



[40 FR 1484, Jan. 7, 1975; 40 FR 6210, Feb. 10, 1975; 40 FR 16192, Apr. 10, 1975; 40 FR 17746, Apr. 22, 1975; as amended at 55 FR 52040, Dec. 19, 1990; 56 FR 9, Jan. 2, 1991; 56 FR 558, Jan. 7, 1991]

**§ 1500.52 Test methods for simulating use and abuse of toys and other articles intended for use by children over 18 but not over 36 months of age.**

(a) *Application.* The test methods described in this section, shall be used to simulate the normal and reasonably foreseeable use, damage, or abuse of toys and other articles intended for use

by children over 18 but not over 36 months of age in conjunction with § 1500.18.

(b) *Impact test*—(1) *Application.* Except as provided in paragraph (b)(4) of this section, toys having a weight of less than 4.0 pounds  $\pm 0.01$  pound (1.8 kilograms) shall be subject to this test.

(2) *Impact medium.* The impact medium shall consist of a  $\frac{1}{8}$ -inch (0.3-centimeter) nominal thickness of type IV vinyl-composition tile, composition 1— asbestos free, as specified by paragraphs 1.2 and 3.1.4 of Interim Amendment-1(YD), dated November 14, 1979, to the Federal Specification entitled Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl-Asbestos, SS-T-312B, dated October 10, 1974,<sup>1</sup> over at least a 2.5-inch (6.4-centimeter) thickness of concrete. The impact area shall be at least 3 square feet (0.3 square meter). The Commission recognizes that this specified impact medium is the equivalent of, and will yield the same impact test results as, a surface covered with vinyl-asbestos tile meeting the requirements of Federal Specification SS-T-312A.

(3) *Testing procedure.* Except as provided in paragraph (b)(4) (i) and (ii) of this section, the toy shall be dropped four times from a height of 3 feet  $\pm 0.5$  inch (0.92 meter) onto the impact medium described in paragraph (b)(2) of this section. The toy shall be dropped in random orientation. After each drop, the test sample shall be allowed to come to rest and shall be examined and evaluated before continuing.

(4) *Large and bulky toys.* (i) A toy that has a projected base area of 400 or more square inches (2,560 or more square centimeters) shall be tested for impact in accordance with paragraph (b)(4)(iii) of this section. The base area for toys with permanently attached legs shall be measured by calculating the area enclosed by straight lines connecting the outermost edge of each leg of the perimeter.

(ii) A toy that has a volume of more than 3 cubic feet (0.085 cubic meter), calculated by the major dimensions without regard to minor appendages, shall be tested for impact in accordance with paragraph (b)(4)(iii) of this section.

(iii) The toys described in paragraph (b)(4) (i) and (ii) of this section shall be tested for impact by tipping them over three times by pushing the samples slowly past their centers of balance onto the impact medium described in paragraph (b)(2) of this section.

(c) *Bite test*—(1) *Application.* A toy (or component or any accessible portion thereof) that has an external dimension of 1.25 inches  $\pm 0.05$  inch (3.18 centimeters) or less and a design configuration that would permit a child to insert a portion into the mouth in any orientation up to a biting thickness of 1.25 inches  $\pm 0.05$  inches (3.18 centimeters), for a penetration of at least 0.25 inch (0.635 centimeter), shall be subject to this test.

(2) *Test equipment*—(i) *Contact mechanism.* The contact mechanism shall be two metal strips or plates each measuring 0.25 inch  $\pm 0.002$  inch (0.635 centimeter) high and each having a contact edge radius of 0.020 inch  $\pm 0.002$  inch (0.05 centimeter) for at least a 150-degree cross-sectional arc. A suggested contact mechanism appears in figure 1 of § 1500.51.

(ii) *Loading device.* The loading device shall be a scale or force gauge having an accuracy of  $\pm 0.5$  pound ( $\pm 225$  grams).

(3) *Testing procedure.* The test article shall be placed in the contact mechanism in any reasonable position for a penetration of 0.25 to 0.5 inch (0.64 to 1.27 centimeters), which position utilizes less than 180 degrees of the arc of the contact mechanism, and a test load increasing to 50 pounds  $\pm 0.5$  pound (22.74 kilograms) shall be evenly applied within 5 seconds. This load shall be maintained for an additional 10 seconds.

