



Quality Certification Alliance

Member Newsletter

Quality and Safety. Delivered.

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Toy Standards: No Small Issue

No longer a voluntary standard, ASTM F963 sets the bar for all toys manufactured for sale in the

Whether you're shopping at the legendary FAO Schwartz in New York City or your local Target retailer, toys are big business. So, it's probably no surprise that the U.S. accounts for more than 30 percent of the world's toy market.

Because of the vast purchasing power, U.S. toy manufacturers have effectively set the standards in product design, engineering and, more importantly, product safety—even though more than 88 percent of products sold in the U.S. today are imported.

Why have domestic manufacturers been able to successfully develop product safety standards? Factors include:

- Technical expertise in product development and use
- Data collection and hazard identification
- Voluntary cooperation among industry members, including representation from manufacturers, government agencies, academic and consumer groups

But developing product safety standards is nothing new. In fact, initial product safety origins date back more than 100 years.

Looking Back: A Historical Perspective

Established in 1898, ASTM International, originally known as the American Society for Testing and Materials, began as an effort to standardize product quality and performance of materials, such as steel for railroads, that were fundamental to America's expansion and development.

Like today, setting standards in the 19th century resulted in some push back from manufacturers who resisted being requested to comply with an external customer standard. After initial failure to gain acceptance of the new standards, principals of what would become ASTM recognized that "a good specification needs both the knowledge of the products behavior during manufacturing and knowledge of those who know its behavior while in service" — any standard must reflect both manufacturing and use requirements."

Today's testing standards incorporate both aspects, as ASTM continues to successfully employ the methodology of consensus building in its standards. It engages not only industry stakeholders but also government offices, testing laboratories, retail outlets, consumer advocates as well as end users.

As a result of this consultative development, voluntary ASTM standards are considered to reflect both best practices and the interests of industry stakeholders. By including participation from government and consumers in developing the standards, confidence in and credibility of standards has improved dramatically. CPSC Chairwoman Inez Tenenbaum has noted that the best way to assure product safety is through partnership between those that are experts in design, technology and manufacturing with those that understand how the end product will be employed.

Since 1973, ASTM has maintained a Consumer Product Committee (F15), which specifically focuses on the 15,000 items regulated under the Consumer Product Safety Commission. Toys fall under F15-22. The CPSC provides significant contributions to the committee's proceedings through technical expertise of staff engineers, toxicologists and economists. In addition, CPSC epidemiologists, with their access to the data resources cataloging injuries, death and hazard patterns related to the use of a product, are instrumental in defining areas where standards are required.

For the toy market, the National Bureau of Standards published the first American toy standard in 1976. Then ASTM picked up the mantle with F963, regularly updating the standard since 1986.

Moving Forward: Turning Best Practices Into Law

The adoption of ASTM F963 as the toy safety standard under Section 106 of the Consumer Product Safety Improvement Act of 2008 (CPSIA) is an example of how industry best practices can become law.

Section 106(b)(1) requires the Commission—in consultation with representatives of consumer groups, juvenile product manufacturers, and independent child product engineers and experts—to examine and assess the effectiveness of ASTM F963 as it relates safety requirements, safety labeling requirements and test methods related to:

- Internal harm or injury hazards caused by the ingestion or inhalation of magnets in children's products
- Toxic substances
- Toys with spherical ends
- Hemispheric-shaped objects
- Cords, straps and elastics
- Battery-operated toys

These points were expressly addressed under the updated ASTM F963 published in December 2008, known as F963-08, which was adopted on an interim basis in February 2009 and formally enacted in August 2009. (There was one exception, as the proposed omission in the updated standard related to toy chests was rejected.)

The key revisions in F963-08 updating the existing F963 include the following protocols:

Hazardous Magnets

"Refrigerator" magnets are commonly used as promotional products without risk to children. However, there are instances where magnets can be considered toys or toy components, such as promotional magnetic sculpture blocks and the newly popular "sonic rocks."

