
**Fine ceramics (advanced ceramics,
advanced technical ceramics) —
Determination of flowability of
ceramic powders**

*Céramiques techniques — Détermination de l'aptitude à l'écoulement
des poudres céramiques*

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ISO 14629:2012

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 14629 was prepared by Technical Committee ISO/TC 206, *Fine ceramics*.

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Fine ceramics (advanced ceramics, advanced technical ceramics) — Determination of flowability of ceramic powders

1 Scope

This International Standard specifies a test method to determine the flowability of granulated or ungranulated ceramic powders by means of a specified funnel. The method is applicable only to powders which flow freely through the specified test orifice.

2 Normative references

The following referenced documents are indispensable for the application 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 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 80000-1, *Quantities and units — Part 1: General*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

3 Principle

The flow time required for approximately 50,0 g of ceramic powder to flow through the orifice of a funnel having specified dimensions is determined. The mass of the powder divided by its flow time gives its flow rate, i.e. flowability.

4 Apparatus

4.1 Funnel

A stainless-steel funnel (Figure 1) having an orifice of diameter 2,5 mm and another funnel with an orifice of diameter 5,0 mm. The funnel shall be made of a non-magnetic, corrosion-resistant metallic material such as stainless steel (for example SUS 304) having sufficient wall thickness and hardness to withstand distortion and excessive wear.

4.2 Container

A stainless-steel container large enough to collect all of the ceramic powders discharged from the orifice of a funnel, e.g. as indicated in Figure 2.

4.3 Stand and horizontal vibration-free base

A stand to support the funnel concentric with the container so that the bottom of the funnel orifice is approximately 50 mm above the top of the container when the apparatus is assembled as shown in Figure 3.

4.4 Sieve

A sieve, as specified in ISO 565, with an aperture size of 0,71 mm.

4.5 Balance

A balance capable of weighing to the nearest 0,1 g or 0,01 g.

NOTE A balance capable of weighing to the nearest 0,01 g should be used for very fluffy powders such as aerosil (fumed silica).

4.6 Stopwatch

A stopwatch capable of measuring the elapsed time to the nearest 0,1 s.

4.7 Glove

A glove composed of a cotton which minimizes static electricity.

NOTE The material of a suitable glove is dependent on safety instructions of powder manufacturer. If possible, use gloves of cotton, polyethylene, latex, etc.

4.8 Level meter

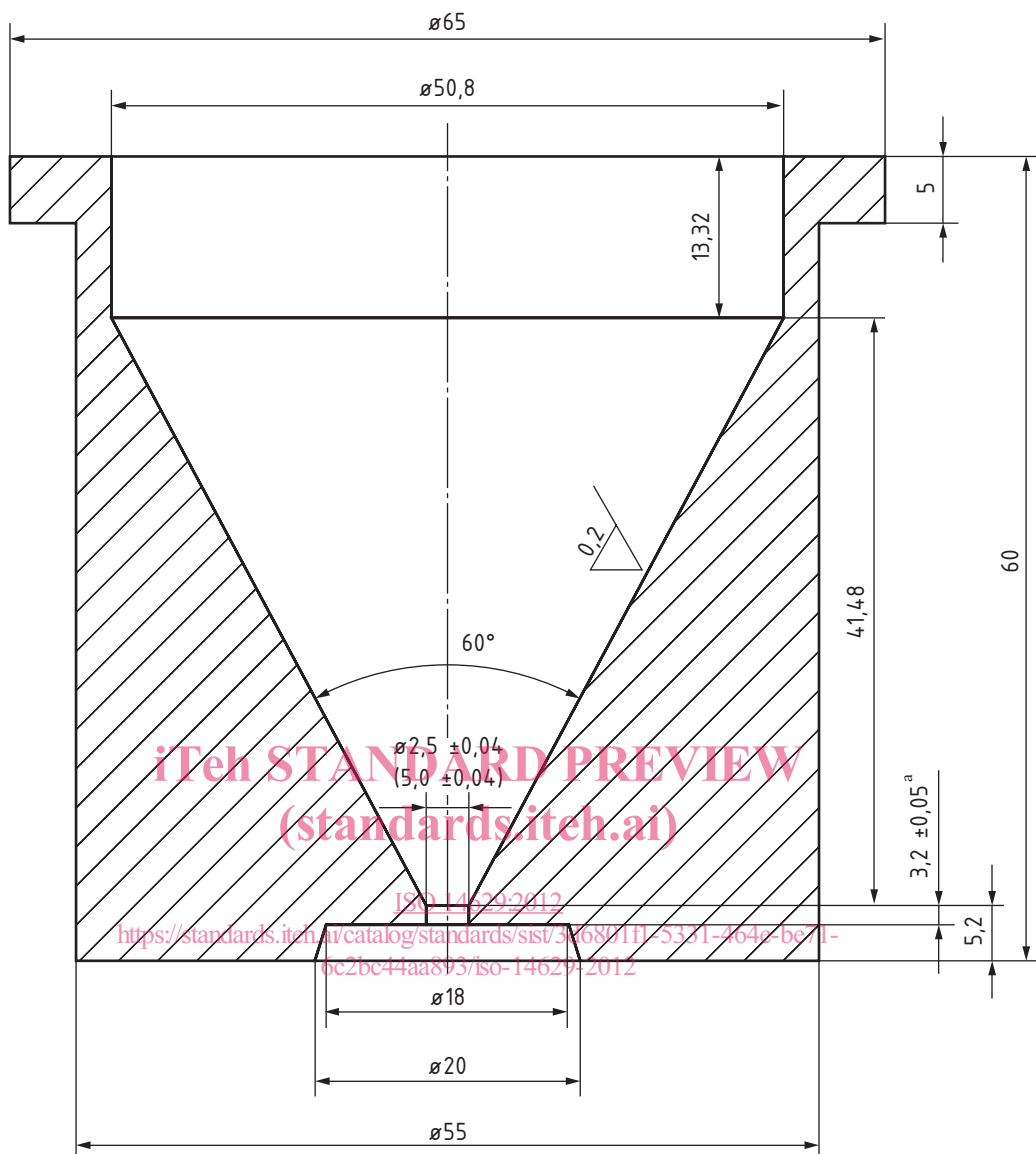
A level meter capable of checking the horizontality of the funnel.