(d) *Flexure test*—(1) *Application.* This test shall be applied to each component of a toy containing metal wire(s), or other metal material(s), for stiffening or for retention of form if the component can be bent through a 60-degree arc by a maximum force of 15 pounds  $\pm 0.5$  pound (6.80 kilograms) applied perpendicularly to the major axis of the component at a point 2 inches  $\pm 0.05$  inch (5 centimeters) from the intersection of the component with the main body of the toy or at the end of the component if the component is less than 2 inches  $\pm 0.05$  inch (5 centimeters) long.

(2) *Testing procedure.* The toy shall be secured in a vise equipped with vise shields that are fabricated from 13-gauge cold-rolled steel or other similar material and that have a 0.375-inch (0.95-centimeter) inside radius. The

<sup>1</sup>See footnote 1 to § 1500.51.

component shall then be bent through a 60-degree arc by a force applied at a point on the component 2 inches  $\pm 0.05$  inch (5 centimeters) from the intersection of the component with the main body of the toy or applied at the end of the component if the component is less than 2 inches (5 centimeters) long. The component shall then be bent in the reverse direction through a 120-degree arc. This process shall be repeated for 30 cycles at a rate of one cycle per two seconds with a 60-second rest period occurring after each 10 cycles. Two 120-degree arc bends shall constitute one cycle.

(e) *Torque test*—(1) *Application*—(i) *General*. A toy with a projection, part, or assembly that a child can grasp with at least the thumb and forefinger or the teeth shall be subject to this test.

(ii) *Toys with rotating components*. Projections, parts, or assemblies that are rigidly mounted on an accessible rod or shaft designed to rotate along with the projections, parts, or assemblies shall be tested with the rod or shaft clamped to prevent rotation.

(2) *Test equipment*—(i) *Loading device*. The loading device shall be a torque gauge, torque wrench, or other appropriate device having an accuracy of  $\pm 0.2$  inch-pound ( $\pm 0.23$  kilogram-centimeter).

(ii) *Clamp*. The clamp shall be capable of holding the test component firmly and transmitting a torsional force.

(3) *Testing procedure*. With the toy rigidly fastened in any reasonable test position, the clamp is fastened to the test object or component. A torque of 3 inch-pounds  $\pm 0.2$  inch-pound (3.46 kilogram-centimeters) shall be applied evenly within a period of 5 seconds in a clockwise direction until a rotation of 180 degrees from the original position has been attained or 3 inch-pounds  $\pm 0.2$  inch-pound (3.46 kilogram-centimeters) exceeded. The torque or maximum rotation shall be maintained for an additional 10 seconds. The torque shall then be removed and the test component permitted to return to a relaxed condition. This procedure shall then be repeated in a counterclockwise direction.

(f) *Tension test*—(1) *Application*—(i) *General*. Any projection of a toy that the child can grasp with at least the thumb and forefinger or the teeth shall

be subject to this test. This test is to be conducted on the same toy that has been subjected to the torque test described in paragraph (e) of this section.

(ii) *Stuffed toys and beanbags*. A stuffed toy or beanbag constructed of pliable materials having seams (such as fabrics) shall have the seams subjected to 15 pounds  $\pm 0.5$  pound (6.80 kilograms) of force applied in any direction.

(2) *Test equipment*—(i) *Clamps*. One clamp capable of applying a tension load to the test component is required. A second clamp suitable for applying a tension load perpendicularly to the major axis of the test component is also required.

(ii) *Loading device*. The loading device is to be a self-indicating gauge or other appropriate means having an accuracy of  $\pm 0.5$  pound ( $\pm 255$  grams).

(3) *Testing procedure*. With the test sample fastened in a convenient position, an appropriate clamp shall be attached to the test object or component. A 15-pound  $\pm 0.5$  pound (6.80-kilogram) direct force shall be evenly applied, within a period of 5 seconds, parallel to the major axis of the test component and maintained for an additional 10 seconds. The tension clamp shall then be removed and a second clamp appropriate for pulling at 90 degrees shall be attached to the test object or component. A 15-pound  $\pm 0.5$  pound (6.80-kilogram) tensile force shall be evenly applied, within a period of 5 seconds, perpendicularly to the major axis of the test component and maintained for an additional 10 seconds.

(g) *Compression test*—(1) *Application*. Any area on the surface of a toy that is accessible to a child and inaccessible to flat-surface contact during the impact test shall be subject to this test.

(2) *Test apparatus*. The loading device shall be a rigid metal disc 1.125 inches  $\pm 0.015$  inch (2.86 centimeters) in diameter and 0.375 inch (0.95 centimeter) in thickness. The perimeter of the disc shall be rounded to a radius of  $\frac{1}{32}$  inch (0.08 centimeter) to eliminate irregular edges. The disc shall be attached to an appropriate compression scale having an accuracy of  $\pm 0.5$  pound ( $\pm 225$  grams).

