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Functional pigments and extenders for special applications —

Part 2: Nanoscale titanium dioxide for sunscreen application

Pigments et matières de charges fonctionnels pour applications spéciales —

Partie 2: Dioxyde de titane nanométrique pour protections solaires

Reference number
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Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Classification **1**
4 Requirements and test methods **1**
5 Sampling **2**
6 Marking and label **2**
7 Test report **3**

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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 256, *Pigments, dyestuffs and extenders*.

ISO 18473 consists of the following parts, under the general title *Functional pigments and extenders for special applications*:

— *Part 1: Nanoscale calcium carbonate for sealant application*

— *Part 2: Nanoscale titanium dioxide for sunscreen application*

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Introduction

The UV radiation of sunlight has great harm to the skin. Overmuch exposure in UV radiation will cause erythema and black spot, age the skin, and can even cause skin carcinoma. Sunscreens, which include UV blockers, are thus applied to skin to provide UV protection. Among them is titanium dioxide which has been used for decades as UV attenuator in sunscreens. Its attenuation is the combined effect of absorbing and scattering incident light. Compared with the pigmentary titanium dioxide, nanoscale titanium dioxide in the same dosage shows higher attenuation property in UV region, and thus provides superior UV protection. Furthermore, nanoscale titanium dioxide in sunscreen, when applied onto skin, maintains a high level of transparency because of its small size. Therefore, nanoscale titanium dioxide is rapidly, widely applied and becomes one of the most excellent inorganic ultraviolet resistant substances in sunscreen nowadays.

Although nanoscale titanium dioxide is commercially used in many sunscreen brands, its properties relevant to sunscreen application are not well defined which even causes misunderstanding among buyers and suppliers. In order to facilitate sound trading and technical transfer, the base for agreement on the characteristics of nanoscale titanium dioxide is to be established and shared by the stakeholders. The purpose of this part of ISO 18473 is to specify the requirements and corresponding test methods for sunscreen application of nanoscale titanium dioxide.

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Functional pigments and extenders for special applications —

Part 2:
Nanoscale titanium dioxide for sunscreen application

1 Scope

This part of ISO 18473 specifies requirements and corresponding methods of test for nanoscale titanium dioxide in powder form for sunscreen application. This part of ISO 18473 covers the surface modified, TiO_2.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 591-1, *Titanium dioxide pigments for paints — Part 1: Specifications and methods of test*

ISO 787-2, *General methods of test for pigments and extenders — Part 2: Determination of matter volatile at 105 °C*

ISO 2859 (all parts), *Sampling procedures for inspection by attributes*

ISO 3262-1, *Extenders for paints — Specifications and methods of test — Part 1: Introduction and general test methods*

ISO 9277, *Determination of the specific surface area of solids by gas adsorption — BET method*

3 Classification

Nanoscale titanium dioxide is classified into several different types based on crystal structure.

For sunscreen application, the crystal types are determined by X-ray examination and the main component can be anatase-type or rutile-type.

4 Requirements and test methods

Nanoscale titanium dioxide applied for industrial use of sunscreen shall comply with the requirements specified in Table 1.

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