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**Measurement of liquid flow in open channels —
Parshall and SANIIRI flumes**

*Mesure de débit des liquides dans les canaux découverts — Canaux
jaugeurs Parshall et SANIIRI*



Reference number
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Foreword

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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.

International Standard ISO 9826 was prepared by Technical Committee ISO/TC 113, *Measurement of liquid flow in open channels*, Subcommittee SC 2, *Notches, weirs and flumes*.

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Measurement of liquid flow in open channels — Parshall and SANIIRI flumes

1 Scope

This International Standard specifies methods of liquid flow measurement in open channels (particularly in irrigation canals) under steady or slowly varying flow conditions, using Parshall and SANIIRI flumes.

These flumes are designed to operate under both free-flow and submergence conditions.

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 772:1988, *Liquid flow measurement in open channels — Vocabulary and symbols*.

3 Definitions and symbols

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

3.1 Parshall flume: Measuring flume having a converging entrance section with a level floor, a short throat section with a floor inclined downwards at a gradient of 3:8, and a diverging exit section with a floor inclined upwards at a gradient of 1:6.

3.2 SANIIRI flume: Measuring flume with a converging entrance section having a level floor with a vertical drop at its downstream end and perpendicular walls to join it to the downstream channel.

4 Selection of flume type

4.1 The choice as to whether a Parshall or a SANIIRI flume should be used depends on several factors such as the range of discharge to be measured, the head available, the modular limit and the maximum submergence ratio, the channel or canal characteristics, the amount of head loss which can be allowed through the flume, the possibility of deepening the bed and providing a drop therein, the accuracy of measurement required, whether or not the flow carries sediment, the operating conditions that necessitate the use of either stationary or portable flumes, and economic considerations.

4.2 Parshall flumes have a rectangular cross-section and a wide range of throat widths varying from very small (0,025 4 m) to large (15 m and greater).

Medium-sized Parshall flumes, with throat widths between about 0,15 m and about 2,5m, which are suitable for measuring discharges in the range from 0,001 5 m³/s to 4,0 m³/s are those most commonly used for flow measurements; they are thus recommended in this International Standard as "standard structures".

Large Parshall flumes with throat widths between about 3 m and about 15 m, the design of which varies depending on the size of the flume, are suitable for measuring discharges in the range from 0,75 m³/s to 93 m³/s.

One of the most desirable features of the Parshall flume is that it operates satisfactorily at high submergence ratios with low head loss, this makes it especially suitable for flow measurements in channels having small bed slopes. However, the complicated design of this flume (see figure 1) offsets somewhat the advantages that it offers.