

Indian Standard

SPECIFICATION FOR DISTILLED WATER GLASS BOTTLES

(First Revision)

1. Scope — Lays down the requirements for distilled water glass bottles.

2. Terminology

2.1 For the purpose of this standard, the definitions as given in IS : 1382-1981 'Glossary of terms relating to glass and glassware (*first revision*)' and IS : 6654-1982 'Glossary of terms relating to glass containers (*first revision*)' shall apply.

3. Nominal Capacity — The bottle shall be of 750 ml nominal capacity.

4. Material — The bottles shall be manufactured either from colourless glass or glass with a slight tinge of colour.

5. Capacity and Mass — The nominal capacity, capacity at filling level, brimful capacity and the mass of the bottles shall be as follows:

<i>Nominal Capacity</i>	<i>Capacity at Filling Level</i>	<i>Brimful Capacity</i>	<i>Mass, Max</i>
ml	ml	ml	g
750	750 ± 10	767 ± 10	454

6. General Requirements

6.1 The bottle shall be free from blisters, cracks, mould marks, stones and chippings and as far as possible shall be free from bubbles, cords, seeds and other visible defects. The glass shall be transparent.

6.2 The bottles shall be well formed with the distribution of glass all over the walls and the base, avoiding any wedge bottom and, particularly thin sections in the walls.

7. Tests

7.1 Alkalinity Test — The bottles shall satisfy the requirements as given in Appendix A.

7.2 Verticality Test — A vertical line through the centre of the circle formed by the inside neck opening shall pass through the centre of the circle described by the widest diameter at the bottom of the bottle. The variation in verticality when tested according to the method given in Appendix B shall not exceed 1.6 mm.

7.3 Thermal Shock Test — The bottle shall be subjected to thermal shock test as laid down in IS : 11930-1986 'Method of thermal shock test for glass containers'. The temperature differential ($t_1 - t_2$) shall be 43°C.

8. Packaging — The bottle shall be packed as agreed to between the purchaser and the supplier.

9. Marking — Each bottle shall be permanently and legibly marked with the maker's name or his registered trade-mark.

9.1 Certification Marking — Details available with the Bureau of Indian Standards.

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APPENDIX A

(Clause 7.1)

TEST FOR ALKALINITY

A-1. Apparatus

A-1.1 Erlenmeyer Flask — of resistant glass and of 250 ml capacity.

A-1.2 Mortar — a suitable mortar made of steel.

A-1.3 Test Sieves — two, one 600 μm IS Sieve and the other 425 μm IS Sieve [see IS : 460 (Part 1) - 1985 'Specification for test sieves : Part 1 Wire cloth test sieves (third revision)'].

A-2. Reagents

A-2.1 Quality of Reagents — Unless specified otherwise, pure chemicals shall be employed in the test, and distilled water [see IS : 1070 - 1977 'Water for general laboratory use (second revision)'] shall be used where the use of water as a reagent is intended.

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

A-2.2 The following reagents are required.

A-2.2.1 Standard hydrochloric acid — 0.01 N.

A-2.2.2 Ethyl alcohol or rectified spirit — 95 percent by volume [conforming to IS : 323-1959 'Rectified spirit (revised)'].

A-2.2.3 Standard sodium hydroxide solution — 0.05 N.

A-2.2.4 Methyl red indicator — Dissolve 0.04 g of methyl red in 75 ml ethyl alcohol or rectified spirit. Add 1.5 ml of standard sodium hydroxide solution or a quantity sufficient to ensure that the colour of the solution corresponds to pH 5.2 and then dilute to 100 ml with water.

A-2.2.5 Test solution — Add 0.4 ml of standard hydrochloric acid and 0.4 ml of methyl red indicator to 100 ml of water. The colour of the solution should be pink. Boil the solution for some time in an Erlenmeyer flask which has been previously tested in accordance with the test given in A-3.1.

A-3. Testing of Erlenmeyer Flask

A-3.1 Boil the test solution in Erlenmeyer flask (see A-2.2.5) and while boiling transfer to the Erlenmeyer flask to be tested. Place the flask quickly in a bath of boiling water so that the level of the solution contained in it is below the level of the water in the bath. Continue boiling for one hour and at the end of this period observe the colour of the solution. Reject the flask if any change of colour of the test solution has taken place.

A-3.1.1 Erlenmeyer flasks which have once passed the test (see A-3.1) may fail to do so after prolonged storage. In such a case, they should be washed with a 5 percent (w/v) solution of glacial acetic acid followed by a wash with water until free from acid before use.

