

# Execution of special geotechnical work - Grouting

## EESTI STANDARDI EESSÕNA

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English Version

## Execution of special geotechnical work - Grouting

Exécution des travaux géotechniques spéciaux -  
Injection

Ausführung von Arbeiten im Spezialtiefbau -  
Injektionen

This European Standard was approved by CEN on 14 September 2020.

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

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## European foreword

This document (EN 12715:2020) 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of an identical text or by endorsement, at the latest by May 2021, and conflicting national standards shall be withdrawn at the latest by month year May 2021.

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 12715:2000. The main changes compared to the previous edition are listed below:

- generally, the text has been checked and brought up to date;
- the Scope now includes Figure 1 to describe the various forms of grouting covered in this document;
- normative references updated and now include reference to EN 1997 for design;
- definitions updated and extended;
- “site investigation” now changed to “ground investigation” in line with EN1997;
- “design considerations” changed to “execution design” in line with EN1997;
- Table 3 moved to Annex B;
- Table 1 included in Clause 8 relating to revised grouting strategies;
- Table B.2 added to characterise grouts;
- Table 5 and A.1 replaced by Annex C with more types of testing included and standards referenced;
- Glossary reviewed and updated;
- Bibliography updated.

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, Turkey and the United Kingdom.

## Introduction

The general scope of TC 288 is the standardization of the execution procedures for geotechnical works (including testing and control methods) and of the required material properties. WG18 has been charged to revise EN 12715:2000, with the subject area of grouting.

The design, planning and execution of grouting call for experience and knowledge in this specialized field. The execution phase requires skilled and qualified personnel and the present document cannot replace the expertise of specialist contractor.

This document has been prepared to complement EN 1997-1, and EN 1997-2.

Until EN 1997-3<sup>1</sup> is published, the design of grouting works is not clearly defined. In particular, the boundary between design under the proposed EN 1997-3 and design as part of the execution of grouting works has not been determined. This document has therefore adopted a distinction between execution design, i.e. the design of grouting methodology and the other phases of design.

Clause 7 “Execution Design” of this document expands on design only where necessary for the execution.

This document provides coverage of the construction and supervision requirements for grouting works.

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<sup>1</sup> Under preparation. Stage at the time of publication: prEN 1997-3.

## 1 Scope

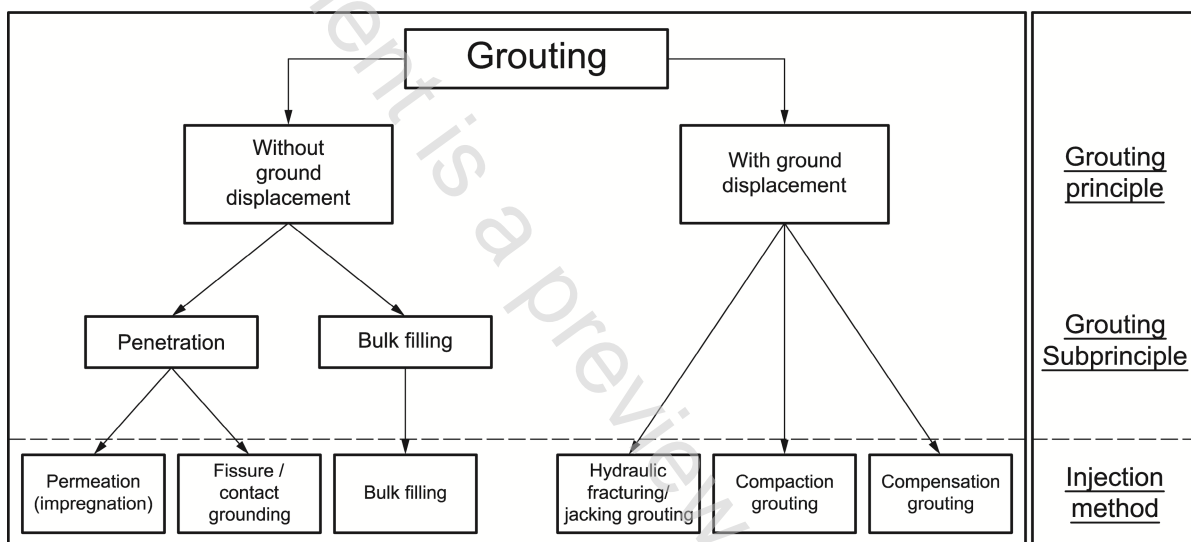
This document is applicable to the execution, testing and monitoring of geotechnical grouting work.

