PUBLISHED DOCUMENT

PD CEN/TR
15123:2005

Design, preparation and application of internal polymer plastering systems

ICS 83.140.99; 91.180

BSI
British Standards

National foreword

This Published Document is the official English language version of CEN/TR 15123:2005.

The UK participation in its preparation was entrusted by Technical Committee B/544, Plastering, rendering, dry lining, to Subcommittee B/544/4, Plastering, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled "International Standards Correspondence Index", or by using the "Search" facility of the *BSI Electronic Catalogue* or of British Standards Online.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a Published Document does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the CEN/TR title page, pages 2 to 13 and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 12 December 2005

ISBN 0 580 46697 3

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CEN/TR 15123

June 2005

ICS 83.140.99; 91.180

English version

Design, preparation and application of internal polymer plastering systems

Planung, Zubereitung und Ausführung von Kunstharzinnenputzsystemen

This Technical Report was approved by CEN on 13 May 2005. It has been drawn up by the Technical Committee CEN/TC 125.

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.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. CEN/TR 15123:2005: E

Contents

Foreword

This document (CEN/TR 15123:2005) has been prepared by Technical Committee CEN/TC 125 "Masonry", the secretariat of which is held by BSI.

This document has been initially 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). It has been revised by CEN/TC 125/JWG5 in conjunction with CEN/TC 241. The CEN technical report gives in different sections guidance for building details, design and materials considerations and the application of polymer plasters. Relevant data are summarized in a series of tables. The recommendations are framed in logical sequence, namely materials and accessories; properties of backgrounds that influence the choice of suitable polymer plastering systems; guidance on preparation of surfaces to be plastered; choice of suitable polymer plasters; methods of application. It is essential that the design clauses are read in conjunction with the clauses on background and preparation.

It is not the function of this document 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.

This TR should be read in conjunction with EN 13914-2.

The following similar Technical Reports are also available:-

CEN/TR 15124:2005 *Design, preparation and application of internal gypsum plastering systems*

CEN/TR 15125:2005 *Design, preparation and application of internal cement and/or lime plastering systems*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Report: 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 the United Kingdom.

1 Scope

This document concerns the design, preparation and application of plaster with polymer as the principal binder type, for internal plastering on all types of background used under normal conditions. It includes plastering onto both new and old backgrounds and the maintenance and repair of existing work. It concerns materials, backgrounds, preparation of the surface to be plastered, choice of suitable polymer plasters, methods of application and inspection and testing of plastering.

Because of the many and varied materials and practices in Europe it is not possible for certain aspects of the standard to enter into sufficient detail to be fully usable to practitioners in each country.

2 Terms and definitions

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

2.1
polymer plaster
plaster with polymer as the principle active binding component. Additives, fillers and aggregates may be added by the manufacturer. The plaster can be delivered as a powder or ready-to-use

2.2
polymer plaster coat
obtained by application of one layer of the product

2.3
polymer plastering system
polymer plaster coat or sequence of coats to be applied to a background to achieve the required flatness and smoothness, including the possible use of a support and/or reinforcement and/or pretreatment

2.4
one coat polymer plaster
polymer plaster applied in one coat which fulfils all the functions of an undercoat and a final coat

2.5
undercoat
lower plaster coat(s) of a plastering system which needs a final coat

2.6
final coat
last plaster coat of a multi-coat plastering system

2.7
efflorescence
formation of crystals on a surface during drying caused by the presence of soluble salts

3 Materials and accessories

3.1 General plasters

3.1.1 General

Where applicable the polymer plaster should conform to prEN 14023. They should be classified in accordance with EN 13501-1 for reaction to fire.

3.1.2 Polymer plasters (e.g. synthetic resin plaster, silicone plaster)

These thin coat plasters harden mainly by physical drying which can sometimes limit the coat thickness. There are no general requirements regarding suction and key of the background and the adhesion to all kinds of dry backgrounds including paints is usually good.

3.1.3 Silicate plasters

These plasters harden chemically and by physical drying. In very rapid drying conditions, precautions need to be taken to retain sufficient moisture to allow an adequate hardening of the plaster.

3.2 Water

The water should be of a quality such that it does not adversely affect the plaster.

Water fit for drinking is suitable for mixes for plastering

NOTE Attention is drawn to the requirements of EN 1008 in cases where water supplies may be of doubtful quality.