For example, there were 34 incidents, including the tragic death of a toddler, in 2006 that prompted the CPSC to recall 3.8 million "Magnetix" branded building sets. When accidentally ingested, the small, high-attraction-force magnets pull toward each other through different sections of the intestines, causing infection, sepsis and even death. Under ASTM F963-08:

- Hazardous magnets and hazardous magnetic components are defined as those that would be considered as small parts and containing a magnet with a Flux (attraction) Index of 50 or greater.
- Magnetic attraction is measured.
- Magnetic toys for children up to age 14 are prohibited from containing hazardous magnets or magnetic components.
- Use and abuse test methods for magnetic toys that are not small parts are also required.
- A hazardous magnet warning is required for hobby, craft and science kits for children older than eight years of age. (However, no hazardous magnet warning is required on magnetic toys that are not considered small parts that pass specified use and abuse test methods).

Toxic Substances

In addition to the lead limits already in place through CPSIA's Section 101 (Children's Products Containing Lead) and the Lead Paint Rule, as well as the CPSIA Section 108 restriction of phthalates, the ASTM F963 standard places limits on the amount of other heavy metals—namely antimony, arsenic, barium, cadmium, chromium, mercury and selenium. (For an in-depth discussion on Toxic Metals, see page two of this newsletter.)

Toys with Spherical Ends and Hemispheric-Shaped Objects

Toys that can be inserted in a child's throat or placed over a child's mouth where normal breathing is obstructed must meet newly specified dimensional requirements under ASTM F963-08. Objects that fall under these guidelines include rattles, suction darts, teacups, Easter egg halves and bowls.

Cords, Straps and Elastics

ASTM F963-08 tries to mitigate strangulation hazards through limitations on length of straps, cords and elastics as well as by requiring breakaway safety features to be incorporated in toys intended for infants and toddlers. Additionally, the standard defines the maximum opening of toy bags used by infants.

Battery-Operated Toys

The requirements of F963-08 address the following areas to minimize the risk associated with battery-operated toys:

- Battery overheating
- Leakage
- Explosion and fire
- Swallowing of batteries

Acoustics

Requirements to this section were changed to provide greater precision in testing as well as to further harmonize F963 with the European toy standard, EN71-1.

Yo-Yo Tether Toys

Yo-yos, of course, have been popular promotional items for years. However, there is potential risk of strangulation. Therefore, the relaxed length of elastic tethers on toys that are attached to the wrist or ankle and thrown or kicked and returned to the user are limited 70 cm.

Flammability

New flammability testing protocols have been introduced for solid and soft toys—including stuffed toys.

A Continuous Process

ASTM F963-08 is recognized not only by the CPSC as the industry standard for toy safety but also by the Toy Industry Association (TIA) and the American National Standards Institute (ANSI). Together, TIA and ANSI formed the Toy Safety Certification Program incorporating ASTM F963's standards as part of the means to measure product safety from development through use.

Because it continues to update its standards by including all stakeholders, ASTM International has influenced quality and safety programs as well as legislation. With each evaluation and subsequent revision, standards are updated with clearer definitions addressing new customer needs as well technological and environmental issues.

Laws such as the CPSIA, which base regulations on evolving standards such as ASTM F963, are better positioned to respond to the public's needs in a timely manner. As Chairwoman Tenenbaum stated in her remarks to the Asia-Pacific Economic Cooperation's Toy Safety conference, "...most of the expertise for safe design and manufacturing is in industry, not in government."

In the same respect, QCA accredited organizations are able to respond to their customers' needs through capacity-building models that require continuous self-evaluation, corrective action and improvement plans.

For additional information on ASTM F963-08 or to purchase the published standards, visit www.astm.org.



Heavy Metals

Misunderstanding the law regarding toxic metals used in manufacturing can be lethal for your business.

Hot off the press: Children's costume jewelry made with high levels of heavy metals is making headlines - again. While cadmium is the current culprit, the situation is unpleasantly similar to the lead recalls of 2007. This time, however, the U.S. Consumer Product Safety Commission (CPSC) was prepared to take swift action.

