

भारतीय मानक मसौदा
क्लोरीन की गोलियाँ — विशिष्टि

(IS 9825 का तीसरा पुनरीक्षण)

Draft Indian Standard
Chlorine Tablets — Specification
(Third Revision of IS 9825)

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ICS 71.060.01

Inorganic Chemicals Sectional Committee, CHD 01

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Inorganic Chemicals Sectional Committee, CHD 01

(formal clauses will be added later)

FOREWORD

This standard was first published in 1981. In the first revision, a new requirement for shelf life was incorporated. Also, the sizes of chlorine tablets were modified with the corresponding changes in the amount of chlorine. The requirements for manufacture, which was prescribed as formulation and available chlorine were suitably revised. Changes were also made in the marking details. The methods for determination of chlorine content and stability of the tablets were suitably modified. In the second revision, the requirements of available chlorine, percent by mass and stability were deleted as they are already covered by the requirements under clauses of size and shelf life.

In this third revision, the standard has been revised based on the technological advancements that have taken place since the last publication of the standard. Also, Amendment no. 1 and reference clause have been incorporated and Packing & Marking clause has been updated.

Chlorine tablets are disinfecting agents for chlorination of small quantities of water meant for use in houses, hospitals, offices, hotels and such other places where safe potable water is not available. The tablets are marketed in different sizes for treating varying amounts of water. For effective disinfection, a chlorine concentration of 1.25 mg/l is required. The dissipation of chlorine is gradual. For quick dissipation, powdering of the tablets, before adding to the recommended quantity of water is desirable. Slow stirring for a minute or so is advisable to achieve a uniform distribution of chlorine in water. A period of about 30 minutes after the addition of chlorine tablets should be allowed to elapse before consuming the water.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2: 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Draft Indian Standard

CHLORINE TABLETS — SPECIFICATION

(Third Revision)

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for chlorine tablets.

2 REFERENCES

The standards given in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Indian Standard are encouraged to investigate the possibility of applying the most recent edition of these standards.

3 TERMINOLOGY

For the purpose of this standard, the following definition shall apply.

3.1 Available Chlorine

The chlorine equivalent of the hypochlorite chlorine present in the material.

4 REQUIREMENTS**4.1 Formulation**

Chlorine tablets shall be a formulation from stable bleaching powder conforming to the requirements of IS 1065, using edible diluents like sodium chloride (*see* IS 253) or iodized salt (*see* IS 7224).

4.2 Description

The tablets shall be of uniform size and white to slightly yellowish white in appearance.

4.3 Size

Based on mass, the tablets shall be of five sizes, each size providing a fixed range of chlorine in the quantity of water prescribed below:

<i>Mass of Tablets</i>	<i>Amount of Chlorine</i>	<i>Volume of water</i>
(g)	(mg)	(litre)
2.5 + 0.125	300 - 480	240
2.0 + 0.100	250 - 400	200
1.0 + 0.050	100 - 160	80
0.5 + 0.025	25 - 45	20
0.25 + 0.013	5 - 9	4

The available chlorine shall be determined by method prescribed in Annex B.

4.4 Moisture

The chlorine tablets shall not have moisture more than 2.0 percent by mass, when tested by the method prescribed in Annex B.

5 SHELF LIFE

The material when taken out from the originally packed containers shall comply with the requirements prescribed in 4. It shall also contain at least 75 percent of the minimum amount of chlorine, depending upon the mass of the tablets, as given in 4.3 above, up to a period of six months from the date of packing.

6 PACKING AND MARKING

6.1 Packing

The tablets shall be packed in air-tight amber-coloured glass bottles or plastics containers.

6.2 Storing

The material shall be stored in shade, at room temperature away from source of heat and moisture.

6.3 Marking

The containers shall be securely closed and marked with the following information.

- a) Name of the material;
- b) Size of tablets and the quantity of water recommended for treatment;
- c) Number of tablets in the bottle;
- d) Month and year of packing;
- e) Indication of the source of manufacture;
- f) Batch number to enable the lot of manufacture to be traced from records; and
- g) Expiry date.

