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

This document has been electronically approved and signed.

DATE: January 13, 2017

BALLOT VOTE SHEET

TO: The Commission
Todd A. Stevenson, Secretary

THROUGH: Mary T. Boyle, General Counsel
Patricia H. Adkins, Executive Director

FROM: Patricia M. Pollitzer, Assistant General Counsel
David M. DiMatteo, Attorney, OGC

SUBJECT: Proposed Revision of ASTM F963 Mandatory Toy Standard

BALLOT VOTE DUE: Monday, January 23, 2017

Attached is a staff briefing package recommending that the Commission allow revisions in ASTM F963-16 to become mandatory. ASTM notified the Commission of these revisions on November 1, 2016. Under section 106(g) of the Consumer Product Safety Improvement Act of 2008, the revised standard shall be considered a consumer product safety standard issued by the Commission unless the Commission notifies ASTM that the Commission has determined that the proposed revision does not improve safety. The Commission must decide by January 30, 2017 whether to allow ASTM F963-16 to go into effect. If the Commission allows ASTM F963-16 to become the new mandatory standard, it would become effective on April 30, 2017. As discussed in staff materials provided to the Commission, staff recommends that the Commission allow the revised ASTM F963 to become the CPSC mandatory standard. Specifically, staff recommends that the Commission publish a direct final rule that incorporates by reference ASTM F963-16 into the Code of Federal Regulations and amends the notice of requirements in 16 CFR part 1112 to reflect the revisions in ASTM F963. A draft *Federal Register* notice for that purpose is attached.

Please indicate your vote on the following options:

I. Allow ASTM F963-16 to become CPSC's mandatory standard and approve publication in the *Federal Register* of the draft direct final rule.

_____ _____
Signature Date

II. Allow ASTM F963-16 to become CPSC's mandatory standard and approve publication in the *Federal Register* of the draft direct final rule, with changes (please specify changes):

_____

_____

_____

_____ _____
Signature Date

III. Do not allow ASTM F963-16 to become CPSC's mandatory standard and do not approve publication in the *Federal Register* of the draft direct final rule.

_____ _____
Signature Date

IV. Take other action (please specify):

_____

_____

_____

_____ _____
Signature Date

Attachment: Staff Briefing Package, Notice of Revision to the Toy Standard, ASTM F963 *Standard Consumer Safety Specification for Toy Safety*

[Billing Code 6355-01-P]

CONSUMER PRODUCT SAFETY COMMISSION

[Docket No. CPSC-2017-00XX]

16 CFR Parts 1112 and 1250

Safety Standard Mandating ASTM F963 for Toys

AGENCY: Consumer Product Safety Commission.

ACTION: Direct final rule.

SUMMARY: Section 106 of the Consumer Product Safety Improvement Act (CPSIA) made ASTM F963-07ε1, *Standard Consumer Safety Specification for Toy Safety*, a mandatory consumer product safety standard. That section also provides procedures for revisions to the standard. In accordance with these procedures, the Commission (CPSC or Commission) recently allowed the update to ASTM F963, ASTM F963–16 , *Standard Consumer Safety Specification for Toy Safety* (ASTM F963–16), to become the mandatory toy standard. This direct final rule incorporates by reference ASTM F963–16 and updates the existing notice of requirements (NOR) that provide the criteria and process for Commission acceptance of accreditation of third party conformity assessment bodies for testing for ASTM F963 pursuant to section 14(a)(3)(B)(vi) of the Consumer Product Safety Act (CPSA).

DATES: The rule is effective on April 30, 2017, unless we receive significant adverse comment by [**insert date 30 days after publication in the FEDERAL REGISTER**]. If we receive timely significant adverse comments, we will publish notification in the *Federal Register,* withdrawing this direct final rule before its effective date. The

incorporation by reference of the publication listed in this rule is approved by the Director of the Federal Register as of April 30, 2017.

ADDRESSES: You may submit comments, identified by Docket No. CPSC-2017-00XX, by any of the following methods:

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.

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 820, 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 notice. 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.

FOR FURTHER INFORMATION CONTACT: For information related to the toy standard, contact: Carolyn T. Manley, Lead Compliance Officer, Office of Compliance

and Field Operations, Consumer Product Safety Commission, 4330 East West Highway, Bethesda, MD 20814-4408; telephone: 301-504-7607; email: cmanley@cpsc.gov.

SUPPLEMENTARY INFORMATION:

A. Background

Section 106 of the Consumer Product Safety Improvement Act of 2008. Section 106(a) of CPSIA mandated that beginning on February 10, 2009, ASTM F 963–07ε1, *Standard Consumer Safety Specifications for Toy Safety*[1], shall be considered a mandatory consumer product safety standard issued by the CPSC. Pub. L. No. 110–314. Since ASTM F963 was first mandated in 2009, there have been two revisions, ASTM F963–08 and ASTM F963-11. Currently, the provisions of ASTM F 963–11 and section 4.27 of ASTM F 963–07e1 (toy chests) are considered consumer product safety standards issued by the Commission under section 9 of the CPSA. Under section 106(g) of the CPSIA, if ASTM proposes revisions to ASTM F963, ASTM must notify the Commission. The revised standard shall be considered to be a consumer product safety standard issued by the CPSC under section 9 of the Consumer Product Safety Act (15 U.S.C. 2058), effective 180 days after the date on which ASTM notifies the Commission of the revision, unless, within 90 days after receiving that notice, the Commission notifies ASTM that it has determined that the proposed revision does not improve the safety of toys.

Notification of Revisions. On November 1, 2016, ASTM notified the CPSC of ASTM's approval and publication of revisions to ASTM F963-16 in a revised standard

[1] Except for section 4.2 and Annex 4 or any provision that restates or incorporates an existing mandatory standard or ban promulgated by the Commission or by statute.

approved on August 1, 2016, ASTM F963-16, *Standard Consumer Safety Specification for Toy Safety*. On [INSERT DATE], the Commission voted to allow the provisions of ASTM F963-16 to become the CPSC mandatory toy standard. As discussed below, the Commission has reviewed the differences between ASTM F963-11 and section 4.27 of ASTM F 963–07e1 (for toy chests the current mandatory toys standard) and ASTM F963-16 (the revised toys standard).

B. Revisions to the ASTM Standard

In general, ASTM F963-16 contains clarifications, corrections, and new requirements that will increase safety, reduce testing burden, or enhance clarity and utility of the standard. A number of changes align ASTM F963 more closely with the European Standard (EN) 71, *Safety of Toys Part 1: Mechanical and Physical Properties,* and International Organization for Standardization (ISO) 8124, *Safety of Toys Part 1: Safety Aspects Related to Mechanical and Physical Properties,* performance requirements. In addition, new provisions were added to the standard to address new types of toys or hazards. The revisions appear in every major section of the standard, beginning with Section 1.7, which has been updated to return toy chest requirements to ASTM F963.[2] Finally, many small editorial changes throughout the revised standard keep the standard's format and numbering consistent. These changes are strictly editorial and do not have an impact on toy safety.

Changes were made in the following sections:

- **Scope -** Updates section 1.7, which lists all sections of the standard, to reflect the addition of toy chests.

[2] Toy chest requirements were last included in the ASTM F963-07ε1.

- **Referenced documents -** Removes one reference, updates one, and adds 22 new references.
- **Terminology** - Adds seventeen new definitions, changes seven definitions, and removes six definitions, generally because they are redundant with new or changed definitions, and thus, are no longer needed.
- **Labeling Requirements** - Updates labeling requirements for battery-operated toys and magnetic toys.
- **Instructional Literature** - Revises language to clarify instructional literature requirements for battery-operated toys and battery-powered ride-on toys.
- **Batteries** - Adds new testing requirements to address toys that contain rechargeable cells and batteries. Adds a new warning label for certain button and coin cell batteries of nominal 1.5 volts or greater to address hazards that have been identified with these cells. Adds four new test methods for toys that contain rechargeable cells and batteries: battery overcharging test, repetitive overcharging test, single fault charging test and short circuit protection test.
- **Cleanliness (biological)** - Changes the test methods for both microbial cleanliness of cosmetics, liquids, pastes, putties, gels, powders, and feathers and the cleanliness of stuffing materials.
- **Cleanliness (stuffing)** - Changes the test methods for both microbial cleanliness of cosmetics, liquids, pastes, putties, gels, powders, and feathers and the cleanliness of stuffing materials.

- **Expanding Materials -** Adds new definitions, performance requirements, test methodology and a test template to address the emerging hazard of gastrointestinal blockage related to ingestion of expanding materials.
- **Heavy Elements** - Allows X-ray Fluorescence Spectrometry Using Multiple Monochromatic Excitation Beams, commonly known as HDXRF, for Total Element Content Screening.
- **Impaction Hazard** - Clarifies impaction hazard test fixture requirements for rigid squeeze toys and tethered rigid components.
- **Magnets** - Includes a new cyclic soaking test for only wooden toys, toys intended to be used in water, mouth pieces of mouth-actuated toys with magnets or magnetic components. New definitions for "experimental/science sets."
- **Mouth-Actuated Toys** - Adds design requirements to prevent the projectile or any liberated toy part from entering the mouth.
- **Projectile Toys** - Includes changes to descriptions, definitions, allowed shapes, types of projectile toys, exemptions, assessments and kinetic energy density levels allowed for certain types of projectile toys.
- **Ride-on Toys (stability)** - Requires dimensional spacing between wheels on the same axis of ride-on toys.
- **Ride-on Toys (overloading)** - Requires a more stringent overload weight test for ride-on and seated toys.
- **Ride-on Toys (restraints) -** Exempts straps used for waist restraints on ride-on toys from the free length and loop requirements.

- **Sound-Producing Toys** - Redefines "mouth-actuated toys" to include a broader range of toys, such as noisemakers and projectile toys; increases peak limits (due to miscalculated values); adds new noise limit; lowers test speed for push-pull toys; and revises the format, sequence and requirements sections for clarification.
- **Toy Chests** - Reincorporates toy chest section 4.27 and associated provisions from ASTM F963-07ε1 into the current 2016 toy standard, and clarifies a multi-positional lid requirement when testing for maximum lid drop requirements.
- **Annex** - Adds Annex A12 to document the rationale for the changes in the 2016 version of ASTM F963.

C. Incorporation by Reference

Although ASTM F963-16 is mandatory by operation of statute, nothing currently in the Code of Federal Regulations (CFR) indicates that ASTM F963 is a CPSC mandatory standard. This direct final rule adds a new part 1250, Safety Standard Mandating ASTM F963 for Toys, which incorporates by reference ASTM F963-16 into the CFR, along with the rest of CPSC's mandatory rules so that the public may more readily ascertain the mandatory rules that apply.

The Office of the Federal Register (OFR) has regulations concerning incorporation by reference. 1 CFR part 51. Under these regulations, agencies must discuss, in the preamble of the final rule, ways that the materials the agency incorporates by reference are reasonably available to interested persons and how interested parties can

obtain the materials. In addition, the preamble to the final rule must summarize the material. 1 CFR 51.5(b).

In accordance with the OFR's requirements, section B of this preamble summarizes the ASTM F963-16 standard that the Commission incorporates by reference into 16 CFR part 1250. The standard is reasonably available to interested parties, and interested parties may purchase a copy of the standard from ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959 USA; phone: 610-832-9585; http://www.astm.org/. A copy of the standard can also be inspected at CPSC's Office of the Secretary, U.S. Consumer Product Safety Commission, Room 820, 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 regulations/ibr_locations.html.

D. Certification

Section 14(a) of the CPSA imposes the requirement that products subject to a consumer product safety rule under the CPSA, or to a similar rule, ban, standard, or regulation under any other act enforced by the Commission, be certified as complying with all applicable CPSC requirements. 15 U.S.C. 2063(a). Such certification must be based on a test of each product, or on a reasonable testing program or, for children's products, on tests on a sufficient number of samples by a third party conformity assessment body accredited by the Commission to test according to the applicable requirements. As noted in the preceding discussion, standards issued under section

106(f)(1)(B) are "consumer product safety standards." Thus, they are subject to the testing and certification requirements of section 14 of the CPSA.

Because toys are children's products, samples of these products must be tested by a third party conformity assessment body whose accreditation has been accepted by the Commission. These products also must comply with all other applicable CPSC requirements, such as the lead content requirements of section 101 of the CPSIA, the phthalates prohibitions of section 106 of the CPSIA, and the tracking label requirement in section 14(a)(5) of the CPSA.

E. Notice of Requirements

In accordance with section 14(a)(3)(B)(vi) of the CPSIA, the Commission has previously published two NORs for accreditation of third party conformity assessment bodies for testing toys (76 FR 46598 (Aug. 3, 2011), 78 FR 15836 (March 12, 2013)). The last NOR provided the criteria and process for our acceptance of accreditation of third party conformity assessment bodies for testing toys to ASTM F963-11. The NOR for ASTM F963-11 is listed in the Commission's rule, "Requirements Pertaining to Third Party Conformity Assessment Bodies." 16 CFR part 1112.

The previous NOR for the toy safety standard included 35 sections from ASTM F963-11 and one section from ASTM F963-07ε1 (Section 4.27, Toy Chests) that required third party testing. The revisions to ASTM F963-11 that were adopted into ASTM F963-16 include new requirements, new test methods, and several clarifications to safety provisions and test methods.

The Commission will require third party testing for 37 sections of ASTM F963-16, including the same 35 sections that required third party testing for ASTM F963-11,

plus two new sections. The new sections are Section 4.40 for Expanding Materials and Section 4.41 for Toy Chests. Section 4.40 for Expanding Materials is a new safety requirement, which addresses a hazard that was not addressed in earlier versions of ASTM F963. Section 4.41 for toy chests reincorporates the toy chest requirements from ASTM F963-07ε1 back into ASTM F963. The incorporation of the toy chest requirements back into ASTM F963-16 simplifies the NOR because it now references only one version of the standard, ASTM F963-16. This rule revises section 1112.15(b)(32)(ii) of the NOR for ASTM F963 in part 1112 to add two new subsections, (JJ) for section 4.40 for expanding materials and (KK) for section 4.41 for toy chests to the NOR. Additionally, references to section 4.27 of ASTM F963–07e1 (toy chests) have been deleted from section 1112.15(b)(32)(i) to reflect that the toy chest provisions of ASTM F963–07e1 have been reincorporated into ASTM F963-16. Finally, the reference to ASTM F963–07e1 regarding toys chests in section 1112.15(c)(1)(ii) has been deleted to reflect that provision as reincorporated into ASTM F963-16, and the citation regarding the incorporation by reference of ASTM F963 has been updated to list ASTM F963–16 in section 1112.15(c)(1) (iii).

Certain provisions of ASTM F963-16 do not require third party testing as was the case in the previous NORs issued for ASTM F963. The ASTM F963-16 provisions that do not require third party testing are in the following areas:

- Any provision of ASTM F963 that section 106 of the CPSIA excepted from being a mandatory consumer product safety standards issued by the Commission. The CPSIA also excepted from ASTM F963 any provision that restates or incorporates an existing mandatory standard or ban promulgated by the

Commission or by statute. In addition, the CPSIA excepted provisions from ASTM F963 that restates or incorporates a regulation promulgated by the Food and Drug Administration or any statute administered by the Food and Drug Administration. Section 4, Public Law No. 112-28 – Aug 12, 2011.

