INTERNATIONAL STANDARD ISO 2425-1974/AMENDMENT 1

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Measurement of flow in tidal channels

AMENDMENT 1

Amendment 1 to International Standard ISO 2425-1974 was developed by Technical Committee ISO/TC 113, *Measurement of liquid flow in open channels.* It was submitted directly to ISO Council, in accordance with clause 6.11.2 of Part 1 of the Directives for the technical work of ISO.

Page 1

2 References

Add the following :

"ISO 4369, *Liquid flow measurement in open channels — The moving boat method.*

ISO 6416, *Liquid flow measurement in open channels — Measurement of discharge by the ultrasonic (acoustic) method.*

ISO 6418, *Liquid flow measurement in open channels — Ultrasonic (acoustic) velocity meters."*

Page 2

4 Units of measurement

Delete the existing text and substitute the following :

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

5 Principles of the method of measurement

Sub-clause 5.3

Renumber to read "5.4" and substitute by the following :

"5.3 Ultrasonic method

The ultrasonic method measures flow at certain elevations in the channel by transmitting pulses in both directions through the water from transducers in the banks on both sides of the channel. The main restriction to the use of the method in tidal channels is the occurrence of density gradients, suspended sediment and path length."

UDC 532.57 : 627.13 **Ref. No. : ISO 2425-1974/A1-1982 (E)**

Descriptors : tides, tide channels, flow measurement.

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8 Direct measurement of tidal flow by the moving-boat method

Delete the existing title and text and substitute by the following :

"8 Direct measurement of tidal flow by the moving-boat and ultrasonic (acoustic) methods

The moving boat and ultrasonic methods may be applicable in either steady or unsteady flow. They are dealt with in ISO 4369, ISO 6416 and ISO 6418."

Pages 14 and 15

Replace the tables in annexes B and C by the following :

Annex B

Example of cubature computation (see 9.5)

River : Hooghly

Date : 26 March 1955

Distance between upper and lower stations (*l*) : 19,812 km

Upper station : Akra

Lower station : Moyapur

Tide : Spring

Headwater discharge : Nil

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Time	Level at upper station d_1	Level at lower station d_2	Average level at beginning of time-interval $\frac{\text{col. 2} + \text{col. 3}}{2}$	Change in average level	Surface area*	Average surface area	Change in volume : col. 5 × col. 7	Change in volume up to the upper station**	Total of change in volume up to the tidal limit : col. 8 + col. 9	Volume of headwater discharge during the time interval $= qt$	Total change in volume up to tidal limit corrected for headwater discharge : col. 10 − col. 11	Discharge : $\frac{\text{col. 12}}{t}$	Lower station		Mean velocity : $\frac{\text{col. 13}}{\text{col. 15}}$	Remarks
													Cross-sectional area***	Average cross-sectional area		
	m	m	m	m	1 000 m^2	1 000 m^2	10^6 m^3	10^6 m^3	10^6 m^3	m^3	10^6 m^3	m^3/s	m^2	m^2	m/s	
5 h 30	2,88	2,51	2,70		18 113								6 977			* The surface area (col. 6) is planimetered from plans.
				− 0,32		18 052	− 5,78	− 10,68	− 16,46		− 16,46	− 9 144		6 782	− 1,35	
6 h 00	2,60	2,16	2,38		17 991								6 580			
				− 0,30		17 919	− 5,37	− 10,56	− 15,93		− 15,93	− 8 850		6 421	− 1,38	** Values of col. 9 have been taken from the tables relating to the previous reach.
6 h 30	2,30	1,85	2,08		17 828					Nil			6 256			
				− 0,28		17 762	− 4,97	− 10,85	− 15,82		− 15,82	− 8 789		6 108	− 1,44	*** Col. 14 is based on cross-sections.
7 h 00	2,01	1,58	1,80		17 697								5 960			
				0,28		17 623	− 4,93	− 9,80	− 14,73		− 14,73	− 8 183		5 825	− 1,40	
7 h 30	1,73	1,32	1,52		17 549								5 691			

Annex C

Example of cubature computation (see 9.5)

River : Hooghly

Date : 26 March 1955

Distance between upper and lower stations (*l*) : 19,812 km

Upper station : Akra

Lower station : Moyapur

Tide : Spring

Headwater discharge : Nil

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Time	Upper station		Lower station		Cross-sectional area*	Average cross-sectional area	Average width at beginning of time-interval : col. 3 + col. 5 / 2	Average width during the interval	Average level at beginning of time-interval : col. 2 + col. 4 / 2	Change in average level	Change in volume : col. 9 × col. 11 × *l*	Change in volume up to upper station**	Total change in volume up to tidal limit : col. 12 + col. 13	Volume of headwater discharge during the time-interval = *qt*	Total change in volume up to tidal limit corrected for headwater discharge : col. 14 − col. 15	Discharge : col. 16 / *t*	Mean velocity : col. 17 / col. 7	Remarks
	Level *d*	Width* *w*	Level *d*	Width* *w*														
	m	m	m	m	m^2	m^2	m	m	m	m	$10^6\ m^3$	$10^6\ m^3$	$10^6\ m^3$	m^3	$10^6\ m^3$	m^3/s	m/s	
5 h 30	2,88	783	2,51	1 046	6 977		914		2,70									
						6 782		910		− 0,32	− 5,77	− 10,68	− 16,45		− 16,45	− 9 139	− 1,35	* Cols. 3, 5 and 6 area based on cross-section.
6 h 00	2,60	778	2,16	1 036	6 586		907		2,38									
						6 421		904		− 0,30	− 5,37	− 10,56	− 15,93		− 15,93	− 8 850	− 1,38	
6 h 30	2,30	772	1,85	1 027	6 256		900		2,08					Nil				
						6 108		896		− 0,28	− 4,97	− 10,85	− 15,82		− 15,82	− 8 789	− 1,44	** The values of col. 13 have been obtained from tables relating to the previous reach.
7 h 00	2,01	767	1,58	1 018	5 960		892		1,80									
						5 825		888		− 0,28	− 4,93	− 9,80	− 14,73		− 14,73	− 8 183	− 1,40	
7 h 30	1,73	760	1,32	1 010	5 691		885		1,52									