3.3 Reinforcement and beads

Reinforcement and beads of whatever type, should conform to EN 13658-1 Metal lath and beads – Definitions requirements and test methods – Part 1: internal plastering.

3.4 Fixings

Fixings for beads such as nails, screws, staples and steel wire should be made of compatible material and should conform to EN 10223-3, EN 10230-1, EN 10244-1 or EN 10244-2.

4 Design - factors influencing the selection of polymer plastering systems

4.1 Functions and properties that may be required

The function and properties achievable are determined by the choice of plaster type.

A plastering system will need to fulfil some of the following functions or properties:

— to even out any small unevenness in the background and provide a flat surface (see Table 1);

— to provide a decorative finish or a background for such a finish;

— to be vapour permeable;

— to have enhanced strength;

— to have enhanced resistance to abrasion.

Special plasters can provide enhanced properties for the following aspects:

— to improve the acoustic properties of a building element (see **5.4**);

4.2 Factors influencing the choice of polymer plasters

The designer should consider all functional and aesthetic aspects of the building.

The choice of polymer plaster(s) or plaster system is determined principally by:

a) type of building (private houses, buildings); purpose of building (flat, school, hospital, office); uses (for example: wet room);

b) the characteristics of the background;

c) the ambient and operating conditions;

d) the traditional usage in any particular area;

e) the type of finish required.

4.3 Background

Consideration should be given to the compatibility between polymer plasters and the background. To achieve this compatibility, the following items should be considered:

a) The background should provide adequate support, strength and rigidity for the adhesion of the plaster.

b) Masonry should conform to the requirements of ENV 1996-2.

c) Boards, slabs and polystyrene should be fixed securely and should only be plastered when they are dry and dimensionally stable.

d) It is important to avoid:

   1) movement of the background, including structural, moisture and thermal movements;

   2) defects in the background, e.g. weakness, contamination.

   3) efflorescence

Such compatibility is necessary to avoid bond failure between successive coats or between the first plaster coat and the background.

If any of these inadequate characteristics of the background exist, then other means of providing support and/or additional adhesion should be used.

If it is necessary to plaster over an existing substrate, ensure that it will have sufficient bond strength to support and provide adhesion for the new plaster.

Where a plaster coat is applied to cement or cement lime background, it is important that the entire substrate is mature, clean and dry, otherwise difficulty with decoration due to the migration of alkalis may be experienced and in extreme cases complete de-bonding of the plaster coat can occur.

5 Characteristics of polymer plasters

5.1 General

Polymer plasters may be decorated with most proprietary finishes when dry.

Polymer plaster can be used in most areas and on most substrates including painted surfaces with or without pre-treatment. Each coat should be allowed to harden and dry before applying the subsequent coat.

Polymer plaster, when hardened and dry, is amongst the least troublesome of plaster surfaces in relation to decorative finish.

5.2 Fire properties

5.2.1 Reaction to fire

See **3.1**.

5.2.2 Fire resistance

Resistance to fire is a property of a system (background and plastering) and not of the product itself.

When relevant, the fire resistance of a system including polymer plastering should be tested and classified in accordance with EN 13501-2.

The manufacturer should declare performance on fire: integrity (E), resistance (R).

5.3 Thermal properties

Normal plasters do not make a significant contribution to thermal insulation. However, they do provide an effective way of sealing porous surfaces and voids.

5.4 Acoustic properties

Even if standard polymer plasters do not contribute specifically to sound absorption, a polymer plastering system contributes to sound absorption due to its flexibility (minor critic frequency) and continuity by filling voids.

If enhanced sound absorption properties are required, then special acoustic plasters should be used. Sound-absorbent finishes may affect sound transmission indirectly to some extent by reducing the level of reverberant noise in either the source room or receiving room.

5.5 Resistance to cracking

When the background has been erected in accordance with the relevant standards and the polymer plaster applied in accordance with this document and the recommendations of the manufacturer, then the polymer plaster will perform satisfactorily.

The maximum coat thickness recommended by the manufacturer should not be exceeded.

5.6 Water resistance

In wet areas polymer plasters with enhanced water resistance should be used.

5.7 Durability

The durability of polymer plaster can be affected by the following:

— Lack of adhesion to the background and between coats e.g. too low or too high temperatures.

— Alkali migration from the background.

