BS EN 14679:2026

BSI Standards Publication

Execution of special geotechnical works — In-Situ Soil Mixing



Documents
Document Sharing Hub

Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing

National foreword

This British Standard is the UK implementation of EN 14679:2026. It supersedes BS EN 14679:2005, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/526, Geotechnics.

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

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2026
Published by BSI Standards Limited 2026

ISBN 978 0 539 31578 3

ICS 93.020

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 August 2026.

Amendments/corrigenda issued since publication

Date	Text affected

Documents
Document Sharing Hub

Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14679

August 2026

ICS 93.020

Supersedes EN 14679:2005

English Version

Execution of special geotechnical works - In-Situ Soil Mixing

Exécution des travaux géotechniques spéciaux - Malaxage des sols en place

Ausführung von besonderen geotechnischen Arbeiten (Spezialtiefbau) - In-situ Bodenmischverfahren

This European Standard was approved by CEN on 12 July 2026.

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, Türkiye 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

© 2026 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN 14679:2026 E

Documents
Document Sharing Hub

Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing

Content

Page

European foreword **4**

Introduction **5**

1 Scope **6**

2 Normative references **6**

3 Terms and definitions **6**

4 Information needed for the execution of the work **10**
4.1 General **10**
4.2 Specific information **10**

5 Geotechnical investigation **11**
5.1 General **11**
5.2 Specific information **11**

6 Materials and products **12**
6.1 General **12**
6.2 Binder **12**
6.3 Water **13**
6.4 Bentonite and polymer **13**
6.5 Additions **13**
6.6 Admixtures **13**
6.7 Reinforcing elements **13**
6.8 Geosynthetics **13**

7 Considerations related to design **13**
7.1 General **13**
7.2 Watertightness of soilmix elements forming a wall **15**
7.3 Trench stability **15**
7.4 Installation of soilmix elements **16**
7.5 Reinforcing element **16**
7.6 Corrosion protection of reinforcing elements **16**

8 Execution **16**
8.1 General **16**
8.2 Construction tolerances **17**
8.3 Preliminary works **18**
8.3.1 Working platform **18**
8.3.2 Mix design and mixing process design **18**
8.4 Methods and tools **19**
8.5 Soil mixing **19**
8.6 Placing the reinforcing elements **21**

9 Supervision, inspection, testing, monitoring and maintenance **21**
9.1 General **21**
9.2 Supervision plan **21**
9.3 Inspection plan **21**
9.4 Testing **22**
9.5 Monitoring **23**
9.6 Maintenance **24**

10 Records **24**

Documents
Document Sharing Hub
Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing

11 Special requirements 25
11.1 Health and safety 25
11.2 Environmental aspects 25
11.3 Sustainability 26
Annex A (informative) Flow-chart 27
Annex B (informative) Specimen quality 28
Annex C (informative) Method statement 31

Documents
Document Sharing Hub
Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing

European foreword

This document (EN 14679:2026) has been prepared by Technical Committee CEN/TC 288 “Execution of special geotechnical works”, 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 February 2027, and conflicting national standards shall be withdrawn at the latest by February 2027.

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 14679:2005.

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

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, 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, Türkiye and the United Kingdom.

Documents
Document Sharing Hub
Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing

Introduction

WG22 has been in charge to revise EN 14679:2005, with the subject area of soilmix elements functioning as earth retaining structures, hydraulic barriers, ground improvement and foundations.

The former title 'Deep Mixing' has been changed to '*In situ* Soil Mixing' by decision 24-2024.

The document has been prepared to complement EN 1997: Eurocode 7 — Geotechnical design. Clause 7 "Considerations related to design" of this document expands on design only when necessary (e.g. mix design), but can provide full coverage of construction and supervision requirements. For the ease of use, a flow-chart has been added in Annex A to explain the interaction between design and execution.

AVA Documents
Document Sharing Hub

Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing

1 Scope

This document specifies general principles for the execution, supervision, inspection, testing, monitoring and maintenance of *in situ* soil mixing works (Deep Mixing) carried out by two different methods: dry mixing and wet mixing.

