



U.S. CONSUMER PRODUCT SAFETY COMMISSION
5 Research Place, Rockville MD 20850

Stephen Harsanyi
Engineering Psychologist
Division of Human Factors

(301) 987-2209
sharsanyi@cpsc.gov

July 29, 2020

TRANSMITTED VIA EMAIL

Ms. Nancy Nord, Subcommittee Chairman for ASTM F15.77
Ms. Molly Lynyak, Manager, Technical Committee Operations for ASTM
c/o ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

Dear Ms. Nord and Ms. Lynyak,

Thank you for bringing forward CPSC staff's negative vote on ASTM ballot F15 (20-04), *Specification for Marketing, Packaging and Labeling Adult Magnet Sets Containing Small, Loose Powerful Magnets with a Flux Index ≥ 50 kG2 mm2* (Item #2), for consideration by the ASTM F15 Committee on Consumer Products.

CPSC staff is concerned, however, that the summary provided for staff's negative vote in Item #2 does not sufficiently capture staff's points. Without reviewing staff's full comment letter that accompanied our negative vote, the members of ASTM F15, charged with determining whether CPSC staff's negative is persuasive, may overestimate the effectiveness of the proposed warning and packaging requirements in prevention of the magnet ingestion hazard. I am requesting that you forward to the F15 Committee this letter with staff's full Negative/Comments (see Appendix), so members can have all of the information they need to make their determination.¹

As detailed in CPSC staff's three letters to the Subcommittee Chairman,² staff's 2014 briefing package on magnet sets,³ and staff's 2020 informational briefing package on magnet sets,⁴ multi-disciplinary teams of CPSC staff determined that the magnet ingestion hazard is unlikely to be addressed effectively by efforts intended only to persuade consumers to take unrealistic actions to avoid the hazard. Staff

¹ The views expressed in this letter are those of CPSC staff and have not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.

² (1) Staff sent a letter to the Subcommittee Chairman on October 18, 2019, which explains staff's participation in the ASTM F15.77 effort; (2) Staff sent a letter to the Subcommittee Chairman on January 9, 2020, which explains staff's negative vote on the iteration of the draft standard proposed in ASTM ballot F15.77 (19-01), item #1; and (3) Staff sent a letter to the Subcommittee Chairman on May 27, 2020, explaining staff's negative vote on the most recent iteration of the draft standard proposed in ASTM ballot F15 (20-04), item #10.

³ Staff's briefing package, "Final Rule on Safety Standard for Magnet Sets," dated September 3, 2014, can be accessed using the following hyperlink: https://cpsc.gov/s3fs-public/pdfs/foia_SafetyStandardforMagnetSets-FinalRule.pdf.

⁴ Staff's informational briefing package, "Staff Briefing Package In Response to Petition CP 17-1, Requesting Rulemaking Regarding Magnet Sets," dated June 3, 2020, can be accessed using the following hyperlink: [https://cpsc.gov/s3fs-public/Informational Briefing Package Regarding Magnet Sets.pdf?FKVcZpHmPKWCZNb7JEI6r0a31WV72PI](https://cpsc.gov/s3fs-public/Informational%20Briefing%20Package%20Regarding%20Magnet%20Sets.pdf?FKVcZpHmPKWCZNb7JEI6r0a31WV72PI).

finds the balloted draft almost exclusively relies on such an attempt to persuade consumers, and is thus, unlikely to be effective.

I encourage F15 Committee members to review CPSC staff's recent 2020 informational briefing package on magnet sets, which was completed on June 3, 2020, after staff's negative vote. As discussed in the package, staff is aware of ingestion incidents dating back to 2010, involving magnet sets with prominent on-package warnings; and despite more than a decade of public awareness-raising campaigns by numerous health and safety advocates,⁵ ingestions of magnets from magnet sets are common and rising.

