

Balls: HMTc Standard

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CORRESPONDENCE

Corrections are logged publicly on the article page, each with its date, the affected value, and the source that resolved it.

Abstract

The Heavy Metal Tested & Certified heavy-metal-safety standard for balls in Children's Toys, Arts, and Crafts, evaluated on element MIGRATION from scraped-off toy material (EN 71-3 Category III, mg/kg of material): a migration ceiling, not a total-content ceiling. 8 of 11 panel analytes publish a numeric limit taken from the strictest applicable government maximum; the remainder are held under mandatory control or a substantiated not-material determination.

1 | How every number on this standard is set

HMTc Method v2.0 (government-limit default; strictest applicable sovereign maximum in the row's native basis, disclosed read-across where the exact cell is unregulated; never occurrence-derived). Category 21 publishes on the element-migration basis only, pooling the EU, US and Mexican migration instruments, with each row pinned to the EN 71-3 material category or categories its scope actually spans.

2 | Master limit table

All values in ppb (µg/kg), as sold basis. A brand meeting every value qualifies for the mark.

ANALYTE	TIER	HMTc LIMIT	BASIS
Lead (Pb)	Tier 1	23,000	government maximum level
Cadmium (Cd)	Tier 1	17,000	government maximum level

Total arsenic (tAs)	Tier 2	25,000	government maximum level
Inorganic arsenic (iAs)	Tier 1	n/m	not material in this matrix
Mercury, total (tHg)	Tier 1	60,000	government maximum level
Methylmercury (MeHg)	Tier 1	n/m	not material in this matrix
Nickel (Ni)	Tier 2	930,000	government maximum level
Tin (Sn)	Tier 2	180,000,000	screening ceiling (European Union)
Aluminium (Al)	Tier 2	28,130,000	government maximum level
Total chromium (Cr)	Tier 2	60,000	screening ceiling (US FDA)
Hexavalent chromium (Cr-VI)	Tier 2	53	government maximum level

3 | Derivation – where each number comes from

Every cell traces to one named sovereign maximum level (the strictest for the nearest analog), or to an explicit control, not-material, or species-bounded determination. No occurrence statistic selects a certification value.

ANALYTE	HMTC	SOVEREIGN ANALOG / DETERMINATION
Lead (Pb)	23,000	government maximum level
Cadmium (Cd)	17,000	government maximum level
Total arsenic (tAs)	25,000	government maximum level

Inorganic arsenic (iAs)	n/m	No sovereign toy-safety instrument sets an inorganic-arsenic limit. Directive 2009/48/EC Annex II Part III point 13, EN 71-3, ISO 8124-3:2020 Table 1, ASTM F963-17 4.3.5 and NOM-252-SSA1-2011 Table 1 all regulate TOTAL arsenic migration from toy material; inorganic arsenic is a dietary speciation with no article-migration counterpart. Arsenic in a rubber, foam, plastic or textile ball wall and its printing is bounded by the published total-arsenic migration ceiling by identity (iAs <= tAs), so a separate inorganic-arsenic ceiling would add no control.
Mercury, total (tHg)	60,000	government maximum level
Methylmercury (MeHg)	n/m	Methylmercury is produced by microbial methylation in aquatic systems and reaches humans by diet. a rubber, foam, plastic or textile ball wall and its printing carries no methylation pathway and no dietary route, and no sovereign toy instrument sets a methylmercury limit: every toy mercury limit (2009/48/EC point 13, ASTM F963-17 4.3.5, ISO 8124-3:2020, NOM-252-SSA1-2011, Canada SOR/2011-17 and SOR/2016-193) is on total mercury. Any organomercury fraction is bounded by the published total-mercury migration ceiling by identity (MeHg <= tHg).
Nickel (Ni)	930,000	government maximum level
Tin (Sn)	180,000,000	government maximum level
Aluminium (Al)	28,130,000	government maximum level
Total chromium (Cr)	60,000	government maximum level
Hexavalent chromium (Cr-VI)	53	government maximum level

4 | Cite this standard

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STATUS AND LICENCE

A normative certification standard, editorially reviewed and version-controlled in-house; every value traces to a named sovereign maximum level, disclosed in the derivation. © 2026 Institute of Contaminant Standards / Heavy Metal Certified. All rights reserved.

DATA AVAILABILITY

The works this reference draws on are listed in full in the references above and on the briefing page at <https://heavymetalcertified.com/standards/toys-balls>. Primary legal instruments and expert-body assessments are named with their public identifiers; the underlying occurrence and toxicology corpus is maintained on the Heavy Metal Index.

COMPETING INTERESTS

This briefing is published by the Heavy Metal Tested & Certified (HMTc) program, operated by the Institute of Contaminant Standards. Its statements about government regulations, toxicology, and occurrence are sourced to the cited primary and expert-body records and to the independently maintained Heavy Metal Index; the program's own certification thresholds are not used as evidence for any factual claim made here.

PUBLICATION HISTORY

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