

# SVENSK STANDARD

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### **Representation av geografisk position med koordinater (ISO 6709:2008, including Cor 1:2009)**

### **Standard representation of geographic point location by coordinates (ISO 6709:2008, including Cor 1:2009)**

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Denna standard ersätter SS-ISO 6709:2008, utgåva 2.

The European Standard EN ISO 6709:2009 has the status of a Swedish Standard. This document contains the official English version of EN ISO 6709:2009.

This standard supersedes the Swedish Standard SS-ISO 6709:2008, edition 2.

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN ISO 6709**

June 2009

ICS 35.040

English Version

**Standard representation of geographic point location by  
coordinates (ISO 6709:2008, including Cor 1:2009)**

Représentation normalisée des latitude, longitude et  
altitude pour la localisation des points géographiques (ISO  
6709:2008, Cor 1:2009 inclus)

Standarddarstellung für geographische Punkte durch  
Koordinaten (ISO 6709:2008, einschließlich Cor 1:2009)

This European Standard was approved by CEN on 12 June 2009.

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 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 Management Centre has the same status as the official versions.

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



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## Foreword

The text of ISO 6709:2008, including Cor 1:2009 has been prepared by Technical Committee ISO/TC 211 “Geographic information/Geomatics” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 6709:2009 by Technical Committee CEN/TC 287 “Geographic Information” the secretariat of which is held by NEN.

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 December 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

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.

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### Endorsement notice

The text of ISO 6709:2008, including Cor 1:2009 has been approved by CEN as a EN ISO 6709:2009 without any modification.

## Introduction

Efficient interchange of geographic-point-location data requires formats which are universally interpretable and which allow identification of points on, above and below the earth's surface. Users in various disciplines may have different requirements. This is exemplified by the use of degrees and decimal degrees, as well as the traditional degrees, minutes and seconds, for recording latitude and longitude. Users may also require various levels of precision and may use latitude and longitude without height.

The use of this International Standard will

- a) reduce the cost of interchange of data,
- b) reduce the delay in converting non-standard coding structures in preparation for interchange by providing advance knowledge of the standard interchange format, and
- c) provide flexible support for geographic point representation.



# Standard representation of geographic point location by coordinates

## 1 Scope

This International Standard is applicable to the interchange of coordinates describing geographic point location. It specifies the representation of coordinates, including latitude and longitude, to be used in data interchange. It additionally specifies representation of horizontal point location using coordinate types other than latitude and longitude. It also specifies the representation of height and depth that may be associated with horizontal coordinates. Representation includes units of measure and coordinate order.

This International Standard is not applicable to the representation of information held within computer memories during processing and in their use in registers of geodetic codes and parameters.

This International Standard supports point location representation through the eXtensible Markup Language (XML) and, recognizing the need for compatibility with the previous version of this International Standard, ISO 6709:1983, allows for the use of a single alpha-numeric string to describe point locations.

For computer data interchange of latitude and longitude, this International Standard generally suggests that decimal degrees be used. It allows the use of sexagesimal notations: degrees, minutes and decimal minutes or degrees, minutes, seconds and decimal seconds.

This International Standard does not require special internal procedures, file-organization techniques, storage medium, languages, etc., to be used in its implementation.

## 2 Conformance

To conform to this International Standard, representations of point locations by coordinates shall satisfy all of the conditions specified in the abstract test suite (see Annex A).

## 3 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.

ISO/IEC 8859-1, *Information technology — 8-bit single-byte coded graphic character sets — Part 1: Latin alphabet No. 1*

ISO/TS 19103, *Geographic information — Conceptual schema language*

ISO 19107, *Geographic Information — Spatial schema*

ISO 19111:2007, *Geographic Information — Spatial referencing by coordinates*

ISO 19115:2003, *Geographic Information — Metadata*

ISO 19118, *Geographic information — Encoding*

ISO/TS 19127, *Geographic Information — Geodetic codes and parameters*

ISO 19133, *Geographic Information — Location based services — Tracking and navigation*

## 4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 4.1

#### **accuracy**

closeness of agreement between a test result or measurement result and the true value

[ISO 3534-2:2006]

### 4.2

#### **altitude**

height where the chosen reference surface is mean sea level

### 4.3

#### **coordinate**

one of a sequence of  $n$  numbers designating the position of a point in  $n$ -dimensional space

NOTE In a coordinate reference system, the coordinate numbers are qualified by units.

[ISO 19111:2007]

### 4.4

#### **coordinate set**

collection of **coordinate tuples** related to the same coordinate reference system

[ISO 19111:2007]

### 4.5

#### **coordinate tuple**

**tuple** composed of a **sequence of coordinates**

NOTE The number of coordinates in the coordinate tuple equals the dimension of the coordinate system; the order of coordinates in the coordinate tuple is identical to the order of the axes of the coordinate system.

[ISO 19111:2007]

### 4.6

#### **depth**

distance of a point from a chosen reference surface measured downward along a line perpendicular to that surface

NOTE A depth above the reference surface will have a negative value.

[ISO 19111:2007]

### 4.7

#### **height**

$h$ ,  $H$

distance of a point from a chosen reference surface measured upward along a line perpendicular to that surface

NOTE A height below the reference surface will have a negative value.

[ISO 19111:2007]

#### 4.8

##### **metadata**

data about data

[ISO 19115:2003]

#### 4.9

##### **precision**

measure of the repeatability of a set of measurements

[ISO 19116:2004]

#### 4.10

##### **resolution**

⟨coordinate⟩ unit associated with the least significant digit of a coordinate

NOTE Coordinate resolution may have linear or angular units depending on the characteristics of the coordinate system.

#### 4.11

##### **sexagesimal degree**

angle represented by a sequence of values in degrees, minutes and seconds

NOTE In the case of latitude or longitude, it may also include a character indicating hemisphere.

EXAMPLE 50,079 572 5 degrees is represented as 50°04'46,461" sexagesimal degrees.

#### 4.12

##### **tuple**

ordered list of values

[ISO 19136:2007]

## 5 Abbreviated terms

CRS Coordinate Reference System

GPL Geographic Point Location

GML Geography Markup Language

UML Unified Modelling Language

XML eXtensible Mark-up Language

## 6 Requirements for the representation of geographic point location

### 6.1 Conceptual model for geographic point locations

A *coordinate* is one of a sequence of numbers describing the position of a point. A *coordinate tuple* is composed of a sequence of coordinates describing one position.

EXAMPLE A coordinate tuple consisting of latitude, longitude and height represents a 3-dimensional geographic position.