

Comparison of current Australian Standard AS 3778.1 with updated ISO standard ISO 772:2022

Current Australian Standard	AS 3778.1	Measurement of water flow in open channels. Hydrometric determinations – Vocabulary and symbols
Updated ISO Standard	ISO 772:2022	Hydrometry – Vocabulary and symbols

High-level comment on differences

This update is a revision of an initial update that referenced ISO 772:2011. During the revision period ISO 772:2022 was released.

This comparison maintains commentary from the 2011 comparison but adds comparison against the 2022 ISO release. Comparisons are indicated accordingly.

Initial ISO 772: 2011 comparison

The updated ISO Standard is moderately different to the current Australian Standard. The differences include at least 180 new definitions, numerous minor changes such as more concise or expanded definitions, removed definitions, updated figures and inclusion of Groundwater definitions into section eight of ISO 772. Groundwater definitions in the current AS standard are captured in *Amendment 1: Additional terms and definitions*. Added terms that are relevant to advances in technology are included in the updated standard and it has an improved flow and clarity. Due to the considerable number of changes/additions to the new ISO standard, every individual change has not been documented and only a general summary of the changes from each section is provided below.

Subsequent ISO 772: 2022 comparison

Changes between 2022 and 2011 versions were conducted

- Precipitation terms have been added (Clause 9)*
- Snow terms have been added (Clause 10)*
- a number of figures have been modified/updated
- an improvement in vocabulary in clauses are cross referenced to related definitions within the vocabulary description to increase clarity and proposed application of the descriptions.

* It is to be noted that addition of precipitation and snow clauses did not reference any World Meteorological Organisation documents/standards in the bibliography.

Initial ISO 772: 2011 comparison

Concerns have been raised over missing key hydrometric terms such as cumec, flood peak, daily flow, dam, storage, and fish ladder. To overcome this shortfall, it is recommended all definitions key to Australian Hydrometric practices continue to be included in the National Industry Guidelines for hydrometric monitoring Part 0: Glossary (http://www.bom.gov.au/water/standards/documents/NI_GL_100_00-2019.pdf).

Subsequent ISO 772: 2022 comparison

No change to issues identified in the initial review (previous paragraph)

It is noted that in Annex A (now titled '*Symbols used in Hydrometry*') some measurements have been classified as a height but is dimensionless! An example is Snow Water Equivalent that is measured in mm/cm/metres by data collection. Given the limited collection of some of these 'specialised' data collection within Australia the impact with reference to adopting this ISO version is not considered an issue and can be managed within the National Guidelines vocabulary as/if required

Reviewer recommendation

Initial ISO 772: 2011 comparison

I recommend that the technical committee

- accept the updated ISO in full to replace current AS. It is not practical to reject this ISO standard as the definitions used are applicable to all other ISO Hydrometry Standards and making changes to the Vocabulary and symbols could trigger further changes to other standards and have unintended consequences.

Subsequent ISO 772: 2022 comparison

- Continue with initial comment to accept the updated ISO in full to replace current AS. It is not practical to reject this ISO standard as the definitions used are applicable to all other ISO Hydrometry Standards and making changes to the Vocabulary and symbols could trigger further changes to other standards and have unintended consequences.

<i>options</i>
<ul style="list-style-type: none"> • <i>accept the updated ISO in full to replace current AS (simplest option!)</i>
<ul style="list-style-type: none"> • <i>reject the updated ISO and withdraw the current AS (in cases where the update is not appropriate for Australian practice)</i>
<ul style="list-style-type: none"> • <i>reject the updated ISO and re-confirm the current AS without change (an alternative option in cases where the update is not appropriate for Australian practice)</i>
<ul style="list-style-type: none"> • <i>further work required to adapt the ISO for an updated AS (non-preferred option, exceptional cases only)</i>

Detailed summary of differences

Initial ISO 772: 2011 comparison

Due to numerous minor changes details every change below was not practical

Subsequent ISO 772: 2022 comparison

- Review with comparison to 2011 version is accepted.
- There has been addition of two new clauses. Implications for Bureau of Meteorology need to be considered since no reference to WMO standards is not evident.
- The addition of the two new clauses is not seen as an impediment to adoption of ISO 772: 2022 into a new AS3778.1 standard

Initial ISO 772: 2011 comparison only. A subsequent comparison with 2022 was not documented due to the 2022 version primarily incorporating additional Clauses (categories), not included previously

Example below

The table below outlines in more detail a summary of the differences between the current Australian Standard under review and the relevant updated ISO standard and includes reviewer comment where relevant.

Column 1: Identifies the number and name of the section in the current Australian Standard

Column 2: Classification of the change for that section. Classified as either:

- **No change (green shading)** – *The updated ISO is the same as the current Australian Standard.*
- **Minor change (blue shading)** – *Changes that have minimal impact on the outcome, including*
 - *minor format, style or heading changes*
 - *minor additions, removals or changes to a few words or clauses*

- addition or exclusion of more detailed explanation
- very minor changes to steps or processes.
- **Significant change (orange shading)** – Changes that have a moderate to major impact on the outcome, such as
 - Changes to requirements
 - Significant changes to calculations, steps or processes.

Column 3: More detail to describe the change, and comment from the reviewer (enough detail for the consideration of AHA and WaMSTeC members in their review).

Text colour is used in this column as follows:

- Black text – More detailed explanation of the changes and reviewer comment. **Specific reviewer comment on the changes highlighted in yellow.**
- Blue text – reference to information included in the updated ISO that is not in the current Australian Standard
- Red text – reference to information included in the current Australian Standard that is not in the updated ISO.

Section (ISO 772)	Classification of change AS to ISO	More detail and comment on changes in the updated ISO
1. General Terms	Minor change	Numerous minor changes with no major impacts on industry. Definitions added, removed, combined into single definition, and corrected. New figure added. Total definitions in AS 3778.1 = 145 and ISO 772 = 176
2. Velocity-area methods	Minor change	Several minor changes including definitions added, removed and moved into different sections. Total definitions in AS 3778.1 = 56 and ISO 772 = 66
3. Flow measurement structures	Minor change	Definitions added minor changes only. Updated figures and rearranged order for easier understanding. Total definitions in AS 3778.1 = 46 and ISO 772 = 53 including 14 (sub-definitions)
4. Dilution methods	Minor change	Numerous definitions removed. Total definitions in AS 3778.1 = 42 and ISO 772 = 22
5. Instruments and equipment	Minor change	Minor notes added, simplified/reworded definitions, figure position within text changed, multiple definitions for bit removed 5.49. Updated definitions for new technologies added. Additional definitions from 5.65 to 5.96. Total definitions in AS 3778.1 = 65 and ISO 772 = 96
6. Sediment transport	Minor change	Figure removed 23 from AS, sediment changed to fluvial sediment, total load combined into one definition, refined definitions, notes and mathematical formula added. Added definitions in ISO 772 from 6.57. Total definitions in AS 3778.1 = 56 and ISO 772:2011 = 68
7. Uncertainties in hydrometric determinations	Minor change	Minor wording changes and changes to NOTES, figure modified and moved. Added definitions in ISO 772 from 7.39 to 7.45. Total definitions in AS 3778.1 = 38 and ISO 772:2011 = 45
8. Groundwater	Minor change	New section / previous included in the amendment of AS 3778.1. Additional and removed nonconsequential definitions, notes added to definitions. Added definitions in ISO 772 from 8.115 to 8.177. Total definitions in AS 3778.1 = 114 and ISO 772:2011 = 177