- Those sections of ASTM F963–16 that pertain to the manufacturing process and, thus, cannot be evaluated meaningfully by a test of the finished product (*e.g.*, the purified water provision at section 4.3.6.1).
- Those provisions of ASTM F963-16 with requirements for labeling, instructional literature, or producer's markings.
- The provision in ASTM F963–16 that sets a limit for a DI (2-ethylhexyl) phthalate in pacifiers, rattles, and teethers. This section is excepted from third party testing because section 108 of the CPSIA sets limits for this and other phthalates that are more stringent than this requirement in ASTM F963-16.

Finally, as noted, some of the revised sections of ASTM F963 include changes to test methods. However, the test method revisions do not involve a change in scientific discipline necessary to conduct the test or a significant increase in complexity. Testing laboratories that are accredited and CPSC-accepted to test to specific sections in ASTM F963-11 are considered by CPSC to be competent to conduct testing to those same sections in ASTM F963-16. Therefore, CPSC will accept testing to support product certifications for sections in ASTM F963-16 if the test laboratory is already CPSC-accepted to those same sections in ASTM F963-11. Test laboratories that conduct testing to support product certifications to ASTM F963-16 must show in their test reports

"ASTM F963-16" and the specific section numbers in the standard to which the product was evaluated.

There are two new sections in ASTM F963-16. Because section 4.41 for Toy Chests merely reincorporates the toy chests provision into ASTM F963-16, the CPSC will accept testing if the laboratory is already CPSC-accepted for ASTM F963-07ε1, Section 4.27 for Toy Chests. Additionally, although section 4.40 for Expanding Materials is a new requirement not previously found in ASTM F963, the CPSC will accept product testing for certification, if the test laboratory is already CPSC-accepted for ASTM F963-11, sections 4.6 for Small Parts and 4.24 for Squeeze Toys. This is because the new provision in section 4.40 in ASTM F963-16 involves mechanical testing, including dimensional measurements and the use of a test gauge. The testing methods have strong similarities with other mechanical testing in section 4.6 Small Objects and Section 4.24-Squeeze Toys of ASTM F963-11. Therefore, CPSC considers test laboratories that are currently CPSC-accepted for testing to section 4.6 Small Objects and Section 4.24-Squeeze Toys of ASTM F963-11 to be competent to conduct testing to this new requirement.

CPSC will accept ASTM F963-16 testing results by test laboratories that are CPSC-accepted to ASTM F963-11 sections for a period not to exceed 2 years. This should allow adequate time for test laboratories to work with their accreditation bodies, make official updates to their accreditation scope to include ASTM F963-16 sections, and submit applications to the CPSC.

The CPSC will open the application process for all sections of ASTM F963-16 when this document is published in the *Federal Register*. Test laboratories that seek

CPSC acceptance for one or more ASTM F963-16 sections will be required to update their accreditation scope. To be CPSC-accepted for sections in ASTM F963-16, a test laboratory's scope of accreditation must include the reference to "ASTM F963-16" and a specific reference to one or more of the 37 sections listed in the NOR. Test laboratories that are currently CPSC-accepted to ASTM F963-11 are instructed to update their accreditation scope to include ASTM F963-16 sections as soon as possible, and submit their application for CPSC acceptance. Test laboratories that were not previously CPSC-accepted to sections of ASTM F963-11 and that wish to request CPSC acceptance to ASTM F963-16 should work with their accreditation bodies to include "ASTM F963-16" sections in their scope of accreditation.

On [INSERT 2 YEARS AFTER PUBLICATION DATE IN FEDERAL REGISTER], the CPSC will no longer accept laboratory applications that reference sections of "ASTM F963-11." At that time, the scope document submitted with applications to CPSC must reference "ASTM F963-16" and the specific section numbers listed in the NOR in section 16 CFR 1112.15(b)(32). This approach will avoid disruption to third party testing to the toy safety standard and allow for a practicable transition from ASTM F963-11 to ASTM F963-16 for testing laboratories, the toy industry, and other interested parties.

F. Direct Final Rule Process

The Commission is issuing this rule as a direct final rule. Although the Administrative Procedure Act (APA) generally requires notice and comment rulemaking, section 553 of the APA provides an exception when the agency, for good cause, finds that notice and public procedure are "impracticable, unnecessary, or contrary to the

public interest." The Commission concludes that notice and comment is unnecessary because ASTM F963 automatically becomes a consumer product safety standard by operation of law. The Commission has voted to allow ASTM F963-16 to become the mandatory CPSC standard. Even without the incorporation by reference, ASTM F963-16 will take effect as the new mandatory CPSC standard pursuant to section 106(g) of the CPSIA. This rule incorporates by reference ASTM F963-16 into the CFR to inform the public what version of the ASTM F963 is mandatory. Because this document merely incorporates by reference a standard that takes effect by operation of statute, public comment could not affect the changes to the standard or the effect of the revised standard as a consumer product safety standard under section 106(g) of the CPSIA. The rule also updates the corresponding provisions of the NOR for ASTM F963 in part 1112 to reflect the revision to the standard. The amendment to part 1112 does not establish substantive requirements, but updates the criteria and process for CPSC's acceptance of accreditation of third party conformity assessment bodies for testing toys under the revised ASTM F963 standard. Therefore, the Commission concludes that public comment is not necessary.

The Commission believes that issuing a direct final rule in these circumstances is appropriate. In Recommendation 95-4, the Administrative Conference of the United States (ACUS) endorsed direct final rulemaking as an appropriate procedure to expedite promulgation of rules that are noncontroversial and that are not expected to generate significant adverse comment. *See* 60 FR 43108 (August 18, 1995). ACUS also recommended using direct final rulemaking when an agency uses the "unnecessary" prong of the good cause exemption to notice and comment rulemaking. Consistent with

the ACUS recommendation, the Commission is publishing this rule as a direct final rule because we do not believe comment is necessary and do not expect any significant adverse comments to the direct final rule.

Unless we receive a significant adverse comment within 30 days, the rule will become effective on April 30, 2017. In accordance with ACUS's recommendation, the Commission considers a significant adverse comment to be one where the commenter explains why the rule would be inappropriate, including an assertion challenging the rule's underlying premise or approach, or a claim that the rule would be ineffective or unacceptable without change.

Should the Commission receive significant adverse comment, the Commission would withdraw this direct final rule. Depending on the comments and other circumstances, the Commission may then incorporate the adverse comment into a subsequent direct final rule or publish a notice of proposed rulemaking, providing an opportunity for public comment.

G. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires that agencies review proposed and final rules for their potential economic impact on small entities, including small businesses, and prepare regulatory flexibility analyses. 5 U.S.C. 603 and 604. The RFA applies to any rule that is subject to notice and comment procedures under section 553 of the APA. 5 U.S.C. 603 and 604. As explained above, the Commission has determined that notice and comment is not necessary for this direct final rule. Thus, the RFA does not apply. We also note the limited nature of this document. The incorporation by reference of ASTM F963-16 and the update to the notice of requirements in part 1112

will not result in any substantive changes to the standard. Rather, with this action, the CFR will reflect the mandatory CPSC standard that takes effect under the CPSIA and will update the corresponding NOR provisions in 16 CFR part 1112.

H. Paperwork Reduction Act

The toy standard contains information collection requirements under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501–3520). OMB has approved the collection of information for ASTM F963-11 under OMB Control No. 3041-0159. ASTM F963-16 updates the labeling requirements for battery-operated toys and magnetic toys, as well as revises the language to clarify instructional literature requirements for battery-operated toys and battery-powered ride-on toys. CPSC will update the burden hours in the existing collection of information to reflect the requirements in the 2016 version of the ASTM F963 standard, including those for labeling and instructional literature.

I. Environmental Considerations

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

H. Preemption

Section 26(a) of the CPSA, 15 U.S.C. 2075(a), provides that where a "consumer product safety standard under [the CPSA)]" is in effect and applies to a product, no state or political subdivision of a state may either establish or continue in effect a requirement dealing with the same risk of injury, unless the state requirement is identical to the federal

standard. Section 26(c) of the CPSA also provides that states or political subdivisions of states may apply to the Commission for an exemption from this preemption under certain circumstances.

Section 106(f) of the CPSIA states that rules issued under that section "shall be considered consumer product safety standards issued by the Commission under section of the Consumer Product Safety Act" thus, implying that the preemptive effect of section 26(a) of the CPSA would apply. Therefore, a rule issued under section 106 of the CPSIA will invoke the preemptive effect of section 26(a) of the CPSA when it becomes effective.

J. Effective Date

Under the procedure set forth in section 106(g) of the CPSIA, when ASTM revises ASTM F963, the revision becomes the CPSC standard within 180 days of notification to the Commission, unless the Commission determines that the revision does not improve the safety of the product. In accordance with this provision, this rule establishes an effective date that is 180 days after we receive notification from ASTM of revisions to the standard. As discussed in section F of this preamble, this is a direct final rule. Unless we receive a significant adverse comment within 30 days, the rule will become effective on April 30, 2017. Additionally, the effective date for the NOR is April 30, 2017, the same date that the provisions of ASTM F963-16 become effective.

List of Subjects

16 CFR Part 1112

Administrative practice and procedure, Audit, Consumer protection, Reporting and recordkeeping requirements, Third party conformity assessment body.

16 CFR Part 1250

Consumer protection, Imports, Incorporation by reference, Infants and children, Law enforcement, Safety, Toys.

For the reasons discussed in the preamble, the Commission amends Title 16 CFR chapter II, as follows:

PART 1112—REQUIREMENTS PERTAINING TO THIRD PARTY CONFORMITY ASSESSMENT BODIES

1. The authority citation for part 1112 continues to read as follows:

Authority: 15 U.S.C. 2063; Pub. L. 110–314, section 3, 122 Stat. 3016, 3017 (2008).

2. Amend § 1112.15 by:

a. Revising paragraph (b)(32);

b. Reserving paragraph (b)(32)(i);

c. Revising paragraph (b)(32)(ii);

d. Adding paragraphs (b)(32)(ii)(JJ) and (KK);

e. Reserving paragraph (c)(1)(ii)

f. Revising paragraph (c)(1)(iii).

The revisions and additions read as follows:

* * * * *

(b) * * *

(32) 16 CFR part 1250, safety standard for toys. The CPSC only requires certain provisions of ASTM F963-16 to be subject to third party testing; and therefore, the CPSC only accepts the accreditation of third party conformity assessment bodies for testing under the following toy safety standards:

(i) [Reserved];

(ii) ASTM F963-16:

* * * * *

* * *

(JJ) Section 4.40, Expanding Materials

(KK) Section 4.41, Toy Chests (except labeling and/or instructional literature requirements)

* * * * *

(c) * * *

(1) * * *

(i) * * *

(ii) [Reserved];

(iii) ASTM F963-16, "Standard Consumer Safety Specification for Toy Safety," August 1, 2016.

* * * * *

3. Add part 1250 to read as follows:

PART 1250—SAFETY STANDARD MANDATING ASTM F963 FOR TOYS

Sec.

1250.1 Scope.

1250.2 Requirements for toy safety.

Authority: The Consumer Product Safety Improvement Act of 2008, Pub. L. No. 110–314,

§ 106, 122 Stat. 3016 (August 14, 2008); Pub. L. No. 112–28, 125 Stat. 273 (August 12, 2011).

§ 1250.1 Scope.

This part establishes a consumer product safety standard for toys that mandates provisions of ASTM F963.

§ 1250.2 Requirements for toy safety.

(a) Except as provided for in paragraph (b) of this section, toys must comply with the provisions of ASTM F963-16, Standard Consumer Safety Specification for Toy Safety, approved August 1, 2016. The Director of the Federal Register approves the incorporation by reference listed in this section in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may obtain a copy of this ASTM standard from ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959 USA; phone: 610-832-9585; http://www.astm.org/. You may inspect a copy at the Office of the Secretary, U.S. Consumer Product Safety Commission, Room 820, 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 regulations/ibr_locations.html.

(b) Pursuant to section 106(a) of the Consumer Product Safety Improvement Act of 2008 section 4.2 and Annex 5 or any provision of ASTM F963 that restates or incorporates an existing mandatory standard or ban promulgated by the Commission or by statute or any provision that restates or incorporates a regulation promulgated by the Food and Drug Administration or any statute administered by the Food and Drug Administration are not part of the mandatory standard incorporated in paragraph (a) of this section.

Dated: _____

_____
Todd A. Stevenson, Secretary
U.S. Consumer Product Safety Commission

Staff Briefing Package

Notice of Revision to the Toy Standard, ASTM F963
Standard Consumer Safety Specification for Toy Safety

January 13, 2017

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BRIEFING MEMORANDUM

UNITED STATES

CONSUMER PRODUCT SAFETY COMMISSION

BETHESDA, MD 20814

This document has been electronically approved and signed.

Memorandum

DATE: January 13, 2017

TO: The Commission
Todd Stevenson, Secretary

THROUGH: Patricia H. Adkins, Executive Director
DeWane Ray, Deputy Executive Director for Safety Operations
Mary T. Boyle, General Counsel

FROM: George A. Borlase, Ph.D., Assistant Executive Director
Office of Hazard Identification and Reduction

Benjamin Mordecai, Mechanical Engineer
Directorate for Laboratory Sciences

SUBJECT: Consumer Product Safety Improvement Act of 2008 - Notice of Revision to the Toy Standard, ASTM F963 *Standard Consumer Safety Specification for Toy Safety*

Notice of Requirements for Accreditation of Third Party Conformity Assessment Bodies for ASTM F963-16

I. Introduction

Section 106(a) of the Consumer Product Safety Improvement Act of 2008 (CPSIA) mandated that beginning on February 10, 2009, ASTM F963-07ε, *Standard Consumer Safety Specifications for Toy Safety*[1], shall be considered a mandatory consumer product safety standard issued by the Consumer Product Safety Commission (CPSC, or the Commission). Pub. L. No. 110–314. Under Section 106(g) of the CPSIA, if ASTM proposes revisions to ASTM F963, the Commission shall be notified. The revised standard shall be considered to be a consumer product safety standard issued by the CPSC under Section 9 of the Consumer Product Safety Act (15 U.S.C. 2058), effective 180 days after the date on which ASTM notifies the Commission of the revision, unless, within 90 days after receiving that notice, the Commission notifies ASTM that it has determined that the proposed revision does not improve the safety of toys.

On November 1, 2016, ASTM notified the Commission that a revised standard, ASTM F 963-16, had been published to replace ASTM F 963-11. Since the standard was first mandated in 2009, there have been two previous revisions to ASTM F963, ASTM F963-08 and ASTM F963-11. Both revisions[2] were accepted by the Commission to become the mandatory safety standard for toys.

This briefing memorandum and attached technical memorandum outlines and assesses the differences between the current mandatory toy standard (ASTM F963-11) and the proposed revision (ASTM F963-16). Staff has concluded that the changes will improve the standard and are not anticipated to affect safety negatively. This conclusion has not yet been reviewed/approved by the commission.

Should the Commission vote to allow ASTM F963-16 to take effect as the new mandatory toy safety standard, a notice of requirements (NOR) in 16 C.F.R. part 1112 would establish the rules for CPSC acceptance of accreditation of testing laboratories for provisions in ASTM F963-16. The NOR would also address the transition from ASTM F963-11 to ASTM F963-16 with respect to CPSC acceptance of testing results to support product certification. Tab B has the staff's recommendation for the ASTM F963-16 NOR.

