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Standard Consumer Safety Specification for Adult Jewelry[1]

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INTRODUCTION

The purpose of this consumer safety specification is to establish nationally recognized safety requirements and test methods for adult jewelry.

1. Scope

1.1 This specification establishes requirements and test methods for specified elements and for certain mechanical hazards in adult jewelry. It does not purport to cover every conceivable hazard of adult jewelry. It does not cover product performance or quality, except as related to safety. This specification has no requirements for those aspects of adult jewelry that present an inherent and recognized hazard as part of the function of jewelry.

1.2 This specification applies only to adult jewelry, as defined in ~~3.1.1~~3.1.3. Children's Jewelry, which is defined as jewelry designed or intended primarily for use by children 12 and under, is addressed in another ASTM standard, Specification F2923~~-11~~.

1.3 This specification does not apply to the following:

1.3.1 Accessories (for example, handbags, belts),

1.3.2 Apparel (except as described in 3.1.1(*q*)),

1.3.3 Footwear (except as described in 3.1.1(*q*)), and

1.3.4 Any other item whose primary purpose is functional (e.g., keys, key chains, or other items not primarily intended to be worn as a personal item of ornamentation).

1.4 This consumer safety specification includes the following sections:

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1.5 The following precautionary statement pertains only to the test methods portion of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with jewelry use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

[1] This consumer safety specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.24 on Jewelry.

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2. Referenced Documents

2.1 *ASTM Standards:*[2]

E1613 Test Method for Determination of Lead by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES), Flame Atomic Absorption Spectrometry (FAAS), or Graphite Furnace Atomic Absorption Spectrometry (GFAAS) Techniques

~~F963~~F963-11 Consumer Safety Specification for Toy Safety

F2853 Test Method for Determination of Lead in Paint Layers and Similar Coatings or in Substrates and Homogenous Materials by Energy Dispersive X-Ray Fluorescence Spectrometry Using Multiple Monochromatic Excitation Beams

F2923 Specification for Consumer Product Safety for Children's Jewelry

2.2 *Code of Federal Regulations:*[3]

16 CFR 1500.14 Products requiring special labeling under section 3(b) of the act

2.3 *CPSC Standards:*[4]

~~CPSC-CH-E1001-08, CPSC-CH-E1001-08.1, CPSC-CH-E1001-08.2~~CPSC-CH-E1001-08 Standard Operating Procedure for Determining Total Lead (Pb) in Non-Metal Children's Products

~~CPSC-CH-E1002-08, CPSC-CH-E1002-08.1, CPSC-CH-E1002-08.2~~CPSC-CH-E1002-08 Standard Operating Procedure for Determining Total Lead (Pb) in Children's Metal Products (Including Children's Metal Jewelry)

~~CPSC-CH-E1003-09.1~~CPSC-CH-E1003-09 Standard Operating Procedure for Determining Lead (Pb) in Paint and Other Similar Surface Coatings

CPSC-CH-E1004-11 Standard Operating Procedure for Determining Cadmium (Cd) Extractability from Children's Metal Jewelry

2.4 *EPA Standards:*[5]

EPA 3050B Acid Digestion of Sediments, Sludges, and Soils

EPA 3051A Microwave Assisted Acid Digestion of Sediments, Sludges, Soils, and Oils

EPA 3052 Microwave Assisted Digestion of Siliceous and Organically Based Matrices

2.5 *European Standards:*[6]

CR 12471: 2002 Screening tests for nickel release from alloys and coatings in items that come into direct and prolonged contact with the skin

~~EN 71-3 (2002) Safety of toys - Part 3: Migration of certain elements~~

EN 1811: 2011 Reference test method for release of nickel from all post assemblies which are inserted into pierced parts of the human body and articles intended to come into direct and prolonged contact with the skin

EN 12472: 2009 Method for the simulation of wear and corrosion for the detection of nickel release from coated items

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *jewelry, n*—a product principally designed and intended as an ornament worn by a person and includes the following:

a. Anklet
b. Arm cuff
c. Bracelet
d. Brooch
e. Chain
f. Crown or tiara
g. Cuff link
h. Hair accessory with significant decorative elements[7]
i. Earrings
j. Ear cuffs
k. Necklace
l. Pins (such as tie tacks and trading pins)
m. Ring
n. Body piercing jewelry

[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, Mail Stop: SDE, Washington, DC 20401, http://www.access.gpo.gov.

