

NOTE.—The Institution desires to call attention to the fact that this Specification is intended to include the technical provisions necessary for the supply of the material herein referred to, but does not purport to comprise all the necessary provisions of a contract.

British Standards Institution.

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BRITISH STANDARD SPECIFICATION

FOR

COTTON DUCK (DYED) FOR CASES AND TRAVELLING BAGS FOR PARACHUTES

FOR AIRCRAFT PURPOSES.

1. **Quality of Yarn.** (a) The yarns used in the manufacture of the fabric shall be spun from a good quality cotton. They shall be level and free from avoidable defects.

(b) Both the warp and weft yarns shall be three-fold.

2. **Weave.** (a) The weave shall be a plain weave.

(b) The ends and picks per inch shall be not less than 43 and 35 respectively.

(c) The fabric shall be uniformly woven and shall be as free as possible from defects of preparation and of weaving; the selvages shall be evenly and well made.

3. **Colour and Finish.** The fabric shall be piece dyed with chrome iron compounds. The colour and finish shall be as specified by the Purchaser in the contract or order.

4. **Width.** The width at any part shall be not less than that specified, nor shall it be greater than that specified by more than $\frac{1}{4}$ inch.

5. **Weight.** The weight of the fabric, when determined by the method described in Appendix I, shall be not more than 12 oz. per sq. yard.

6. **Freedom from Impurities.** (a) The water extract of a sample of the fabric, prepared and tested as described in Appendix II, shall have:—

(i) a pH value of not less than 5 nor more than 9, and

(ii) an iron content of not more than 0.01 per cent by weight referred to the weight of the cloth.

(b) The alkali content, calculated as anhydrous sodium carbonate, determined by the method described in Appendix III, shall not exceed 1.5 per cent by weight of the fabric.

7. **Strength.** The breaking strength of any specimen, when determined by the method described in Appendix IV, shall be not less than 100 lb. per inch width of warp or weft.

8. **Selection of Test Samples.** (a) A sample of the finished cloth, 18 inches long and the full width of the piece, shall be selected by the Inspector from the cloth made from each weaver's beam for the tests described in Appendices I and IV.

(b) A sample of the finished cloth, 6 inches long and the full width of the piece, shall be selected by the Inspector from each piece for the tests described in Appendices II and III.

APPENDIX I.

Method for the Determination of Weight.

A piece of the selected sample of suitable size (not less than 12 inches square and clear of the selvage) shall be conditioned for not less than 6 hours (or in case of dispute for not less than 48 hours) in an atmosphere with a relative humidity of 65 per cent and a temperature of 70° F., and then weighed under the same conditions.

APPENDIX II.

Methods for the Determination of pH Value and Iron Content.

(a) *pH Value.* Five grammes of the material, cut into pieces about one inch square shall be boiled for one hour in 100 ml. of recently boiled and cooled 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 (liquid A) and a portion of the liquid then withdrawn and the pH value determined. In case of dispute, the pH value shall be determined by the electrometric method using a glass electrode.

(b) *Iron Content.* For the determination of iron, the liquid (A) shall be filtered and 25 ml. withdrawn and placed in a 50 ml. standard flask. Two drops of pure thioglycollic acid shall be added, followed by sufficient pure ammonia solution of specific gravity 0.880 to make the liquid distinctly alkaline, and the whole shall then be made up to 50 ml. with distilled water. This liquid (B) shall be placed in a suitable colorimeter and compared with liquid (C) made up from a standard iron solution.

The standard iron solution shall be prepared by dissolving 0.1 gramme 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 10 parts of iron per million or 0.01 mg. of iron per 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, two drops of pure thioglycollic acid, and sufficient ammonia solution to make the liquid distinctly alkaline. The whole shall then be made up to 50 ml. with distilled water, liquid (C).

APPENDIX III.

Method for the Determination of Alkali Content.

1 gramme of the material cut into pieces about 1 inch square shall be placed in a chemically resistant glass flask and thoroughly wetted and boiled with 30 ml. of distilled water for ten minutes. The mixture shall be cooled to room temperature and without removal of the cloth, 10 ml. $\frac{N}{10}$ hydrochloric acid shall be added and the whole allowed to stand for 15 minutes. The excess acid shall then be titrated with $\frac{N}{10}$ caustic soda, using methyl orange as indicator, and the alkali content of the cloth calculated as anhydrous sodium carbonate.

APPENDIX IV.

Method for the Determination of Breaking Strength.

At least six test specimens $2\frac{1}{2}$ inches wide shall be cut from the test sample in the direction of the warp and at least six in the direction of the weft. No two specimens cut in the same direction shall contain the same longitudinal threads.

The threads shall be frayed out from the sides of each specimen so as to reduce the width to 2 inches, and each specimen shall be fixed in an approved testing machine of constant rate of traverse type, so that the length between the supports is 7 inches. The capacity of the machine shall be about 1,000 lb., and the rate of traverse 18 inches per minute.

The test shall be carried out under ordinary atmospheric conditions, but in cases of dispute the specimens shall be conditioned for not less than 48 hours in an atmosphere with a relative humidity of 65 per cent and a temperature of 70° F., and then tested under the same controlled conditions.

This Specification having been approved by the Aircraft Industry Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council of the Institution as a British Standard on 20th May, 1940.

NOTE.

In order to keep abreast of progress in the Industries concerned, the British Standards are subject to periodical review.

Suggestions for improvements, addressed to the British Standards Institution, 28 Victoria Street, London, S.W.1, will be welcomed at all times. They will be recorded, and in due course brought to the notice of the Committees charged with the revision of the Publications to which they refer.