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.

Toilet cleaner are now available in liquid and powder form in the market. For liquid toilet cleaner a separate standard BDS 1707 exists which is not applicable for powder form.

This powder toilet cleaner is used for removing, by chemical action, stains and hard water deposits from sanitary ware made of porcelain (sanitary ware made with a pottery base and a glaze fired at cone 91-2) and from steel and cast iron sanitary ware covered with a coating of acid resistant porcelain enamel.

As the product is acidic and thereby corrosive in nature adequate precautions should be taken while using the same.

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 13760:1993 Amendment 1:2002 Toilet Cleaner, Powder – Specification;
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 Toilet Cleaner, Powder

1. Scope

1.1 This standard prescribes requirement and methods of sampling and test for toilet cleaner powder for porcelain surfaces.

1.2 This standard is applicable only for the powder toilet cleaner which is acidic in nature. This standard is not applicable for the powder toilet cleaner which is alkaline or neutral in nature.

1.3 This standard is not applicable for the liquid toilet cleaner, for which a separate standard BDS 1707 exists.

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 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 and the following shall apply.

3.1 Ambient Temperature

It is the temperature between 21 and 38°C.

4. Types – There shall be three types of powder toilet cleaners, namely:

Type 1 – Acidic Powder Toilet Cleaner;

Type 2 – Alkaline Powder Toilet Cleaner; and

Type 3 – Neutral Powder Toilet Cleaner.

5. Requirements

5.1 Description - White or coloured granular powder which may be perfumed to mask the acidic odour.

5.1.1 The material shall contain suitable acid or alkali and/or surfactant generating chemicals and may contain other desirable additives like corrosion inhibitors, wetting agents, etc. The ingredients used in manufacture of the material shall be intimately blended and processed and shall be suitable for the intended purpose.

NOTE — A suggestive list of various possible ingredients is given in Annex A, for information only.

5.2 Keeping Quality

The material shall conform to the requirements thereof for at least one year from the date of manufacture when stored in original sealed containers under cover at ambient conditions.

5.3 Specific requirements

Acidic, alkaline and neutral toilet cleaner powder shall comply with the specific requirements given in Table 1, 2 and 3 respectively when tested in accordance with the method prescribed therein.

Table 1 Requirements for Acidic Toilet Cleaner Powder

Sl. No. (1)	Characteristic (2)	Requirement (3)	Test method (4)
i.	Acidity, 1 g of the powder on reaction with water generates acid which consumes volume of 0.1N NaOH solution, mL, Not less than	20.0	B-1
ii.	pH, 1 % solution at (25 ± 2) °C, Not more than	3.0	B-2
iii.	Efficiency	To pass the test	B-3
iv.	Effect on Porcelain Enamel	To pass the test	B-4
v.	Loss on Drying, percent by mass, Not more than	5.0	B-5
vi.	Water Insoluble Substance, percent by mass, Not more than	5.0	B-6

Table 2 Requirements of Alkaline Toilet Cleaner Powder

Sl. No.	Characteristics	Requirements	Test Method
(1)	(2)	(3)	(4)
i.	pH, 1 % solution at (25 ± 2) °C, Not more than	10.5-13	B-2
ii.	Surfactant as SLES, percent by mass, min.	5	B-7
iii.	Efficacy a) Ability to remove rust and stains in 5 minutes b) Ability to remove lime scale: Mass of loss of marble, percent by mass, not less than	To pass the test 0.5	B-8
iv.	Effect on porcelain Enamel	To pass the test	B-4
v.	Corrosion Inhibition: Loss in percent by mass of the metal, max.	0.15	B-9

Table 3 Requirements of Neutral Toilet Cleaner Powder

Sl. No.	Characteristics	Requirements	Test Method
(1)	(2)	(3)	(4)
i.	pH, 1 % solution at (25 ± 2) °C, Not more than	6.5-7.5	B-2
ii.	Surfactant as SLES, percent by mass, min.	5	B-7
iii.	Efficacy: a) Ability to remove rust and stains in 5 minutes b) Ability to remove lime scale: Mass of loss of marble, percent by mass, not less than	To pass the test 0.5	B-8
iv.	Corrosion Inhibition: Loss in percent by mass of the metal, max.	0.15	B-9

6. Packaging

6.1 The material shall be supplied in narrow mouth or sprinkler type polyethylene containers fitted with suitable caps or laminated pouches. The size of the containers/pouches shall preferably be 25 g, 50 g, 500 g, 1000 g or as agreed to between the purchaser and the supplier.

