SLOVENSKI STANDARD

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Mavļ ni proizvodi, ojaļ eni z vlakni - Definicije, zahteve in preskusne metode

Fibrous gypsum plaster casts - Definitions, requirements and test methods

Formteile aus faserverstärktem Gips - Begriffe, Anforderungen und Prüfverfahren

Produits en staff - Définitions, prescriptions et méthodes d'essai

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This European Standard was approved by CEN on 19 June 2006.

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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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 13815:2006) has been prepared by Technical Committee CEN/TC 241 “Gypsum and gypsum based products”, 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of an identical text or by endorsement, at the latest by February 2007, and conflicting national standards shall be withdrawn at the latest by May 2008.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA which is an integral part of this document.

This document replaces no existing European Standard.

This European Standard includes:

— an informative annex A concerning sampling procedure for testing;

— an normative annex B on the thermal conductivity of the gypsum plaster;

— an normative annex C concerning factory production control ;

— an informative annex D illustrating the scope of this standard with regard to the classification of the categories of production of the fibrous gypsum plaster casts and to the intended uses;

— an informative annex ZA : providing information for regularity marking.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This European Standard applies to fibrous gypsum plaster construction products, obtained by thin casting of a specific reinforced plaster and intended to be used in fibrous gypsum plaster structures.

The fibrous gypsum plaster structures are made by assembling these casts together and fastening them by sealed fixing or screwing to the substrate. They are then sealed and pointed to form continuous surfaces without any visible joint.

Fibrous gypsum plaster structures are suitable for finishing with direct surface decoration (e.g. paints).

The diagram below shows the family of gypsum products.