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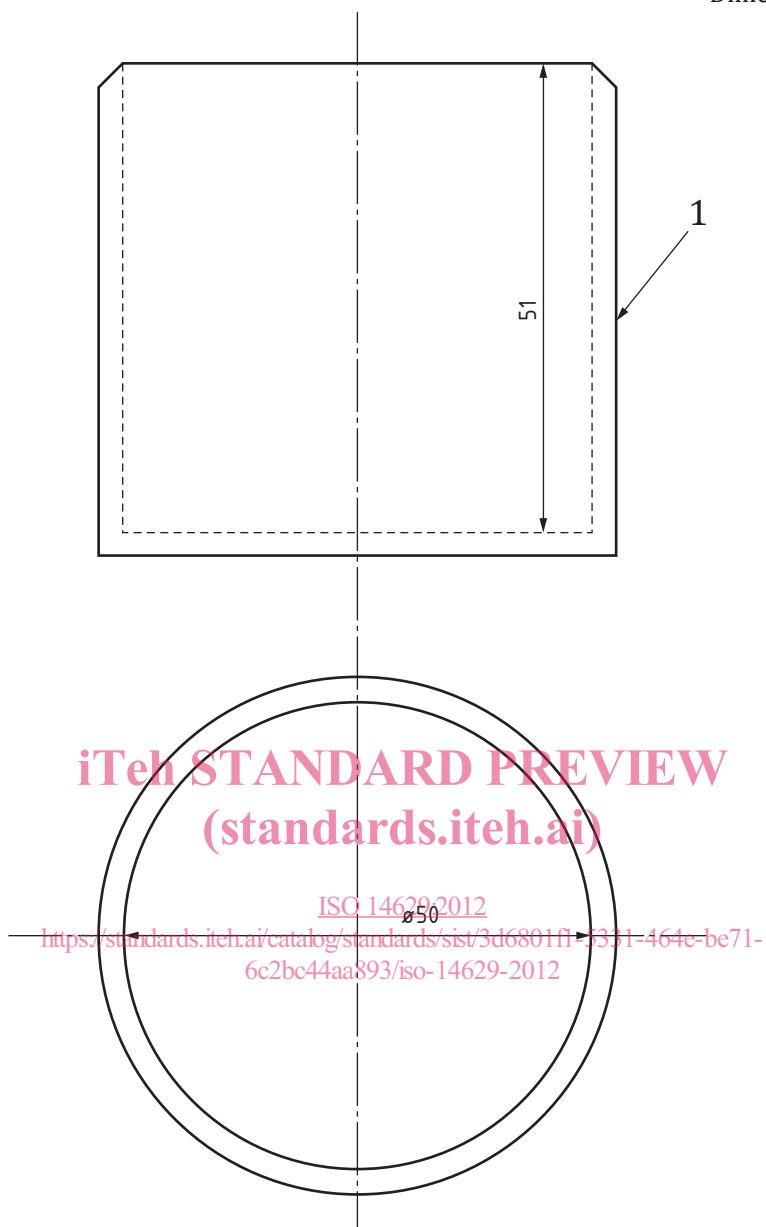
Dimensions in millimetres



