SLOVENSKI STANDARD
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Projektiranje, priprava in uporaba zunanjih in notranjih ometov - 1. del: Zunanji ometi

Design, preparation and application of external rendering and internal plastering - External rendering

Planung, Zubereitung und Ausführung von Innen- und Außenputzen - Teil 1: Außenputz

Conception, préparation et mise en oeuvre des enduits extérieurs et intérieurs - Partie 1: Enduits extérieurs

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ICS:

91.100.10	Cement. Mavec. Apno. Malta	Cement. Gypsum. Lime. Mortar

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EUROPEAN STANDARD

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Design, preparation and application of external rendering and internal plastering - External rendering

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This European Standard was approved by CEN on 15 December 2004.

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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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 13914-1:2005) has been prepared by Technical Committee CEN/TC125 'Masonry', the Secretariat of which is held by BSI, following preparation by CEN/TC125/JWG5 - Joint Working Group with CEN/TC241 for codes of application for external rendering and internal plastering, in conjunction with CEN/TC241. The first draft was prepared by the European section of International Union of Contractors of Plastering, Dry Lining, Stucco and Related Activities (UIEP) at the request of the CEN Technical Sector Board (Resolution No. BTS1/56/1991).

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of an identical text or by endorsement, at the latest by September 2005, and conflicting national standards shall be withdrawn at the latest by September 2005.

This document gives requirements[1)] and recommendations for building details, design and materials considerations, the selection of mixes and the application of cement-based and lime-based renderings on external backgrounds.

NOTE (to English version only) The term 'rendering mortar' is used in the European Standard product specification EN 998-1, but to reflect common usage in relation to this document and for ease of reference the term 'render' (noun) has been used.

A rendered finish may be applied to a variety of backgrounds, either to improve resistance to rain penetration and weathering and/or for aesthetic reasons.

For the purposes of this document (except where stated in relation to a specific product standard) the term 'strength' should be considered in terms of relative strengths between different types of backgrounds compared with the nominal strengths of prescribed render mixes. Although it may be possible to consider this in terms of compressive strength, this standard deals with aspects of a craft as opposed to design calculations. Therefore 'strength' is not considered in terms of numerical values derived from test. Similar considerations also apply to terms such as 'movement', 'absorbency' and 'permeability' etc. used in this document.

This document refers only to the technical suitability of materials and/or procedures. The user will during the application need to observe any legal obligations relating to health and safety at any stage.

The values of certain parameters in this document may be set by CEN members so as to meet the requirements of national regulations. These parameters are designed by |_| in the text.

Because this document is a code-like document as opposed to the more conventional EN product standard, it is appropriate to mention that, as with product standards, the use of the verbal form 'shall' denotes a requirement for which verification of compliance has to be able to be demonstrated. Recommendations are denoted by the verbal form 'should' and should be followed unless there is a justifiable reason for not doing so.

It is not the function of this standard to assign responsibility for the design and application of any work or actions mentioned within to any specific party. Such responsibility is a matter for other documentation associated with the work, e.g. the contract.

It has been assumed in the drafting of this document that the application of its provisions is entrusted to appropriately qualified and experienced people, for whose guidance it has been prepared.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

[1)] This document contains certain elements of specification and other requirements which are denoted by the use of the verbal form 'shall'.

1 Scope

This document specifies requirements and recommendations for the design, preparation and application of cement, lime or other mineral binders, and/or combinations thereof, masonry cement and polymer modified binder based external renderings, on all common types of backgrounds, to both vertical walls and horizontal soffits. It includes rendering on both new and old backgrounds and the maintenance and repair of existing work. Renders with organic materials as the principal binder are not included in the scope of this document.

This document gives guidance on the use of established site, factory and semi-finished factory made renders.

NOTE 1 Because of the many and varied materials and practices in Europe it is not possible for certain aspects of the document to enter into sufficient detail to be fully usable to practitioners in each country. Such recommendations required to complement, but not alter any basic European recommendation are given in documentation prepared by each country. Aspects of this document which may need to be complemented are indicated where they occur by a footnote referencing this paragraph. Due to the wide range of climatic conditions in Europe, it is not possible to recommend precise drying times for backgrounds and render coats. Any times given are for guidance only.