Within a day of the report being published, CPSC Chairman Inez Tenenbaum issued a statement warning manufacturers against the use of cadmium, antimony and barium in lieu of lead in children's products. Additionally, she gave parents an unprecedented warning advising that they "not allow young children to be given or play with cheap metal jewelry."

Defining The 'Heavy' In Metals

While heavy metals are often used in the manufacturing process, most consumers don't know why they are used or what the long-term ramifications of exposure are. In this instance, what you don't know *can* hurt you.

The term "heavy metals" is used to describe chemical elements commonly found in the earth's crust that have a specific gravity level at least five times higher than the specific gravity of water. In small quantities, certain heavy metals are nutritionally essential for our health. Iron, copper, manganese and zinc, for example, are commonly found in natural foods as well vitamin supplements.

Other heavy metals, however, are toxic in even the smallest quantities. Absorbed into the body through contact, inhalation or digestion, these substances cannot be metabolized. Over time, the accumulation of toxic metals can be extremely hazardous as they attack the body's building blocks of proteins, enzymes and DNA.

In general, heavy metal toxicity can result in damaged or reduced mental and central nervous function, as well as damage to blood composition, lungs, kidneys, liver and other vital organs. Long-term exposure may result in slowly progressing physical, muscular and neurological degenerative processes that mimic Alzheimer's disease, Parkinson's disease, muscular dystrophy and multiple sclerosis. Repeated long-term contact with some metals or their compounds has also been shown to cause cancer.

Breaking Down The Elements

Heavy metals have an appealing reflective property that helps make products and surface coatings shine, a quality with particular appeal in the promotional products industry. However, toxic heavy metals cannot be distinguished through the naked eye. This is where the U.S. governmental regulations step in. The following seven heavy metals are among a number of toxic

metals that are regulated for public safety:

Antimony

Primarily used in flame retardants, antimony's qualities include poor conductivity of heat and electricity and the ability to increase hardness or mechanical strength. As a colorant, antimony produces a vivid green to yellow hue. Antimony has been found in everything from clothing to toys to seat covers.

Antimony exposure has been shown to result in adverse effects in human respiratory, cardiovascular and reproductive systems.

Arsenic

Odorless and tasteless, arsenic in its various compounds is listed by the U.S. Center for Disease Control's Agency for Toxic Substances and Disease Registry (ATSDR) and the EPA as the single most toxic substance.

Well known for centuries as a poison and widely used as a pesticide, arsenic is also commonly used as a wood preservative, in electronics manufacturing, in paints and pigments, in bronze plating, and for clarifying glass and ceramics.

The known toxic effects of arsenic exposure are as diverse as its uses. Because it targets a number of metabolic processes, arsenic affects nearly all organ systems of the body. Excessive and prolonged exposure to arsenic can cause neurological and reproductive damage, cancer and even death.

Barium

Combined with other chemicals such as sulfur or carbon, barium compounds have many useful applications. Barium sulfate is used as a radio-contrast agent for X-ray imaging of the digestive system, which allows doctors to perform medical tests. Barium can find its way into promotional products through imitation leather coverings, rayon fabrics and plastics. Like other toxic heavy metals, it also has application in glazes, electroplating and electronics.

Jewelry is among those products frequently electroplated. With the alarm already set off in children's jewelry, the statement from the CPSC admonishing manufacturers not to now substitute barium puts the industry on notice regarding the oversight the CPSC is preparing to exercise.

Cadmium

This soft, silver-white, lustrous heavy metal occurs naturally in soil but is also a by-product of the commercial zinc, lead and copper refinement processes. Primarily used in leather tanning and pigment dyes, cadmium's low cost, malleable qualities, anti-corrosive nature and ability to conduct electricity have made it an ideal ingredient in rechargeable batteries that power everything from an everyday flashlight to the Magellan Space Probe.

