SVENSK STANDARD
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Utgåva 1

Golvmaterial – Avjämnings- och beläggningsmassor baserade på kalciumsulfat (gips) –
Del 1: Definitioner och krav

Binders, composite binders and factory made mixtures for floor screeds based on calcium sulfate –
Part 1: Definitions and requirements

ICS 01.040.91; 91.100.10; 91.100.50

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EUROPEAN STANDARD
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EN 13454-1

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English version

Binders, composite binders and factory made mixtures for floor screeds based on calcium sulfate - Part 1: Definitions and requirements

Liants, liants composites et mélanges fabriqués en usine à base de sulfate de calcium pour chapes de sol - Partie 1: Définitions et spécifications

Calciumsulfat-Binder, Calciumsulfat-Compositbinder und Calciumsulfat-Werkmörtel für Estriche - Teil 1: Begriffe und Anforderungen

This European Standard was approved by CEN on 24 June 2004.

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 Central Secretariat or to any CEN member.

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Contents

Foreword

This document (EN 13454-1:2004) 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of an identical text or by endorsement, at the latest by March 2005, and conflicting national standards shall be withdrawn at the latest by June 2006.

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 for binders, composite binders and factory made mixtures for floor screeds based on calcium sulfate consists of two parts:

Part 1: Definitions and requirements

Part 2: Test methods

This document specifies binders, composite binders and factory made mixtures where the principal active constituent is calcium sulfate.

The requirements in EN 13454-1 on binders and composite binders are based on the results of tests according to EN 13454-2.

The requirements on factory made mixtures for floor screeds based on calcium sulfate are in accordance with EN 13813.

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, Switzerland and United Kingdom.

1 Scope

This document applies to calcium sulfate binders and composite binders made of calcium sulfate used for the manufacture of floor screeds for interior use in buildings. It also includes requirements for factory made mixtures made of calcium sulfate used for the manufacture of floor screeds which are given in EN 13813. This document does not cover the application of floor screeds. Floor screeds made with products covered by this document may contribute to thermal and sound insulation and fire protection of the floor.

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 12086, *Thermal insulating products for building applications - Determination of water vapour transmission properties.*

EN 13454-2:2003, *Binders, composite binders and factory made mixtures for floor screeds based on calcium sulfate - Part 2: Test methods.*

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

EN 13813:2002, *Screed material and floor screeds - Screed material - Properties and requirements.*

EN 13892-2, *Methods of test for screed materials - Part 2: Determination of flexural and compressive strength.*

EN ISO 140-6, *Acoustics - Measurement of sound insulation in buildings and of building elements - Part 6: Laboratory measurements of impact sound insulation of floors (ISO 140-6:1998).*

3 Terms and definitions

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

3.1
calcium sulfate constituents
calcium sulfate in its various dehydration phases, for example hemihydrate and anhydrite

3.2
additives
materials added to calcium sulfate binder or mixture by the manufacturer to influence the chemical and/or the physical properties

NOTE Additives are, for example, fillers, pozzolans, pigments and artificial resins

3.3
admixtures
materials added to the binder or mixture in small quantities and which, by chemical or physical action or both, change the properties of the calcium sulfate constituent, e.g. its workability, hardening or setting

NOTE Admixtures are, for example accelerators, retarders and plasticizers

3.4
aggregates
materials consisting of uncrushed and/or crushed mineral material with particle sizes and shapes suitable for the production of floor screeds

3.5
screed
layer or layers of screed material laid in situ, directly onto a base, bonded or unbonded, or onto an intermediate layer or insulating layer, to obtain one or more of the following purposes:

— to obtain a defined level,

— to carry the final flooring,

— to provide a wearing surface

3.6
binder
material used for the purpose of holding solid particles together in a coherent mass

3.7
consistency
fluidity of fresh screed material which characterises its ease of use

3.8
flow diameter
dimension for consistency of stiff factory made mixtures

3.9
spread
dimension for consistency of flowing and highly plastic mixtures

4 Types of binders and factory made mixtures

4.1 Calcium sulfate binders (CAB)

Calcium sulfate binders (CAB) consist of calcium sulfate constituents binding by hydration and may contain admixtures and additives (see 5.2.a).

4.2 Calcium sulfate composite binders (CAC)

Calcium sulfate composite binders (CAC) consist of calcium sulfate binders (CAB) and contain additional additives (see 5.2.b).

4.3 Factory made mixtures (CA)

Factory made mixtures (CA) consist of binders or composite binders and aggregates and may contain admixtures and additives with or without water. The means of determining the suitability of the aggregates for use in factory made mixtures shall be recorded in the manufacturer's documentation of the factory production control.

With respect to the manufacturing methods, factory made mixtures shall be suitable for application in one of the three consistencies: stiff, highly plastic or flowing (see 6.9).

If calcium sulfate binders or calcium sulfate composite binders, as specified in this document, are used for the manufacture of factory made mixtures, the tests specified in EN 13454-2 for determination of the pH value and for determination of shrinkage and swelling need not to be carried out.

