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**Extenders — Specifications and  
methods of test —**

**Part 19:  
Precipitated silica**

*Matières de charge — Spécifications et méthodes d'essai —*

*Partie 19: Silice précipitée*

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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](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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 256, *Pigments, dyestuff and extenders*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 298, *Pigments and extenders*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 3262-19:2000), which has been technically revised.

The main changes compared to the previous edition are as follows:

- the main title has been changed from "Extenders for paints" to "Extenders";
- in [Table 1](#), carbon content has been revised and organic surface has been refined;
- in [6.3.8](#), magnesium perchlorate has been changed to an example for a desiccant;
- in [7.2.3](#), suitable examples for carbon steel have been added;
- the text has been editorially revised and the normative references have been updated.

A list of all parts in the ISO 3262 series can be found on the ISO website.

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](http://www.iso.org/members.html).

# Extenders — Specifications and methods of test —

## Part 19: Precipitated silica

### 1 Scope

This document specifies requirements and corresponding methods of test for precipitated silica.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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 787-11, *General methods of test for pigments and extenders — Part 11: Determination of tamped volume and apparent density after tamping*

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

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 5794-1:2010, *Rubber compounding ingredients — Silica, precipitated, hydrated — Part 1: Non-rubber tests*

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

ISO 18451-1, *Pigments, dyestuffs and extenders — Terminology — Part 1: General terms*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 18451-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1

##### **precipitated silica**

amorphous silica precipitated by reaction of sodium silicate solution with a mineral acid and/or carbon dioxide

## 4 Requirements and test methods

For precipitated silica complying with this document, the essential requirements are specified in [Table 1](#) and the conditional requirements are listed in [Table 2](#).

In order to determine the pH value of hydrophobic silica in an aqueous suspension, a 1 + 1 mass fraction mixture of water and methanol is used.

**Table 1 — Essential requirements and test methods**

Characteristic	Unit	Requirement		Test method according to
		Grade A	Grade B	
Silica content, min.	% mass fraction	95	95	See <a href="#">Clause 6</a>
Carbon content <sup>a</sup>		<0,3	≥0,3 <sup>b</sup>	See <a href="#">Clause 7</a>
Organic surface treatment and surface coating	—	No	Yes	See <a href="#">Clause 7</a>
Matter volatile at 105 °C	% mass fraction	max. 8		ISO 787-2
Loss on ignition	% mass fraction	3 to 8	3 to 15	ISO 3262-1
Oil absorption value <sup>c</sup>	g/100g	120		ISO 787-5
pH value of aqueous suspension	—	3,5 to 9		ISO 787-9
<sup>a</sup> The carbon content is also part of the loss on ignition. <sup>b</sup> Usually does not exceed 15 %. <sup>c</sup> A test method with higher reproducibility and repeatability is described in ASTM D2414. However, the results cannot be compared directly with oil absorption values determined in accordance with ISO 787-5.				

**Table 2 — Conditional requirements and test methods**

Characteristic	Unit	Requirement		Test method according to
		Grade A	Grade B	
Residue on 45 µm sieve, max.	% mass fraction	To be agreed between the interested parties	Not applicable	Spray method ( <a href="#">Clause 8</a> ) <sup>a</sup>
Particle size distribution (instrumental method)	% mass fraction	To be agreed between the interested parties		
Apparent density after tamping	g/ml	To be agreed between the interested parties		ISO 787-11
Specific surface area	m <sup>2</sup> /g			ISO 5794-1:2010, Annex D
<sup>a</sup> Only for hydrophilic materials.				

## 5 Sampling

Take a representative sample of the product to be tested according to ISO 15528.

## 6 Determination of silica content

### 6.1 Principle

A test portion is repeatedly treated with hydrochloric acid and evaporated to dryness. To render the dehydrated silicic acid thus formed as insoluble as possible, it is then heated for 2 h at (140 ± 5) °C. Any chlorides present are removed by extracting the precipitate with hot dilute hydrochloric acid.