6.1.1 The containers/pouches shall be packed in cartons or as agreed to between the purchaser and the supplier. The cartons shall be marked with batch number.

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

a) Name of the product;

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 in gm;

f) Instructions for use;

g) Date of manufacture;

h) Use best before;

i) Maximum retail price;

j) **Cautionary note:**

   i. Material highly acidic and corrosive, avoid physical contact with contents. In case of contact, wash immediately.

   ii. Keep away from children'.

k) Any other requirement as prescribed by the statutory authorities.

7.1 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.

8. Sampling - Representative samples of the material shall be drawn as prescribed in Annex C.

9. Criteria for Conformity - A lot shall be declared as conforming to the requirements of this standard if the test results of the composite sample satisfy the requirements prescribed under clause 5 and table 1.

10. Test Methods

10.1 Tests shall be conducted as prescribed in Annex B. References to relevant clauses are given in 5.1 to 5.3.

10.2 Quality of Reagents - 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.

Annex A

(Clause 5.1.1)

Suggestive List of Ingredients

1. Sodium bisulphate;
2. Oxalic acid;
3. Citric acid;
4. Cationic and nonionic surfactants like:
    a) Glycerol mono stearate,
    b) Ethylene glycol mono stearate,
    c) Di-ethylene glycol mono stearate, and
    d) Quaternary ammonium surfactants;
5. Anionic detergent powder such as sodium lauryl sulphate, sodium salt of linear alkylbenzene sulphonic acid, alpha olefin sulphonate (AOS), etc.
6. Silica dessicant or other suitable dessicants.
7. Sulphamic acid;
8. Sodium sulphate; and
9. Sodium chloride.

Annex B

(Clause 4.3; Table 1)

Methods of Test for Toilet Cleaner Powder

B-1 Test for Acidity

B-1.1 Reagents

B-1.1.1 Standard Sodium Hydroxide Solution - 0.1 N

B-1.1.2 Methyl Red Indicator Solution - Dissolve 0.05 g of methyl red in 100 mL of water.

B-1.2 Procedure

Weigh accurately 50 g of the powder into a 500 mL beaker and add 250 mL demineralised water and stir to dissolve the powder. Transfer the solution to 500 mL standard flask. Rinse the beaker with demineralised water and make up the volume to 500 mL. Pipette out 10 mL of this solution into a 250-mL conical flask and add 50 mL of demineralised water. Titrate with N/10 NaOH Solution until the colour changes from pink to yellow, using methyl red indicator.

B-1.3 Calculation

$$\text{Acidity} = V \times N$$

Where

V = volume, in mL, of standard sodium hydroxide solution used in titration; and

N = normality of standard sodium hydroxide solution used.

B-2 Determination of pH

B-2.1 Apparatus

B-2.1.1 100 mL beaker and 1 mL pipette

B-2.1.2 Procedure

Add 100 mL of demineralised water to 1 mL of the test solution (see B-1) to be pipetted out into a 100 mL beaker. Stir well and then check the pH using the previously calibrated pH metre.

B-3 Test for Efficiency

B-3.1 Apparatus

B-3.1.1 Porcelain Plate

Unglazed porcelain streak plate.

B-3.2 Reagent

B-3.2.1 Ferric Chloride Solution - 5.0 percent approximately of the anhydrous salt.

B-3.3 Procedure

B-3.3.1 Preparation of Stained Specimens

Take the porcelain plate and wet one side with ferric chloride solution. Set the stain by baking at 130°C for 2 hours.

B-3.3.2 Sprinkle the sample powder over the stain to cover the stain and put few drops of water to wet the powder and allow the sample to react for 5 minutes and gently wipe off. Note the colour of the plate. The original white appearance of the plate should be restored.