This document does not cover the following:

a) the use and application of special renders for liquid retaining structures, e.g. coatings, and for backgrounds to cladding systems;

b) the structural repair of concrete;

c) the installation of proprietary external thermal insulation composite systems (ETICS);

d) the specification and use of sealants used to seal joints for use with rendering;

e) the use of gypsum based renders used externally, but their use may be permitted in some countries;

NOTE 2 Gypsum based products soften when subject to prolonged moist conditions. The use of such products externally will depend upon the climatic conditions where the render will be used and on the local building traditions. With the exception of some drier countries in southern Europe gypsum based renders are generally not recommended for external use and are therefore not included within the scope of this document. Their use may be permitted and controlled locally[2].

f) the design and installation of flashings at windowsills and elsewhere.

At various points in this document reference is made to the use of sealants. The specification of sealants and the design of such joints is outside the scope of this document.

2 Normative references

The following referenced documents are indispensable for the application 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 413-1, *Masonry cement — Part 1: Composition, specifications and conformity criteria.*

EN 459-1, *Building lime — Part 1: Definitions, specifications and conformity criteria*

[2)] Refer to NOTE 1 of Clause 1 for further information.

EN 771-1, *Specification for masonry units —Part 1: Clay masonry units*

EN 771-3, *Specification for masonry units — Part 3: Aggregate concrete masonry units (Dense and light-weight aggregates)*

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

EN 998-1, *Specification for mortar for masonry — Part 1: Rendering and plastering mortar*

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

EN 12878, *Pigments for the colouring of building materials based on cement and/or lime — Specifications and methods of test*

EN 13055 (all parts), *Lightweight aggregates*

EN 13139, *Aggregates for mortar*

prEN 13658-2, *Metal lath and beads — Definitions, requirements and test methods — Part 2: External rendering*

EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods (ISO 1461:1999)*

3 Terms and definitions

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

3.1
render (rendering mortar[3)]) *(noun)*
mixture of one or more inorganic binders, aggregates, water and sometimes admixtures and/or additions used as an external render

3.2
render (*verb*)
action of applying render

3.3
rendering
(i)(verb) application of render
(ii)(noun)render when on the background

3.4
factory made render
render batched and mixed in a factory. It may be ‘dry render’ which is ready mixed only requiring the addition of water and further mixing or ‘wet render’ which is supplied ready to use

3.5
wet retarded ready-to use render
wet factory made render (see 3.4) for which the set has been retarded

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[3)] NOTE (to English version only) The term ‘rendering mortar’ is used in the European Standard product specification
EN 998-1, but to reflect common usage in relation to this document and for ease of reference the term ‘render’ (noun) has been used.

3.6
ready mixed dry render
dry factory made render(see 3.4)

3.7
semi-finished factory made render
render described either in 3.7.1 or 3.7.2

3.7.1
pre-batched render
constituents batched in a factory, supplied to the building site and mixed there according to the manufacturer's specifications and instructions

3.7.2
pre-mixed lime/sand for render
constituents batched and mixed in a plant, supplied to the building site where further constituents specified or supplied by the factory are added (e.g. cement)

3.8
site made render
render composed from individual constituents batched and mixed on the building site

3.9
render mix
proportions of the constituent materials that are used to make the render

3.10
undercoat
bottom layer or layers of a render system

3.11
designed render
render designed and manufactured to fulfil specified or stated properties and measured by specified or stated test methods (performance concept)

3.12
prescribed render
render made in predetermined proportions the properties of which are assumed from the stated proportions of the constituents (recipe concept)

3.13
render system
coat or sequence of coats to be applied to a background which can be used in conjunction with a support and/or reinforcement and/or a preparatory treatment

3.14
final coat
ultimate coat of a multicoat rendering system

3.15
renovation render
designed render for use on moist backgrounds containing water soluble salts

3.16
reinforcement
material incorporated into a render system to improve resistance to cracking

3.17
firring
material fixed to members to provide a surface at the position necessary to receive a fixing or finishing

3.18
background
normally the surface on to which the rendering is applied, but see 3.19 (support) and 3.20 (metal lath)

3.19
support
material used to support lathing so that it is largely independent of the background

3.20
lathing
mesh which when fixed to a background provides a key for rendering and in some cases support and stability

4 General

4.1 Essential principles

The design shall include working drawings and specifications prepared in sufficient detail to afford proper guidance for the execution of the work. In the preparation of rendering details the design shall take into account all the following points:

a) the nature and condition of the background;

b) the nature and conditions of exposure of the rendering;

c) the functional requirements;

d) the type of rendering;

e) the type of finish/appearance.

