SVENSK STANDARD
SS-EN 16907-2:2018

Fastställd/Approved: 2018-12-12
Utgåva/Edition: 1
Språk/Language: engelska/English
ICS: 13.080.99;93.020

Schakt och fyllning för anläggningsbyggande – Del 2: Klassificering av material

Earthworks – Part 2: Classification of materials

Standarder får världen att fungera

SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.

Delta och påverka
Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

Ta del av det färdiga arbetet
Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standard-paket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

Utveckla din kompetens och lyckas bättre i ditt arbete
Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på www.sis.se eller ta kontakt med oss på tel 08-555 523 00.

Standards make the world go round

SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.

Take part and have influence
As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

Get to know the finished work
We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

Increase understanding and improve perception
With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

If you want to know more about SIS, or how standards can streamline your organisation, please visit www.sis.se or contact us on phone +46 (0)8-555 523 00

Europastandarden EN 16907-2:2018 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 16907-2:2018.

The European Standard EN 16907-2:2018 has the status of a Swedish Standard. This document contains the official version of EN 16907-2:2018.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Schakt och fyllning för anläggningsbyggande, SIS/TK 539.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16907-2

December 2018

ICS 13.080.99; 93.020

English Version

Earthworks - Part 2: Classification of materials

Terrassements - Partie 2: Classification des matériaux

Erdarbeiten - Teil 2: Materialklassifizierung

This European Standard was approved by CEN on 14 May 2018.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, 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

Ref. No. EN 16907-2:2018 E

Contents

Page

European foreword

This document (EN 16907-2:2018) has been prepared by Technical Committee CEN/TC 396 "Earthworks", the secretariat of which is held by AFNOR.

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 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

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 is one of the European Standards within the framework series of EN 16907 on *Earthworks*, as follows:

— *Part 1: Principles and general rules,*

— *Part 2: Classification of materials (this document),*

— *Part 3: Construction procedures,*

— *Part 4: Soil treatment with lime and/or hydraulic binders,*

— *Part 5: Quality control,*

— *Part 6: Land reclamation earthworks using dredged hydraulic fill,*

— *Part 7: Hydraulic placement of extractive waste.*

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

Introduction

This European Standard is part of a European Standard on Earthworks. It was decided by CEN/TC 396 to establish a stand-alone standard part on the classification of materials used in earthworks.

The different regional situations in geology and climate result in national differences in the earthwork procedures which do not allow a single classification of materials throughout Europe at present. Therefore, this standard identifies the principles and systems for classification considering national practices. Furthermore the test procedures suitable for earthworks are identified.

1 Scope

This document defines a common basis for description and classification for use by all parties involved in the design, planning and construction of the earthworks.

This document specifies the processes and properties to be used in the description and classification of earthworks materials. It specifies soil and rock groups as a basis of material specifications for earth structure elements. This classification relates to the physical and chemical properties of the soil and rock materials.

NOTE 1 The approach to description of soil and rock set out in EN ISO 14688-1 and EN ISO 14689 respectively and the approach to classification of soil set out in EN ISO 14688-2 are applicable to earthworks, but the range and scope of classification for earthworks given here is more detailed and orientated to the specific demands of earthwork procedures and earth structure elements.

NOTE 2 Informative examples of existing national experience based classification systems and their use are presented in the annexes to EN 16907-1:2018.

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.

EN 932-1, *Tests for general properties of aggregates — Part 1: Methods for sampling*

EN 1997-2, *Eurocode 7 — Geotechnical design — Part 2: Ground investigation and testing*

EN 13383-1, *Armourstone — Part 1: Specification*

EN 16907-1:2018, *Earthworks — Part 1: Principles and general rules*

EN ISO 14688-1, *Geotechnical investigation and testing — Identification and classification of soil — Part 1: Identification and description (ISO 14688-1)*

EN ISO 14689, *Geotechnical investigation and testing — Identification, description and classification of rock (ISO 14689)*

EN ISO 22475-1, *Geotechnical investigation and testing — Sampling methods and groundwater measurements — Part 1: Technical principles for execution (ISO 22475-1)*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16907-1:2018 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1.1
description
identification and naming of a given material and its physical and soil mechanical properties that are relevant for earthwork purposes

3.1.2
classification
definition of material groups and classes and assigning of materials to groups and classes with similar properties for earthworks

3.1.3
classification parameters
values of characteristics that define groups and classes

3.1.4
characteristics
material properties which may be relevant for a defined use

3.1.5
properties
physical and chemical attributes of a material

3.1.6
intrinsic properties
properties of solids of soils and rock which do not change in the course of earthworks such as particle size distribution, particle shape, mineralogy, plasticity, organic or carbonate content

3.1.7
state properties
properties of the soil or rock that may change during earthworks; such as density, water content, strength, consistency, relative density or stiffness

3.1.8
materials
all soils, rocks, by-products and recycled mineral materials handled during earthworks

3.1.9
material groups
classification of materials based on intrinsic properties

3.1.10
material class
classification of materials based on intrinsic and state properties for use in specific aspects of earthworks

3.1.11
particle size
dimension of a material particle defined by a representative diameter which is determined by sieving or by sedimentation analysis

3.1.12
particle fraction
mass percentage of particles in a range of particle sizes with defined lower and upper diameters referring to the total mass of particles in a soil volume or sample

EXAMPLES Sand fraction: mass percentage of particles with particle sizes between 0,063 mm and 2,0 mm.

3.1.13
fines
particles with a particle size smaller than 0,063 mm

3.1.14
anthropogenic material
natural materials processed mechanically e.g. by crushing or washing, manufactured materials including secondary manufactured materials and recycled materials

3.2 Abbreviations and symbols

For the purposes of this document the abbreviations and symbols given in EN 16907-1:2018 and the following apply.

Abbreviations for terms and tests

DG	Degradability
FR	Fragmentability
MDE	Micro-Deval Test
LA	Los Angeles Test
IDD	Intact dry density

Symbols for Quantities

C_C	Coefficient of curvature	dimensionless
C_{LA}	Los Angeles coefficient (by LA test)	dimensionless
C_{MDE}	Micro-Deval coefficient	dimensionless
C_{OM}	Organic matter content	dimensionless (%)
C_U	Coefficient of uniformity ($C_U = D_{60}/D_{10}$)	dimensionless
C_x	Mass percentage of particles smaller than x (mm) (e.g. $C_{0,063} < 5$ %: the content of fines is less than 5 % of the soil mass)	dimensionless (%)
D	Particle size (representative diameter)	mm