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BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

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Title: BS EN 14679 Draft Execution of special geotechnical works. In-Situ Soil Mixing.

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Responsible Committee Secretary: Mr Christopher Starr (BSI)

Direct tel:

E-mail: christopher.starr@bsigroup.com

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

English Version

Execution of special geotechnical works - In-Situ Soil Mixing

Exécution des travaux géotechniques spéciaux -
Colonnes de sol traité

Ausführung von besonderen geotechnischen Arbeiten
(Spezialtiefbau) - Tiefreichende Bodenstabilisierung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 288.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European Foreword

This document (prEN 14679:2025) has been prepared by Technical Committee CEN/TC 288 “*Execution of special geotechnical works*”, the secretariat of which is held by AFNOR.

This document is currently submitted to CEN Enquiry.

This document will supersede EN 14679:2005.

The document has been prepared to stand alongside EN 1997-1:2024, EN 1997-2:2024 and EN 1997-3:2025. This document provides full coverage of the construction and supervision requirements.

1 Scope

This document specifies general principles for the execution, supervision, inspection, testing and monitoring 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 soil mixing 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 standard does not apply to shallow soil stabilization, which consists of granulating the surface soil and mixing it with binder using soil stabilizing machines to improve soil performance as an alternative to soil replacement, typically in road works.

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 197-1, *Cement – Part 1: Composition, specification and conformity criteria for common cements*

EN 197-5, *Cement – Part 5: Cement Portland-composite cement CEM II/C-M and Composite cement CEM VI*

EN 197-6, *Cement — Part 6: Cement with recycled building materials*

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

EN 1997-1, *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 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*

3 Terms and definitions

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

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

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

3.1

admixture

constituent added during the mixing process in small quantities related to binder mass to modify soilmix or binder properties

3.2

addition

additive

fine-grained and inorganic constituent used to improve certain properties of soilmix or to achieve special properties or to partially replace cement, e.g. filler aggregates, fly ash, granulated blast furnace slag

3.3

binder

chemically reactive material, including cement or similar products, with or without additions and admixtures

Note 1 to entry: For environmental applications other materials with binder-like properties can be used to meet the intended purpose

3.4

binder content [kg/m³]

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

Note 1 to entry: Binder quantity can also be defined as ratio of mass of dry binder to mass of dry soil, expressed in percentage.

3.5

binder content in-place [kg/m³]

ratio of mass of dry binder to volume of mixture, which is the volume of the soil to be treated plus 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 paddle-type mixing tools, 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),

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 the inclusion of a secondary process to assist or extend the mixing, e.g. using jetting and/or compressed air

3.9

mass mixing

in situ treatment of the entire soil block, divided into working cells, using dry or wet mixing, carried out repeatedly in vertical and horizontal directions through the soil mass using various 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

mixing equipment

equipment with different mixing tools rotating around a vertical or horizontal axis, vertical trenching tools, jet-assisted tools, cutters or drums, in single or multiple arrangements

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

3.11

mixing factor

indicator for mixing energy, similar to blade rotation number, but applicable to any soil mixing tool (horizontal axis rotation, trencher, or other) except paddle-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 factor to be applied.

3.12

mixing process

mechanical disaggregation of the soil structure and dispersion of binder in the soil with or without the use of added water, jetting or compressed air

3.13

mixing tool

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

3.14**penetration**

phase of mixing process cycle in which the mixing tool is delivered to the appropriate depth

3.15**penetration speed [m/min]**

vertical movement per unit time of the mixing tool during penetration

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

3.16**process design**

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

3.17**quality control plan****QCP**

document containing the project-specific quality control and quality assurance programme to meet the design requirements, including supervision, inspection, testing, monitoring and corrective action in case of nonconformity

3.18**retrieval or withdrawal**

phase of mixing process cycle in which the mixing tool is moved from bottom depth to the ground surface

3.19**rotation speed [rev./min]**

number of revolutions of the mixing tool per unit time

3.20**sample quality class**

classification of the samples extracted from the soil mix element according to their surface, structure, amount of irregularities and composure

3.21**slurry**

colloidal mixture of water and binder that assists in loosening the soil for effective mixing and improving the characteristics of the in-situ soil upon setting

3.22**soil mixing**

in situ ground treatment in which soil is blended with binder

3.23**soilmix design**

ratios of soil, binder and water required to meet the design requirements of the treated soil

3.24**soilmix material**

product of soil mixing, consisting of a mixture of the in-situ soil and binder, providing a material with improved strength, hydraulic conductivity, and/or stiffness upon setting compared to the original soil (also referred to as treated soil)