AS 2148—2004
ISO 2449:1974

Australian Standard™

Milk and liquid milk products—Density hydrometers for use in products with a surface tension of approximately 45 mN/m

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This Australian Standard was prepared by Committee FT-010, Chemical Analysis of Dairy Products. It was approved on behalf of the Council of Standards Australia on 20 January 2004 and published on 4 March 2004.

The following are represented on Committee FT-010:

Australian Food and Grocery Council
Department of Primary Industries Queensland
Food Standards Australia New Zealand
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This Standard was issued in draft form for comment as DR 03540.

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Milk and liquid milk products—Density hydrometers for use in products with a surface tension of approximately 45 mN/m

Originated as AS N40.1—1962.
Prevoius edition AS 2148—1978.
Second edition 2004.

Published by Standards Australia International Ltd
GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 5751 0

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee FT-010, Chemical Analysis of Dairy Products, to supersede AS 2148—1978. *Hydrometers for use in milk.*

This Standard is identical to and reproduced from ISO 2449:1974, *Milk and liquid milk products—Density hydrometers for use in products with a surface tension of approximately 45 mN/m.*

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee FT-010. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide specifications for glass hydrometers of constant mass, for use in milk and liquid milk products with a surface tension of approximately 45 mN/m, which indicate density (g/mL) at 20°C (27°C in tropical countries).

Two types of hydrometers are specified, a precision type and a wide-range type, which comply in all important respects with ISO/R 387, *Principles of construction and adjustment of hydrometers*.

Notes on the verification of the hydrometers are given in Annex A, a suitable hydrometer cylinder is described in Annex B and suitable thermometer is described in Annex C.

As this Standard is reproduced from an International Standard, the following applies:

(a) In the source text, ‘this International Standard’ should read ‘this Australian Standard’.

(b) A full point substitutes for a comma when referring to a decimal marker.

(c) Substitute ‘mL’ for ‘ml’ wherever it appears.

AUSTRALIAN STANDARD

Milk and liquid milk products—Density hydrometers for use in products with a surface tension of approximately 45 mN/m

0 INTRODUCTION

The system of units known as the Système International d'Unités (SI), and adopted by ISO (see ISO 1000, *SI units and recommendations for the use of their multiples and of certain other units*), has been used in this International 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 in the present International Standard is the "millinewton per metre" (mN/m), the recommended submultiple of the SI unit of surface tension "newton per metre" (N/m); 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/s^2. (1 mN/m = 1 dyn/cm).

2) The SI unit of density, i.e. mass divided by volume, is the "kilogram per cubic metre" (kg/m^3), a permitted submultiple of this unit being the "gram per cubic centimetre" (g/cm^3). As a convenient synonym for the latter unit, the SI unit system permits the use of the "gram per millilitre" (g/ml), and this method of expressing density, accepted in ISO/R 387, has been adopted in the present International Standard. (1 g/ml ≡ 1 g/cm^3). It should be noted that "density (g/ml)" means "grams (mass) per millilitre" and not "grams (observed weight) per millilitre".

1 SCOPE AND FIELD OF APPLICATION

1.1 This International Standard gives specifications for glass hydrometers of constant mass, for use in milk and liquid milk products with a surface tension of approximately 45 mN/m, which indicate density (g/ml) at 20 °C (27 °C in tropical countries).

1.2 Two types of hydrometers are specified, a precision type and a wide-range type, which comply in all important respects with ISO/R 387.

1.3 Notes on the verification of the hydrometers are given in annex A, a suitable hydrometer cylinder is described in annex B and a suitable thermometer is described in annex C.

2 SCALE RANGES, SUBDIVISION OF SCALES AND TOLERANCES

2.1 Scale ranges

The scale ranges shall be as follows :

a) 1,025 to 1,035 g/ml for the precision hydrometer, and

b) 1,015 to 1,045 g/ml for the wide-range hydrometer.

NOTE – Additional precision hydrometers of scale range of 1,015 to 1,025, 1,035 to 1,045 or 1,040 to 1,050 g/ml may be required for certain purposes.

2.2 Subdivision of scales

The scale shall be subdivided at each 0,000 2 g/ml for a precision hydrometer, and at each 0,000 5 g/ml for the wide-range hydrometer.

2.3 Tolerances

The density indication shall not be in error at any point on the scale by more than ± 0,000 2 g/ml for a precision hydrometer, or by more than ± 0,000 5 g/ml for a wide-range hydrometer.

3 ADJUSTMENT

3.1 Reading level

The hydrometer shall be adjusted to be read at the top of the liquid meniscus, i.e. where the meniscus appears to meet the stem. (See clause 8 b).)

3.2 Immersion

The hydrometer shall be adjusted to give correct readings when the emergent stem is wetted by the liquid to a level not more than 3 mm above the top of the meniscus.

3.3 Temperature and surface tension

The hydrometer shall be adjusted to indicate density in grams per millilitre at 20 °C when floating in a liquid at 20 °C with a surface tension of 45 mN/m.

NOTES

1 The value 45 mN/m is taken as the average surface tension at 20 °C of a freshly formed surface of cows' milk, i.e. obtained by pouring milk into a vessel until some has overflowed.