

Foreword

This Bangladesh Standard was adopted by the Bangladesh Standards and Testing Institution on after the draft finalized by the Soap and Detergent Sectional Committee and approved by the Chemical Divisional Committee.

The liquid glass cleaner is intended primarily for use on wind shields, windows, globes, shells, tablewares, glass mirrors, and the surfaces of other glasswares products. The material shall be capable of removing dust/dirt, road grime and other foreign materials commonly spoiling such glass surfaces. The glass cleaner is not intended for use on transparent plastic surfaces.

Due to its growing demand the sectional committee decided to formulate this standard. While revising this standard the sectional committee gave due consideration to the views of the producers, consumers and technologists and felt that it should be related to the prevailing trade and manufacturing practices followed in this field in the country.

In the preparation of this standard, assistance derived from the following publications is acknowledged with thanks:

IS 8540:1986 (Reaffirmed 1997) Specification for Glass Cleaner, Liquid (First Revision);
Bureau of Indian Standards.

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 BDS 103.

Bangladesh Standard

Specification for

Liquid Glass Cleaner

1. Scope

1.1 This standard prescribes requirement and methods of sampling and test for liquid glass cleaner.

2. Normative references

2.1 The following Bangladesh Standards are necessary adjuncts to this Standard. For undated references the latest edition of the publication referred to applies.

BDS 103	Methods of rounding off numerical values.
BDS 833	Water for laboratory use.
BDS 1765	Methods for Random Sampling.
BDS ISO 13736	Determination of flash point – Abel closed-cup method.
BDS ASTM D2825	Standard Terminology Relating to Polishes and Related Materials.

3. Terms and Definitions

For the purposes of this Standard, the definitions given in BDS ASTM D2825 shall apply.

4. Requirements

4.1 Composition — The cleaner may contain synthetic detergent, colouring agent, water, monohydric and polyhydric alcohols and their derivatives, ammonia, amine and perfumes.

4.1.1 The cleaner shall be a clear and homogenous liquid or a suitable suspension of solid matter in the medium and shall acquire homogeneity on shaking.

4.2 Odour — The cleaner shall not have any disagreeable odour.

4.3 Colour — The cleaner may be tinted in suitable stable colour. It shall not impart stain to glass surfaces.

4.4 Toxicity — The cleaner shall have no injurious effect on the human skin and shall be free from toxic ingredients.

4.5 Stability — It shall be stable in normal conditions of storage and handling.

4.6 Application and Performance — The material shall be capable of smooth, uniform and easy application.

4.6.1 The material shall be applied to the glass surface by means of either a pad or soft cloth or an in-built spray device in the pack and rubbed gently with a circular motion of hand using a soft cloth.

4.6.2 The applied film shall be easily removable within 3 to 4 minutes of application and shall leave the surface dean and shall produce an appearance equal to that produced by an approved sample when tested as described in A-1.

4.6.3 The cleaner shall not produce visible corrosion or discolouration on an aluminium panel, when tested as described in A-2.

4.7 The material shall comply with the requirements given in Table 1 when tested according to the methods prescribed in relevant Bangladesh Standard and Annex A reference to which is given in column 4 and 5 of Table 1.

Table 1 Specific requirements for liquid glass cleaner

Sl. No.	Characteristic	Requirement	Test method; BDS/Annex
(1)	(2)	(3)	(4)
i.	Water content, percent by mass, Max.	88.0	A-3
ii.	Flash point, °C, Min	27	BDS ISO 13736
iii.	Non-volatile matters content, percent by mass, Max.	1.0	A-4
iv.	pH value	7.0 – 10.0	A-5

4.8 **Keeping Quality** — The cleaner shall not show any setting and separation into distinct layers. It shall retain the properties as specified from 4.1 to 4.7 and Table 1 for 2 years from the month and year of manufacture.

5. Packaging

5.1 The glass cleaner shall be packed in glass, metal or suitable plastic containers with or without in-built spray device. No product shall be so packed that it will act on the container or be acted on by it.

5.2 The container shall be leak-proof and the spray device, if used, shall be protected against any damage during transit.

5.3 The containers shall be packed in cardboard or fibreboard or wooden boxes with suitable nests or as agreed to between the purchaser and the manufacturer.