Based on NEISS data, CPSC Epidemiology staff estimates 4,500 emergency department-treated ingestions involving magnets from, or possibly from, magnet sets (excluding incidents involving magnets with insufficient details to suggest or contraindicate characteristics of magnet sets) occurred from 2009 to 2018. Furthermore, cases have increased significantly in the years since the court vacated the CPSC regulation.⁶ Additionally, both NEISS and CPSRMS data demonstrate that the majority of victims are age 5 years and older, meaning that child-resistant packaging aimed at blocking access to magnet sets by children under this age range is ineffective for the majority of victims. Staff concludes that magnet sets will continue to present a hazard to children and teens, primarily due to the hidden nature of the hazard and the difficult-to-control chain of events that lead to injury, especially if the proposed standard passes without including performance requirements that effectively mitigate the magnet ingestion hazard.

CPSC staff appreciates the efforts of the ASTM F15.77 subcommittee, and looks forward to continuing to work with the subcommittee to develop effective measures for addressing this challenging product hazard.

Sincerely,



Stephen Harsanyi
Engineering Psychologist,
Division of Human Factors

CC: Susan Bathalon, CPSC Children's Program Area Risk Manager
Patricia L. Edwards, CPSC Voluntary Standards Coordinator
Benjamin Mordecai, CPSC Toy Program Lead Testing Engineer

⁵ Campaigns by health organizations, such as the American Academy of Pediatrics (AAP) and the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN), have endeavored to educate the medical community and the public about the dangers of magnet ingestion. Consumer Reports shared articles and an online video to publicize the hazard and aid in preventing future incidents. Other efforts, such as outreach from consumer advocacy groups (examples include Consumer Federation of America and Kids In Danger) and standard development by ASTM, have also attempted to raise public awareness of the hazard. See staff's 2020 informational briefing package for more information.

⁶ See staff's 2020 informational briefing package.

Appendix
Staff's Letter Explaining Staff's Negative Vote on ASTM Ballot F15 (20-04), Item #10,⁷
Specification for Marketing and Labeling Adult Magnet Sets Containing Small, Loose, Powerful
Magnets with a Flux Index $\geq 50 \text{ kG}^2 \text{ mm}^2$ WK68963



U.S. CONSUMER PRODUCT SAFETY COMMISSION
5 Research Place, Rockville MD 20850

Stephen Harsanyi
Engineering Psychologist
Division of Human Factors

(301) 987-2209
sharsanyi@cpsc.gov

May 27, 2020

TRANSMITTED VIA EMAIL

Ms. Nancy Nord
Subcommittee Chairman for ASTM F15.77,
c/o ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

Dear Ms. Nord:

This letter responds to ASTM ballot F15.77 (20-04), item #1, *Specification for Marketing and Labeling Adult Magnet Sets Containing Small, Loose, Powerful Magnets with a Flux Index $\geq 50 \text{ kG}^2 \text{ mm}^2$ WK68963* ("draft standard").¹ Staff of the U.S. Consumer Product Safety Commission (CPSC) is voting negative on the ballot item.²

The draft standard seeks to minimize the hazard of children and teens ingesting magnets from magnet sets intended for adult use, by establishing requirements for warnings, instructions, marketing, and packaging ("proposed requirements"). Based on staff's technical expertise and its examination of magnet sets, incident reports, consumer reviews, and the available literature, staff concludes that relying only on the draft standard's proposed requirements is unlikely to effectively mitigate the hazard associated with the ingestion of small, powerful magnets from magnet sets. As discussed in staff's letter to the subcommittee on October 18, 2019, which explains staff's participation in the ASTM F15.77 effort, and staff's letter to the subcommittee on January 9, 2020, which explains staff's negative vote on the previous version of the draft standard proposed in ASTM ballot F15.77 (19-01), item #1, there are numerous factors that render the proposed requirements inadequate, including, but not limited to, the following:

1. *Consumer Common Recognition*: Studies show that consumers are unlikely to consult and heed warning information for products and features they perceive as simple, familiar, and non-

¹ The views expressed in this letter are those of CPSC staff and have not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.

² 16 CFR part 1031, as amended in 2016, permits CPSC staff to vote and hold leadership positions on an optional basis, provided that such activities have the prior approval of CPSC's Office of the Executive Director. CPSC staff sought and received approval to vote in October 2019, on matters pertaining to ASTM subcommittee F15.77.