[4] Available from U.S. Consumer Product Safety Commission (CPSC), 4330 East West Hwy., Bethesda, MD 20814, http://www.cpsc.gov. All subsequent versions of these Standard Operating Procedures approved by the CPSC staff satisfy this standard.

[5] Available from United States Environmental Protection Agency (EPA), Ariel Rios Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20004, http://www.epa.gov.

[6] Available from European Committee for Standardization (CEN), Avenue Marnix 17, B-1000, Brussels, Belgium, http://www.cen.eu. Many national organizations issue their own versions of these test methods; these versions will satisfy this standard.

[7] Bobby pins, barrettes, headbands, etc. without a significant decorative element are not hair accessories, but are grooming aids. Combs, brushes and similar items not intended to be worn as an item of personal ornamentation are not hair accessories. Novelty products such as deely boppers are not hair accessories.

o. Jewelry placed in the mouth for display or ornament

p. Any component of a product listed in *a* – *o*.

q. Any charm, bead, chain, link, pendant or other attachment to shoes or clothing designed to be removed and worn, alone or attached to an item in *a* – *o*, as an ornament by a person.

r. Watch in which a timepiece is a component of an ornament, excluding the timepiece itself if the timepiece can be removed from the ornament.

s. Jewelry components in craft kits where the final assembled jewelry product is principally designed and intended as an ornament worn by a person. Tools used to make jewelry are not jewelry.

3.1.2 *body piercing jewelry, n*—any part of jewelry that is manufactured or sold for placement in a new piercing or a mucous membrane, but does not include any part of that jewelry that is not placed within a new piercing or a mucous membrane.

3.1.2.1 *Discussion*—

Earrings, unless specifically sold for a new piercing, are not body piercing jewelry.

3.1.3 *adult jewelry, n*—jewelry designed or intended primarily for use by consumers over age 12.

3.1.4 *paint and surface coating, n*—a fluid, semi-fluid, or other material, with or without a suspension of finely divided coloring matter, which changes to a solid film when a thin layer is applied to a metal, wood, stone, paper, leather, cloth, plastic, or other surface.

3.1.4.1 *Discussion*—

This term does not include printing inks or those materials which actually become apart of the substrate, such as the pigment in a plastic article, or those materials which are actually bonded to the substrate, such as by electroplating or ceramic glazing.

3.1.5 *hazardous magnet, n*—a magnet with a flux index >50 as measured by the method described in ~~14.8~~Consumer Safety Specification F963-11 and which is swallowable or a small object.

3.1.6 *accessible, n*—jewelry or a jewelry component shall be considered accessible if it is swallowable, ingestible or mouthable in an as-received condition.

3.1.6.1 *Discussion*—

Jewelry or a jewelry component shall be considered swallowable or ingestible pursuant to the method described in 14.7. Jewelry or a jewelry component shall be considered mouthable if it does not fit within the test apparatus described in 14.7 but has a dimension less than 5 cm in any direction.

4. Intended User Labeling and Warnings[8]

4.1 Jewelry designed or intended primarily for use by consumers over age 12 may include an age label reflecting the primary intended user for whom the product is designed and intended, or a warning that the product is not intended for children. Examples of an age label might include, but are not limited to, “Not for children 12 and younger,” “Not for <12,” “For 13+,” “Adult use only,” or any similar language, symbol or combination designed to communicate the primary intended user. User labels, if provided, can appear in any reasonable location where they will be seen and understood by the target consumer.

[8] Specification F2923~~-11~~ sets forth comprehensive standards for children’s jewelry (jewelry designed or intended primarily for use by consumers 12 and under). The standard includes detailed guidance for age grading, as well as guidance and checklists to assist in distinguishing children’s jewelry from adult jewelry.

