This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: F3458 – 21

Standard Specification for Marketing, Packaging, and Labeling Adult Magnet Sets Containing Small, Loose, Powerful Magnets (with a Flux Index ≥50 kG² mm²)[1]

This standard is issued under the fixed designation F3458; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers marketing, packaging, labeling, and warning requirements for adult magnet sets containing small, powerful magnets. It is aimed at minimizing the identified hazards to children and teens associated with ingesting small, powerful magnets that are intended for adults, that is, those persons 14 years of age and older.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D3359 Test Methods for Rating Adhesion by Tape Test

F963 Consumer Safety Specification for Toy Safety

2.2 *Federal Statutes and Standards:*[3]

16 CFR 1501 Method for Identifying Toys and Other Articles Intended for Use by Children under Three Years of Age which Present Choking, Aspiration, or Ingestion Hazards because of Small Parts

16 CFR 1500.121 Labeling requirement; prominence, placement and conspicuousness

16 CFR Part 1700 Poison Prevention Packaging

21 U.S.C. Section 301 et. seq. Federal Food Drug and Cosmetics Act

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *magnet set, n*—aggregation of separable magnetic objects that are marketed or commonly used as a manipulative or construction item for puzzle working, sculpture building, mental stimulation, education, or stress relief.

3.1.2 *permanent storage container, n*—receptacle designed to hold the magnet set when not in use.

3.1.3 *small, powerful magnet, n*—individual magnet of a magnet set that is a small object (as measured in Section 6 and Fig. 1) and has a flux index ≥50 kG^2 mm^2 as determined in Section 6.

4. Instructional Literature

4.1 Instructions shall be provided with the product that are easy to read and understand, and are in the English language, at a minimum. These instructions shall include information on assembly, maintenance, cleaning, storage, and use.

4.2 The instructions shall include all of the warnings specified in 8.7.

4.3 The instructions shall describe the manufacturer's suggested strategy for counting and storing magnets.

4.4 The instructions shall describe typical hazard patterns, including young children finding loose magnets and teens putting magnets near their mouth or nose.

4.5 The instructions shall include an illustration of the hazard as shown in Fig. 2. It is acceptable to use another illustration if the comparable meaning is conveyed.

4.6 The instructions shall warn the consumer to seek immediate medical care or to call the poison control center if it is possible that magnets have been ingested.

[1] This specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.77 on Magnets.

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

[3] Available from U.S. Government Printing Office, Superintendent of Documents, 732 N. Capitol St., NW, Washington, DC 20401-0001, http://www.access.gpo.gov or http://www.govinfo.gov.

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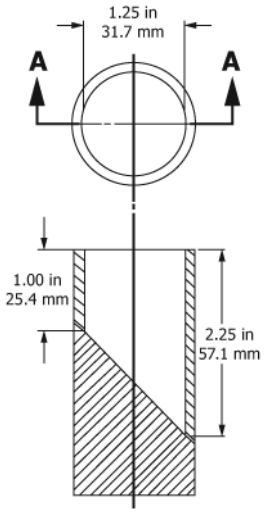

FIG. 1 Test Cylinder

4.7 Typical symptoms shall be described on the instructional literature, including that the symptoms are often non-specific (abdominal pain, fever, etc.) and that it is possible that there will be a delay in symptoms or no initial symptoms. It is important to warn consumers not to wait for symptoms to appear if it is possible that magnets have been ingested.

4.8 The instructions shall warn that the product must be kept away from pets.

4.9 The instructions shall warn that the product must be kept away from pacemakers.

4.10 Any instructions provided in addition to those required by this section shall not contradict or confuse the meaning of the required information or otherwise be misleading to the consumer.

4.11 An example of product instructions follows:

"WARNING — INTERNAL INJURY HAZARD
Swallowed magnets can damage internal organs and have resulted in DEATH and SERIOUS INJURIES.

These magnets are NOT toys. Keep away from ALL children.

[Insert Fig. 2 or comparable illustration.]

NEVER put near mouth or nose. Magnet ingestions are often accidental and there is a possibility that they will occur from:
1. Young children finding loose or missing magnets;
2. Older children and teens playing with magnets in their mouths or nose and imitating piercings.

Be aware of dropped or separated magnets. When not in use, locate all magnets and count them individually or return them to the following shape to be sure that none are missing. Store all magnets safely away from children, and in storage container.

[Insert manufacturer's recommended strategy for magnet quantity accountability.]

Seek immediate medical attention or contact the poison control center immediately if you think magnets were ingested. It is possible that X-rays or prompt surgical removal will be required. Do not wait for symptoms to appear as it is feasible that by then it will be too late for medical intervention.