Soil mixing considered in this document is limited to methods which involve:

— mixing by rotating mechanical mixing tools, including jetting and/or compressed air assistance, where the lateral support provided by the surrounding ground is not removed;

— different shapes and configurations of soilmix elements, either columns, panels, walls or any combination of more than one single element, with or without overlapping;

— treatment of soils and fills, including brownfields, sludges, etc., with possible limited penetration into the rock;

— mass mixing;

— environmental mixing, involving installation of containment and permeable reactive barriers and solidification/stabilization of contaminated soils and sludges.

This document does not apply to shallow soil stabilization, which consists of granulating the surface soil and mixing it with binder using stabilizing machines to improve performance. Shallow soil stabilization is in the scope of EN 16907-4.

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 206 (all parts), *Concrete — Specification, performance, production and conformity*

EN 1008, *Mixing water for concrete — Specification for sampling, testing and assessing the suitability of water, including water recovered from processes in the concrete industry, as mixing water for concrete*

EN 1990-1, *Eurocode — Basis of structural and geotechnical design — Part 1: New structures*

EN 1997-1:2024, *Eurocode 7 — Geotechnical design — Part 1: General rules*

EN 1997-2, *Eurocode 7 — Geotechnical design — Part 2: Ground properties*

EN 1997-3:2025, *Eurocode 7 — Geotechnical design — Part 3: Geotechnical structures*

EN 16228 (all parts), *Drilling and foundation equipment — Safety*

3 Terms and definitions

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

Documents
Document Sharing Hub
Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing

3.1
admixture
constituent added during the mixing process in small quantities related to the mass of binder to modify the properties of the fresh or hardened soilmix material

3.2
addition
finely divided inorganic constituent used in conjunction with a binder to improve certain properties or to achieve special properties

3.3
binder
cement, or any combination of one or more cements with or without additions that can be accounted for in the calculation of equivalent binder

3.4
binder content
ratio of mass of dry binder to volume of soil to be treated

3.5
binder content in-place
ratio of mass of dry binder to volume of mixture, which is the volume of the soil to be treated plus either the volume of the slurry for the wet method or the volume of the dry binder for the dry method

3.6
blade rotation number
BRN
indicator for mixing energy, applicable to blade (wings)-type mixing tools where the rotation axis is the direction of penetration, showing the total number of mixing blade rotations per metre of tool movement

Note 1 to entry: Examples of BRN evaluation include the following formulas:

— for single-stroke wet mixing and slurry injection below the blades

$$\text{BRN} = \Sigma M \left(\frac{R_p}{V_p} + \frac{R_w}{V_w} \right)$$

— for single-stroke dry mixing and binder injection above the blades

$$\text{BRN} = \Sigma M \frac{R_w}{V_w}$$

where:

BRN	blade rotation number (rev./m);
ΣM	total number of mixing blades (a full-diameter blade is counted as two blades, i.e. M = 2);
R_p	rotational speed of the mixing tool during penetration (rev./min);
V_p	penetration speed (m/min);
R_w	rotational speed of the mixing tool during withdrawal (rev./min);
V_w	withdrawal speed (m/min).

Documents
Document Sharing Hub
Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing

In the case of multiple restrokes along the entire treatment depth, the resulting blade rotation number is the sum of the BRN values calculated for each stroke of the mixing tool. Other formulae can also be used to suit a particular mixing tool configuration and process.

3.7
dry mixing
process of mechanical disaggregation of the soil in situ and its mixing with dry binder

3.8
hybrid mixing
wet mixing with a secondary process to assist or extend the mixing done by the mixing tool

EXAMPLE using jetting and/or compressed air assistance.

3.9
mass mixing
in situ treatment of an entire defined soil block, divided into working cells using mixing tools

Note 1 to entry: Usual practice is to treat in one sequence a cell of soil within the operational range of the machine. Treatment depth is typically limited to about 8 m in favourable ground conditions.

3.10
mix design
ratios of soil, binder and water required to meet the design requirements of the soilmix material

3.11
mixing equipment
equipment with either a rotating mixing tool, a trenching tool, a jet-assisted tool, a cutter or drum, in single or multiple arrangements

Note 1 to entry: For tubular mixing, the mixing tools are arranged inside a casing.

