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Paints and varnishes — Determination of preservatives in water-dilutable coating materials —

Part 2: Determination of in-can total formaldehyde

Peintures et vernis — Dosage des agents de préservation dans les produits de peinture diluables à l'eau —

Partie 2: Dosage du formaldéhyde total en pot

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Foreword

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This document was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 16, *Chemical analysis*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 139, *Paints and varnishes,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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Paints and varnishes — Determination of preservatives in water-dilutable coating materials —

Part 2: Determination of in-can total formaldehyde

1 Scope

This document specifies the apparatus and the analytical methods for determining the in-can total formaldehyde content in water-dilutable coating materials, where the main sources of formaldehyde are in-can preservatives.

This document is also applicable to polymer dispersions.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1513, *Paints and varnishes — Examination and preparation of test samples*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
ready for use
state of a product when it is mixed in accordance with the manufacturer's instructions in the correct proportions and thinned if required using the correct thinners so that it is ready for application by the approved method

[SOURCE: ISO 11890-2:2020, 3.7]

3.2
in-can free formaldehyde content
concentration of formaldehyde which is available in the coating as an *in-can preservative* (3.9) as determined by:

— method A of this document, i.e. photometric detection after derivatization with acetylacetone;

— method B of this document, i.e. liquid chromatography detection after derivatization with DNPH (2,4-dinitrophenyl-hydrazine); or

— method C of this document i.e. liquid chromatography detection with post-column derivatization with acetylacetone; where water is used as an extraction solvent for all three methods

Note 1 to entry: In-can free formaldehyde content corresponds to the amount of formaldehyde in milligrams, based on 1 kg of *coating material* (3.4) or polymer dispersion, which is available unbound in the sample at the time of derivatization.

Note 2 to entry: Since the free formaldehyde is in equilibrium with bound formaldehyde and the equilibrium can be influenced by the solvent, the content of free formaldehyde in water can differ from that in another solvent. This definition for in-can free formaldehyde content is only valid with respect to water as the extraction solvent.

3.3
in-can total formaldehyde content
concentration of free and bound formaldehyde in the *coating material* (3.4)

Note 1 to entry: Bound formaldehyde content is the concentration of formaldehyde remaining bound to the depot substance after equilibrium is established between free formaldehyde and the depot substances, and which can potentially be released by a formaldehyde depot substance.

3.4
coating material
DEPRECATED: coating
product, in liquid, paste or powder form, that, when applied to a substrate, forms a layer possessing protective, decorative and/or other specific properties

[SOURCE: ISO 4618:2023, 3.48]

3.5
water-dilutable coating material
water-reducible coating material
water-based coating material
water-borne coating material
water-thinnable coating material
DEPRECATED: water paint
coating material (3.4) whose viscosity is reduced by the addition of water

[SOURCE: ISO 4618:2023, 3.272]

3.6
formaldehyde depot substance
compound that releases formaldehyde over a long period of time

3.7
extinction
attenuation of a light beam traversing a medium through absorption and scattering

Note 1 to entry: Extinction depends on the wavelength of the radiation.

[SOURCE: ISO 13320:2020, 3.1.9]

3.8
preservative
substance that prevents the growth of undesirable microorganisms

[SOURCE: ISO 8124-7:2015, 3.6]

3.9
in-can preservative
biocide used to prevent growth of microorganisms during storage of a stock solution of a *coating material* (3.4) or *water-based coating material* (3.5)

[SOURCE: ISO 4618:2023, 3.141]