भारतीय मानक **IS 14364 : 2024**

Indian Standard

क्वाटर्नरी अमोनियम यौगिक आधारित सतह मार्जक, द्रव — विशिष्टि

(पहला पुनरीक्षण)

Quaternary Ammonium Compound Based Surface Cleaner, Liquid — Specification

(First Revision)

ICS 71.100.40

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Soaps, Detergents and Surface Active Agents Sectional Committee, CHD 25

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Soaps, Detergents and Surface Active Agents Sectional Committee had been approved by the Chemical Division Council.

Hard surfaces, namely, floors, laminated table tops, kitchen table tops need frequent cleaning for the removal of dust and dirt, and stains. While the conventional liquid cleaners those are based on soaps and detergents clean and wash away the dirt during cleaning, these, often, do not contain any effective antibacterial agent for dealing with bio-burden.

A hard surface cleaner with a suitable quaternary ammonium compound not only cleans the surface superficially but also effectively reduces the bio-burden and keeps the environment clean due to the effect of antibacterial agent. A product of this type helps to create hygienic environment through cleaning and reducing the effect of bio-burden substances. It also helps to reduce the malodour caused due to decomposition of organic matters present on hard surfaces, that is, kitchen, table tops, floors in kitchen and bathroom, etc.

A product of this type may be used either neat in a small area which deserves cleansing of ingrained dirt/heavily soiled area or in a diluted amount suitably with water for cleaning and maintaining a hygienic environment.

The quaternary ammonium compounds (QAC) may be cetylpyridinium chloride, cetalkonium chloride, benzalkonium chloride or any other quaternary ammonium compound, suitable for the purpose.

This standard was first published in 1996. In this revision, the following changes has been made.

a) The requirements for total non-volatile matter, *p*H and QAC content have been modified;
b) The composition of the hard surface soil has been modified;
c) Provisions have been made to allow mosaic/porcelain/granite tile or other intended surfaces and alternate condition for drying in the method for determination of cleaning property;
d) Description has been updated, color clause has been modified, stability on dilution has been modified and other suitable containers are allowed for packing;
e) Further, all the amendments have been incorporated and packing and marking clause have been updated; and
f) Further the style and formatting have been done in line with the latest practices.

The composition of the Committee responsible for the formulation of this standard is given in Annex D.

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.

Indian Standard

QUATERNARY AMMONIUM COMPOUND BASED SURFACE CLEANER, LIQUID — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and methods of sampling and tests for quaternary ammonium compound based surface cleaner in liquid form.

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provision 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 standard are encouraged to investigate the possibility of applying the most recent edition of these standards:

IS No.	*Title*
IS 4905 : 2015/ ISO 24153 : 2009	Random sampling and randomization procedures (*first revision*)
IS 8171 : 1992	Glossary of terms relating to polishes and related materials (*second revision*)

3 TERMINOLOGY

For the purpose of this standard the definitions given in IS 8171 shall apply.

4 REQUIREMENTS

4.1 Description

A quaternary ammonium compound-based surface cleaner liquid shall be miscible in water in all proportions.

4.2 Composition

The material shall consist essentially of quaternary ammonium compound, if any, in an aqueous medium.

4.3 Odour

The material shall be odourless or with a pleasant fragrance.

4.4 Colour

The material shall be colourless or with a suitable colour.

4.5 Stability on Dilution

The material shall be clear and free from sedimentation or cloudiness when diluted with water, as recommended by the manufacturer, at (10 ± 2) °C and (45 ± 2) °C for 48 h.

4.6 Cleaning Property

The material when applied, either neat or diluted with water as per usage instructions given by the manufacturer, by means of a clean lint-free cloth or a cotton mop, the cleanability shall be as described in Annex A.

4.7 Applicability

The material when applied with a lint-free cloth or mop, either neat or diluted as per usage instructions given by the manufacturer, shall spread evenly without crawling. The material shall not show any streaks or spots and patches after the mopped surface dries naturally. The cleaned surface shall not show any film deposition or shed white powder on drying.

4.8 Keeping Quality

The material shall conform to the requirements of this standard as mentioned in **4.1**, **4.2**, **4.3**, **4.4**, **4.5**, **4.6**, **4.7** and Table 1 (**4.9**). There shall be no deterioration in the characteristics when tested after two years from the date of manufacture or as per the shelf life declared by the manufacturer whichever is more, when stored in its original sealed container at ambient temperature.

4.9 The cleaner shall also comply with the requirements specified in Table 1.

Table 1 Requirements for QAC Cleaner Liquid

(*Clauses* 4.8 *and* 4.9)

Sl No.	Characteristic	Requirement	Method of Test
(1)	(2)	(3)	(4)
i)	Total non-volatile matter, percent by mass, *Min*	2.0	**B-1**
ii)	*p*H	2 to 11.5	**B-2**
iii)	QAC content, percent by mass, *Min*	0.10	**B-3***

5 PACKING

The material shall be packed in glass bottles, suitable plastic containers or any other suitable containers, provided with a pilfer-proof cap made of either metal or plastic. These containers may then be packed in suitable cardboard or fibreboard boxes or as agreed to between the purchaser and supplier.

6 MARKING

The containers should be marked with the following:

a) Indication of the source of manufacture;
b) Net content of the material;
c) Name of the material;
d) Month and year of manufacture, and batch no. or code no.;
e) Direction for use; and
f) Cautionary label 'DO NOT MIX WITH HOUSEHOLD SOAP AND DETERGENTS'.

