AS 4747.3:2025

Australian STANDARD®

STANDARDS Australia

Metering systems for non-urban water supply

Part 3: Technical requirements for open channel metering systems



AS 4747.3:2025

This Australian Standard® was prepared by CE-024, Measurement Of Water Flow In Open Channels and Closed Conduits. It was approved on behalf of Standards Australia's Standards Development and Accreditation Committee on 13 June 2025.

This Standard was published on 27 June 2025.

The following are represented on Committee CE-024:

Australian Bureau of Meteorology
Australian Hydrographers Association
Australian Industry Group
Department of Planning and Environment (NSW)
Engineers Australia
Institute of Instrumentation, Control & Automation Aust
Irrigation Australia
National Measurement Institute
University of South Australia
Water NSW

This Standard was issued for comment as DR AS 4747.3:2024

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals and new products by visiting:

www.standards.org.au

ISBN: 978 1 76175 274 2

Australian Standard®

Metering systems for non-urban water supply

Part 3: Technical requirements for open channel metering systems

Originated as ATS 4747.3—2008.
Revised and redesignated AS 4747.3—2013.
Second edition AS 4747.3:2025.

© Standards Australia Limited 2025

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

How to read this Standard

This page explains the meaning of the language and structure of this Standard.

Refer to Standards Australia's Standardisation Guide 006 for more details about drafting rules.

Australian and Australian/New Zealand Standards are voluntary unless they are referenced in legislation or called up in contracts.

Requirements

To conform to a Standard, all requirements in the Standard need to be met.

A requirement is any statement in the Standard which uses the word "shall".

Recommendations, permissions and possibilities

The following words are commonly used in Standards, but statements using them do not have to be followed to conform to the Standard:

(a) "should" means that something is recommended.

(b) "may" means that something is permitted.

(c) "can" means that something is possible.

Structure of Standards

A Standard always has the following parts:

(i) The Preface states who developed the Standard, what the Standard is aiming to do, and how it relates to other documents.

(ii) The Scope states what the Standard is about, what it covers and what it does not cover.

(iii) The Normative references clause lists other documents that are referenced in the Standard as part of requirements.

(iv) The Terms and definitions clause defines important terms to help with understanding the Standard.

A Standard may also include other parts, such as the following:

(1) A normative appendix sets additional requirements that need to be conformed to.

(2) An informative appendix provides additional information or guidance. An informative appendix provides additional information or guidance. They usually do not contain requirements. If an informative appendix does contain requirements, the Standard will explain when those requirements apply.

(3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

Preface

This Standard was prepared by the Standards Australia Committee CE-024, Measurement Of Water Flow In Open Channels and Closed Conduits, to supersede AS 4747.3—2013, *Meters for non-urban water supply, Part 3: Technical requirements for open channel meters*.

The objective of this document is to set out the technical requirements for non-urban metering systems in open channel applications.

This document forms part of the AS 4747 series covering the metering of non-urban water supply. A list of all parts in this series can be found in the Standards Australia online catalogue.

The major changes in this edition are as follows:

(a) The relevant terms and definitions from AS 4747.1 have been incorporated into this document. AS 4747.1 has been withdrawn.

(b) An Introduction section has been included to explain the relationship between this document and regulatory documents such as the Metrological Assurance Framework (MAF). AS 4747.8 has been withdrawn and the material previously contained in that document relating to in-service compliance is now covered by the MAF.

(c) Pseudo-regulatory requirements and validation/verification requirements have been removed.

(d) The content in this document has been consolidated so that it is easier to navigate. The document structure has been aligned with AS 4747.2:2025 which deals with closed conduit metering systems.

(e) The technical requirements have been clarified.

(f) There is additional flexibility in the design requirements by conformance with other Australian and International Standards.

(g) The term “metering system” replaces the use of other terms such as “modular metering system” and “self-contained meter”.

(h) The product documentation requirements have been updated, and the purchasing guidelines have been removed.

(i) The appendix related to uncertainty of measurement has been updated, and a new calculation example has been provided.

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is for information and guidance only.

NOTE This document applies to areas subject to legislation. Refer to the relevant federal, state and territory authorities for the legal and regulatory requirements that apply in that jurisdiction.

