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Hidrometrija - Slovar in simboli (ISO/DIS 772:2020)

Hydrometry - Vocabulary and symbols (ISO/DIS 772:2020)

Hydrometrie - Begriffe und Symbole (ISO/DIS 772:2020)

Hydrométrie - Vocabulaire et symboles (ISO/DIS 772:2020)

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Hydrometry — Vocabulary and symbols

Hydrométrie — Vocabulaire et symboles

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Foreword

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This document was prepared by Technical Committee [iso/tc113, Hydrometry]

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Introduction

In the preparation of this International Standard, the following principles were adopted wherever possible:

a) to standardize suitable terms and symbols without perpetuating unsuitable ones;

b) to discard any term or symbol with differing meanings in different countries, or for different people, or for the same person at different times, and to replace that term or symbol by one which has an unequivocal meaning;

c) to exclude terms which are self-evident.

As far as possible terms in existing International Standards have been included; however, these terms may be the subject of future amendments.

NOTE that similar or identical terms may have separate definitions under the different categories.

It is recognized that it is not possible to produce a complete set of definitions which will be universally acceptable, but it is hoped that the definitions provided and the symbols used will find widespread acceptance and that their use will lead to better by understanding of the hydrometric practices.

Hydrometry — Vocabulary and symbols

1 Scope

This International Standard gives terms, definitions and symbols used in standards in the field of hydrometry.

2 Structure of the vocabulary

The terminology entries are presented in systematic order, grouped into sections according to particular methods of determination or in relation to particular subjects. Annex A lists the symbols used in this International Standard.

The structure of each entry is in accordance with ISO 10241. Country codes are in accordance with ISO 3166-1.

3 Terms and definitions - General terms

3.1
hydrometry
science and practice of measuring the components of the hydrological cycle, including rainfall, water level, flow and sediment transport of surface waters, and groundwater characteristics

3.2
hydrology
science that deals with the waters above and below the land surfaces of the Earth, their occurrence, circulation and distribution, their properties and their reaction with environment

3.3
flow
water flowing on or below the land surface under gravitational influence

3.4
runoff
volume of water flowing through a given channel cross section in unit time related to a given catchment area

3.5
discharge
Q
Volume of water flowing through a given channel cross section in unit time

3.6
current
directed movement of water

3.7
steady flow
condition in which the discharge does not change in magnitude with respect to time

3.8
unsteady flow
condition in which the discharge changes in magnitude with respect to time

3.9
uniform flow
flow, in an open channel, in which the depth and velocity remain constant along the open channel

Note 1 to entry: For uniform flow, the velocity vector is constant along every stream line. Uniform flow is possible only in an open channel of constant slope and cross section.

3.10
non-uniform flow
flow, in an open channel, in which depth and/or velocity change along the open channel

3.11
critical flow
flow, in an open channel, in which the specific energy is a minimum for a given discharge

Note 1 to entry: Under this condition, the Froude number is equal to unity and small surface disturbances cannot travel upstream.

3.12
subcritical flow
flow in an open channel at less than critical velocity, that has a Froude number of less than unity, and in which small surface disturbances can travel upstream

3.13
supercritical flow
flow in an open channel at more than critical velocity, that has a Froude number of greater than unity, and in which small surface disturbances cannot travel upstream

3.14
transverse flow
lateral flow
flow horizontally perpendicular to the main direction of flow

Note 1 to entry: Transverse (lateral) flow is frequently associated with secondary flow.

Note 2 to entry: Transverse (lateral) flow in open channels with a curved plan form causes superelevation of the water surface at the outside of the bend.

3.15
stratification
state of a water body that consists of two or more layers arranged according to their density, the lightest layer being on top and the heaviest at the bottom

3.16
critical depth
depth of flow at which critical flow occurs

3.17
critical velocity
velocity at critical flow

3.18
channel
course of a river, stream, or other watercourse

3.19
open channel
longitudinal boundary surface consisting of the bed and banks or sides within which water flows with a free surface

3.20
canal
man-made channel, usually of regular cross-sectional shape

3.21
stable channel
open channel in which the bed and the sides remain essentially stable over a substantial period of time in the reach under consideration, and in which the scour and deposition during the rising and falling stages are negligible

3.22
unstable channel
open channel that changes frequently and significantly in its plan-form and/or cross-sectional form for the reach under consideration

3.23
tidal channel
open channel in which the flow is subject to tidal influence

3.24
tide
periodic rise and fall of water due principally to the gravitational attraction of the sun and the moon

3.25
estuary
lower tidal reaches of a river that is freely connected with the sea which receives fresh water supplies from upland drainage areas

3.26
stream
water course water flowing in an open channel

3.27
river
large natural water course

3.28
large river
major river
large natural water course that generally flows into the sea

3.29
creek
brook
small natural water course

3.30
torrent
small natural water course that is characterized by steep slopes and significant rapid changes in discharge and that can transport considerable volumes of solid material

3.31
alluvial river
river which flows through alluvium formed from its own deposits