6. **Marking** - The containers/pouches shall be marked with the following:

- a) Name of the material;
- b) Name and address of the manufacturer. In the case of imported products, name and address of the distributor/ importer including the country of origin;
- c) Registered trade mark / brand name, if any;
- d) Batch or lot number;
- e) Net content of the material;
- f) Direction for use;
- g) Date of manufacture;
- h) Use best before;
- i) Maximum retail price;
- j) **Cautionary note:**
 - i. The material can be skin irritants. Avoid prolonged contact.
 - ii. Keep away from children'.
- k) Any other requirement as prescribed by the statutory authorities.

6.1 The containers may also be marked with the BSTI Certification Mark.

NOTE - The use of the BSTI Certification Mark is governed by the provisions of the Bangladesh Standards and Testing Institution Act 2018 and the Rules and Regulations made there under. Details of conditions be under which a license for the use of the BSTI Certification Mark may granted to manufacturers or processors, may be obtained from the Bangladesh Standards and Testing Institution.

7. Sampling - The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in Annex B.

Annex A

(Clause 4.7 and Table 1)

Methods of Test for Liquid Glass Cleaner

A-0 Quality of Reagents

A-0.1 Unless specified otherwise, pure chemicals and distilled water (see BDS 833) shall be used in tests.

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

A-1 Test for Cleaning Efficiency

A-1.1 Procedure — To test the cleaning and polishing property of the glass cleaner, it is recommended that both sides of the glass panel should be suitably prepared for application of the cleaner.

A-1.2 Take two panels of clear, plate glass 150 x 75 x 1.5 mm. Dust them with pulverized clay until a thin uniform coating is obtained. Spray a mist coat of water on each panel to wet the clay and allow to dry for 6 hours. Apply a similar coat of clay on the other side of the glass panels. Further apply a mist coat of carbon tetrachloride containing 10 percent mineral oil on both sides of the panels. Allow the panels to air dry for 24 hours. To one panel, apply the sample by spreading over the surface with a rag and immediately wipe off and polish with a clean cloth. Similarly treat the other side of the panel. Using the same conditions of test, clean the other panel with the approved sample and compare the two panels for cleaning properties. The efficiency of the sample shall not be inferior to that of the approved sample.

A-2 Test for Corrosion or Discolouration

A-2.1 Procedure — Place approximately 3 mL of the cleaner on a cleaned, grease free surface of 75 x 50 x 1 mm aluminium panel and cover with a watch glass. At the end of 6 hours, remove the watch glass, rinse panel with distilled water and air dry at room temperature. Inspect the panel for any attack or discolouration.

A-3 Determination of Water Content

A-3.0 Outline of the Method — The material is heated under reflux with an organic solvent which is immiscible with water. The carrier liquid distils into a graduated receiver carrying with it water which then separates to form the lower layer, the excess carrier liquid overflowing from the trap and returning to the still.

A-3.1 Apparatus — The Dean and Stark apparatus used for determination of water content has the following essential features.

A-3.1.1 Flask — of 500 mL capacity, as shown in Fig. 1, and made of hard resistance glass, well annealed and as free as possible from striae and similar defects. Alternatively, a metal flask may be used.

