



Publié 1982-12-01

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.

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### 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*.”

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### 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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Imprimé en Suisse

Prix basé sur 4 pages

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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 :

STANDARDSISO.COM : Click to view the full PDF of ISO 2425:1974/Amd 1:1982

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  |
|--------|------|------|---|-------------------------|---------------|----------------------|---------------------------------------|--|--|---|---|---|------------------------------|------------------------------|--------|----|---|
|        |      |      |   |                         |               |                      |                                       |  |  |   |   |   | Level at upper station $d_1$ | Level at lower station $d_2$ |        |    |   |
| Time   |      |      | 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 :<br>col. 5 x col. 7 | Change in volume up to the upper station** | Total of change in volume up to the tidal limit :<br>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 :<br>col. 10 - col. 11 | Discharge :<br>$\frac{\text{col. 12}}{t}$ | Cross-sectional area***      | Average cross-sectional area |        |    | Remarks   |
| 5 h 30 | 2,88 | 2,51 | 2,70  | - 0,32                  | 18 113        | 1 000 m <sup>2</sup> | 10 <sup>6</sup> m <sup>3</sup>        | 10 <sup>6</sup> m <sup>3</sup>             | 10 <sup>6</sup> m <sup>3</sup>                                       | 10 <sup>6</sup> m <sup>3</sup>                                | 10 <sup>6</sup> m <sup>3</sup>  | m <sup>3</sup> /s                         | m <sup>2</sup>               | m <sup>2</sup>               | m/s    |    | * The surface area (col. 6) is planimeted from plans.                               |
| 6 h 00 | 2,60 | 2,16 | 2,38  | - 0,30                  | 17 991        | 18 052               | - 5,73                                | - 10,68                                    | - 16,46  | Nil   | - 16,46   | - 9 144                                   | 6 580                        | 6 782                        | - 1,35 |    | ** Values of col. 9 have been taken from the tables relating to the previous reach. |
| 6 h 30 | 2,30 | 1,85 | 2,08  | - 0,28                  | 17 828        | 17 919               | - 5,37                                | - 10,56                                    | - 15,93  |   | - 15,93   | - 8 850                                   | 6 256                        | 6 421                        | - 1,38 |    | *** Col. 14 is based on cross-sections.   |
| 7 h 00 | 2,01 | 1,58 | 1,80  | 0,28                    | 17 697        | 17 762               | - 4,97                                | - 10,85                                    | - 15,82  |   | - 15,82   | - 8 789                                   | 5 960                        | 6 108                        | - 1,44 |    |   |
| 7 h 30 | 1,73 | 1,32 | 1,52  |                         | 17 549        | 17 623               | - 4,93                                | - 9,80                                     | - 14,73  |   | - 14,73   | - 8 183                                   | 5 825                        | 5 825                        | - 1,40 |    |   |