6.3.1 A leaflet containing instructions for use shall be enclosed with each bottle.

6.3.2 *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the standard mark.

7 SAMPLING

Representative samples of the material shall be drawn and their conformity to this standard shall be determined in accordance with the method prescribed in Annex C.

8 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see IS 1070*) shall be used in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the result of analysis.

ANNEX A

(Clause 2)

LIST OF REFERRED STANDARDS

<i>IS No.</i>	<i>Title</i>
IS 253 : 2014	Specification for common salt (<i>fourth revision</i>)
IS 265 : 2021	Hydrochloric acid — Specification (<i>fifth revision</i>)
IS 695 : 2020	Acetic acid — Specification (<i>fourth revision</i>)
IS 1065 (Part 1) : 2019	Stable bleaching powder — Specification: Part 1 household and industrial use (<i>Third Revision</i>)
IS 1070 : 2023	Reagent grade water — Specification (<i>fourth revision</i>)
IS 2124 : 2023	Sodium Bicarbonate — Specification (<i>third revision</i>)
IS 2316 : 1990	Methods of preparation of standard solutions for colorimetric and volumetric analysis (<i>second revision</i>)
IS 4905 : 2015/ISO 24153 : 2009	Random sampling and randomization procedures (<i>first revision</i>)
IS 7163 : 1989	Potassium iodide, pure and analytical reagent — Specification (<i>first revision</i>)
IS 7224 : 2006	Iodized salt, vacuum evaporated iodized salt and refined iodized salt — Specification (<i>second revision</i>)

ANNEX B

(Clause 4.3)

DETERMINATION OF AVAILABLE CHLORINE

B-1 REAGENTS

B-1.1 Potassium Dichromate Solution — 0.02 N

Carefully pulverize a quantity of potassium dichromate ($K_2Cr_2O_7$) and dry at $(110 \pm 5)^\circ C$ to constant mass. Dissolve 0.9808 g of the dried reagent in water to make exactly 1 litre and mix thoroughly.

B-1.2 Standard Sodium Thiosulphate Solution — 0.02 N (*see* IS 2316)**B-1.2.1 Standardization of Sodium Thiosulphate Solution**

In a 250 ml glass-stoppered flask, take 2 g of potassium iodide and about 25 ml water to dissolve it. Then add approximately 2 g of sodium bicarbonate and 5 ml of concentrated hydrochloric acid. Just before the effervescence subsides, add 25 ml of potassium dichromate solution. When the effervescence ceases, stopper the flask and allow to stand for 10 min in a cool dry place. Dilute with 50 ml of water and titrate against standard sodium thiosulphate solution till liquid in the flask has assumed a yellowish green colour. Then add starch solution and continue with the addition of sodium thiosulphate solution until the blue colour is just discharged.

B-1.3 Starch Indicator Solution

Titrate 1 g of starch with 10 ml of cold water and pour, with constant stirring, into 200 ml of boiling water. Allow to settle and use the clear supernatant liquid.

B-1.4 Potassium Iodide — solid (*see* IS 7163)

B-1.5 Glacial Acetic Acid — *see* IS 695

B-1.6 Sodium Bicarbonate — *see* IS 2124

B-1.7 Hydrochloric Acid — concentrated (*see* IS 265)

B-2 PROCEDURE

Weigh accurately about 1g to 12.5 g of the material depending upon the size of the tablet and grind in a mortar with water till a smooth paste is formed. Add 15 ml to 25 ml of water and decant off the fine part into a 250 ml flask. Again grind the material left behind and repeat the process of decanting off till no gritty material is left. Wash the pestle and mortar in the same flask. Make the solution to 250 ml. Take 25 ml of the solution, add 2 g of potassium iodide crystals and 100 ml of water and then add 5 ml of glacial acetic acid and titrate it against standard sodium thiosulphate solution till the pale yellow colour is left. At this stage, add starch indicator and continue the addition of standard sodium thiosulphate solution till the blue colour is discharged.