II. Discussion

A. Overview of the Differences between ASTM F963-11 and ASTM F963-16

In general, the new standard contains clarifications, corrections, and new requirements that will increase safety, reduce testing burden, or enhance clarity and utility of the standard. A number of changes align

[1] Except for Section 4.2 and Annex 4 or any provision that restates or incorporates an existing mandatory standard or ban promulgated by the Commission or by statute.

[2] Except for Section 4.27 (regarding toy chests) of ASTM F963-07ε[1], which remains in effect.

ASTM F963 more closely with the European Standard (EN) 71, *Safety of Toys Part 1: Mechanical and Physical Properties,* and International Organization for Standardization (ISO) 8124, *Safety of Toys Part 1: Safety Aspects Related to Mechanical and Physical Properties,* performance requirements. In addition, new provisions were added to the standard to address new types of toys or hazards. The revisions appear in every major section of the standard, beginning with Section 1.7, which has been updated to return toy chest requirements to ASTM F963.[3] Finally, many small editorial changes throughout keep the standard's format and numbering consistent. Staff agrees that these changes are strictly editorial and do not have an impact on toy safety.

Changes were made in the following sections that are detailed in Table 1 and analyzed in Tab A:

- Section 1 - Scope: Section 1.7, which lists all sections of the standard, was updated to reflect the addition of toy chests.
- Section 2 - Referenced documents: One reference was removed, one was updated, and 22 new references were added.
- Section 3 - Terminology: Seventeen new definitions were added, seven definitions changed, and six definitions were removed, generally because they are redundant with new or changed definitions and are thus, no longer needed.
- Section 4 - Safety Requirements: A summary of the changes is listed in Table 1, and full analyses are in Tab A.
- Section 5 - Labeling Requirements: Labeling requirements for battery-operated toys and magnetic toys were updated.
- Section 6 - Instructional Literature: Language is revised to clarify instructional literature requirements for battery-operated toys and battery-powered ride-on toys.
- Section 8 - Test Methods: Numerous changes were made in the test methods. A summary of the changes is listed in Table 1 and detailed analyses are in Tab A.
- Annex A - Rationale: Annex A12 was added to document the rationale for the changes in the 2016 version of ASTM F963.

[3] Toy chest requirements were last included in the ASTM F963-07ε[1].

Table 1. Summary of Changes

Subject of Change	Description	Tab A Section	Section 2 - Referenced Documents	Section 3 - Terminology	Section 4 - Safety Requirements	Section 5 - Labeling Requirements & Section 6 - Instructional Literature	Section 8 - Test Methods	Annex A - Rationale
Batteries	New testing requirements have been added to address toys that contain rechargeable cells and batteries. A new warning label has been added for certain button and coin cell batteries of nominal 1.5 volts or greater to address hazards that have been identified with these cells. Four new test methods for toys that contain rechargeable cells and batteries: battery overcharging test, repetitive overcharging test, single fault charging test and short circuit protection test.	III. A.	24 new reference standards	§3.1.9 Cell battery (C) §3.1.10 Coin cell battery (A) §3.1.53 Non-replaceable battery (C) §3.1.60 Primary battery (A) §3.1.61 Primary cell (A) §3.1.78 Secondary battery (A) §3.1.79 Secondary cell (A)	§4.25	§5.15.2 §6.5	§8.18 §8.19	§A8.1 §A8.2 §A12.8
Cleanliness, Microbiological	Changes have been made in the test methods for both microbial cleanliness of cosmetics, liquids, pastes, putties, gels, powders, and feathers and the cleanliness of stuffing materials.	III. B. 1.	n/a	§3.1.20 Cosmetics (C)	§4.3.6	n/a	§8.4	§ A12.1
Cleanliness, Stuffing	Changes have been made in the test methods for both microbial cleanliness of cosmetics, liquids, pastes, putties, gels, powders, and feathers and the cleanliness of stuffing materials.	III. B. 2.	n/a	n/a	§4.3.7	n/a	§8.29	§A12.10.1
Expanding Materials	New definitions, performance requirements, test methodology and a test fixture have been added to the standard to address the emerging hazard of gastrointestinal blockage related to ingestion of expanding materials.	III. C.	n/a	§3.1.8 Expanding material (A)	§4.40	n/a	§8.30	§A12.3

Subject of Change	Description	Tab A Section	Section 2 - Referenced Documents	Section 3 - Terminology	Section 4 - Safety Requirements	Section 5 - Labeling Requirements & Section 6 - Instructional Literature	Section 8 - Test Methods	Annex A - Rationale
Heavy Metal Elements	Allows X-ray Fluorescence Spectrometry Using Multiple Monochromatic Excitation Beams, commonly known as HDXRF for Total Element Content Screening.	III. D.	n/a	n/a	§4.3.5	n/a	§8.3.	§A11.10 §A12.7
Impaction Hazard	Clarifies impaction hazard test fixture requirements for rigid squeeze toys and tethered rigid components.	III. E.	n/a	n/a	§4.24	n/a	n/a	§A11.1 §A12.10.2
Magnets	Inclusion of a new cyclic soaking test for only wooden toys, toys intended to be used in water, mouth pieces of mouth-actuated toys with magnets or magnetic components. New definitions for experimental/science sets.	III. F.	n/a	§3.1.39 Hazardous magnet (C) §3.1 Hazardous magnetic component (C) §3.1.49 Magnetic / electrical experimental set (A)	§4.38	§5.17	§8.25	§A12.4
Mouth-Actuated Toys	Adds design requirements to prevent the projectile or any liberated toy part from entering the mouth.	III. G.	n/a	n/a	§4.6.2.2	n/a	§8.13	§A12.10.3 §A12.10.4 §A12.10.5
Projectile Toys	Revisions include changes to descriptions, definitions, allowed shapes, types of projectile toys, exemptions, assessments and kinetic energy density levels allowed for certain types of projectile toys.	III. H.	n/a	§3.1.5 Arrow (A) §3.1.24 Discharge mechanism (C) §3.1.35 Free flight (A) §3.1.48 Leading edge (A) §3.1.63 Projectile (C) §3.1.64 Projectile with stored energy (A) §3.1.65 Projectile without stored energy (A) §3.1.73 Resilient leading edge (A) §3.1.75 Rigid leading edge (A)	§4.21.	n/a	§8.9 §8.13.2 §8.14	§A12.2 §A12.10.3 §A12.10.5

Subject of Change	Description	Tab A Section	Section 2 - Referenced Documents	Section 3 - Terminology	Section 4 - Safety Requirements	Section 5 - Labeling Requirements & Section 6 - Instructional Literature	Section 8 - Test Methods	Annex A - Rationale
Ride-on and Seated Toys, Stability	Ride-on toys require a dimensional spacing between wheels on the same axis.	III. I. 1	n/a	n/a	§4.15.1	n/a	n/a	§A12.6.2.1
Ride-on and Seated Toys, Collapse Hazard	Ride-on and seated toy tests require a more stringent overload weight.	III. I. 2	n/a	n/a	n/a	n/a	§8.28	§A12.6.1.1
Ride-on and Seated Toys, Restraints	Straps used for waist restraints on ride-on toys are exempt from the free length and loop requirements.	III. I. 3	n/a	n/a	§4.14.6	n/a	n/a	§A12.6.3
Sound-Producing Toys	Added definitions, exemption list to include mouth-actuated toys; increased peak limits (due to miscalculated values); added new sound limit; lowered test speed for push-pull toys; and the format, sequence and requirements sections were revised for clarification purposes.	II.J.	Adds: ISO 11201 Removes: 16 CFR 1500.47	§3.1.1 A-weighted sound pressure level (R) §3.1.1 A-weighted equivalent sound pressure level, L_{Aeq} (A) §3.1.13 C-weighted peak sound pressure level (R) §3.1.13 C-weighted peak sound pressure level, (L_{Cpeak}) (A) §3.1.17 Continuous sound (R) §3.1.28 Equivalent sound pressure level (L_{Aeq}) (R) §3.1.42 Impulsive sound (R) §3.1.54 Peak sound pressure level (L_{Cpk}) (R) §3.1.69 Push/pull toys (A)	§4.5	n/a	§8.20	§A12.9

Subject of Change	Description	Tab A Section	Section 2 - Referenced Documents	Section 3 - Terminology	Section 4 - Safety Requirements	Section 5 - Labeling Requirements & Section 6 - Instructional Literature	Section 8 - Test Methods	Annex A - Rationale
Toy Chests	Reincorporates toy chest Section 4.27 and associated provisions from ASTM F963-07ε1 back into the current 2016 toy standard, and clarifies a multi-positional lid requirement when testing for maximum lid drop requirements.	III.K.	No changes from the toy chest mandatory standard provision in ASTM F963-07ε1.				§8.27	§A12.5

B. Staff Assessment of the Revised Standard

As detailed in Tab A, staff concludes that the proposed revision improves the current standard, with no change anticipated to affect toy safety negatively.

During assessment of the revisions, staff raised concerns about two items: (1) the addition of an exemption to the cord-length requirement for ride-on toys (Tab A III-I-3), and (2) the reduction in speed from 2 m/s to 1 m/s for sound limit testing for push-pull toys (Tab A III-J). However, staff ultimately concluded that there was no decrease in safety. Regarding the ride-on toys' cord length exemption, staff did not find incident data to support objecting to the exemption. Regarding the test speed reduction for sound testing, staff has concluded that, although changes in the sound requirements may appear to have decreased stringency because the speed at which a push/pull toy is moved during testing has been reduced, the revision actually increases stringency because an additional requirement for an A-weighted peak sound measurement has been applied. Additionally, the test method has been changed to provide additional clarity and an increase in repeatability and the new sound limits are still within accepted noise-limit standards.

C. Effective Date

According to Section 106 of the CPSIA, the Commission has 90 days from the date of notification by ASTM (November 1, 2016) to respond to ASTM that the Commission has determined that the proposed revision does not improve the safety of the product. Unless the Commission objects to the proposed revision through notification to ASTM, or specifies a later date, the revised standard will replace the current standard, effective 180 days from notification (on April 30, 2017). The new standard applies only to toys manufactured on or after the effective date. Because this revision has been well publicized by ASTM, by testing laboratories, and by the Toy Industry Alliance, staff believes that this date is adequate.

D. Certification, Testing, and CPSC Acceptance of Third Party Laboratories

Section 14(a)(2) of the CPSA requires that children's products subject to a children's product safety standard enforced by the Commission must be certified as complying with all applicable CPSC requirements. The certification must be based on tests by a third party conformity assessment body (testing laboratory) accredited by the Commission to test according to the applicable requirements. Section 14(a)(3) of the CPSA requires the Commission to publish a NOR for the accreditation of third party testing laboratories to assess whether a children's product conforms to the applicable children's product safety rule. The Commission's requirements for CPSC acceptance of third party testing laboratories are found in 16 C.F.R. part 1112. Currently, part 1112 states the criteria for laboratory acceptance and certification timing for specified sections of ASTM F963-11.

If the Commission accepts the staff's recommendation to allow ASTM F963-16 to take effect as the new mandatory toy safety standard, a Commission rulemaking would revise the existing NOR found in part 1112 to establish the rules for CPSC acceptance of accreditation of testing laboratories for provisions in ASTM F963-16. The NOR would also address the transition from ASTM F963-11 to ASTM F963-16 with respect to CPSC acceptance of testing results to support product certification (Tab B).

III. Recommendations

Staff recommends that the Commission allow ASTM F963-16 to take effect as the new mandatory toy safety standard, with no objections to the standard or the effective date.

Staff also recommends that the Commission publish a NOR in an amendment to 16 C.F.R. part 1112 for establishing the criteria for CPSC acceptance of accreditation of third party testing laboratories to conduct testing in accordance with ASTM F963-16. The NOR would also provide for a transition from ASTM F963-11 to ASTM F963-16 with respect to CPSC acceptance of testing results that support compliance to the new ASTM F963-16 standard. The staff recommends an effective date for required third party testing to be the same as the effective date as the new standard.

TAB A: TECHNICAL ANALYSIS OF CHANGES BETWEEN ASTM F963-11 AND ASTM F963-16

UNITED STATES

CONSUMER PRODUCT SAFETY COMMISSION

BETHESDA, MD 20814

Memorandum

DATE: January 13, 2017

TO: Benjamin Mordecai, Mechanical Engineer/Project Manager, Toys

THROUGH: Joel Recht, Associate Executive Director, Engineering Sciences
Andrew Stadnik, Associate Executive Director, Laboratory Sciences
Alice Thaler, Associate Executive Director, Health Sciences

FROM: Vincent Amodeo, Mechanical Engineer
Susan Bathalon, Children's Program Area Risk Manager
Xinrong Chen, Toxicologist
David Cobb, Chemist
Jill Hurley, Engineering Psychologist
Sandra Inkster, Physiologist
Douglas Lee, Electrical Engineer
Benjamin Mordecai, Mechanical Engineer
Hope Nesteruk, Children's Program Manager
Kristen Talcott, Human Factors Engineer

SUBJECT: Technical Analysis of Changes Between ASTM F963-11 and ASTM F963-16

I. Background

This memorandum compiles the technical analysis of CPSC's subject matter experts (SME) regarding the changes to ASTM F963. Staff outlines the differences between the current mandatory toy standard (ASTM F963-11) and the new revised ASTM F963-16, and provides staff's assessment regarding the level of safety associated with toys.

II. Summary of Revisions

Staff has reviewed all of the revisions made to ASTM F963-16 and found no revisions that would result in a determination that the revision does not improve the safety of the consumer products covered by the standard. In general, the new standard contains clarifications, corrections, and new requirements that will increase safety, reduce testing burden, or enhance clarity and utility of the standard. As detailed in Section III, a number of changes are to align ASTM F963-16 more closely with the European Standard (EN) 71, *Safety of Toys Part 1: Mechanical and Physical Properties,* and International Organization for Standardization (ISO) 8124, *Safety of Toys Part 1: Safety Aspects Related to Mechanical and Physical Properties,* performance requirements. In addition, new provisions were added to the standard to address new types of toys or identified hazards. The revisions appear in every major section of the standard, beginning with Section 1.7, which has been updated to reflect that toy chest requirements have been reinstated to F963, after being deleted for 5 years. Finally, many small editorial changes throughout, keep the standard's format and numbering consistent, but have not been included in the technical analysis.

III. Specific Changes between ASTM F963-11 and ASTM F963-16

A. Batteries

ASTM reviewed and revised all battery requirements in ASTM F963-16 to enhance safety and clarify the definitions, requirements, and test methods. Significant changes regarding battery-operated toys were made in the following sections in ASTM F963-16: Section 2 - Referenced Documents, Section 3 – Terminology, Section 4 - Safety Requirements, Section 5 - Labeling Requirements, Section 6 - Instructional Literature, Section 8 - Test Methods, and Annex A - Rationale.

