D.T.D. 65A

Ministry of Defence
Defence Procurement Agency, ADRP2
Abbey Wood
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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.

MINISTRY OF AVIATION

D.T.D. 65A

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Superseding Specification D.T.D. 65
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Aircraft Material Specification

SILK TAPE FOR PARACHUTES

NOTE.—This Specification is one of a series issued by the Ministry of Aviation 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.

1. Quality of yarn.

(a) The warp shall be made from yarns of spun silk which have been thoroughly degummed. It shall be of natural colour.

The weft shall be of good quality cotton of natural colour, and shall not be sized or otherwise treated.

(b) The yarns shall be of the counts and twists shown in the following table:—

	Counts of 2 fold yarn.		Twist. (Doubling).	
	Counts.	Tolerance	Turns per in.	Tolerance
Warp 2 fold silk	64 dram per 1,000 yards.	± 4	8	± 1
Weft 2 fold cotton	2/24s.	± 2	10	± 1

2. Weave.

(a) The weave shall be a plain weave.
(b) The ends and picks per inch shall be not less than 34 and 10 respectively.
(c) The tape shall be uniformly woven and as free as possible from defects.

3. Width.

The width of the tape shall be not less than 0.9 inches or greater than 1.1 inches.

4. Freedom from impurities.

(a) There shall be no sizing or weighting material of any description in the silk. The amount of matter extractable by water from the silk shall not exceed 1.8 per cent. by weight when determined by the method described in Appendix I.

(b) The silk shall contain not more than 0.05 per cent. of chlorides, calculated as chlorine, when determined by the method described in Appendix I and not more than 0.01 per cent. of iron and 0.005 per cent. of copper when determined by the method described in Appendix II.

(c) An aqueous extract of the silk prepared as described in Appendix III shall have a *p*H value not less than 6 or greater than 9.

5. Breaking strength.

The breaking strength of any specimen shall be not less than 280 lb. when determined by the method described in Appendix IV.

6. Selection of test samples.

When the Inspector is satisfied that no size is used and that no washing treatment has been carried out on the tape after weaving, a test sample shall be selected from each batch of yarn for the chemical tests described in clauses 4 *(a)*, *(b)* and *(c)*.

When a particular quantity of tape can be correlated with a batch of yarn, a test sample, which may consist of specimens cut from separate lengths, shall be selected from each four gross yards for the tests described in clause 5. In other cases, a test sample shall be selected from each four gross yards for the tests described in clauses 4 and 5.

APPENDIX I

Methods for the determination of water soluble material and chlorine

Twenty grammes of the silk shall be boiled for two hours in 600 ml. of recently boiled distilled water in a chemically resistant glass beaker. The hot liquid shall be filtered through an ashless paper and the silk washed with 100 ml. of hot recently boiled distilled water. The filtrate and washings shall be evaporated to about 100 ml. and divided into two equal portions. One portion shall be evaporated to dryness and after heating at 110°C. for four hours the weight of the residue shall be determined. This shall be taken as the water soluble matter in 10 grammes of silk. The other portion shall be used for the determination of chlorine by one of the usual methods.

APPENDIX II

Methods for the determination of iron and copper

Any approved method for determining compliance with the specification of the iron and copper in the silk may be used, but in cases of dispute the following method shall be adopted:

Method for the determination of iron and copper

The following reagents shall be used in the determination of iron and copper—

Water distilled through a glass condenser.
Sodium sulphate, pure, anhydrous.
Sulphuric acid, pure, concentrated.
Ammonia, pure, specific gravity 0.880.
Citric acid, pure.
Sodium diethyldithiocarbamate 0.1 per cent. solution.
Amyl alcohol, pure, neutral redistilled.
Copper sulphate pentahydrate, pure.
Thioglycollic acid, pure.
Iron wire.
Hydrochloric acid, Normal strength.
Hydrochloric acid, pure, concentrated.

One gramme of the silk shall be placed in a Kjeldahl flask with 2 g. of sodium sulphate, 10 ml. of sulphuric acid, and 25 ml. of distilled water. The mixture shall be heated and digested till colourless, evaporated to small bulk, cooled, diluted with 10 ml. of distilled water and transferred to a 50 ml. standard flask. The digestion flask shall be washed out with about 30 ml. of distilled water in three separate portions. The washings shall be added to the bulk and made up to 50 ml., one half of which shall be used for the determination of iron and the other half for the determination of copper.

