AS 3778.3.7—2007

Australian Standard®

Measurement of water flow in open channels

Part 3.7: Velocity-area methods—Measurement by ultrasonic (acoustic) method

This Australian Standard® was prepared by Committee CE-024, Measurement of Water Flow in Open Channels and Closed Conduits. It was approved on behalf of the Council of Standards Australia on 5 April 2007.
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The following are represented on Committee CE-024:

- Australian Industry Group
- Australian National Committee on Irrigation and Drainage
- Department of Environment and Water Resources
- Institute of Instrumentation, Control and Automation Australia
- Irrigation Association of Australia
- National Measurement Institute
- Plumbing Products Industry Group
- University of New South Wales
- University of South Australia
- Water Services Association of Australia

This Standard was issued in draft form for comment as DR 07108.

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 the public comment period.

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Part 3.7: Velocity-area methods—Measurement by ultrasonic (acoustic) method

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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 3778.3.7—2001.

The objective of this Standard is to specify methods for measuring discharge in large rivers and estuaries by the moving-boat technique.

This Standard is identical to and reproduced from ISO 6416:2004, *Hydrometry—Measurement of discharge by ultrasonic (acoustic) method*.

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 'ISO 6416' should read 'AS 3778.3.7'.

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

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1 Scope

This International Standard describes the establishment and operation of an ultrasonic (transit-time) gauging station for the continuous measurement of discharge in a river, an open channel or a closed conduit. It also describes the basic principles on which the method is based, the operation and performance of associated instrumentation and procedures for commissioning.

It is limited to the “transit time of ultrasonic pulses” technique, and is not applicable to systems that make use of the “Doppler shift” or “correlation” or “level-to-flow” techniques.

This International Standard is not applicable to measurement in rivers with ice.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 772:1996, *Hydrometric determinations — Vocabulary and symbols*

ISO 4373:1995, *Measurement of liquid flow in open channels — Water-level measuring devices*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 772 apply.

4 Applications

4.1 Open channels

4.1.1 The method is suitable for use in river flow measurement, a significant advantage being additional freedom from siting constraints in comparison with other available techniques. In particular, the method does not demand the presence of a natural control or the creation of a man-made control at the proposed gauge location, as it does not rely upon the establishment of a unique relation between water level and discharge.

4.1.2 Gauges using the method are capable of providing highly accurate flow determinations over a range of flows contained within a defined gauge cross-section. They are tolerant of the backwater effects created by tides, downstream tributary discharges, downstream weed growth, reservoir or head-pond water level manipulation, and periodic channel obstruction.

NOTE For locations subjected to significant bed level or profile instability, it may not be possible to use gauges.