TABLE 1 Lead Content Limits for Adult Jewelry

Materials Covered (Except as Excluded per Table 2)	Maximum Total Lead Limits in Adult Jewelry
Electroplated metal with suitable under and finish coats	6.0%
Unplated metal	1.5%
Plastic or rubber, including acrylic, polystyrene, plastic beads and stones, and polyvinyl chloride (PVC)	200 ppm
Materials not otherwise classified	600 ppm
Paint or surface coating	600 ppm

5. Specification for Lead in Adult Jewelry

5.1 *Lead Content Limits for Components of Adult Jewelry:*

5.1.1 Accessible components[9] of adult jewelry shall meet the lead content limits of Table 1 unless the component is excluded per Table 2.

5.1.2 *References*—Tests for total lead content shall be conducted in accordance with a method appropriate for the material in 14.1.

5.2 *Exclusions from Lead Content Testing Requirements in Adult Jewelry:*

5.2.1 The materials listed in Table 2 are excluded from testing for total lead content in any component of adult jewelry.

6. Specifications for Adult Body-Piercing Jewelry

6.1 Body-piercing jewelry shall be made exclusively of the materials listed in Table 3.

7. Specifications for Antimony, Arsenic, Barium, Cadmium, Chromium, Mercury, and Selenium in Paint and Surface Coatings of Adult Jewelry

7.1 Surface-coating materials applied on or to adult jewelry shall not contain compounds of antimony, arsenic, barium, cadmium, chromium, mercury, or selenium, of which the metal content of the *soluble* material of these substances is in excess of the levels by weight of the contained solids (including pigments, film solids, and driers) given in Table 4. The analytical results obtained should be adjusted in accordance with the test method described in 14.2 prior to comparing them to the values in Table 4 to determine conformance. The soluble level shall be determined by dissolving the contained solids (dried film including pigments, film solids, and driers) as specified in 14.2. An alternative test method may be used if it meets the requirements of Annex A1.

[9] Where components are made of the same material, only one component is subject to any chemical test references in this standard.

TABLE 2 Materials Excluded from Lead Limits in Adult Jewelry

Stainless or surgical steel within the designations of Unified Numbering System UNS S13800 – S66286, not including the stainless steel designated as 303 Pb (UNS S30360), provided that no lead or lead-containing metal is intentionally added
Precious metals: gold; sterling silver (at least 925/1000); platinum; palladium; rhodium; osmium; iridium; ruthenium; titanium
Natural or cultured pearls
Precious gemstones: diamond, ruby, sapphire, emerald
Glass, ceramic, or crystal decorative components, including cat's eye, cubic zirconia, cubic zirconium (CZ), rhinestones, and cloisonné
Semiprecious gemstones and other minerals, provided they are not based on lead or lead compounds, excluding aragonite, bayldonite, boleite, cerussite, crocoite, ekanite, linarite, mimetite, phosgenite, samarskite, vanadinite and wulfenite
Wood, provided it is not treated in any way to add lead
Paper and similar materials made from wood or other cellulosic fiber, including, but not limited to, paperboard, linerboard and medium, and coatings on such paper that soak into the paper and cannot be scraped off the surface
Elastic, fabric, ribbon, rope, or string, unless it contains intentionally added lead
All natural decorative material, including amber, bone, coral, feathers, fur, horn, leather, shell or wood, that is in its natural state and is not treated in a way that adds lead
Adhesive
Repurposed components. Repurposed components are "found" objects that are incorporated into jewelry, and may include, but are not limited to, silver or pewter utensils, bottle caps, buttons.

TABLE 3 Approved Materials for Adult Body-Piercing Jewelry

Surgical implant stainless steel
Surgical implant grade titanium
Niobium (Nb)
Solid 14 karat or higher white or nickel-free gold
Solid platinum
A dense, low-porosity plastic, including, but not limited to,Tygon or Polytetrafluoroethylene (PTFE) if the plastic contains no intentionally added lead

7.2 *Reference*—Specification F2923~~-11;~~; Consumer Safety Specification F963~~-11; EN 71-3.~~ -11. Follow recommended instructions and shield the test material from light.[10]

8. Specification for Cadmium in Certain Substrate Materials of Adult Jewelry

8.1 Accessible metal or plastic/polymeric components of adult jewelry shall be screened for total cadmium content. Covered components of adult jewelry containing 1.5 % or less total cadmium do not need to be tested for migratable cadmium. Compliance with the screening limits may be established by any method appropriate for the covered material in 14.1. Potentially ingestible or swallowable covered components of adult jewelry that exceed this screening level shall be tested for soluble cadmium using an acid extraction test. Swallowable parts shall be identified by the method described in 14.7. The soluble level shall be determined by using the method and limits specified in 14.3 where the component is a plastic or polymeric material, and by using the method and limits specified in 14.4 where the component is metal. Covered components that are mouthable and not ingestible or swallowable shall be tested using a saline extraction test using the method and limits specified in 14.5. If a jewelry product or component in one dimension is smaller than 5 cm, it is mouthable. An alternative test method may be used in lieu of any of these methods if it meets the requirements of Annex A1.

8.2 *Exclusions from Cadmium Substrate Testing Requirements in Adult Jewelry:*

8.2.1 Only accessible metal or plastic/polymeric components are subject to cadmium substrate testing. All other materials are excluded from screening and/or testing. Other materials may be added should data or information regarding potential exposure risks from cadmium in other materials become available.

8.2.2 *Reference*—Specification F2923~~-11.~~.

9. Antimony, Arsenic, Barium, Chromium, Mercury and Selenium in Substrates of Adult Jewelry

9.1 This standard does not establish limits on antimony, arsenic, barium, chromium, mercury and selenium in substrate materials used in adult jewelry based on the absence of data establishing a potential safety risk.

10. Representations Regarding Nickel Exposure in Metal Components of Adult Jewelry

10.1 Representations regarding the safety of adult jewelry for adults sensitive to nickel or the limited potential for nickel to be released from metal components of adult jewelry shall be based on reasonable and representative tests, analyses or compositional assessments suitable for the application. Reasonable and appropriate test methods include, but are not limited to, those ~~identfied~~identified in 14.6. Precious metals listed in Table 2, and stainless or surgical steel grades 304, 316 or 430, are expected to meet these requirements and do not require testing.

10.2 *Reference*—EN 1811: 2011; CR 12741: 2002; EN 12472: 2009.

11. Phthalates in Adult Jewelry

11.1 This standard does not establish limits on phthalates in adult jewelry based on the absence of data establishing a safety risk.

12. Liquid Filled Jewelry Requirements

12.1 *Liquid Screen*—Adult jewelry should not contain materials which would require special labeling under 16 CFR 1500.14.

13. Mechanical Requirements for Adult Jewelry

13.1 *Hazardous Magnets*—Adult jewelry that contains hazardous magnets as received should include a warning statement which contains the following text or substantially equivalent text which clearly conveys the same warning.

13.1.1 For all adult jewelry containing hazardous magnets:

WARNING. Contains magnets. Prolonged wearing can form a hole in body tissue. Swallowed or inhaled magnets can attract through and squeeze intestines or other body tissue, causing serious injury or death. Seek immediate medical attention if swallowed or inhaled.

[10] "It has been shown that the extraction of soluble cadmium can reveal a two-fold to five-fold increase when extraction is conducted in the light rather than the dark." Consumer Safety Specification F963-11, Section 8.3.4, Note 7.

TABLE 4 Maximum Soluble Migrated Antimony, Arsenic, Barium, Cadmium, Chromium, Mercury and Selenium from Paint and Surface Coating of Adult Jewelry

Element	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Chromium (Cr)	Mercury (Hg)	Selenium (Se)
Maximum soluble element (in mg/kg or ppm) in paint or surface coatings of adult jewelry[A]	60	25	1000	75	60	60	500

[A] Due to interlaboratory variability, ~~the~~ Specification F2923-~~11,~~ and Consumer Safety Specification F963-11 ~~and EN 71-3 methods~~ establish the following analytical correction factors (in %): Sb, As and Se: 60%; Hg: 50%; Ba, Cd, and Cr: 30%.

