

Specification for

**Powder organic
coatings for application
and stoving to
aluminium alloy
extrusions, sheet and
preformed sections for
external architectural
purposes, and for the
finish on aluminium
alloy extrusions, sheet
and preformed sections
coated with powder
organic coatings**

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Pigments, Paints and Varnishes Standards Committee (PVC/-) to Technical Committee PVC/25 upon which the following bodies were represented:

- Aluminium Coatings Association
- Aluminium Federation
- Aluminium Window Association
- British Institute of Interior Design
- Department of the Environment (Building Research Establishment)
- Greater London Council
- HEVAC Association
- Home Improvement Powder Coatings Association
- Oil and Colour Chemists' Association
- Paintmakers Association of Great Britain Ltd.
- Royal Institute of British Architects
- Steel Window Association

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Foreword

This British Standard has been prepared under the direction of the Pigments, Paints and Varnishes Standards Committee at the request of the Aluminium Window Association.

Aluminium alloy windows are frequently located in relatively inaccessible locations and this standard has been prepared as the direct result of the need to ensure that coatings applied to aluminium components (and especially to aluminium windows) have a satisfactory service life with low maintenance requirements. The preparation of the standard was undertaken simultaneously with the revision of BS 4842:1972 and note was taken of comments from industry on that standard. These comments showed that with the development of new coating products a standard corresponding to BS 4842 but applicable to powder organic coatings and finishes should be prepared. Technical considerations indicated that liquid coatings and finishes and powder coatings and finishes required different performance test procedures and therefore separate standards would be required for each. This standard deals with powder organic coatings for and finishes on aluminium alloy components; BS 4842 deals similarly with liquid organic coatings for and finishes on aluminium alloy components. (BS 6497 deals with powder organic coatings for and finishes on galvanized steel sections and preformed sheet.)

This standard relates to two different interfaces (between coating manufacturer and coating applicator and between applicator and, for example, architect) and has therefore been divided into sections in such a way that compliance can be claimed with the appropriate section. In order to assist in identifying these two interfaces, the term “coating” has been used consistently in section 2 to describe the powder organic coating when applied to the test panels, and the term “finish” has been used in section 3 when referring to the powder organic coating as applied by the applicator.

Section 2 of this standard gives the requirements for the organic coatings to be applied to aluminium alloy components and the tests described therein are intended to be carried out by the coating manufacturer. Section 3 gives the requirements for the finish on extrusions, sheet and preformed sections of aluminium alloy and the tests described therein are intended to be carried out by the coating applicator.

Some coatings containing metallic pigments and certain coatings with gloss levels below 50 units may not comply with all the requirements of section 2 of this standard.

It is stressed that preparation and pre-treatment of the metal surface are very important in producing satisfactory finishes on aluminium. Therefore, to ensure optimum adhesion, a preliminary chemical conversion of the aluminium surface has been made a requirement of section three of this standard.

Indeed, preparation and pre-treatment of the surface are so important that the inclusion of a rapid, routine test to detect faulty processing was considered essential, even though none of the tests available could test the pre-treatment processes independently of other parameters. Thus a test to assess the quality of pre-treatment is specified in **10.8**, although failure in this test does not necessarily imply that faulty pre-treatment is the only cause. This test has been specifically introduced as it is an accelerated procedure which reveals when the pre-treatment conditions are becoming unsatisfactory. This same test is also specified in **4.13** as a means of assessing the permeability of the coating.

Attention is drawn to the note in 10.5 explaining that technical difficulties in the coating process can affect the achievement of a specified maximum thickness of finish. Where a purchaser has supplied drawings (or sample sections) indicating where an excessive thickness of finish on a significant surface would cause problems during fabrication of a product from a coated component, the finish on those surfaces is not to exceed 120 μm . The applicator may need to advise when such drawings (or sections) should be supplied.

It was considered essential to section 2 of this standard that there should be a performance test to assess the resistance to weathering of organic coatings. It was also desirable that this test should include the assessment of permissible loss in gloss. While there were merits in having an accelerated procedure [see 4.10 a)] which allows a coating to be assessed within about 12 weeks, evidence was cited which showed that the loss of gloss after that period could be more severe than that observed under practical conditions. Moreover the converse had also been observed. Thus the decline in gloss could not be considered an exact measure of potential performance and this prevented the property being used in the assessment of a coating.

An alternative procedure [see 4.10 b)] was proposed to overcome this problem, despite the disadvantage of a test period of 1 year. However, while this test was more akin to practical conditions and generally more reliable, again the loss of gloss experienced could not be correlated with performance. It is for this reason that both tests in this specification include an evaluation of coatings for their resistance to chalking to partially resolve the difficulty. Each of the weathering tests is believed to have value but also has disadvantages, and hence the Technical Committee responsible for preparing this standard concluded that both should be included. The artificial weathering test is for use routinely but in the event of a dispute, the product is required to satisfy the appropriate requirements after undergoing both that and the natural weathering test.

It is important that the finish on architectural components should be compatible with sealing compounds used in the building industry. In general, finishes which comply with section 3 of this standard will satisfy this requirement but, in cases of doubt, the user should satisfy himself that the particular sealant he intends to use is compatible with and adheres to the finish by referring the matter to the sealant supplier.

It has been assumed in the drafting of this British Standard that the test methods will be applied by those who are appropriately qualified and experienced.

Certification. Attention is drawn to the certification facilities offered by BSI described on the inside back cover of this standard.

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.

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Summary of pages

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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.

