PRODUCT MANUAL FOR LIQUID CHLORINE, TECHNICAL ACCORDING TO IS 646: 2020

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.	**Product**	:	IS 646: 2020
	Title	:	Liquid Chlorine, Technical - Specification
	No. of Amendments	:	0
2.	**Sampling Guidelines:**		
a)	**Raw material**	:	No specific requirement.
b)	**Grouping guidelines**	:	Not applicable (no varieties are indicated in the ISS).
c)	**Sample Size**	:	Adequate sample may be ensured based on the test method employed. Shall be tested in the factory for all the requirements. (Owing to the harmfulness of the material and the fact that currently there is no BIS recognised OSL).
3.	**List of Test Equipment**	:	Please refer ANNEX –A
4.	**Scheme of Inspection and Testing**	:	Please refer ANNEX –B
5.	**Possible tests in a day:**		
	All requirements.		
6.	**Scope of the Licence:**		
	“Licence is granted to use Standard Mark as per IS 646: 2020 with the following scope:		
	Name of the product	Liquid Chlorine, Technical	

ANNEX A

List of Test Equipment

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference	Test Equipment
1.	Description (Clause 2.1)	i. Clean white tile.
2.	Composition (Clause 2.2)	i. Mercurimetric Method (Assembly as per Fig. 1 of IS 646) i. Sample cylinder ii. Filtering tube – consisting of a 150 x 6 mm iron nipple iii. Needle valve iv. Gas collecting bomb of 250 ml capacity and provided with a calibrated neck made of 5 mm bore thick-walled tubing. The capacity of calibrated neck shall be 2.5 ml, subdivided to 0.02 ml with every 0.1 ml numbered. Graduation shall extend at least half way around and every fifth mark shall be calibrated around circumference. v. Levelling bottle vi. Two-way stop cock (at least 3 in numbers) – 2 mm bore. vii. Bubbler viii. Concentrated Hydrochloric acid ix. Empty catch bottle x. Pail xi. Milk of lime or caustic soda solution xii. 60 cm long heavy rubber tubing xiii. Clean, dry mercury xiv. Beaker xv. Ring stand ii. OrsatMethod i. Assembly as specified in Fig. 2 of IS 646 ii. Special burette as in Fig. 2B of IS 646. iii. Potassium Iodide solution iv. Acidic brine – Saturated sodium chloride brine made acidic with hydrochloric acid

		v. Caustic soda solution vi. Absorption bulb vii. 3-way stop cock viii. Purge line
3.	Moisture (Clause 2.3)	i. Phosphorus Pentoxide Powder ii. Magnesium Perchlorate – granules in the size range 3 to 5 mm. iii. Sodium Hydroxide iv. Iodized Starch Indicator – 0.2 % starch solution containing 40 g of potassium iodide and 4 g of sodium hydrogen carbonate per litre v. Acetone vi. Chlorine-Resistant Grease vii. Apparatus shown as per Fig. 3 of IS 646 viii. Weighing balance with least count of at least 0.1 mg.
4.	Mercury (A-3)	i. Mercury Analyser based on Cold Vapour atomic absorption spectrometry technique ii. Analytical Balance (LC 0.1 mg) iii. pH meter iv. 100 ml beaker, 100 ml, 250 ml volumetric flask v. Sodium Hydroxide Solution, Dilute Hydrochloric Acid (1:1), 4% Potassium Permangnate, Stannous Chloride, Hydroxylamine Hydrochloride 10%, Mercuric Chloride AR Grade, Potassium Dichromate 1%
5.	Arsenic (A-4)	i. Analytical Balance (LC 10 mg) ii. Apparatus for test of Arsenic (Modified Gutzeit Method) as per Fig 1 of IS 2088 iii. Thermometer iv. Reagents and materials: Arsenic Trioxide, Sodium Hydroxide, Lead Acetate Solution, Filter Paper, Absorbent Cotton Wool, Dilute Sulphuric Acid, Stannous Chloride Solution, Potassium Iodide Solution
6.	Lead (A-5)	i. ICP-OES or Atomic Absorption Spectrophotometer OR i. Nessler Cylinder (100 ml), Analytical balance (LC 1 mg), Standard Lead Solution, Acetic Acid, Hydrogen Sulphide Gas
7.	Miscellaneous	i. Water for general laboratory use ii. Glass burette

		iii.	Dryer
		iv.	Stop watch / timer / clock
		v.	Calculator
		vi.	Standard/Ordinary laboratory facilities,glassware and chemicals.
		vii.	Sample container
		viii.	Adequate and safe facility for sampling and testing in view of harmful nature of chlorine.

The above list is indicative only and may not be treated as exhaustive.

ANNEX B

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 equipment.

2. TEST RECORDS – 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 license shall be stencilled or printed on the label affixed to each container of the product, provided always that the product thus marked and packed conforms to all the requirement of the specification.

3.1 Marking and packing shall be done as per the provisions of the Indian Standard. In addition In addition, the following details shall be mentioned on each container:

a) BIS Licence No. CM/L _____.

b) BIS website details i.e–"For details of BIS certification please visit www.bis.gov.in"

4. CONTROL UNIT – For the purpose of this Scheme, the total quantity of the material produced during the day, 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 If the sample fails to satisfy the requirement of any of the characteristics, the particular control unit shall be considered unfit for the purpose of marking. This material may, however, be reprocessed and the defect rectified.

6. PRECAUTIONS IN HANDLING – Chlorine is a powerful irritant to skin, mucous membrane and respiratory system. Because of hazardous nature of liquid chlorine, intending users are strongly advised to take guidance from IS 4263.

6.1 In India, chlorine is deemed to be an explosive, when contained is any metal container, in a compressed or liquefied state, within the meaning of the Indian Explosives Act, 1984. The filling, possession, transport and importation is governed by the Gas Cylinder Rules, 2016.

7. 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

(1)				(2)	(3)		
Test Details				**Test equipment requirement R: required (or) S: Sub-contracting permitted**	**Levels of Control**		
Cl.	**Requirement**	**Test Method**			**No. of Sample**	**Frequency**	**Remarks**
		Clause	**Reference**				
3.1	Description	3.1	IS 646: 2020	**R**	One	Once in a month	Test is to be carried out with utmost care as the exposure to liquid chlorine is very harmful and could be fatal.
3.2	Composition	Appendix - A	-do-				-do-
Table 1 , Sl no (i)	Chlorine in vapourized liquid	A-2	-do-	**R**	One	Each Control Unit	-do-
Table 1 , Sl no (ii)	Moisture	Appendix - B	-do-	**R**	One	Fortnightly	-do-
Table 1 , Sl no (iii)	Mercury	A-3	-do-	**R**	One	-do-	-do-
Table 1 , Sl no (iv)	Arsenic	A-4	-do-	**R**	One	-do-	-do-
Table 1 , Sl no (v)	Lead	A-5	-do-	**R**	One	-do-	-do-
3	Packing and Marking	3	-do-	Adequate inspection to ensure that the containers are suitably packed and marked as per stipulated requirements.			

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 empaneled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer maydefine the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval to BO head.