(3) *Testing procedure*. The disc shall be positioned so that the contact surface

is parallel to the surface under test. A direct force of 25 pounds  $\pm 0.5$  pound (11.4 kilograms) shall be evenly applied within 5 seconds through the disc. This load shall be maintained for an additional 10 seconds. During the test the toy is to rest on a flat, hard surface in any convenient position.

[40 FR 1485, Jan. 7, 1975; 40 FR 6210, Feb. 10, 1975; 40 FR 16192, Apr. 10, 1975; as amended at 56 FR 10, Jan. 2, 1991]

**§ 1500.53 Test methods for simulating use and abuse of toys and other articles intended for use by children over 36 but not over 96 months of age.**

(a) *Application.* The test methods described in this section shall be used to simulate the normal and reasonably foreseeable use, damage, or abuse of toys and other articles intended for use by children over 36 but not over 96 months of age in conjunction with § 1500.18.

(b) *Impact test*—(1) *Application.* Except as provided in paragraph (b)(4) of this section, toys having a weight of less than 10.0 pounds  $\pm 0.01$  pound (4.6 kilograms) shall be subject to this test.

(2) *Impact medium.* The impact medium shall consist of a  $\frac{1}{8}$ -inch (0.3-centimeter) nominal thickness of type IV vinyl-composition tile, composition 1— asbestos free, as specified by paragraphs 1.2 and 3.1.4 of Interim Amendment-1(YD), dated November 14, 1979, to the Federal Specification entitled Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl-Asbestos, SS-T-312B, dated October 10, 1974,<sup>1</sup> over at least a 2.5-inch (6.4-centimeter) thickness of concrete. The impact area shall be at least 3 square feet (0.3 square meter). The Commission recognizes that this specified impact medium is the equivalent of, and will yield the same impact test results as, a surface covered with vinyl-asbestos tile meeting the requirements of Federal Specification SS-T-312A.

(3) *Testing procedure.* except as provided in paragraph (b)(4) (i) and (ii) of this section, the toy shall be dropped four times from a height of 3 feet  $\pm 0.5$  inch (0.92 meter) onto the impact medium described in paragraph (b)(2) of this section. The toy shall be dropped in random orientation. After each drop,

the test sample shall be allowed to come to rest and shall be examined and evaluated before continuing.

(4) *Large and bulky toys.* (i) A toy that has a projected base area of 400 or more square inches (2,560 or more square centimeters) shall be tested for impact in accordance with paragraph (b)(4)(iii) of this subsection. The base area for toys having permanently attached legs shall be measured by calculating the area enclosed by straight lines connecting the outermost edge of each leg of the perimeter.

(ii) A toy that has a volume of more than 3 cubic feet (0.085 cubic meter), calculated by the major dimensions without regard to minor appendages, shall be tested for impact in accordance with paragraph (b)(4)(iii) of this section.

(iii) The toys described in paragraph (b)(4) (i) and (ii) of this section shall be tested for impact by tipping them over three times by pushing the samples slowly past their centers of balance onto the impact medium described in paragraph (b)(2) of this section.

(c) *Bite test*—(1) *Application.* A toy (or component) that is a mouth toy shall be subject to this test.

(2) *Test equipment*—(i) *Contact mechanism.* The contact mechanism shall be two metal strips or plates each measuring 0.25 inch  $\pm 0.002$  inch (0.635 centimeter) high and each having a contact edge radius of 0.020 inch  $\pm 0.002$  inch (0.5 centimeter) for at least a 150-degree cross-sectional arc. A suggested contact mechanism appears in figure 1 of § 1500.51.

(ii) *Loading device.* The loading device shall be a scale or force gauge having an accuracy of  $\pm 0.5$  pound ( $\pm 225$  grams).

(3) *Testing procedure.* The test article shall be placed in the contact mechanism in any reasonable position for a penetration of 0.25 to 0.5 inch (0.64 to 1.27 centimeters), which position utilizes less than 180 degrees of the arc of the contract mechanism, and a test load increasing to 100 pounds  $\pm 0.5$  pound (45.50 kilograms) shall be evenly applied within 5 seconds. This load shall be maintained for an additional 10 seconds.

(d) *Flexure test*—(1) *Application.* This test shall be applied to each component of a toy containing metal wire(s), or