A-4. Procedure

A-4.1 Crush the two glass bottles selected for this test (see A-1.2), such that the crushed glass completely passes through 600 μm IS Sieve but fails to pass through 425 μm IS Sieve. Spread the crushed glass on a glazed paper and pass a magnet over them to remove any particles of iron which may have been introduced during crushing. Weigh accurately 5 g of the crushed glass, wash free from dust by repeated washing with ethyl alcohol or rectified spirit and dry at $100 \pm 2^\circ\text{C}$. Transfer the clean, dry crushed glass to the Erlenmeyer flask (see A-3.1) and treat with 100 ml of a fresh portion of the boiling test solution. Place the flask quickly in a bath of boiling water so that the level of the solution contained in it is below the level of the water in the bath. Continue boiling for 30 minutes. Titrate the solution without filtering to the original pink colour with standard hydrochloric acid.

A-4.1.1 The glass bottles shall be taken to have satisfied the test if not more than 3 ml 0.01 N hydrochloric acid are required for the titration.

APPENDIX B

(Clause 7.2)

TEST FOR VERTICALITY OF BOTTLES

B-0. General

B-0.1 This test determines the combined effect of the offset of mouth with the body and mouth being at an angle of the body.

B-1. Assembly

B-1.1 Assembly for the determination of verticality shall be as shown in Fig. 1.

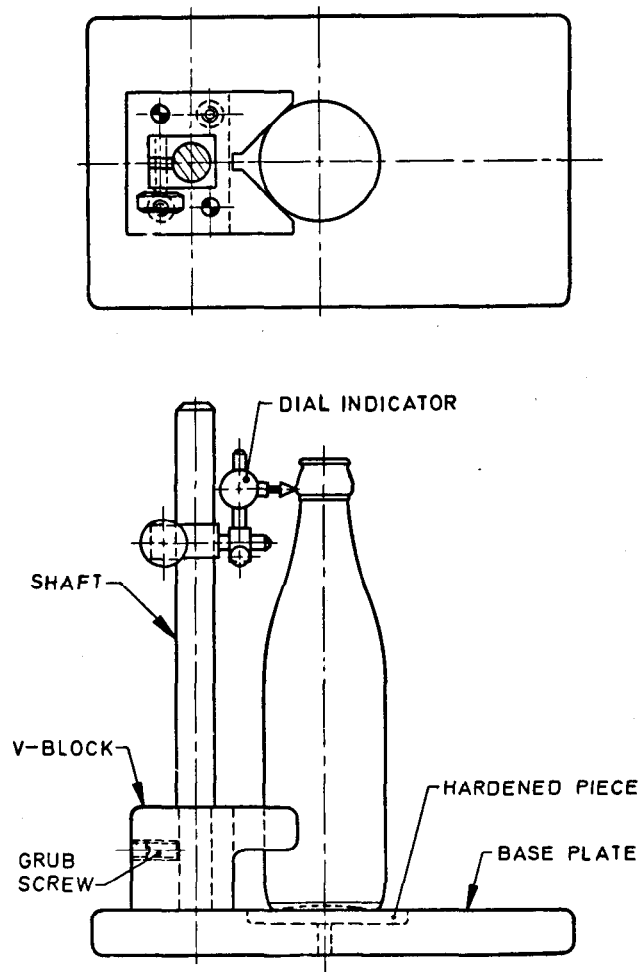


FIG. 1 ASSEMBLY FOR TESTING VERTICALITY OF BOTTLE

B-2. Procedure

B-2.1 Fill the bottle with water in order to give in more stability and place it on its base on the flat plate having a pillar bolted to it at right angles. Adjust the 'V' block mounted on the pillar in such a manner that it is in contact with the outer diameter of the bottle at about the middle. Adjust the dial indicator fitted to the pillar so that its measuring point comes in contact with the outer edge of the neck of the bottle. Rotate the bottle, keeping the body always in contact with the 'V' block. Note down the maximum deflection on the indicator.

B-2.1.1 Half of the total deflection shown by an indicator shall be the variation in verticality.

EXPLANATORY NOTE

This standard was first issued in 1957 and was reaffirmed in 1978. This revision gives the requirements for distilled water bottles.

In the present standard, the nominal size of the bottle has been specified as 750 ml in place of 560 ml as this size of bottle is commonly used. Also the requirements pertaining to capacity at filling level, brimful capacity and the mass of the bottles has been incorporated in the standard. The 1957 version of the standard had felt the need of inclusion of bursting pressure test and this question was discussed in detail and it was felt by the committee responsible for preparing this standard that there was no need of specifying the internal pressure resistance test. The verticality test and thermal shock test have been laid down in this version of the standard. The sampling clause has been deleted from the revision as it is planned to prepare a separate Indian Standard on sampling criteria for glass containers and a reference will be made of this standard when available.

This standard does not cater for the bottles for medicinal purposes.