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SPECIFICATION

FOR

BLANKETS; RUBBER, OFFSET

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THIS SPECIFICATION APPLIES TO NATURAL OR SYNTHETIC RUBBER BLANKETS FOR USE ON
OFFSET, LITHOGRAPHIC OFFSET AND DUPLICATING MACHINES, AND PRINTING PRESSES.

NATIONAL RESEARCH COUNCIL, OTTAWA, CANADA

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Specification
for

BLANKETS; RUBBER, OFFSET

1. DEFINITION

1.1 This specification applies to natural or synthetic rubber blankets for use on offset, lithographic offset and duplicating machines, and printing presses.

2. APPLICABLE PUBLICATIONS

2.1 The following publications are applicable to this specification:

2.1.1 ASTM D412, Method of Tension Testing of Vulcanized Rubber

2.1.2 CGSB 1-GP-2, Oil; Linseed, Boiled

2.1.3 CGSB 9-GP-1, Paper; Bond and Ledger

2.1.4 CGSB 3-GP-8, Dry Cleaning Solvent

2.1.5 U.S. Military, MIL-I-3606, Ink, Printing, Lithographic Offset, with Drier.

2.2 Reference to the above publications is to the issues in effect on the date of invitation to tender, unless otherwise specified.

3. GENERAL REQUIREMENTS

The blanket shall be made from three or four layers of fabric bonded to each other by a rubber compound. The blanket shall be coated on one side with a natural or synthetic rubber compound having composition, thickness and surface characteristics for printing both solid ink prints and fine-screen halftones.

4. DETAIL REQUIREMENTS

4.1 Surface Characteristics - The printing surface of the blankets shall have no pinholes nor projections larger than 0.002 inch, and not more than two pinholes or projections within any 1-inch square area. The weave of the fabric backing shall not be visible on the rubber surface.

4.2 Hardness - The blankets shall have a Shore Durometer Type A hardness of not less than 73 and not more than 80.

Method Par. 6.4

4.3 Tensile Strength - not less than 250 pounds per inch width on specimens cut parallel to the around-cylinder direction with Die C.

Method ASTM D412

4.4 Stretch - not more than 2 per cent temporary stretch and not more than 1 per cent permanent stretch.

Method Par. 6.5

4.5 Thickness - The over-all thickness of the blanket shall be 0.065 ± 0.003 inch or 0.075 ± 0.003 inch as specified by the purchaser. The variation in thickness within any one blanket shall be not more than 0.002 inch, and among blankets in any one shipment, not more than 0.003 inch.

Method Par. 6.6

4.6 Absorption of Oil - The sample shall absorb not more than 0.01 gram of boiled linseed oil per square inch of surface area, and shall not increase in thickness by more than 0.003 inch.

Method Par. 6.7

4.7 Absorption of Petroleum Distillate - The sample shall absorb not more than 0.02 gram of petroleum distillate per square inch of surface area.

Method Par. 6.8

4.8 Resistance to Wash Solvents - There shall be no evidence of ply separation. The sample shall not increase in thickness by more than 20 per cent, and the adhesive strength shall be not less than 1 pound.

Method Par. 6.9

4.9 Serviceability - The blankets shall show no evidence of tackiness and shall not show cracks, glaze or other indications of deterioration.

Method Par. 6.10

4.10 Performance

4.10.1 The blanket shall not cause the following defects in the printed sheet:

- (a) Weak areas in an otherwise acceptable print.
- (b) Weak mottled prints.
- (c) Tails on dots or slight blur on back of image.
- (d) Pinholes at same place on each sheet.
- (e) Long or short image along press direction of rotation.
- (f) Tack resulting in picking of the paper in the nonprinting areas.

- 4.10.2 There shall be no noticeable swelling and embossing of the printing area above the surrounding rubber surface. Additional pinholes, surface projections or separation of the blanket layers at any point shall not develop.

Method Par. 6.11

- 4.10.3 The fidelity of reproduction shall be restored within 5 copies after a smash test.

Method Par. 6.11

- 4.11 Resistance to Storage Temperatures - The blankets shall not be damaged by storage under the following conditions (there shall be no solar radiation):

4.11.1 Plus 155°F for 4 hours.

4.11.2 Minus 65°F for 3 days.

Method Par. 6.12

- 4.12 Dimensions and Design - The blanket shall be in accordance with the make, model and rated size of the press specified by the purchaser. The edges of the blanket shall be straight and parallel and the dimensions shall be within 1/32 inch of the nominal values. The corners shall be 90° to an accuracy that would result in no greater skewness than 1/32 inch per 15 inch length of the blanket. Slots and other provisions for attachment to the press cylinder shall be precisely located to fit without deformation or buckling of the blanket.

