

**PRODUCT MANUAL FOR  
Ferrosilicon  
According to IS 1110:1990**

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	<b>Product</b>	:	IS 1110:1990
	<b>Title</b>	:	Ferrosilicon
	<b>No. of amendments</b>	:	3
2.	<b>Sampling Guidelines</b>		
a)	<b>Raw material</b>	:	No specific requirement
b)	<b>Grouping Guidelines</b>	:	<p>Sample of each grade and size designation is to be testing for considering GoL/Inclusion.</p> <p>However, for applications intended to cover two or more grades for both the size designations, samples drawn should include size designation 1 of one grade and size designation 2 for any one of the remaining grades so as to cover both the size designations for these grades. Otherwise stated it means that there is no need to draw samples of both the size designations for each of the grades applied for in case of application intended for two or more grades.</p>
c)	<b>Sample Size</b>	:	100 gms
3.	<b>List of Test Equipment</b>	:	Please refer Annex - A
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer Annex – B
5.	<b>Possible tests in a day</b>	:	Size designation, Extraneous contamination ,Carbon & Sulphur by chemical method, all required elements by instrumental Method
6.	<b>Scope of the Licence :</b>		
	Licence is granted to use Standard Mark as per IS 1110:1990 with the following scope:		
	<b>Name of the product</b>	FERROSILICON	
	<b>Grade Designation</b>	FeSi65...	
	<b>Size Designation</b>	1,...	

**ANNEXURE A**  
**PRODUCT MANUAL FOR**  
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**LIST OF TEST EQUIPMENT**

Major test equipment required to test as per requirements of Indian Standard.

Sr. No.	Test Equipment	Tests used in with Clause Reference
1.	Sodium carbonate, Sodium peroxide, Dilute Hydrochloric Acid, Concentrated Hydrochloric Acid, Perchloric Acid, Silver Nitrate, Hydrofluoric Acid, Sulphuric Acid, Analytical balance, IS Sieve 150 microns, Nickel Crucible(25 to 30ml) or silicon free iron crucible with cover, Muffle furnace, Tongs, Polythene Beaker 500 ml with polythene cover plate, Glass beaker 500ml, Hot Plate, glass rod for stirring, filter paper, wash bottle, Platinum Crucible, Dessicator	Chemical Composition, Clause 7.2 (Silicon) and Table 1
2.	Dilute Sulphuric Acid, Concentrated Sulphuric Acid, Chromic Sulphuric Acid, Manganese sulphate, Ammonium Hydroxide, Ammonium Persulphate, soda, Asbestos, Anhydrous (Magnesium Perchlorate), Magnesite Brick Powder, Lead Foil, Buchner funnel, mortar grinder, IS Sieve 85(842 Microns) to 70(708 microns), IS Sieve 50, combustion boat, low carbon standard steel of known carbon content Recommended Apparatus: Apparatus for determination of carbon by gravimetric method comprising oxygen cylinder & purifier, furnace with combustion tube, train for purifying & absorbing CO <sub>2</sub>	Chemical Composition, Clause 7.2 (carbon) and Table 1
3.	Concentrated Nitric Acid, Concentrated Hydrochloric Acid, Hydrofluoric Acid, Sodium Carbonate, Zinc 99.9% pure, Barium Chloride, Acid Wash Solution, Dilute Hydrochloric Acid, Beaker 600ml tall form, Hot plate, pulp pad, filter assembly, platinum or porcelain crucible, Muffle furnace	Chemical Composition, Clause 7.2 (Sulphur) and Table 1
4.	Concentrated Nitric Acid, Hydrofluoric Acid, Dilute Potassium Permanganate Solution, sodium Nitrite solution, Boric Acid, Ammonium Hydroxide, Ammonium Molybdate, Potassium Nitrate wash solution, Nitric acid wash solution, Sodium Hydroxide, standard Sodium Carbonate solution, Distilled water, Methyl Orange, Phenolphthalein, Conical flask, Hot Plate, Platinum dish, filter assembly	Chemical Composition, Clause 7.2 (Phosphorus) and Table 1

5.	Hydrofluoric Acid, Concentrated Nitric Acid , Dilute Hydrochloric Acid , Concentrated Hydrochloric Acid, Sodium Hydroxide solution, Ammonium Chloride solution ( 50% & 2%), Phenolphthalein solution, EDTA, Congo Red Indicator paper, Sodium Acetate, glacial acetic acid, Xylenol Orange, Zinc Acetate, glacial acetic acid, distilled water, Aluminium foil 99.9 percent, Absolute Alcohol, Ammonium Fluoride, Perchloric acid, Distilled water  Dessicator, Hot plate, Platinum dish, polythene Beaker, Steam bath, Volumetric flask 500ml, conical flask, Steam bath, pipette	Chemical Composition, Clause 7.2 (Aluminium) and Table 1
6.	Hydrofluoric Acid, concentrated Nitric Acid, Perchloric Acid, Sodium Carbonate, Potassium carbonate , Dilute Hydrochloric Acid, Ammonium Chloride, Ammonium Hydroxide solution, Sodium Hydroxide solution, EDTA., calcein or Murexide Indicator solution  Platinum Crucible, Hot Plate, Water bath	Chemical Composition, Clause 7.2 (Calcium) and Table 1
7.	Hydrofluoric Acid, Concentrated Nitric Acid, Dilute Sulphuric Acid, Phosphoric Acid, Silver Nitrate solution, Ammonium Persulphate solution, Sodium Chloride solution, Arsenous Oxide, Sodium Hydroxide, Hydrochloric Acid, Phenolphthalein, Sodium Bicarbonate, Potassium Permanganate, Concentrated Sulphuric Acid, Concentrated Hydrochloric Acid Platinum Crucible, Hot Plate, pipette	Chemical Composition, Clause 7.2 (Manganese) and Table 1
8.	ICP-AES	Chemical Composition, Clause 7.2 (Ti,B,Zr) and Table 1
9.	Analytical balance, distilled water still, burette, pipette, filter assembly, volumetric flask, wash bottles, fuming chamber, dessicator, Hot plate or heating element, What man filter paper 40,41, conical flask	Chemical composition Clause 7.2 General equipments
10.	IS Sieve 3mm, 10 mm, 40 mm, 150 mm	Size Clause 8

