

Aerospace Material Specification

STRIPPABLE TEMPORARY PROTECTIVE
COATING FOR ALUMINIUM ALLOYS

NOTE. This specification is one of a series issued by the Ministry of Technology, either to meet a limited requirement not covered by any existing British Standard for aerospace material or to serve as a basis for inspection of materials the properties and uses of which are not sufficiently developed to warrant submission to the British Standards Institution for standardisation.

1. Scope

This specification covers the requirements for a strippable material for the temporary protection of aluminium alloys.

2. Definition

The term 'temporary protective' shall denote a material suitable for protecting aluminium alloys against scores, scratches, corrosion and incidental damage under normal storage and handling conditions for a period of not less than 2 years.

The coating shall be such that when applied to the aluminium substrate a smooth continuous coating is obtained that can be readily peeled from the surface by hand stripping.

3. Description

The material shall consist of:

A solution or dispersion of synthetic resins and colouring matter, with plasticisers if required, in a solution of organic solvents. It shall be supplied at a viscosity suitable for spray application without the further addition of thinners.

4. Applicable specifications

The following publications (latest issues) shall form part of this specification to the extent specified therein:

British Standards Institution

B.S.L.70 Aluminium-copper-magnesium-silicon-manganese alloy sheets and strips.

B.S.1470 Wrought aluminium and aluminium alloys.

B.S.3900 Methods of test for paints.

Ministry of Defence

DEF-1053 Standard methods of testing paints, varnish, lacquer, and related products.

5. Requirements**5.1 Physical requirements.****5.1.1 Consistency.**

The material shall be capable of being easily mixed to a smooth homogeneous condition.

5.1.2 Freedom from objectionable ingredients.

Substances which may cause injury or discomfort to operators during or after application shall not be used.

5.1.3 Solids content.

When tested by the method laid down in B.S.3900 Part B.2 with a final drying period of 2 hours at 105°C (221°F) the solids content shall be greater than 20 per cent.

5.1.4 Stability.

The keeping qualities of the material when stored in its original sealed container shall be such that it retains all the properties detailed in this specification for not less than the following periods after date of despatch:

- (a) twelve months in temperate climates;
- (b) six months in tropical climates.

5.1.5 Weight per gallon.

The weight per gallon shall not vary from the value obtained on the approved sample by more than ± 0.1 lb.

5.2 Film properties.**5.2.1 Surface drying time.**

When prepared by the method described in Appendix I and tested by the method described in B.S.3900 Part C.2, the coating shall be surface dry after 30 minutes following application of the final coat at a temperature of 18°—21°C (65°—70°F).

5.2.2 Pressure test.

When prepared by the method described in Appendix I but dried for four hours and tested by the method described in DEF.1053 Method No. 15 using a weight of 2 lb, the panels when separated shall not show detachment of coating. Slight sticking of the two coatings to each other shall be disregarded.

5.2.3 Resistance to abrasion.

When prepared and coated in accordance with Appendix I and tested as described in Appendix II there shall be no exposure of the metal substrate in the test area.

5.2.4 Surface appearance.

On inspection the panel prepared in Clause 5.2.1 shall not show seeds, blisters, pinholes or other irregularities.

5.2.5 Flexibility.

When coated in accordance with Appendix I and tested by the method laid down in B.S.3900 Part E.1, a film of the coating shall withstand being bent double at 0°C around a mandrel of $\frac{1}{4}$ inch diameter without cracking or detachment.

5.2.6 Peel test.

When prepared and coated in accordance with Appendix I and testing as described in Appendix III the film shall not peel under a load of 100 gm and shall peel under a load of 500 gm.

5.2.7 Resistance to salt spray.

When applied to aluminium alloy to B.S.L.70 in accordance with Appendix I and tested to the requirements of DEF.1053 Method 24 for a period of 168 hours, the panel shall show no sign of corrosion or other deterioration of the substrate.

5.2.8 Resistance to artificial weathering.

When prepared by the method described in Appendix I including acid chromate pickling and tested by the method described in B.S.3900 Part F.3, the panels shall show no sign of corrosion or other deterioration of the substrate. The film shall be capable of being easily removed from the aluminium surface in a continuous film after drying for 2 hours at 18°—21°C (65°—70°F). A/L 1 12/67

6. Preparation for delivery

In addition to bearing the markings called for by statutory and contractual requirements, the package constituting a consignment shall be legibly and durably marked with:

- (a) The specification number and title designation;
- (b) The distinctive batch number;
- (c) Date of despatch;
- (d) Manufacturer's reference number of designation.

7. Type approval

Before any particular manufacturer's material is accepted as complying with the requirements of this specification, the manufacturer shall obtain type approval. Application for type approval shall be submitted to the Director of Chemical Inspection (D.C.I.), E.135/17 Royal Arsenal, Woolwich, London, S.E.18, accompanied by:

- (i) evidence that the materials comply with all the requirements of Section 5.
- (ii) wet samples of all material for which approval is sought together with details of their formulation, i.e., percentage of colouring matter, medium, volatile matter and nature of medium, plasticisers and the specification references, where applicable, of the ingredients.

After provisional formal approval has been given, no change in the formulation will be permitted unless approval of the change has been sought and given.

8. Routine inspection tests

For each manufactured batch of material in a delivery a representative sample shall be tested by the manufacturer and proved to conform to the requirements of this specification before release is authorised.

APPENDIX I

Preparation of test panels.

Unless otherwise specified all test panels shall be to B.S.1470 Grade S1C-H, 22 swg., and they shall be acid chromate pickled as described in specification B.S.3900 Part A.3, para. 5.2.2.

The panels after pickling shall be sprayed with two or three coats of the material under test to give a dry film weight of 2.25 oz \pm 0.25 oz per square yard. A drying time of 5 minutes shall be allowed between coats.

Before submitting to test, all test panels shall be aged for seven days, unless otherwise specified, at a temperature of 18°—21°C (65°—70°F).

APPENDIX II*Abrasion test.*

Use the apparatus and proceed as described in DEF.1053, Method No. 8 but replace the fabric with a piece of nylon impregnated with carborundum and increase the weight to 10 lb instead of 4 lb.

NOTE. Details of the carborundum impregnated cloth may be obtained from D.C.I., Royal Arsenal, Woolwich, S.E.18.

APPENDIX III*Peel test.*

Cut a 2 inches wide strip through the film to the metal down the centre of a 6 inches x 4 inches panel, the cut being parallel to the 6 inches edge. Fold the top of the strip back on itself and attach to it an 8 inches long piece of adhesive tape. Incline the panel at an angle of 5° from vertical so that the tape hangs free without touching the panel, and attach weights to the other end of the tape. Raise the panel so that the film is supporting the weight and determine the weight necessary to peel away the film from the panel.

Approved for issue,

E. W. RUSSELL,

Director of Materials Research and Development/Aviation.

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Clause 5.2.8

Resistance to artificial weathering.

Delete When prepared by the method described in Appendix I including acid chromate pickling and tested by the method described in B.S.3900 Part F3, the panels shall show no sign of corrosion or other deterioration of the substrate.

Insert When prepared by the method described in Appendix I including acid chromate pickling and tested by the method described in B.S.3900 Part F3 for 168 hours, the panels shall show no sign of corrosion or other deterioration of the substrate.

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