Changes in the Current Revision

Section 2 - Referenced Documents: The Referenced Documents section has been revised to update references to other battery and power supply standards. The revised list includes:

2.2 American National Standards Institute (ANSI) Standards:

- ANSI C18.1 M, Part 1 American National Standard for Portable Primary Cells and Batteries with Aqueous Electrolyte–General and Specifications
- ANSI C18.1 M, Part 2 American National Standard for Portable Primary Cells and Batteries with Aqueous Electrolyte –Safety Standard

- ANSI C18.2 M, Part 1 American National Standard for Portable Rechargeable Cells and Batteries –General and Specifications
- ANSI C18.2 M, Part 2 American National Standard for Portable Rechargeable Cells and Batteries –Safety Standard
- ANSI C18.3 M, Part 1 American National Standard for Portable Lithium Primary Cells and Batteries –General and Specifications
- ANSI C18.3 M, Part 2 American National Standard for Portable Lithium Primary Cells and Batteries –Safety Standard
- ANSI/UL 1012 Power Units Other Than Class 2
- ANSI/UL 60950–1 Information Technology Equipment –Safety –Part 1: General Requirements
- ANSI/UL 2595 General Requirements for Battery-Powered Appliances

2.4 Federal Standards:

- 29 C.F.R. Part 1910 Occupational Safety and Health Standards
- MIL-D-17951 Military Specification: Deck Covering, Lightweight, Nonslip, Abrasive Particle Coated Fabric, Film, or Composite and Sealing Compound

2.5 ISO and International Electrotechnical Commission **(**IEC) Standards:

- IEC 60384–14 Fixed Capacitors for Use in Electronic Equipment—Part 14: Sectional Specification—Fixed Capacitors for Electromagnetic Interference Suppression and Connection to the Supply Mains
- IEC 60738–1 Thermistors—Directly Heated Positive Temperature Coefficient—Part 1: Generic Specification
- IEC 60950–1 Information Technology Equipment—Safety—Part 1: General Requirements
- IEC 62133 Secondary Cells and Batteries Containing Alkaline or Other Non-acid Electrolytes—Safety Requirements for Portable Sealed Secondary Cells and for Batteries Made From Them, For Use in Portable Applications

2.6 Underwriters Laboratories (UL) Standards:

- UL-94 Standard for Safety of Flammability of Plastic Materials for Parts in Devices and Appliances Testing
- UL 1642 Standard for Lithium Batteries
- UL 2054 Standard for Household and Commercial Batteries
- UL 62133 Secondary Cells and Batteries Containing Alkaline or Other Non-acid Electrolytes—Safety Requirements for Portable Sealed Secondary Cells and for Batteries Made from Them, for Use in Portable Applications
- ANSI/UL 1012 Power Units Other Than Class 2
- ANSI/UL 2595 General Requirements for Battery-Powered Appliances
- ANSI/UL 60950–1 Information Technology Equipment— Safety—Part 1: General Requirements

2.7 CSA Group:

- CAN/CSA E62133[1]
- Secondary Cells and Batteries Containing Alkaline or Other Non-acid Electrolytes—Safety Requirements for Portable Sealed Secondary Cells and for Batteries Made from Them, for Use in Portable Applications

Section 3 - Terminology: The terminology section has been revised to add or update definitions for button cell battery (3.1.9), coin cell battery (3.1.10), non-replaceable battery (3.1.53), primary battery (3.1.60), primary cell (3.1.61), secondary battery (3.1.78), and secondary cell (3.1.79). These revised definitions clarify the specific requirements for battery-operated toys.

Section 4 - Safety Requirements: The safety requirements section has been revised in Section 4.25 to address an increase in the number of incidents involving battery-operated toys with newer technology batteries. CPSC has incident reports that reference overheating, venting, smoking, explosion, and ignition of battery packs with rechargeable high-density batteries, including nickel metal hydride, lithium-ion, and lithium-ion polymer-type batteries. Requirements were added for lithium-ion cell and battery compliance with acceptable industry voluntary standards from ANSI, UL, or IEC. Requirements were also added for certification of battery chargers by the Nationally Recognized Testing Laboratory (NRTL). Tests for overcharging, repetitive overcharging, single-fault charging, and short-circuit protection were added to ensure that the individual cells that are incorporated into battery packs are used within their safe operating specifications, and that the proper safety protection circuitry is used in battery packs to protect against overcharging, short circuiting, or overheating during use and while charging.

Section 5 - Labeling Requirements: The labeling requirements section has been revised to include Section 5.15.2, *Button or Coin Cell Batteries,* to provide safety labeling for packaging and instructions of battery-operated toys that contain replaceable button or coin cell batteries. Although ASTM F963 requires that a screwdriver or other common household tool be used to secure button and coin cells in toys, the National Capital Poison Center database reports that toys are the number-two source of button or coin cell batteries ingestions. These new requirements are intended to inform consumers about the hazards of ingesting button or coin cell batteries before they purchase toys that contain these types of batteries.

Section 6 - Instructional Literature: Section 6.5 has been revised to clarify instructional literature requirements for battery-operated toys and battery-powered, ride-on toys. For battery-operated toys, the literature includes instructions advising users not to mix old and new batteries, or mix alkaline, carbon-zinc, or rechargeable batteries within the same battery pack. For battery-powered ride-on toys, the literature includes guidance on the maintenance, maximum weight and age limitations, safety labeling, and warnings to use only manufacturer-specified batteries and chargers.

[1] A CSA standard that has been adopted by the Canadian government as a Canadian national standard is designated CAN/CSA.

Section 8 - Test Methods: Section 8.18 and Section 8.19 have been revised. The revision to Section 8.18 moves the cheesecloth specification from an existing footnote into the test requirement proper. The revision to Section 8.19 adds the test methods referenced in Section 4 for overcharging, repetitive overcharging, single-fault charging, and short-circuit protection.

Annex A8 - Design Guidelines for Battery Operated-Toys: This rationale has been added to provide safety guidance for design practices for airtight toys and toys that contain replaceable button or coin cell batteries. These guidelines are intended to reduce explosion incidents in airtight toys and ingestion incidents with button or coin cell batteries.

Annex A12.8: This section provides the rationale for changes made to the battery-operated toy safety provisions. The rationale for adding requirements for high-energy density batteries includes CPSC incident data, and the need for additional requirements to address fire, overheating, smoke, and thermal burn hazards with battery-operated toys that contain high-energy density batteries. The rationale for including button and coin cell labeling requirements includes National Capital Poison Center incident data and information on the conditions that can cause serious injury or death if coin cells are lodged in a child's esophagus.

Staff Analysis of Changes Related to Batteries

The changes made to the batteries requirement sections of ASTM F963-16 represent significant changes to enhance battery safety of the newer technology, rechargeable and non-rechargeable batteries. Because these batteries have a higher energy density than previous battery technology and can be more energetic, the battery section changes were made to reduce the risk of overheating, smoking, fire, or explosion that can cause serious injury or property damage associated with these more powerful batteries. Additionally, button or coin cell batteries that can be ingested and that subsequently become lodged in the esophagus of a child can cause serious injury or death if not removed within 2 hours. The revisions to ASTM F963-16 include improved warning labels about the ingestion hazard. Staff concludes that all of the changes made to ASTM F963-16 that relate to battery-operated toys improve safety.

B. Cleanliness

1. Microbiological Cleanliness

Section 4.3.6 and Section 8.4 of ASTM F963-16 establish the performance and testing requirements for microbial cleanliness. Significant changes to provisions in ASTM F963-16 related to microbiological safety of toys under CPSC jurisdiction[2] are located in Section 4.3.6 - safety requirements for the toxicology of liquids, pastes, putties, gels, powders, and items of avian feather origin; and Section 8.4 - tests for cleanliness and preservative effectiveness. In addition, Annex A12.1 of ASTM F963-16 includes the rationale for changes to the standard related to microbiological safety. Details about the changes in each section are provided below.

[2] Our review excludes cosmetics, which are under FDA jurisdiction.

Changes in the Current Revision

Section 4 - Safety Requirements: The 2016 revision updates to Section 4.3.6 of ASTM F963 address requirements for the toxicology of liquids, pastes, putties, gels, powders, and items of avian feather origin. These requirements for microbiological safety are associated with a potential lack of cleanliness, shelf-life degradation, and contamination. Significant changes in the microbiological safety requirements include expansion of the cleanliness test to include feather products, and a clarification that process water used in the manufacturing and filling of toys must comply with the bacteriological standards for U.S. Pharmacopeial Convention (USP) Purified Water, as well as for drinking water per the EPA standard.

Section 8 - Test Methods: The 2016 revisions to Section 8.4 of ASTM F963 address significant changes in the test methods for cleanliness and preservative effectiveness. These changes are as follows:

- Cosmetic Toiletry and Fragrance Association (CTFA) Microbiology Guidelines are included in addition to the USP methods
- The acceptable microbial loads for determining cleanliness are added for various product categories
- The pathogens that must be found to be absent for the cleanliness test are added
- The products included in the preservative effectiveness test are expanded to "liquids, pastes, putties, gels, and powders" in the preservative effectiveness test
- The sampling intervals for the preservative effectiveness test are added to be 14 days and 28 days
- The evaluation criteria are added for the preservative effectiveness test
- A minimum set of microorganisms is added for the preservative effectiveness test

Annex A12 - Rationale: The 2016 revision added microbiological safety provisions to Annex A12.1 of ASTM F963.

Staff Analysis of Changes Related to Microbiological Cleanliness

Most microbiological tests are conducted and documented at the manufacturing site, which is expected to continue. ASTM F963-16 updates the requirements for microbiological safety by expanding the scope of products required to be tested; providing more specific requirements for both cleanliness and preservative effectiveness test; and providing CTFA test guidelines as additional and more appropriate test methods. The revised version provides clearer standards for microbiological testing, with an expanded scope and updated test methods. As a result, staff concludes that the revised requirements improve the safety associated with potential lack of cleanliness, shelf life degradation, and contamination when liquids, pastes, putties, gels, powders, and items of avian feather origin are used in the manufacturing of toys.

2. Stuffing Cleanliness

Section 4.3.7 and Section 8.29 of ASTM F963-16 establish the performance and testing requirements for the cleanliness of stuffing materials. Previous versions of ASTM F963 included only Section 4.3.7, which required stuffing materials to be "free of objectionable matter originating from insect, bird, rodent, or other animal infestation and of contaminants, such as splinters and metal chips to the extent possible in good manufacturing practice." Section 4.3.7 referenced the test method in Chapter 16 of *Official Methods of Analysis of the Association of Official Analytical Chemists*, and additionally required fiber filling to

meet Commonwealth of Pennsylvania Regulation Title 34, Chapter 47, Section 47.317[3] (34 PA Reg. 47.317), "Tolerances of the Commonwealth of Pennsylvania Regulation for Stuffed Toys." Together, the requirements in Section 4.3.7 address a variety of foreseeable stuffing contaminates including the following five main categories:

- Foreign matter, such as dirt, stones, and other hard materials having jagged or sharp edges
- Chemicals, including oil (1%), lead (20 ppm), arsenic (As_2O_3, 2 ppm), ammonia (5%), and urea (1%)
- "Plastic or metal ornaments such as eyes and nose not of a safety design or not attached to the stuffed toy so as to prevent removal"
- "Material bearing electrostatic charge with adherence characteristics which when exposed could lodge in the windpipe, ears or nostrils"
- Highly flammable filling material

Changes in the Current Revision

Section 4 - Safety Requirements: ASTM F963-16 removed the references to Chapter 16 of Official Methods of Analysis of the Association of Official Analytical Chemists and 34 PA Reg. 47.317 because ASTM standards should not reference one specific state law. Additionally, glass was added to the list of objectionable materials and contaminates.

Section 8 - Test Methods: ASTM F963-16 adds a new visual inspection test method as Section 8.29.

Annex A12 - Rationale: Annex A12.10.1 includes the rationale for the changes to Section 4 and to Section 8, which referenced the CPSC toy testing manual and general practice. Regarding the deletion of Official Methods of Analysis of the Association of Official Analytical Chemists and 34 PA Reg. 47.317, the test method was overly complicated and the subcommittee felt that ASTM standards should not reference one specific state law.

Staff Analysis of Changes Related to Stuffing Cleanliness

Previous versions of ASTM F963 addressed stuffing material contaminants such as foreign matter and chemicals, along with flammability and small-part ornaments on stuffed toys by referencing Chapter 16 of *Official Methods of Analysis of the Association of Official Analytical Chemists* and 34 PA Reg. 47.317. With the exception of foreign matter, those requirements were redundant with other elements of the standard and other federal regulations. In addition, according to the CPSC toy test manual, stuffing materials are screened for small parts only.[4] Therefore, staff agrees with the rationale in Annex A12.10.1 and concludes that the revisions to Section 4.3.7 and the addition of the test method in 8.29 provide a net improvement in safety while reducing testing burden by eliminating redundant requirements.

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[3] http://www.pacode.com/secure/data/034/chapter47/s47.317.html

[4] https://www.cpsc.gov/s3fs-public/pdfs/blk_pdf_testtoys.pdf, pp. 35.

C. Expanding Materials

Section 4.40 and Section 8.30 of ASTM F963-16 establish the performance and testing requirements for expanding materials. New definitions, performance requirements, test methodology, and a test fixture have been added to ASTM F963-16 to address the emerging hazard of gastrointestinal (GI) blockage related to ingestion of expanding materials. A rationale for these new sections has been added to the Mandatory Information in the standard's Annexes. ASTM decided to develop these new requirements rather than align the standard with the pre-existing expanding toy requirements of EN 71 and ISO 8124-1 because adoption of the requirements in these international standards would have meant that toys long sold in the United States without reported incident would be considered non-compliant or unsafe, *e.g.,* die-cut expanding foam shapes packaged in soluble capsules.

Changes in the Current Revision

Section 3 - Terminology: ASTM F963-16 has been revised to add a new definition, Section 3.1.28, for expanding materials, which applies to any material used in a toy that expands more than 50% in any dimension from its as-received state at any point during a continuous 72 hour submersion in deionized water.

Section 4 - Safety Requirements: ASTM F963-16 has been revised to add a new Section 4.40, for expanding materials. This section requires that toys and components of toys, which fit entirely inside the small parts cylinder as received and are determined to be expanding materials as defined in Section 3.1.28, must pass completely through a 20 mm diameter circular opening in the new Expanding Toy Test Template, depicted in Figure 30 of ASTM F963-16, when tested in accordance with a new test methodology defined in Section 8.30.

Section 8 - Test Methods: ASTM F963-16 has been revised to add Section 8.30, a new test methodology for expanding materials. The test method applies to toys or components intended for children at least three years of age, which can fit in the small parts cylinder as received, and which can expand when hydrated. After preconditioning at normal room temperature and humidity, these items are immersed in 37°C ± 2°C deionized water for 72 hours. If any dimension expands by more than 50% at any time, the toy or component must be tested to determine if it can pass completely through the new expanding toy test template. For non-rigid items that are not small enough to pass easily through the gauge, a force of up to 20 N (4.5 lbf) may be applied at an angle perpendicular to the test gauge, using a 10 mm (0.394-in.) diameter plastic rod with a hemispherical end to simulate the muscular action of the sphincter. Expanding materials toys or components that pass through the text gauge, with or without application of the specified force, are considered to pass the performance requirement. Those that do not pass through the gauge are considered to fail.

Annex A12 - Rationale: ASTM F963-16 now includes Annex A12.3, which explains the basis for the new requirements for expanding materials. These were developed to address fatal and potentially fatal GI blockage caused by ingestion of expanding materials in toys, as has been reported with ingestion of similar expanding materials found in toys and other household objects, such as water retaining beads used in floral products. The rationale indicates that the requirements have an anatomical basis. Specifically, the pyloric sphincter, the connection between the stomach and the small intestine, is identified as the limiting dimension of the GI tract regarding the potential for GI blockage. Its maximum diameter in an 18-month-

old child is reported to be approximately 20 mm, according to ASTM consulted medical experts. The new expanding material requirements are predicated on the assumption that fully expanded objects having a dimension greater than 20 mm will not easily pass through the pyloric sphincter when subjected to peristaltic muscle contractions, whereas smaller objects that are small or compressible enough to pass through the pyloric sphincter when fully expanded are unlikely to cause an intestinal blockage.