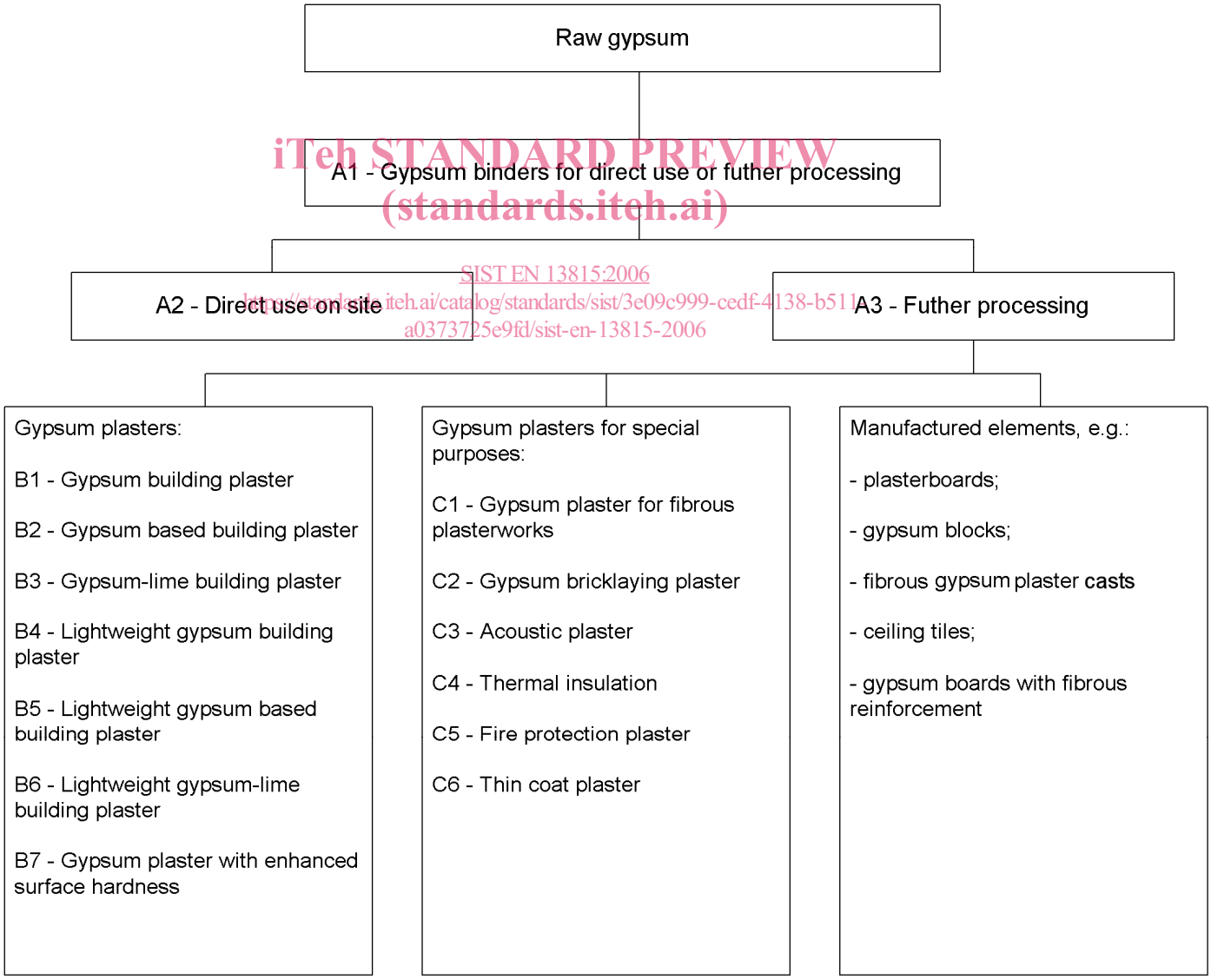


Diagram – Family of gypsum products

1 Scope

This European Standard specifies the characteristics and performance requirements for fibrous gypsum plaster cast-sections, rigid sheets, rigid tiles - made by various techniques in factories or workshops.

This European Standard is applicable to:

- conventional series produced products;
- series produced products with varying properties ;
- individual (and non-series) produced products, insofar required to be CE marked.

See 4.1 and annex D concerning the classification of the fibrous gypsum plaster casts.

This European Standard covers the following performance characteristics of the fibrous gypsum plaster casts : reaction to fire, thermal resistance, as well as resistance to impact by a hard steel ball and cohesion.

The following performance characteristics are linked to systems assembled with fibrous gypsum plaster casts : fire resistance, impact resistance, direct airborne sound insulation, acoustic absorption to be measured according to the corresponding European test methods. If required, tests have to be done on assembled systems simulating the end use conditions.

This European Standard defines the reference test methods for the technical specifications.

This European Standard also covers additional technical characteristics of fibrous gypsum plaster casts that are of importance for use and acceptance of the products by the building industry and the reference tests for these characteristics.

It provides for assessment of conformity of the products to this standard.

This standard does not apply to:

i) fibre reinforced gypsum sheet products (see pr EN 15283);

ii) gypsum elements for suspended ceilings (see EN 14246);

iii) solid casts;

iv) run fibre reinforced products;

v) plaster based stucco casts, carton pierre decors, resin decors;

vi) moulds, models and mock-ups made of fibrous gypsum plaster;

vii) fibrous gypsum plaster casts that, by nature, are not intended to be fastened in position;

viii) fibrous gypsum plaster casts for sets (theatre, cinema, TV);

ix) fibrous gypsum plaster casts and decors intended to be installed directly on existing partitions, walls and ceilings, for purely decorative applications.

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 635-3:1995, *Plywood — Classification by surface appearance. — Part 3: Softwood*.