3.32
incised river
river which has formed its channel by a process of erosion

3.33
braided river
river characterized by a wide and shallow open channel in which flow passes through a number of small interlaced channels

3.34
reach
length of open channel between two defined cross sections

3.35
meandering channel
water course formed by natural flow processes and movement of sediments following generally an alternating regular sinuous path

3.36
thalweg
line joining the lowest points of successive cross sections of a water course

3.37
unit discharge
discharge per unit width
q_u
discharge through a unit width of a given vertical section

3.38
yield specific discharge
q
discharge per unit area of catchment or aquifer

3.39
stream gauging
discharge measurement
flow measurement
stream flow measurement
river gauging
all of the operations necessary for the measurement of discharge of a stream

3.40
gauge
device installed at a gauging station for measuring the level of the surface of water relative to a datum

3.41
left bank
bank to the left of an observer looking downstream

3.42
right bank
bank to the right of an observer looking downstream

3.43
invert
stream bed
stream bottom
channel bed
channel bottom
lower part of the stream channel situated between the banks

3.44
bed slope
bottom slope
S_o
difference in elevation of the bed per unit horizontal distance, measured in the direction of flow

Note 1 to entry: The slope is usually mathematically negative in the direction of flow

3.45
bed profile
shape of the bed in a vertical plane

3.46
side slope
difference in elevation between the bottom and top of bank per unit horizontal distance

3.47
surface slope
S_w
inclination of the surface of the stream in a reach measured in the direction of flow

3.48
fall
difference in elevation of the water surface between the extremities of a defined reach at a given instant of time, for example as recorded at a twin-gauge station

3.49
top width
width of the open channel measured across the stream at the water surface normal to the direction of flow

3.50
wetted perimeter
P_w
contact length between a stream of flowing water and its containing open channel, measured in a direction normal to the flow

3.51
cross section
<of a stream> section normal to the mean direction of flow bounded by the free surface and wetted perimeter

3.52
gauging section
measuring section
section at which discharge measurements are taken

3.53
high water mark
flood mark
mark left on a structure or any other object indicating exceptional stages of flood

3.54
debris line
trash line
traces of any kind left on the banks or obstacles or flood plain by a flood

Note 1 to entry: The debris line may be used to determine the highest level attained by the water surface during a flood.

3.55
surface velocity
flow velocity at the surface at a given point

3.56
mean velocity
<at a cross section> flow velocity at a given cross section of a stream, obtained by dividing the discharge by the cross-sectional area

3.57
slush ice
mass of loosely packed anchor ice that is released from the bottom, or frazil ice that floats or accumulates under surface ice

3.58
velocity head
theoretical vertical height to which a liquid particles can be elevated by its kinetic energyIt is expressed as the square of the velocity divided by twice the acceleration due to gravity

3.59
gauged head
elevation of the free surface above the horizontal datum of a section

3.60
total head
energy head
H
sum of the elevation of the free surface above the horizontal datum of a section plus the velocity head based on the mean velocity at that section

Note 1 to entry: The total head, H, is given by the following equation:

$$H = h + \alpha \frac{\bar{v}^2}{2g}$$

where

H is the gauged head of water level;

$\bar{v}$ is the mean velocity of the water;

A is the Coriolis coefficient;

G is the acceleration due to gravity.

The Coriolis coefficient ($\alpha \geq 1$), also known as energy coefficient or energy correction factor, takes into account the non-uniform velocity distribution. In many cases, αis assumed to equal unity

3.61
total head line
energy head line
plot of the total head in the direction of flow

3.62
energy gradient
difference in total head per unit horizontal distance, measured in the direction of flow

3.63
energy loss
head loss
difference in total head between two cross sections in the direction of flow

3.64
stage
gauge height
water level
elevation of the free surface of a stream, lake or reservoir relative to a specified datum

3.65
reference gauge
stage gauge that discharge is normally linked to

3.66
stage-discharge relation
rating curve
rating table
equation, curve or table that expresses the relation between the stage and the discharge in an open channel at a given cross section

3.67
hydrograph
graphical representation of changes of hydrometric parameters with respect to time

Note 1 to entry: Typically, stage and discharge hydrographs are used for open channel flows.

3.68
cumulative volume curve
curve in which the cumulative value of a hydrometric parameter is plotted against time

Note 1 to entry: Integral of the hydrograph, e.g. cumulative discharge curve

3.69
storage curve
table
curve depicting the volume of stored water plotted against stage

3.70
gauging station
site on a stream, river or lake at which systematic measurements of stage, velocity or discharge or any combination of the three are made

3.71
slope station
twin-gauge station
gauging station at which two water-level gauges define a reach for measurement of water-surface slope as an essential parameter for establishing a stage-discharge relation

3.72
control
physical properties of a cross section or a reach of an open channel, either natural or artificial, that govern the relation between stage and discharge at a location in the open channel

3.73
rating
relation between discharge and other variables, or the taking of observations and making of calculations needed to establish the relation

3.74
unit-fall rating
relation between stage and discharge when the fall is equal to one