6.1 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 there under, and the products may be marked with the Standard Mark.

7 SAMPLING AND CRITERIA FOR CONFORMITY

The method of drawing representative samples of the QAC based surface cleaner liquid shall be as prescribed in Annex C.

* Procedure is applicable for only cetylpyridinium chloride. For other quaternary compounds, internal methods can be used.

ANNEX A

(*Clause* 4.6)

DETERMINATION OF CLEANING PROPERTY

A-1 REAGENT

A-1.1 Hard Surface Cleaner Soil

A-1.1.1 Disperse calcium stearate/magnesium stearate/stearic acid (35 parts) in white spirit/thinner/methylated spirit/alcohol (61 parts) and mix thoroughly with carbon black (4 parts).

A-1.1.2 Mix 0.3 g each of lanolin/hydrogenated castor oil/soft butter and grease.

A-1.1.3 Mix 3 g of the mix described in A-1.1.1 with the mix prepared in A-1.1.2.

A-2 TEST TILE

Take a while/light coloured mosaic/porcelain/ granite tile or other intended surfaces with glazed finished of dimensions 15 cm × 6 cm, suitably cleaned and free from any scratch marks. Apply a thin coat of 'hard surface cleaner soil' on the surface of tile uniformly. Leave the tile to dry at room temperature, overnight or in a hot air oven set at 60 °C to 70 °C for at least 1 h.

A-3 PROCEDURE

Divide the test tile into two equal sized portions. Clean one part of the soiled tile with the Test product either neat or diluted as per usage instructions given by the manufacturer, with the help of a lint free cloth or a cotton mop.

Similarly, clean the other half of the soiled tile with just plain tap water or hard water.

Record the visual assessment ratings of both portions of the tile from a group of trained panels comprising of not less than five.

Performance Assessment Criteria: The cleaning ability of the test product should be remarkably better than the water washed portion.

ANNEX B

(*Table 1*)

METHOD OF TESTS

B-1 TOTAL NON-VOLATILE MATTER

B-1.1 Procedure

Weigh accurately about 10 g of the sample in tared flat bottomed dish of approximately 10 cm dia, provided with a cover. Heat the sample without the cover on a steam bath till the bulk of the volatile matter is evaporated. Transfer the dish in a hot air oven kept at 105 °C ± 2 °C; maintain at this temperature for 4 h, cool in desiccator and weigh. Repeat heating and cooling till constant mass is obtained.

B-1.2 Calculation

$$\text{Non-volatile matter, percent by mass} = \frac{100 \times B}{A}$$

where

B = mass, in g, of the non-volatile residue; and

A = mass, in g, of the sample taken for the test.

B-2 DETERMINATION OF *p*H

B-2.1 Procedure

Check the *p*H of the product in a *p*H meter with reference to the standard buffer solutions.

B-3 DETERMINATION OF QAC CONTENT

B-3.1 Procedure

Take 2 ml of the sample in a 100 ml stoppered measuring cylinder and dilute to 10 ml. Add 20 ml of chloroform and 5 ml of acid methylene blue and titrate with 0.004 M sodium lauryl sulphate solution shaking vigorously and allowing the layers to separate after each addition, until the colour of methylene blue is equally dispersed in both the choroform and the aqueous layers.

Note the volume of standard sodium lauryl sulphate solution used and calculate the percent (*w/v*) of the active cationic substance content of the product.

B-3.2 Calculation

Percent of the active cationic substance calculated as cetyl pyridinium chloride, anhydrous basis

$$= V \times P \times 0.067\,998$$

where

V = volume of 0.004 M sodium lauryl sulphate solution used, in ml; and

P = factor for 0.004 M sodium lauryl sulphate solution.

ANNEX C

(*Clause* 7)

SAMPLING AND CRITERIA FOR CONFORMITY

C-1 SAMPLING

C-1.1 Lot

All containers of the same size and capacity containing QAC surface cleaner liquid produced under similar conditions of manufacture shall constitute a lot. Each lot shall be tested separately for the various requirements of the standard.

C-1.2 Scale of Sampling

The number of containers to be selected for the sample shall be as given in Table 2.

Table 2 Scale of Sampling

(*Clause* C-1.2)

Sl No.	No. of Containers in the Lot	No. of Containers to be Selected
(1)	(2)	(3)
i)	Up to 500	13
ii)	501 to 1 000	20
iii)	1 001 and above	32

These containers shall be selected at random from the lot as per IS 4905.

C-1.3 Preparation of Test Samples

Shake well each of the containers selected as per Table 2. From each of these selected containers a representative portion of material shall be taken, which shall be sufficient for carrying out tests for all characteristics given in the standard.

C-1.3.1 *Composite Sample*

Out of these portions, a small but equal quantity of material shall be taken and mixed thoroughly to make a composite sample.

C-1.3.2 *Individual Sample*

The remaining portion of the material from each selected container shall constitute an individual test sample.

C-1.4 Number of Tests

Test for odour, colour and stability shall be performed on individual sample. The test for all other characteristics shall be conducted on composite sample.

C-1.5 Criteria for Conformity

The lot shall be deemed to conform to the standard if all the test results according to **C-1.4** satisfy the corresponding requirements.

ANNEX D

(*Foreword*)

COMMITTEE COMPOSITION

Soaps, Detergents, and Surface Active Agents Sectional Committee, CHD 25

Organization	*Representative(s)*
Harcourt Butler Technical University, Kanpur	DR P. K. S. YADAV **(*Chairperson*)**
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