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Standard Consumer Safety Specification for Sling Carriers[1]

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INTRODUCTION

This consumer safety specification addresses incidents associated with sling carriers as identified by the U.S. Consumer Product Safety Commission (CPSC). In response to incident data compiled by the CPSC, this specification attempts to minimize the following hazards: fall hazards, suffocation hazards, and deficiency of consumer education regarding product use. This specification is intended to cover normal use and reasonably foreseeable misuse or abuse of the product(s).

This specification is written within the current state-of-the-art of sling carrier technology and will be updated whenever substantive information becomes available that necessitates additional requirements or justifies the revision of existing requirements.

1. Scope

1.1 This consumer safety specification establishes performance requirements, test methods and marking requirements to promote safe use of sling carriers.

1.2 This consumer safety specification is intended to minimize the risk of injury to an occupant from the normal use and reasonably foreseeable misuse of products.

1.3 For purposes of definition, a sling carrier is a product of fabric or sewn fabric construction, which is designed to contain up to two (2) children in an upright or reclined position while being supported by the caregiver's torso. Sling carriers are normally used from full-term birth to 35 lb (15.9 kg) unless the manufacturer indicates that a higher weight limit is allowed.

NOTE 1—Slings consist of a variety of unstructured designs ranging from a hammock-shaped product suspended on the caregiver's upper torso to a long length of material wrapped around the caregiver's body.

1.4 The sling carrier is normally "worn" by the caregiver, and thus the child is supported from one or both shoulders of the caregiver. These products are worn on the front, hip or back of the caregiver, with the child either facing towards or away from the caregiver or reclined on the front only of the caregiver.

1.5 No sling carrier produced after the approval date of this consumer safety specification shall, either by label or other means, indicate compliance with the specification unless it complies with all of the requirements contained herein.

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[1] This consumer safety specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.21 on Infant Carriers, Bouncers and Baby Swings.

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1.6 This consumer safety specification is not intended to address incidents and injuries resulting from the interaction of other persons or objects with the caregiver and child while the sling carrier is in use.

1.7 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.

1.8 The following precautionary caveat pertains only to the test methods portion, Section 7, 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.*

1.9 *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]

D3359 Test Methods for Rating Adhesion by Tape Test

F963 Consumer Safety Specification for Toy Safety

2.2 *Federal Regulations:*[3]

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

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

16 CFR 1500.48 Technical Requirements for Determining a Sharp Point in Toys or Other Articles Intended for Use By Children Under Eight Years of Age

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 1610 Standard for the Flammability of Clothing Textiles

2.3 *ANSI Standards:*[4]

ANSI Z535.1 Safety Colors

ANSI Z535.4 Product Safety Signs and Labels

ANSI Z535.6 Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *attachment system, n*—fastenings, straps, hoops, buckles, or similar parts which are fitted to the sling carrier for the purpose of securing the article to the caregiver's torso.

3.1.2 *conspicuous, adj*—visible when the product is in the manufacturer's recommended carrying position to a caregiver who is placing the occupant in the sling carrier or when the caregiver places the product on his or her body.

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

3.1.4 *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.

3.1.5 *full term infant, n*—a baby born 38+ weeks after conception.

[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 U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, http://www.access.gpo.gov.

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

3.1.6 *manufacturer's recommended carrying position(s), n*—any carrying position that is presented as a normal, allowable, or acceptable configuration for use of the product by the manufacturer in any descriptive or instructional literature.

3.1.6.1 *Discussion*—

This specifically excludes positions that the manufacturer shows in a like manner in its literature to be unacceptable, unsafe, or not recommended.

3.1.7 *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.

3.1.8 *occupant, n*—individual who is placed or carried in the sling carrier in one of the manufacturer's recommended carrying positions in accordance with 1.4.

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

3.1.10 *reclined, n*—any position other than upright.