Symptoms of magnet ingestion are often non-specific (abdominal pain, fever, etc.), and can take from hours to weeks to appear. By then, the damage can be severe. Untreated ingestions of magnets are likely to cause intestinal blockage, perforation, bleeding, infection, and death.

Keep away from pets.

Keep away from pacemakers."

5. Sales/Marketing Requirements

5.1 *General*—Manufacturers shall not knowingly market or sell the product to persons under 14 years of age or to anyone known to be buying it for someone under 14 years of age.

5.2 *Retail Sales*—Manufacturers shall undertake reasonable efforts to ensure that the product is not marketed and displayed to consumers in a manner that represents the product as a toy

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FIG. 2 Example of Hazard Illustration

for persons under the age of 14. Examples of such efforts include, among others, actions such as:

5.2.1 Including with wholesale or bulk orders instructions and warnings about where to merchandise or how to market, and

5.2.2 Informing retailers about appropriate merchandising practices, including in-store product placement, warnings, and signage.

5.3 *Online Sales:*

5.3.1 Manufacturers shall undertake reasonable efforts to ensure that online sellers do not sell the product to persons under 14 years of age. An example of such efforts includes seeking agreement from the online sellers that, before the sale, consumers be shown the warnings in 8.7.

5.3.2 Manufacturers who sell directly to consumers online:

5.3.2.1 Before the sale, shall show the signal word "Warning" and, at a minimum, text that clearly conveys the warnings in 8.7.

5.3.2.2 Include on their website instructional literature, including information about the hazard pattern.

5.3.2.3 Shall not make any claims that are regulated by 21 U.S.C. Section 301 et. seq. unless the requirements of those provisions are complied with.

TEST METHODS

6. Test Method for Determining Small Powerful Magnets

6.1 *Small Object Test Method*—(see Note 1). The individual magnets from a magnet set subject to this specification shall be tested for fit within a test cylinder with dimensions as specified in Fig. 1. If any individual magnet in a magnet set can fit entirely within the cylinder, in any orientation and without being compressed, it is considered a small magnet.

NOTE 1— Paragraph 6.1 uses the definition of the cylinder in 16 CFR 1501.4.

6.2 *Magnet Flux Index Test Methods*—(See Note 2.)

NOTE 2—The source for the Magnet Flux Index test method is Specification F963, subsection 8.25.

6.2.1 *Flux Density Measurement:*

6.2.1.1 *Test Equipment*—Direct current (dc) field gauss meter with a resolution of 5 gauss (G) capable of determining the magnetic flux density of the field with an accuracy of 1.5 % or better. The meter shall have an axial type probe with:

(1) An active area diameter of 0.76 mm ± 0.13 mm, and

(2) A distance between the active area and probe tip of 0.38 mm ± 0.13 mm.

6.2.2 *Test Method:*

6.2.2.1 Place the probe's tip in contact with the pole surface of the magnet.

6.2.2.2 Keep the gauss meter's probe perpendicular to the surface.

6.2.2.3 Move the probe across the surface to locate the maximum absolute flux density.

6.2.2.4 Record the maximum absolute flux density measurement.

6.2.3 *Area Measurement of the Pole Surface:*

6.2.3.1 *Test Equipment*—Calipers or similar device with a resolution of 0.1 mm.

6.2.3.2 *Test Method*—If the pole surface of the magnet is flat, calculate the area using the appropriate geometric formula. If the pole is not flat (for example, hemispherical), the pole surface area is the maximum cross section of the magnet perpendicular to an axis through the magnet poles (see Fig. 3).

NOTE 3—On multi-pole magnets, use the area of the largest single pole, which can be determined using magnetic field viewing film or equivalent.

6.2.4 *Calculation*—The flux index (kG^2 mm^2) is calculated by multiplying the area of the pole surface (mm^2) of the magnet by the square of the maximum flux density (kG^2).

