



उत्पाद मैनुअल
Ferric Chloride, Technical - Specification
IS 711:2023 के अनुसार

PRODUCT MANUAL
FOR Ferric Chloride, Technical - Specification
ACCORDING TO IS 711:2023

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना- I के तहत प्रमाणन के संचालन में अभ्यास और पारदर्शिता के संचालन में पारदर्शिता सुनिश्चित करने के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन लाइसेंस/प्रमाणपत्र प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

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.	उत्पाद Product	:	IS 711:2023
	शीर्षक Title	:	Ferric Chloride, Technical - Specification
	संशोधनों की संख्या No. of amendments	:	NIL
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific requirements
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	NA (Each form to be tested)
c)	नमूने का आकार Sample Size	:	Anhydrous powder - 500 gram, Liquid/ Hydrated - 500 ml
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer Annex-A

4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer Annex-B
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	All tests		
6.	लाइसेंस का दायरा / Scope of the Licence:		
	“Licence is granted to use Standard Mark as per IS 711:2023 with the following scope:		
	Name of the product	Ferric Chloride, Technical	
	Form	Anhydrous powder/Hydrated/Liquid.	

BUREAU OF INDIAN STANDARDS
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ANNEX-A

LIST OF TEST EQUIPMENTS

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests Used In With Clause Reference	Test Equipment/Chemical
1.	Relative Density at 25°/25°C	• Relative Density Hydrometer • Hydrometer Cylinder • Thermometer — of a suitable range and conforming to IS 2480 (Part 1) • Constant Temperature Bath
2.	Ferric chloride	• Gooch crucible/ Sintered Glass Crucible • Potassium Iodide • Conc HCl • Glass stoppered flask • Titration assembly • Standard Sodium Thiosulphate Solution • Solid Cuprous Iodide • Distilled Water • Weighing Balance • Beaker/ Measuring cylinder • Starch Solution
3.	Free acid or basicity	• Weighing Balance • Rectified Spirit • Phenolphthalein indicator • Titration assembly • Volumetric Flask • Conical Flask • Standard Potassium Hydroxide Solution • Standard HCl • Potassium Fluoride Solution
4.	Ferrous salts	• Potassium ferrocyanide solution • Conc HCl • Distilled Water • Beakers • Weighing Balance
5.	Insoluble matter	• Glass crucible/Tared sintered glass crucible • Weighing Balance • Distilled Water • Drying Oven (110oC) • Dilute HCl
6.	Free chlorine	• Starch Iodide Paper • Weighing Balance • Hot Plate • Flask • Distilled Water

7.	Sulphates	• Barium chloride Solution • Weighing Balance • Distilled Water • Drying Oven (110oC) • Gooch Crucible/ Sintered Glass Crucible • Filter Papers • Hot Plate • Pipette • Dilute HCl OR Ion chromatography setup as per B-20
8.	Nitrates	• Weighing Balance • Dilute HCl • Conc HCl • Standard potassium nitrate solution • Conc H₂SO₄ • Dilute H₂SO₄ • Standard Indigo Carmine Solution • Distilled water • Flask/ Beakers • Hot Plate • Titration assembly • Dilute ammonium hydroxide solution OR Ion chromatography setup as per B-20
9.	Alkalis and alkaline earths (expressed as sulphates)	• Hydrogen Peroxide • Separating funnel • Filter Papers • Hot plate • Platinum Crucible • Weighing Balance • Conc HCl • Dilute HCl • Distilled water • Ether • H₂SO₄ • Ammonium thiocyanate Solution • Potassium permanganate solution • Amyl alcohol • Amyl Acetate
10.	Copper	• Hydrogen Peroxide Ether • Copper sulphate Ethyl alcohol • Solid Ammonium chloride Sodium Hydroxide • Chloroform • Potassium Ferrocyanide Solution Rectified spirit • Standard HCl • Standard Zinc Solution Separating Funnel Distilled water • pH paper/ pH meter Turbidity meter Weighing