CPSC Hotline: 1-800-638-CPSC (2772) ★ CPSC's Web Site: <http://www.cpsc.gov>

⁷ Note: In this letter, staff refers to ASTM ballot F15 (20-04), item #10, as "ASTM ballot F15.77 (20-04), item #1."

threatening, such as the subject magnet sets. Incident data and consumer reviews of magnet sets demonstrate that consumers commonly recognize magnet sets as suitable for children; warning information that suggests the contrary is unlikely to be perceived as credible. In addition, studies demonstrate that the more familiar consumers are with a product, the less likely they are to look for and read a warning; in contrast, consumers are more likely to discredit or ignore the warning. If caregivers have observed their child, or their child's peers, using the product, or a similar product, without incident, caregivers may conclude that their child can use the product safely, regardless of what the warnings state. Similarly, recommendations from other consumers and caregivers, including online reviews of magnet sets by others who have purchased these sets, can lead consumers to disregard the hazard.

2. *Required Repackaging:* Consumers are unlikely to repackage the sets in their entirety after each use, which is likely to be required to limit children's access to the sets and individual magnets. Magnet sets are designed and marketed for users to make complex sculptures, and for other purposes that discourage consumers from dismantling and repackaging the entire set. Magnet sets can have upwards of 1,000 tiny magnets, making the task of finding and collecting every individual magnet, after every use, difficult and time-consuming. Even small increases in time, effort, and other "costs," can have a substantial effect on compliance with a warning, and can quickly drive compliance rates to zero.
3. *Accessibility:* As evidenced in incident reports, magnets from magnet sets are often acquired by children without the packaging and instructions, such as from children sharing sets and children finding loose magnets in their environment. In such cases, any warning information limited to these sources, as well as packaging characteristics, are ineffective. Additionally, incident data show that the majority of victims have been 5 years or older, rendering the proposed child-resistant packaging requirements ineffective. For children under 5 years, users would have to repackage the magnet sets properly and in their entirety after every use for child-resistant packaging to be effective, which staff assesses as unlikely.
4. *Misunderstood Hazard:* It is typical for magnet ingestions by older children and teens to be accidental in nature, and consumers are unlikely to anticipate and appreciate the vulnerability of children and teens who do not have a history of mouthing inedible objects. Therefore, consumers are unlikely to keep the magnets away from these populations, regardless of warning information, which is likely to be perceived as not pertaining to these children.
5. *Characteristics of Older Children:* Older children are unlikely to comply with the warnings. It is evident in some incident reports that older children intentionally ingested magnets. Although older children presumably would be capable of understanding the danger posed by magnet ingestion, they are likely to give in to peer pressure, test limits, bend rules, and underestimate the risk and consequences. In fact, warnings about keeping magnet sets away from all children could have the unintended effect of making the product more appealing to these older children.
6. *Historical Inadequacy of Similar Efforts:* While some magnet sets are sold without warnings regarding the ingestion hazard, incidents and consumer reviews indicate that young children are continuing to access magnet sets even when there are prominent warnings, 14+ age labels, instructions, marketing, and packaging that attempt to communicate the appropriate user

population and warn about the ingestion hazard. Staff is aware of numerous incidents as early as 2010 that involved products with magnet ingestion hazard warnings. For example, an incident report from 2011 includes an image of magnet set packaging, which marketed the product to “grown-ups,” had a warning to keep the product away from “all children,” and included a clear magnet ingestion warning.³ Nonetheless, the product was involved in a magnet ingestion incident involving a 9-year-old child.

Additionally, in the appendix below, staff lists other concerns with the draft standard; however, resolution of these concerns, in staff’s technical opinion, would not adequately address the hazard.

Magnet ingestion is a significant concern of staff’s, primarily due to the hidden nature of the hazard, the vulnerable populations at risk, and the difficult-to-control chain of events that lead to injury and death. In staff’s briefing package, *Final Rule on Safety Standard for Magnet Sets*, dated September 3, 2014, a multidisciplinary team of CPSC staff concluded that warnings, even strengthened warnings, as well as other methods of addressing consumer behavior (e.g., bitterants, child-resistant packaging, and sales restrictions), would not adequately reduce the hidden hazard and risk of injury associated with magnet sets.⁴

Although staff appreciates the efforts of the ASTM F15.77 subcommittee, staff does not believe that this hazard can be addressed adequately by methods that rely only on overriding the common perception by consumers of the product as a suitable plaything for children, and on encouraging consumers to consistently and unrealistically alter their behavior in some way to avoid the hazard. Thus, staff cannot support the current ballot item. Staff looks forward to working with ASTM to develop requirements that effectively alleviate the hazard associated with the subject magnet sets.