B-3.4 Result

B-3.4.1 The material shall be able to remove rust stains within 5 minutes.

B-4 Test for Effect on Porcelain Enamel

B-4.1 Apparatus

B-4.1.1 Porcelain Enamel Plate

New 70 mm × 70 mm white porcelain acid-resistant enamelled steel plate. The enamelling shall be 1 mm.

B-4.2 Procedure

Place approximately one gram of diatomaceous earth on the plate (see B-4.1.1) to make a 16 mm diameter circle with a depth of 10 mm and place 2 g of the sample over the diatomaceous earth circle and put few drops of water to wet the same. Cover the wetted area with a watch glass and set aside for 16 hours. At the expiry of 16 hours, wash using a rag or sponge, dry the plate and examine with a 5 × magnifying glass for any etching by comparing with a new plate, under good lighting conditions.

B-4.3 Result

B-4.3.1 The material shall not have any etching effect on porcelain.

B-5 Loss on Drying

B-5.1 Procedure

Take one gram of the sample in a previously weighed petri dish. Heat at 105 ± 2 °C for 1 hour. Cool and weigh. Repeat the heating and cooling till the last two weighings differ by not more than 1 mg.

B-5.2 Calculation

Percent loss on drying, percent by mass = $\frac{B \times 100}{A}$

Where

B = loss, in g, of the mass; and

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

B-6 Water Insoluble Substance

B-6.1 Procedure

Weigh accurately about 10 g of the material in a 250 mL beaker and add 50 mL of demineralised water, mix well for one minute. Pass the entire solution through No. 4 filter paper and collect the insoluble substance on the filter paper. Dry the filter paper in an oven maintained at 105 ± 2 °C for one hour. Cool and weigh. Repeat until the difference between the two consecutive weighings is not more than 1 mg.

B-6.2 Calculation

Percent of water insoluble substance, percent by mass = $\frac{B \times 100}{A}$

Where

B = mass, in g, of water insoluble substance; and

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

Annex C

(Clause 7)

Sampling of Toilet Cleaner Powder

C-1 General Requirements for Sampling

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

C-1.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

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

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

C-1.4 The samples shall be placed in clean, dry and airtight glass or other suitable containers on which the material has no action.

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

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

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

C-2 Scale of Sampling

To determine the conformity of a consignment of toilet cleaner powder to this standard, samples shall be selected so as to be representative of the whole consignment. In the absence of any prior agreement between the purchaser and the supplier on the mode of sampling and determining the criteria of conformity, the following sampling scheme is recommended to serve as a guide.

C-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 of different sizes of containers, the containers belonging to the same batch and size shall be grouped together and each such group shall constitute a separate lot.

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

C-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.

C-2.3 These containers shall be chosen at random from the lot. In order to ensure the randomness of selection, random number table as agreed to between the purchaser and the supplier shall be used. In case such a table is 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 (N being the total number of containers in the lot and n the number of containers to be selected). Every rth container thus counted shall be withdrawn from the lot to give a sample for test.

Table 2 Number of Containers to be Selected

(Clause C-2.2)

Lot Size (N) (1)	**No. of Containers to be selected (n)** (2)
50 - 500	10
501 – 1000	15
Above 1000	20

C-3 Preparation of Composite Sample

C-3.1 Shake well each of the container selected as in C-2.3. Remove adequate quantity of material such that the total quantity obtained from all the containers provided material sufficient for all the tests (about 500 g). Thoroughly mix the materials drawn from all the selected containers so as to form the composite sample. Divide this composite sample into three parts each sufficient for carrying out the intended tests and transfer them to thoroughly cleaned dry sample containers. Send one each to the purchaser and the supplier and reserve the third as

reference sample bearing the seals of the purchaser and the supplier. Keep the reference sample bearing the seals of the purchaser and the supplier. Keep the reference sample at a place agreed to between the purchaser and the supplier.

C-4 Number of Tests

C-4.1 Tests for all the characteristics specified in clause 4 and table 1 shall be done on the composite sample.