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Metallic powders — Determination of flow rate by means of a calibrated funnel (Gustavsson flowmeter)

Poudres métalliques — Détermination du temps d'écoulement au moyen d'un entonnoir calibré (cône d'écoulement de Gustavsson)

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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).

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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.

This document was prepared by Technical Committee ISO/TC 119, *Powder metallurgy*, Subcommittee SC 2, *Sampling and testing methods for powders (including powders for hardmetals)*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/SS M11, *Powder metallurgy*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 13517:2013), which has been technically revised.

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

— tolerance for the funnel angle has been added;

— reference grit has been used instead of Chinese emery grit;

— the mandatory Clauses 2 and 3 (Normative references and Terms and definitions) have been added and the subsequent clauses have been renumbered.

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.

Metallic powders — Determination of flow rate by means of a calibrated funnel (Gustavsson flowmeter)

1 Scope

This document specifies a method for determining the flow rate of metallic powders, including powders for hardmetals and mixes of metallic powders and organic additives such as lubricants, by means of a calibrated funnel (Gustavsson flowmeter).

The method is applicable only to powders which flow freely through the specified test orifice.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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/

4 Principle

Measurement of the time required for 50 g of a metallic powder to flow through the orifice of a calibrated funnel of standardized dimensions.

5 Apparatus

5.1 Calibrated funnel, with the dimensions shown in Figure 1 (see Clause 6). The dimensions shown for the flowmeter funnel, including the orifice, are not to be considered controlling factors. Calibration with reference grit, as specified in Clause 6, determines the working flow rate of the funnel.

The funnel shall be made of a non-magnetic, corrosion-resistant metallic material with sufficient wall thickness and hardness to withstand distortion and excessive wear.

5.2 Stand and horizontal vibration-free base, to support the funnel rigidly, e.g. as indicated in Figure 2.

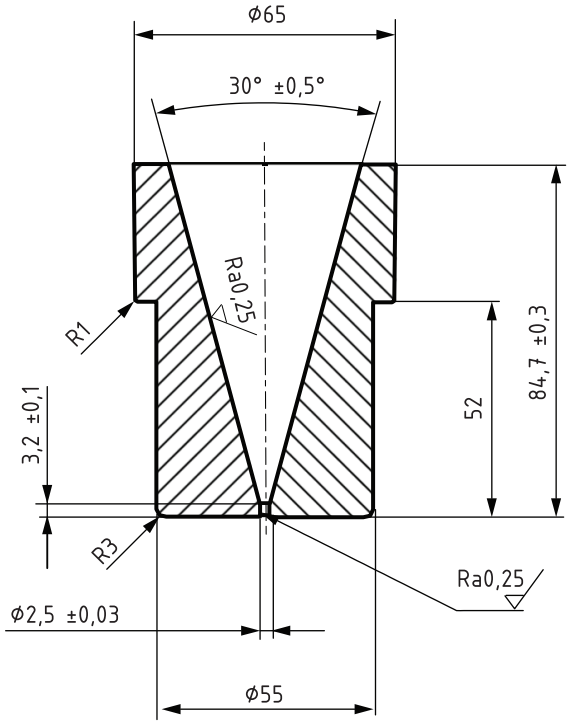
5.3 Balance, of sufficient capacity, capable of weighing the test portion to an accuracy of ± 0,05 g.

5.4 Timing device, capable of measuring the elapsed time to an accuracy of ± 0,1 s.

5.5 Reference grit, a reference powder used for calibration of the funnel[1)].

1) Material complying with 5.5 can be purchased as "Chinese emery grit". This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the company named above. Equivalent products may be used if they can be shown to lead to the same results.

Dimensions in millimetres



NOTE For dimensions with no individual tolerance, refer to ISO 2768-1 and tolerance class medium. Applicable only for new funnels.

Figure 1 — Calibrated funnel (Gustavsson flowmeter)

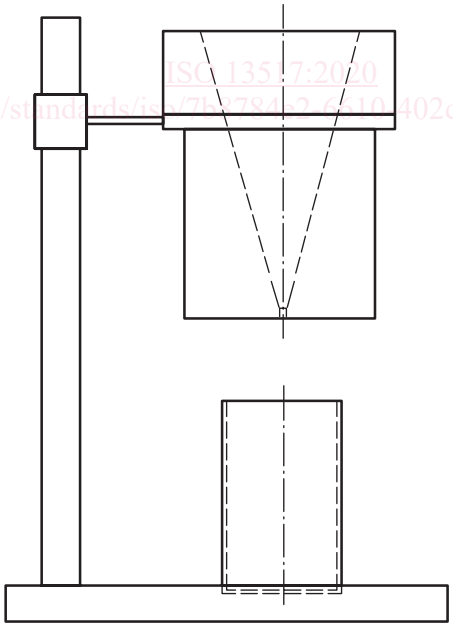


Figure 2 — Arrangement of calibrated funnel and stand