



NSAI
Standards

Standard Recommendation
S.R. CEN/TR 15996:2010

Hydrometry - Measurement of snow water equivalent using snow mass registration devices

S.R. CEN/TR 15996:2010

Incorporating amendments/corrigenda issued since publication:

<i>This document replaces:</i>	<i>This document is based on:</i> CEN/TR 15996:2010	<i>Published:</i> 17 February, 2010
This document was published under the authority of the NSAI and comes into effect on: 5 March, 2010		ICS number: 07.060
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Údarás um Chaighdeáin Náisiúnta na hÉireann		

ICS 07.060

English Version

Hydrometry - Measurement of snow water equivalent using snow mass registration devices

Hydrométrie - Mesurage de l'équivalent en eau de la neige
au moyen de dispositifs d'enregistrement de la masse
neigeuse

Hydrometrie - Messung des Schnee-Wasser-Äquivalents
unter Verwendung eines Gerätes zur Erfassung der
Schneemenge

This Technical Report was approved by CEN on 11 January 2010. It has been drawn up by the Technical Committee CEN/TC 318.

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Foreword

This document (CEN/TR 15996:2010) has been prepared by Technical Committee CEN/TC 318 "Hydrometry", the secretariat of which is held by BSI.

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

Introduction

Snow water equivalent (SWE) measurements

Snow water equivalent (SWE) is the height of water that would be obtained by melting the snowpack on a corresponding surface area, and is normally expressed in millimetres (mm).

Knowledge of the SWE is essential for estimation of total runoff and flood forecasting in river basins where snowfall occurs. Independent of the selected method, the SWE measurements should proportionally represent the total SWE in the studied area.

The parameter is predominant in avalanche theory and avalanche danger forecasting as well as for risk assessment of heavy snow loads. Additionally, the development of SWE measurements using satellite sensors has increased the need for validation and calibration using in-situ measurements.

Annex A is a list of methods for determination of SWE.

Snow mass registration devices

Snow mass registration devices are widely used in North America and Europe. Different problems experienced in the use of the equipment have resulted in a slow development of the technique, but improvements in equipment design and data management in recent years have increased interest in the method. Annex B shows a table of station networks running during publication of this report.

1 Scope

This Technical Report defines the requirements for the use of snow mass registration devices for measurement of SWE under natural environmental conditions. It includes weighing and pressure measuring methods.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN ISO 772:2000, *Hydrometric determinations — Vocabulary and symbols (ISO 772:1996)*

CEN ISO/TS 25377, *Hydrometric uncertainty guidance (HUG) (ISO/TS 25377:2007)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 772:2000 apply.

4 Symbols and abbreviated terms

Table 1 lists the symbols used in this document.

Table 1 — Symbols

Symbol	Term	Unit
SWE	Snow water equivalent	mm
M	Snow mass	kg
ρ	Density	kg/m ³
V	Volume	m ³
A	Area	m ²

Table 2 lists the abbreviated terms used in this document.

Table 2 — Abbreviated terms

Abbreviation	Term
SPA	Snow Pack Analyzer
GPR	Ground-penetrating radar
PVC	Polyvinyl chloride

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