

ISO 748:2007-10 (E)

Hydrometry - Measurement of liquid flow in open channels using current-meters or floats

Contents		Page
Foreword		v
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Principle of the methods of measurements	1
5	Selection and demarcation of site	2
5.1	Selection of site	2
5.2	Demarcation of site	3
6	Measurement of cross-sectional area	3
6.1	General	3
6.2	Measurement of width	3
6.3	Measurement of depth	4
7	Measurement of velocity	5
7.1	Measurement of velocity using current-meters	5
7.1.1	Rotating-element current-meters	5
7.1.2	Electromagnetic current-meters	5
7.1.3	Measurement procedure	5
7.1.4	Oblique flow	6
7.1.5	Determination of the mean velocity in a vertical	7
7.1.6	Errors and limitations	10
7.2	Measurement of velocity using floats	11
7.2.1	General	11
7.2.2	Selection of site	11
7.2.3	Measuring procedure	11
7.2.4	Types of float	11
7.2.5	Determination of velocity	12
7.2.6	Main sources of error	13
8	Computation of discharge	13
8.1	General	13
8.2	Graphical method	13
8.2.1	Depth-velocity-integration	13
8.2.2	Velocity-area integration method (velocity-contour method)	14
8.3	Arithmetic methods	16
8.3.1	Mean-section method	16
8.3.2	Mid-section method	16
8.4	Independent vertical method	17
8.5	Mean-section method -- Horizontal planes	20
8.6	Determination of discharge from surface-float velocity measurements	20
8.7	Determination of discharge for variations of water level	22
8.7.1	General	22
8.7.2	Computation of discharge	22
8.7.3	Computation of mean water level	22

9	Uncertainties in flow measurement	23
9.1	General	23
9.2	Definition of uncertainty	23
9.3	Method of calculating the uncertainty in discharge by measurement of velocity by current-meter	24
9.3.1	General	24
9.3.2	Contributory uncertainties	24
9.3.3	Example	26
9.3.4	Combined uncertainty	26
9.4	Method of calculating the uncertainty in discharge by measurement of velocity using floats	27
9.4.1	General	27
9.4.2	Contributory uncertainties	27
9.4.3	Combined uncertainty in discharge	28
9.4.4	Example	28
Annex A (informative)	Correction for sag, pull, slope and temperature in measurement of cross- section width by tape or wire	30
Annex B (informative)	Distance measurement across the cross-section	33
Annex C (informative)	Corrections for wetted length of wire when measuring depths with wire not normal to surface	36
Annex D (informative)	Correction for drift	39
Annex E (informative)	Uncertainties in the velocity-area measurement	40
Annex F (informative)	Determination of mean velocity from float measurements	44
Bibliography	46