3.1.11 *restraint system, n*—a means of securing the occupant in any of manufacturer's recommended carrying positions.

3.1.12 *ring sling, n*—a sling carrier constructed of a long, rectangular, oblong, or similarly shaped piece of fabric with two rings (usually either nylon or metal) attached to one end.

3.1.12.1 *Discussion*—

The end of the fabric without rings is threaded through and between rings to make a pouch for the baby and a tail of fabric. The rings bear the weight of the baby in the sling, and the caregiver can adjust the sling through the rings.

3.1.13 *seam, n*—a place where fabric components are joined, by means such as sewing, welding, heat sealing, or gluing.

3.1.14 *static load, n*—vertically downward load applied by weights or other means.

3.1.15 *substantially similar carrying position, n*—carrying positions where the sling fabric orientation does not vary regardless of the direction the baby is facing relative to the wearer, or regardless of the positioning of the product to the wearer.

3.1.16 *support area(s), n*—the area(s) in the sling carrier where the occupant's weight rests in the product.

4. Calibration and Standardization

4.1 The product shall be completely assembled in accordance with the manufacturer's instructions.

4.2 No testing shall be conducted within 48 h of manufacture.

4.3 The product to be tested shall be at an ambient temperature of 73°F ± 9°F (23°C ± 5°C) for at least one hour before testing. All testing shall be conducted in this temperature range.

4.4 All testing required by this consumer safety specification shall be conducted on the same unit in the order presented in this specification, except where directly indicated.

5. General Requirements

5.1 *Laundering*—The sling shall be washed and dried twice in accordance with the manufacturer's instructions. Any resulting shrinkage shall not prevent any removable parts from being refitted without damaging the seams of the fabric and shall not impair the performance and use of the article. *This test will be the first test conducted on the fabric.*

5.2 *Hazardous Sharp Points or Edges*—There shall be no sharp points or edges as defined by 16 CFR 1500.48 and 16 CFR 1500.49 before and after testing.

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

5.4 *Lead in Paint*—The paint or surface coating on the product shall comply with 16 CFR 1303.

5.5 *Wood Parts*—Prior to testing, any wooden parts shall be smooth and free of splinters.

5.6 *Locking and Latching*—Any product designed with a locking or latching attachment system must remain in the manufacturer's recommended carrying position before and after completion of all tests in this standard.

5.7 *Labeling*—Warning labels (whether paper or non-paper) shall be permanent when tested in accordance with 7.3.

5.7.1 Warning statements applied directly onto the surface of the product by hot stamping, heat transfer, printing, wood burning, and so forth shall be permanent when tested in accordance with 7.4.

5.7.2 Non-paper labels shall not liberate small parts when tested in accordance with 7.4.

5.8 *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 in. (5.33 mm) and 0.375 in. (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 (see Fig. 1). The product shall be evaluated in all manufacturers' recommended carrying positions.

5.9 *Scissoring, Shearing, and Pinching*—The product, when in a manufacturer's recommended use position(s), shall be designed and constructed so as 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 exists when the edges of any rigid parts admit a probe greater than 0.210 in. (5.33 mm) and less than 0.375 in. (9.53 mm) diameter at any accessible point throughout the range of motion of such parts.

5.10 *Monofilament Threads*—Monofilament threads shall not be used.

5.11 *Flammability*—There shall be no Class 2 or 3 fabrics used in the construction of a sling carrier when the product is evaluated against the requirements of 16 CFR 1610.

5.11.1 If a sling carrier is incapable of being evaluated to the requirements of 16 CFR 1610 due to construction characteristics, the product shall not be flammable as defined under 16 CFR 1500.3(c)(6)(vi) when tested in accordance with Consumer Safety Specification F963, Annex 5.

6. Performance Requirements

6.1 *Structural Integrity*—At the conclusion of each test, there shall be no failures such as seam separation, fabric tears, permanent deformation, breakage or disengagement of attachment systems, or a hazardous condition as defined in 5.2 – 5.5, 5.8, or 5.9. Adjustable attachment systems of the sling carrier shall not slip more than 1 in. (25.44 mm) per element.