EN 1611-1:1999, *Sawn timber —- Appearance grading of softwoods — Part 1: European spruces, firs, pines and Douglas firs.*

EN 10327, *Continuously hot-dip coated strip and sheet of low carbon steels for cold forming — Technical delivery conditions.*

EN 10244-2, *Steel wire and wire products —- Non-ferrous metallic coatings on steel wire — Part 2: Zinc or zinc alloy coatings.*

EN 12524, *Building materials and products — Hygrothermal properties — Tabulated design values.*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire tests.*

EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services.*

EN 20140-9, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 9: Laboratory measurements of room-to-room airborne sound insulation of a suspended ceiling with a plenum above it.*

EN 13279-1, *Gypsum binders and gypsum plasters — Part 1: Definitions and requirements*

EN 13658-1, *Metal lath and beads — Definitions, requirements and test methods — Part 1: Internal plastering.*

EN ISO 140-3, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 3: Laboratory measurements of airborne sound insulation of building elements (ISO 140-3:1995).*

EN ISO 354, *Acoustics — Measurement of sound absorption in a reverberation room (ISO 354:2003).*

EN ISO 717-1, *Acoustics - Rating of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation (ISO 717-1:1996).*

EN ISO 6946, *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method (ISO 6946:1996).*

EN ISO 10456, *Building materials and products — Procedures for determining declared and design thermal values (ISO 10456:1999).*

ISO 7892, *Vertical building elements — Impact resistance tests — Impact bodies and general test procedures*

3 Terms, definitions, symbols and abbreviations

For the purposes of this standard, the following definitions apply.

3.1 General terms and definitions

3.1.1
fibrous gypsum plaster cast (or fibrous plaster cast)
product made by casting specific gypsum plaster mixed with water and reinforced with fibres, cloth, grilles, lathwork, laths or profiles. It may contain admixtures, fillers or aggregates as long as they will not contribute in any stage of the fire and they are not classified as dangerous substances in European regulations.

3.1.2
fibrous gypsum plaster interior architectural cast
cast of any shape and configuration, intended for interior architectural works such as volumetric ceilings, vaults, shaped wall linings, porticos.

3.1.3
fibrous gypsum plaster technical function cast
cast of any shape and configuration that have technical functions such as shafts for smoke extraction, metal structure fireproof casings.

3.1.4
fibrous gypsum plaster unit (or fibrous plaster slab)
flat rectangular fibrous gypsum plaster casts for works such as flat suspended ceilings

3.2 Technical terms and definitions

3.2.1
face
surface of the cast intended to be exposed when installed

3.2.2
back
surface of the cast intended to be concealed when installed

3.2.3
edge
boundary of the cast

NOTE Edges can be square or bevelled (see Figures 1and 2) and can include reinforced rims and/or rebates for surface jointing (see Figure 3)

3.2.4
thickness
distance between the face and the back of the cast

NOTE The thickness of the cast is generally constant but can show possible reinforced rim edges or complementary reinforcements.

3.2.5
minimum thickness
minimum thickness dimension required for the whole of a cast

3.2.6
nominal thickness
contractual thickness or thickness declared by the manufacturer and given in the designation of a cast

3.2.7
reinforcement
material incorporated in the product to provide overall cohesion and durability.
The reinforcement may be organic (e.g. jute), mineral (e.g. glass or rock) or metal (see Table 1) as long as it is not classified as a dangerous substance in European regulations.

NOTE There are two types of reinforcements defined by their functions:
- elementary reinforcements;
- complementary reinforcements.

3.2.8
elementary reinforcement
initial reinforcement distributed throughout and fully integrated into the cast (e.g. hessian)

3.2.9
complementary reinforcement
in some casts, additional reinforcements integrated into or on the product (e.g. lightweight steel sections)

3.2.10
prime layer (or fibrous plaster firstings)
face layer of plaster, without reinforcement

3.2.11
cavity
small hollow in plaster, caused by possible air bubbles

3.2.12
handling framework
separate component used to provide temporary rigidity and/or support to products during removal from its mould, handling and assembly, usually removed after use (see Figure 4)

3.2.13
wad (or fixing pad)
scrim comprising natural fibres usually jute or sisal fully impregnated and coated with plaster and extended to form a grip or handle (see Figure 4)

Glass fibres may be used (long fibres, weave or mat).

3.2.14
fibrous plaster rope
long scrim comprising natural fibres usually jute or sisal, or strip of hessian, fully impregnated and coated with plaster and extended to form a grip

Glass fibres may be used (long fibres, weave or mat).