NOTE — The grinding of the sample should be carried out with minimum delay, preferably within 10 min after opening the sample container.

B-3 CALCULATION

$$\text{Available chlorine, percent by mass} = \frac{A \times N \times 35.46}{M}$$

where

A = volume in ml, of standard thiosulphate solution used;
 N = normality of standard sodium thiosulphate solution; and
 M = mass in g, of the material taken for the test.

ANNEX C

(Clause 4.4)

DETERMINATION OF MOISTURE

C-1 PROCEDURE

Weigh accurately 5 g to 10 g of the material in an open dry weighing glass bottle, and place it for 24 h in a vacuum desiccator over fused anhydrous calcium chloride under an absolute pressure of 30 mm to 40 mm of mercury. Weigh the weighing glass bottle again. The decrease in mass corresponds to the moisture content of the material.

C-2 CALCULATION

$$\text{Moisture content, percent by mass} = \frac{M_1 - M_2}{M_1} \times 100$$

where

M_1 = mass in g, of the material taken before drying; and
 M_2 = mass in g, of the material after drying.

ANNEX D*(Clause 7)***SAMPLING OF CHLORINE TABLETS****D-1 GENERAL REQUIREMENTS OF SAMPLING**

D-1.1 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

D-1.1.1 Samples shall not be exposed to the atmosphere for a longer time than necessary, and sampling shall be done as rapidly and as thoroughly as possible.

D-1.1.2 Samples shall be placed in a cool and dry place.

D-1.1.3 The sample containers shall be of such a size that they are nearly filled by the samples.

D-1.1.4 Each sample container so filled shall be sealed air-tight after filling, and marked with full details of sampling, the date of sampling, the month and year of manufacture of the material and its size.

D-1.1.5 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

D-1.1.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal room temperature.

D-2 SCALE OF SAMPLING**D-2.1 Lot**

All the containers in a single consignment of same size of the material drawn from a single batch of manufacture shall constitute the lot. If a consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and the groups of containers in each batch shall constitute separate lots.

D-2.2 The number of containers (n) to be selected from the lot shall depend upon the size of the lot (N) and shall be in accordance with Table 1.

D-2.3 These containers shall be selected at random from the lot and in order to ensure randomness of selection, random number tables may be used (*see* also IS 4905). In case, such tables are not available, the following procedure may be adopted:

'Starting from any container, count them in the order 1, 2, 3, up to r , where r is the integral part of N/n . Every r^{th} container thus counted shall be withdrawn to constitute the sample.'

D-3 PREPARATION OF SAMPLES

D-3.1 Empty out the containers selected in **D-2** in a plastics bag/glass bottle and mix thoroughly. In case the quantity so collected exceeds 1.5 kg, reduce it by coning and quartering.

D-3.2 Divide the sample collected/reduced in **D-3.1** into three equal parts, each of which shall be called a composite sample to represent the lot.

D-3.3 Immediately transfer each of the three composite samples obtained in **D-3.2** to an appropriate glass/ plastics container which shall be sealed air-tight and marked with necessary details for identification.

Table 1 Number of Containers to be selected*(Clause D-2.2)*

SI No.	Lot Size	Sample Size
	N	<i>n</i>
(1)	(2)	(3)
i)	2 to 8	2
ii)	9 to 27	3
iii)	28 to 64	4
iv)	65 to 125	5
v)	126 to 216	6
vi)	217 to 343	7
vii)	344 to 512	8
viii)	513 to 729	9
ix)	730 to 1 000	10
x)	1 001 to 1 331	11

D-3.4 One of the three composite samples shall be marked for the purchaser, another for the supplier, and the third kept as a referee sample.

D-3.5 The referee sample shall be kept at a place and under conditions agreed to between the purchaser and the supplier. The referee sample shall be used in case of a dispute.

D-4 CRITERIA FOR CONFORMITY

The material in any lot shall be accepted as conforming to the requirements of this standard if the composite sample meets the requirements given in 4, when tested as per the procedure laid down in Annex B and C.