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## Extenders — Specifications and methods of test —

### Part 17: Precipitated calcium silicate

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

*Partie 17: Silicate de calcium précipité*

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# Contents

Page

Foreword.....	iv
<b>1 Scope.....</b>	<b>1</b>
<b>2 Normative references.....</b>	<b>1</b>
<b>3 Terms and definitions.....</b>	<b>1</b>
<b>4 Requirements and test methods.....</b>	<b>2</b>
<b>5 Sampling.....</b>	<b>2</b>
<b>6 Determination of silica content.....</b>	<b>2</b>
6.1 Principle.....	2
6.2 Reagents.....	3
6.3 Apparatus.....	3
6.4 Procedure.....	4
6.4.1 Number of determinations.....	4
6.4.2 Test portion.....	4
6.4.3 Determination.....	4
6.4.4 Determination of the total loss on ignition.....	4
6.5 Expression of results.....	5
6.6 Precision.....	5
<b>7 Determination of the composition by spectrometry.....</b>	<b>5</b>
7.1 Principle.....	5
7.2 Reagents and materials.....	6
7.3 Apparatus.....	6
7.4 Procedure.....	7
7.4.1 Preparation of standard matching solutions.....	7
7.4.2 Spectrometric measurement.....	7
7.4.3 Calibration graph.....	8
7.4.4 Preparation of the test solution.....	8
7.4.5 Determination.....	8
7.5 Expression of results.....	9
7.5.1 Concentration of Ca, Na and Si.....	9
7.5.2 Calculation of the oxide content for each element.....	9
7.6 Precision.....	9
<b>8 Determination of residue on sieve.....</b>	<b>10</b>
8.1 Principle.....	10
8.2 Materials.....	10
8.3 Apparatus.....	10
8.4 Procedure.....	10
8.4.1 Number of determinations.....	10
8.4.2 Test portion.....	10
8.4.3 Determination.....	10
8.5 Expression of results.....	11
8.6 Precision.....	11
<b>9 Test report.....</b>	<b>11</b>

## 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 document 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)).

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This document was prepared by Technical Committee ISO/TC 256, *Pigments, dyestuffs 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 3262-17:2000), which has been technically revised.

The main changes are as follows:

- the first part of the title has been changed to "Extenders";
- ISO 19246 has been added as an alternative test method for oil absorption value in [Table 2](#);
- ISO 13320 has been added as test method for particle size distribution in [Table 3](#);
- DIN 53163 has been added as test method for lightness (standard value *Y*) in [Table 3](#);
- CAS-numbers have been added to all reagents used for the test methods specified;
- 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 17: Precipitated calcium silicate

### 1 Scope

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

### 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 648, *Laboratory glassware — Single-volume pipettes*

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 — Specifications and methods of test — Part 1: Introduction and general test methods*

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

ISO 5794-1:2022, *Rubber compounding ingredients — Silica, precipitated, hydrated — Part 1: Non-rubber tests*

ISO 13320, *Particle size analysis — Laser diffraction methods*

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

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

ISO 19246, *Rubber compounding ingredients — Silica — Oil absorption of precipitated silica*

DIN 53163, *Pigments and extenders — Determination of lightness of extenders and white pigments in powder form*

### 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 terminology databases for use in standardization at the following addresses:

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

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

**3.1 precipitated calcium silicate**  
amorphous silicate precipitated by reaction of sodium silicate solution with a mineral acid and/or a calcium salt

## 4 Requirements and test methods

For precipitated calcium silicate complying with this document, the essential requirements are specified in [Table 1](#) and the conditional requirements are listed in [Table 2](#). The test methods listed in [Tables 1](#) and [2](#) shall apply.

**Table 1 — Essential requirements**

Characteristic	Unit	Requirements	Test method
Silica content, min.	% mass fraction	75	See <a href="#">Clause 6</a> or <a href="#">Clause 7</a>
Oxide content		1 to 5	See <a href="#">Clause 7</a>
— Na <sub>2</sub> O			
— CaO	2 to 24		
Residue on 45 µm sieve, max.	% mass fraction	2	See <a href="#">Clause 8</a>
Matter volatile at 105 °C, max.	% mass fraction	10	ISO 787-2
Loss on ignition	% mass fraction	3 to 10	ISO 3262-1
Oil absorption value, min.	g/100 g	80	ISO 787-5 or ISO 19246
pH value of aqueous suspension	—	8 to 12	ISO 787-9

**Table 2 — Conditional requirements**

Characteristic	Unit	Requirements	Test method
Particle size distribution (laser diffraction method)	µm	To be agreed between the interested parties	ISO 13320
Lightness (tristimulus value Y)	—		DIN 53163
Specific surface area	m <sup>2</sup> /g		ISO 5794-1:2022, Annex E

## 5 Sampling

Take a representative sample of the product to be tested, as specified in 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 which has been 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.

The precipitate is ignited at 1 000 °C, giving impure silicon dioxide, which is treated with sulfuric and hydrofluoric acid. The silicon tetrafluoride formed is evaporated off and the silica content is calculated from the resulting loss in mass.