As soon as possible there should be an exchange of information between those responsible for the constructional work, the rendering and any subsequent work, and with other trades whose work will affect or be affected by the rendering. Other requirements to be declared are as follows:

1) scaffolding;

2) any curing required;

3) monitoring of progress.

4.2 Building programme

The following items shall be considered by all those involved in planning the programme:

a) obtaining agreement between all the various parties on the programme times for all the necessary operations;

b) the suitability of the weather conditions during the application of the render;

c) sufficient time for the background to be inspected and for it to dry out;

d) sufficient time for preparation of the background, application and drying out of each coat of rendering. This may be longer than the minimum times referred to in 7.8.3;

e) the programme should be kept up to date as the project proceeds;

f) sufficient time for inspection of the work as it proceeds.

A record should be kept of the dates of completion of each area.

5 Materials

5.1 Materials for site-made renders

Constituent materials with established suitability shall be used, as detailed in 5.1.1 to 5.1.4.

NOTE Where there is no European Standard for a particular constituent material or where there is an existing European Standard which does not cover the particular product or where the constituent deviates significantly from the European Standard, the establishment of suitability may result from:

— a European Technical Approval which refers specifically to the use of the constituent material in site-made renders conforming to EN 13914-1;

— a relevant national standard or provisions valid in the place of use of the site-made render which refers specifically to the use of the constituent material in site-made renders conforming to EN 13914-1.

5.1.1 Mineral binders

Mineral binders with established suitability shall be used. Binders shall conform to the relevant standards listed in Table 1.

Table 1 — Mineral binders

Material	Standard	Remarks
Common cements	EN 197-1	Not all types will be suitable for each and every application[4)]
Building lime	EN 459-1	
Hydraulic lime	EN 459-1	
Masonry cements	EN 413-1	

5.1.2 Aggregates

Aggregates with established suitability for use in renders shall be used. Aggregates shall conform to the relevant standard, when suitable. Lightweight aggregates shall conform to EN 13055 and aggregates for mortar shall conform to EN 13139.

5.1.3 Admixtures

Where available, admixtures shall conform to EN 934-3.

Only those admixtures shall be used which do not exert any harmful influence on the render. They shall not impair the strength or durability of the render, or, where applicable, the protection against

4) Refer to NOTE 1 of Clause 1 for further information.

corrosion of the reinforcement or of lathing. In addition, they shall not modify, other than in the manner intended, the setting and hardening of the binder.

NOTE It should also be borne in mind that certain types of admixtures, for example water repellent agents, can impair the adhesion of subsequent layers of the render and paint.

With all admixtures the manufacturer's instructions shall be precisely followed. Overdosage shall be avoided.

Proprietary bonding agents shall be compatible with cement and/or lime. They can, for example, be based on styrene-butadiene rubber (SBR), and acrylic polymers. Bonding agents improve the adhesion of renderings to smooth surfaces, and to low or high suction backgrounds if incorporated in spatterdash, stipple, adhesive slurries or in undercoat mixes. They can also reduce the suction of the background when applied to high suction backgrounds. Manufacturers' instructions concerning the use of these products should be carefully followed.

5.1.4 Additions

5.1.4.1 Fibres

The fibres shall not affect the chemical or physical stability of the render.

Natural fibres shall be dry, clean and free from oil or grease.

Alkali-resistant mineral fibres and certain polymer fibres can be used, either as loose fibre or in premixes. Manufacturers' literature should be consulted for likely improvements to the render as well as limitations on use and long term deterioration.

Metal fibres shall have adequate durability. Metal fibres shall not be adversely affected by alkaline or weak acid conditions.

5.1.4.2 Pigments

Pigments shall conform to EN 12878 and be used only if they are proven to be satisfactory. Pigments shall be stable, unaffected by lime or exposure to light. They shall not easily be leached out by water nor shall they have any adverse effect upon the cement or other constituents of the rendering.

5.2 Water

The water shall be of a quality such that it does not adversely affect the render.

