

Measurement of the

Density of milk using a hydrometer —

Part 1: Specification for hydrometers
for use in milk

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Chemical Society	National Farmers' Union
Commonwealth Bureau of Dairy Science and Technology	National Institute for Research in Dairying*
Dairy Trade Federation*	Office of the High Commissioner for Australia*
Department of Health and Social Security	Office of the High Commissioner for New Zealand*
Department of Trade and Industry, Laboratory of the Government Chemist*	Process Plant Association
Institute of Food Science and Technology	Royal Association of British Dairy Farmers*
Milk Marketing Board*	Royal Institute of Public Health and Hygiene
Milk Marketing Board for Northern Ireland*	Royal Society of Health
Milking Machine Manufacturers' Association	Scottish Milk Trade Federation
Ministry of Agriculture, Fisheries and Food*	Society of Chemical Industry
National Association of Creamery Proprietors and Wholesale Dairymen	Society of Dairy Technology*
	United Kingdom Dairy Association*
	West of Scotland Agricultural College

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this standard:

Association of British and Dominion Condensed Milk Manufacturers	Hannah Research Institute
Association of British Manufacturers of Milk Powder	Ice Cream Alliance Ltd.
Association of Butter Makers, Blenders and Packers	Ice Cream Federation Ltd.
Association of Public Analysts	Joint Committee of the Milk Marketing Board and the Dairy Trade Federation
Association of Public Health Inspectors	London Provision Exchange
British Food Manufacturing Industries Research Association	Ministry of Agriculture, Government of Northern Ireland
British Paper and Board Makers' Association	Society for Analytical Chemistry
	University of Reading

This British Standard, having been approved by the Dairying Industry Standards Committee, was published under the authority of the Executive Board on 29 October 1973

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Amendments issued since publication

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Foreword

BS 734 was first published, under the authority of the Dairying Industry Standards Committee, in 1937 and a revised edition was published in 1955. In 1959 the standard was again revised; Part 2 “Methods” was published in that year, and in 1960, Part 1, “Apparatus”.

Part 1 of this British Standard specifies hydrometers of two sizes to meet the need of the dairying industry to deal with milk samples of differing volumes. Two scale ranges are provided for each size.

This revision has been based on draft International Standard ISO 2449, “*Milk and Liquid milk products — density hydrometers for use in products with a surface tension of approximately 45 mN/m*”, to which the Nos. 1 and 1A hydrometers strictly conform. The smaller, less precise Nos. 2 and 2A hydrometers, which do not appear in the ISO document, have been retained in a modified form as their use is widespread in the United Kingdom. The Nos. 3 and 3A hydrometers specified in the 1960 edition have not, however, been retained.

The basis of adjustment of the hydrometers adopted in 1937 was density in grams (mass) per millilitre at 20 °C in a liquid with a surface tension of 46 dyn/cm. In this revision, however, the internationally accepted value of 45 mN/m (see 3.3, Note) for the average surface tension at 20 °C of freshly formed surfaces of milk has been adopted as the basis of adjustment.

NOTE The system of units known as the International System of units (SI), and adopted by ISO [see BS 3763, “*The International System of units (SI)*”], has been used in this British Standard as follows.

- 1) Instead of the surface tension unit “dyne per centimetre” (dyn/cm) used in ISO R 387, “*Principles of construction and adjustment of hydrometers*”, the unit adopted is the “millinewton per metre” (mN/m), the appropriate decimal multiple of the SI unit of surface tension “newton per metre” (N/m), where the newton (N), the SI unit of force, is defined as that force which, when applied to a body having a mass of 1 kg gives it an acceleration of 1 m/s². (1 mN/m = 1 dyn/cm.)
- 2) The SI unit of density, i.e. mass per unit volume, is the “kilogram per cubic metre” (kg/m³), an appropriate decimal multiple being the “gram per cubic centimetre” (g/cm³). As a convenient synonym for the latter unit, the SI system allows the use of “gram per millilitre” (g/ml), and this method of expressing density, accepted in ISO R387, has been adopted. It should be noted that “density (g/ml)”, means “gram (mass) per millilitre” and not “gram (observed weight) per millilitre.” (1 g/ml = 1 g/cm³.)

Details of cylinders in which the hydrometers may be used are given in Appendix A, and suitable thermometers for use with them are described in Appendix B.

Notes on the verification of hydrometers are given in Appendix C, with two recommended procedures for comparison with similar reference hydrometers in order to determine corrections for hydrometer errors. For the benefit of users, these methods will also be included in the revision of the 1959 edition of Part 2 of this British Standard BS 734, “*Measurement of the density of milk using a hydrometer*”, Part 2¹⁾, “*Method for the determination of milk density*”.

Details of the facilities available for verification of the hydrometers are given in Appendix D.

¹⁾ In course of preparation

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