7. Test Method for Determining Label Permanence

7.1 Test for warnings applied directly onto a paper or non-paper label surface attached to product:

7.1.1 A paper label (excluding labels attached by a seam) shall be considered permanent if, during an attempt to remove it without the aid of tools or solvents, it cannot be removed, it

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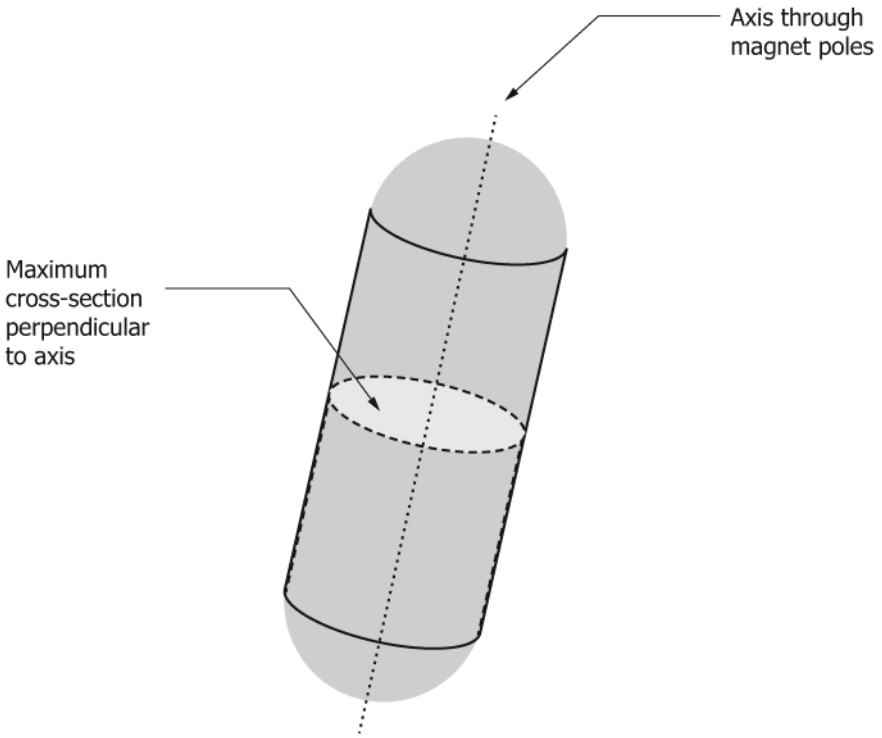

FIG. 3 Illustration of Pole Surface on a Magnet with Rounded Ends

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tears into pieces upon removal, or such action damages the surface to which it is attached.

7.1.2 A non-paper label (excluding labels attached by a seam) shall be considered permanent if, during an attempt to remove it without the aid of tools or solvents, it cannot be removed or such action damages the surface to which it is attached.

7.1.3 A warning label attached by a seam shall be considered permanent if it does not detach when subjected to a 67 N pull force applied in any direction using a 2 cm diameter clamp surface.

7.2 *Adhesion Test for Warnings Applied Directly onto the Surface of the Permanent Storage Container:*

7.2.1 Apply the tape test defined in Test Methods D3359, Test Method B, cross-cut tape test, eliminating parallel cuts.

7.2.2 Perform this test once in each different location where warnings are applied.

7.2.3 The warning statements will be considered permanent if the printing in the area tested is still legible and attached after being subjected to this test.

8. Product Marking and Labeling

8.1 *Warning Design for Product*—The warning required by Section 9 shall consist of a safety alert symbol consisting of an exclamation point inside a solid triangle and the signal word "WARNING" in black letters on an orange background and be on a signal panel.

8.2 *Safety Alert Symbol:*

8.2.1 The safety alert symbol, when used with the signal word, shall precede the signal word. The base of the safety alert symbol shall be on the same horizontal line as the base of the letters of the signal word. The height of the safety alert symbol shall equal or exceed the signal word letter height.

8.2.2 The solid triangle portion shall be the same color as the signal word lettering, and the exclamation mark portion shall be the same color as the signal word panel background. As an alternative, it is acceptable for the safety alert symbol to consist of a black triangle band and black exclamation mark on a yellow triangle.

8.3 *Message Panel:*

8.3.1 *Panel Format*—It is acceptable for the panels to be in a horizontal or vertical format.

8.3.2 *Panel Shape*—It is acceptable for the panels to be non-rectangular to make good use of the available space.

8.3.3 *Panel Color*—The message panel shall have either black lettering on a white background or white lettering on a black background.

8.3.4 *Word Message*—At a minimum, use the English language for the word message and make it concise, and easy to read and understand.

8.4 *Distinctiveness and Permanence*—The safety label shall be distinctive on the product. It is acceptable to use a contrasting border to achieve distinctiveness. The label shall be permanent as determined by Section 7.

8.5 *Letter Style and Type Sizes:*

8.5.1 Signal words shall appear in sans serif letters in upper case only. It is recommended that the message panel lettering be a combination of uppercase and lowercase letters. It is acceptable to use uppercase-only lettering for short messages or emphasis of individual words.

8.5.2 The minimum type size shall be 5.1 mm (0.2 in.) for the signal word and 2.0 mm (0.08 in.) for the warning text.