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Measurement of water flow in open channels

Part 4.5: Measurement using flow gauging structures — Triangular profile weirs (ISO 4360:2020, IDT)



AS 3778.4.5:2022

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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 3778.4.5—1991, *Measurement of water flow in open channels, Part 4: Measurement using flow gauging structures, Method 4.5: Triangular profile weirs*.

The objective of this document is to specify methods for the measurement of the flow of water in open channels under steady flow conditions using triangular profile weirs. The flow conditions considered are steady flows which are uniquely dependent on the upstream head and non-modular (drowned) flows which depend on downstream as well as upstream levels.

This document is identical with, and has been reproduced from, ISO 4360:2020, *Hydrometry — Open channel flow measurement using triangular profile weirs*.

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Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

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

Contents

| | |
|---|-----------|
| Preface | ii |
| Foreword | v |
| 1 Scope | 1 |
| 2 Normative references | 1 |
| 3 Terms and definitions | 1 |
| 4 Symbols | 1 |
| 5 Principle | 2 |
| 6 Installation | 2 |
| 6.1 General | 2 |
| 6.2 Selection of site | 2 |
| 6.3 Installation conditions | 3 |
| 6.3.1 General | 3 |
| 6.3.2 Measuring structure | 4 |
| 6.3.3 Approach channel | 5 |
| 6.3.4 Downstream channel | 5 |
| 7 Maintenance | 6 |
| 8 Measurement of head(s) | 6 |
| 8.1 General | 6 |
| 8.2 Location of head measurement(s) | 6 |
| 8.2.1 Modular (free) flow | 6 |
| 8.2.2 Non-modular (drowned) flow | 6 |
| 8.3 Gauge wells | 7 |
| 8.4 Zero setting | 9 |
| 8.5 Dimensions | 10 |
| 9 Discharge characteristics | 10 |
| 9.1 Formulae of discharge | 10 |
| 9.1.1 Modular (free) flow | 10 |
| 9.1.2 Non-modular flow | 11 |
| 9.2 Coefficients | 11 |
| 9.2.1 Coefficient of discharge, C_d | 11 |
| 9.2.2 Coefficient of velocity for modular flow, C_v | 11 |
| 9.2.3 Non-modular flow reduction factor, f , with crest tappings | 11 |
| 9.2.4 Non-modular flow reduction factor, f , with tailwater recorder | 11 |
| 9.3 Limitations | 12 |
| 10 Uncertainties of flow measurement | 12 |
| 10.1 General | 12 |
| 10.2 Combining measurement uncertainties | 13 |
| 10.3 Uncertainty of discharge coefficient $u(C_d)$ for the triangular profile weir | 14 |
| 10.4 Uncertainty budget | 14 |
| 11 Example | 15 |
| 11.1 General | 15 |
| 11.2 Characteristics — Gauging structure | 15 |
| 11.3 Characteristics — Gauged head instrumentation | 15 |
| 11.4 Discharge coefficient | 15 |
| 11.5 Discharge calculation | 16 |
| 11.6 Uncertainty statement | 16 |
| Annex A (informative) Introduction to measurement uncertainty | 18 |
| Annex B (informative) Sample measurement performance for use in hydrometric worked examples | 26 |

| | | |
|---------------------|---|-----------|
| Annex C | (informative) Spreadsheet for use with this document | 29 |
| Bibliography | | 30 |

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 113, *Hydrometry*, Subcommittee SC 2, *Flow measurement structures*.

This fourth edition cancels and replaces the third edition (ISO 4360:2008), which has been technically revised.

The main changes compared to the previous edition are as follows.

- The calculations and examples have been updated to correct an error in the previous edition.
- A URN has been added containing a spreadsheet that has been developed to support the standard and facilitate calculation of discharge and uncertainty (see [Annex C](#)).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

NOTES

Australian Standard®

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1 Scope

This document specifies methods for the measurement of the flow of water in open channels under steady flow conditions using triangular profile weirs. The flow conditions considered are steady flows which are uniquely dependent on the upstream head and non-modular (drowned) flows which depend on downstream as well as upstream levels.

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. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 772, *Hydrometry — Vocabulary and symbols*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Symbols

| Symbol | Unit of measurement | Quantity |
|----------|---------------------|---|
| α | dimensionless | Coriolis coefficient |
| A | m ² | area of approach channel |
| B | m | width of approach channel |
| b | m | breadth of weir crest perpendicular to flow direction |
| C_d | dimensionless | coefficient of discharge |
| C_v | dimensionless | coefficient of velocity |
| $C_v f$ | dimensionless | combined coefficient of velocity for non-modular flow |
| f | dimensionless | non-modular (drowned) flow reduction factor |
| g | m/s ² | acceleration due to gravity |
| H | m | total head relative to crest level |
| h | m | gauged head relative to crest level (upstream head is inferred if no subscript is used) |
| N | dimensionless | number of measurements in a set |
| p | m | height of weir (difference between upstream mean bed level and crest level) |
| Q | m ³ /s | volumetric rate of flow |
| $u()$ | as parameter | standard uncertainty in parameter specified in parentheses |