

<b>STN</b>	<b>Funkčné pigmenty a plnivá na špeciálne použitie Časť 1: Nanorozmerový uhličitan vápenatý na použitie v tmeloch (ISO 18473-1: 2015)</b>	<b>STN EN ISO 18473-1</b>  67 0575
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Functional pigments and extenders for special applications - Part 1: Nanoscale calcium carbonate for sealant application (ISO 18473-1:2015)

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

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## Functional pigments and extenders for special applications - Part 1: Nanoscale calcium carbonate for sealant application (ISO 18473-1:2015)

Pigments et matières de charges fonctionnels pour applications spéciales - Partie 1: Carbonate de calcium nanométrique pour les enduits (ISO 18473-1:2015)

Funktionelle Pigmente und Füllstoffe für besondere Anwendungen - Teil 1: Calciumcarbonat im Nanomaßstab für Dichtmassen (ISO 18473-1:2015)

This European Standard was approved by CEN on 6 May 2018.

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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN ISO 18473-1:2018 (E)**

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## **European foreword**

The text of ISO 18473-1:2015 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 18473-1:2018 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of an identical text or by endorsement, at the latest by April 2019, and conflicting national standards shall be withdrawn at the latest by April 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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## **Endorsement notice**

The text of ISO 18473-1:2015 has been approved by CEN as EN ISO 18473-1:2018 without any modification.

**INTERNATIONAL  
STANDARD**

**ISO  
18473-1**

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**Functional pigments and extenders for  
special applications —**

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

*Pigments et matières de charges fonctionnels pour applications  
spéciales —*

*Partie 1: Carbonate de calcium nanométrique pour les enduits*



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ISO 18473-1:2015(E)

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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

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## ISO 18473-1:2015(E)

### 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](http://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](http://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

Sealants are widely used to prevent the penetration of air, gas, or liquid in many industries including construction, automobile, and electronics. Extenders are essential part of sealant formulation to reduce cost and improve their rheological and mechanical properties. Content of extenders vary significantly and can be as high as 50 % (mass fraction). The most common extender in sealants is calcium carbonate ( $\text{CaCO}_3$ ) because it is readily available and comes in various sizes which act as a rheological modifier, a reinforcing agent, and opacifier. Commercial calcium carbonate can be divided into ground calcium carbonate (GCC) and precipitated calcium carbonate (PCC), possesses three crystal structures including calcite, aragonite, and vaterite, and exists in various morphologies such as cubic, spherical, spindle, fibrous, needle-like, etc. Calcium carbonates with calcite crystal structure and cubic or spherical morphology are most widely used in sealant applications.

Nanoscale calcium carbonate (NCC) provides various sealants with improved performance and additional functionalities including thixotropy, flame resistance and improved durability and recyclability, and has become a major component in sealant formulation. Nanoscale calcium carbonate in the powdered form is readily manufactured nowadays, mostly through precipitation route to control the size and morphology. Surface treatment is crucial for utilizing NCC in sealants. Native  $\text{CaCO}_3$  is hydrophilic. As a result, it tends to agglomerate in organic polymers and plasticizers. NCC, in particular, has a greater propensity for agglomeration because of its small size and large specific surface area. NCCs are surface treated to render them hydrophobic and improve their dispersibility in hydrophobic systems. Surface treatment also improves polymer matrix compatibility, thus improving interfacial adhesion between extender and polymer.

It has been found that the particle size, specific surface area, mass fraction, morphology, pH value, magnesium content, oil absorption value, moisture content, and other characteristics of supplied nanoscale calcium carbonate all have impact on the performance of the sealant incorporating these nanoparticles. The need to specify the characteristics of NCC which relate to sealant performance comes from the following facts. First, the agreements between customers and suppliers do not always cover all material characteristics that have influences on performance and/or processability of sealants or they have been interpreted differently by the customers and suppliers. Second, nanomaterials are relatively new. Material properties can depend on the techniques to measure them. Therefore, providing information regarding characteristics of nanoscale calcium carbonate in sealants will facilitate the communication between customers and suppliers.

This part of ISO 18473 lists the properties, measurements, and characteristics of nanoscale calcium carbonate and intends to aid its acceptance and application in sealants.

# Functional pigments and extenders for special applications —

## Part 1: Nanoscale calcium carbonate for sealant application

### 1 Scope

This part of ISO 18473 specifies requirements and corresponding methods of test for surface treated nanoscale calcium carbonate in powder form for sealant application.

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

ISO 787-5, *General methods of test for pigments and extenders — Part 5: Determination of oil absorption value*

ISO 787-9, *General methods of test for pigments and extenders — Part 9: Determination of pH value of an aqueous suspension*

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

ISO 3262-6, *Extenders for paints — Specifications and methods of test — Part 6: Precipitated calcium carbonate*

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

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

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**