Other common uses of cadmium include electroplating. Like lead, cadmium can also make paints and other surface coatings brighter and easier to apply. The amount of cadmium reportedly found in the currently recalled children's jewelry ranged from 10 to more than 90 percent. By contrast, the maximum amount of cadmium allowed by California's Prop 65 in flatware is only 0.0003 percent.

Cadmium and cadmium compounds are known to be human carcinogens. It is also believed to cause pulmonary emphysema and bone disease.

Chromium

Like most natural elements, chromium exists in different forms. Chromium (III) is an essential nutrient that helps the body use sugar, protein and fat. The metal chromium, the chromium (0) form, is used for making "stainless" steel. Chromium (VI) and chromium (III) are used for chrome plating, dyes and pigments, leather tanning and wood preserving.

Chromium (VI) compounds are known human carcinogens. Lung cancer as well as digestive tract, skin and blood disorders are commonly associated with chromium exposure.

Mercury

Number three on the ATSDR's list of toxic substances (following arsenic and lead), metallic mercury is used to produce a range of cleansers and reagents. It is also used in thermometers and other gauges, dental fillings and batteries. Mercury salts have been used in skin lightening creams and continue to be used in antiseptic creams and ointments—items that have become increasingly popular as promotional products.

The colloquialism "mad as a hatter" came out of the association between the symptoms of mercury poisoning exhibited by hat makers who used a form of mercury to add a metallic sheen to felted hats. Attacking the nervous system, symptoms included slurring of speech and trembling hands. The EPA has determined that mercuric chloride and methylmercury are possible human carcinogens.

Selenium

As a colorant, selenium produces a brilliant ruby red. Most processed selenium is used in the optical electronics industry. With its ability to convert sunlight into electricity, selenium also plays a fundamental role in the environmental industry through production of solar cells.

Chronic oral exposure to high concentrations of selenium compounds can produce a disease with symptoms of hair loss, nail brittleness and neurological abnormalities (such as numbness and other odd sensations in the extremities). Selenium sulfide is a probable human carcinogen.

Expanding Regulations

Many states already regulate the toxic substances above through vehicles such as California's Prop 65. Additionally, the CPSC has adopted ASTM 963, the formerly voluntary toy standard, as the recognized and approved testing standard for heavy metals such as antimony, arsenic, barium, cadmium, chromium, lead, mercury and selenium.

As the public continues to learn more about cadmium and other heavy metals being substituted for lead, regulations will be expanded. Recently, State Representative Jackie Speier (D-CA) introduced H.R. 4428: The Children's Toxic Metals Act, a proposal to ban the manufacture, sale and distribution of children's jewelry containing antimony, barium or cadmium. Similar bills have also been introduced in the U.S. Senate by Senator James Alesi (R-NY) and by Senator Charles Schumer (D-NY).

Assuring Product Compliance

Safe and compliant products aren't designed, developed or manufactured by chance. They are the result of careful planning, documentation and evaluation.

It starts by having good communication with your development and manufacturing partners, including distribution of detailed and accurate safety specification packages and lists of banned and restricted substances. By eliminating communication gaps and guesswork in product development and manufacturing, the use of toxic metals in your products can be controlled, assuring that the integrity of both your brand and your customer's brand stays intact.

Quality Certification Alliance is a Chicago, Illinois based independent accreditation organization that addresses the need for measurable compliance and particularly product safety within the promotional products industry.

QCA Executive Director is D. Fenton. For full articles and references and additional information on the organization, visit www.qcalliance.org.

QCA's Newsletter is edited by staff member Karin Wu who also teaches international business and manufacturing at the Art Institute of Seattle and has been active in sourcing and importing product from the Americas and Asia for 20 years.

Calendar of Events

ICPHSO Symposium, D.C.	Feb 15-18, 2010
ASI Show, San Diego	Feb 24-26, 2010
QCA Board Conference Call	Feb 24, 2010
NEPPA Show, Sturbridge, MA	Mar 2, 2010
QCA Board Conference Call	Mar 12, 2010