6.1.1 *Static Load*—The sling carrier shall meet the criteria in 6.1 when tested in accordance with 7.1.

6.1.2 *Dynamic Load*—The sling carrier shall meet the criteria in 6.1 when tested in accordance with 7.2.

6.2 *Restraint System*—If the manufacturer includes a restraint system on the product, each separate restraint system shall comply with the following:

6.2.1 The restraint system shall include both waist and crotch restraint, where the crotch restraint's use is mandatory when the waist restraint system is in use.

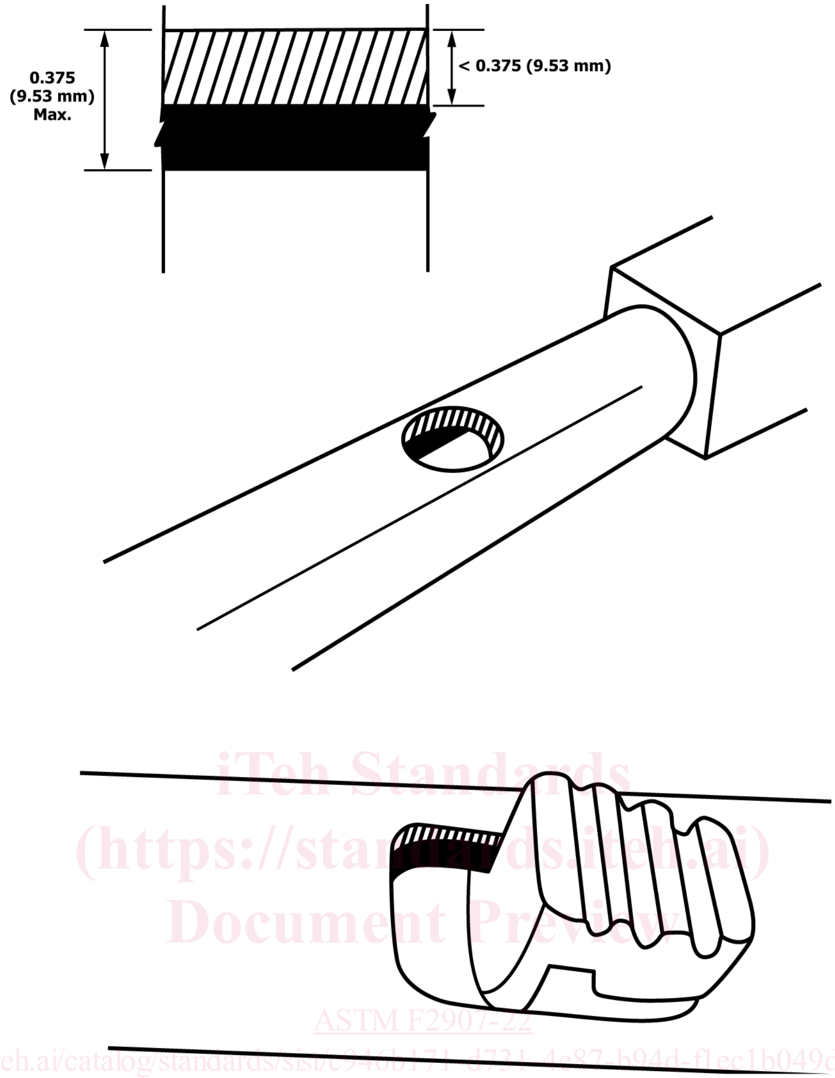

FIG. 1 Opening Example

6.2.2 The anchorages for the restraint system shall not separate from their attachment points through normal use when tested in accordance with 7.6.