		balance Hot plate • Thymol blue indicator • Dilute Ammonium Hydroxide Solution Citric Acid • Carbon Tetrachloride Anhydrous Sodium Sulphate Resorcinol • Titration assembly • Sodium Diethyl Dithiocarbamate Solution • Standard copper solution • Dithizone solution • Nessler cylinder OR ICP-OES setup as per B-11.4
11.	Arsenic	Apparatus for Determination of Arsenic (Modified Gutzeit Method) • Lead Acetate Solution • Lead Acetate Paper Strips • Absorbent Cotton wool Impregnated with Lead Acetate • Mercuric Bromide Solution • Sensitized Mercuric Bromide Paper Strips • Dilute Sulphuric Acid Conc. Hydrochloric Acid • Potassium Iodide Solution (15% m/v) Stannous Chloride Solution • Zinc Granules • Standard Arsenic Stock Solution Silver Diethyldithiocarbamate solution Rubber Stopper • Tweezers Or Apparatus for Determination of Arsenic (Silver Diethyldithiocarbamate Method) • Spectrophotometer or Photoelectric Absorptiometer • Photometric Cells • Standard Arsenic Stock Solution Conc. Hydrochloric Acid • Potassium Iodide Solution (15% m/v) Stannous Chloride Solution • Absorbent Cotton wool Impregnated with Lead Acetate • Silver Diethyldithiocarbamate solution
12.	Cyanide	a) For determination of cyanide using Titrimetric method as per IS 3025 (Part 27/Sec 1) : 2021 (applicable for concentrations above 1 mg/L or 1 ppm) Apparatus • Cyanide Distillation Apparatus consisting of • Boiling Flask, Heating Mantle, Gas Absorber, Ground Glass ST Joints • Koch micro burette of 10 ml capacity

		- Analytical Balance and other standard laboratory apparatus Reagents - Distilled water - sodium hydroxide - Lead Carbonate — Powdered - Sulphamic Acid - magnesium chloride - Sulphuric Acid Concentrated. - Glacial acetic acid - p-dimethyl amino benzal rhodanine - acetone. - Silver nitrate - Sodium chloride - Potassium chromate indicator OR b) For determination of cyanide using Flow Injection Analysis as per IS 3025 (Part 27/Sec 2) : 2022 (applicable for cyanide concentrations from 2 µg/l to 500 µg/l) - Flow injection analysis system for gas diffusion method (as per IS 3025 (Part 27/Sec 2)) - Lead acetate test paper, - Membrane filter assembly, with membrane filters having a pore size of 0.45 µm - pH measuring device - Other laboratory apparatus - Standard laboratory reagents and other reagents as per IS 3025 (Part 27/Sec 2) OR c) For determination of cyanide using continuous flow analysis (CFA) as per IS 3025 (Part 27/Sec 3) : 2021 (applicable for cyanide concentrations from 2 µg/l to 500 µg/l) - Continuous flow analysis system for distillation method as per IS 3025 (Part 27/Sec 3) or Continuous flow analysis system for gas diffusion method. - Lead acetate test paper, - Membrane filter assembly, with membrane filters having a pore size of 0.45 µm - pH measuring device - Other laboratory apparatus - Standard laboratory reagents and other reagents as per IS 3025 (Part 27/Sec 3)
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13.	Cadmium	Atomic absorption spectrometer and associated Equipment as per IS 3025 (Part 41):2023 OR ICP-OES and associated equipment
14.	Lead	Apparatus and reagents for determination of lead as per A-8 of IS 299:2012 • Nessler cylinder, 100 ml capacity and other standard laboratory apparatus • Lead nitrate • Acetic Acid • Hydrogen Sulphide Gas • Distilled water and other standard laboratory reagents OR ICP-OES and associated equipment
15.	Mercury	Apparatus and reagents for determination of mercury as per A-10 of IS 299:2012 • Mercury Analyzer, based on cold vapour atomic absorption spectrometry technique • Other standard laboratory apparatus • Nitric Acid • Concentrated Hydrochloric Acid • hydrochloric acid • stannous chloride • tin metal (pellet) • sulphuric acid • potassium permanganate • Hydroxylamine Hydrochloride • Mercuric Chloride, A.R. Grade • Potassium Dichromate • Distilled water and other standard laboratory reagents
16.	Nickel	Apparatus and reagents for determination of nickel as per AAS method given IS 3025 (Part 54) • Atomic absorption spectrophotometer with air-acetylene flames. Hollow-cathode lamp or electrodeless discharge lamp for use at 232.0 nm • Hydrochloric Acid, Nitric Acid, Sulphuric Acid, nickel oxide, other standard laboratory apparatus and reagents OR ICP-OES and associated equipment

