

Code of practice for

Use of sprayed lightweight mineral coatings used for thermal insulation and sound absorption in buildings

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Elements and Components (of diverse materials) for Buildings Standards Policy Committee (ECB/-) to Technical Committee ECB/24, upon which the following bodies were represented:

- Association of Metropolitan Authorities
- Association of Structural Fire Protection Contractors and Manufacturers
- British Steel Industry
- Department of the Environment (Building Research Establishment)
- Department of the Environment for Northern Ireland
- Department of Transport (Marine Directorate)
- Fibre Cement Manufacturers' Association Limited
- Institution of Structural Engineers
- Loss Prevention Council
- Steel Construction Institute
- Warrington Fire Research Centre

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Foreword

This British Standard has been prepared under the direction of the Elements and Components (of diverse materials) for Buildings Standards Policy Committee.

This standard deals with the use of sprayed lightweight mineral coatings for improvement of thermal insulation and sound absorption characteristics of buildings. It is intended for the guidance of specifiers, applicators and site inspectors. If the same coatings are used for condensation control, specialist advice should be sought.

Coatings for fire protection are not covered and reference should be made to BS 8202-1.

Spray applied (projection) plasters are outside the scope of this standard. Guidance on the use of these materials is given in BS 5492.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard gives recommendations for the use of sprayed lightweight mineral coatings to improve the thermal insulation and sound absorption characteristics of buildings or building elements.

The standard does not cover fire protection or sprayed (projection) plasters. For advice on these subjects reference should be made to BS 8202-1 and BS 5492 respectively.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definition

For the purposes of this standard, the following definition applies.

spray

sprayed lightweight mineral coating

3 Validation

Any data submitted for thermal and acoustic performance should be supported by appropriate independent validation.

4 General

4.1 Composition

Spray should comprise the following principal ingredients:

- a) *Base*
 - 1) *Various mineral fibres*, having a length to breadth ratio of at least 3 to 1; or
 - 2) *Exfoliated vermiculite*, complying with BS 3797; or
 - 3) *Expanded perlite*, complying with BS 3797.
- b) *Binding agent*, of which one or more binders can be used. These may include a hydraulic binder, e.g. Portland cement, high alumina cement or gypsum plaster, or an inorganic liquid binder, e.g. silicate solution.
 Portland cement should comply with BS 12. High alumina cement should comply with BS 915-2. Gypsum plaster should comply with BS 1191-1.
- c) *Fillers*. Typically hydrated lime, limestone or other aggregate.

4.2 Choice of product

Sprays are versatile materials which will cover areas of irregular size and shape including complex angles and profiles. However, each product should be chosen carefully to meet the particular requirements for the given end use. The following factors should be taken into account:

- a) appearance;
- b) compatibility with substrate;
- c) ease of installation;
- d) density;
- e) abrasion resistance;
- f) impact resistance;
- g) sound absorption;
- h) strength;
- i) suitability for use in plenums;
- j) suitability for environment;

NOTE For example, in an external environment in areas of high humidity, in damp conditions or in chemically aggressive environments some products may be unsuitable or may require additional protection. Professional advice should be sought.

- k) combustibility;
- l) surface spread of flame;
- m) thermal conductivity;
- n) other uses, e.g. fire protection (see BS 8202-1).

The variety of products and application methods available enable a wide range of surface finishes to be obtained, ranging from flat surfaces to highly textured surfaces.

4.3 Decorative and protective surface finishes

Where decorative or protective surface finishes are required, care should be taken to ensure that the applied finish will be compatible with the spray and will not impair its performance. The elasticity of the surfacing material should be sufficient to accommodate any dimensional movement of the spray.

4.4 Health and safety considerations

This standard covers a range of different types of material. The need for site controls will vary according to the type of material being used. The application of some types of spray may generate levels of dust and particulate matter sufficient to cause irritation of the skin, eyes and respiratory tracts. For guidance on personal exposure and exposure limits reference should be made to the relevant guidance notes published by the Health and Safety Executive¹⁾.

¹⁾ A list of HSE publications is obtainable from: HSE, Information Centre, Baynards House, 1-13 Chepstow Place, Westbourne Grove, London W2 4TF.

5 Substrate preparation

5.1 General

The substrate preparation should ensure that:

- a) an adequate bond or retention of the spray is obtained to enable it to perform its required function;
- b) that the spray is compatible with the materials to which it is applied.

The initial surface condition of any substrate is important when considering bonding of any coating to it. The surface should be free from oil, grease, dirt, dust, scale, loose paint, mould release agents or other materials or conditions likely to impair adhesion.

When deciding on substrate preparation, which in some cases may involve mechanical retention (see clause 6), it is essential to consider the following:

- 1) nature of the surface, including any finishes applied prior to application of the spray;
- 2) geometric shape of the substrate;
- 3) vibration;
- 4) thermal movement;
- 5) deflection;
- 6) properties of the spray;
- 7) bond between the spray and the substrate;
- 8) environmental conditions.

It is not possible to give recommendations for all types of spray and all surface conditions in this standard. Recommendations for common substrates are given in 5.2.

5.2 Common substrates

5.2.1 Painted surfaces

The paint should be well bonded to the surface beneath it and should not be chalking or otherwise deteriorating in such a way as to affect the bond of the spray. Certain paints, e.g. gloss paints and powder epoxy paints, can cause problems of adhesion and consideration should be given to special treatment to ensure proper retention for the particular end use, e.g. removal or abrasion of the paint, pinning, or adhesives.

It is essential to ensure that painted surfaces are chemically resistant to the spray. Paints that are chemically incompatible should be sealed with an alkali/water resistant sealer coat (see 5.3).

NOTE Portland cement has an initial pH value of 12 to 12.5 and cement-bound mixes may, therefore, attack alkali-sensitive paints, e.g. paints containing alkyd binders. Paints containing water sensitive binders may also be attacked by sprays.

5.2.2 Concrete and masonry

Where necessary, the suction of masonry should be reduced by applying a light water spray or a suitable sealer (see 5.3). Normal sound clean concrete surfaces require no particular treatment but very smooth surfaces, as for example concrete cast against a hard impervious form face, may require the use of a bonding agent (see 5.3) or mechanical or other treatment, e.g. abrasive blasting, or mechanical retention to provide a suitable key (see clause 6).

5.2.3 Gypsum plaster and plasterboard

Portland cement-bound sprays should not be applied directly to unsealed gypsum plaster surfaces or plasterboard, as the setting characteristics of the cement can be affected and bond loss may result. For suspended ceilings, screens and laths, see 5.2.7.

5.2.4 Metals

If a primer is used it should be compatible with the spray to be applied. For guidance on protective measures, see BS 5493.

Plastics coated metals should be chemically compatible with the spray. Most plastics coated metals have a smooth surface, which can cause adhesion problems in the same way as gloss paints (see 5.2.1). Thus special consideration is required. "White rusting" of zinc coated steel, which can result in corrosion of the base steel, may occur in continually damp conditions and where ventilation is poor. Under these conditions steel surfaces which have been zinc coated, e.g. galvanized, should be primed using a system compatible with both the coated steel and the cement based spray. Specialist advice should be sought.

On large flat steel surfaces a bonding agent (see 5.3) or mechanical retention (see clause 6) should be used.

Aluminium should be sealed (see 5.3) before applying alkaline materials.

Particular consideration should be given to vibration, thermal movement and design loading. Mechanical retention of the coating should be considered (see clause 6).

5.2.5 Glass and plastics materials (including glass reinforced and foam materials)

Specialist advice should be sought. Many plastics materials are flexible, smooth surfaced and temperature sensitive.