BS ISO 18473-2:2015

BSI Standards Publication

Functional pigments and extenders for special applications

Part 2: Nanoscale titanium dioxide for sunscreen application

National foreword

This British Standard is the UK implementation of ISO 18473-2:2015.

The UK participation in its preparation was entrusted to Technical Committee STI/1, Pigments.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 86237 3

ICS 87.060.10

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 August 2015.

Amendments issued since publication

Date	Text affected

BS ISO 18473-2:2015

INTERNATIONAL STANDARD

ISO 18473-2

First edition
2015-08-15

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
ISO 18473-2:2015(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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*

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.

INTERNATIONAL STANDARD ISO 18473-2:2015(E)

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.

Table 1 — Requirements for use in sunscreen

Characteristic	Unit	Requirement	Test method
Median primary particle size[a]	nm	≤100	To be agreed between the interested parties: TEM[b] or DLS[c] method
Specific surface area (BET)[d]	m^2/g	≥15, if applicable	ISO 9277
Mass fraction of titanium dioxide	% (by mass)	≥70	ISO 591-1
Crystal structure	—	Rutile or anatase (main component)	XRD[a]
Hg	% (by mass)	Subject to relevant legislative requirements	Subject to relevant legislative requirements
Pb	% (by mass)	Subject to relevant legislative requirements	Subject to relevant legislative requirements
As	% (by mass)	Subject to relevant legislative requirements	Subject to relevant legislative requirements
Moisture	% (by mass)	To be agreed between the interested parties	ISO 787-2
Loss on ignition	—	To be agreed between the interested parties	ISO 3262-1

NOTE The agents used as surface modifier for TiO_2 could be agreed between the interested parties, if necessary.

[a] In the case of surface modification, the primary particle size refers only to TiO_2 particle not including the surface modification layer.

[b] TEM — Transmission electron microscopy.

[c] DLS — Dynamic light scattering.

[d] BET — Brunauer–Emmett–Teller.

5 Sampling

Obtaining a representative sample of an industrial powdered product is subject to lot variation and separation by particle size during handling and packaging. For more information about the sampling procedures, refer to ISO 2859.

6 Marking and label

The outer packing shall clearly mark in a visible location the manufacturer name and address, product name, type, brand, net weight and batch number or production date, this ISO standard number, and a “store dry” mark.

7 Test report

The test report shall contain at least the following information:

a) all information necessary to completely identify the product tested;

b) a reference to this part of ISO 18473, i.e. ISO 18473-2;

c) the results of the test, the method used where a choice is available, and whether or not the product complies with the relevant specification limits;

d) any deviation from the method of test specified;

e) the date of the test and place.

ICS 87.060.10
Price based on 3 pages

This page deliberately left blank

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.

...making excellence a habit.™