

NOTICE

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AVIS

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SPECIFICATION FOR CLOTH, KNIT, JERSEY, 60/40 COTTON/NYLON

1.1 Scope

This specification covers the requirements for Cloth, Knit, Jersey, 60/40 Cotton/Nylon.

1.2 Classification

The fabric must be classified as: Cloth, Knit, Jersey, 60/40 Cotton/Nylon.

1.3 Applicable Documents

The following documents form part of this specification to the extent specified, and are supportive of this specification when referenced; all other document references are to be considered supplemental information only. In the event of a conflict between the documents referenced and the contents of this specification, then the contents of this specification must take precedence:

CAN/CGSB Standards (email: ncr.cgsb-ongc@pwgsc.gc.ca)

- CAN/CGSB-4.2-M Textile Test Methods

American Association of Textile Chemists and Colorists Standards (www.aatcc.org)

- AATCC Test Method 16 Colourfastness to Light
- AATCC Test Method 30 Antifungal Activity Assessment on Textile Material: Mildew and Rot Resistance of Textile Material

American Society for the Testing of Materials (www.astm.org)

- ASTM D 2594 Standard Test Method for Stretch Properties of Knitted Fabrics Having Low Power
- ASTM D 3886 Standard Test Method for Abrasion Resistance of Textile Fabrics (Inflated Diaphragm Apparatus)

FED Standards (Download Documents: <http://assist.daps.dla.mil/quicksearch/>)

- FED-STD-595C - Colors Used in Government Procurement

International Standards Organization (ISO) (www.iso.org)

- ISO 11092 Textiles - Physiological Effects - Measurement of Thermal and Water Vapour Resistance Under Steady-State Conditions (Sweating Guarded Hot-Plate Test)
- ISO 20743 Textiles - Determination of Antibacterial Activity of Textile Products

NFPA National Fire Protection Association (NFPA) (www.nfpa.org)

- NFPA 1975 Standard on Emergency Services Work Clothing Elements

1.4 Sealed Patterns

The following sealed pattern is available to the bidders to be used for the guidance of the manufacturer for finish only. Under no circumstances must a sealed pattern be mutilated or cut.

DSSPM 262-09: Cloth, Knit, Jersey, 60/40 cotton/nylon, 130 g/m², Colour Light Sand. For finish only.

1.5 Order of Precedence

In the event of any inconsistency in contract documents such as contract, specification and sealed patterns, the order of precedence must be contract, specification, and sealed pattern. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification must take precedence. For any inconsistency in technical details between languages, the language of the original document, which in this case is English, must take precedence. Nothing in this document supersedes applicable laws and regulations, unless a specific exemption has been obtained.

2.0 **REQUIREMENTS**

2.1 Fabric Structure

The fabric must be a 60% cotton/40% nylon intimate blend, knitted in jersey stitch. It must have no melt/no drip characteristics, be moisture wicking and have an anti-microbial finish. When tested in accordance with the applicable test methods, the finished fabric must comply with the requirements specified in Table 1.

2.2 Cotton

The cotton must be combed.

2.3 Nylon

The nylon must be first quality, high tenacity, semi-dull nylon 6,6 staple having a nominal cut length of 1-1/2 inches and a round cross section with a nominal denier of 1.6 to 1.8 and a melting point of 260 °C. No form of nylon waste must be used, such as undrawn fiber, mixtures of deniers, lusters or cross sections, and waste from any stage of fiber production: whether drawn, un-drawn, or mixed or garneted fiber.

2.4 Yarns

The yarns must be singles made from a blend of 40 ± 2 percent nylon and the remaining percentage cotton, based on the dry weight of the desized cloth when tested as specified in Table 1. The yarns must be drawn a minimum of three times and ring spun with a 3.9 twist multiplier.

2.5 Workmanship

The material covered by this specification must be free of imperfections or blemishes such as may adversely affect its appearance or serviceability. For inspection purposes, imperfections and blemishes are

considered defects when clearly visible at a normal inspection distance of approximately 1 m (3.3 ft) under good, preferably Northern Light, lighting conditions.

2.6 Colour

The fabric must be a non-florescent earth-tone colour. By definition, earth tone is considered a color scheme that draws from a color palette of browns, tans, grays, greens, oranges, whites and some reds. The colors in an earth tone scheme are muted and flat in an emulation of the natural colors found in soils, moss, trees and rocks. For the purpose of this specification, the earth tone color must be based on the predominantly brown, tan and gray color series (lusterless) within FED STD-595C, where those colors do not include any elements of orange, red and white.

2.7 Dyeing

Dyeing must be carried out using good commercial practices. Only reactive or vat dyes must be used for dyeing the cotton component. Sulphur dyes must not be used. Dyes, treatments, or finishes containing copper must not be used. Acid dyes must be used for the nylon component. Complete penetration of both component fibres is required. Colour must be uniform across both fibres such that colour speckling does not occur. The finished, dyed cloth must be free from dyeing defects such as shading, streaking, botching, barre, spots, frosting, etc. Hydrophobic softeners or lubricants must not be used.

2.8 Antifungal Assessment.

When tested in accordance with Table 1, there must be 100% surface inhibition and no growth free zone (i.e., 0 mm). These requirements are applicable to both testing as received and after 25 launderings.