3.2.15
developed area
total measured and/or calculated area of the cast face

3.2.16
surface mass
mass per square metre of developed area

3.2.17
GRG cast (glass fibre reinforced gypsum)
specific product made from plaster – calcium sulfate hemihydrate alpha based or specially modified beta based - mixed with water and in which the reinforcement is glass fibre

3.2.18
PMGRG cast (polymer modified glass fibre reinforced gypsum)
specific product made from plaster – calcium sulfate hemihydrate alpha based or specially modified beta based - mixed with water with the addition of resin and in which the reinforcement is glass fibre.

3.3 Symbols and abbreviations

For the purposes of this standard, the following symbols and abbreviations apply:

cpp indicates conventional series production (see 4.1a);

cppv indicates series production of products with varying properties (see 4.1b);

ipp indicates individual (and non-series) production (see 4.1c);

f reinforcement class - consecutive number indicates the type of elementary reinforcement (see Table 2);

m index which indicates presence of complementary reinforcement by lightweight steel sections, e.g. f 2m (see Table 1);

w index which indicates presence of complementary reinforcement by softwood lath, e.g. f 3w (see Table 2);

ρ density in kilograms per cubic metre (kg/m^3);

$\lambda_{23\text{-}50}$ thermal conductivity of the product when in equilibrium at 23 °C and 50 % relative humidity in Watts per metre per Kelvin (W/m.K);

M mass in kilograms;

M_c moisture content;

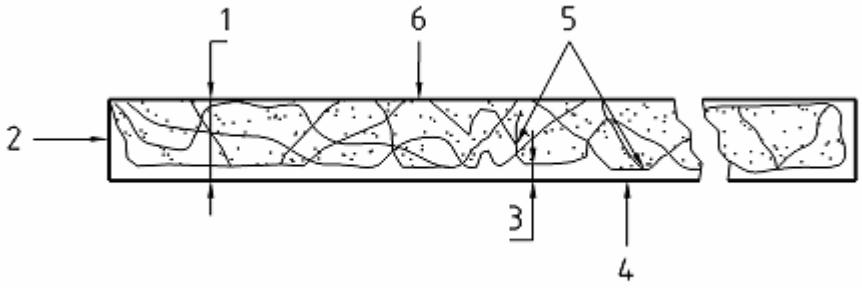
A_d developed area in square millimetres (m^2);

GRG see 3.2.17

PMGRG see 3.2.18.

ITT initial type test

FPC factory production control

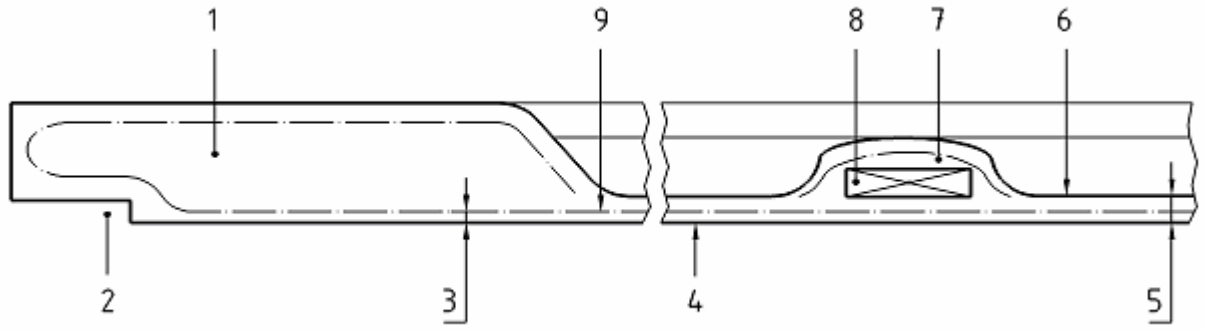


Key
1 Thickness
2 Square edge
3 Prime layer
4 Face
5 Elementary reinforcement
6 Back

