



Standard Specification for Extractable Hazardous Metals in Synthetic Turf Infill Materials¹

This standard is issued under the fixed designation F3188; 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 relates to the amount of certain metals that have the potential to be extracted from synthetic turf infill materials if ingested. The time, temperature, and pH of the extraction fluid approximate the conditions the infill material would experience in the stomach during the digestive process. The levels of extractable metals are compared to maximum levels allowed in children's toys.

1.2 This specification applies to all materials (man-made or natural) that are intended for use as infill materials for synthetic turf sports surfaces.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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.*

1.5 *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

[D1193 Specification for Reagent Water](#)

[F963 Consumer Safety Specification for Toy Safety](#)

[F2075 Specification for Engineered Wood Fiber for Use as a Playground Safety Surface Under and Around Playground Equipment](#)

¹ This specification is under the jurisdiction of ASTM Committee F08 on Sports Equipment, Playing Surfaces, and Facilities and is the direct responsibility of Subcommittee F08.65 on Artificial Turf Surfaces and Systems.

Current edition approved June 1, 2016. Published June 2016. DOI: 10.1520/F3188-16.

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.

[F3012 Specification for Loose-Fill Rubber for Use as a Playground Safety Surface under and around Playground Equipment](#)

2.2 *European Standard:*³

[EN 71-3:2013 Safety of toys – Part 3: Migration of certain elements](#)

2.3 *U.S. EPA Standards and Methods:*⁴

[EPA Method 6010B Inductively Coupled Plasma-Atomic Emission Spectrometry; SW 846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods](#)

[EPA Method 7470A Mercury in Liquid Waste \(Manual Cold-Vapor Technique\); SW 846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods](#)

3. Terminology

3.1 *Definitions:*

3.1.1 *hazardous metal, n*—metal that could have the potential to cause harm to humans.

3.1.2 *infill material, n*—any material added to a synthetic turf fabric to provide shock attenuation, ballast, or other functions as part of the synthetic turf system.

4. Performance Requirements

4.1 *Hazardous Metal Content*—When the infill sample is analyzed using the procedure described in 10.4 (including the correction for statistical errors as described in 10.6) the maximum content of hazardous metals shall not exceed the level shown in Table 1.

TEST METHODS

5. Summary of Test Method

5.1 The synthetic turf infill soluble hazardous metal content is determined using a procedure contained in Consumer Safety Specification F963. This procedure simulates the situation in which synthetic turf infill material remains in contact with stomach acid for a period of time after swallowing. The

³ Available from European Committee for Standardization (CEN), Avenue Marnix 17, B-1000, Brussels, Belgium, <http://www.cen.eu>.

⁴ Available from United States Environmental Protection Agency (EPA), William Jefferson Clinton Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, <http://www.epa.gov>.