— Contamination from the background e.g. oil, salts.

— Dust on the background.

— Incorrect usage.

— Persistent high humidity and dampness.

— Movement in the structure.

5.8 Surface requirements

5.8.1 Flatness

The flatness of the plastered finish will depend upon the accuracy to which the background has been constructed and the thickness of the plaster specified. Backgrounds which are built within the tolerances specified in ENV 1996-2 may still not be able to be plastered plumb or to line unless sufficient plaster thickness is specified. Thinner applications of plaster will only overcome minor irregularities or small deviations from line of the background. In general, no tolerance can be specified for very thin plaster coats since this will closely follow the contour of the background.

Table 1 gives recommendations for classes of flatness of the plastered finish.

NOTE 1 Care should be taken that the thicknesses applied should not exceed the manufacturer's recommendations.

NOTE 2 Under certain conditions where the plasterwork is subject to shallow angle lighting e.g. in long corridors with end lighting, although within this deviation limit, plasterwork can still reveal minor inherent surface irregularities.

Table 1 — Classes of flatness

Class	Standard of finish required – gap under straight edge	Minimum standard of background flatness to achieve standard of finish required
0	No requirement	No requirement
1[2)]	10 mm in 2 m	15 mm in 2 m
2[2)]	7 mm in 2 m	12 mm in 2 m
3[2)]	5 mm in 2 m	10 mm in 2 m
4[1)]	3 mm in 2 m	5 mm in 2 m
5[1)]	2 mm in 2 m	2 mm in 2 m
NOTE National annexes may advise on plaster thickness required for given levels of flatness and also the flatness class normally used.		
[1)] This is only appropriate to a plastering system of 6 mm plaster thickness or less.		
[2)] To achieve the required standard of surface finish where there are greater irregularities in the background it will require an additional levelling coat or coats or lightweight polymer plasters.		

5.8.2 Verticality of the background and the plastered finish

The background should be constructed to a suitable accuracy. The verticality of the plastered finish will depend upon the accuracy to which the background has been constructed and the thickness of the plaster specified.

Additionally the following should be provided:

— linings, openings and windows etc. to be in alignment

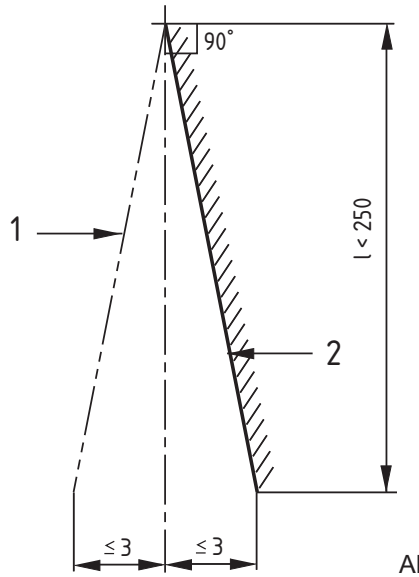
— grounds fixed to a correct plane.

5.8.3 Angularity

Recommended limits for angularity are given in Table 2, for use when a high degree of accuracy of angularity between adjacent surfaces of the background and of the plaster finish are required.

Table 2 — Classes of deviation

Length of adjacent surface l m	Deviation from right angle mm
$l < 0,25$	3
$0,25 \leq l < 0,5$	5
$0,5 \leq l < 1$	6
$1 \leq l \leq 3$	8



All dimensions in mm

Key
1 Alternative angle of reveal
2 Reveal in plastered wall recess
l length of adjacent surface

NOTE See Table 2.

Figure 1 — Example of measurement of angularity of plastered reveal showing length l, for l less than 0,25 m

5.9 Thickness

5.9.1 General purpose

Table 3 — Nominal and minimum thickness of undercoat(s) of a multi-coat system or one coat system

Thickness	Nominal	Minimum[1)]
One coat or undercoat of a multi-coat system	6 mm	0,3 mm[2)]
[1)] The minimum permissible thickness values should be limited to individual points only in all cases of application: undercoat(s) of a multi-coat system or one coat system. [2)] For plasterboard or similar smooth surfaces minimum thickness may be 0,1 mm.		

For performances on fire, thermal insulation and acoustical properties, other thicknesses (minimum and maximum) should be required depending of the national regulation and/or technical agreement.

