

Australian Standard™

**Measurement of water flow in open
channels**

**Part 3.1: Velocity-area methods—
Measurement by current-meters and
floats**

[ISO title: Measurement of liquid flow in open channels—Velocity-area
methods]



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 29 September 2000 and published on 13 March 2001.

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Australian Water and Wastewater Association
Department of Natural Resources, Qld
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Department of Land and Water Conservation, New South Wales
Department of Public Works and Services, New South Wales
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Australian Standard™

Measurement of water flow in open channels

**Part 3.1: Velocity-area methods—
Measurement by current-meters and floats**

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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.

This Standard is identical to and is reproduced from ISO 748:1997, *Measurement of liquid flow in open channels—Velocity-area methods*.

This Standard is Part 3.1 of AS 3778, *Measurement of water flow in open channels*, which is published in parts as follows:

AS		
3778		Measurement of water flow in open channels
3778.1	Part 1:	Vocabulary and symbols
3778.2	Part 2:	General
3778.2.1	Part 2.1:	Guidelines for the selection of methods of measurement
3778.2.2	Part 2.2:	Establishment and operation of a gauging station
3778.2.3	Part 2.3:	Determination of the stage-discharge relation
3778.2.4	Part 2.4:	Estimation of uncertainty of a flow-rate measurement
3778.2.5	Part 2.5:	Guidelines for the selection of flow gauging structures
3778.3	Part 3:	Velocity-area method
3778.3.1	Part 3.1:	Measurement by current meters and floats (this Standard)
3778.3.2	Part 3.2:	Measurement by moving boat method
3778.3.3	Part 3.3:	Measurement by slope-area method
3778.3.4	Part 3.4:	Collection and processing of data for determination of errors in measurement
3778.3.5	Part 3.5:	Investigation of total error
3778.3.6	Part 3.6:	Measurement of flow in tidal channels
3778.3.7	Part 3.7:	Measurement by ultrasonic (acoustic) method
3778.3.8	Part 3.8:	Electromagnetic method using a full-channel-width coil
3778.4	Part 4:	Measurement using flow gauging structures
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3778.4.2	Part 4.2:	Rectangular broad-crested weirs
3778.4.3	Part 4.3:	Round-nose horizontal broad-crested weirs
3778.4.4	Part 4.4:	V-shaped broad-crested weirs
3778.4.5	Part 4.5:	Triangular profile weirs
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3778.6.6	Part 6.6:	Cableway system for stream gauging
3778.6.7	Part 6.7:	Ultrasonic (acoustic) velocity meters
3778.6.8	Part 6.8:	Position fixing equipment for hydrometric boats

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<i>Reference to International Standard</i>		<i>Australian Standard</i>	
ISO		AS	
1000	SI units and recommendations for the use of their multiples and of certain other units	1000	The international system of units (SI) and its application
31	Quantities, units and symbols	2900	Quantities, units and symbols
772	Liquid flow measurement in open channels—Vocabulary and symbols	3778	Measurement of water flow in open channels
1100	Liquid flow measurement in open channels	3778.1	Part 1: Vocabulary and symbols
1100-1	Part 1: Establishment and operation of a gauging station	3778.1.2	Part 2.2: General—Establishment and operation of a gauging station
1100-2	Part 2: Determination of the stage-discharge relation	3778.2.3	Part 2.3: General—Determination of the stage-discharge relation
5168	Measurement of fluid flow—Estimation of uncertainty of flow-rate measurement	3778.2.4	Part 2.4: General—Estimation of uncertainty of a flow-rate measurement

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AUSTRALIAN STANDARD

Measurement of water flow in open channels

Part 3.1:

Velocity-area methods—Measurement by current-meters and floats

1 Scope

This International Standard specifies methods for determining the velocity and cross-sectional area of water flowing in open channels without ice cover, and for computing the discharge therefrom.

It covers methods of employing current-meters and floats to measure the velocities. Although, in most cases, these measurements are intended to determine the stage-discharge relation of a gauging station, this International Standard deals only with single measurements of the discharge; the continuous recording of discharges over a period of time is covered in ISO 1100-1 and ISO 1100-2.

NOTE The methods for determining the velocity and cross-sectional area of water flowing in open channels with ice cover are specified in ISO 9196.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 772 and the following definition apply.

3.1 unit-width discharge

discharge through a unit width of a section at a given vertical

4 Principle of the methods of measurements

4.1 The principle of these methods consists of measuring velocity and cross-sectional area. A measuring site is chosen conforming to the specified requirements; the width, depending on its magnitude, is measured either by means of steel tape or by some other surveying method, and the depth is measured at a number of points across the width, sufficient to determine the shape and area of the cross-section.

Velocity observations are made at each vertical preferably at the same time as measurement of depth, especially in the case of unstable beds. They are made by any one of the standard methods using current-meters. If unit width discharge is required, it is generally computed from the individual observations.

In the integration method, the mean velocity is obtained directly.