^a or $6,4 \pm 0,05$ for 5,0 diameter

Figure 1 — Example of funnel

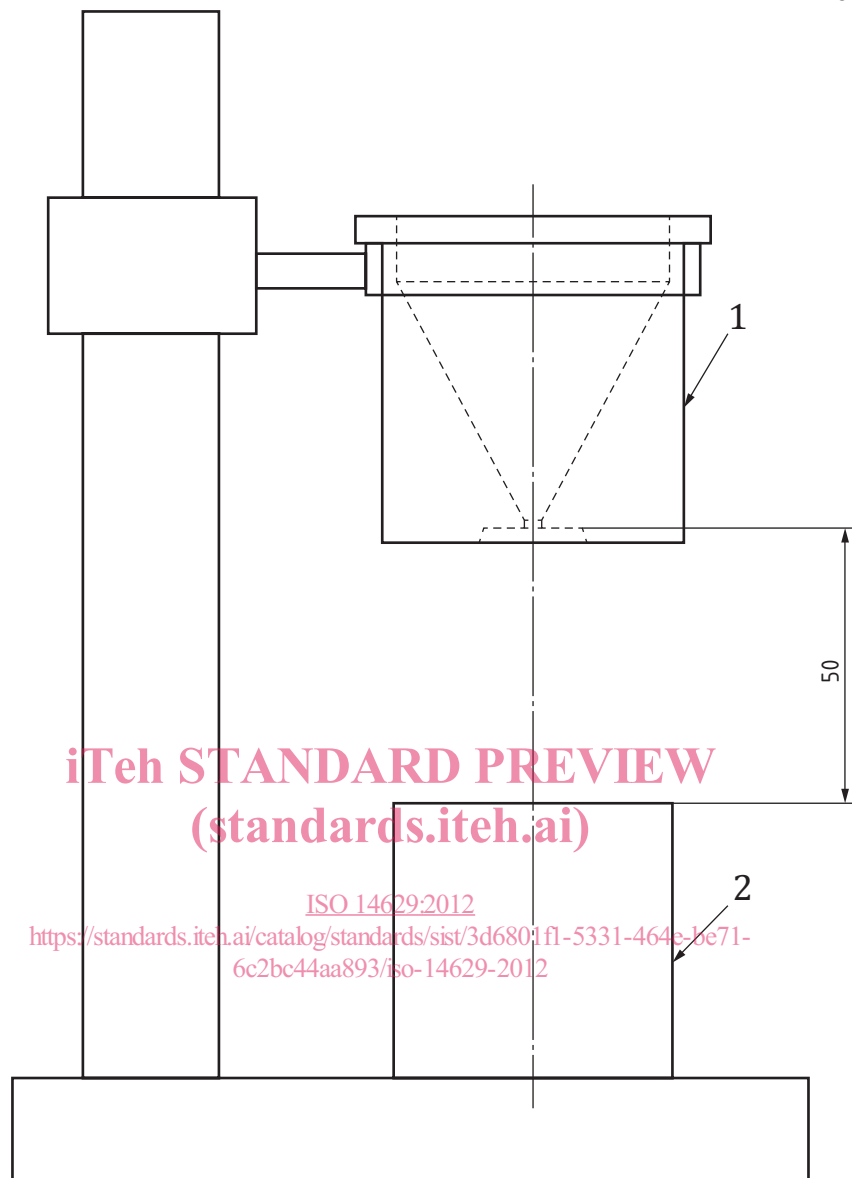
Dimensions in millimetres



Key
1 container

Figure 2 — Example of container

Dimensions in millimetres

**Key**

- 1 funnel
- 2 container

Figure 3 — Example of apparatus for flowability**5 Sampling**

5.1 The mass of the test samples shall be at least 200 g.

5.2 In general, the powder should be tested in the as-received condition. In certain instances, the powder may be dried. If the powder is required to be dried, it should be dried at $(110 \pm 5)^\circ\text{C}$ for at least 1 h and cooled down to room temperature in a desiccator. If the powder contains volatile substances, it shall not be dried.

5.3 Should there be any treatment (e.g. drying) of the powder before measurement, it shall be recorded in the test report.