NOTE 1—Manufacturers of adult jewelry containing hazardous magnets should be aware that magnetic fields can affect the function of pacemakers or other implanted electronic medical devices. Consideration of additional warnings should be given.

13.2 *Adult Jewelry Containing Batteries*—This requirement is intended to address ingestion and inhalation hazards associated with adult jewelry that contains batteries.

13.2.1 For all adult jewelry with batteries, batteries that are swallowable or small objects as specified in 14.7 shall not be accessible without the use of a coin, screwdriver, or other common household tool. Testing is performed using the recommended batteries installed.

13.3 *Suction Tongue Studs*—Suction tongue studs should include a warning statement which contains the following text or substantially equivalent text which clearly conveys the same warning:

WARNING. CHOKING HAZARD. Keep away from children.

14. Test Methods

14.1 *Test Methods to Determine Total Heavy Element Content:*

14.1.1 Testing to determine total heavy element content, including for screening purposes, shall be based on any suitable method, such as:

(1) CPSC-CH-E1003-09 ~~and/or CPSC-CH-E1003-09.1~~

(2) ~~CPSC-CH-E1001-08, CPSC-CH-E1001-08.1 and/or CPSC-CH-E1001-08.2~~CPSC-CH-E1001-08

(3) ~~CPSC-CH-E1002-08, CPSC-CH-E1002-08.1 and/or CPSC-CH-E1002-08.2~~CPSC-CH-E1002-08

(4) EPA 3050B

(5) EPA 3051A

(6) EPA 3052

(7) Test Method F2853-10

14.1.2 Composite testing of similar or like materials in accordance with Annex A7 of Consumer Safety Specification F963-11 is acceptable.

14.2 *Method to Dissolve Soluble Matter in Paint and Surface Coatings:*

14.2.1 Soluble elements in paint and surface coatings of jewelry should be tested in accordance with the method to dissolve soluble matter in paint and surface coatings of toys as required in ~~the current published version of~~ Consumer Safety Specification F963-11. Consistent with Consumer Safety Specification F963-11, if the sample weight of surface coating materials is less than 10 mg, the sample is not tested for soluble heavy metals in coatings.

14.3 *Method to Determine Cadmium Availability in Plastic Jewelry Components:*

14.3.1 Plastic components of jewelry that are swallowable and exceed 1.5 % total cadmium shall be tested for migratable cadmium in accordance with ~~the current published~~Consumer Safety Specification F963~~version of EN 71-3.~~-11.

14.3.2 Extracted cadmium shall not exceed 75 mg/kg (75 ppm). The analytical results as determined in 14.3 shall be adjusted by subtracting the assumed inter-laboratory analytical correction factor of 30 %.

14.4 *Method to Determine Cadmium Availability in Metal Jewelry Components*—Metal components of jewelry that are swallowable and exceed 1.5 % total cadmium shall be tested for migratable cadmium in accordance with CPSC-CH-E1004-11, as adjusted for inter-laboratory variability in accordance with 14.4.1.

14.4.1 Extracted cadmium shall not exceed 200 µg. The analytical results as determined in 14.4 shall be adjusted by subtracting the assumed inter-laboratory analytical correction factor of 30 %.

14.4.1.1 *Example 1*—The analytical result for cadmium is 230 µg; the correction factor is 30 % (0.30). Adjusted analytical results = 230 − (230 × 0.30) = 230 − 69 = 161. The result does not exceed the allowed value for migratable cadmium and is therefore acceptable.

14.4.1.2 *Example 2*—The analytical result for migratable cadmium is 300 µg; the correction factor is 30 % (0.30). Adjusted analytical results = 300 − (300 × 0.30) = 300 − 90 = 210. The result exceeds the allowed value for migratable cadmium and is therefore not acceptable.

14.5 *Saline Extraction Procedure for Plastic and Metal Components of Jewelry:*