17.	Selenium	Apparatus and reagents for determination of nickel as per AAS method given IS 3025 (Part 56) • Atomic Absorption Spectrometer — Fitted • with a hydride system and a suitable radiation source for the determination of selenium • Gas Supply — with argon or nitrogen • Glassware and other standard laboratory apparatus • Sulphuric Acid, Hydrochloric Acid, Hydrogen Peroxide, Sodium Hydroxide, Sodium Tetrahydroborate, selenium dioxide, distilled water and other laboratory reagents OR ICP-OES and associated equipment
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The list above is indicative only and may not be considered as exhaustive

ANNEX B

SCHEME OF INSPECTION AND TESTING

1. **LABORATORY-** A laboratory shall be maintained, which shall be suitably equipped (as given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the method given in the specification.

1.1 The manufacturer shall prepare and implement a calibration plan for the test equipment.

2. **TEST RECORD-** The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. **PACKING AND MARKING** - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each container, containing this product provided always that the material so marked conforms to each requirement of the specification.

3.2 Packing and Marking shall be done as per the requirements of the standard. The containers shall also be marked with the following:

a) BIS licence number and "For BIS certification details please visit www.bis.gov.in"

4. **CONTROL UNIT-** For the purpose of this scheme, entire quantity of the material produced in a reaction vessel at a time shall be taken as one control unit.

5. **LEVELS OF CONTROL:-** The tests as indicate in Table 1 and at the levels of controls in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark.

6. **REJECTION** - 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.

TABLE1
LEVELS OF CONTROL

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or)S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods Clause Reference			No. of Sample	Frequency	Remarks
4.1	Description	4.1	IS 711:2023	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
Table 1	Requirements for Ferric Chloride, Technical						
i)	Relative Density at 25°/25°C	B-2	IS 711:2023	R	One	Each control unit	
ii)	Ferric chloride (as FeC13)	B-3	IS 711:2023	R	One	Each control unit	
iii)	Free acid (HCl) or Basicity (as Fe2O3)	B-4	IS 711:2023	R	One	Each control unit	
iv)	Ferrous salts (as FeCl2)	B-5	IS 711:2023	R	One	Each control unit	
v)	Insoluble matter	B-6	IS 711:2023	R	One	Each control unit	

vi)	Free chlorine (as Cl)	B-7	IS 711:2023	R	One	Each control unit	
vii)	Sulphates (as SO ₄)	B-8 or B-20	IS 711:2023	R	One	Each control unit	
viii)	Nitrates (as NO ₃)	B-9 or B-20	IS 711:2023	R	One	Each control unit	
ix)	Alkalis and alkaline earths (expressed as sulphates)	B-10	IS 711:2023	R	One	Each control unit	
x)	Copper	B-11	IS 711:2023	R	One	Each control unit	
xi)	Zinc	B-11	IS 711:2023	R	One	Each control unit	
xii)	Arsenic (as As ₂ O ₃)	B-12	IS 711:2023	R	One	Each control unit	
xiii)	Cyanide (as CN ⁻)	B-13	IS 711:2023	R	One	Each control unit	
xiv)	Cadmium (as Cd)	B-14	IS 711:2023	R	One	Each control unit	
xv)	Chromium (as Cr),	B-15	IS 711:2023	R	One	Each control unit	
xvi)	Lead (as Pb),	B-16	IS 711:2023	R	One	Each control unit	
xvii)	Mercury (as Hg),	B-17	IS 711:2023	R	One	Each control unit	
xviii)	Nickel (as Ni)	B-18	IS 711:2023	R	One	Each control unit	
xix)	Selenium (as Se)	B-19	IS 711:2023	R	One	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: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.