

---

---

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

*Poudres métalliques — Détermination du temps d'écoulement au  
moyen d'un entonnoir calibré (appareil de Hall)*

iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

ISO 4490:2018

<https://standards.iteh.ai/catalog/standards/iso/fbfa3d84-29c9-4163-b099-1544cf6ed3ff/iso-4490-2018>



iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

ISO 4490:2018

<https://standards.iteh.ai/catalog/standards/iso/fbfa3d84-29c9-4163-b099-1544cf6ed3ff/iso-4490-2018>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<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 Principle</b> .....	<b>1</b>
<b>5 Apparatus</b> .....	<b>1</b>
<b>6 Calibration of the funnel</b> .....	<b>3</b>
6.1 Calibration by the manufacturer of the funnel.....	3
6.2 Calibration by the user of the funnel.....	3
<b>7 Sampling</b> .....	<b>4</b>
7.1 General.....	4
7.2 Test sample weight.....	4
7.3 Test portion weight.....	4
7.4 Number of test portions.....	4
<b>8 Procedure</b> .....	<b>4</b>
<b>9 Expression of results</b> .....	<b>4</b>
<b>10 Precision</b> .....	<b>5</b>
<b>11 Test report</b> .....	<b>5</b>
<b>Bibliography</b> .....	<b>7</b>

Document Preview

ISO 4490:2018

<https://standards.iteh.ai/catalog/standards/iso/fbfa3d84-29c9-4163-b099-1544cf6ed3ff/iso-4490-2018>

## 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 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 the following URL: [www.iso.org/iso/foreword.html](http://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)*.

This fifth edition, which cancels and replaces the fourth edition (ISO 4490:2014), has been revised to include a precision statement together with some other minor clarifications.

<https://standards.iteh.ai/catalog/standards/iso/fbfa3d84-29c9-4163-b099-1544cf6ed3ff/iso-4490-2018>

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

## 1 Scope

This document specifies a method for determining the flow rate of metallic powders, including powders for hard metals, by means of a calibrated funnel (Hall 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**, the dimensions of which are shown in [Figure 1](#). 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**, which shall support the funnel rigidly. An example is shown in [Figure 2](#).

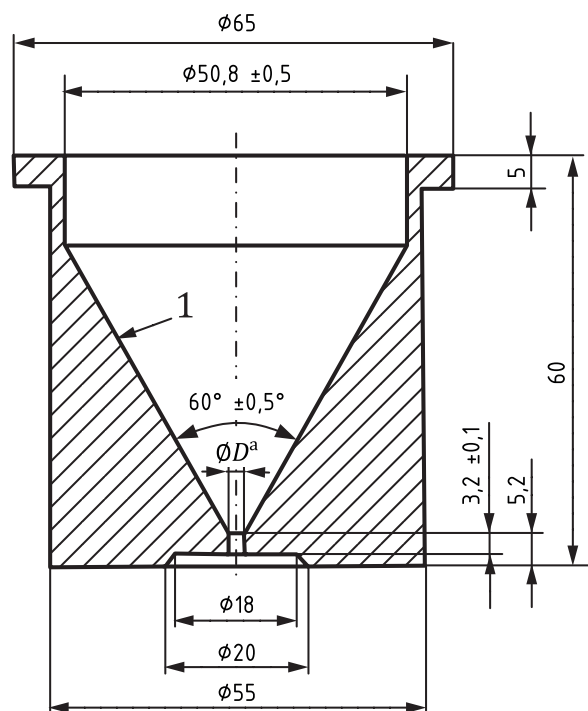
**5.3 Balance** of sufficient capacity, capable of weighing the test portion to an accuracy of  $\pm 0,05$  g.

**5.4 Timing device**, capable of measuring the elapsed time to an accuracy of  $\pm 0,1$  s.

**5.5 Reference grit**, a reference powder<sup>1)</sup> used for calibration of the funnel, shall be used.

1) Material complying with [5.5](#) can be purchased as “Chinese emery grit” from ACuPowder International, LLC, 901 Lehigh Avenue, Union, NJ 07083, USA. 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

**Key**1 polished to  $R_a \leq 0,4 \mu\text{m}$ a  $D = 2,5^{+0,4}_0$ .

iTeh Standards  
<https://standards.itih.ai>  
 Document Preview

**Figure 1 — Calibrated funnel (Hall flowmeter)**

ISO 4490:2018

<https://standards.itih.ai/catalog/standards/iso/fbfa3d84-29c9-4163-b099-1544cf6ed3ff/iso-4490-2018>