- 4.13 Treatment of Edges - The side edges of the blanket shall be coated to retard penetration of liquids.

- 4.14 Color - as specified by the purchaser.

- 4.15 Identification Marking - The bottom layer of fabric shall have at least one contrasting colored thread woven within the warp, to indicate the around-cylinder direction of the completed blanket.

5. PREPARATION FOR DELIVERY

- 5.1 Packaging - Blankets shall be packaged back-to-back in lots of 50, with two cartons of 50 per package.

- 5.2 Packing - Blankets shall be packed in containers of the type, size and kind commonly used for the purpose, so constructed as to insure acceptance and safe delivery by common or other carriers at the lowest rate to point of delivery called for in the contract or purchase order.

- 5.3 Marking - Unless otherwise specified, each carton of 50 blankets shall be clearly marked with the name of the commodity and PPandS Catalogue number. Shipping containers shall be clearly marked with the manufacturer's name and address, the consignee's name and address, contract or purchase order number, and the quantity contained therein.

6. INSPECTION

6.1 Sampling - The sample for inspection and testing shall consist of at least five blankets of the duplicating machine size and at least six square feet of the larger sizes.

6.2 Tests - All tests except the storage temperature test shall be carried out at 70-90°F and 45-55 per cent relative humidity. Blankets shall be in equilibrium prior to test.

6.3 Surface Characteristics - Place a piece of stiff paper having an opening 1 ± 0.01 inch square on the rubber surface of the blanket. Examine the area visible through the opening for pinholes and projections, with a microscope having a magnification of not less than 40 diameters and equipped with either a calibrated eyepiece scale or a calibrated micrometer ocular. Make this examination at not less than 10 locations over the blanket area.

6.4 Hardness - Place the blanket, rubber side up, on a flat cast-iron or steel plate. Test for hardness with a Shore Durometer, Type A, at ten locations over the blanket area.

6.5 Stretch - Determine stretch on a specimen 1 ± 0.01 inch wide and approximately 13 inches long cut with the long dimension in the around-cylinder direction. While the strip is lying flat without tension on a flat surface, lay out two reference points on the rubber surface not less than 10 inches apart, not less than 1 inch from the ends of the strip, and midway between the two sides. Mark the points with a pin prick and a cross with a sharp pencil and accurately measure the distance to 0.01 inch. Clamp the strip in jaws and place under 50 pounds tension. After 1 hour, and while the strip is under tension, measure the distance between the two reference points. Remove the weights and lay the strip on a flat surface. After 5 minutes, remeasure the distance between the reference points. The increase in distance between reference points before removal of tension is the temporary stretch; the increase after removal is the permanent stretch. Each value shall be expressed as a percentage of the original distance between reference points.

6.6 Thickness - Determine thickness by using a dial gauge graduated to 0.001 inch and actuated by a dead-weight load of 6 ounces exerted through a flat presser foot $3/8$ inch in diameter. The thickness shall be the average of three determinations made at six locations over the blanket area.

6.7 Absorption of Oil - Determine the inside cross-sectional area at one end of an oil-gauge glass about 2.5 inches in diameter, or a similar metal cylinder having accurately machined ends (do not use copper or brass). Weigh a 3 inch square specimen. Clamp the cylinder against the rubber surface of the specimen to make an airtight seal; then pour boiled linseed oil into the cylinder to a depth of $1/2$ inch. The linseed oil shall conform to CGSB 1-GP-2 and have viscosity O-R at 77°F as determined by the Gardner Bubble Viscometer. After 20 hours, remove the specimen from the cylinder. Wipe the specimen clean with a dry cloth, then weigh the specimen again. The oil absorption is the gain in weight per square inch of surface exposed to the oil. Measure the thickness of the specimen exposed to oil, in accordance with par. 6.6.

6.8 Absorption of Petroleum Distillate - Follow the test procedure given in par. 6.7 but using petroleum distillate instead of boiled linseed oil. The petroleum distillate shall be a narrow-range distillate of the type generally used in sheet-fed printing inks; it shall have a boiling range of 500 to 550°F, and a Kauri-Butanol number of 25.5 to 26.5.

