

**Ministry of Defence
Defence Procurement Agency, ADRP2
Abbey Wood
Bristol
BS34 8JH**

OBSOLESCENCE NOTICE

All DTD specifications were declared obsolescent from 1st April 1999. All DTD 900 series approvals also lapsed at that time. The standards will no longer be updated but will be retained as obsolescent documents to provide for the servicing of existing equipment.

Further Guidance

The aim in declaring the specifications obsolescent is to recognise that the documents are not being updated and thus should be used with care by both purchaser and supplier. For example, a specification could contain valid technical information but may also contain type approval clauses that contradict procurement policy and/or use materials that do not comply with environmental legislation. The obsolescent specification can still be used as a basis for a purchase provided that the supplier and purchaser agree suitable changes to the specification within the purchase order/contract.

For the DTD 900 system, each specification has provided an MoD approved material and process. For these items, the declaration of obsolescence will constitute the termination of both the extant MoD approval and the continuing MoD assessment that had underpinned those approvals. Again, the technical content of the document remains valid and can be used by both purchaser and supplier as a basis for a contract but an acceptable (to the parties) approval/assessment procedure would be required.

Aircraft Material Specification
STOVING ENAMEL

NOTE 1. This specification is one of a series issued by the Procurement Executive, Ministry of Defence, either to meet a limited requirement not covered by any British Standard 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.

NOTE 2. The order should state:

- (i) *Whether the material is required to be suitable:*
 - (a) *for application by brush, spray or dipping, and*
 - (b) *for convection oven or radiant heat stoving.*
- (ii) *The finish required, i.e. matt, semi-matt or glossy.*

NOTE 3. Specification DEF-1053 Standard Methods of Testing Paint, Varnish, Lacquer and Related Products is published for the Ministry of Defence by H.M.S.O. and is on sale to the public.

1. Description

(a) The material shall be suitable for direct application to metal as a two-coat scheme and shall be suitable for application by brushing, spraying, as specified in the contract.

(b) The material, when stoved as specified in Clause 3, shall form a uniformly smooth and serviceable covering.

The limits of weight shall be as follows:—

Colour	oz per sq yd		
	Glossy	Semi-matt	Matt
Aluminium and black	1.3-1.8	1.6-2.2	2.0-2.5
Other colours	1.6-2.2	2.0-2.5	2.3-2.8

2. Colour and Finish

(a) Two coats of the material shall be applied to a smooth clean metal panel by brush, spray or dipping as specified and after stoving as specified in Clause 3, the film shall conform to the limits of weights specified in Clause 1. The film shall match the standard in colour and finish.

(b) The standard of colour shall be one of the British Standard Colours listed in the latest issue of B.S. 381; the standards for aluminium, white and black are obtained from the Director of Quality Assurance (Materials).

(c) The standards of finish shall be agreed with the Director of Quality Assurance (Materials), C36 Royal Arsenal East, Woolwich, London, S.E.18.

3. Stoving schedule

The stoving schedule shall be that recommended by the manufacturer. The temperature shall not exceed 170°C. The time shall not exceed two hours per coat unless otherwise agreed between the manufacturer and the Director of Quality Assurance (Materials).

4. Toughness, hardness and adhesion

(a) *Bend test.* A film of the material, prepared and tested as described in Appendix 1(a), shall withstand being bent double at 0°C round a mandrel of ¼ inch diameter without becoming detached or damaged.

(b) *Scratch test.* The resistance to scratching of a film of the material prepared and tested as described in Appendix 1(b), shall be such that a scratch through the film is not obtained. The scratch shall also be free from jagged edges of width greater than 1 mm.

5. Protection against sea water

The protection against sea water of a film of the material, prepared and tested as described in Appendix II, shall be such that no flaking, change of colour, blistering or corrosion shall occur.

6. Resistance to organic solvents

The resistance to organic solvents of films of the material shall be such that when prepared and tested by the method described in Appendix III, the film shall not become detached or damaged. There shall be no permanent change in the original condition or appearance of the film. Slight loss of gloss shall be disregarded.

7. Resistance to lubricating oils

The resistance to lubricating oils of films of the material shall be such that when tested by the method described in Appendix IV any scratch produced shall not penetrate the top coat.

8. Durability (type test)

The durability of a film of the material, prepared and tested as described in Appendix V shall be such that the film shall not show signs of cracking, chipping, flaking, blistering or more than a slight change of colour, slight chalking, or slight loss of gloss, and the metal shall be free from corrosion.

9. Keeping qualities

The keeping qualities of the material shall be such that, when stored in its original sealed containers the material shall retain the properties detailed above for not less than the following periods after the date of delivery :

- (a) Twelve months in temperate climates.
- (b) Six months in tropical climates.

10. Type approval

Before any particular manufacturer's material is accepted as complying with the requirement of this specification, the manufacturer must obtain type approval. Applications for type approval shall be submitted to The Director of Quality Assurance (Materials) C.36 Royal Arsenal, Woolwich, London. S.E.18. accompanied by:

- (i) evidence that the materials comply with Clauses 1 to 7 inclusive of this specification.
- (ii) wet samples including thinners of all materials for which approval is sought together with details of their formulation, i.e. percentage of pigments, medium, volatile, and nature of medium, pigments and extenders, and the specification references, where applicable, of the ingredients.
- (iii) one sprayed panel prepared in accordance with Appendix IV in respect of each finishing colour for which approval is sought, and marked on the reverse with the description and film weight of each applied coat.