6.3 *Occupant Retention:*

6.3.1 *Ring Slings*—When tested in accordance with 7.5, after 100 cycles the maximum slippage of the attachment system shall be 3 in. (76.2 mm) and no part of the test mass shall pass below the bottom of the test torso.

6.3.2 *Products Other Than Ring Slings*—When tested in accordance with 7.5, after 100 cycles the maximum slippage of the attachment system and the restraint system (if applicable) shall be 1 in. (25 mm) and no part of the test mass shall pass below the bottom of the test torso.

6.3.3 When tested in accordance with 7.5, after the completion of each phase of the test, the attachment system and the restraint system (if applicable) shall not be released, there shall be no failures (as defined in 6.1), and no part of the test mass shall pass below the bottom of the test torso.

7. Test Methods

7.1 *Static Load Test:*

7.1.1 Fasten the sling carrier to a test torso (see Fig. 2) as directed in the instruction manual supplied with the product. If the sling carrier is manufactured in multiple sizes, the size that fits the test torso is the required size for the sample submission.

7.1.2 By some appropriate means, mark the position of the attachment system. If sling does not have any hardware and is fastened by means of fabric, mark the position on the fabric. This will be the start point for the remainder of the test.

7.1.3 Using a 6-in. (150-mm) standard weld cap (see Fig. 3), center a weight equal to three times the manufacturer's recommended maximum weight, or 60 lb (27.2 kg), whichever is greater, in the support area of the sling carrier. Include the weight of the weld cap in the total. Gradually apply the weight within a 5-s period and maintain for an additional 1 min.

7.1.4 Mark and measure the amount of slippage in the attachment system. Evaluate results per requirements of 6.1.

7.1.5 If two occupants can be carried in any carrying position according to the manufacturer's instructions, the applicable weight in 7.1.3 shall be applied in both support areas of the sling carrier concurrently.

