www.bis.gov.in

उत्पाद मैन्युअल
हाइड्रोक्लारिक अम्ल - विशिष्टि
IS 265: 2021 के अनुसार

PRODUCT MANUAL FOR
Hydrochloric Acid — Specification
ACCORDINGTO IS 265: 2021

नियम 2018 की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरणके प्रचलन मे रीति और पारदर्शिता के सुसंगता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप मे उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग 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.	**मानक संख्या** **IS No.**	:	IS 265:2021
	शीर्षक **Title**	:	Hydrochloric Acid — Specification
	संशोधनों की संख्या **No. of amendments**	:	NIL
2.	**नमूना दिशानिर्देश** **Sampling Guidelines**		
a)	**कच्चा माल** **Raw material**	:	N.A
b)	**समूहीकरण दिशानिर्देश** **Grouping Guidelines**	:	Sample shall be tested for each Grade to cover respective grade
c)	**नमूने का परिमाण** **Sample Quantity**	:	2 X500 ml Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)
d)	**परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर** **Parameters to be Declared**		1.Grades

	in Test Request		Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.
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 aday**		
	a) Description b) Total acidity c) Iron d) Free chlorine and bromine e) Sulphites (SO2) f) Heavy Metals g) Residue on Ignition h) Sulphates (H2SO4) i) Arsenic j) Ammonium compounds k) Mercury l) Organic carbon		
6.	**लाइसेंस का दायरा /Scope of the Licence:**		
	"Licence is granted to use Standard Mark as per IS 265: 2021 with the following scope:		
	Name of the product	Hydrochloric Acid	
	Grade	a) Technical Grade b) Chemical Pure Grade c) Food Grade d) Analytical reagent Grade e) Boiler Water Grade	

ANNEX – A

LIST OF TEST EQUIPMENTS

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Tests Used In With Clause Reference	Test Equipment
1.	**TOTAL ACIDITY, Cl. 4.2 & B1**	Lung-Rey Pipette/Ordinary weighing bottle/Glass ampoule Burette Stand Volumetric flask-100ml Sodium Hydroxide Methyl Orange indicator Distilled water Weighing balance Conical flask-500ml Glass Beaker – 250ml Hydrochloric Acid
2.	**RESIDUE ON IGNITION, Cl. 4.2 & C1**	Hydrochloric Acid Weighing balance Platinum/Silica dish Sand bath Fume cupboard Concentrated Sulphuric Acid Pipette – 1ml Desiccator Electric furnace Stopwatch
3.	**SULPHATES, Cl. 4.2, D1, D2, D3 & D4**	**FOR TECHNICAL, BOILER, CHEMICALLY PURE AND FOOD GRADE** Hydrochloric Acid Weighing balance Porcelain dish Sodium Carbonate-Analytical reagent grade Hot plate Barium Chloride Pipette – 5ml Distilled water Sintered glass crucible (G NO.4)/Gooch crucible Filtration assembly Vacuum pump Laboratory Oven **FOR ANALYTICAL REAGENT GRADE** Hydrochloric Acid Weighing balance Porcelain dish Sodium Carbonate-Analytical reagent grade Barium Chloride Distilled water Potassium Sulphate Volumetric flask- 1000ml Pipette – 1ml & 10ml