The Director of Quality Assurance (Materials) may at his discretion grant a provisional type approval on the basis of short term tests before natural ageing tests can be completed. Provisional approvals will be issued only in special circumstances and after consideration of evidence supplied by the applicant of durability of materials of the same or similar formulation, definition of the type of medium and the names of the manufacturers of any proprietary resins used, in addition to details supplied under (i), (ii) and (iii) above.

Type approval must be obtained in respect of each finishing colour. After provisional or formal approval has been given no change in the formulation will be permitted unless approval of the change has been sought and given.

11. Routine inspection

A representative sample of each batch shall be tested by the manufacturer and proved to comply with Clauses 1 to 7 inclusive before release is authorised.

The Director of Quality Assurance (Materials) may require the manufacturer to test to Clause 8 at any time.

APPENDIX I

Method for the determination of toughness, hardness and adhesion

(a) *Bend test.* Method No. 13 of Specification DEF-1053 shall be used. Two coats of the material shall be applied to the panel by spray, such that when stoved in accordance with Clause 3 the total film weight conforms with that specified in Clause 1. The panel shall then be kept at room temperature for 1 hour. The bend test shall then be made at 0°C using a mandrel ¼ inch in diameter. The chamber shall be fitted with a circulating fan and shall be kept closed during the test.

(b) *Scratch test.* Method No. 14 of specification DEF-1053 shall be used employing a chromate dipped hard aluminium panel and a load of 1500 grammes. The test panel shall be coated with the material as specified at (a) above, and, after stoving, the panel shall be kept at room temperature for 1 hour before testing.

APPENDIX II

Method for the determination of protection against sea water

(a) A burnished steel panel, prepared by Method 2, para. 2 of specification DEF-1053 shall be coated with the material in accordance with Appendix I(a). The back of the panel shall be protected either with the material under test or with any other protective which will not affect the testing solution. The edges of the panel shall then be protected by dipping for ¼ inch in melted wax. Alternatively two panels painted on one side only may be placed back to back and sealed round the edges with wax.

(b) The test panel shall be partially immersed at ordinary temperatures continuously for one week in the testing solution of the composition given below, immediately after which time the panel shall be examined visually.

Composition of the testing solution:

Sodium Chloride	.....	.....	.....	.....	.....	.....	30 grammes.
Anhydrous magnesium chloride	.....	.....	.....	.....	.....	.....	3 grammes (or equivalent in hydrated crystals).
Anhydrous magnesium sulphate	.....	.....	.....	.....	.....	.....	2 grammes (or equivalent in hydrated crystals).

made up to 1,000 ml with distilled water.

APPENDIX III

Method for the determination of resistance to organic solvents

A panel of smooth soft aluminium, pre-treated in accordance with Method No. 2 para. 5(a) (ii) and (b) (ii) of Specification DEF-1053 and coated with the material as specified in Appendix I (a), shall be immersed for 15 minutes in a mixture of:

75 parts by volume	.....	.....	.....	.....	2.2.4 trimethyl pentane I.P. reference fuel quality
25 parts by volume	.....	.....	.....	.....	pure toluene B.S. 805.

It shall then be allowed to dry for 30 minutes. The panel shall then be examined for appearance and condition.

The panel shall be kept in a horizontal position at room temperature for 24 hours and shall then be bent double over a mandrel ¼ inch in diameter at room temperature using Method No. 13 of specification DEF-1053.

APPENDIX IV

Method for the determination of resistance to lubricating oils

A panel of chromate dipped hard aluminium prepared and coated as specified in Appendix I(b) shall be completely immersed continuously for 4 days in Lubricating Oil: Aircraft Turbine Engine, Synthetic Type to Specification D.Eng.RD.2487 (RDE/O/463) at a temperature of 18°C (65°F) to 21°C (70°F). It shall then be removed from the oil and wiped with a soft rag dipped in a mixture of:

75 parts by volume	.....	.....	.....	.....	2.2.4 trimethyl pentane I.P. reference fuel quality
25 parts by volume	.....	.....	.....	.....	pure toluene B.S. 805.

The panel shall then be subjected to the scratch test described in Appendix I(b) employing a load of 1,000 grammes.

APPENDIX V

Method for the determination of durability

A panel of burnished steel shall be prepared as described in Method No. 2, para. 2 of Specification DEF-1053 and shall be coated with the material as specified in Appendix I(a). The panel shall have an exposed area of at least 35 sq in and the back of the panel shall be protected. The edges of the panel shall be rounded but not protected other than by application of the material under test.

The treated panel shall be exposed for 12 months in the open facing south at an angle of 45° to the horizontal. During the exposure the panel shall be sprayed three times daily at intervals of three to four hours with a solution, the composition of which is given in Appendix II(b).

Corrosion within ¼ in of the edge of the panel may be ignored in assessing the results of the tests.

Approved for issue,

E. W. RUSSELL,

Director/Materials.

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