TR 73 : Part 3 : 2020
(ICS 07.120; 13.100)

TECHNICAL REFERENCE

Handling of engineered nanomaterials in workplaces

– Part 3: Occupational and environmental monitoring of engineered nanomaterials

Singapore Standards Council

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IOM (Institute of Occupational Medicine) Singapore Pte Ltd
Ministry of the Environment and Water Resources
Ministry of Manpower
Nanyang Technological University
National University Health System
National University of Singapore
PUB, Singapore's National Water Agency
Singapore Food Agency
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Foreword

This Technical Reference was prepared by the Working Group on Health, Safety and Environment set up by the Technical Committee on Nanotechnology under the purview of CSC.

TR 73 consists of the following parts under the generic title "Handling of engineered nanomaterials in workplaces":

Part 1: Health and safety practices in occupational settings relevant to nanotechnologies
Part 2: Overview of available frameworks for the developmemnt of occupational exposure limits and bands for nano-objects and their aggregates and agglomerates (NOAAs)
Part 3: Occupational and environmental monitoring of engineered nanomaterials

This TR is a provisional standard made available for application over a period of three years. The aim is to use the experience gained to update the TR so that it can be adopted as a Singapore Standard. Users of the TR are invited to provide feedback on its technical content, clarity and ease of use. Feedback can be submitted using the form provided in the TR. At the end of the three years, the TR will be reviewed, taking into account any feedback or other considerations, to further its development into a Singapore Standard if found suitable.

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Handling of engineered nanomaterials in workplaces – Part 3: Occupational and environmental monitoring of engineered nanomaterials

0 Introduction

Given the rapid development of nanotechnology industries and the foreseen increase in production volumes of nanomaterials worldwide, it is expected that the number of products available in the Singapore market will increase significantly in the coming years. Hence, it is important that comprehensive risk assessments are conducted for various engineered nanomaterials, as the rapid increase in their manufacture and use raises inevitable questions regarding their potential effects on health and on the environment. Detection, quantification and characterisation of nanomaterials including measurement of nanoparticle concentration and characterisation of particle size distribution, are critical aspects of monitoring engineered nanomaterials. Nanoparticle concentration and size distribution largely control how they behave in the environment. Highly selective detection, quantification and characterisation methods are important for many types of nanomaterials environmental research. Less selective methods that can rapidly screen the engineered nanoparticles are also needed.

1 Scope

This Technical Reference (TR) provides guidance on occupational health and safety measures relating to the handling of engineered nanomaterials including the use of engineered controls and appropriate personal protective equipment. It also provides guidance on dealing with spills, accidental releases and appropriate handling of these materials during disposal.

This part of the TR shows the development of a standard operating procedure for the monitoring of nanoparticles released into the environment, in the air and water.

2 Normative references

The following referenced documents are indispensable for the application of this dcoument. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/TR 20489	Sample preparation for the characterization of metal and metal-oxide nano-objects in water samples
TR 73 : Part 1 : 2020	Handling of engineered nanomaterials in workplaces – Part 1 : Health and safety practices in occupational settings relevant to nanotechnologies
TR 73 : Part 2 : 2020	Handling of engineered nanomaterials in workplaces – Part 2 : Overview of available frameworks for the development of occupational exposure limits and bands for nano-objects and their aggregates and agglomerates (NOAAs)