2.9 Antimicrobial Properties

When treated in Canada, the products used to impart anti-microbial properties to the fabric must have a Pest Control Product Registration Number that has been issued by the Pest Management Regulatory Agency of Health Canada as an antimicrobial. When treated outside of Canada, the products used to impart anti-microbial properties to the fabric must be registered with the United States Environment Protection Act under the Federal Insecticide, Fungicide, and Rodenticide Act as an antimicrobial. The anti-microbial product must be acceptable for use on a textile substrate that will be in direct, prolonged contact with the skin.

Table 1: Requirements for Finished Fabric

Property	Test Method	Minimum Acceptable	Maximum Acceptable
Mass (g/m ²)	CAN/CGSB 4.2 Test Method 5.1	99	121
Fiber Content	CAN/CGSB 4.2 Test Method 14	58% cotton 38% nylon	62% cotton 42% nylon
Yarn Count (yarns per cm)		Wales = 12 Courses = 15	Wales = 16 Courses = 18
Air Permeability (cm ³ /cm ² /s)	CAN/CGSB 4.2 Test Method 36	110	
Abrasion Resistance (9 kPa)	ASTM D 3886	110,000 cycles	
Pilling	CAN/CGSB 4.2 Test Method 51.1	3-4	
Wicking after 5 washes (Note 1)	See Note 3	Wales & Courses: 15 cm in less than 16	

		minutes	
Dimensional Stability after 3 wash-dry cycles	CAN/CGSB 4.2 Test Method 58 III E Wash temperature of 60°C		Wales: ±3% Courses: ±3%
Colour Fastness to Laundering	CAN/CGSB 4.2 Test Method 19.1 Test No. 2		Change: GS 4 Staining: GS 4
Colour Fastness to Light	AATCC Test Method 16 (Option E)		GS 4 after 20 AATCC fading units
Colour Fastness to Perspiration	CAN/CGSB 4.2 Test Method 23		Change: GS 4-5 Staining: GS 4-5
Stretch Recovery	ASTM D 2594		4% growth, measured after 1 hour
Moisture Vapour Transmission Resistance (m ² Pa/W)	ISO 11092		4.0
Thermal Resistance (CLO)	ISO 11092		0.15
Thermal Shrinkage -thermal shrinkage	CAN/CGSB 4.2 Test Method 155.20 (Para 7.3.1)		5%
Thermal Shrinkage -heat resistance			No Melt No Drip, No Ignition
Thermal Stability	NFPA 1975 (Section 8.3)		No melt, no drip; no sticking to each other or glass, layers easy to separate
Antibacterial Assessment Initial	ISO 20743	99.9% Reduction	
Antibacterial Assessment After 25 Washes (Note 2)		90% Reduction	
Antifungal Assessment Initial	AATCC Test Method 30 (Test III)	100% surface inhibition and no growth free zone (0 mm)	
Antifungal Assessment After 25 Washes (Note 2)			

Notes:

1. Laundering conditions must be in accordance with CAN/CGSB-4.2 No.58 Test III E (Tumble dry with an exhaust temperature of <60°C).
2. The 12th, 24th, and 25th wash cycles must be blanks: no detergent, soap, etc. - water only, cycles as specified. The ballast must be washed by itself prior to the 12th and 24th wash cycles as a blank: no detergent, soap, etc. – water only.
3. Test Method for Vertical Wicking:
 - a) Conditioning - Condition the test specimens to textile standard atmosphere of 65 ± 2% R.H. and 20 ± 2°C in accordance with CAN/CGSB 4.2, Method 2, Conditioning Textile Materials for Testing;
 - b) Equipment. - The equipment required to carry out this test is:
 - a. Retort stand with clip;

- b. Distilled water;
- c. Multiple step stop watch;
- d. 250 ml beaker
- c) Preparation of Test Specimens - Three specimens, 15 cm long, must be marked with a graduated scale of 1 cm intervals using a felt pen with water-soluble ink for fabrics where the change of colour is negligible as the water is moving along the specimen or by lines of stitching using a contrasting thread on fabrics where there is a marked change in colour when the fabric is wet. The fabric must be tested in both the lengthwise and crosswise directions. The test should be run at in a conditioning room set at 65% humidity and 21°C;
- d) Method - A test specimen must be suspended vertically over a bath of distilled water that is at room temperature as per Figure 1. Timing must commence immediately upon the water reaching the first mark on the strip of fabric after the end of the specimen is suspended in the water;
- e) Record the results - Record the time it takes for the water to reach each marked interval using a multiple step stop watch. Each test must run for a maximum of 15 minutes; and
- f) Report - Report the distance the water travels as a function of the time for both the lengthwise and crosswise direction.

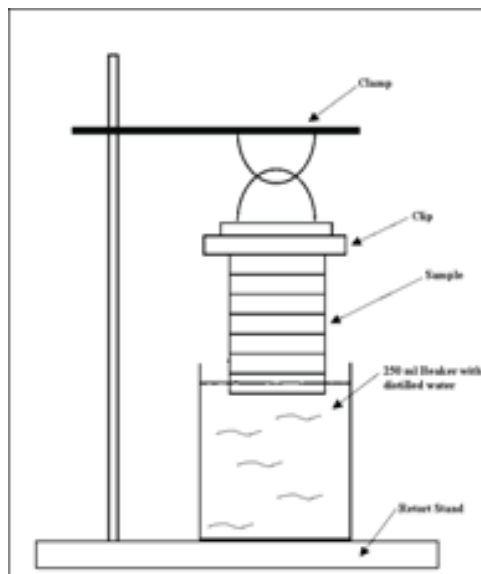


Figure 1: Vertical Wicking Fixture (not to scale)