

NOTICE



This documentation has been reviewed by the technical authority and does not contain controlled goods. Disclosure notices and handling instructions originally received with the document shall continue to apply.

AVIS

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**SPECIFICATION  
FOR  
CLOTH, NYLON COTTON, MULTICAM®, OIL AND WATER REPELLENT TREATED**

1.1 Scope

This specification covers the requirements for cloth, nylon cotton blend with the MULTICAM® camouflage pattern and a finishing treatment for oil and water repellency.

***Note: It is known that the NYCO 6.6 Oz Ripstop MULTICAM Quarpel (MIL-DTL-44436B, Class 10) material distributed by 1947 LLC (www.1947llc.com) fully meets the requirements within this specification.***

1.2 Classification

The fabric must be classified as: Cloth, Nylon Cotton, MULTICAM®, Oil and Water Repellent Treated.

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

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

- FED-STD-191A Federal Standard for Textile Test Methods

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

- AATCC Test Method 8 Colorfastness to Crocking: AATCC Crockmeter Method
- AATCC Test Method 118 Oil Repellency: Hydrocarbon Resistance Test

1.4 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.

## 1.0 REQUIREMENTS

### 1.1 Fabric

The weave must be a plain weave with reinforcement ribs in both the warp and filling directions forming a uniform pattern. The ribs must be formed by having every twenty-fourth warp end contain two ends weaving as one and every thirteenth filling contain two picks weaving as one. When tested in accordance with the specified test methods, the finished fabric must comply with the performance requirements of Table 1.

### 1.2 Workmanship

The material covered by the Specification must be free of imperfections or blemishes such as may adversely affect its appearance or serviceability. For inspection purposes, imperfections and blemishes will be considered defects when clearly visible at a normal inspection distance of approximately 1 meter (3.3 ft) under good, preferably North light, lighting conditions.

### 1.3 Yarns

The cotton must be carded and combed. The nylon must be first quality, high tenacity, semi-dull staple having a nominal cut length of 3.8 cm (1.5 in) and a round cross-section with a nominal denier of 1.6 to 1.8. 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. The warp yarn must be 2-ply and the filling yarn must be 2-ply or singles.

### 1.4 Fiber Content

When calculated on a moisture regain basis, fiber content must be specified as nylon 50% and cotton 50% with allowance of +/- 5%.

### 1.5 Dyeing and Printing

The cloth(s) must be dyed to a ground shade either matching or approximating Cream 524 and then overprinted with the MULTICAM® camouflage pattern by roller or screen printing in a manner that gives the required degree of colour fastness and a uniform, good penetration of colour in the fibres and fabric as follows:

- (a) When the ground shade is dyed to match Cream 524, the remaining colors are obtained by subsequent printing using six rollers or screens, as appropriate for the Tan 525, Pale Green 526, Olive 527, Dark Green 528, Brown 529 and Dark Brown 530 areas of the pattern;
- (b) When the ground shade is dyed to approximate Cream 524 all seven colors of the camouflage pattern are obtained by subsequent printing using seven rollers or screens to match all seven colors; and
- (c) Resin bonded pigments are not be used.

### 1.6 Finish

The fabric must be given a durable fluorocarbon, oil resistant and water repellent treatment that meets the requirements specified in Table 1.

### 1.5 Spectral Reflectance

Spectral reflectance data must be obtained from 600 to 860 nanometers (nm) at 20 nm intervals on a spectrophotometer relative to the barium sulfate standard, the preferred white standard. Other white reference materials may be used provided they are calibrated to absolute white, e.g. magnesium oxide or vitrolite tiles. The spectral band width must be less than 26 nm at 860 nm. Reflectance measurements

must be made by either the monochromatic or polychromatic mode of operation. When the polychromatic mode of operation is used, the spectrophotometer must operate with the specimen diffusely illuminated with the full emission of a continuous source that simulates either CIE Source A or CIE Source D65. Measurements must be taken on a minimum of two (2) different areas and the data averaged. The measured areas should be at least 15 cm (6 in) away from the selvage. The cloth must be measured as a single layer backed with four layers of the same shade. The specimen must be viewed at an angle no greater than 10 degrees from normal, with the specular component included. Specimens must be oriented in different directions during testing. When possible, the specimens tested must not contain the same warp or filling yarns when presented to the sample port. Photometric accuracy of the spectrophotometer must be within 1 percent and wavelength accuracy within 2 nanometers. The diameter for standard aperture size used in the color measurement device must be 9.4869 mm (0.3725 in) or larger. Any color having spectral reflectance values falling outside the limits at four or more of the wavelengths specified must be considered a test failure.

Wavelength, Nanometers (nm)	Cream 524 and Tan 525		Pale Green 526, Olive 527 and Brown 529		Dark Green 528 and Dark Brown 530	
	Min.	Max.	Min.	Max.	Min.	Max.
600	22	44	12	30	3	11
620	24	45	12	30	3	11
640	24	45	12	32	4	12
660	25	45	12	32	4	12
680	28	45	14	34	4	13
700	28	46	14	34	6	16
720	30	48	16	36	6	20
740	32	50	18	36	10	25
760	36	50	20	40	14	30
780	38	52	22	40	18	35
800	40	54	22	42	22	40
820	44	56	24	44	24	42
840	46	57	26	44	27	43
860	48	58	28	46	29	45

Table 1: Finished Cloth

Property	Test Method	Minimum Acceptable	Maximum Acceptable
Mass (g/m <sup>2</sup> )	CAN/CGSB-4.2 Test 5.1	200	237
Woven Count (yarn/cm)	CAN/CGSB-4.2 Test 6	Warp: 41 Weft: 20	
Breaking Strength (N)	CAN/CGSB-4.2 Test 9.1	Warp: 1900 Weft: 880	
Tearing Strength (N)	CAN/CGSB-4.2 Test 12.1	Warp: 40 Weft: 40	
Water Resistance	CAN/CGSB-4.2 Test 26.2	As received: 90	
Dimensional Stability in laundering (after 3 cycles)	CAN/CGSB-4.2 Test 24.2 or CAN/CGSB-4.2 Test 58 (III.E3)		Warp: 3.5% Weft: 3.5%
Air permeability (cm <sup>3</sup> /cm <sup>2</sup> /s)	CAN/CGSB-4.2 Test 36		5
Colourfastness to Light (after 40 AATCC Fading Units)	AATCC Test Method 16 Option 1 or 3		Dk. Green 528: 3-4 Brown 529: 3-4 Dark Brown 530: 3-4 Cream 524: 3 Tan 525: 3 Pale Green 526: 3 Olive 527: 3
Colourfastness to Crocking (all colours)	AATCC 46 8		Colour Change (Dry): 3.5 Colour Change (Wet): 3.5
Colourfastness to Laundering - 5 Cycles (each colour)	CAN/CGSB-4.2 Test 19.1		Colour Change: 3-4 Staining: 3-4
pH	FED-STD-191A Method 2811	5	8.5
Oil Repellency - As received AND - After 15 launderings	AATCC 118  Laundering: CAN/CGSB-4.2 Test 24.2 or CAN/CGSB-4.2 Test 58 (III.E3)	5	
Water Resistance (Absorption) - As received AND - After 15 launderings	FED-STD-191A Method 5500.1  Laundering: CAN/CGSB-4.2 Test 24.2 or CAN/CGSB-4.2 Test 58 (III.E3)		Max average 25%  Max for any single determination 30%