AUSTRALIAN STANDARD

DENSITY BOTTLES

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PREFACE

This standard was prepared by the Association's Committee on Laboratory Glassware and Related Apparatus under the direction of the Chemical Standards Board, in response to a request from the National Measurement Laboratory. It is based on BS 733:1965, differing mainly from the British standard in that all reference to imperial units has been deleted. Density is expressed in kilograms per cubic metre.

The density of a liquid at a given temperature is a characteristic physical constant which is often included in standard specifications. The two methods most commonly used for determining the density of a liquid are by means of a hydrometer or a density bottle. Density hydrometers and their use are dealt with in AS 2026. The type of bottle specified herein is not suitable for determining the densities of liquids with relatively high viscosities because of the small capillary bore of the stopper, and for more viscous liquids, density bottles of the Hubbard type are usually used. For determination of density at temperatures below room temperature, the Reischauer type of density bottle is recommended.

For work of high precision, and especially for the determination of the density of volatile liquids, the use of a loosely fitting cap is desirable to reduce evaporation. Such a cap is easily made from a test tube of suitable size and it has therefore not been considered necessary to include a specification for it in this standard.

Appendices A, B and C describe, respectively, alternative methods for determining the capacity of a density bottle, standard methods of calculating density from the measurements obtained using a density bottle, and the calculations required for the measurement of liquid in bulk.

This standard requires reference to the following standards:

AS 2026 Density Hydrometers

AS 2162 SAA Volumetric Glassware Code

BS 1797 Tables for Use in the Calibration of Volumetric Glassware

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard for DENSITY BOTTLES

1 SCOPE. This standard specifies requirements for a series of density bottles suitable for the determination of the density of a liquid with an uncertainty of not greater than 1 part in 10 000.

NOTE: The accuracy obtainable depends on the size of the density bottle, the maintenance of constant temperature and the skill of the operator.

2 DEFINITION. For the purpose of this standard the following definition applies:

Capacity—the volume of water at 20° C, expressed in millilitres, required to fill the bottle at 20° C, the stopper being inserted in the neck and the bottle filled to the top of the capillary bore.

NOTE: Recommended methods for the determination of the capacity of density bottles are described in Appendix A.

3 NOMINAL CAPACITIES AND TOLERANCES ON CAPACITIES.

3.1 Nominal Capacities. Four sizes of density bottle are specified, of nominal capacities 10 mL, 25 mL, 50 mL and 100 mL.

3.2 Tolerances on Capacities. The tolerances on capacities shall be as shown in Table 1.

4 MATERIAL. The bottles shall be made of good quality clear glass. They shall be of sound workmanship and shall be well annealed. The stopper and the bottle shall have similar thermal properties.

5 DIMENSIONS.

5.1 Mandatory Dimensions. The bottles shall conform to the dimensions specified in Table 2.

5.2 Recommended Dimensions. Recommended dimensions for density bottles are given in Table 3. These dimensions are for the guidance of manufacturers and are not a mandatory part of the standard.

6 CONSTRUCTION.

6.1 Body. The shape of the body of the bottle shall be substantially as shown in Fig. 1 so as to provide a large base on which the bottle shall stand vertically without rocking or spinning. The bottle shall not topple when placed empty, with the stopper inserted, on a non-slip surface inclined at an angle of 15 degrees to the horizontal.