *moveable side, n*—top portion of an otherwise stationary side that is intended to move with respect to the frame (other than a foldable side) when the product is in the manufacturer's recommended use position to provide easier access to the occupant.

3.1.19 *non-full-size crib, n*—crib that (*1*) is intended for use in or around the home, for travel and other purposes; and (*2*) has an interior length dimension either greater than 55 in. (139.7 cm) or smaller than 49¾ in. (126.3 cm), or an interior width dimension greater than 30⅝ in. (77.7 cm) or smaller than 25⅜ in. (64.3 cm), or both.

3.1.19.1 *Discussion*—This does not include mesh/net/screen cribs, nonrigidly constructed cribs, cradles (both rocker and pendulum types), car beds, baby baskets and bassinets (also known as junior cribs). Non-full-size crib includes, but is not limited to, the following:

3.1.19.2 *oversize crib, n*—non-full-size crib with an interior length dimension greater than 55 in. (139.7 cm), or an interior width dimension greater than 30⅝ in. (77.7 cm), or both.

3.1.19.3 *portable crib, n*—non-full-size crib designed so that it may be folded or collapsed, without disassembly, to occupy a volume substantially less than the volume it occupies when it is used.

3.1.19.4 *specialty crib, n*—unconventionally shaped (circular, hexagonal, etc.) non-full-size crib incorporating a special mattress or other unconventional components.

3.1.19.5 *undersize crib, n*—non-full-size crib with an interior length dimension smaller than 49¾ in. (126.3 cm), or an interior width dimension smaller than 25⅜ in. (64.3 cm), or both.

3.1.20 *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 or labels made from fabric.

3.1.21 *occupant, n*—that individual who is in a product that is set up in one of the manufacturer's recommended use positions.

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

3.1.23 *play yard (aka playpen), n*—framed enclosure that includes a floor and has mesh or fabric sided panels primarily intended to provide a play or sleeping environment for children. It may fold for storage or travel.

3.1.24 *protrusion, n*—projection on the unit over which an item worn by a child may become hooked.

3.1.25 *rigid sided product, n*—product with sides/ends constructed of rigid materials like wood, plastic, or metal generally configured as a horizontal rail/vertical slat assembly.

3.1.26 *seam, n*—means of joining fabric components such as sewing, welding, heat sealing, or gluing.

3.1.27 *static load, n*—vertically downward force applied by a calibrated force gage or dead weights.

3.1.28 *stationary side, n*—side or end panel that is not intended to fold, slide, or move with respect to the frame when the product is in the manufacturer's recommended use position.

3.1.29 *strap, n*—piece of flexible material of which the width is significantly greater than the thickness.

3.1.30 *structural failure, n*—damage to a component(s) or assembly resulting in partial separation (greater than 0.04 in. (1 mm) over original configuration), or complete separation of the component(s) or assembly.

4. Calibration and Standardization

4.1 All testing shall be conducted on a concrete floor that may be covered with ⅛-in. (3-mm) thick vinyl flooring cover, unless test instructs differently.

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

4.3 No testing shall be conducted within 48 h of manufacturing.

4.4 The product to be tested shall be preconditioned in a room with ambient temperature of 73 ± 9°F (23 ± 5°C) for at least 1 h prior to testing. Testing shall then be conducted within this temperature range.

4.5 All testing required by this specification shall be conducted on the same unit.

5. General Requirements

5.1 *Corner Posts:*

5.1.1 No corner post assembly shall extend more than 0.06 in. (1.50 mm) above the upper edge of an end or side panel, whichever is higher, when measured from the lowest point on the upper edge of the end or side panel within 3 in. (76 mm) from the outermost contour of the post or elbow (see Fig. A1.3).

5.1.1.1 This requirement applies when any moveable side is in either the raised or lowered position.

5.1.2 The limitations in 5.1.1 do not apply to a corner post assembly that extends at least 16 in. (400 mm) above the uppermost surface of the side rail in its highest position.

5.1.3 Corner posts intended to accept removable vertical extensions made up of two or more segments (such as canopy post extensions) shall not permit the attachment of individual segments such that the resultant vertical extension would be in violation of the dimensional requirements of 5.1.

5.1.4 The dimensional requirements in 5.1 shall also apply to vertical members of circular cribs.

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

5.3 There shall be no small parts, as defined by 16 CFR 1501, before testing or liberated as a result of testing in accordance with this specification.

