

ISO 3082:2017-07 (E)

Iron ores - Sampling and sample preparation procedures

Contents		Page
Foreword		vi
1	Scope	1
2	Normative references	1
3	Terms and definitions	2
4	General considerations for sampling and sample preparation	4
4.1	Basic requirements	4
4.2	Establishing a sampling scheme	4
4.3	System verification	5
5	Fundamentals of sampling and sample preparation	6
5.1	Minimization of bias	6
5.1.1	General	6
5.1.2	Minimization of particle size degradation	6
5.1.3	Extraction of increments	6
5.1.4	Increment mass	7
5.2	Overall precision	8
5.3	Quality variation	10
5.4	Sampling precision and number of primary increments	11
5.4.1	Mass-basis sampling	11
5.4.2	Time-basis sampling	11
5.5	Precision of sample preparation and overall precision	12
5.5.1	General	12
5.5.2	Preparation and measurement of gross sample	13
5.5.3	Preparation and measurement of partial samples	13
5.5.4	Preparation and measurement of each increment	13
6	Methods of sampling	14
6.1	Mass-basis sampling	14
6.1.1	Mass of increment	14
6.1.2	Quality variation	14
6.1.3	Number of primary increments	15
6.1.4	Sampling interval	15
6.1.5	Methods of taking increments	15
6.2	Time-basis sampling	15
6.2.1	Mass of increment	15
6.2.2	Quality variation	15
6.2.3	Number of increments	16
6.2.4	Sampling interval	16
6.2.5	Methods of taking increments	16
6.3	Stratified random sampling within fixed mass or time intervals	16
6.3.1	General	16
6.3.2	Fixed mass intervals	17
6.3.3	Fixed time intervals	17
7	Sampling from moving streams	17
7.1	General	17
7.2	Safety of operations	17
7.3	Robustness of sampling installation	18

7.4	Versatility of sampling system	18
7.5	Primary samplers	18
7.5.1	Location	18
7.5.2	Types of primary sampler	18
7.5.3	General design criteria for primary cutters	19
7.5.4	Cutter aperture of primary sampler	23
7.5.5	Cutter speed of primary sampler	23
7.6	Secondary and subsequent samplers	24
7.7	Online sample preparation	24
7.7.1	Arrangement for sample preparation	24
7.7.2	Crushers	24
7.7.3	Dividers	24
7.7.4	Dryers	25
7.8	Checking precision and bias	25
7.9	Cleaning and maintenance	25
7.10	Example of a flowsheet	28
8	Sampling from stationary situations	30
8.1	General	30
8.2	Sampling from trucks and wagons	30
8.2.1	General	30
8.2.2	Sampling devices	30
8.2.3	Number of primary increments	31
8.2.4	Method of sampling	31
8.3	Sampling from ships, stockpiles and bunkers	31
9	Stopped-belt reference sampling	31
10	Sample preparation	32
10.1	Fundamentals	32
10.1.1	General	32
10.1.2	Drying	33
10.1.3	Crushing and grinding	33
10.1.4	Mixing	33
10.1.5	Division	34
10.1.6	Mass of divided sample	35
10.1.7	Split use and multiple use of sample	37
10.2	Method of constituting partial samples or a gross sample	39
10.2.1	General	39
10.2.2	Method of constitution for mass-basis sampling	39
10.2.3	Method of constitution for time-basis sampling	39
10.2.4	Special procedure for moisture content	40
10.3	Mechanical methods of division	40
10.3.1	Mechanical increment division	40
10.3.2	Other mechanical division methods	41
10.4	Manual methods of division	42
10.4.1	General	42
10.4.2	Manual increment-division method	42
10.4.3	Manual strip-division method	44
10.4.4	Manual riffle-division method	46
10.5	Preparation of test samples for chemical analysis	47
10.5.1	Mass and particle size	47
10.5.2	Preparation to 250 μm nominal top size	50
10.5.3	Final preparation	50
10.5.4	Grinding to 100 μm or 160 μm nominal top size	50
10.5.5	Distribution of samples for chemical analysis	51
10.6	Preparation of test samples for moisture determination	51
10.7	Preparation of test samples for size determination	52
10.8	Preparation of test samples for physical testing	52
10.8.1	Selection of sample preparation procedure	52
10.8.2	Extraction of test samples	54

10.8.3	Reserve samples	59
11	Packing and marking of samples	61
	Annex A (informative) Inspection of mechanical sampling systems	62
	Annex B (normative) Formulae for number of increments	69
	Annex C (informative) Alternative methods of taking the reference sample	72
	Annex D (normative) Procedure for determining the minimum mass of divided gross sample for size determination using other mechanical division methods	78
	Annex E (normative) Riffledividers	81
	Bibliography	83