

Australian Standard<sup>®</sup>

**Meters for water supply**

**Part 4: In-service compliance testing**



This Australian Standard® was prepared by Committee WS-024, Water Meters. It was approved on behalf of the Council of Standards Australia on 15 January 2007. This Standard was published on 8 March 2007.

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The following are represented on Committee WS-024:

- Australian Electrical and Electronic Manufacturers Association
  - Australian Industry Group
  - Australian Institute of Refrigeration Air Conditioning and Heating
  - Consumer Affairs Victoria
  - National Measurement Institute
  - Water Industry Alliance
  - Water Services Association of Australia
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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through public comment period.

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**Part 4: In-service compliance testing**

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## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WS-024, Water Meters.

The objective of this Standard is to provide the water metering industry with guidance for the timely sampling, testing, and assessment of in-service compliance of populations of water meters

This Standard is Part 4 of AS 3565, Water Metering, which is published in Parts as follows:

### AS

- 3565 Meters for water supply
- 3565.1 Part 1: Cold water meters
- 3565.2 Part 2: Combination meters
- 3565.3 Part 3: Water meters with integral dual check valves

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

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## FOREWORD

This Standard has been prepared in relation to the National Measurement Act, NMI R49-1 and impending State Regulations covering the control and accuracy performance compliance of water meters while in-service.

The Standard is currently limited to 20 mm water meters.

Meter sampling points are calculated on register or equivalent age. The conversion to equivalent age is based on an Australia wide average annual domestic consumption of 240 kL/annum.

The continued accuracy of water meters in-service depends amongst other factors on the meter age, usage patterns, the water chemistry, suspended solids and the volume of water passed through the meter throughout its lifecycle. It is clear from meter performance studies that new meter accuracy requirements deteriorate within a few years after being installed in service and no longer meet the factory as new criteria.

In writing this Standard, the capability of current technology and the cost benefit of replacement policies has been taken into account. The impact of requiring unrealistic accuracy levels at very low flows will be to shorten the life of water meters, and increase costs of compliance, which will inevitably be passed on to the consumer. It should be noted that meters, as they age, generally lose accuracy and under-register actual volume passed through the meter.

The in-service test criteria is established to ensure that meter accuracy is maintained throughout the economic life of the meter, which recognizes the low flow accuracy deterioration of meters in service. Meters are tested at designated flow rates based on water usage studies and represent the flow rates of water used by consumers within a typical household. A weighted meter accuracy is then calculated for use in determination of the population performance.

The selection of the test flow rates for in-service compliance takes into consideration that domestic flow rates used by consumers is mainly at flows between 300 and 2400 L/h. Mains water pressure generally limits the maximum flow

Therefore, the in-service compliance test flow rates take into consideration the known residential flow rates where water is mostly used, the early deterioration of meter accuracy at low flows within the meter lifecycle and the economic impacts for water utilities and consumers of large scale meter replacement programs. In recognition of in-service meter performance, test flow rates are directly related to factors that affect performance of meters in service.

The weighting factors used in this Standard are based on available water industry data. Studies showed a greater proportion of the water is used at lower flows than previous data. The committee considered that this better reflected the conditions after installation of water saving devices. It was considered to be the best information available at the time of publication.

Populations of water meters should be replaced when they no longer maintain the required accuracy limits. It is not economical to test every meter within a population. Therefore, statistical sampling techniques are used to measure performance. The standard assumes a population of water meters does not have a predetermined life. Provided they are routinely sample tested and remain accurate within the specified limits, meters can remain in-service. When accuracy falls outside the limits, rules for failed samples are invoked.

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## Australian Standard Meters for water supply

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### Part 4: In-service compliance testing

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#### 1 SCOPE

This Standard specifies requirements for the timely sampling, testing, and assessment of in-service compliance of populations of water meters and individual meters.

This Standard is limited to 20 mm water meters.

NOTE: Larger sizes will be included once criteria have been validated by testing.

#### 2 APPLICATION

This Standard is intended for use by network utility operators or meter providers responsible for maintaining metrological performance (in-service compliance) of meters throughout the life of the meters.

It is not intended for—

- (a) meter populations that are not large enough to provide a statistically meaningful sample (for populations typically less than 15);
- (b) meters that have been tampered with or damaged; and
- (c) other devices such as volume correctors or pressure regulators.

#### 3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

##### AS

- |        |  |
|--------|--|
| 1199   | Sampling procedures for inspection by attributes   |
| 1199.0 | Part 0: Introduction to the ISO 2859 attribute sampling system                               |
| 1199.1 | Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection |
| 1199.2 | Part 2: Sampling plans indexed by limiting quality (LQ) for isolated lot inspection          |

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|--------|---------------------------|
| 3565   | Meters for water supply   |
| 3565.1 | Part 1: Cold water meters |

##### NSC

- |       |  |
|-------|--|
| R49-1 | Water Meters Intended for the Metering of Cold Potable Water             |
|       | Part 1: Metrological and Technical Requirements                          |
|       | Part 2: Methods of testing for pattern approval and initial verification |

#### 4 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

##### 4.1 Definitions relating to meters

Definitions relating to meters are given in AS 3565.1.



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