

Dentifrices (toothpaste, gel, powder, tablets): HMTc Standard

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heavy metals, food safety, dietary exposure

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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 dentifrices (toothpaste, gel, powder, tablets) in Oral Care, evaluated on finished oral-care product as placed on market: total heavy-metal content per unit mass of product as sold (ug/kg). Not a dietary maximum level and not a migration/leachate value.. 5 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), Category 20 Oral Care: a formulated oral product takes the strictest applicable sovereign finished-cosmetic contaminant maximum in its as-sold basis, with the Germany BVL 2017 toothpaste tier read across to non-toothpaste oral-mucosal forms where it is stricter; an oral-care article takes the Canadian mouth-contact accessible-part lead ceiling and is otherwise held under component-level control. Species never replace totals, no ingredient purity specification anchors a finished-product cell, no migration value anchors a content cell, and no cell is occurrence-derived.

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
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Lead (Pb)	Tier 1	500	government maximum level
Cadmium (Cd)	Tier 1	100	government maximum level
Total arsenic (tAs)	Tier 2	500	government maximum level
Inorganic arsenic (iAs)	Tier 1	≤ tAs	bounded by tAs (reflex speciation)
Mercury, total (tHg)	Tier 1	100	government maximum level
Methylmercury (MeHg)	Tier 1	≤ tHg	bounded by tHg (reflex speciation)
Nickel (Ni)	Tier 2	10,000	human-grade read-across (South Korea)
Tin (Sn)	Tier 2	control	measured every lot; no human-food maximum
Aluminium (Al)	Tier 2	560,000	human-grade read-across (European Union)
Total chromium (Cr)	Tier 2	50	human-grade read-across (AU)
Hexavalent chromium (Cr-VI)	Tier 2	5	human-grade read-across (European Union)

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)	500	government maximum level
Cadmium (Cd)	100	government maximum level
Total arsenic (tAs)	500	government maximum level
Inorganic arsenic (iAs)	≤ tAs	iAs carries no product-specific sovereign cell; it is a component of and bounded by its parent total tAs (iAs ≤ tAs), an enforceable ceiling via reflex speciation rather than an empty cell.

Mercury, total (tHg)	100	government maximum level
Methylmercury (MeHg)	≤ tHg	MeHg carries no product-specific sovereign cell; it is a component of and bounded by its parent total tHg (MeHg ≤ tHg), an enforceable ceiling via reflex speciation rather than an empty cell.
Nickel (Ni)	10,000	South Korea — human-food analog
Tin (Sn)	control	No jurisdiction sets a tin content limit for any oral-care or cosmetic product; the sovereign tin maximum levels in the register are canned-food and food-contact values written for tinplate migration into food and are a different basis entirely. Tin is additionally not a pure impurity in this category: stannous fluoride and stannous chloride are authorised anticaries and antigingivitis actives in dentifrices and mouthrinses, so a finished-product tin ceiling would be exceeded by design in a compliant stannous formulation and would be meaningless as a contaminant control. The cell is held under mandatory analytical control with a declaration reconciliation rather than declared not-material, because tin is unambiguously present at material levels in this category and an absence claim would be contradicted on its face.
Aluminium (Al)	560,000	European Union — human-food analog
Total chromium (Cr)	50	AU — human-food analog
Hexavalent chromium (Cr-VI)	5	European Union — human-food analog

4 | Cite this standard

Pendergrass, K. (2026). *Dentifrices (toothpaste, gel, powder, tablets): HMTc standard*. Institute of Contaminant Standards.

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References

[1] AU — human-food maximum levels

Binds Cr. Strictest applicable human-food sovereign maximum for the nearest analog.

MAXIMUM LEVEL

[2] European Union — human-food maximum levels

Binds Al, Cr-VI. Strictest applicable human-food sovereign maximum for the nearest analog.

MAXIMUM LEVEL

[3] South Korea — human-food maximum levels

Binds Ni. Strictest applicable human-food sovereign maximum for the nearest analog.

MAXIMUM LEVEL

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/dentifrices>. 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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