
**Iron ores and direct reduced iron —
Determination of size distribution by
sieving**

*Minerais de fer et minerais de fer préreduits — Détermination de la
granulométrie par tamisage*

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

ISO 4701:2019

<https://standards.iteh.ai/catalog/standards/iso/dd2c1b58-8532-4d8d-9900-2006362fd4d2/iso-4701-2019>



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

ISO 4701:2019

<https://standards.iteh.ai/catalog/standards/iso/dd2c1b58-8532-4d8d-9900-2006362fd4d2/iso-4701-2019>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

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
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principles and planning	2
4.1 General	2
4.2 Purpose of the analysis	2
4.3 Impact of ore and DRI properties	2
4.3.1 Effect of moisture content	2
4.3.2 Degradation of material	3
4.3.3 Magnetic ores	3
4.4 Nature of sample	4
4.5 Choice of sieving method	4
4.6 Maximum particle size permitted on a sieve	4
4.7 Specified loading of sieves	5
4.7.1 General	5
4.7.2 Batch sieving with a single sieve or nest of sieves	5
4.7.3 Loading of continuous sieving machines	6
4.8 Sieving time	6
4.8.1 General	6
4.8.2 End point ruling	7
4.8.3 Retention time for continuous sieving machines	7
5 Apparatus	7
5.1 Sieve media	7
5.1.1 Shape of aperture	7
5.1.2 Size of aperture	7
5.1.3 Construction of sieve media	7
5.1.4 Sieve frames for hand or mechanical nest sieving	7
5.2 Sieving machines	8
5.3 Accessories for wet sieving	8
5.4 Drying equipment	9
5.5 Equipment for the determination of mass	9
6 Samples	10
6.1 Derivation of size sample	10
6.2 Mass of test sample(s) for sieving	10
6.2.1 General	10
6.2.2 Minimum mass	10
7 Procedures	11
7.1 Drying	11
7.2 Division	11
7.3 Preparation and maintenance of sieves for test or nest sieving	11
7.4 Sieving	12
7.4.1 General	12
7.4.2 Hand placing on individual sieves	12
7.4.3 Hand sieving in the –40 mm to +1 mm range	12
7.4.4 Hand sieving in the –1 mm range	13
7.4.5 Mechanical batch sieving	14
7.4.6 Wet sieving of coarse and fine samples	14
7.4.7 Continuous machine sieving	15
7.5 Determination of mass	15
7.5.1 General	15
7.5.2 Wet sieving — Determination of mass of solids-content in washings	16

7.6	Determination of sieving end point	16
7.6.1	Dry sieving	16
7.6.2	Wet sieving	17
8	Verification	17
8.1	General	17
8.2	Checking of division	17
8.3	Verification of sieve media	17
8.4	Verification of sieving machines	17
8.5	Verification of weighing devices	17
9	Results	17
9.1	Evaluation of results	17
9.2	Calculation and expression of results	18
9.3	Repeatability and acceptance of results	19
10	Test report and working log	20
11	Precision	20
11.1	Overall precision, β_{SPM}	20
11.2	Precision of preparation and measurement, β_{PM}	20
	Annex A (informative) Steps for establishing operating conditions	22
	Annex B (normative) Scheme of sample preparation and sieving procedure	23
	Annex C (normative) Maximum mass to be retained at completion of batch sieving	24
	Annex D (informative) Size apertures in R20 and R40/3 series	26
	Annex E (informative) Typical batch sieving apparatus	27
	Annex F (informative) Desirable features of mechanical sieving machines	28
	Annex G (normative) Procedure for determining the minimum mass of sample used for sieving	31
	Annex H (normative) Flowsheet of the procedure for the acceptance of analytical values for test portions	34
	Annex I (informative) Additional information	35
	Annex J (normative) Determination of the average particle size (APS)	37
	Bibliography	38

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).

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).

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.

This document was prepared by Technical Committee ISO/TC 102, *Iron ore and direct reduced iron*, Subcommittee SC 1, *Sampling*.

This fifth edition cancels and replaces the fourth edition (ISO 4701:2017), of which it constitutes a minor revision. The following change has been made:

- in [Annex C](#), a formula has been included to correct the maximum mass to be retained on the sieve at completion of sieving in accordance with the actual bulk density of iron ore.

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.