Water fit for drinking is suitable for mixes for rendering. Attention shall be drawn to the requirements of EN 1008 in cases where water supplies may be of doubtful quality.

5.3 Types of render

5.3.1 General

Ready mixed renders can be mixed entirely in the factory or partly in the factory and subsequently completed on site. Alternatively, render may be mixed entirely on site.

Further detailed design recommendations and sub-division according to location of manufacture and purpose are given in 6.17.

5.3.2 Factory made and semi-finished factory made renders

Factory made and semi-finished factory made renders shall conform to the requirements of EN 998-1 for those parts of the process either wholly or partly carried out in the factory. For those parts of the process for semi-finished factory made renders completed on site, only materials permitted by the manufacturer shall be used. No addition of any material is permitted for wet, ready-to-use renders. Unless otherwise specified by the manufacturer, no addition, other than water in the recommended proportions, shall be added to dry factory made renders. Where permitted, only materials conforming to the requirements of 5.1 and 5.2 should be used.

5.4 Reinforcement, supports and beads

Reinforcement, supports and beads should conform to recommendations given in Table 2.

Table 2 — Materials for reinforcement, supports and beads

Product	Material	Specification	Remarks
Reinforcement and/or support	Expanded metal (stainless steel or zinc coated steel)	prEN 13658-2	Specify grades 1.4301 or 1.4401 if EN 13658-2 does not limit grades.
	Profiled welded wire mesh (stainless steel or zinc coated steel)	prEN 13658-2	Specify grades 1.4301 or 1.4401 if EN 13658-2 does not limit grades.
Support	Ribbed lathing –expanded metal (stainless steel or zinc coated steel)	prEN 13658-2	Ribs are formed integrally with expanded metal thus providing rigidity in the direction of the rib.
Support	Stainless steel or zinc coated steel, clay pellet lath	prEN 13658-2	
Reinforcement	Plain welded wire mesh of stainless steel or of zinc coated steel	prEN 13658-2	For supports, mesh should be of 10 mm to 40 mm pitch with wires not less than 1 mm diameter. Where the aggregate grain size exceeds 3 mm consideration should be given to using a mesh larger than 15 mm. Welded mesh of this kind is used primarily as a support when rendering over certain backgrounds. For reinforcement the mesh size should be no greater than 25 mm × 25 mm.
	Non-metallic mesh made from alkali resistant mineral fibres	-	With the strands from the two directions connected together.
Support	Slab-type supports, e.g. lightweight woodwool slabs		(Use of materials with established suitability)
Angle beads, corner beads, stop beads and render stops and profiles for special purposes	Stainless steel, polyvinyl chloride or combinations thereof	prEN 13658-2	Should be used under local situations or regional conditions of high humidity and/or salt laden atmospheres or salts in background (see 6.12)
	Zinc coated steel)	prEN 13658-2	Careful consideration should be given to the choice of this type of material for its use in local situations or regional conditions of high humidity and/or salt-laden atmospheres or salts in background (see 6.12)

Metal lathing, reinforcement and beads of whatever type shall be suitable for external use.

Steel other than stainless steel shall be zinc coated after manufacture of the finished product. After fabrication the items shall be hot dip zinc coated.

5.5 Fixings

5.5.1 General

Fixings should conform to the recommendations of Table 3.

Table 3 — Materials for fixings [5)]

Product	Material	Specification
Nails	Stainless steel or zinc coated steel	–
Pins for shot-firing	Stainless steel or zinc coated steel	–
Staples	Stainless steel or zinc coated steel	-
Screws and bolts [a]	Stainless steel or zinc coated steel	–
Soft fixings and ancillary components	Polyamide, polypropylene or polyethylene	–
Washers, ancillary angles and brackets [b]	Zinc coated steel or otherwise suitably coated or thermoplastics	–
Wire	Stainless steel or zinc coated steel	prEN 13658-2
NOTE The fixings for lathing and beads should be made of a material compatible with adjacent materials. [a] Including expanding bolts and drill anchors. [b] Often used in conjunction with shot-fired or screwed fixings.		

5.5.2 Fixing blocks in solid backgrounds

Only dovetailed shaped blocks that can be cast in should be used. Some types of plastics, e.g. high density polyethylene and some cement composite blocks have proved satisfactory. Wooden blocks shall not be used.

5) Materials for fixings[5)]