3.12
mixing index
indicator for mixing energy, similar to blade rotation number, but applicable to any soil mixing tool (horizontal axis rotation, trencher, or other) except blade-type vertical axis rotation tools

Note 1 to entry: The corresponding formula can be specified by the specialist contractor, along with a specification of the minimum target mixing index to be applied.

3.13
mixing process
process of soil mixing

Note 1 to entry: Use of added water, jetting or compressed air for assistance are possible during the process

3.14
mixing process design
selection of an appropriate mixing method and mixing tool, and specification of the mixing process parameters and binder or self-hardening slurry feeding rates to meet the design requirements of the project

3.15
mixing tool
tool used to disaggregate the soil and distribute and mix binder with the soil in situ

Documents
Document Sharing Hub
Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing

3.16
penetration speed
distance covered in the direction of penetration per unit of time by the mixing tool during penetration

Note 1 to entry: Can also be expressed as distance covered in the direction of penetration per tool revolution, e.g. mm/rev.

3.17
reinforcing element
elements (e.g., steel bars, cages or beams) installed into the material of a soilmix element either by driving when the element material is still fresh, or by sealing in a hole drilled in the hardened material

3.18
soil mixing
mechanical disaggregation of the soil and incorporation and dispersion of binder in the soil

3.19
soilmix material
product resulting from the mixing process, providing a material with improved strength, hydraulic conductivity, and/or stiffness upon setting compared to the original soil (also referred to as treated soil)

3.20
soilmix element
volume of soilmix material that is produced in situ during a single installation sequence using a mixing tool

Note 1 to entry: The geometry of the mixing tool and the mixing process determine the dimension of an element (not applicable to mass mixing).

Note 2 to entry: Reinforcing elements may be installed into soilmix element.

Note 3 to entry: Geosynthetics may be installed into soilmix element to achieve lower permeability.

3.21
spoil return
surplus mixture of disaggregated soil or weak rock and dispersed binder, arising from the mixing process

3.22
stroke
one complete cycle (penetration and withdrawal) of the mixing process along the entire length of treatment

Note 1 to entry: stroke is not applicable to mass mixing.

3.23
suitability study
laboratory and/or field trials to confirm mix design and/or execution design

3.24
water to binder ratio
weight of water added to the dry binder divided by the weight of the dry binder

Note 1 to entry: For wet mixing, the total water to binder ratio of the soilmix material is the weight of water in the slurry plus the weight of soil water divided by the weight of dry binder.

Documents
Document Sharing Hub
Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing

3.25
wet mixing
process of mechanical disaggregation of the soil in situ and its mixing with slurry

3.26
withdrawal speed
distance covered per unit time of the mixing tool during withdrawal

Note 1 to entry: Can also be expressed as distance covered per tool revolution, e.g. mm/rev.

4 Information needed for the execution of the work

4.1 General

4.1.1 Prior to the execution of the work, all relevant information shall be provided.

4.1.2 This information should include:

— any legal or statutory restrictions;

— the location of main grid lines for setting out element positions;

— the location and conditions of buildings, roads, utilities, etc., adjacent to the work area, including any necessary surveys;

— a suitable quality management system, including supervision, inspection, testing, monitoring and maintenance, in accordance with EN 1997-1:2024, Clauses 10 and 11;

NOTE Clause 9 of this document refers to supervision, inspection, testing, monitoring and maintenance during execution.

— the geometry of the site (boundary conditions, topography, access, slopes, etc.);

— available space for storage, treatment and/or disposal of spoil;

— archaeological constraints;

— potential presence of unexploded ordnance and its location;

— the environmental restrictions, including noise, vibration, pollution;

— future or ongoing construction activities, such as dewatering, tunnelling, deep excavations.

4.2 Specific information

4.2.1 The specific information shall include geotechnical information and data as specified in Clause 5.

NOTE Different from the reason for design of geotechnical structures, for execution the average ground properties and their distribution are relevant to choose suitable work methods.

Documents
Document Sharing Hub
Full document details: BS EN 14679:2026 Execution of special geotechnical works — In-Situ Soil Mixing