Factory made mixtures can be produced and delivered as:

a) *prebatched* (dry) in a factory and mixed on the construction site in factory specified proportions and conditions,

b) *premixed* (dry) in a factory and mixed on the construction site by adding water,

c) *ready mixed* (wet) which is supplied to the construction site in a pre-mixed and gauged condition.

5 Requirements for binders (CAB; CAC)

5.1 General

5.1.1 Reaction to fire

Calcium sulfate binders (CAB and CAC) are reaction to fire Class $A1_{fl}$ without testing according to Commission Decision 96/603/EC as amended, provided that they contain less than 1 % by mass or volume of organic material, whichever is the more onerous. For products which contain 1 % or more of organic material, the product shall be tested and classified in accordance with EN 13501-1.

5.1.2 Release of regulated substances

NOTE For CE marking purposes see Annex ZA.

5.2 Content of calcium sulfate ($CaSO_4$)

The content of calcium sulfate in the following materials shall be:

a) calcium sulfate binders (CAB): ≥ 85 % calcium sulfate by mass,

b) calcium sulphate composite binders (CAC): ≥ 50 % and < 85 % calcium sulfate by mass.

The content of calcium sulfate shall be determined as specified in EN 13454-2.

5.3 pH

The pH of binders shall be ≥ 7,0.

The pH shall be determined as specified in EN 13454-2.

5.4 Setting times

The setting times shall be as follows:

a) initial setting time ≥ 30 min,

b) final setting time ≤ 12 h.

The setting times shall be determined as specified in EN 13454-2.

5.5 Strength

The strength of binders shall comply with the requirements of Table 1.

Table 1 — Strengths of binders (CAB) and (CAC) defined as characteristics values

Strength class	Minimum flexural strength N/mm^2		Minimum compressive strength N/mm^2	
	Tested after			
	3 days	28 days	3 days	28 days
20	1,5	4,0	8,0	20,0
30	2,0	5,0	12,0	30,0
40	2,5	6,0	16,0	40,0

The strength of binders shall be determined as specified in EN 13454-2.

5.6 Shrinkage and swelling

The values for shrinkage and swelling shall not exceed 0,2 mm/m.

Shrinkage and swelling shall be determined as specified in EN 13454-2.

6 Requirements for factory made mixtures CA

6.1 General

NOTE Factory made mixtures placed on the market of the European Economic Area, and therefore subject to conformity with the construction Products Directive, are covered by EN 13813; tests performed to EN 13454-2 may, however, be taken into account to demonstrate conformity to EN 13813. Factory made mixtures are, though, marked in accordance with EN 13813.

6.2 Reaction to fire

Factory made mixtures (CA) are reaction to fire Class $A1_{fl}$ without testing according to Commission Decision 96/603/EC as amended, provided that they contain less than 1 % by mass or volume of organic material, whichever is the more onerous. Products which contain 1 % or more of organic material shall be tested and classified in accordance with EN 13501-1.

6.3 Release of regulated substances

NOTE For CE marking purposes see Annex ZA of EN 13813:2002.

6.4 Water vapour permeability

Where the intended use of a factory made mixture is for moisture diffusion control, the permeability to water vapour of the factory made mixture shall be determined in accordance with EN 12086.

6.5 Impact sound insulation

Impact sound insulation is a property of the assembled system and not of the product itself.

When relevant, the impact sound insulation of a system including factory made mixtures shall be determined in accordance with EN ISO 140-6.

6.6 Thermal resistance

This requirement is defined in EN 13813.

6.7 Chemical resistance

This requirement is defined in EN 13813.

NOTE Floor screeds based on calcium sulfate are not used as wearing surfaces and, consequently, they are not exposed to chemical influences. A chemical resistance test is, therefore, not necessary.

6.8 pH

For factory made mixtures based on calcium sulfate the pH value shall be ≥ 7 when determined in accordance with EN 13454-2.

NOTE The test is not necessary for factory made mixtures produced exclusively from calcium sulfate binder (CAB) or calcium sulfate composite binder (CAC) as defined in 4.1 or 4.2 and aggregates as defined in 3.4 and controlled as specified in 4.3.

6.9 Consistency

6.9.1 General

A manufacturer of screed materials may declare the consistency in mm determined in accordance with EN 13454-2. Where the consistency value is greater than 300 mm, it may be determined in accordance with EN 12706.

For premixed and prebatched mixtures the consistency is determined with a given water to solid ratio as specified by the supplier.

6.9.2 Flowing mixtures

The spread shall be ≥ 220 mm.

The spread shall be determined as specified in EN 13454-2.

With this consistency the mixtures shall not segregate (no visual sedimentation, no visual development of layers).

6.9.3 Highly plastic mixtures

The spread shall be between 150 mm and less than 220 mm and determined as specified in EN 13454-2.

6.9.4 Stiff mixtures

The flow diameter shall be 110 mm to 140 mm.

The flow diameter shall be determined as specified in EN 13454-2.

6.10 Working time

The minimum working time for flowing, highly plastic and stiff mixtures shall be ≥ 30 min.

The working time shall be determined as specified in EN 13454-2.