Note: 1. Any other established Instrumental or Chemical method may also be used for Chemical composition. However in case of dispute the procedure given in latest version of IS 1599 shall be the referee method.

2. This is an indicative list for the purpose of guidance only and may not be taken as exhaustive

**ANNEXURE B**  
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**SCHEME OF INSPECTION AND TESTING**

1. **LABORATORY** - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.
  - 1.1 The manufacturer shall prepare a calibration plan for the test equipments.
2. **TEST RECORDS** –The manufacturer shall maintain test records for the tests carried out to establish conformity.
3. **LABELLING AND MARKING**–The Standard Mark as given in the Schedule of the license and Licence Number (i.e. CM/L.....) shall be marked on each package and the marking shall be done as per the provisions of the Indian Standard, provided always that the product thus marked and packed conforms to all the requirement of the specification. In addition each container the information *For details of BIS certification please visit [www.bis.gov.in](http://www.bis.gov.in)* shall also be marked.
  - 3.1 **TEST CERTIFICATE** - For each consignment of BIS Certified material conforming to the specification there shall be a test certificate which shall contain the Standard Mark, the lot/cast number and the corresponding test results (as given in Annexure- I enclosed).
4. **CONTROL UNIT** – For the purpose of this scheme each Cast(Melt) of Ferrosilicon shall constitute a control unit.
5. **LEVELS OF CONTROL** - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.
  - 5.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.
  - 5.2 **REJECTIONS** – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

**TABLE 1 LEVELS OF CONTROL**  
(Clause 5 of the Scheme of Inspection and Testing)

TEST DETAILS				Test equipment requirement R: required (or)S: Sub-contracting permitted	LEVELS OF CONTROL		Remarks
Clause	Requirements	Test Method			No. of Samples	Frequency	
		Clause	Reference				
7.1	Constitution of Consignment	3.3, 7.1	IS 1110:1990	R		Adequate inspection to ensure that each consignment is complying with requirements specified for lot method	
7.2	Chemical Composition						
	i) Silicon	7.2.1, 7.2.2, 7.2.3, 7.2.4 and Table-1	IS 1110:1990 IS 1559 (Parts 1 to 7) or any other established instrumental/chemical method.	R	1	Casts of same grade produced in a week	
	ii) Carbon			R	1	-do-	
	iii) Sulphur			R	1	-do-	
	iv) Phosphorus			R	1	-do-	
	v) Aluminium			R	1	-do-	
	vi) Calcium			R	1	-do-	
	vii) Manganese			R	1	-do-	
	viii) Boron			S	1	Casts of same grade produced in a year	
	ix) Zirconium			S	1	-do-	
	x) Titanium			S	1	-do-	
8	Size			8	IS 1110:1990	R	Each Packed bag or container
9	Extraneous contamination	9	IS 1110:1990	R	1	Each Control Unit	

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: The control unit and levels of control as decided by the Bureau are obligatory to which the licensee shall comply with.

**ANNEXURE I**  
**TEST CERTIFICATE FORMAT**  
**XYZ COMPANY**  
**TEST CERTIFICATE FOR Ferrosilicon According to IS 1110:1990**

<b>BIS STANDARD MARK</b>
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TEST CERTIFICATE NO. \_\_\_\_\_ DATED \_\_\_\_\_  
 To M/s \_\_\_\_\_

It is certified that the material described below fully conforms to IS 1110:1990. Chemical and physical properties of the product, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks Licence No. CM/L \_\_\_\_\_ are as indicated below against each order no. etc.

(PLEASE REFER TO IS 1110:1990 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

**TEST RESULTS**

Order no & date	Constitution of consignment	Grade	Cast No./ Melt No.	Quantity (in tonnes)	Chemical Analysis (in %)										Size Designation	Remarks
					Al	Ca	C	Si	S	Ph	B*	Ti*	Zr*	Mn		

\*As and when tested

REMARKS  
 SHIPPING ADVICE NO. WAGON No.s

FOR XYZ COMPANY

**"For details of BIS certification please visit [www.bis.gov.in](http://www.bis.gov.in)**