Sincerely,

STEPHEN
HARSANYI

Stephen Harsanyi
Engineering Psychologist,
Division of Human Factors

Digitally signed by STEPHEN HARSANYI
DN: c=US, o=U.S. Government, ou=Consumer
Product Safety Commission, cn=STEPHEN
HARSANYI
c=US, o=U.S. Government, ou=Consumer Product
Safety Commission, cn=STEPHEN HARSANYI
Date: 2020.05.27 10:29:30 -0400

CC: Molly Linyak, Manager, Technical Committee Operations, ASTM International
Susan Bathalon, CPSC Children’s Program Area Risk Manager
Patricia L. Edwards, CPSC Voluntary Standards Coordinator
Ben Mordecai, CPSC Toy Program Lead Testing Engineer

³ CPSC staff shared this incident, I1160250A, with ASTM F15.77 on March 31, 2020; however, the image is from the IDI, which was not shared with the subcommittee.

⁴ https://cpsc.gov/s3fs-public/pdf/foia_SafetyStandardforMagnetSets-FinalRule.pdf

Appendix
Additional Concerns with the Proposed ASTM F15.77 Draft Standard

In addition to CPSC staff's above comments, staff notes the following concerns:

- “Adults” should not be defined in the draft standard as including children 14 years of age or older. The legal age of adulthood is not below 18 in any U.S. state. Furthermore, there have been incidents of magnet ingestion involving children 14 years of age and older.
- The draft instructions and packaging requirements for counting and storing magnets (sections 4.3 and 9.2.1, respectively), which are intended to assure that all magnets have been collected, can place unreasonable expectations and burdens upon consumers. For example, a manufacturer could meet these requirements by instructing consumers to produce a certain shape, such as a cube. However, consumers may lack the time, desire, or ability to construct a shape like this after every use.
- Section 8.5 should indicate clearly that the permanent storage container must have a minimum type size of 5.1 mm (0.2 inches) for the signal word and 2.0 mm (0.08 inches) for the warning text if the permanent storage container is the outer packaging for the product. As written, a permanent storage container used as the outer packaging may have a type size of 3.8 mm (0.15 inches) for the signal word and 1.5 mm (0.06 inches) for the warning text if the container is 50.8 mm (2 inches) or less. The ASTM F15.77 subcommittee agreed to this, after staff voiced concern that the warning should be larger for this product, explaining that the product is non-threatening in appearance and has a hidden hazard.
- The draft requirements in section 8.7 vary in numerous ways from the warning label exemplified in figure 3 of the draft standard. The language in figure 3 was developed by the Marking and Labeling task group and agreed upon by the subcommittee.
- There should be a requirement that information provided with the product, including in warning labels and marketing, shall neither contradict nor confuse the meaning of the required information or otherwise be misleading to the consumer.
- The draft standard allows the product to be marketed as a “toy,” which can reduce the perceived hazardousness of the product, which is non-threatening in appearance, and suggest that the product is a suitable plaything for children.
- The illustration exemplified in figure 4 of the draft standard has not been tested, so it is unknown if it effectively will communicate the hazard to those that see it. The illustration is similar to a pictogram modified by staff, which, pre-modification, was created and tested for the CPSC by Kalsher & Associates, LLC (Contract HHSP233201860070A), and found to fail the comprehension criteria of ANSI Z535.3, *American National Standard Criteria for Safety Symbols* (2011; R2017).⁵ Although untested, the illustration does appear to address the concerns identified by Kalsher & Associates.

⁵ See <https://cpsc.gov/s3fs-public/CPSC%20Gather%20Consumer%20Feedback%20-%20Final%20Report%20with%20CPSC%20Staff%20Statement%20-%20REDACTED%20and%20CLEARED.pdf>, accessed on May 7, 2020.