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24 June 1954
SUPERSEDING
Army 7-7A
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MILITARY SPECIFICATION

THREAD, SILK, SEWING
(FOR PROPELLANT BAGS)

1. SCOPE

1.1 This specification covers sewing silk thread, for fabricating bags used in the assembly of cannon propellant charges.

1.2 Classification.- The sewing silk thread shall be of the following classes, as specified (see 6.1):

Class 1 - 350 yards per ounce.
Class 2 - 550 yards per ounce.

2. APPLICABLE DOCUMENTS

2.1 The following specifications, of the issue in effect on the date of invitation for bids, form a part of this specification:

SPECIFICATIONS

MILITARY

MIL-G-2550 - General Specification For Ammunition Except Small Arms Ammunition.
MIL-P-10025 - Packing And Marking For Domestic Shipment Of Inert Ammunition Components; General Specification.

(Copies of specifications required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Material.- The thread shall be manufactured from pure silk only, subjected to a complete boil-off, and processed so as to be suitable for use in electrically-operated sewing machines commonly used for sewing cloth.

3.2 Physical and chemical properties.- The thread shall conform to the physical and chemical properties specified hereunder, when tested in accordance with the corresponding test procedure contained in section 4 of this specification.

3.2.1 Color.- The color of the thread shall be natural.

3.2.2 Finish.- The thread shall have a soft finish.

3.2.3 Construction.- The thread shall be of three-ply construction.

3.2.4 Twist.- The twist of the thread shall be left-hand (machine).

3.2.5 Yards per ounce, minimum, shall be as follows:

Class 1 - 350
Class 2 - 550.

3.2.6 Breaking strength, pounds, minimum, shall be as follows:

Class 1 - 6
Class 2 - 4.

3.2.7 Elongation, percent, maximum, shall be as follows:

Class 1 - 20
Class 2 - 20.

3.2.8 Acidity or alkalinity.

3.2.8.1 pH of water extract.- The pH of water extract shall be 7.0 ± 2.0.

3.2.8.2 Organic acidity or alkalinity.- The organic acidity or alkalinity shall be 0.10 percent, maximum.

3.2.9 Ether extract.- The ether extract shall not exceed 2.0 percent.

3.3 Workmanship.- The thread shall be free from all clearly recognizable imperfections avoidable in manufacture, which may affect its appearance or serviceability.

4. QUALITY ASSURANCE PROVISIONS

4.1 Lot.- A lot shall consist of all thread manufactured by one manufacturer under one contract, in one unchanged process in accordance with the same specification, and same specification revision.

4.2 Sampling.- Five boxes from each lot shall be selected by the inspector. One cone shall be selected from each box, and at least 50 feet of thread shall be removed from the cone before samples are taken. Two samples of not less than 200 yards each shall be taken from each cone, and marked to indicate the box from which they were taken. One of the samples from each pair shall be held for possible future examination, and the remaining samples shall constitute the test sample representing the lot. This sample shall be marked to show the lot number, name of manufacturer, contract number, and net weight of lot.

4.3 Inspection.- Inspection shall be in accordance with Specification MIL-G-2550.

4.4 Tests.

4.4.1 Twist.- A portion of the thread shall be held in a vertical position. The direction of the spirals or twists, of the thread shall be observed. If the spirals, or twists incline upward in a right-hand direction the twist shall be considered left-hand(machine).

4.4.2 Yards per ounce.- Approximately 100 yards of the sample shall be accurately measured, weighed, and calculated to yards per ounce. The average of five determinations shall be reported. In case of dispute, the determination shall be made on conditioned material (i.e., material which is in equilibrium with an atmosphere having a relative humidity of 65 ± 2 percent and a temperature of 70° to 80° F. The material shall be considered to be in equilibrium when it shows no progressive change in weight in 24 hours.)

4.4.3 Breaking strength.- The breaking strength shall be determined on a testing machine of the pendulum (inclination-balance) type. The pendulum shall have a maximum swing of 45° from the vertical. The machine shall also be so arranged as to permit determination of the elongation of the sample at the time of rupture. A single strand of the sample, without knots, shall be wound on round hook jaws or drums which are at least 10 inches apart, and pulled to rupture at a rate of 12 ± 1/2 inches per minute (under no load). The breaking load shall not be recorded if the specimen breaks in or at the edge of the jaws or drums of the testing machine. The average of 10 determinations shall be reported as the breaking strength of the sample. In case of dispute the determination shall be made on conditioned material (see 4.4.2).

