

<b>STN</b>	<b>Hydrometria</b> <b>Meranie prietoku kvapalín v otvorených korytách</b> <b>Rýchlostno-plošné metódy využívajúce</b> <b>merania bodových rýchlostí</b> <b>(ISO 748: 2021)</b>	<b>STN</b> <b>EN ISO 748</b>  75 1202
------------	--	--

Hydrometry  
Measurement of liquid flow in open channels  
Velocity area methods using point velocity measurements

Hydrométrie  
Mesurage du débit des écoulements à surface libre  
Méthodes d'exploration du champ des vitesses utilisant le mesurage de la vitesse par point

Hydrometrie  
Durchflussmessung in offenen Gerinnen mittels Fließgeschwindigkeitsmessgeräten

Táto norma obsahuje anglickú verziu európskej normy EN ISO 748: 2021 a má postavenie oficiálnej verzie.

This standard includes the English version of the European Standard EN ISO 748: 2021 and has the status of the official versions.

#### **Nahradenie predchádzajúcich noriem**

Táto norma nahrádza STN EN ISO 748 z októbra 2008 v celom rozsahu.

**134571**

## **Anotácia**

Tento dokument stanovuje metódy na určenie rýchlosti a plochy priečného profilu vody prúdiacej v otvorených korytách a na výpočet prietoku pomocou zariadení na meranie bodovej rýchlosti.

Je aplikovateľný pre metódy využívajúce hydrometrické vrtule, akustické dopplerove prístroje na meranie rýchlosti (ADV), stacionárnu metódu použitia akustického doppleroveho prístroja na meranie rýchlosti prúdenia (ADCP), meranie povrchovej rýchlosti vrátane plavákov a iných systémov na meranie povrchovej rýchlosti.

Aj keď tento dokument pojednáva o niektorých všeobecných postupoch, nepopisuje podrobne ako sa majú tieto systémy používať alebo rozmiestňovať.

POZNÁMKA. – Podrobné postupy nájdete v pokynoch od výrobcov prístrojov a príslušných verejných agentúr.

## **Národný predhovor**

### **Normatívne referenčné dokumenty**

Nasledujúce dokumenty, celé alebo ich časti, sú v tomto dokumente normatívnymi odkazmi a sú nevyhnutné pri jeho používaní. Pri datovaných odkazoch sa použije len citované vydanie. Pri nedatovaných odkazoch sa použije najnovšie vydanie citovaného dokumentu (vrátane všetkých zmien).

POZNÁMKA 1. – Ak bola medzinárodná publikácia zmenená spoločnými modifikáciami, čo je indikované označením (mod), použije sa príslušná EN/HD.

POZNÁMKA 2. – Aktuálne informácie o platných a zrušených STN možno získať na webovej stránke [www.unms.sk](http://www.unms.sk).

ISO 772 zavedená v STN EN ISO 772 Hydrometria. Slovník a značky (ISO 772: 2011) (75 0100)

ISO 25377: 2020 dosiaľ nezavedená

### **Vypracovanie normy**

Spracovateľ normy: Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, Bratislava

Technická komisia: TK 64 Hydrológia a meteorológia

EUROPEAN STANDARD

EN ISO 748

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2021

ICS 17.120.20

Supersedes EN ISO 748:2007

English Version

## Hydrometry - Measurement of liquid flow in open channels - Velocity area methods using point velocity measurements (ISO 748:2021)

Hydrométrie - Mesurage du débit des écoulements à surface libre - Méthodes d'exploration du champ des vitesses utilisant le mesurage de la vitesse par point (ISO 748:2021)

Hydrometrie - Durchflussmessung in offenen Gerinnen mittels Fließgeschwindigkeitsmessgeräten (ISO 748:2021)

This European Standard was approved by CEN on 24 October 2021.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## **European foreword**

This document (EN ISO 748:2021) has been prepared by Technical Committee ISO/TC 113 "Hydrometry" in collaboration with Technical Committee CEN/TC 318 "Hydrometry" the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2022, and conflicting national standards shall be withdrawn at the latest by June 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 748:2007.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **Endorsement notice**

The text of ISO 748:2021 has been approved by CEN as EN ISO 748:2021 without any modification.