© Standards Australia Limited 2025

Contents

Page

Preface ..... **v**

Introduction ..... **vii**

Section 1 Scope and general **1**
1.1 Scope 1
1.2 Normative references 1
1.3 Terms and definitions 2
1.4 Symbols and abbreviated terms 6
1.5 Evaluation of product conformity 6

Section 2 Materials **7**
2.1 General 7
2.2 Resistance to corrosion 7
2.2.1 General 7
2.2.2 Corrosion-resistant materials 7
2.3 Material durability test — Ultraviolet exposure test 7

Section 3 Principles of measurement **9**
3.1 Methods 9
3.2 Requirements related to specific technologies 9
3.3 Metering of open channel conditions 12
3.4 Velocity area methods 12
3.5 Flow computation 12

Section 4 Design **14**
4.1 Output 14
4.1.1 General 14
4.1.2 Flow rate 14
4.1.3 Volume 14
4.1.4 Other data output 14
4.2 Electronic data storage 14
4.3 Sampling rate 14
4.4 Frost protection 15
4.5 Bypass 15

Section 5 Performance requirements **16**
5.1 General 16
5.2 Rated operating conditions 17
5.3 Measurement of performance 17
5.3.1 General 17
5.3.2 Direct volumetric comparison 17
5.3.3 Indirect volumetric calculation 18

Section 6 Product documentation **19**

Appendix A (normative) **Demonstration of conformance** **21**

Appendix B (informative) **Uncertainty of measurement — Example** **22**

Bibliography **25**

© Standards Australia Limited 2025

Introduction

The National Water Initiative (NWI) (2004) was established to increase the productivity and efficiency of Australia's water use. The Commonwealth and all Australian states and territories agreed to the NWI. Clause 88 of the NWI refers to the development of the National Meter Specification, now known as AS 4747. This Australian Standard contributes to the outcomes of the NWI.

The requirements for non-urban water metering systems are described in the following documents:

(a) Parts 2, 3 and 4 of the AS 4747 series. Parts 2 and 3 describe the construction and technical requirements and Part 4 describes the installation and commissioning requirements for meters to conform to this series.

NOTE 1 AS 4747.1, which was a glossary of terms, has been withdrawn and the relevant terms and definitions are now included in Parts 2, 3 and 4.

NOTE 2 AS 4747.5 and AS 4747.6 have been withdrawn and the content combined to form AS 4747.4.

NOTE 3 AS 4747.8 has been withdrawn and replaced by the Metrological Assurance Framework (MAF).

(b) The National Measurement Institute (NMI) documents NMI M 10 and NMI M 11. These describe the requirements and test methods for the pattern approval and verification of non-urban water metering systems.

AS 4747 references the requirements and test procedures specified in the NMI documents. NMI M 10 and NMI M 11 are freely available from an Australian government website.

(c) The Metrological Assurance Framework 2 (MAF2). This describes —

(i) the nationally consistent compliance management approach for non-urban water meters in Australia; and

(ii) the rules and guidelines used to maintain compliance for non-urban water meters, including methods and practices for validation.

NOTE 4 Compliance is usually maintained by State and Territory regulators or irrigation infrastructure operators.

The MAF 2 is freely available from an Australian government website.

Pattern approval and verification are regulatory requirements specified under the *National Measurement Act 1960*. This standard does not require meters to be pattern approved or verified. However, testing and evaluation performed for pattern approval purposes can also be used to demonstrate conformance to AS 4747. Pattern approval certificates for approved meters are available from an Australian government website.

At the time of publication, water meters with a maximum continuous flow rate (Q_3) greater than 16 kL/h are exempt from pattern approval and verification under the *National Measurement Act 1960.*

Verification and validation are separate and distinct requirements described in the above documentation. The requirements for verification are defined under the *National Measurement Act 1960.* The MAF2 describes practices for validation and verification.

© Standards Australia Limited 2025

NOTES

Australian Standard®

Metering systems for non-urban water supply

Part 3: Technical requirements for open channel metering systems

Section 1 Scope and general

1.1 Scope

This document sets out the technical requirements for non-urban metering systems in open channel and partially filled conduit applications. The document covers metering principally used for non-urban water supply.

NOTE 1 Metering systems are defined in Clause 1.3.

NOTE 2 The installation and commissioning requirements for metering systems are specified in AS 4747.4.

NOTE 3 A partially filled conduit is an open channel condition.

NOTE 4 The requirements for metering systems operating in fully charged closed conduits are specified in AS 4747.2.

The technical requirements in this document cover all design elements of the metering system including ancillary equipment.

This document excludes the following:

(a) Validation and verification of metering systems.

(b) Telemetry systems.

NOTE 5 Telemetry systems can be subject to regulatory requirements.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1565, *Copper and copper alloys — Ingots and castings*

AS 2345, *Dezincification resistance of copper alloys*

AS 2738, *Copper and copper alloys — Compositions and designations of refinery products, wrought products, ingots and castings*

AS 3558.5, *Methods of testing plastics and composite materials sanitary plumbing fixtures, Method 5: Determination of degradation by ultraviolet light*

AS 4747.4, *Meters for non-urban water supply, Part 4: Installation and commissioning of metering systems*

AS/NZS 1567, *Copper and copper alloys — Wrought rods, bars and sections*

AS ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

AS ISO/ IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes and services*

ASTM A276, *Standard specification for stainless steel bars and shapes*

© Standards Australia Limited 2025