7.1.6 Repeat 7.1.1 – 7.1.5 for all manufacturer's recommended carrying positions.

7.2 *Dynamic Load Test:*

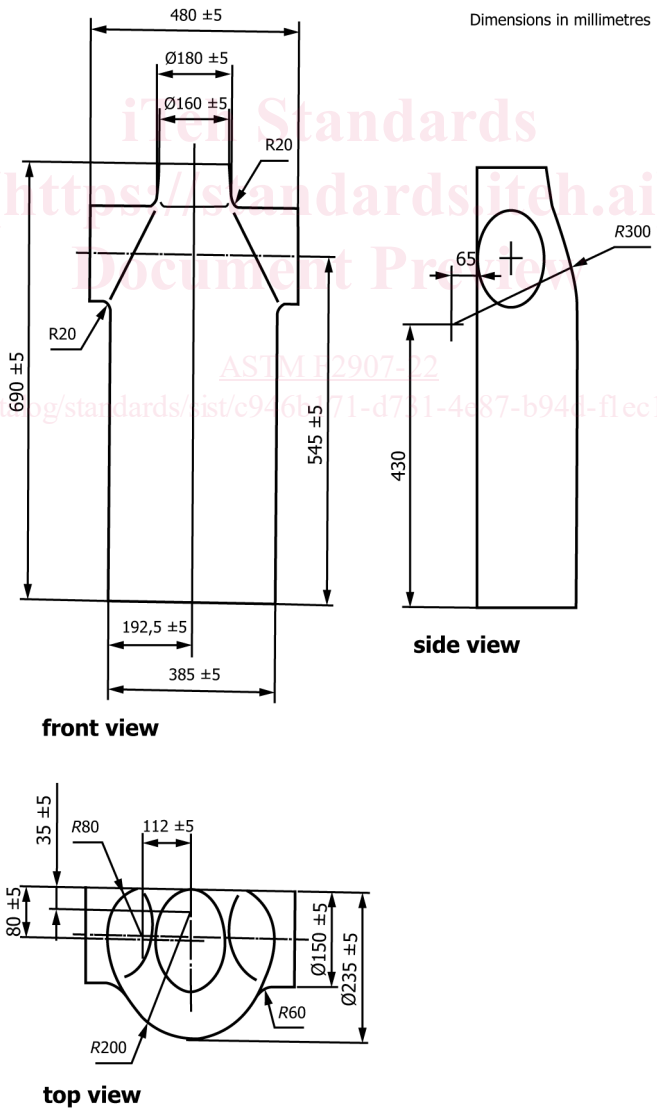

FIG. 2 Test Torso

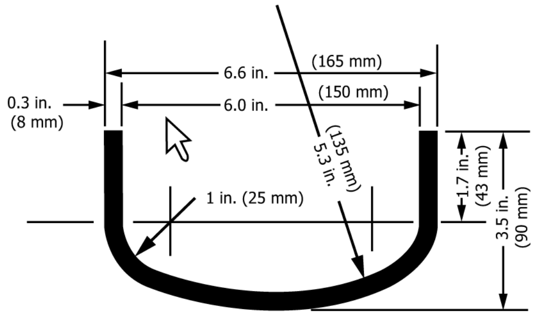

FIG. 3 Standard 6-in. (150-mm) Weld Cap

7.2.1 Fasten the sling carrier to a test torso (see Fig. 2) as directed in the instruction manual supplied with the product. If the sling carrier is manufactured in multiple sizes, the size that fits the test torso is the required size for the sample submission.

7.2.2 *Single Occupant Products:*

7.2.2.1 Determine the appropriate number of test cycles using Table 1 based on the number of separate manufacturer's recommended carrying positions.

7.2.2.2 Position a 6 in. to 8 in. diameter shot bag weighing 35 lb (15.9 kg) or a mass equal to the manufacturer's recommended maximum weight for the specific carrying position of the product, whichever is greater, a distance of 1 in. (25 mm) above the support area of the sling carrier.

7.2.2.3 Drop the weight onto the support area ten times with a cycle time of 4 s ± 1 s per cycle to preset the attachment system.

7.2.2.4 By some appropriate means, mark the position of the attachment system. If the sling does not have any hardware and is fastened by means of fabric, mark the position of the fabric. This will be the start point for the remainder of the test.

7.2.2.5 Drop the weight onto the support area an additional X times with a cycle time of 4 s ± 1 s per cycle.

7.2.2.6 Mark and measure the amount of slippage in the attachment system. Evaluate results per requirements of 6.1.

7.2.2.7 Repeat 7.2.2.2 – 7.2.2.6 for each separate carrying position.

7.2.3 *Two Occupant Products:*

7.2.3.1 If two occupants can be carried in any carrying position according to the manufacturer's instructions, load one support area with the applicable static load as determined in 7.1.2. Repeat steps 7.2.2.1 – 7.2.2.6 in the other support area.

7.2.3.2 Repeat 7.2.3.1 with the static and dynamic static loads reversed in each support area. Note that weights for each support area may be different, and the applicable weight(s) shall be used.

7.2.3.3 Repeat 7.2.3.1 and 7.2.3.2 for each separate carrying position.

TABLE 1 Test Cycles Based on Manufacturer's Recommended Carrying Positions

Manufacturer's recommended carrying positions[A]	Total number of cycles for each carrying position in the dynamic load test (7.2) and occupant retention test (7.5)	Cycles in initial slippage test (7.5.2.7)	Remaining cycles (7.5.2.9)
1	1000	100	900
2	500	100	400
3	350	100	250

[A] Those positions that are substantially similar in fabric position and loading patterns will count as one (1) position. A product for one occupant that may be worn on the front and back has two carrying positions. Products for up to two occupants that allow for different combinations of front/back carry positions shall all be considered separate carrying positions. The configuration where both children are carried on the front of the caregiver is considered one carrying position, and the configuration where one child is carried on the back and one child is carried on the front is considered a second carrying position.