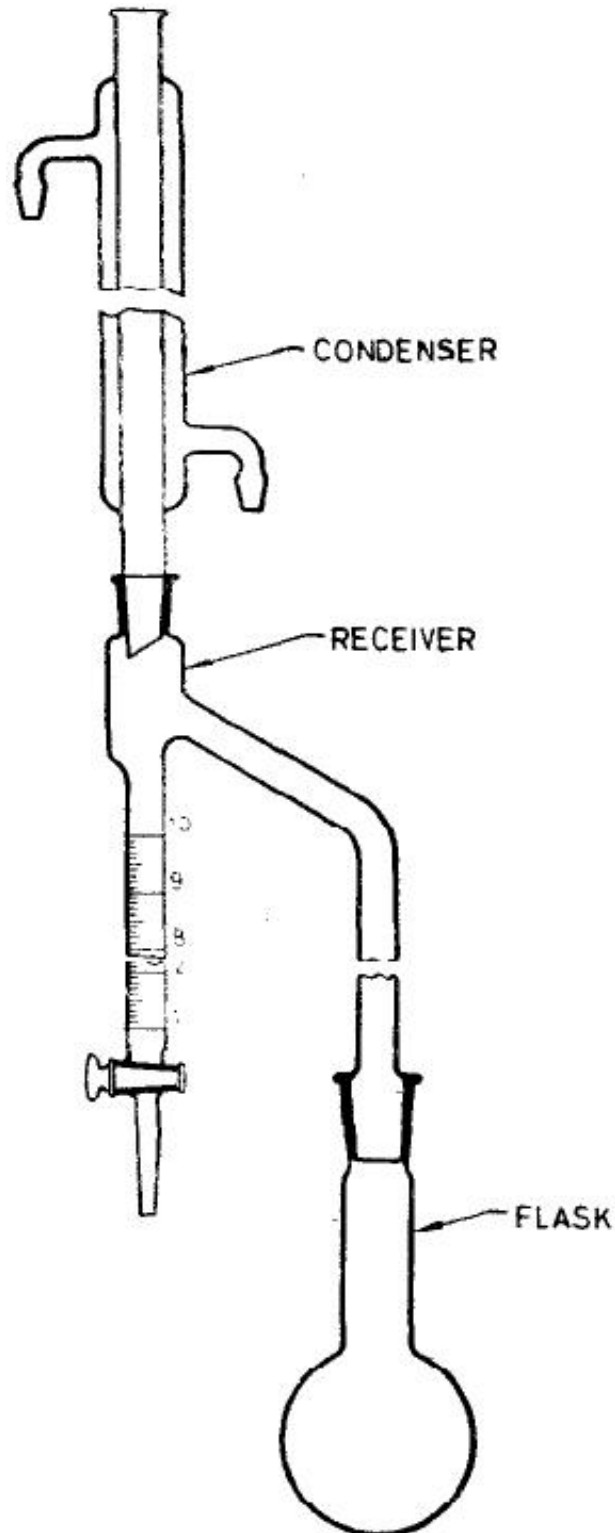
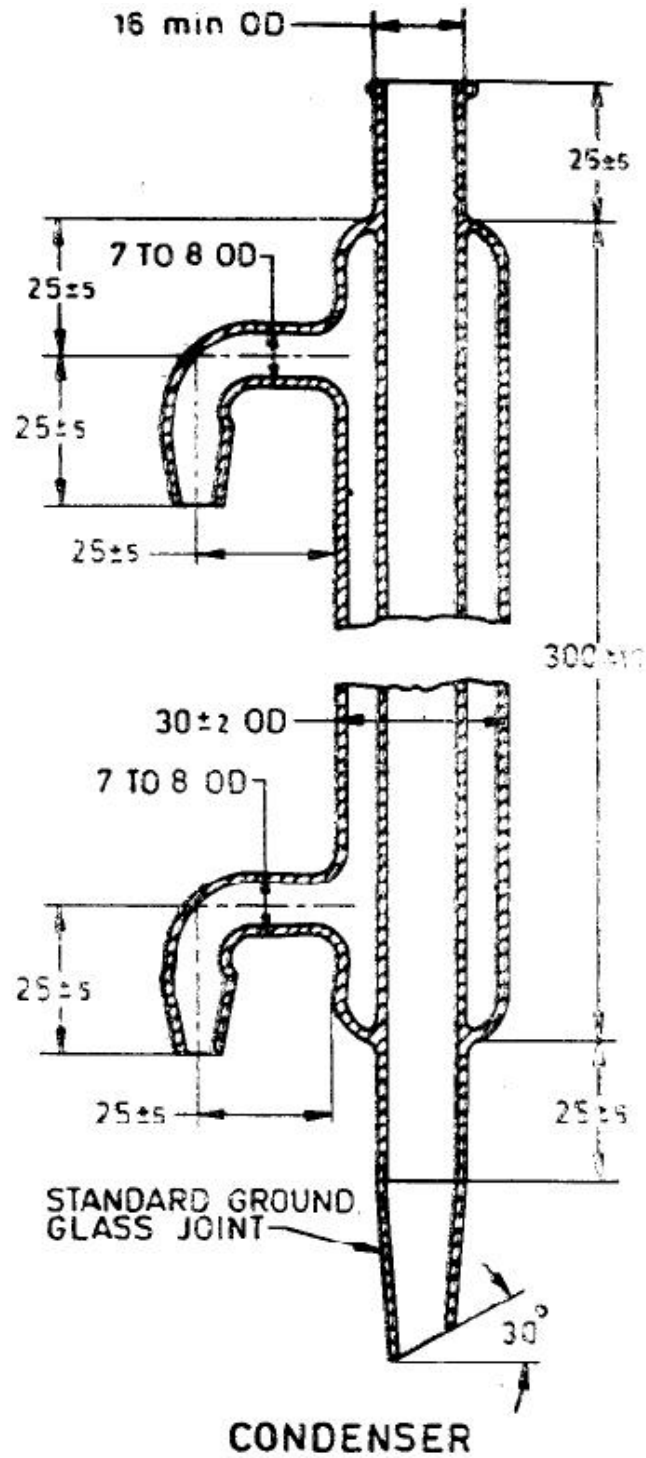


Fig. 1 Dean and Stark Assembly (with 10-mL Receiver)

A-4.1.2 Condenser - made of Lard resistance glass, well annealed and as free as possible from striae and similar defects, with shape and dimensions as shown in Fig. 2.