4.4.4 Elongation.- The elongation shall be determined at the same time as the breaking strength, and on the same specimens. The elongation of the sample shall be recorded at the time of rupture. The percent of elongation in the initial length of sample between the jaws or drums of the testing machine shall be calculated. The average of 10 determinations shall be reported. In case of dispute the determination shall be made on conditioned material (see 4.4.2).

4.4.5 Acidity or alkalinity.

4.4.5.1 pH of water extract.- Ten pieces of thread, weighing approximately 0.5 gram each, shall be cut from various portions of the sample. These pieces shall be combined, weighed, and transferred to a 250-ml. beaker. A 150-ml. portion of distilled water (freshly boiled and cooled to room temperature in absence of air) shall be added to the beaker. The beaker shall be covered with a watch glass, and allowed to stand, with occasional stirring, at room temperature for 3 hours. The pH of the liquid shall be determined by means of a pH meter, which has previously been calibrated at the same temperature as the sample solution. The distilled water used for this test shall be carried through the above operations as a blank, and shall have a pH value between 6.0 and 7.0. The solution shall be retained for the determination of organic acidity or alkalinity.

4.4.5.2 Organic acidity or alkalinity.- If the pH value of the water extract from the pH determination is greater than 7.0, the solution shall be titrated with N/10 hydrochloric acid, using methyl red as the indicator. If the pH value of the water extract is less than 7.0, the solution shall be titrated with N/10 sodium hydroxide, using phenolphthalein as the indicator. Any acidity or alkalinity present shall be calculated to acetic acid or sodium carbonate, respectively. If the pH value of the water extract from the pH determination is exactly 7.0, the water extract shall be divided into two equal portions. One portion shall be titrated with N/10 sodium hydroxide,

using phenolphthalein as an indicator, and the acid equivalent calculated to acetic acid. The other portion of the water extract shall be titrated with N/10 hydrochloric acid, using methyl red as the indicator, and the alkali equivalent calculated to sodium carbonate. In this latter case(when the pH value is 7.0), the greater calculated value shall be reported.

4.4.6 Ether extract.- Approximately 20 grams of the thread, with not less than 2 grams from each sample, shall be removed and accurately weighed. The weighed sample shall then be placed in a ground-glass Soxhlet extraction apparatus. Ether shall be poured through the condenser until it siphons over into a weighed receiving flask. The flask shall be heated by means of a steam bath, and the extraction allowed to proceed for 2 hours. The apparatus shall then be taken apart, only after the ether has nearly all been collected in the middle section of the apparatus, from which it shall be siphoned over into a receptacle for waste ether. The flask containing the oily ether extract shall be heated over the steam bath to entirely remove the remaining ether, them dried in the oven at 100°C for 1 hour. The flask shall be cooled in a desiccator, weighed, and the gain in weight calculated to percentage of ether extract in the sample.

4.5 Resubmission and retest.- If the inspection tests show that the lot fails to comply with the requirements, the manufacturer may have the option of having tests made on each of the primary samples, the expense of such tests to be borne by the manufacturer. The manufacturer may then remove defective portions of the lot represented by the primary samples which fail to comply with the requirements, and again submit the lot for inspection and acceptance. The lot may be accepted provided that new samples, selected in accordance with 4.2, comply with all the requirements specified herein, and that two additional samples pass any test or tests failed on original submission.

5. PREPARATION FOR DELIVERY

5.1 Packaging.- The thread shall be wound on cones, each holding 1 to 2 pounds. The cones shall be individually wrapped in tissue paper or other suitable cellulose sheeting.

5.2 Packing.- The thread cones shall be packed in boxes so constructed and closed as to insure acceptance by common or other carriers for safe transportation, at the lowest rate, to the point of delivery.

5.3 Marking.- Each container shall be marked in accordance with Specification MIL-P-10025.

6. NOTES

6.1 Ordering data.- Procurement document should specify the following:

a. Title, number, and date of this specification.
b. Class required (see 1.2).

Notice.- When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility or obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

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