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BUREAU OF STANDARDS
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UNITED STATES GOVERNMENT MASTER SPECIFICATION FOR
FRICTION TAPE

FEDERAL SPECIFICATIONS BOARD SPECIFICATION No. 291

This specification was officially promulgated by the Federal Specifications Board on May 20, 1925, for the use of the Departments and Independent Establishments of the Government in the purchase of friction tape.

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I. TYPE

Friction insulating tape shall be of a single type as described below. Specifications for rubber insulating tape may be found in Federal Specifications Board Specification No. 292.

II. MATERIAL AND WORKMANSHIP

The tape shall be made of cotton sheeting, evenly and firmly woven from good cotton, free from unsightly defects, dirt, knots, lumps, and irregularities of twist. It shall be thoroughly impregnated and evenly coated on both sides with an adhesive and insulating rubber compound.

III. GENERAL REQUIREMENTS

This specification covers the requirements for friction tape to be used to cover electrical insulation applied to wires and cables.

IV. DETAIL REQUIREMENTS

1. The compound shall be practically free from active sulphur or other substances, which will act injuriously upon copper, iron, or other metals, or upon the fabric.

2. The compound shall adhere firmly to the fabric, and shall not pull away so as to leave bare spots when adjacent layers of the tape are separated.

3. The tape shall not ravel badly when being unwound from the original roll.

4. The thickness and weights of the tape shall conform to the following table:

Width.....inch.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2
Tolerance, plus or minus.....do.....	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{32}$
Pinholes:					
Maximum number in 3 yards.....	6	6	9	12	15
Maximum number in any single yard.....	3	3	4	5	6
Thickness { minimum.....inch.....	0.013	0.013	0.013	0.013	0.013
{ maximum.....do.....	.017	.017	.017	.017	.017
Nominal weight, per roll.....pound.....	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	1 or $1\frac{1}{4}$	$1\frac{1}{2}$
Length per pound, ¹ minimum.....yard.....	82	55	41	27	20
Net weight per 100 rolls, ² minimum.....pound.....	25	50	50	100 or 125	150

¹ The thickness shall be measured with a micrometer graduated to 0.001 inch having a circular foot, 0.24 to 0.26 inch in diameter and with a pressure of 3 ounces on specimen. Five measurements shall be made at random in a length of not less than 3 feet, and no measurement shall be outside the limits stated above.

² Exclusive of core, wrapping and box.

V. METHOD OF INSPECTION, SAMPLING, AND TESTS

1. **SAMPLING.**—One roll from each 250 rolls or fraction thereof shall be selected at random for test. At least 2 feet of the outer layers shall be removed and discarded before taking specimen for test.

2. **TENSILE STRENGTH.**—The tensile strength of the tape shall be not less than 40 pounds per inch of width. The distance between the jaws shall be 12 inches, and the rate of separation shall be 12 inches per minute.

3. ADHESION.—The adhesion between adjacent layers of the tape shall be such that when a strip of tape 30 inches long is taken from a roll and wound upon a mandrel, 1 inch in diameter under a tension of 10 pounds per inch of width, and allowed to stand three minutes with the weight attached, a weight of 4.5 pounds per inch of width shall not cause the plies to separate at a rate greater than 15 inches per minute. The test shall be made at a room temperature of not less than 21° C., nor more than 24° C., the sample having been kept within these limits for at least one hour immediately preceding the time of testing. The mandrel shall be so free in its bearing that a weight of 1 ounce will cause it to revolve freely when suspended from a cotton string wound in a single layer on the center of the mandrel.

4. HEAT.—After a strip has been exposed to dry air at a temperature of 100° C. for 16 hours and allowed to cool to room temperature, a test specimen shall withstand the test prescribed in V 3, except that the weight applied to unwind the tape shall be 1.5 pounds per inch of width, instead of 4.5 pounds.

5. SULPHUR.—When a sample of tape is wrapped on a clean, smooth, copper rod, sealed in a test tube, and baked for 16 hours at 100° C., the copper shall not show the blue-black color characteristic of copper sulphide.

6. DIELECTRIC STRENGTH.—The dielectric strength shall be determined by placing a sample between two flat electrodes, one-fourth inch wide by 4 inches long, having square edges and rounded ends. A 60-cycle voltage of practically sine wave form shall be applied at a value not exceeding 100 volts, and raised at the rate of 100 volts per second until puncture occurs. The electrode pressure due to its weight shall not exceed 1.0 lbs./in.² The breakdown voltage shall be not less than 1,000 volts.

7. PINHOLES.—When the tape is held before a strong light, the number of pinholes in a length not less than 3 yards shall not exceed the limits given in the table.

VI. PACKING AND MARKING

Each roll shall be wrapped in oil paper or metal foil and inclosed in a paper carton, unless otherwise specified. The wrappings shall be secure and shall protect the contents fully. Each package shall be marked with the name of the manufacturer, and the nominal width and weight of tape.

VII. ADDITIONAL INFORMATION

No detailed information.

VIII. GENERAL SPECIFICATIONS

United States Government General Specifications for Rubber Goods, Federal Specifications Board Specification No. 59, and United States Government General Specifications for Textiles in effect on date of issuance of proposal, shall form part of this specification. *

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