5.4 The paint and surface coating on the product shall comply to 16 CFR 1303.

5.5 There shall be no flammable solids as defined in 16 CFR 1500.3 (c) (6) (vi) before or after testing in accordance with this specification.

5.6 *Scissoring, Shearing, or Pinching:*

5.6.1 A product, when in the manufacturer's recommended use position, shall be designed and constructed to prevent injury to the occupant from any scissoring, shearing, or pinching when members or components rotate about a common axis or fastening point, slide, pivot, fold, or otherwise move relative to one another. Scissoring, shearing, or pinching that may cause injury shall not be permissible when the edges of the rigid parts admit a probe that is greater than 0.210 in. (5.30 mm) and less than 0.375 in. (9.50 mm) diameter at any accessible point throughout the range of motion of such parts.

5.6.2 Products that allow the top rail to be in a lowered position when the unit is erected, as shown in Fig. A1.4, shall be evaluated for the potential for scissoring, shearing or pinching. Those components of the top rail, its hinges, locks, or mechanism that are deemed to be capable of scissoring, shearing or pinching shall be tested in accordance with 5.6.2.1 – 5.6.2.4.

5.6.2.1 At all intersections of the *drop top rail* with the *top rail saddle* (Point A, Fig. A1.4), the insertion of a probe greater than 0.210 in. (5.30 mm) in diameter and less than 0.375 in. (9.50 mm) in diameter to a depth of more than 0.210 in. (5.30 mm) shall not be permitted in any position throughout the range of motion of the top rail.

5.6.2.2 All intersections of the *hinge legs* and *saddle* with the *drop top rail* and the *inclined leg* (Point B, Fig. A1.4) where no padding of ¼ in. (6.30 mm) or less exists, shall allow a 0.375-in. (9.50-mm) diameter probe to pass between adjacent members in any and all positions when rotating the hinge legs about their respective pivots.

5.6.2.3 The hinge legs shall allow a 0.375-in. (9.50-mm) diameter probe to pass between said hinge legs in any and all positions allowed when rotating the hinge legs about their respective pivots.

5.6.2.4 At all intersections of the drop side rail locking mechanism (hinge legs with the saddle) (Point C, Fig. A1.4) the intersection of the probe greater than 0.210 in. (5.30 mm) in diameter, and less than 0.375 in. (9.50 mm) in diameter, and greater than 0.210 in. (5.30 mm) deep within the intersecting parts in any and all positions shall not be permitted.

5.7 Toy accessories attached to, removed from, or sold with a product, as well as their means of attachment, must meet applicable requirements of Specification F963.

5.8 *Latching and Locking Mechanisms:*

5.8.1 All latches that are intended to be latched and unlatched during normal use while the child is in the product shall engage automatically when placed in the use position before and after testing. Latches may be manually activated to allow placement into the use position but must engage automatically when released.

5.8.2 Any unit that folds shall have a latching or locking device or other provision in the design that will prevent the unit from unintentionally folding when properly placed in the manufacturer's recommended use position.

5.8.2.1 During and upon completion of all testing, the unit shall remain in its manufacturer's recommended use position.

5.8.3 If a unit is designed with a latching or locking device:

5.8.3.1 That device shall remain engaged and operative after testing.

5.8.3.2 Each single-action locking or latching device that is provided to prevent folding shall require a minimum force of 10 lbf (45 N) to activate the release mechanism when tested in accordance with 8.13.2.

5.8.3.3 Each double-action locking or latching device that is provided to prevent folding shall require two distinct and separate actions for release. There are no force requirements for double-action locking or latching devices. For a device that is located under the mattress, the removal of a mattress is considered one of the two required actions for the release of a double action device.

5.8.3.4 Product designs requiring latching or locking of a top rail(s) to prevent folding that include central hinge(s) and rail assembly(ies) that moves downward when folded, as shown in Fig. A1.5, shall have a locking device that automatically engages when placed in a manufacturer's recommended use position.

5.8.3.5 No top rail shall give the appearance of being in the manufacturer's recommended use position unless the locking device is fully engaged. If the product has a latching device that automatically engages and is intended to be set up by first erecting the side rails, and then depressing a center floor hub, the product shall be evaluated for false latch by testing in accordance with 8.27.

5.9 *Openings:*