6.9 Resistance to Wash Solvents - Determine the thickness (par 6.6) of a specimen 4.5 inches long by 0.59 inch wide and completely immerse it in the test solvent, which shall be a mixture of 75 per cent n-hexane and 25 per cent trichloroethylene, for 72 hours. Remove the specimen from the solvent, dry its surface and examine it visually for ply separation. Measure its thickness again (par 6.6) and calculate the percentage increase (swelling). Test for adhesive strength as follows:

6.9.1 Separate the plies at one end of the specimen for a length of 1.5 inches so that the rubber face and the adjacent fabric ply are on one side and the remaining fabric plies on the other. Pull the two sides apart using a tensile tester operating at a rate of 3 inches per minute clamp separation. Average the values observed at 2-1/2, 3 and 3-1/2 inch marks of the specimen.

6.10 Serviceability - Place a 3 inch square specimen of blanket under a 2 inch square opening. Apply ink (see 6.10.1) with a hand roller over the opening. Expose the specimen to an ambient temperature of 140°F for 1 hour. Wash the specimen with a naphtha petroleum solvent having a boiling point between 190 and 265°F, and then expose it again to an ambient temperature of 140°F for 1 hour. Repeat this entire cycle 20 times. The samples shall be kept clean, and hung up when not being tested. Perform the test for tackiness after the 10th, 15th and 20th cycles by pressing the specimen firmly, face down, against a sheet of bond paper conforming to CGSB 9-GP-1 for not less 2 seconds. Then with the left edge of the paper held firmly against a horizontal surface, pull the right edge of the specimen horizontally. Evidence of distinct adhesion to the paper shall constitute failure in this test. Examine the specimen after the 20th cycle for cracks, glaze or other evidence of deterioration.

6.10.1 The ink used shall be black ink conforming to the latest issue of U.S. Military Specification MIL-I-3606.

6.11 Performance

6.11.1 Carefully wash the blanket surface with cleaning liquid conforming to CGSB 3-GP-8 and dry. Conduct the following tests on an offset duplicating machine. The test plate shall be ball-grained (220) aluminum and shall include 133-line halftones, solid ink areas and unprinted areas. Ink shall be black conforming to the latest issue of U.S. Military Specification MIL-I-3606, to which the required quantity and type of drier has been added to produce drying in 8 to 14 hours. Paper shall be No. 7 bond, white, basis weight 17 x 22 - 32M, conforming to CGSB 9-GP-1.

6.11.2 Run 25 to 35 sheets through the duplicating machine (on impression). Allow the ink image to remain on the blanket for 4 hours with a blanket remaining on the cylinder under tension. Wash the ink off with a cleaning liquid conforming to CGSB 3-GP-8. Immediately after the blanket is washed, examine it both without magnification and under not less than 9-power magnification for evidence of embossing or other defects on the blanket surface. Use side illumination at a low angle to the blanket surface.

- 6.11.3 Following the embossing test, make a run of 500 impressions, at a rate of 4,000 per hour, adjusting the tension of the blanket as required at 250 and 500. Run at least 500 more impressions without stopping. The amount of ink printed on the paper shall be such that prints of good density are obtained without undue spread of halftone dots. Examine the press sheets both without magnification and under not less than 9-power magnification.
- 6.11.4 Determine smash and recovery by feeding through the press a sheet of paper to which are attached a 1 inch wide strip of the bond paper and a 1 inch wide strip of Bristol board 0.0079 inch thick.
- 6.12 Resistance to Storage Temperature - Place the blanket flat or loosely rolled in a temperature chamber, lower the temperature to -65°F and maintain for 3 days. Return the temperature in the chamber to normal room temperature. One hour after the blanket has reached room temperature, examine for evidence of damage or deterioration. Return the blanket to the chamber, raise the temperature to 155°F, and maintain for 4 hours. Allow the chamber to return to room temperature and examine the blanket again for evidence of damage or deterioration.

7. NOTES

- 7.1 Purchaser Options - In ordering offset blankets to this specification, purchasers should state:
- (a) Make, model and rated size of the press machine with which the blankets are to be used.
 - (b) Blanket thickness (par. 4.5).
 - (c) Color (par. 4.14).
- 7.2 The publication listed in par. 2.1.1 is available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103, U.S.A.
- 7.3 The publications listed in par. 2.1.2, 2.1.3 and 2.1.4 are available from the CGSB Secretary.
- 7.4 The publication listed in par. 2.1.5 is available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., U.S.A.

Correspondence regarding this specification should be addressed to the Secretary, Canadian Government Specifications Board, c/o Dept. of Defence Production, No. 4 Bldg., Ottawa 4, Canada.