Staff Analysis of Changes Related to Expanding Materials

Assuming materials of concern are ingested in pre-expanded state, significant expansion does not occur until the object leaves the acidic conditions of the stomach (after it has passed through the pyloric sphinter), Therefore, staff believes the appropriate limiting dimensions of concern regarding intestinal blockage should be identified as the stretch limit (diameters) of the small intestine and the ileocecal sphincter (junction between the small and large intestine), as influenced by the ability of coordinated small intestine muscle contractions (peristalsis) to move non-rigid, resilient, compressible objects towards the large intestine rather than the pyloric sphincter. However, because this emerging hazard was not addressed in the previous edition of ASTM F963, the introduction of these new requirements in ASTM F963-16 represents a significant improvement in toy safety and should help to prevent the recently recognized hazard of fatal and potentially fatal intestinal blockages caused by ingestion of toys and toy components made of certain superabsorbent materials of concern. Clarification of the underlying rationale is advised and additional research may be needed in future revisions to ASTM F963 to determine if objects ranging from 10 mm to 20 mm diameter when fully expanded are likely to cause blockage of a young child's small intestine or ileocecal sphincter. Staff intends to submit comments on this matter to ASTM F963 for subsequent revisions.

D. Heavy Metal Elements

Changes in the Current Revision

Section 4 - Safety Requirements: Section 4.3 has been revised to provide clarifications in the following sections:

1. Section 4.3.5, addition of Note 3: Provides clarification on the allowance of testing raw materials instead of finished products to establish compliance with the heavy elements requirements.
2. Section 4.3.5.2, Note 4: Provides clarification that CPSIA-mandated total Pb in substrate requirement applies to all accessible parts or components of toys intended for ages 12 and under regardless of whether item can be mouthed, licked or ingested.
3. Section 4.3.5.2ε^1 and 2: Provides clarification on materials exempted from testing and clarification on testing of stickers and printed textiles.

CPSC staff believes that these revisions provide clarifications of these sections of the standard, which serve to eliminate confusion and inconsistent application of testing. Staff believes that the revisions improve the standard by ensuring that the standard's subsections are consistent, that the revisions do not change the requirements for conformance, and that the revisions do not affect toy safety negatively.

Section 8 - Test Methods: Section 8.3.1.4, *Alternative Total Screen Method* was added, providing an alternative test method to screen for heavy metal element content. This method involves use of Energy

Dispersive X-ray Fluorescence Spectrometry Using Multiple Monochromatic Excitation Beams more commonly referred to as high definition XRF or HDXRF. This alternative method is limited to homogeneous polymeric materials. CPSC staff support the inclusion of this technology for total heavy metal element screening. CPSC staff has done extensive work testing a variety of polymeric materials for ASTM F963 heavy metal elements using HDXRF and wet chemical test methods, and have found HDXRF to be reliable for determining compliance with ASTM F963 requirements for total heavy metal element content. This data was presented to ASTM through an official report[5].

Total heavy metal element content can be determined in fewer than 5 minutes using HDXRF. The wet chemical test methods described in subsequent sections, may take several hours. The ability to use HDXRF for total heavy metal element screening should result in lower laboratory testing costs due to less time involved. CPSC staff believes that the allowance of HDXRF for total heavy metal element screening does not affect toy safety negatively. The same heavy metal element requirements still apply, and HDXRF is a reliable method for testing for compliance to those requirements. The acceptance of HDXRF for total heavy metal element screening increases testing options that allow for more efficient and faster determinations of compliance.

Clarification was also made in the previous subsection to specify that further testing of small metallic parts is limited to components that have total cadmium concentration exceeding 75 ppm. CPSC staff believes that this clarification does not negatively affect toy safety because components with cadmium concentrations below that limit are not a safety risk. In CPSC staff's experience, metallic parts that contain no more than 75 ppm total cadmium always conform to the cadmium migration, i.e., solubility, requirement. Therefore, if content testing shows that cadmium content is less than or equal to 75 ppm, the migration testing provides no benefit. Cadmium migration testing is still required for component parts that contain more than 75 ppm cadmium.

Annex A7 - Rationale: Tables A7.1 and A7.2 were added to show examples of calculations for composite testing for total heavy metal elements.

Annex A11.10.1 - Rationale: Rationale for the new HDXRF total element screening method option was added.

Annex A11.10.5 - Rationale: Rationale for the exemption of paper and paperboard from soluble heavy metal element testing was added.

Annex A12.7 - Rationale: Rationale for acceptance of HDXRF for Total Element Content Screening was added.

[5] Study of the Applicability of X-ray Fluorescence Spectrometry for Use in ASTM F963 Total Element Screening, April 2015

Staff Analysis of Changes Related to Heavy Metal Elements

CPSC staff believes that these additions improve the standard by allowing use of HDXRF, a faster non-destructive analytical test to screen for total element content, allowing for more efficient and faster determinations of compliance and do not affect toy safety negatively.

E. Impaction Hazard

The impaction hazard involves the scenario where younger children fall when mouthing a toy and the toy becomes wedged in the throat. In general, the impaction hazard testing applies to toys that are rigid, rounded at one end, and longer than the internal dimensions of the small parts test cylinder. Impaction hazard testing is required with many different toys. However, impaction hazard changes in ASTM F963-16 are specific to squeeze toys and tethered toys.

Changes in the Current Revision

Section 4 - Safety Requirements: The safety requirements have been modified in Section 4.24 to clarify that if a squeeze toy is one of several components in the toy fixture, only the squeeze toy component would need to be tested on the squeeze toy impaction hazard test fixture. For example, if a squeeze toy was attached to another toy, then only the squeeze portion would be subject to the squeeze toy requirements.

Annex A11.1 - Rationale: The impaction hazard rationale incorporates changes related to spherically shaped toys that have a flexible tether and fastener. Flexible tethers are short fabric or elastic material used with a toy at one end and a fastener at the other end. These flexible tethers attach the toy to the child and prevent the toy from falling to the ground. The clarifications in Annex A11.1 exempt the fastener on flexible tethered toys from impaction hazard testing when the toy is intended for children at least 18 months but under 48 months of age. This exemption applies only if the tether has a weight less than 1.1 pounds, and a length less than 12 inches.

Annex A12.10.2 - Rationale: This rationale explains that the changes in Section 4.24 were to exempt the non-squeeze components that are attached to squeeze toys.

Staff Analysis of Changes Related to Impaction Hazard

The changes in the squeeze toy component test and appendix serve to identify that only the squeeze portion of a toy is subject to squeeze toy requirements. Staff views this change as a beneficial clarification to the standard that will at least maintain the current level of safety.

The new annex was rearranged to clarify why certain lightweight and small sized tethers with fasteners are exempt from the impaction hazard fixture testing. Staff considers this a beneficial clarification to the standard that will maintain the current level of safety.

F. Magnets

Sections 4.38 and 8.25 of ASTM F963-16 establish the performance requirements and test methodology for toys that contain hazardous magnets intended for children up to 14 years of age. The requirements are primarily intended to address the ingestion hazard associated with small, high-powered magnets. The

requirements do not apply to magnets used in "motors, relays, speakers, electrical components, and other similar devices where the magnetic properties are not part of the play pattern of the toy." Also, the requirements do not apply to magnets in magnetic/electrical experimental sets intended for children over eight, provided that specific safety labeling requirements are met.

Changes in the Current Revision

Section 3 - Terminology: The terminology has been revised to clarify the definition of a hazardous magnet and a hazardous magnetic component, and to update the reference to the applicable section within the standard. Section 3.1.49 added a new definition for magnetic/electrical experimental sets.

Section 4 - Safety Requirements: Clarifications were made to the text of Section 4.38.1 and Section 4.38.2 to update the referenced section and its title. Section 4.38.3 changed "Hobby, craft, and science kit-type items" to the newly defined "magnetic / electrical experimental sets" to clarify exempted products.

Section 5 - Labeling: Section 5.17 clarified the labeling requirements that apply to the newly defined "magnetic/electrical experimental sets," which were formerly known as "hobby and craft items."

Section 8 - Test methods:

Section 8.25 Magnet Test Methods: This was previously Section 8.24 in ASTM F963-11.

Section 8.25.1 clarified that "dc" stands for direct current, and added a requirement for the gauss meter accuracy for measuring the magnetic field of the magnet(s).

Section 8.25.4 added a soaking test to the magnet use-and-abuse test method for "wooden toys, toys intended to be used in water, and mouth pieces of mouth-actuated toys with magnets or magnetic components." This soaking test was added as a performance requirement to ensure that glued magnets do not loosen due to toy use in water, mouthing by children, or changing humidity levels.

Section 8.25.4.1 states, "Submerge the toy or toy component completely in a container of demineralized water at a temperature of 21.0°C ± 5.0°C for 4 minutes, remove the toy, shake off the excess water, and keep the toy at room temperature for 10 minutes. Perform the soaking test for a total of four cycles." The test is based on a soaking test introduced in EN 71 in 1998 that is applicable to glued wooden toys intended for children under 36 months of age, mouthed-actuated toys, and toys with small balls. ASTM added the soaking test prior to conducting magnet toy use and abuse testing in response to concerns that repeated saliva and water contact may cause adhesive breakdown and liberate small magnets. Additionally, properties of wood can change with humidity level, affecting dimensions such as the size of holes, thereby reducing the security of magnets in wooden products.

Notes 43 and 44 were added to Section 8.25.4 to clarify the test requirements for products intended for children aged eight years and older and to define "unique magnetic components" for test purposes.

Section 8.25.4.2 clarified the "cycling as received" test to clarify that the test is designed to simulate reasonably foreseeable play and to specify the requirements for toys with only a single magnet. Specific requirements were added to clarify the procedure for testing products with only a single magnet.

Section 8.25.4.3 added the drop test of Section 8.7.1 or 8.7.2 to the magnet use-and-abuse test method.

Section 8.25.4.6 changed the impact test units to metric and added tolerances.

Section 8.25.4.7 added a compression test and clarified that this test applies to magnets that are accessible but cannot be grasped.

Staff Analysis of Changes Related to Magnets

Staff agrees with the changes made to the magnet terminology and test methods, which improve safety by clarifying the test procedures. The addition of the soaking test method described in Section 8.25.4.1 and the test methods for products with single magnets in Section 8.25.4.2 are improvements in safety.

G. Mouth-Actuated Toys

ASTM F963-2016 redefines mouth-actuated toys to include a broader range of toys such as noisemakers and projectile toys. The primary play activity of mouth-actuated toys is an output occurrence, such as noise or launch of a projectile when the child blows into the toy. The primary hazard associated with mouth-actuated toys is choking from liberated components of the toy or the projectile. Mouth –actuated toys in the 2011 version of the standard focused on noisemakers and testing to prevent liberation of small parts or the mouthpiece. The 2016 revision includes several tests intended to prevent any portion of the toy or projectile from being liberated and aspirated.

Changes in the Current Revision

Section 4 - Safety Requirements: The safety requirements have been modified with the addition of section 4.6.2.2, which has several provisions for mouth-actuated projectile toys. This section requires the mouth-actuated projectile toy prevent passage of the projectile backwards and into the mouth of the child if they were to inhale while holding the toy in their mouth. Additional tests prevent liberation of the mouthpiece or other parts of the toy when subjecting the toy to simulated child handling, such as dropping it.

Section 8.13 - Test Methods: The test methods Section 8.13.2 has been included for mouth-actuated projectile toys. This test ensures that the projectile is unable to travel backwards into the mouth of the user. The test applies air pressure 10 times from the end of the toy towards the mouthpiece, for 5 second durations. To pass this test, no projectile shall pass completely through the mouthpiece, and no structural portion of the toy or the mouth piece can break off when the toy is dropped, pulled, pushed or twisted under various forces applicable to the age of intended use.

Annex A12.10.3 - Rationale: The rationale provided for mouth actuated projectile toys address the potential choking hazards if the child inhales rather than exhales.

Staff Analysis of Changes Related to Mouth Actuated Toys

Staff agrees with the changes to add tests to the mouth-actuated projectiles and believes this is an improvement in the standard. These new test requirements are intended to prevent choking of any mouth actuated projectile or toy component from entering into the child's mouth.

H. Projectile Toys

The primary hazards associated with projectile toys are choking and eye impaction from discharge of the projectile. ASTM F963-11 has many requirements intended to minimize injuries. However, due to the growing complexity of projectile toys, the standard introduces several new specifications and defined terms with certain projectile toys. ASTM F963-16 established several new performance and test methods for these new projectile toy specifications. The ASTM F963-16 revision replaces much of the previous standard to better align with EN 71 and ISO 8124 performance requirements.

ASTM F963-16 classifies projectile toys under three categories: (1) projectile toys with stored energy, (2) projectile toys without stored energy, and (3) projectiles with rotors.

Changes in the Current Revision

Section 3 - Terminology: This section has been revised to add new classifications for several projectile toys:

- Section 3.1.5 Arrow: An arrow projectile has a shaft length of 150 mm and is intended to be discharged from a bow
- Section 3.1.24 Discharge Mechanism: Definitions for discharge mechanisms and projectiles were clarified to better align with the changes of this revision
- Section 3.1.35 Free Flight: Free flight is characterized for projectiles as unconstrained travel through the air
- Section 3.1.48 Leading Edge: The term leading edge was added to better assess eye injury potential. Leading edges are classified into resilient and rigid, based on the Shore A scale for hardness
- Section 3.1.63 Projectile: Any object intended to be launched into free flight
- Section 3.1.64 Projectile Toy with Stored Energy: Any projectile toy capable of storing energy independent of the user
- Section 3.1.65 Projectile Toy without Stored Energy: Any projectile toy incapable of storing energy independent of the user
- Section 3.1.73 Resilient Leading Edge: the leading edge of any projectile made with material with a hardness value of 70 or less, according to the Shore A scale
- Section 3.1.75 Rigid Leading Edge: the leading edge of any projectile made with material with a hardness value greater than 70, according to the Shore A scale

Section 4 - Safety Requirements: This section has been revised to include a tip assessment gauge for all types of projectiles, into which the leading edge should be unable to be fully inserted. Projectiles with suction cup leading edges must have a minimum length of 57 mm. Any projectile with rigid leading edges must be free of unintended projections. Ground based projectiles, where intermittent free flight is typical of the play pattern, and inaccessible projectiles, are exempt from the projectile requirements of this standard. Additional exemptions are given to projectiles traveling less than 300 mm and 100 mm depending on the requirement that is referenced.

Section 4.21.2: Projectile toys with stored energy shall not contain any small parts, including the projectiles themselves, if they are intended for use by children less than three years old. For projectile

toys intended for children three years and older, projectiles that travel 100 mm or less, small parts that are released and incapable of traveling 100 mm, and small parts of foam, which form solid foam shafts, are exempted from this requirement. If a projectile exhibits a kinetic energy greater than 0.08 J, it must have a resilient leading edge. This leading edge shall not detach when tested; or, if detached, and if still able to be launched in free flight, it should still meet the requirements for projectile toys with stored energy. Corners adjacent to leading edges must be rounded, exhibiting a radius of at least 0.25 mm. No projectile launched from a stored-energy toy should have a Kinetic Energy Density (KED) greater than 2500 J/m^2. All projectiles launched with stored energy shall be free of sharp edges/points before/after use and abuse testing. Improvised projectiles should not be able to be launched a distance of 300 mm or more.