A-3.1.3 Spray Tube - made of glass, sealed at one end, having four small holes equidistantly placed around the wall near the closed end of the tube, with the shape and dimensions as shown in Fig. 2.

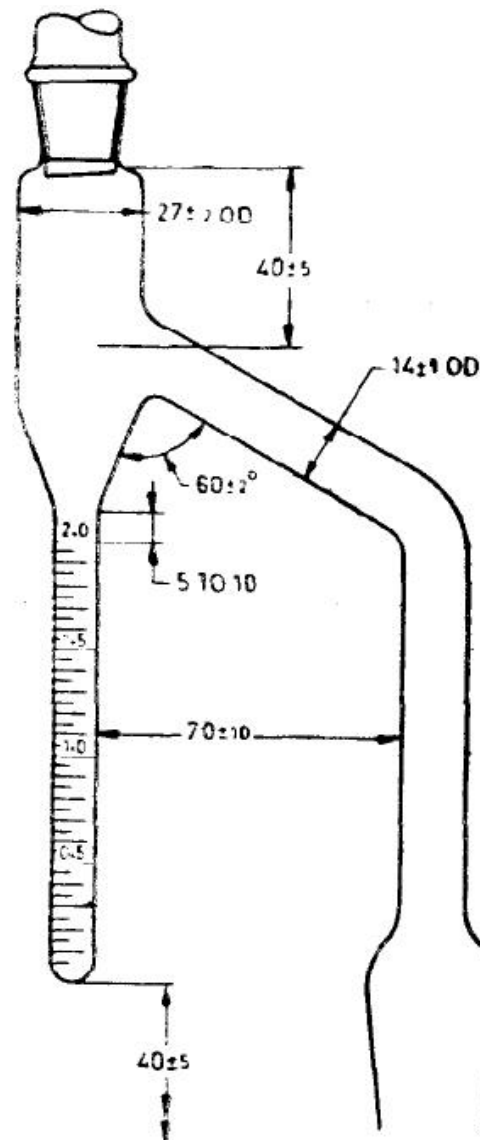


All dimensions in millimetres.

Fig. 2 Condenser and Spray Tube (Dean and Stark Apparatus)

A-3.L4 Two-Millilitre Receiver - made of hard resistance glass, well annealed and as free as possible from striae and similar defects, provided with ground glass joints, and of shape and dimensions given in Fig. 3. It consists essentially of the upper chamber together with the tube and ground joint leading to the flask and the graduated tube. When a metal flask is used, care shall be taken to provide an air-tight connection between the flask and the receiver. The graduated portion shall have a capacity of 2 mL at 20°C when filled to the highest graduation mark.

The scale shall cover the range of 0.1 mL to 2 mL and shall be divided into intervals of 0.05 mL. The graduation marks corresponding to 0.5 mL, 1.0 mL, 1.5 mL and 2.0 mL shall be numbered. The numbered graduation marks shall be carried completely round the tube. The graduation marks corresponding to 0.15 mL, 0.25 mL, 0.35 mL and so on up to and including 1.95 mL, shall be carried half way round the tube. The remaining graduation marks shall be intermediate in length and shall project equally at each end beyond the shortest graduation marks. The error at any point on the scale shall not exceed ± 0.03 mL and the difference between the errors at any points shall not exceed 0.03 mL.



All dimensions in millimetres.

Fig. 3 2-mL Receiver (Dean and Stark Apparatus)

A-3.1:5 Graduated Cylinder — 100 ML.