A blank digestion shall simultaneously be carried out without the silk but with the same amounts of sodium sulphate, sulphuric acid and distilled water, and the final 50 ml. of liquid from the blank divided into two equal portions for use in the determination of iron and copper.

Estimation of Iron. —A standard solution of iron shall be prepared by dissolving 0.1 g. of iron wire in hydrochloric acid, evaporating to dryness, dissolving the residue in distilled water containing 1 ml. of hydrochloric acid, and diluting to one litre with distilled water. This liquid shall be diluted with 9 times its volume of distilled water to form a standard solution containing 0.01 mg. of iron per ml.

To the 25 ml. of digestion liquid shall be added 2 drops of thioglycollic acid followed by ammonia solution in sufficient amount to render the liquid alkaline. The solution shall then be made up to 50 ml. with distilled water. The same quantities of thioglycollic acid and ammonia solution shall be added to the 25 ml. of liquid from the blank digestion, and this solution also made up to 50 ml.

From 1 to 10 ml. of the standard iron solution as required shall be placed in a 50 ml. standard flask with 1 ml. of N hydrochloric acid, 2 drops of thioglycollic acid, and sufficient ammonia solution to render the liquid slightly akaline, and the whole made up to 50 ml. with distilled water. This liquid shall then be separately compared in a suitable colorimeter with the solutions from the silk digestion and the blank, and the amounts of iron in each determined. The amounts of iron in the solution from the silk digestion shall be reduced by the amount of iron in the solution from the blank, for calculation of the percentage of iron in the silk.

Estimation of Copper. —A copper solution, containing 0.01 mg. of copper per ml., shall be prepared by dissolving 0.0393 g. of copper sulphate pentahydrate and 1 ml. of sulphuric acid in distilled water and diluting to one litre with distilled water.

Ten ml. of cold ammonium citrate solution prepared by mixing equal volumes of ammonia and a solution of 50 g. of citric acid in 100 ml. of distilled water shall be added to the 25 ml. of digestion liquid in a separating funnel, together with 5 ml. of ammonia solution and 10 ml. of sodium diethyldithiocarbamate solution. The liquid shall then be extracted by shaking with 50 ml. of amyl alcohol. The aqueous layer shall be drawn off and discarded, the amyl alcohol layer being drawn off and filtered if necessary (test liquid A).

The same procedure shall be followed and the same quantities of reagents shall be used with 25 ml. of solution from the blank digestion (test liquid B), also with a suitable amount (from 1 to 10 ml.) of the standard copper solution (test liquid C). The reagents used, i.e. 10 ml. of cold ammonium citrate solution prepared as above, 5 ml. of ammonia solution and 10 ml. of sodium diethyldithiocarbamate solution, shall be extracted similarly with 50 ml. of amyl alcohol (producing test liquid D).

The test liquids A, B and D shall be separately compared with the test liquid C from the standard copper solution in a suitable colorimeter.

For the purpose of comparison of test liquids A and B with C, the amount of copper in C shall be regarded as increased by the amount found in liquid D.

The amount of copper in the liquid A from the silk digestion shall be reduced by the amount found in liquid B from the blank digestion, for calculation of the percentage of copper in the silk.

APPENDIX III

Method for the determination of pH value

Five grammes of the silk shall be boiled for one hour in 100 ml. of recently boiled distilled water in a chemically resistant glass flask. The flask shall then be stoppered and allowed to cool to room temperature. The liquid shall be made up to 100 ml. with recently boiled and cooled distilled water, and the *p*H value determined by the electrometric method using the glass electrode.

APPENDIX IV

Method for the determination of tensile strength

Four specimens of the tape of suitable length shall be cut from the test sample.

The specimens shall be placed evenly in the jaws of a suitable testing machine so that the unstretched length of tape between the jaws is 8 inches. The load shall be uniformly applied at such a rate that the minimum permissible breaking load is reached in approximately one minute. If a specimen breaks in or at the jaws at a load lower than that specified a duplicate test shall be made on another piece. In cases of dispute the specimens shall be conditioned for not less than 24 hours in an atmosphere with a relative humidity of 65 ± 2 per cent. and a temperature of 20° C. ± 2° C. (68° F. ± 4° F.) and then tested under the same conditions.

Approved for Issue,

N. J. L. MEGSON.

Director of Materials Research and Development (Air).

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