Section 4.21.3: Projectile Toys without Stored Energy shall not have any sharp points/edges before/after use and abuse testing. Arrows must not exhibit a KED greater than 2500 J/m^2. They shall be protected and the tip should not detach during use. If the tip does detach, the projectile shall not be able to be launched into free flight. An exemption to this rule is if the projectile is resilient, is must continue to have a KED no greater than 2500 J/m^2.

Section 4.21.4 - Rotors: Rotors on projectiles that travel in a horizontal plane should now be protected. Toys with unprotected rotors have been involved in injuries and product recalls by the CPSC. Previous versions of ASTM F963 did not include rotors. ASTM F963-16 lists some examples of approved rotor designs but no test or performance requirements are established. These design examples include the following:

- The design denies access to the blade ends during rotation of the blades
- Rotor blades are curved or swept back
- Blade ends are “clutched” or loosely attached so that the ends are not directly powered
- Rotors or propellers leading edges are made with material a resilient material

Examples of these designs are also presented.

Section 8 - Test Methods: This section has been revised to add new test methodology for projectiles. Standardized tests for measuring the projectile launch distance and length of projectiles are defined. The tip assessment gauge assessment detailing the projectile’s leading edge should not be able to penetrate the full depth of the gauge, is explained. The F963-16 revision introduces an impact test for tip assessment. Only projectile toys with stored energy and arrows fired without stored energy shall be launched into a concrete block to determine the durability of projectile tips.

Kinetic energy determination was modified to include the maximum velocity of five measurements as opposed to the average. This change is to align with the requirements of ISO 8124 Part 1 and EN 71 Part 1. The KED test is defined and suggests for the contact area calculation that the projectile shall be fired into a hard perpendicular surface from a distance of 300 mm. The projectile can be inked and fired onto a clean sheet, or a carbon marking paper may be used. The resulting markings are measured to determine the contact area.

Previous versions of F963 were ambiguous in the limitations of improvised projectiles. Any pen/pencil or common household object could be considered a projectile. ASTM F963-16 places limitations on the improvisation by limiting the dimensions and material. Those limitations are based on household wooden

pens/pencils, nails, glass marbles, and metallic coins. The improvised projectile must be launched more than 300 mm in order to be considered hazardous.

Annex A12 - Rationale: Eighteen separate rationales have been included for the projectile revisions, which are each discussed below.

Annex A12.2.2.1: A toy can be both the projectile and the discharge mechanism at the same time. These toys shall be considered as projectiles launched by a stored energy discharge mechanism, as shown in Fig. A12.1. For these types of toys, the discharge mechanism is a function of the materials used to construct the projectile. The child manipulates, or twists, stretches, bends, etc. the projectile to introduce energy into the projectile. After some period, the projectile enters free flight.

Annex A12.2.2: The distinct difference between projectile toys with stored energy and projectiles without stored energy is that significant time can pass between cocking and a "ready-to-fire" position. The main hazard of projectile toys with stored energy is their ability to launch projectiles inadvertently. Projectiles without stored energy are at much lower risk of launching projectiles inadvertently which exempts them from small parts and improvised projectile requirements.

Annex A12.2.3 defines non-stored energy discharge mechanisms as those incapable of storing energy without independent action of the child. Examples of non-stored energy discharge mechanisms include spring powered pumps without fire mechanisms, non-pressurized bellows powered air systems, and certain friction type launchers.

Annex A12.2.4 Section 4.21 deletes redundant text references of the sling shots and sharp pointed darts scope exclusions, as these products are not considered toys are not included in the F963 standard.

Annex A12.2.5 - Exemption for Ground-Based Types of Toys: Ground-based toys may involve toy or toy components traveling through the air, but not intended to be sent into free flight for significant distances. For this reason, these types of toys are not considered projectile toys and are exempt from the projectile requirements.

Annex A12.2.6 - Exemptions for Projectiles that Travel less than 300 mm: Projectiles traveling 300 mm or less generally do not possess enough energy to cause injury. For this reason, these projectiles are exempt from minimum leading edge measurements in Section 4.21.1.1, resilient leading edge testing in Section 4.21.2.2, improvised projectile testing of Section 4.21.2.6, and rotor inaccessibility in Sections 4.21.4. These test exemptions do not include projectiles with suction cup tips, small parts.

Annex A12.2.7 - Leading Edge Assessment of Projectiles: The F963-16 standard requires that all projectiles that have rigid leading edges, regardless of the type of launch mechanism, be assessed using the Tip Assessment gauge. The dimensions of this gauge are based on the 2 mm requirement and are intended to simplify the pass/fail determination. The rigid leading edges of projectiles were found to have radii ranging from 2 mm to flat. Flat leading edges, and the corners adjacent to the flat leading edge, need to be smooth as it could reasonably be expected to strike the eye. In addition, for rigid tipped projectiles fired by stored energy launchers, the corner adjacent to the leading edge shall have a radius of at least 0.25 mm.

Annex A12.2.7.1 Includes a new Figure 15, requires more leading edge designs to use the test gauge with lower allowable tolerances.

Annex A12.2.8 - Projectiles with Suction cups: Most fatalities that involved projectiles with suction cups were related to the child chewing on the projectiles. CPSC data indicated that most incidents involved projectiles that were considered small parts. However, in one incident the projectile end was even with the top portion of the small parts cylinder. To prevent this, the dimensional requirements were added to suction cup projectiles.

Annex A12.2.9 - Exemption for small Parts of Foam Projectiles: Foam darts are inherently lightweight but lack mechanical strength, resulting in consistent failures during torque and tension testing. Failures during testing can be caused by the clamping hardware used. Historical data do not indicate any fatalities or serious injuries from foam darts of this nature.

Annex A12.2.10 - Kinetic Energy: The projectiles velocity measurement associated with kinetic energy are calculation values based on the average of five tests described in Section 4.21.2.2. This averaged velocity value aligns F963 with ISO 8124 Part 1 and EN 71 Part 1.

Annex A12.2.11 - Kinetic Energy Density: The rationale for this inclusion considered the limitation in the kinetic energy calculation that does not factor in the "projected area of the projectile," which may become in contact with the eye. A projectile tip with less surface area has a higher degree of eye injury than an object with the same velocity with a larger surface area. Annexes A12.2.11.2 through A12.2.11.11 document the historical development and subsequent use of the kinetic energy density concept.

Annex A12.2.12 - Improvised Projectiles: Several annexes describe the rationale for the new safety provisions to prevent improvised projectiles from being used in the discharge mechanism.

- Annex A12.2.12.1 and A12.2.12.2: The discharge mechanisms of the projectile should be designed to specifically prevent the launching of readily available improvised projectiles such as pencils, nails, marbles, coins and stones. These improvised projectiles align F963 with ISO 8124 Part 1. In addition, the design of the discharge mechanism should accept the toy's intended projectiles.
- Annex A12.2.12.3: Discharge mechanisms incapable of firing any defined improvised projectiles 300 mm are exempt from the requirements of 4.21.2.6.

Annex A12.2.13 - Bow and Arrow Sets: The 150 N pull force for bow and arrow sets was defined by anthropometric data based on the pull strength of 13-year-olds, who constitute the strongest intended users. The bow draw distance of 70 cm is also based on anthropometric data for 13-year-olds. Both of these values are used in the bow and arrow Safety Requirements in Section 4.21.3.3.

Annex A12.2.14 - Rotors: Toys with spinning horizontal rotors and unprotected edges with the capability to fly have been associated with injuries. The new safety requirements of 4.21.4 specify rotor designs are intended to mitigate injuries associated with horizontally spinning rotors.

Annex A12.10.3 - Section 4.6.2.2: This section was added to address potential choking hazards of mouth-actuated projectile toys if the user inhales rather than exhales potentially causing the projectile to travel backwards into the mouth.

Annex A12.10.5 - Section 8.13.2: The test equipment and test procedure were taken from EN 71 for alignment purposes.

Staff Analysis of Changes Related to Projectile Toys

Staff agrees with the additions and revisions to Section 4.21 and Section 8.14, as explained above. Staff understands and agrees with the rationales listed under Annex A12 for projectiles. Staff believes the additions and revisions are an overall improvement in toy safety.

I. Ride-on and Seated Toy Stability, Collapse Hazard, and Restraints

There are many types of ride-on and seated toys, where the child's primary activity with the toy is intended to be from the seated position. Designs of ride-on and seated toys vary greatly in their function and their features because ride-on toys are available for a wide range of ages. ASTM F963 has many safety requirements and test methods for a variety of ride-on and seated toys, however, only three areas were changed in the 2016 version of ASTM F963. These changes are associated with collapse prevention for any manufacturer-intended age of use, lateral tip-over prevention for wheeled toys intended for children less than 5 years old, and prevention of falls through waist restraint allowances on ride-on toys for toddlers less than 18 months old.

1. Ride-On and Seated Toy Stability

Stability requirements in ASTM F963 Standard Consumer Safety Specification for Toy Safety are intended to minimize sideways, forward, and backward tip-over of seated and ride-on toys intended for children less than five years old.

Changes in the Current Revision

Section 4 - Safety Requirements: The safety requirements include new dimensional criterion to determine whether wheels on ride-on or seated toys are considered to be one unit or separate components. The new language in Section 4.15.1 states that if wheels are on the same axle or axis and the centers of each wheel are less than 5.9 inches apart, then these wheels are considered a single wheel component.

Annex A12.6.2.1 - Rationale: The rationale for the ride-on toy stability revisions explains that the axle wheel spacing less than the minimum 5.9 inch is considered laterally unstable. This sideways wheel tip-over criterion is based on the waist breadth of a 3-year old child. In addition, EN 71 has the same wheel gap spacing requirements for ride-on toys, so the harmonization among standards is increased.

Staff Analysis of Changes Related to Ride-On and Seated Toy Stability

The new definition for a single wheel unit is based on the anatomical waist data for a small sized child. The 2016 revision of the single wheel definition clarifies and highlights that the design of wheeled riding toys with wheels on the same axis needs a minimum dimensional gap. Staff considers this clarification an improvement in the 2016 standard, as explained above.

2. Ride-On and Seated Toy Collapse Hazard

ASTM F963-16 requires that ride-on and seated toys meet new requirements intended to verify their ability to safely handle being overloaded. Seated or ride-on toy overload performance requirements are intended to prevent collapse or partial collapse of toys to mitigate injuries from hazards of sharp edges, falls, projections, crushing, and exposure to internal moving mechanisms. The ride-on and seated toy collapse requirements apply to toys intended for children under 14 years old.

Changes in the Current Revision

Section 8 - Test Methods: The test methods for ride-on or seated toys designed to seat one child were modified in Section 8.28 to default to the greater weight of either (1) the 95th percentile weight associated with intended age or, (2) the maximum indicated allowable weight. The 2011 version considered weight input from the label on the product, which typically indicated a maximum allowable user weight. The 2016 version considers both the 95th percentile weight associated with the intended age and the maximum weight of the intended user as indicated in the label. The overload weight used in the test method is a calculated value. This overload weight is triple the greatest weight of either the 95th percentile weight of the age or the maximum weight indicated on the label, whichever is greater. Each seat is tested with the overload weight for the prescribed test period. The applied load revisions apply to both single and multiple-occupant seated and ride-on toys.

Similarly, the test method on multiple-occupant ride-on toys defaults to the heavier weight associated with the labeling information of age or maximum weight. For multiple-occupant ride-on toys, the overload weight is doubled and applied simultaneously to each seat. This doubling of the overload weight is a change from the previous standard, which required tripling the overload weight. Another change with this test method is the requirement for simultaneous loading of all seats rather than one seat at a time. This simultaneous applied weight to all seats more realistically represents several children using the product at the same time. Although the new multiple-occupant applied overload weight is doubled instead of tripled, the total combined and simultaneous applied load on several seats of the toy is more stringent overall than the previous multiple ride-on toy overload test method.

Annex A12.6.1.1 - Rationale: This rationale provides for the more stringent overload applied weight of Section 8.28. The emphasis is on toys intended to accommodate multiple children. The rationale states that the previous test method is insufficient because of misrepresentation of actual product usage when applying the overload weight to one seat at a time. This new test requires that all occupant riding or standing areas have a load applied simultaneously.

Staff Analysis of Changes Related to Ride-On and Seated Toy Collapse Hazard

There are new overload test requirements to prevent collapse on single or multiple-occupant ride-on toys and seated toys. In the single seated toys, a heavier applied load must be selected from the manufacturer label information of weight or intended age. Multiple seated toys will require the same heavier applied load selection and test all seats simultaneously, rather than one seat at a time. Staff considers these changes to be an improvement in the standard and in safety for ride-on and seated toys.

3. Ride-On and Seated Toy Restraints

Changes in the Current Revision

Section 4.14.6 - Safety Requirements: The safety requirements have been revised to add a new exemption for ride-on toys, specifically excluding waist restraints from the free length and loop requirements in Section 4.14.1. Section 4.14.1 attempts to minimize potential entanglement and strangulation hazards in toys for children less than 18 months that incorporate accessible cords, straps, and elastics 12 inches long in free length, or able to tangle and form a loop, which must then comply with a specified head probe identified in figure 10 of ASTM F963-16.

Annex A12.6.3 - Rationale: Rationales for 2016 Revisions to exclude ride-on toys from the free length and loop requirements explains that the intent of the original safety provision was to reduce entanglement and strangulation by toys where a child could pick up a toy incorporating an accessible cord or loop and place the toy cord or loop around the neck. The subcommittee feels that waist restraints on ride-on toys are not readily accessible to be placed around the neck by the occupant and found no incident data to support restraint straps pose a strangulation or entanglement hazard. In addition, incorporating the use of waist restraints on role play toys are thought to encourage safe behavior at an early age.

Staff Analysis of Changes Related to Ride-On and Seated Toy Restraints

Staff believes the restraint exemption was added as a clarification to the types of toys intended to fall within the scope of the hazard pattern. The subcommittee's rationale states that "waist restraints have been incorporated into ride-on toys for children ages 12 months and older, and there is no incident data to suggest a hazard." Staff reviewed CPSC published Toy-Related Death and Injury reports for the years 2009 through 2014. There were no fatalities or injuries reported for non-powered or powered ride-on toys associated with straps or restraints. Staff conducted a review of all strangulation and entanglement hazards for the past 10 years related to ride-on toys and did not find any incidents involving waist restraints.

Given the lack of incident data, staff believes ASTM F963-16 maintains the same level of safety as the previous version. Staff will continue to monitor incident data and will take appropriate action should incidents arise.

J. Sound-Producing Toys

Section 4.5 of ASTM F963-16 establishes requirements intended to minimize hearing damage from toys designed to produce sound. Within this section, there are seven exemptions for toys producing sound. Sections 4.5.1 through 4.5.1.6 outline the specific sound pressure levels in toys such as close to the ear toys, toys not intended to be close to the ear, push/pull toys, and toys with impulse sound. Section 8.20, *Tests for Toys Which Produce Noise,* details the test methods and conditions under which toys that produce sound must comply.