A-3.2 Procedure - Weigh 100 g of the material in the flask, add 100 mL of dry petroleum hydrocarbon solvent (boiling point 75 to 85°C) and 1 mL of dry ethyl acetate, or amyl acetate and thoroughly mix the contents of the flask. Pour petroleum hydrocarbon solvent into the receiver up to the level of the side tube. Attach the flask to the Dean and Stark condensing and collecting system and heat the flask at such a rate that the condensate falls from the end of the condenser at a rate of two to five drops per second. Continue the distillation until condensed water is no longer visible in any part of the apparatus except at the bottom of the graduated tube and until the volume of water collected remains constant. Remove the persistent ring of condensed water in the condenser tube, if any, by increasing the rate of distillation by a few drops per second. Wash droplets of water which adhere to the lower end of the condenser tube into the receiver with petroleum hydrocarbon solvent, using the spray tube.

A-3.3 Note the number of millilitres of water in the receiver at the temperature at which the sample was measured. Assuming the density of 1.000 g/mL for the water collected in the receiver, calculate the percentage of water (by mass) in the material.

A-4 Determination of Non-Volatile Matter

A-4.1 Procedure — Weigh accurately a 50 g sample of the cleaner into a tared glass beaker and heat on a steam bath to dryness. Place the beaker in an oven at 100 to 103°C and dry to constant mass. (If decomposition or discolouration of the solids occurs, carry out the drying in a vacuum oven at 45 to 50°C.) Report the mass of the residue as a percentage by mass of the cleaner.

A-4.2 Calculation

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

Where,

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

B = mass in g of the beaker and solids after drying, and

C = mass in g of the beaker.

A-5 Determination of pH Value

A-5.1 Procedure - Determine the pH on the undiluted sample by a suitable pH meter using glass electrode.

Annex B

(Clause 7)

Sampling of Liquid Glass Cleaner**B-1 General Requirement of Sampling**

B-1.0 In drawing, preparing, storing and handling of test samples, the following precautions and directions shall be observed.

B-1.1 Samples shall be taken in a place not exposed to dust or soot.

B-1.2 The sampling instrument shall be clean and dry when used.

B-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

B-1.4 Samples shall be placed in clean, dry and air-tight glass containers or other suitable containers on which the material has no action.

B-1.5 The sample containers shall be of such size that they are almost completely filled up by the sample.

B-1.6 Each sample container shall be sealed air-tight after filling and marked with full details of sampling, the date of sampling and the month and year of manufacture of the material.

B-1.7 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

B.2. Scale of Sampling

B-2.0 For determining conformity of a consignment to this specification, sample shall be selected so as to be representative of the consignment. Samples drawn in compliance with an agreement between the purchaser and the manufacturer shall be held to be representative of the consignment. In case of dispute, the following scheme is recommended to serve as guide.

B-2.1 Lot — All the containers in a single consignment of the material drawn from the same batch of manufacture and of the same size shall constitute a lot. If a consignment is declared or known to consist of different batches of manufacture or different sizes of containers, the containers belonging, to the same batch and size shall be grouped together and each group shall constitute a separate lot.

B-2.1.1 Samples shall be tested for each lot for ascertaining conformity of the material to the requirements of this specification.

B-2.2 The number of containers (n) to be chosen from a lot shall depend upon the size of the lot (N) and shall be in accordance with Table 2.

Table 2 Number of Containers to Be Selected

Lot Size (N) (1)	No. of Containers to be selected (n) (2)
Up to 500	10
501 – 1000	15
1001 and Above	20

B-2.3 These containers shall be chosen at random from the lot and in order to ensure the randomness of selection, a random number table shall be used. In case such tables are not available, the following procedure shall be adopted:

Arrange all the containers in the lot in a systematic manner and starting from any container, count them as 1, 2, 3, up to r and so on, where r is the integral part of N/n . Every r th container thus counted shall be withdrawn to give sample for test.

NOTE - For details of this procedure as well as other methods of random selection, reference may be made to BDS 1765.

B-3 Preparation of Composite Sample

B-3.1 Shake well each of the containers selected according to B-2.3 and pour out quantity of liquid such that the total quantity obtained from all the containers provides material sufficient for all the tests (about 500 g). Thoroughly mix the material drawn from the selected containers so as to form composite sample. Divide the composite sample into three parts, each sufficient for carrying out the intended tests and transfer them to thoroughly clean and dry sample containers. Send one each of these to the purchaser and the supplier. Reserve the third composite sample as referee sample bearing the seals of the purchaser and the supplier. Keep the referee sample at a place agreed to between the purchaser and the manufacturer.

B-4 Number of Tests and Criteria for Conformity

B-4.1 Tests for all the characteristics shall be done on the composite sample.

B-4.2 The lot shall be declared as conforming to this specification if the test results satisfy the corresponding requirements laid down in this specification.