AS 2417—2001
ISO 9906:1999(E)

Australian Standard™

Rotodynamic pumps—Hydraulic performance acceptance tests—Grades 1 and 2

Standards Australia

This Australian Standard was prepared by Committee ME-030, Pumps. It was approved on behalf of the Council of Standards Australia on 16 February 2001 and published on 6 March 2001.

The following interests are represented on Committee ME-030:

Australian Pump Manufacturers

South Australian Water Corporation

Sydney Water Corporation

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Australia web site at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Australian Standard*, has a full listing of revisions and amendments published each month.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.com.au, or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

This Standard was issued in draft form for comment as DR 00286.

Australian Standard™

Rotodynamic pumps—Hydraulic performance acceptance tests—Grades 1 and 2

Originated as AS CB9—1931.
Previous editions AS 2417.1—1980, AS 2417.2—1980 and AS 2417.3—1980.
AS 2417.1—1980, AS 2417.2—1980 and AS 2417.3—1980 revised, amalgamated and redesignated as AS 2417—2001.

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

ISBN 0 7337 3760 9

PREFACE

This Standard was prepared by the Standards Australia Committee ME-030, Pumps to supersede AS 2417—1980, Parts 1, 2 and 3.

This Standard is identical with and has been reproduced from ISO 9906:1999(E), *Rotodynamic pumps—Hydraulic performance acceptance tests—Grades 1 and 2*.

Statements expressed in mandatory terms in notes to text, tables and figures are deemed to be requirements of this Standard.

As this Standard is reproduced from an international Standard the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text, 'this International Standard' should read 'this Australian Standard'.

(c) A full point substitute for a comma when referring to a decimal marker.

References to international Standards should be replaced by reference to identical Australian Standards, as follows:

Reference to International Standard or other publication		*Australian/New Zealand Standard*	
ISO		AS	
1438	Water flow measurement in open channels using weirs and Venturi flumes	3778	Measurement of water flow in open channels
1438-1	Part 1: Thin-plate weirs	3778.4.1	Part 4.1: Measurement using flow gauging structures—Thin plate weirs
2186	Fluid flow in closed conduits—Connections for pressure signal transmissions between primary and secondary elements	—	
3354	Measurement of clean water flow in closed conduits—Velocity-area method using current-meters in full conduits and under regular flow conditions	—	
3966	Measurement of fluid flow in closed conduits—Velocity area method using Pitot static tubes	—	
4373	Measurement of fluid flow in open channels—Water-level measuring devices	3778.6.5	Part 6.5: Measuring devices, instruments and equipment—Water-level measuring devices
5167	Measurement of fluid flow by means of pressure differential devices	2360	Measurement of fluid flow in closed conduits
5167-1	Part 1: Orifice plates, nozzles and Venturi tubes inserted in circular cross-section conduits running full	2360.1.1	Part 1.1: Pressure differential methods—Measuring using orifice plates, nozzles or Venturi tubes—Conduits with diameters from 50 mm to 1200 mm

ISO		AS	
8316	Method by collection of liquid in a volumetric tank—Method by collection of a liquid in a volumetric tank	2360.6.2	Part 6.2: Volumetric methods—By volume
5198	Centrifugal, mixed flow and axial pumps—Code for hydraulic performance tests—Precision grade		—
7194	Measurement of fluid flow in closed conduits—Velocity-area methods of flow measurement in swirling or asymmetric flow conditions in circular ducts by means of current-meter or Pitot-static tubes		—
9104	Measurement of liquid flow in closed conduits—Methods of evaluating the performance of electro-magnetic flow-meters for liquids		—
IEC			
60034	Recommendations for rotating electrical machinery (excluding machines for traction vehicles)—		—
60034-2	Part 2: Determination of efficiency of rotating electrical machinery		-
60051	Recommendations for direct acting electrical measuring instruments and their accessories		—

The term ‘informative’ has been used in this Standard to define the application of the annex or appendix to which it applies. An ‘informative’ annex or appendix is only for information and guidance.

CONTENTS

INTRODUCTION

This International Standard combines and replaces the former acceptance test standards ISO 3555:1977 (corresponding to grade 1 of this International Standard) and ISO 2548:1975 (corresponding to grade 2 of this International Standard), but there is an important change in the verification of guarantees, because the uncertainty of measurement must not influence the acceptability of a pump and the tolerances are due to constructional differences only.

New tolerance factors have been introduced to ensure as far as possible that a pump which was acceptable under the previous International Standards (ISO 2548 and/or ISO 3555) would also be acceptable under this International Standard.

Contrary to this International Standard, ISO 5198 is not to be understood as an acceptance test code. It gives guidance for measurements of very high accuracy and for the thermodynamic method for direct measurement of efficiencies, but it does not recommend verification of guarantees.

Terms used in this International Standard such as “guarantee” or “acceptance” should be understood in a technical but not in a legal sense. The term “guarantee” therefore specifies values for checking purposes determined in the contract, but does not say anything about the rights or duties arising, if these values are not reached or fulfilled. The term “acceptance” does not have any legal meaning here, either. Therefore, an acceptance test carried out successfully alone does not represent an "acceptance" in the legal sense.

NOTES

AUSTRALIAN STANDARD

Rotodynamic pumps—Hydraulic performance acceptance tests—Grades 1 and 2

1 Scope

This International Standard specifies hydraulic performance tests for acceptance of rotodynamic pumps (centrifugal, mixed flow and axial pumps, hereinafter simply designated as “pumps”). It is applicable to pumps of any size and to any pumped liquids behaving as clean cold water (such as defined in 5.4.5.2). It is neither concerned with the structural details of the pump nor with the mechanical properties of their components.

This International Standard contains two grades of accuracy of measurement: grade 1 for higher accuracy, and grade 2 for lower accuracy. These grades include different values for tolerance factors, for allowable fluctuations and uncertainties of measurement.

For pumps produced in series with selection made from typical performance curves and for pumps a with power input of less than 10 kW, see annex A for higher tolerance factors.

This International Standard is applicable both to a pump itself without any fittings and to a combination of a pump associated with all or part of its upstream and/or downstream fittings.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 1438-1, *Water flow measurement in open channels using weirs and Venturi flumes — Part 1: Thin-plate weirs.*

ISO 2186, *Fluid flow in closed conduits — Connections for pressure signal transmissions between primary and secondary elements.*

ISO 3354, *Measurement of clean water flow in closed conduits — Velocity-area method using, current-meters in full conduits and under regular flow conditions.*

ISO 3966, *Measurement of fluid flow in closed conduits — Velocity area method using Pitot static tubes.*

ISO 4373, *Measurement of liquid flow in open channels — Water-level measuring devices.*

ISO 5167-1, *Measurement of fluid flow by means of pressure differential devices — Part 1: Orifice plates, nozzles and Venturi tubes inserted in circular cross-section conduits running full.*

ISO 5198, *Centrifugal, mixed flow and axial pumps — Code for hydraulic performance tests — Precision grade.*

ISO 7194, *Measurement of fluid flow in closed conduits — Velocity-area methods of flow measurement in swirling or asymmetric flow conditions in circular ducts by means of current-meters or Pitot-static tubes.*

ISO 8316, *Measurement of liquid flow in closed conduits — Method by collection of the liquid in a volumetric tank.*

ISO 9104, *Measurement of liquid flow in closed conduits — Methods of evaluating the performance of electro-magnetic flow-meters for liquids.*