Changes in the Current Revision

Section 2 - References: This section was revised to remove the reference to 16 CFR 1500.47 Method for determining the sound pressure level produced by toy caps and add a reference to ISO 11201 Acoustics—

Noise Emitted by Machinery and Equipment—Determination of Emission Sound Pressure Levels at a Work Station and at Other Specified Positions in an Essentially Free Field Over a Reflecting Plane with Negligible Environmental Corrections.

Section 3 - Terminology: This section was revised to remove definitions for continuous sound and impulsive sound, language that is no longer used elsewhere in the standard. Definitions for A-weighted sound pressure level and equivalent sound pressure level (L_{Aeq}) were combined into a single definition, A-weighted equivalent sound pressure level, L_{Aeq}, in Section 3.1.1. Definitions for C-weighted peak sound pressure level and peak sound pressure level (L_{Cpk}) were combined into a single definition, C-weighted peak sound pressure level, L_{Cpeak}, in Section 3.1.13. A new definition was added for push/pull toys in Section 3.1.69.

Section 4 - Safety Requirements:

Section 4.5: The phrases "continuous sounds" and "impulsive sounds" were removed and replaced with their respective measurement type, *i.e.,* L_{Aeq} or L_{Cpeak}, throughout the section. ASTM F963-11 required the tester to make a determination on whether a sound was continuous or impulsive, which would dictate the required testing. In ASTM F963-16, toys are subjected to both the tests for continuous and impulsive sound. This change also aligns with EN 71. An exemption to all sound-related requirements was added for toys that alter or reproduce the child's voice. The exemption to A-weighted equivalent sound pressure level (L_{Aeq}) requirements for push and pull toys, previously written in Section 4.5.1.3, was moved to the exemptions list in Section 4.5.

Section 4.5.1.2: A requirement was added that restricts the maximum A-weighted maximum sound pressure level (L_{AFmax}) to 85 dB for toys in which the sound level is produced by the translational motion of floor or table top toys where the motion is imparted on the toy by the child, including push/pull toys.

Section 4.5.1.4: The C-weighted peak sound pressure level limit (L_{Cpeak}) for close-to-the-ear toys was raised from 95 dB to 110 dB due to an erroneous calculation in ASTM F963-11. The sound limit now aligns with EN 71.

Section 8 - Test Methods:

Section 8.20: The phrases "continuous sounds" and "impulsive sounds" were replaced with their respective measurement type (i.e. L_{Aeq} or L_{Cpeak}) throughout Section 8.20, which reflects the changes in Sections 3 and 4.

Sections 8.20.1 through 8.20.2.6 were substantially re-organized to format the sequence of test methods. The test conditions, mounting of the toys, test operation, and specific test methods were aligned with EN 71.

Section 8.20.1.3: The required instrumentation system, including the microphone and cable, was also revised in Section 8.20.1.3. ASTM F963-11 allowed for the use of a class 1 or 2 instrument; ASTM F963-16 requires the use of a class 1 instrument.

Section 8.20.1.5: The definition of "cycle" was added to reduce inconsistency in interpretation between testers. A full cycle is completed when all actions such as winding, pumping, or resetting, have been

taken and the toy is ready for the next cycle. Direction on how to test toys was added, including direction that states that toys where the sound is caused by the motion of the child will be tested in accordance with the method for push and pull toys.

Section 8.20.2.1: The tolerance placed on the measurement distance was changed from 50 cm ± 0.5 cm to 50 cm ± 1 cm in Section 8.20.2.1. This brings the tolerance into alignment with EN 71.

Section 8.20.2.4: The height of the microphone used to test rattles was changed from 120 cm to 100 cm to align with EN 71.

Section 8.20.2.5: The speed at which push and pull toys are tested was changed from 2 m/s to a speed no greater than 1 m/s. The new test speed aligns with EN 71and improves test repeatability.

Annex A12 - Rationale: A 2016 rationale was added to ASTM F963-16 and includes Annex A12.9 Acoustics, which details the changes relating to sound-producing toys.

Staff Analysis of Changes Related to Sound-Producing Toys

Overall, staff believes that the changes in ASTM F963-16 related to sound-producing toys will maintain the current level of safety. Specific analysis by section is provided below.

Sections 3, 4.5, and 8.20 (general): Staff views the elimination of the phrases "continuous sounds" and "impulsive sounds" as a beneficial revision to the standard that improves safety. Staff agrees with ASTM that the previous version required the tester to make a determination on sound type, which could lead to misclassification and incorrect testing of toys. With the new language, toys will be subjected to both the tests for continuous and impulse sounds.

Section 4.5: Staff has concerns about the impact of the new exemption for "sounds produced by toys that reproduce or alter the child's voice such as walkie-talkies, recording devices, megaphones, kazoos, etc." because it exempts a category of toys from testing that are designed to amplify the voice and have the potential to produce large amounts of sound. However, staff also agrees that this category of toy is similar to other categories toys that already had exemptions to sound testing and there is no test method detailed in the standard that would facilitate testing of these toys (no defined input). Staff therefore concludes that the change maintains the current level of safety.

Section 4.5.1.2: Staff believes that the changes regarding push-pull toys and sound produced by the translational motion of floor or table top toys where the motion is imparted on the toy by the child increase safety. Previously, these toys were subject to the A-weighted equivalent (L_{Aeq}) sound limits, which average the sound over an entire cycle. The revision requires these toys also meet a maximum A-weighted sound pressure (L_{AFmax}) limit that restricts sound to 85 dB at any point during the test, which is much more restrictive than the previous requirements and harmonizes with EN 71. The L_{AFmax} requirement also applies to push-pull toys, which were previously exempt from any A-weighted sound pressure level testing.

Section 4.5.1.4: Staff believes that the increase in the C-weighted peak limit (L_{Cpeak}) for close-to-the-ear toys in Section 4.5.1.4 will maintain the current level of safety. Although this change allows a toy to be louder, making the requirement less restrictive, staff agrees with ASTM's assertion that the previous

value (95 dB) was incorrectly calculated by misapplying a factor of safety, which resulted in a requirement that restricted sound to a level far below the noise limit that on which the requirement was based. The new 110 dB L_{Cpeak} limit, measured at the test distance of 50 cm, does not exceed the OSHA and U.S. military limit of 140 dBP at the ear, when using the assumptions of a free-field sound environment and that toys will be held no closer than 2.5 cm from the ear (the same assumptions used in the other ASTM F963-16 sound limit calculations). It should be noted that the OSHA and U.S. military noise limits are based on adult, not child exposure. There are no known sound limits that apply specifically to children.

Section 8.20: Staff believes that the changes to format and sequence of test methods in Sections 8.20.1 through 8.20.2.6 maintain the current level of safety. The changes to the standard are mostly editorial (moving text) or clarifying by providing additional detail on test methodologies.

Section 8.20.1.3: Staff believes that the revision to the required instrumentation system to require the use of a class 1 instrument will increase measurement accuracy, however class 1 instruments are also more expensive than class 2 instruments, which may increase the burden on test labs.

Section 8.20.1.5: Staff believes that the addition of the definition of "cycle" will reduce test methodology variation between testers by providing clear start and finish points, and does not impact safety. Although some testers using a previous version may have interpreted the use cycle to only include the portion of time in which the toy produces sound, which could result in a higher measured sound level than if the entire cycle is taken into account, the revision accurately represents the actual user scenario, *i.e.*, a toy that requires action to prepare for the next sound cycle may not be capable of producing sound continuously. As stated earlier, staff believes that the direction that states that toys where the sound is caused by the motion of the child will be tested in accordance with the method for push and pull toys will increase safety because it applies additional sound requirements to this category of toy.

Section 8.20.2.1: Staff believes that the change to measurement distance tolerance in Section 8.20.2.1 maintains the current level of safety. Increasing the tolerance by 0.5 cm will allow for measurements 0.5 cm farther away from the source, which will decrease the measured sound. Although the change may allow for louder toys to pass testing, the magnitude of change is negligible and within standard instrument measurement error levels. For example, a toy that measured 65 dB at 50.5 cm would measure 65.09 dB at 50 cm, whereas a toy that measured at 65 dB at 51 cm would measure 65.17 dB at 50 cm (assuming free field sound environment). Class 1 sound level meters have a defined tolerance of 0.7 dB, so this difference is within the allowable measurement error.

Section 8.20.2.4: Staff believes that the change in height of the microphone used to test rattles will increase safety. Moving the microphone closer to the reflective surface (floor) will likely increase the measured sound. The measured sound level is a combination of the sound coming directly from the rattle and the sound from the rattle reflecting from the floor. Because sound level decays over distance, a microphone closer to the floor will measure a greater sound level than one that is farther away. Therefore, toys that are near the sound limits and would have otherwise passed testing may fail testing under the new method.

Section 8.20.2.5: Staff disagrees with ASTM's rationale (provided in Annex A12) for the reduction in test speed for push and pull toys:

> *In 8.20.2.5, the speed at which push/pull toy are operated was changed from 2 m/s to a speed that maximizes the sound output but does not exceed 1 m/s. 1 m/s is more sensible as children of a suitable age that play with push/pull toys would have difficulty achieving 2 m/s and many toys would not stay upright when moving at this speed.* (ASTM F693-16, p. 53).

Although staff agrees that a speed of 2 m/s is unlikely to be sustained by child, push-pull toy are exempt from requirements for sustained sound (measures of A-weighted equivalent sound pressure level, L_{Aeq}). Push-pull toys are subject to limits on maximum sound (L_{AFmax}) and peak sound (L_{Cpeak}), which can be produced by near-instantaneous action. Staff believes that it is possible for a child to reach a speed of 2 m/s for this duration. Staff's conclusion is consistent with the rationale that the ASTM standard committee provided for the 2008 revision:

> *It is implausible that a child could sustain the maximum speed at which the push/pull toy is tested (2 m/s). The speed represents a "worst-case" condition that would only be achievable momentarily at best. This supports regulating against immediate, acute hazards such as impulsive sounds versus chronic hazards that are presented by exposure to long-term, excessively loud continuous sounds.* (ASTM F693-16, p. 75).

Staff discussed concerns with the reduction in push-pull toy test speed with the ASTM task group chairman in a November 15, 2016 telephone call. The task group chairman provided additional rationale, not included in Annex A12, that staff believes is more compelling than the rationale provided in ASTM F963-16. Most importantly, the task group chairman said that the 2 m/s test speed resulted in non-repeatable testing results due to 1) the difficulty of keeping a toy on the test rig track and 2) the production of non-intended noise during testing that increased measured sound levels. The change also brings ASTM F963-16 into alignment with the newest version of EN 71 Section 8.28.2.7.3, in which the push-pull test speed was also reduced from 2 m/s to a maximum of 1 m/s.

Although staff disagrees with the rationale for decreasing push-pull toy test speed provided in Annex A12 and believes that the reduction in test speed, when considered in isolation from the other changes to the standard, will allow toys that would have exceeded sound limits under the previous test protocol to pass testing, staff does believe that the additional rationale provided by the task group chairman justifies the change. When combined with the highly restrictive new limit of 85 dB for L_{AFmax} in Section 4.5.1.2 that harmonizes with EN 71, staff believes that the overall changes for push-pull toys maintain the current level of safety.

K. Toy Chests

Toy chests are toy storage containers for children where the lid lifts upward for access inside the toy chest. Severe injuries have occurred when a child partially or fully releases their hold of the lid to reach inside the toy chest. The injuries occurred when the lid fell onto hands, arms or the back of the head. The most severe injuries occurred when the lid fell onto the back of the child's head and entrapped the neck between the lid and the edge of the toy chest. Currently, toy chest are tested to protect children from the three distinct injury scenarios of (1) entrapment and strangulation hazards associated with sudden lid closing or dropping, (2) crushing, pinching, and laceration hazards associated with lid and lid support mechanisms, and (3) suffocation hazards due to lack of adequate ventilation. In 2008, ASTM removed all toy chest provisions from the ASTM F963-08 revision, and created a new and separate toy chest standard, ASTM F834-08, *Standard Consumer Safety Specification for Toy Chests.* In May 2009, the Commission

rejected the ASTM F963-08 removal of toy chest safety requirement in Section 4.27 and associated test methods, instructional and producer markings from the earlier ASTM F 963-07ε[1] revision. As a result of the Commission's rejection of ASTM F963-08, Section 4.27 removal from ASTM F963, Section 4.27 of ASTM F 963-07 remained the mandatory standard for toy chests, in addition to the requirements of ASTM F963-08, which the Commission allowed to go into effect as the mandatory toy standard. In 2011, ASTM submitted a revision, ASTM F963-11 to the Commission, and the Commission allowed ASTM F963-11 to become the mandatory toy standard. However, the ASTM F963-11 did not reincorporate the toy chests requirements of Section 4.27 from the earlier ASTM F963-07ε[1] back into the standard. Therefore, Section 4.27 from ASTM F 963-07ε[1] remained mandatory along with the requirements of ASTM F963-11. ASTM F963-16 reincorporates the toy chest requirements from ASTM F963-07ε[1] back into the toy standard and withdraws ASTM F834.

Changes in the Current Revision

Section 2 - Referenced Documents: ASTM F963-16 removed the reference to F834 *Consumer Safety Specification for Toy Chests*, which existed in the 2011 and 2008 revisions of ASTM F963. However, the F834 document was not existent in the mandatory toy chest provisions in ASTM F963-07ε1.

Section 4 - Safety Requirements: ASTM F963 reincorporates the safety requirements for the toy chest safety requirements in Section 4 without change compared to the mandatory standard, which references ASTM F 963-07ε[1] Section 4.27.

Section 6 - Instructional Literature: The instructional literature emphasizes correct manufacturer assembly instruction and requires a method to check for accurate assembly, which is concurrent with the mandatory toy chest standards referenced in Section 6 ASTM F963-07 ε[1].

Section 7 - Producer's Markings: ASTM requires labeling for manufacturer and model identification, which is consistent with the existing requirements of the mandatory standard for toy chest in Section 7 of ASTM F963-07 ε[1].

Section 8 - Test Methods: ASTM F963-2016 revised a test of the lid performance on toy chests to ensure that the lid movement drops a minimum amount at several discrete positions rather than at one fully opened position. This clarification of multiple lid positions is included in Section 8.27.1.1 (a). The multi-positional test for toy chest lids requires a maximum vertical drop of 0.5 inch closure under its own weight. The lid support mechanism is a specific hardware used in toy chests designs that prevents the opened toy chest lid from suddenly dropping on the child's fingers, arms, or head. Overall, the toy chest test method remains nearly unchanged from the ASTM F 963-07ε[1] standard, except to clarify that the lid position requires several and up to 24 distinct tests of lid positions when the lid is moved in an upward and downward motion.

Annex A12 - Rationale: This annex of the ASTM F963-16 standard provides rationale for many of the 2016 revisions in the document. For historical purposes, Annex A10.8 Toy Chests, although outdated, will remain intact with the citation of ASTM F834 Standard Specification for Toy Chests. Annex A12.10 was added to provide language for reincorporating toy chests into the ASTM F963 toy standard. This annex states that toy chest safety standard provisions have been returned to ASTM F963 to eliminate the toy chest exemption with the renewed consistency of toy chest scope in both ASTM and Federal Toy

Standard. The A12.10 rationale also clarifies the necessity of incremental lid position drop test of Section 8.27.1.1 (a).

