
**Hydrometry — Field measurement of
discharge in large rivers and rivers in
flood**

*Hydrométrie — Mesurage in situ du débit des grandes rivières et des
débits de crue*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 9825 was prepared by Technical Committee ISO/TC 113, *Hydrometry*.

This second edition cancels and replaces the first edition (ISO 9825:1994), which has been technically revised.

Hydrometry — Field measurement of discharge in large rivers and rivers in flood

1 Scope

This International Standard deals specifically with the measurement of discharge in large rivers and the measurement of rivers in flood. It also describes the relevant field measurements when it becomes necessary to use indirect methods of estimating discharge.

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 748, *Measurement of liquid flow in open channels — Velocity-area methods*

ISO 772, *Hydrometric determinations — Vocabulary and symbols*

ISO 772, Amendment 1:2002

ISO 1070, *Liquid flow measurement in open channels — Slope-area method*

ISO 1438-1, *Water flow measurement in open channels using weirs and Venturi flumes — Part 1: Thin-plate weirs*

ISO 3846, *Liquid flow measurement in open channels by weirs and flumes — Rectangular broad-crested weirs*

ISO 3847, *Liquid flow measurement in open channels by weirs and flumes — End-depth method for estimation of flow in rectangular channels with a free overfall*

ISO 4359, *Liquid flow measurement in open channels — Rectangular, trapezoidal and U-shaped flumes*

ISO 4360, *Liquid flow measurement in open channels by weirs and flumes — Triangular profile weirs*

ISO 4369, *Measurement of liquid flow in open channels — Moving-boat method*

ISO 4371, *Measurement of liquid flow in open channels by weirs and flumes — End depth method for estimation of flow in non-rectangular channels with a free overfall (approximate method)*

ISO 4374, *Liquid flow measurement in open channels — Round-nose horizontal broad-crested weirs*

ISO 4377, *Hydrometric determinations — Flow measurement in open channels using structures — Flat-V weirs*

ISO 6416, *Hydrometry — Measurement of discharge by the ultrasonic (acoustic) method*

ISO 6420, *Liquid flow measurement in open channels — Position fixing equipment for hydrometric boats*

ISO 8333, *Liquid flow measurement in open channels by weirs and flumes — V-shaped broad-crested weirs*

ISO 9213, *Measurement of total discharge in open channels — Electromagnetic method using a full-channel-width coil*

ISO 9555-1, *Measurement of liquid flow in open channels — Tracer dilution methods for the measurement of steady flow — Part 1: General*

ISO 9555-2, *Measurement of liquid flow in open channels — Tracer dilution methods for the measurement of steady flow — Part 2: Radioactive tracers*

ISO 9555-3, *Measurement of liquid flow in open channels — Tracer dilution methods for the measurement of steady flow — Part 3: Chemical tracers*

ISO 9555-4, *Measurement of liquid flow in open channels — Tracer dilution methods for the measurement of steady flow — Part 4: Fluorescent tracer*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 772 and Amendment 1 apply.

4 Units of measurement

The units of measurement used in this International Standard are SI units.

5 Appropriate techniques

Due to the dimensions of large rivers and the hazards associated with measuring flood flows, some of the techniques available for discharge measurement on smaller rivers under normal flow conditions may not be appropriate, or may need modification if used.

River dimensions, stream conditions, feasibility of measurements, measuring instruments and equipment, purpose and available funds will, in a general sense, dictate the choice of methodology. In many instances, the choice of technique will be decided upon by the physical conditions at the site. Hazards discussed in this International Standard are confined to those peculiar to the measurement of discharge of large rivers and rivers in flood.

Those techniques that may be partially or entirely appropriate within certain limitations imposed by degree of difficulty of operation are the following:

- a) velocity-area methods in accordance with ISO 748, ISO 4369, ISO 6416, ISO 6420, ISO 9213.
- b) Tracer dilution methods in accordance with ISO 9555, Parts 1 to 4.
- c) Weirs and flumes in accordance with ISO 1438-1, ISO 3846, ISO 3847, ISO 4359, ISO 4360, ISO 4371, ISO 4374, ISO 4377, ISO 8333.
- d) Indirect methods in accordance with ISO 1070.

6 Nature of difficulties likely to be encountered

6.1 Measured parameters

When any of the three parameters used to determine discharge (width, depth and velocity) is abnormally large, it may cause problems that are not usually encountered.