

ISO 4701:2019 (E)

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

Contents

	Foreword
1	Scope
2	Normative references
3	Terms and definitions
4	Principles and planning
4.1	General
4.2	Purpose of the analysis
4.3	Impact of ore and DRI properties
4.3.1	Effect of moisture content
4.3.2	Degradation of material
4.3.3	Magnetic ores
4.4	Nature of sample
4.5	Choice of sieving method
4.6	Maximum particle size permitted on a sieve
4.7	Specified loading of sieves
4.7.1	General
4.7.2	Batch sieving with a single sieve or nest of sieves
4.7.2.1	General
4.7.2.2	Apertures > 4 mm
4.7.2.3	Apertures < 4 mm
4.7.3	Loading of continuous sieving machines
4.8	Sieving time
4.8.1	General
4.8.2	End point ruling
4.8.3	Retention time for continuous sieving machines
5	Apparatus
5.1	Sieve media
5.1.1	Shape of aperture
5.1.2	Size of aperture
5.1.3	Construction of sieve media
5.1.4	Sieve frames for hand or mechanical nest sieving
5.2	Sieving machines
5.3	Accessories for wet sieving
5.4	Drying equipment
5.5	Equipment for the determination of mass
6	Samples
6.1	Derivation of size sample
6.2	Mass of test sample(s) for sieving
6.2.1	General
6.2.2	Minimum mass
7	Procedures
7.1	Drying
7.2	Division
7.3	Preparation and maintenance of sieves for test or nest sieving
7.4	Sieving
7.4.1	General

7.4.2	Hand placing on individual sieves
7.4.3	Hand sieving in the -40 mm to +1 mm range
7.4.4	Hand sieving in the -1 mm range
7.4.5	Mechanical batch sieving
7.4.6	Wet sieving of coarse and fine samples
7.4.7	Continuous machine sieving
7.5	Determination of mass
7.5.1	General
7.5.2	Wet sieving — Determination of mass of solids-content in washings
7.6	Determination of sieving end point
7.6.1	Dry sieving
7.6.1.1	Procedure when using a nest of sieves
7.6.1.2	Procedure for using a sequence of individual sieves
7.6.2	Wet sieving
8	Verification
8.1	General
8.2	Checking of division
8.3	Verification of sieve media
8.4	Verification of sieving machines
8.5	Verification of weighing devices
9	Results
9.1	Evaluation of results
9.2	Calculation and expression of results
9.3	Repeatability and acceptance of results
10	Test report and working log
11	Precision
11.1	Overall precision, β SPM
11.2	Precision of preparation and measurement, β PM
Annex A	(informative) Steps for establishing operating conditions
Annex B	(normative) Scheme of sample preparation and sieving procedure
Annex C	(normative) Maximum mass to be retained at completion of batch sieving
Annex D	(informative) Size apertures in R20 and R40/3 series
Annex E	(informative) Typical batch sieving apparatus
Annex F	(informative) Desirable features of mechanical sieving machines
F.1	Continuous sieving machines
F.2	Nest sieving machines
F.3	Variable motion drives
Annex G	(normative) Procedure for determining the minimum mass of sample used for sieving
G.1	Formulae
G.2	Examples of calculation of the minimum mass of sample used for sieving
Annex H	(normative) Flowsheet of the procedure for the acceptance of analytical values for test portions
Annex I	(informative) Additional information
I.1	General
I.2	Choice of sieving method (4.5)
I.3	End point ruling (4.8.2)
I.4	Construction of sieve media (5.1.3)
Annex J	(normative) Determination of the average particle size (APS)