Grouting for geotechnical purposes (geotechnical grouting) is a process in which the remote placement of a pumpable material in the ground is indirectly controlled by adjusting its rheological characteristics and by the manipulation of the placement parameters (pressure, volume and the flow rate).

The following principles and methods of geotechnical grouting are covered by this document:

- displacement grouting (compaction and compensation grouting);
- grouting without displacement of the host material (permeation, fissure/contact grouting, bulk filling).

Figure 1 illustrates the various injection methods associated with these two principles.



**NOTE** The term consolidation grouting is sometimes used to emphasize an improvement in the strength or deformation characteristics of a soil or rock mass, with the aim that it does not undergo any unacceptable deformation. The term compensation grouting is used when the objective of grouting is to concurrently compensate for ground loss.

**Figure 1 — Grouting principles and methods**

The principal objectives of geotechnical grouting are:

- the modification of the hydraulic/hydrogeological characteristics of the ground;
- the modification of the mechanical properties of the ground;
- the filling of natural cavities, mine workings, voids adjacent to structures;
- inducing displacement to compensate for ground loss or to stabilize and lift footings, slabs and pavements.

Specialized grouting activities, generally associated with structural and/or emergency works, are not covered by this document.

The execution, testing and monitoring of jet grouting work is not covered by this document and is covered by EN 12716.

## 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, specifications and conformity criteria for common cements*

EN 197-2, *Cement - Part 2: Assessment and verification of constancy of performance*

EN 480-1, *Admixtures for concrete, mortar and grout - Test methods - Part 1: Reference concrete and reference mortar for testing*

EN 480-2, *Admixtures for concrete, mortar and grout - Test methods - Part 2: Determination of setting time*

EN 480-4, *Admixtures for concrete, mortar and grout - Test methods - Part 4: Determination of bleeding of concrete*

EN 480-5, *Admixtures for concrete, mortar and grout - Test methods - Part 5: Determination of capillary absorption*

EN 480-6, *Admixtures for concrete, mortar and grout - Test methods - Part 6: Infrared analysis*

EN 480-8, *Admixtures for concrete, mortar and grout - Test methods - Part 8: Determination of the conventional dry material content*

EN 480-10, *Admixtures for concrete, mortar and grout - Test methods - Part 10: Determination of water soluble chloride content*

EN 480-11, *Admixtures for concrete, mortar and grout - Test methods - Part 11: Determination of air void characteristics in hardened concrete*

EN 480-12, *Admixtures for concrete, mortar and grout - Test methods - Part 12: Determination of the alkali content of admixtures*

EN 934-1, *Admixtures for concrete, mortar and grout - Part 1: Common requirements*

EN 934-3, *Admixtures for concrete, mortar and grout - Part 3: Admixtures for masonry mortar - Definitions, requirements, conformity and marking and labelling*

EN 934-4, *Admixtures for concrete, mortar and grout - Part 4: Admixtures for grout for prestressing tendons - Definitions, requirements, conformity, marking and labelling*

EN 934-6, *Admixtures for concrete, mortar and grout - Part 6: Sampling, assessment and verification of the constancy of performance*

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

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

EN 16228-6, *Drilling and foundation equipment - Safety - Part 6: Jetting, grouting and injection equipment*

EN ISO 22282 (series), *Geotechnical investigation and testing - Geohydraulic testing (ISO 22282 series)*