
Pigmenti in polnila - Določanje eksperimentalno simuliranega sproščanja nanopredmetov, prisotnih v barvah, lakih in pigmentiranih plastičnih materialih (ISO 21683:2019)

Pigments and extenders - Determination of experimentally simulated nano-object release from paints, varnishes and pigmented plastics (ISO 21683:2019)

Pigmente und Füllstoffe - Bestimmung der experimentell simulierten Freisetzung von Nanoobjekten aus Beschichtungen und pigmentierten Kunststoffen (ISO 21683:2019)

Pigments et matières de charge - Détermination de la libération simulée de nanoobjets présents dans des peintures, des vernis et des plastiques pigmentés (ISO 21683:2019)

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ICS:

87.060.10 Pigmenti in polnila Pigments and extenders

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Pigments and extenders - Determination of experimentally simulated nano-object release from paints, varnishes and pigmented plastics (ISO 21683:2019)

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Pigmente und Füllstoffe - Bestimmung der experimentell simulierten Freisetzung von Nanoobjekten aus Beschichtungen und pigmentierten Kunststoffen (ISO 21683:2019)

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European foreword

The text of ISO 21683:2019 has been prepared by Technical Committee ISO/TC 256 "Pigments, dyestuffs and extenders" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 21683:2020 by Technical Committee CEN/TC 298 "Pigments and extenders" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2021, and conflicting national standards shall be withdrawn at the latest by March 2021.

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**Pigments and extenders —
Determination of experimentally
simulated nano-object release from
paints, varnishes and pigmented
plastics**

*Pigments et matières de charge — Détermination de la libération
simulée de nanoobjets présents dans des peintures, des vernis et des
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 256, *Pigments, dyestuffs and extenders*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The possible release of nano-objects (nanoscale pigments and extenders) from paints, varnishes and pigmented plastics into surrounding air or liquid is an important consideration in health and safety, for the end user and the environment. Therefore, it is important to obtain data about the propensity of pigmented paints and plastics to release nano-objects, thereby allowing exposure to be evaluated^[10], controlled and minimized. This property will likely depend on both the physico-chemical properties of the nano-objects and the matrix containing the nano-objects.

The currently available methods to assess the propensity of pigmented paints, varnishes and plastics to release nano-objects into the air require energy to be applied to a sample to induce abrasion, erosion or comminution, which cause dissemination of the particles into the gaseous phase, i.e. generation of aerosols.

Due to their higher sensitivity, the particle number concentration and the number-weighted particle size distribution are necessary for the quantification of the release of nano-objects since the particle mass depends on the cubed particle diameter and the mass concentrations of nano-objects are too low in order to detect them with currently commercially available instruments. Further measurements, such as the total particle surface concentration, e.g. References [11] and [12], can be helpful for the interpretation e.g. in regard to health aspects. If the shape, morphology, porosity, and density of the particle material are known, an exact conversion into the different quantity types is possible by measuring the total particle size distribution.

Beside the selection of appropriate measurement instrumentation, a quantitative assessment of process-induced particle release requires furthermore detailed information on the samples, the introduced stress and the kind of interconnection with the instruments. [Figure 1](#) shows for example the single stages, which have to be considered for the quantitative characterization of airborne particulate release.

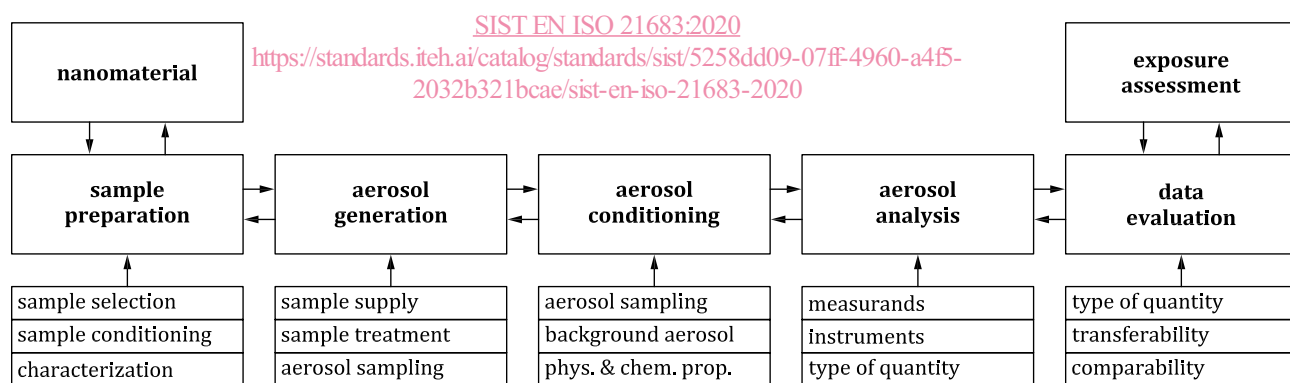


Figure 1 — Stages for the characterization of process-induced airborne particulate release^[5]

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