International Standard 4374

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Liquid flow measurement in open channels — Round-nose horizontal crest weirs

Mesure de débit des liquides dans les canaux découverts — Déversoirs horizontaux à seuil arrondi

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4374 was developed by Technical Committee ISO/TC 113, *Measurement of liquid flow in open channels*, and was circulated to the member bodies in October 1980.

It has been approved by the member bodies of the following countries :

Australia	India	Spain
China	Italy	Switzerland
Czechoslovakia	Netherlands	United Kingdom
France	Romania	USA
Germany, F. R.	South Africa, Rep. of	USSR

The member body of the following country expressed disapproval of the document on technical grounds :

Belgium

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Liquid flow measurement in open channels — Round-nose horizontal crest weirs

1 Scope and field of application

1.1 This International Standard deals with the measurement of flow in rivers and artificial channels under steady flow conditions using round-nose horizontal crest weirs (see figure 1).

1.2 The flow conditions considered are limited to steady flows which are uniquely dependent on the upstream head. Drowned flows, which depend on downstream as well as upstream levels, are not covered.

1.3 The round-nose horizontal crest weir has a good discharge range and modular limit and is more appropriate for use in small and medium sized installations. It is particularly robust and insensitive to minor damage.

1.4 Annex A gives the guidelines for the selection of weirs and flumes for the measurement of the discharge of water in open channels.

2 Reference

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

3 Definitions and symbols

For the purpose of this International Standard, the definitions given in ISO 772 apply. A full list of symbols with the corresponding units of measurement is given in annex B.

4 Units of measurement

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

5 Installation

5.1 Selection of site

5.1.1 The weir shall be located in a straight section of channel avoiding local obstructions, roughness or unevenness of the bed.

5.1.2 A preliminary study should be made of the physical and hydraulic features of the proposed site, to check that it conforms (or can be made to conform) to the requirements necessary for measurement of discharge by the weir. Particular attention should be paid to the following features in selecting the site :

a) The adequacy of the length of channel or regular cross-section available (see 5.2.2.2.).

b) The uniformity of the existing velocity distribution (see annex C).

c) The avoidance of a steep channel (but see 5.2.2.6).

d) The effects of any increased upstream water level due to the measuring structure.

e) The conditions downstream (including such influences as tides, confluences with other streams, sluice gates, mill dams and other controlling features which might cause drowning).

f) The impermeability of the ground on which the structure is to be founded and the necessity for piling, grouting or other means of controlling seepage.

g) The necessity for flood banks, to confine the maximum discharge to the channel.

h) The stability of the banks, and the necessity for trimming and/or revetment in natural channels.

j) Uniformity of the section of the approach channel.

k) Effect of wind. Wind can have a considerable effect on the flow over a river, flume or weir, especially when it is wide and the head is small and when the prevailing wind is in a transverse direction.

l) Aquatic weed growth.

m) Sediment transportation.

5.1.3 If the site does not possess the characteristics necessary for satisfactory measurements, or if an inspection of the stream shows that the velocity distribution in the approach channel deviates appreciably from the examples shown in annex C, the site should not be used unless suitable improvements are practicable. Alternatively, the performance of the installation should be checked by independent flow measurement.