		Hot plate Hydrochloric Acid-1N (Approximately) Test tubes
4.	**IRON, Cl. 4.2, E2 & E3**	**<u>METHOD 1(BIPYRIDYL METHOD)</u>** Hydrochloric Acid Spectrophotometer/Photoelectric absorptiometer Dil. Hydrochloric acid Hydroxylammonium Chloride 2,2-bipyridyl Hot plate Ferrous Ammonium sulphate Ammonium Acetate Platinum/Silica dish of 100ml Water Bath Volumetric flask-100ml ,1000ml Pipette – 1ml,2ml,5ml(graduate) Weighing balance Measuring jar – 25ml,50ml Concentrated sulphuric acid Distilled water **<u>METHOD 2(THIOCYANATE METHOD)</u>** Hydrochloric Acid Weighing balance Hot plate Nessler cylinders – 50ml capacity Ammonium Per sulphate n-Butanol Potassium Thiocyanate Pipette – 2ml,5ml,25ml(graduate) $KMnO_4$ Volumetric flask-100ml Standard iron solution Distilled water
5.	**CHLORINE & BROMINE, Cl.4.2, F2 & F3**	**<u>TECHNICAL GRADE</u>** Hydrochloric Acid Conical flask-100ml Weighing balance Stoppered weighing bottle Pipette – 1ml,10ml(graduate) Distilled water Stopper Conical flask-500ml Ferric Iron salt (Water soluble) Potassium iodide Starch Sodium thiosulphate-0.1N Glass cylinder- 25ml,50ml(graduate) **<u>BOILER WATER, CHEMICALLY PURE AND ANALYTICAL REAGENT GRADES</u>** Hydrochloric Acid Distilled water Pipette -10ml(graduate) Micro burette-5 ml Cadmium iodide Starch

		Pipette – 1ml,5ml(graduate) Sodium thiosulphate-0.05N **Glass cylinder- 25ml (graduate)**
6.	**SULPHITES, Cl. 4.2, G2 & G3**	**FOR BOILER WATER,TECHNICAL & CHEMICALLY PURE GRADE** Hydrochloric Acid Weighing balance Measuring jar 25ml,50ml and 100ml Pipette – 5ml,10ml(graduate) Distilled water Stopper Conical flask-500ml Standard Iodine-0.1N Starch Sodium thiosulphate-0.1N **FOR ANALYTICAL REAGENT GRADE** Potassium Iodide Hydrochloric Acid Standard Iodine -0.01N Starch Distilled water Stoppered Conical Flask-500ml Pipette – 5ml (graduate) Micro burette-5 ml Measuring jar-100ml
7.	**HEAVY METALS, Cl.4.2 & H1**	Hydrochloric Acid Weighing balance Distilled water Platinum or silica crucible(100ml capacity) Steam bath Hot plate Volumetric flask -1000ml Dilute hydrochloric acid Dilute Ammonia solution Standard Iron solution Nessler cylinder – 50ml Concentrated Nitric Acid Pipette – 5ml,10ml(graduate) Lead Nitrate Dilute Acetic acid Hydrogen Sulphide gas Measuring jar-25 ml Ferrous **Ammonium Sulphate** **Sulpuric Acid**
8.	**ARSENIC, Cl. 4.2 & J1**	Hydrochloric Acid Spectrophotometer/Photoelectric absorptiometer Cotton wool Weighing balance Rectified sprit Arsenic trioxide Weighing bottle Glass beakers-100ml, 250ml Glass cylinder- 250 ml Water white pyridine Pipette – 2ml,5ml,10 ml(graduate)

		Volumetric flask-100ml,250ml,1000ml Stoppard glass bottle-250ml Silver diethyldithiocarbamate Lead Acetate Mercuric bromide Dilute Sulphuric acid Concentrated Hydrochloric Acid Potassium Iodide Stannous chloride Zinc granules Standard Arsenic Apparatus as per Cll 3.2 of IS 2088 Sodium hydroxide Silver nitrate cold bath pyridine ether arrangement for drying in oven Hydro Fluoric Acid Hydrogen Peroxide Paper strips Distilled water
9.	**AMMONIUM COMPOUNDS, Cl. 4.2 & K1**	Sodium Hydroxide Hydrochloric Acid Ammonium Chloride Distilled water Potassium Iodide Mercuric Chloride Pipette – 1ml,2ml(graduate) Litmus paper Conical flask-250ml Volumetric flask – 1000ml
10.	**Mercury, Cl. 4.2, L1 & L2**	**<u>DITHIZONE METHOD</u>** Hydrochloric Acid Beaker-250ml Dithizone Separating funnel-500ml Chloroform Ammonia Glacial Acetic acid 1:1 Sulphuric Acid Volumetric flask – 100ml,500ml,1000ml Distilled water Pipette – 5ml,10ml(graduate) Measuring cylinder-25ml Disodium salt of EDTA Potassium Thiocyanate Sodium Acetate Sulphuric Acid Mercuric Chloride Potassium Permanganate Hydroxylamine Hydrochloride **<u>MERCURY ANALYZER METHOD</u>** Mercury Analyzer(Cold vapour atomic absorption

