Tattoo inks (permanent and temporary): 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.

KEYWORDS

heavy metals, food safety, dietary exposure

PUBLICATION HISTORY

This revision 2026-08.

Abstract

The Heavy Metal Tested & Certified heavy-metal-safety standard for tattoo inks (permanent and temporary) in Cosmetics and Personal Care — Leave-on, evaluated on finished leave-on cosmetic, TOTAL CONTENT as placed on market (ug/kg of product as sold), on the technically-unavoidable--impurity basis every instrument in this family uses. Not a migration/leachate basis, not a dietary basis, not an ingredient purity specification.. 6 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-only initial setting: every numeric cell is the strictest applicable sovereign maximum for this exact leave-on cosmetic form expressed as total content of the finished product as placed on market, or a disclosed read-across where the exact cell is unregulated, or a substantiated not-material determination, or a control. No cell is occurrence-derived, no cell is precautionary or feasibility-adjusted, and no cell is anchored on an ingredient or colour-additive purity specification.

2 | Master limit table

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

ANALYTE	HMTC LIMIT	BASIS

Lead (Pb)	700	government maximum level (European Union)
Cadmium (Cd)	100	government maximum level (DE)
Total arsenic (tAs)	500	government maximum level (European Union)
Inorganic arsenic (iAs)	≤ tAs	bounded by tAs (reflex speciation)
Mercury, total (tHg)	100	government maximum level (DE)
Methylmercury (MeHg)	≤ tHg	bounded by tHg (reflex speciation)
Nickel (Ni)	5,000	government maximum level (European Union)
Tin (Sn)	control	measured every lot; no human-food maximum
Aluminium (Al)	control	measured every lot; no human-food maximum
Total chromium (Cr)	control	measured every lot; no human-food maximum
Hexavalent chromium (Cr-VI)	500	government maximum level (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)	700	government maximum level (European Union)
Cadmium (Cd)	100	government maximum level (DE)
Total arsenic (tAs)	500	government maximum level (European Union)
Inorganic arsenic (iAs)	≤ tAs	bounded by tAs (reflex speciation)
Mercury, total (tHg)	100	government maximum level (DE)
Methylmercury (MeHg)	≤ tHg	bounded by tHg (reflex speciation)
Nickel (Ni)	5,000	government maximum level (European Union)

Tin (Sn)	control	The register carries no tin row for the EU tattoo and permanent-make-up entry, and no jurisdiction publishes a tin maximum for a finished cosmetic either, so neither instrument governing this row supplies a tin number. Whether Appendix 13 sets a tin concentration limit for these mixtures has NOT been verified against the instrument, and the register carries no tin row for the entry; this standard does not fill a cell from recollection, so the question is recorded as a register gap for resolution through the verified regulatory-fetch pathway and the cell is a control in the meantime. If a sovereign tin value is confirmed and ingested, this cell is re-derived as a numeric cell. The register's other tin values are dietary maximum levels and food-contact or skin-contact organotin limits, in bases that cannot anchor a total-content mixture cell. Tin is a real presence here through tin-oxide pigments and organotin stabiliser residues in ink carriers.
Aluminium (Al)	control	Neither instrument governing this row sets an aluminium maximum: the EU tattoo and permanent-make-up entry lists no aluminium value, and no jurisdiction publishes an aluminium maximum for a finished cosmetic. There is no near-neighbour cell to read across from. Aluminium is nonetheless intrinsic to this product form rather than incidental, because aluminium-lake pigments and alumina substrates are standard ink chemistry, so a single contaminant ceiling would be meaningless while the metal cannot go unmeasured.

Total chromium (Cr)	control	Neither instrument governing this row sets a total-chromium maximum. The EU tattoo and permanent-make-up entry regulates chromium only as Cr(VI), which is the deliberate and correct choice: total chromium in an ink is dominated by benign trivalent chromium from chromium-oxide and chromium-hydroxide green pigments, so a total-chromium ceiling would not be protective as a standalone number. No jurisdiction publishes a total-chromium maximum for a cosmetic either. Total chromium is therefore carried as the mandatory screen that governs the Cr(VI) reflex on this row, and no ceiling is invented.
Hexavalent chromium (Cr-VI)	500	government maximum level (European Union)

4 | Cite this standard

Pendergrass, K. (2026). *Tattoo inks (permanent and temporary): HMTc standard*. Institute of Contaminant Standards.

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References

[1] European Union
Binds Pb, tAs, Ni, Cr-VI.
MAXIMUM LEVEL

[2] DE
Binds Cd, tHg.
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.

COMPETING INTERESTS

This standard 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.

DATA AVAILABILITY

PUBLICATION HISTORY

The works this standard draws on are listed in full in the references above and on the standard page at https://heavymetalcertified.com/standards/tattoo-inks. 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.

This revision 2026-08. The full dated record is maintained at https://heavymetalcertified.com/standards/tattoo-inks.

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