Figure 1 - Cutaway drawing of a unit with square edges, reinforced with organic fibre (jute or sisal fibre)

Key
1 Thickness
2 Bevelled edge
3 Face
4 Elementary reinforcement
5 Back

Figure 2 - Cutaway drawing of a unit with bevelled edges, reinforced with chopped glass fibre roving



Key

1 Reinforcement rim edge
2 Rebate for surface jointing
3 Prime layer
4 Face
5 Thickness
6 Back
7 Fibrous plaster rope
8 Complementary reinforcement
9 Elementary reinforcement

Figure 3 - Cutaway drawing of a unit with rebated edges for surface jointing, reinforced with glass fibre tissue and complementary reinforcement by softwood laths

4 Classifications

4.1 Categories of production

There are three categories of production of fibrous gypsum plaster products defined by their manufacturing process and commercial destination (see annex D):

a) "cpp" Conventional series production

Concerns products placed on the market, manufactured in large volumes of the same product made over time.

b) "cppv" Series production of products with varying properties

Concerns products placed on the market, manufactured in series production with different performances (e.g. different size, shape, strength).

c) "ipp" Individual (and non-series) production (see scope),

Concerns products of individual design that are ordered for and installed in one and the same known work.

Under these conditions, "ipp" are :

- **individually** designed and manufactured, upon request and for specific purposes ; or
- custom-made for a specific order to obtain one or several end use performances different from products manufactured in series.

4.2 Product ranges

There are three ranges of fibrous gypsum plaster casts, defined by their principal functions, shapes and configurations :

a) casts for interior architecture (see 3.1.2)

b) casts for technical function (see 3.1.3)

c) units (see 3.1.4)

5 Requirements

5.1 Fire behaviour

5.1.1 Reaction to fire

When the intended use of fibrous gypsum plaster casts is for fire exposed situations for which there are regulatory requirements, and when the products contain less than 1 % by mass or volume of organic material (the higher level to be taken into account), fibrous gypsum plaster casts are classified A1 according to Decision 96/603/EC as amended (no contribution to fire) without testing.

Where subject to regulatory requirements, and the product contains more than 1 % by mass or volume, it shall be tested and classified according to EN 13501-1.

5.1.2 Fire resistance

NOTE Fire resistance is the property of an assembled system, not of the product itself.

Where the manufacturer wishes to declare the characteristic (e.g. when it is subject to regulatory requirements), the performances of a relevant system composed of fibrous gypsum plaster casts shall be determined and classified according to EN 13501-2.

5.2 Dangerous substances

Materials used in products shall not release any dangerous substances in excess of the maximum permitted levels specified in a relevant European Standard for the material or permitted in the national regulations of the member state of destination.

5.3 Impact resistance

NOTE Impact resistance is a characteristic dependent on an assembled system and not of the product in isolation.

Where the manufacturer wishes to declare the characteristic (e.g. when it is subject to regulatory requirements), the impact resistance of a system composed of fibrous gypsum plaster casts shall be determined according to ISO 7892.

5.4 Protection against noise

NOTE Airborne sound insulation is a characteristic dependent on an assembled system and not of the product in isolation.

5.4.1 Airborne sound insulation

5.4.1.1 Direct airborne sound insulation

Where the manufacturer wishes to declare the characteristic (e.g. when it is subject to regulatory requirements), the direct airborne sound insulation performance of a suitable system composed of fibrous gypsum plaster casts shall be determined according to EN ISO 140-3, with the sound rating (R) being determined according to EN ISO 717-1.

5.4.1.2 Insulation of a suspended ceiling with a plenum above it

Where the manufacturer wishes to declare the characteristic (e.g. when it is subject to regulatory requirements), the airborne sound insulation performance of a suitable system composed of fibrous gypsum plaster casts shall be determined according to EN 20140-9, with the sound rating ($D_{n,c}$) being determined according to EN ISO 717-1.

5.4.2 Acoustic absorption

NOTE Acoustic absorption is a characteristic dependent on an assembled system and not of the product in isolation.