Staff Analysis of Changes Related to Toy Chests

ASTM F963-16 has two new changes affecting the mandatory toy chest safety requirements, which currently reference ASTM F963-07ε1. First, a clarification was added to the Test Methods section that addresses toy chest lid performance requirements. Second, performance requirements for toy chests are being reincorporated into ASTM F963. Staff believes the inclusion of toy chest provisions in ASTM F963-16 brings continuity between the current publications of the ASTM toy standard and the mandatory toy safety standard, as explained above.

TAB B: THIRD PARTY TESTING TO THE ASTM F963-16 STANDARD FOR TOY SAFETY AND NOTICE OF REQUIREMENTS FOR ACCREDITATION OF THIRD PARTY CONFORMITY ASSESSMENT BODIES FOR ASTM F963-16

UNITED STATES

CONSUMER PRODUCT SAFETY COMMISSION

BETHESDA, MD 20814

Memorandum

DATE: January 13, 2017

TO: Benjamin Mordecai, Mechanical Engineer
Directorate for Laboratory Sciences

FROM: Scott Heh, Program Manager
Directorate for Laboratory Sciences

SUBJECT: Third Party Testing to the ASTM F963-16 Standard for Toy Safety and Notice of Requirements for Accreditation of Third Party Conformity Assessment Bodies for ASTM F963-16

I. Introduction

Section 106(a) of the Consumer Product Safety Improvement Act of 2008 (CPSIA) mandated that, beginning on February 10, 2009, ASTM F963-07ε,[1] *Standard Consumer Safety Specifications for Toy Safety,*[1] shall be considered a mandatory consumer product safety standard issued by the Consumer Product Safety Commission (CPSC, or the Commission). The CPSIA also provides that if ASTM revises ASTM F963, the revised standard shall be considered to be a consumer product safety standard issued by the CPSC under Section 9 of the Consumer Product Safety Act (15 U.S.C. 2058), effective 180 days after the date on which ASTM notifies the Commission of the revision, unless, within 90 days after receiving that notice, the Commission notifies ASTM that it has determined that the proposed revision does not improve the safety of toys.

On November 1, 2016, ASTM notified the Commission that a revised standard, ASTM F963-16 had been published to replace ASTM F963-11. There have been two previous revisions to ASTM F963, ASTM F963-08 and ASTM F963-11. Each revision was accepted by the Commission to replace the previous version of the standard to become the mandatory safety standard for toys.[2]

Section 14(a)(3) of the CPSA requires the Commission to publish a notice of requirements (NOR) for the accreditation of third party testing laboratories to assess whether a children's product conforms to the applicable children's product safety rule. The Commission's requirements for CPSC acceptance of third party testing laboratories are found in 16 C.F.R. part 1112. Currently, part 1112 states the criteria for laboratory acceptance and certification timing for specified sections of ASTM F963-11. Should the Commission vote to allow ASTM F963-16 to take effect as the new mandatory toy safety standard as recommended by staff in the briefing package, the Commission must revise the current NOR to reflect ASTM F963-16.

This memorandum presents the staff's recommendation for revising the existing NOR found in part 1112 to establish the rules for CPSC acceptance of accreditation of testing laboratories for provisions in ASTM F963-16. The recommendation for revising the NOR also addresses the transition from ASTM F963-11 to ASTM F963-16 with respect to acceptance of testing results to support product certification.

II. ASTM F963-16 – Sections Excepted From Third Party Testing

Staff recommends that certain sections of ASTM F963-16 be required for third party testing and that other sections be excepted from required third party testing. The recommendations for excepted sections are the same staff recommendations that the Commission approved in NORs for third party testing and

[1] Except for Section 4.2 and Annex 4 or any provision that restates or incorporates an existing mandatory standard or ban promulgated by the Commission or by statute.

[2] Except for Section 4.27 (requirements for toy chests) of ASTM F963-07ε,[1] which remained in effect.

laboratory accreditation acceptance for ASTM F963-08 and for ASTM F963-11 [FR Vol. 78 No. 48, March 12, 2013]. The ASTM F963-16 sections that staff recommends be excepted from required third party testing are in the following categories:

- Any section of ASTM F963 that Section 106 of the CPSIA excepted as mandatory consumer product safety standards issued by the Commission. The ASTM toy safety standard that was referenced in the CPSIA is the ASTM F963-07 version. The CPSIA excepted Section 4.2 and Annex 4 of ASTM F963-07. These are flammability-related requirements and test methods.[3] The CPSIA also excepted from ASTM F963 any provision that restates or incorporates an existing mandatory standard or ban promulgated by the Commission or by statute. In addition, the CPSIA excepted sections from ASTM F963 that restate or incorporate a regulation promulgated by the Food and Drug Administration or any statute administered by the Food and Drug Administration [Section 4, Public Law 112-28 – Aug 12, 2011]
- Those sections of ASTM F963-16 that pertain to the manufacturing process and thus cannot be evaluated meaningfully by a test of the finished product (e.g., the purified water provision at Section 4.3.6.1)
- Those sections of ASTM F963-16 with requirements for labeling, instructional literature, or producer's markings
- The provision in ASTM F963-16 that sets a limit for a dioctyl phthalate in pacifiers, rattles, and teethers. This section is recommended to be excepted from third party testing because Section 108 of the CPSIA sets limits for this and other phthalates that are more stringent than this requirement in ASTM F963-16 and are mandated by the statute.

III. ASTM F963-16 Sections Compared to ASTM F963-11 Sections

The previous NOR for the toy safety standard included 35 sections from ASTM F963-11 and one section from ASTM F963-07ε1 (Section 4.27 - Toy Chests) that were required for third party testing. The revisions to ASTM F963-11 that were adopted into ASTM F963-16 include new requirements, new testing methods, and several clarifications to safety provisions and testing methods. These revisions are described in detail in the main briefing memorandum and the supporting Tab A memorandum from the Directorate for Laboratory Sciences. The staff recommends 37 sections of ASTM F963-16 for required third party testing. This includes the same 35 sections that were required for ASTM F963-11 plus two new sections. The new sections are Section 4.40 for expanding materials and Section 4.41 for toy chests. Section 4.40 on Expanding Materials is a new safety requirement, which addresses a hazard that was not addressed in earlier versions of ASTM F963. Section 4.41 for toy chests incorporates the toy chest requirements from ASTM F963-07ε1. The incorporation of the toy chest requirements into ASTM F963-16 simplifies the NOR since it can now reference only one version of the standard, ASTM F963-16.

[3] In the ASTM F963-16 version of the standard, Annex 4 that has flammability testing procedures is in Annex 5

Twenty-three of the 37 ASTM F963-16 sections in the staff's recommendation are equivalent to sections in ASTM F963-11. These sections have no substantive modifications. Fourteen of the 37 sections were revised in ASTM F963-16. Table 1 lists the 37 ASTM F963-16 sections that staff recommends for required third party testing and denotes if there were changes in these sections between the ASTM F963-11 and ASTM F963-16 versions of the standard.

Table 1. ASTM F963-16 List of 37 Sections Recommended for Required Third Party Testing and Comparison with ASTM F963-11

	F963-16 Section	Section Name	Changed	Description of Change
1	4.3.5.1(2)	Surface Coating Materials – Soluble Test for Metals	Yes	Added test method alternatives.
2	4.3.5.2	Toy Substrate Materials	Yes	Added test method alternatives.
3	4.3.6.3	Cleanliness of Liquids, Pastes, Putties, Gels, Powders and items of Avian Feather Origin (except for cosmetics and tests on formulations used to prevent microbial degradation)	Yes	Added avian feather products. Revised test methods.
4	4.3.7	Stuffing Materials	Yes	Added inspection for glass contaminants. Revised test method.
5	4.5	Sound Producing Toys	Yes	Revised test methods and requirements.
6	4.6	Small Objects (except labeling and/or instructional literature requirements)	Yes	Expanded requirements and test methods to include mouth-actuated projectile toys.
7	4.7	Accessible Edges (except labeling and/or instructional literature requirements)	No	
8	4.8	Projections (except bath toy projections)	No	
9	4.9	Accessible Points (except labeling and/or instructional literature requirements)	No	
10	4.10	Wires or Rods	No	
11	4.11	Nails and Fasteners	No	
12	4.12	Plastic Film	No	
13	4.13	Folding Mechanisms and Hinges	No	
14	4.14	Cords, Straps, and Elastics	Yes	Exemption added for ride-on toys.
15	4.15	Stability and Overload Requirements	Yes	Revised test methods and requirements.
16	4.16	Confined Spaces	No	
17	4.17	Wheels, Tires, and Axles	No	
18	4.18	Holes, Clearances, and Accessibility of Mechanisms	No	
19	4.19	Simulated Protective Devices (except labeling and/or instructional literature requirements)	No	
20	4.20.1	Pacifiers with Rubber Nipples/Nitrosamine Test	No	
21	4.20.2	Toy Pacifiers	No	
22	4.21	Projectile Toys	Yes	Revised test methods and requirements.
23	4.22	Teethers and Teething Toys	No	
24	4.23.1	Rattles with nearly spherical, hemispherical, or circular flared ends	No	

	F963-16 Section	Section Name	Changed	Description of Change
25	4.24	Squeeze Toys	Yes	Clarification that requirement only applies to portions of toy with a squeeze toy function
26	4.25	Battery-Operated Toys (except labeling and/or instructional literature requirements)	Yes	Addition of new requirements and test methods.
27	4.26	Toys Intended to Be Attached to a Crib or Playpen (except labeling and/or instructional literature requirements)	No	
28	4.27	Stuffed and Beanbag-Type Toys	No	
29	4.30	Toy Gun Marking	No	
30	4.32	Certain Toys with Nearly Spherical Ends	No	
31	4.35	Pompoms	No	
32	4.36	Hemispheric-Shaped Objects	No	
33	4.37	Yo-Yo Elastic Tether Toys	No	
34	4.38	Magnets (except labeling and/or instructional literature requirements)	Yes	Added new use and abuse test methods.
35	4.39	Jaw Entrapment in Handles and Steering Wheels	No	
36	4.40	Expanding Materials	Yes	New section in F963-16 with new requirements and test methods.
37	4.41	Toy Chests (except labeling and/or instructional literature requirements)	Yes	New section in F963-16 that incorporates ASTM F963-07ε1 Section 4.27.

IV. **Laboratory Competence and CPSC Acceptance of Accreditation**

16 CFR part 1112 establishes a baseline requirement that, to be considered for CPSC acceptance, a laboratory must be accredited to International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) Standard ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories" (ISO/IEC 17025). Laboratories that are ISO/IEC 17025 accredited have been assessed to have the technical and managerial competence to conduct testing in accordance with the standards and test methods that are listed in the laboratory's scope of accreditation. The scope of accreditation is issued and made publically available by the laboratory's accreditation body.

The CPSC only accepts laboratory accreditations for the specified ASTM F963 sections that are published in the NOR. These sections become part of the menu of choices on the CPSC laboratory application form, which is submitted through the CPSC website, for which laboratories may apply for CPSC acceptance and listing on the CPSC website.

It is CPSC staff's opinion that testing laboratories, which have been CPSC-accepted for sections in ASTM F963-11, have already been accredited to conduct the same or similar testing as specified for those same sections ASTM F963-16. This is a straightforward conclusion for those sections that were unchanged from ASTM F963-11 to ASTM F963-16.

As noted, some of the revised sections included changes in testing methods. Staff considers that the testing method revisions did not involve a change in scientific discipline or a significant increase in

complexity. Laboratories that were accredited and CPSC-accepted to the ASTM F963-11 sections are considered to continue to have the competency to conduct testing to those same sections in ASTM F963-16.

The test methods associated with the new provisions in ASTM F963-16 Section 4.40 on expanding materials involve mechanical testing, including dimensional measurements and the use of a test gauge. CPSC staff believes that laboratories that are currently CPSC-accepted for other mechanical testing provisions in ASTM F963-11 are competent to conduct testing to this new requirement, as there are strong similarities between the tests required for this element and tests for which the laboratory is already accepted for conducting per ASTM F963-11, Section 4.6 Small Objects and Section 4.24-Squeeze Toys.

V. Acceptance of Accreditation and Third Party Testing to Support Certification to ASTM F963-16

Staff recommends that the Commission approve an approach for acceptance of testing that supports ASTM F963-16 certification, and acceptance of laboratory accreditation, that takes into account testing laboratories that are already CPSC-accepted for testing to relevant sections in ASTM F963-11 and ASTM F963-07ε1 Section 4.27.

Staff recommends that testing to support product certifications to sections in ASTM F963-16 be accepted by the CPSC if the laboratory is already CPSC-accepted to those same sections in ASTM F963-11. There would be two exceptions to this provision. For ASTM F963-16, Section 4.41 for toy chests, the CPSC would accept testing if the laboratory was already CPSC-accepted for ASTM F963-07ε1, Section 4.27 for toy chests. For ASTM F963-16, Section 4.40 for expanding materials, the CPSC would accept product testing if the laboratory is already CPSC-accepted for ASTM F963-11, Sections 4.6 for small parts and 4.24 for squeeze toys. Laboratories that conduct testing to support product certifications to ASTM F963-16 must show in their test reports "ASTM F963-16" and the specific section numbers in the standard to which the product was evaluated.

The staff recommends that the CPSC accept ASTM F963-16 testing results by laboratories that are CPSC-accepted to ASTM F963-11 sections for a period not to exceed two years. This should allow adequate time for testing laboratories to work with their accreditation bodies, make official updates to their accreditation scope to include ASTM F963-16 sections, and submit applications to the CPSC.

The CPSC will open the application process for all sections of ASTM F963-16 (as shown in Table 1) when a NOR is published in the Federal Register as an amendment to 16 CFR part 1112. Testing laboratories that seek CPSC acceptance for one or more ASTM F963-16 sections will be required to update their accreditation scope. To be CPSC-accepted for sections in ASTM F963-16, a laboratory's scope of accreditation must include the reference to "ASTM F963-16" and a specific reference to one or more of the 37 specific subsection numbers from Section 4 of the standard as shown in Table 1. Laboratories that are currently CPSC-accepted to ASTM F963-11 will be instructed to update their accreditation scope to include ASTM F963-16 sections as soon as possible, and submit their application for CPSC acceptance. Laboratories that were not previously CPSC-accepted to ASTM F963-11

sections,and that wish to request CPSC acceptance to ASTM F963-16 will be instructed to work with their accreditation bodies to include "ASTM F963-16" sections in their scope.

Beginning two years after the date of the NOR publication, the CPSC will no longer accept laboratory applications that reference "ASTM F963-11" sections. At that time, the scope document submitted with applications to CPSC must reference "ASTM F963-16" and the specific section numbers as recommended in this memorandum for publication in the NOR.

The CPSC would provide notice of these requirements through a Federal Register notice and through direct email to all current CPSC-accepted laboratories and their accreditation bodies.

This approach would avoid disruption to third party testing to the toy safety standard and allow for a practicable transition from ASTM F963-11 to ASTM F963-16 for testing laboratories, the toy industry, and other interested parties.

VI. **Recommendation**

Staff recommends that the Commission publish a NOR in an amendment to 16 CFR part 1112 for establishing the criteria for CPSC acceptance of accreditation of third party testing laboratories to conduct testing in accordance with ASTM F963-16. As presented in this memorandum, the NOR would define the sections in ASTM F963-16 that are required for third party testing. The NOR would also provide rules for a transition from ASTM F963-11 to ASTM F963-16 with respect to CPSC acceptance of testing results that support compliance to the new ASTM F963-16 standard.

The staff recommends an effective date for required third party testing to be the same as the effective date as the new standard.