# Contents

Page

Foreword.....	v
<b>1 Scope.....</b>	<b>1</b>
<b>2 Normative references.....</b>	<b>1</b>
<b>3 Terms and definitions.....</b>	<b>1</b>
<b>4 Principle of the methods of measurements.....</b>	<b>1</b>
<b>5 Site selection.....</b>	<b>2</b>
5.1 Selection of site.....	2
5.2 Demarcation of site.....	3
<b>6 Measurement of cross-sectional area.....</b>	<b>3</b>
6.1 General.....	3
6.2 Measurement of width.....	3
6.3 Measurement of depth.....	3
<b>7 Measurement of mean velocity.....</b>	<b>4</b>
7.1 Determination of mean velocity using point velocity measurements.....	4
7.1.1 General.....	4
7.1.2 Measurement procedure.....	4
7.1.3 Oblique flow.....	5
7.1.4 Determination of the mean velocity in a vertical.....	5
7.1.5 Integration method.....	8
7.1.6 Errors and limitations.....	8
7.2 Determination of mean velocity from surface velocity.....	8
7.2.1 General.....	8
7.2.2 Non-contact systems.....	9
7.2.3 Surface one-point method by current meter.....	9
7.2.4 Measurement of velocity using floats.....	9
7.2.5 Exceptions.....	9
7.2.6 Main sources of error.....	9
<b>8 Computation of discharge.....</b>	<b>10</b>
8.1 Arithmetic methods.....	10
8.1.1 General.....	10
8.1.2 Mean-section method.....	10
8.1.3 Mid-section method.....	10
8.1.4 Bathymetric verticals.....	11
8.2 Independent vertical method.....	11
8.3 Mean-section method — Horizontal planes.....	13
<b>9 Uncertainties in flow measurement.....</b>	<b>13</b>
9.1 General.....	13
9.2 Method of calculating the uncertainty in discharge by measurement of velocity by current meter.....	14
9.2.1 General.....	14
9.2.2 Contributory uncertainties.....	14
9.3 Method of calculating the uncertainty in discharge by measurement of velocity using floats.....	16
9.3.1 General.....	16
9.3.2 Contributory uncertainties.....	16
9.3.3 Combined uncertainty in discharge.....	17
9.4 Limitations.....	18
9.5 Interpolated variance estimator (IVE).....	19
9.6 Q+.....	19
9.7 Flaure.....	19
<b>Annex A (informative) Use of point velocity current meters.....</b>	<b>20</b>

**ISO 748:2021(E)**

<b>Annex B (informative) Surface velocity measurement using floats .....</b>	<b>23</b>
<b>Annex C (informative) Example surface velocity systems .....</b>	<b>27</b>
<b>Annex D (informative) Uncertainties in the velocity-area measurement.....</b>	<b>29</b>
<b>Annex E (informative) Velocity measurement under ice conditions.....</b>	<b>32</b>
<b>Annex F (informative) Corrections for wetted length of wire when measuring depths with wire not normal to surface .....</b>	<b>38</b>
<b>Bibliography.....</b>	<b>41</b>

# Hydrometry — Measurement of liquid flow in open channels — Velocity area methods using point velocity measurements

## 1 Scope

This document specifies methods for determining the velocity and cross-sectional area of water flowing in open channels and for calculating the discharge employing point velocity measurement devices.

It is applicable to methods using rotating-element current meters, acoustic doppler velocimeters (ADV), acoustic doppler current profiler (ADCP) stationary method, surface velocity measurement including floats and other surface velocity systems.

Although some general procedures are discussed, this document does not describe in detail how to use or deploy these systems.

NOTE For detailed procedures, refer to guidelines from instrument manufacturers and the appropriate public agencies.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 772, *Hydrometry — Vocabulary and symbols*

ISO 25377:2020, *Hydrometric uncertainty guidance (HUG)*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**