		technique) Hydrochloric Acid Volumetric flask – 100ml Potassium Permanganate Concentrated Nitric Acid Measuring cylinder– 50ml Pipette – 5ml,10ml(graduate) Hydroxylamine Hydrochloride Distilled water Stannous chloride Potassium dichromate Mercuric chloride
11.	**TOTAL ORGANIC CARBON (TOC), Cl. 4.2, M1**	TOTAL ORGANIC CARBON (TOC) Analyser Potassium hydrogen phthalate(AR) Sodium Hydroxide (AR) Sodium Hydrogen Carbonate(AR) Hydrochloric Acid Millipore water P^H meter Volumetric flask – 500ml Laboratory Oven Desicator Measuring cylinders-25ml,50ml Beaker-250ml

Annex B

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing theStandard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the differenttests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 **RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT**:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: entire quantity of the acid of one grade produced at a time in each reaction vessel.

The material produced only by synthesis of pure chlorine and hydrogen shall be suitable for food grade. Hydrochloric acid obtained as a by-product from other chlor-organic processes, will not be suitable material for food grade unless it meets the requirement of total organic carbon as specified in the Table 1 of IS 265

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommendedlevels of control are given in **Table 1**. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan.

2. ENSURING COMPLIANCE THROUGH TESTING- Manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred:

i) Shared testing resources like common facility,

ii) Cluster based testing facility,

iii) Sub-contracting to outside laboratories which may either be:

a) BIS recognised/empanelled laboratories, or

b) Any accredited laboratory as per ISO/IEC 17025

2.1 **TEST RECORDS**- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be

incorporated legibly and indelibly on container of the acid provided always that the material in each container to which this mark is thus applied conforms to every requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 **Additional Marking requirements**: The container of the material shall also be marked with the following additional requirement.

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

4. HYGIENIC CONDITIONS: In case of food grade Hydrochloric acid, hygienic conditions shall be complied in day to day production and quality control activities, Schedule for each activity for this purpose shall be displaced prominently in the factory premises and records of compliance shall be maintained

5. REJECTION - The production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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,201

Table 1
(Recommended Levels of Control By BIS- For Guidance Only)

1				2		
TEST DETAILS				**LEVELS OF CONTROL**		
CLAUSE	**REQUIREMENTS**	**TEST METHOD**				
		CLAUSE	**REFERENCE**	**NO OF SAMPLES**	**FREQUENCY**	**REMARKS**
4.1	Description		265:2021	One	Each control unit	
4.2	Total Acidity	Annex B	-do-	-do-	-do-	
-do-	Residue on ignition	Annex C	-do-	-do-	-do-	
-do-	Sulphates	Annex D	-do-	-do-	-do-	
-do-	Iron	Annex E	-do-	-do-	-do-	
-do-	Free chlorine and bromine	Annex F	-do-	-do-	-do-	
-do-	Sulphites	Annex G	-do-	-do-	-do-	
-do-	Heavy metals	Annex H	-do-	-do-	-do-	
-do-	Arsenic	Annex J	-do-	-do-	-do-	
-do-	Ammonium compounds	Annex K	-do-	-do-	-do-	
-do-	Mercury	Annex L	-do-	-do-	-do-	
-do-	Organic carbon	Annex M	-do-	-do-	-do-	