



BSI Standards Publication

Characterization of sludge - Evaluation of sludge density

National foreword

This British Standard is the UK implementation of EN 17183:2018.

The UK participation in its preparation was entrusted to Technical Committee EH/5, Sludge characterization.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2019
Published by BSI Standards Limited 2019

ISBN 978 0 580 98672 7

ICS 13.030.20

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2019.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

English Version

Characterization of sludge - Evaluation of sludge density

Caractérisation des boues - Evaluation de la masse
volumique des boues

Beurteilung der Schlammmdichte

This European Standard was approved by CEN on 19 October 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

Contents

Page

European foreword	3
Introduction	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions.....	5
4 Principle	6
5 Interferences	6
6 Apparatus	6
7 Procedure	6
8 Expression of results	7
9 Precision	7
10 Test report.....	7
Annex A (informative) Density vs temperature of distilled water.....	8
Annex B (informative) Examples of pycnometer types.....	9
Annex C (informative) Determination of density of the liquid and of the solid fractions	10
C.1 Determination of density of the liquid fraction.....	10
C.2 Determination of density of the solid fraction.....	10
Annex D (informative) Results of validation trials	12
Bibliography	15

European foreword

This document (EN 17183:2018) has been prepared by Technical Committee CEN/TC 308 “Characterization and management of sludge”, 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.

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

Knowledge of density is critical to most unit operations in both (i) wastewater treatments which are affected by the difference of density between solid and liquid, e.g. sedimentation, floatation, and (ii) sludge management operations which are affected by bulk density, e.g. centrifugation, storage, spreading. In particular, the effectiveness of secondary clarifiers and sludge thickeners is enhanced by higher sludge floc density which also increases the dewatered cake concentration at the end of mechanical dewatering.

Density also affects the (i) sludge volume and, therefore, the transport costs, and (ii) the sludge fluid-dynamic behaviour and, consequently, the head losses in a pipeline or the thermal coefficient in case of turbulent flow, being the Reynolds number depending from it.

Density is also useful in modelling sewage bio-reactor, such as biofilm reactor (biofiltration, fluidized beds).

Densities of the dry solids and of the liquid phase should also allow the sludge origin and its degree of decomposition or stabilization to be roughly evaluated, and density of the liquid could give useful indications on the soluble substrate concentration and on the presence of other substances lighter than water [6].