5.9.2 To plasterboard

A thin polymer plaster coat can be used on plasterboard. For certain types of plasterboards special plasters should be chosen. Manufacturers should be consulted.

5.9.3 To solid backgrounds

The thickness of plaster that is necessary to enable a flat, true and uniform surface to be obtained depends on the degree of variation in level and line of the background.

Beads can assist the finishing of plaster e.g. at corner or against other materials.

5.9.4 Service conduits and ducts

The thickness of plaster will be a minimum cover of 5 mm the extreme protrusions of any service duct or conduit.

5.10 Surface hardness

A polymer plaster provides good surface hardness and resistance.

If additional surface hardness is required special polymer plasters should be used.

6 Types and standards of plaster finish

The final coat can be finished with a variety of finishes. These can range from smooth flat finishes to a number of different types of textured, patterned or coloured finishes, e.g. scraped, felted and sprayed. If the designer specifies a special plaster finish and trials to be made prior to the works (to ensure that the plasterer can achieve the designer's specification) this should be carefully described in the contract documentation.

It is recommended that the following levels of smooth finish are used in relation to the decorative finishes described:

Table 4 — Standards of smooth finish

Level 1	for use in areas where finish is not critical
Level 2	to receive a textured wallpaper or a textured wall covering or a textured paint
Level 3	to receive a matt paint or smooth wallpaper or smooth wall covering
Level 4	to receive a semi-gloss paint and/or with glancing illumination[1)]
NOTE Level 1 is assumed to apply unless otherwise specified. Finished plasterwork may need preparation for certain finishes.	
[1)]Additional requirements may need to be specified for use with gloss paint.	

7 Application

7.1 General

Before plastering starts, environmental conditions should be considered. The surface to be plastered should be free of frost and it is recommended that the background temperature should be at least

5 °C. The plaster should not be subjected to temperatures below 5 °C before it has dried. Before plastering, the building should be weather tight.

Backgrounds should not be plastered until sufficient time has been allowed for them to dry out (particularly important for concrete backgrounds). Backgrounds should be examined for contamination, structural integrity and strength.

On new work, designed to be plastered, the removal of all dust, loose material and any contamination such as splashes of oil or plaster may be all that is needed. Any organic growth or efflorescence on the wall should be removed.

Substrates that have previously been painted with gloss or semi-gloss paints should be sanded before plastering, if necessary.

Before any plastering is begun all cutting back and drilling for fixing and supports for services should preferably be completed.

Structural movement joints should be clearly identified and should not be plastered over.

7.2 Storage

Attention should be paid to the provision of proper storage for plant and materials on site.

7.3 Preparation

Polymer plaster delivered as a powder is mixed with clean water by hand or mechanically. The manufacturer's instructions should be followed.

7.4 Application

Depending upon the type and condition of the background it may be necessary to use a preparatory pre-treatment.

The plaster may be applied by hand using trowel or by spraying by machine in continuous process

7.5 Drying time

When the application is finished the drying time depends on the thickness of the plaster, the moisture and the ventilation of the building.

When the application is finished the plaster should be ventilated until it has dried.

The plaster should be dry prior to decoration. Paint should be selected and applied in accordance with the paint manufacturer's recommendations.

Bibliography

Standards publications

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*

ENV 1996-2, *Eurocode 6: Design of masonry structures - Part 2: Design, Selection of materials and execution of masonry*

EN 10223-3, *Steel wire and wire products for fences — Part 3: Hexagonal steel wire netting for engineering purposes*

EN 10230-1, *Steel wire nails — Part 1: Loose nails for general applications*

EN 10244-1, *Steel wire and wire products — Non-ferrous metallic coatings on steel wire — Part 1: General principles*

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

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

EN 13914-2, *Design, preparation and application of external rendering and internal plastering - Part 2: Design considerations and essential principles for internal plastering*

prEN 14023*, Bitumen and bituminous binders — Framework specification for polymer modified bitumens*

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001. Email: orders@bsi-global.com. Standards are also available from the BSI website at http://www.bsi-global.com.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: +44 (0)20 8996 7111. Fax: +44 (0)20 8996 7048. Email: info@bsi-global.com.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: +44 (0)20 8996 7002. Fax: +44 (0)20 8996 7001. Email: membership@bsi-global.com.

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsi-global.com/bsonline.

Further information about BSI is available on the BSI website at http://www.bsi-global.com.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL