

**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
PROOFED FABRIC AND TAPE FOR
INFLATABLE LIFERAFT EQUIPMENT

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, or to serve as a basis for inspection of material, the properties and uses of which are not sufficiently developed to warrant submission to the British Standards Institution for standardisation.

SECTION 1: GENERAL

1. Scope

This specification defines the essential requirements for single-ply, two-ply, and three-ply fabric proofed with natural rubber or synthetic rubber or combinations of natural and synthetic rubber. The contract or order shall state the type of material which is required by reference to the fabric proofing formula as exemplified in Column 2 of Table I, and shall state the type or types of rubber to be used.

2. Materials

(a) *Fabrics.*—Cotton fabrics shall normally be used and shall comply with specification British Standard 2F57 including treatment with pentachlorophenyl laurate in accordance with Clause 3(d) of that Standard. The use of other fabrics shall be subject to prior approval. All fabrics shall be as free as possible from defects to the satisfaction of the inspector.

(b) *Rubber proofing.*—No formulation for facing or interply proofing shall be used unless the proofer has obtained type approval. The requirements for type approval are stated in Section 2.

Natural rubber proofings shall contain a copper inhibiting anti-oxidant.

With proofings containing butadiene-styrene, a bonding layer may be applied to the textile face consisting of about 10 g per sq m of self colour natural rubber compound.

Pentachlorophenyl laurate shall be included in the proofing compound.

The amount of pentachlorophenyl laurate shall be 2.0-2.1 per cent on the nominal weight of proofing.

3. Construction and manufacture

(a) The details of commonly used proofed fabrics and tapes are set out in Table I, and proofed fabric and tape to these constructions shall conform to all of the requirements of Table I.

In orders or contracts for proofed fabrics or tapes of other details the requirements shall be set out in accordance with the headings and style of Table I, and the order or contract shall also require compliance with the remainder of this specification.

(b) When a bias ply is included in the construction, the bias ply shall be at 45°. Bias joins shall be clean, uniform and neatly made, free from blisters and shall adhere firmly. The width of bias joins shall be not less than 10 mm.

(c) The weights per unit area given in Table I Column 14, are maxima; they include an allowance of 15 g per sq m for dusting powder on each proofed face and are rounded up to the next 5 g per sq m.

(d) At the processing stage the weight of each interply proofing shall be determined separately before further processing.

(e) Tape shall be cut at 45° bias from single ply fabric conforming to the foregoing requirements.

(f) The width of tape shall be measured on the roll.

(g) The bias adhesive used with tape shall be an approved self-vulcanising solution.

4. Variation of weight across width

The variation of weight across width shall not exceed 10 per cent of the nominal weight of proofing.

5. Lateral leakage

The lateral leakage of three-ply fabric shall not exceed 20 litres per sq m per 24 hours. The lateral leakage of other fabrics shall not exceed 14 litres per sq m per 24 hours.

6. Effects of twisting on air permeability

Not more than 20 bubbles shall break the surface in 5 minutes.

7. Ply adhesion

The ply adhesion between pairs of plies in multi-ply fabric shall be such that a 2.5 kg load does not give separation of more than 5 mm per 50 mm width in 5 minutes.

8. Adhesion of surface coating

The adhesion of each and every surface coating shall be such that a 2.5 kg load does not give separation of more than 5 mm per 50 mm width in 5 minutes. In the course of the test, the coating shall not prevent cure of self-vulcanising solution.

9. Ply adhesion in bias joins

When fabric has a bias ply on the inner or outer face, the ply adhesion between the bias joins shall be such that a 2 kg load does not give separation of more than 5 mm per 50 mm width in 5 minutes.

10. Tape adhesion

The tape adhesion shall be such that a 1.7 kg load does not give separation of more than 5 mm per 50 mm width in 5 minutes.

11. Fabrics with bias plies

Right and left hand bias fabrics must be supplied on separate poles. A right hand bias fabric has the bias join running upwards from left to right, and left hand bias has the join running upwards from right to left when viewed along the warp direction of the straight ply with the bias ply towards the observer. Where the bias ply is not a facing fabric, the face designated "outer" shall be towards the observer.

12. Quality of manufacture and freedom from defects

The proofed fabrics shall be as free as possible from defects to the satisfaction of the inspector. The edges of proofed fabrics shall be uniformly trimmed.

13. Marking

(a) In addition to any special requirements in the order, each roll of proofed fabric and tape shall be stamped with a composite marking as follows:

(b) *Position and frequency of marking.*

(b) (1) *Tapes.*—The complete marking shall be stamped on one flat face of each roll so that the first line of the marking is nearly at the middle.

(b) (2) *Fabrics.*—The complete marking shall be impressed on the fabric face designated in Table I as "inner"; it shall be impressed along each roll as shown in Fig. 1.

(c) *Information required in marking.*— The marking shall consist of letters and figures providing information on the following:

- (c) (1) *Tapes:*
- (a) Width;
 - (b) R.A.F. Stores Section and Reference Number, if quoted on the order;
 - (c) Proofer's Identity Letter;
 - (d) Batch Number;
 - (e) Except where natural rubber is used, the basic material of the proofing;
 - (f) Numbers denoting month and year of manufacture, e.g. 12/63

- (c) (2) *Fabrics:*
- (a) Proofer's Identity Letter;
 - (b) Proofed Fabric Formula, in the order given in Table I, col 2;
 - (c) Letters RH or LH denoting hand of bias;
 - (d) R.A.F. Section and Reference Number, if quoted on the order;
 - (e) The proofer's piece or roll number;
 - (f) Letters indicating the basic material of interply and face coatings, in the same sequence as given in the proofed fabric formula;
 - (g) Numbers denoting month and year of manufacture, e.g. 12/63.

(d) *Details of marking.*—The letter R shall be used to indicate natural rubber. The symbols used to denote proofer's identity, synthetic rubbers, and fabric combinations not listed in Table I shall be as required in the initial type approval of each proofed fabric type. Typical arrangements of characters for tapes and fabrics are shown in fig. 2 and fig. 3 and 3a.

Marking medium.—The marking medium used shall give a readily visible contrast with the colour of the face to which it is applied; it shall normally be yellow. The marking medium shall not contain more than 20 parts per million of copper, or of manganese or of cobalt. After application to any cotton textile nominated in column 4 of Table I (or to any synthetic textile used in the proofed fabric) and heating over water for 48 hours at 70° + 2°C, the medium shall not reduce the strength of the textile by more than 10 per cent.

SECTION 2: TYPE APPROVAL

14. (a) Before any material may be released as complying with all or part of the requirements of the specification the proofer must obtain type approval. Separate approval is required for each type of item listed in Table I and for any special combinations that may be ordered as complying with all or part of this specification.

(b) Applications for approval shall be submitted to the Aeronautical Quality Assurance Directorate (I.NM.2) Harefield House, Harefield, Middlesex, accompanied by:

- (i) Quantitative details of the composition of the proofing and of the vulcanising process.
- (ii) Test evidence of the extent to which the material complies with the requirements of Section 1 of this specification.
- (iii) Two samples, each one yard long and the full width of the fabric taken at 30 yards apart from one piece of proofed fabric.

(c) The material shall also pass such other tests as may from time to time after discussion with the proofer be deemed necessary by the Aeronautical Quality Assurance Directorate.

(d) After type approval has been granted no major change in composition or method of processing shall be made until formal approval has been sought and given.

SECTION 3: NORMAL INSPECTION

15. (a) Each piece of proofed fabric shall be examined for freedom from defects.

(b) Where the tests required by Clauses 3(a), 3(b), 4, 6 and 7 are called for these tests shall be carried out on each piece.

(c) Where the tests required by Clauses 5, 8, 9 and 10 are called for these tests may be carried out at a reduced frequency at the discretion of the Inspecting Authority, but the Inspecting Authority may at its option call for the complete range of tests appropriate to any fabric to be repeated at any time, and may require evidence that the declared composition and processing method are being maintained. The full range of tests shall be repeated when a major change is made in composition or process of proofing.

(d) The tests required are:

- (i) Single-ply fabrics -Clauses 3(a), 4 and 8
- (ii) Multiply fabrics -Clauses 3(a), 3(b), 4, 7, 8 and 9
- (iii) Multiply fabrics for buoyancy chambers -Clauses 3(a), 3(b), 4, 5, 6, 7, 8 and 9
- (iv) Tapes and fabrics for tapes -Clauses 3(a) and 10

16. Sampling and testing methods

Tape adhesion shall be tested at the full width at the appropriate proportionate load when the width is less than 50 mm. Ply adhesion of bias joins shall be tested on 10 mm widths (i.e. with an actual load of 400 g). Otherwise the selection of test specimens and methods of testing shall be in accordance with British Standard F. 100.

17. Release notes

The proofer shall certify on each release note that the material released is similar to that previously type approved, and shall state the approval reference numbers.

18. Delivery

Each roll of proofed fabric shall be separately supplied tightly rolled, preferably on 4ft 6 in wooden poles. The outer wrapping shall bear one complete identity marking.

Tapes shall be rolled so as to prevent self adhesion, e.g. by inter-leaving with paper.

Approved for issue,

E. W. RUSSELL,

Director of Materials Research and Development Aviation

TABLE I

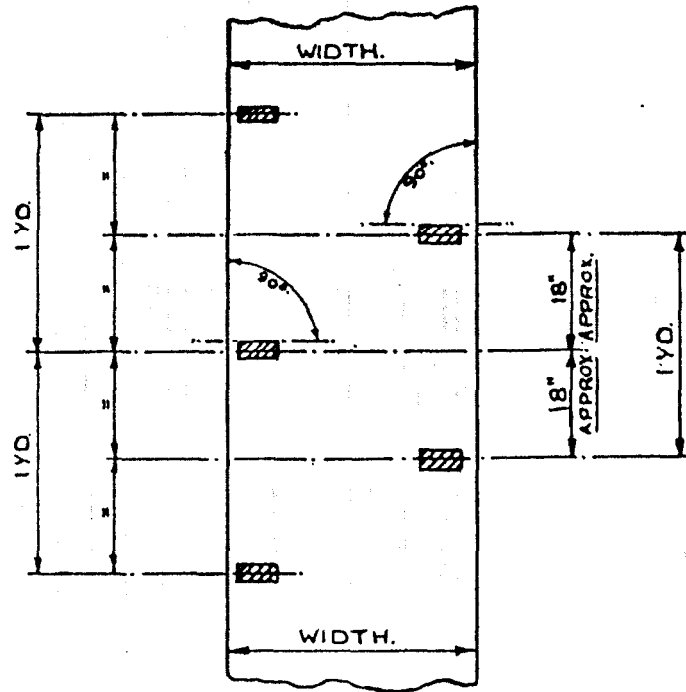
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Type of Fabric	Fabric Proofing Formula	Width of Proofed Fabric	TEXTILE PLYS			PROOFING WEIGHT (GRAMS PER SQ M)				PROOFED FABRIC WEIGHT (GRAMS PER SQ M)			
			Inner	Middle	Outer	Inner Face	Between Inner Face and Centre Ply	Between Centre Ply and Outer Face	Outer Face	Textile (max)	(Proofing nominal)	Tolerance on Proofing	Max Permitted Total
Tapes	30 unvulcanised (T) 50 Y or Blue	30mm +5 -2		T		30 unvl.			50 Y or Blue		80	-5 + 10	
	30 unvulcanised (T) 50 Y or Blue	50mm +5 -2		T		30 unvl.			50 Y or Blue		80	-5 + 10	
Single Ply for Canopy	30 unvulcanised (T) 50 Y or Blue	12mm ±2		T		30 unvl.			50 Y or Blue		80	-5 + 10	
	30 unvulcanised (T) 80 DS	as ordered		T		30 unvl.			80 DS		110	-5 + 10	
	65 T 65 Y	as ordered		T		65 ± 5			65 ± 5		130	-10 + 10	
	D 65 Y	40 in min		D		Nil			65 ± 5	65	65	-5 + 5	150
Two Ply for Canopy	50 T 60 Y	as ordered		T		50 ± 5			60 ± 5 Y		110	-10 + 10	
	40 (T) 50 T 60 Y	as ordered	(T)	—	T	40 ± 5	50 ± 5		60 ± 5 Y		150	-5 + 15	
Two Ply Buoyancy Chamber	D 100 (D) 40 Y	40 in min.	D	Nil	(D)	Nil	100	± 5	40 ± 5 Y	130	140	-5 + 20	305
	P 100 (D) 40 Y	40 in min.	P	Nil	(D)	Nil	100	+15	40 ± 5 Y	141	140	-5 + 20	315
	R 100 (R) 40 Y	40 in min.	R	Nil	(R)	Nil	100	-5	40 ± 5 Y	105	140	-5 + 20	280
	40 (T) 100 T 80 DS	as ordered	(T)	Nil	T	40 ± 5	100	± 5	80	—	220	-5 + 25	—
	T 100 (T) 40 Y	40 in min.	T	Nil	(T)	Nil	100	+15	40 ± 5 Y	—	140	-5 + 20	—
								-5					
Two Ply Floor: non-inflatable	60 Y (D) 60 P 60 Blue	40 in min.	(D)	Nil	P	60 Y ± 5	60 ± 5		60 ± 5 B	141	180	-5 + 15	370
	60 Y (D) 60 D 60 Blue	40 in min.	(D)	Nil	D	60 Y ± 5	60 ± 5		60 ± 5 B	130	180	-5 + 15	355
	60 Y (R) 60 R 60 Blue	40 in min.	(R)	Nil	R	60 Y ± 5	60 ± 5		60 ± 5 B	105	180	-5 + 15	330
Three Ply Buoyancy Chamber	P 100 (P) 60 P 40 Y	40 in min.	P	(P)	P	Nil	100 + 15 -5	60 ± 5	40 ± 5 Y	228	200	-5 + 25	470
	C 100 (C) 60 C 40 Y	40 in min.	C	(C)	C	Nil	100 + 15 -5	60 ± 5	40 ± 5 Y	240	200	-5 + 25	480
Three Ply Floor: non-inflatable	40 C 100 (C) 60 C 80 DS	40 in min.	C	(C)	C	40 ± 5	100 + 15 -5	60 ± 5	80 ± 5 DS	240	280	-5 + 30	580
	40 P 100 (D) 60 P 80 DS	40 in min.	P	(D)	P	40 ± 5	100 + 15 -5	60 ± 5	80 ± 5 DS	217	280	-5 + 30	560
	40 Y C 70 (C) 70 C 40 Blue	40 in min.	C	(C)	C	40 ± 5 Y	70 ± 10	70 ± 10	40 ± 5 B	240	220	-5 + 30	520
	40 Y P 70 (P) 70 P 40 Blue	40 in min.	P	(P)	P	40 ± 5 Y	70 ± 10	70 ± 10	40 ± 5 B	228	220	-5 + 30	510

NOTES.—(1) Brackets () denote the bias ply.

(2) Colours:—Y denotes Traffic Yellow B.S.381, DS denotes Dark Steel, Bk. denotes Black, FO denotes Flame Orange (non-fluorescent), FLO denotes Fluorescent Orange, PW denotes Pigmented White

(3) T denotes any textile that may from time to time be approved.

DTD 537.



THE STAMP IMPRESSION MAY BE INVERTED AT EITHER SIDE.

FIG. 1.

DTD 537.

784

30 MM 27c/2010.
F-1234.

HEIGHT OF CHARACTERS $\frac{3}{16}$ INCH. MINIMUM

FIG. 2.

M-P 100 (P) 60 P 40 Y.

RH-27C/2340-56859-R/R.

1"	1"	1"
2	2	2
3	3	3
4	4	4
MINIMUM	MINIMUM	MINIMUM

FIG. 3.

G-40C 100(C)60C 80 DS.
GG123-R/S-LH

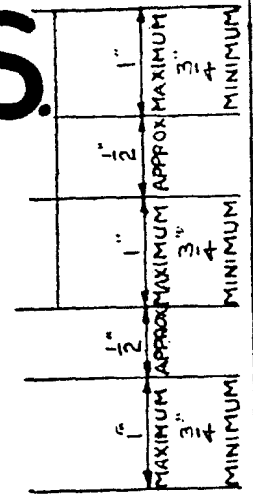


FIG. 3a.