

DIN EN ISO 14284:2023-04 (E)

Steel and iron - Sampling and preparation of samples for the determination of chemical composition (ISO 14284:2022)

Contents		Page
European foreword.....		5
Foreword.....		6
1	Scope	7
2	Normative references	7
3	Terms and definitions	7
4	Requirements for sampling and sample preparation	9
4.1	General.....	9
4.2	Sample.....	10
4.2.1	Quality.....	10
4.2.2	Size.....	11
4.2.3	Identification.....	11
4.2.4	Sample conservation.....	11
4.2.5	Sample for arbitration.....	11
4.3	Sampling.....	12
4.3.1	Sample from a melt.....	12
4.3.2	Sample from a product.....	12
4.4	Preparation of a sample.....	12
4.4.1	Preliminary preparation of a sample.....	12
4.4.2	Test sample in the form of chips.....	12
4.4.3	Test sample in the form of fragments.....	13
4.4.4	Test sample in the form of a solid block.....	13
4.4.5	Preparation of a test sample by remelting.....	15
4.5	Safety precautions.....	15
4.5.1	Personal protection.....	15
4.5.2	Machinery.....	15
4.5.3	Hazardous materials.....	15
5	Liquid iron for steelmaking and pig-iron production	15
5.1	General.....	15
5.2	Spoon sampling.....	16
5.2.1	Methods.....	16
5.2.2	Maintenance of equipment.....	17
5.3	Probe sampling.....	17
5.3.1	General.....	17
5.3.2	Methods.....	18
5.4	Preparation of a test sample.....	18
5.4.1	Preliminary preparation.....	18
5.4.2	Test sample for a chemical method.....	18
5.4.3	Test sample for a thermal method.....	18
5.4.4	Test sample for a physical method.....	18
6	Liquid iron for cast iron production	19
6.1	General.....	19
6.2	Spoon sampling.....	19
6.2.1	General.....	19
6.2.2	Methods.....	19
6.2.3	Chilled sample.....	20
6.2.4	Non-chilled sample.....	20

6.2.5	Maintenance of equipment.....	20
6.3	Probe sampling.....	21
6.4	Preparation of a test sample.....	21
6.4.1	Preliminary preparation.....	21
6.4.2	Test sample for chemical methods.....	21
6.4.3	Test sample for thermal methods.....	22
6.4.4	Test sample for physical methods.....	22
6.5	Sampling and sample preparation for the determination of oxygen and nitrogen.....	22
6.5.1	General.....	22
6.5.2	Method.....	22
6.5.3	Preparation of the test portion.....	22
7	Liquid steel for steel production.....	23
7.1	General.....	23
7.2	Spoon sampling.....	23
7.2.1	Methods.....	23
7.2.2	Maintenance of equipment.....	23
7.3	Probe sampling.....	24
7.3.1	General.....	24
7.3.2	Methods.....	24
7.4	Preparation of a test sample.....	24
7.4.1	Preliminary preparation.....	24
7.4.2	Test sample for chemical methods.....	24
7.4.3	Test sample for thermal methods.....	25
7.4.4	Test sample for physical methods.....	25
7.5	Sampling and sample preparation for the determination of nitrogen and oxygen.....	25
7.5.1	Methods of sampling.....	25
7.5.2	Preparation of the test portion.....	26
7.6	Sampling and sample preparation for the determination of hydrogen.....	26
7.6.1	General.....	26
7.6.2	Methods of sampling.....	27
7.6.3	Preparation of the test portion.....	27
8	Pig-irons.....	27
8.1	General.....	27
8.2	Increment sampling.....	27
8.2.1	Number of increments.....	27
8.2.2	Methods.....	28
8.2.3	Consignment of mixed pig-irons.....	28
8.3	Preparation of a test sample.....	28
8.3.1	General.....	28
8.3.2	Test sample for chemical methods.....	29
8.3.3	Test sample for thermal methods.....	29
8.3.4	Test sample for physical methods.....	30
9	Cast iron products.....	30
9.1	General.....	30
9.2	Sampling and sample preparation.....	30
9.2.1	General.....	30
9.2.2	Test sample for chemical methods.....	31
9.2.3	Sample in the form of a solid block for analysis by thermal methods.....	32
9.2.4	Test sample for physical methods.....	32
10	Steel products.....	32
10.1	General.....	32
10.2	Selection of a laboratory sample or a test sample from a cast product.....	33
10.3	Selection of a laboratory sample or a test sample from a wrought product.....	33
10.3.1	General.....	33
10.3.2	Sections.....	33
10.3.3	Plates or slabs.....	33
10.3.4	Light sections, bars, rods, sheets, strips and wires.....	33
10.3.5	Tubes and pipes.....	35
10.4	Preparation of a test sample.....	35
10.4.1	General.....	35

10.4.2	Test sample in the form of chips.....	35
10.4.3	Test sample in the form of a solid block.....	35
10.5	Sampling of leaded steel.....	36
10.6	Sampling and sample preparation for the determination of oxygen.....	36
10.6.1	General.....	36
10.6.2	Methods of sampling.....	36
10.6.3	Preparation of a test portion.....	37
10.7	Sampling and sample preparation for the determination of hydrogen.....	37
10.7.1	General.....	37
10.7.2	Methods of sampling.....	37
10.7.3	Preparation of a test portion.....	38
Annex A (informative) Sampling probes for use with liquid iron and steel.....		39
Annex B (informative) Sampling probes for use with liquid steel for the determination of hydrogen.....		47
Bibliography.....		50