

**UK/SC/5094 Issue 5**

Specification for  
**CLOTH, COATED  
ACRYLIC ON NYLON  
BROWN PRINT ON GREEN**



**OPERATIONAL INFRASTRUCTURE  
PROGRAMME**

Property of:  
OIP  
DE&S  
MOD Abbey Wood

**NN/SCD/P1628/3/1**  
**NV/354/05**

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**SPECIFICATION UK/SC/5094 – ISSUE TABLE**

<b>Issue Number</b>	<b>Comments</b>	<b>Date Published</b>
1	Initial issue	17 April 1990
2	Specification reformatted. Standards updated.	28 January 2004
3	Specification reformatted.	29 July 2010
4	Reformatted. References to QAA changed to Authority. Standard Patterns are no longer available, Para amended.	22 June 2011
5	Reformatted.	24 Sept 2013

## 1 **SCOPE**

- 1.1 This specification describes the requirements of a printed coated fabric to be used in the manufacture of garnishing material for the MK 7 Woodland camouflage net.

## 2 **RELATED SPECIFICATIONS AND DOCUMENTS**

Reference is made in this specification to:

BS EN ISO 105-B02	Textiles - Tests for colour fastness to artificial light: xenon arc fading lamp test
BS EN 1421	Determination of tensile strength and elongation at break
BS EN ISO 2286	Rubber – or plastic – coated fabrics. Determination of roll characteristics
BS 3424	Methods of test for coated fabrics
BS 3900	Methods of test for paints
BS 7070	Specification for unleaded petrol (gasoline) for motor vehicles
UK/SC/4830	Measurement of colour, calculation of colour difference and numerical tolerances for certain MoD cloths

- 2.1 Reference in this specification to a British Standard or any other specification or document means, unless otherwise stated, the edition current at the date of such tender or contract.

## 3 **SAMPLE**

- 3.1 If requested by the Contractor a reference sample will be provided by the Authority. It is to provide the criteria for any particulars or properties not fully defined in this specification.

## 4 **MATERIALS AND MANUFACTURE**

- 4.1 The base cloth shall be plain woven from continuous filament semi-matt nylon 6.6 yarns of 110 decitex with 27 ends per cm and 27 picks per cm minimum and of mass 61 g per square metre.
- 4.2 Alternative base cloths may be considered by the Authority named in the contract prior to the start of the contract.
- 4.3 The fabric shall be dyed green to match the reference sample.
- 4.4 A heat setting treatment shall be applied to the base fabric to enable the cloth to withstand the subsequent processing.
- 4.5 The fabric shall be uniformly coated on each face with a cross-linked acrylic polymer incorporating a suitable matting agent.
- 4.6 The colour of the coating shall be green to match the sample. The optical properties of the coating shall comply with the requirements of Table 1 and Annex D of this specification.

4.7 The print on one of the coated sides shall be brown to match the colour and design of the sample. Previous samples were rotary screen printed using a pigmented, matt printing paste that contained titanium dioxide and mica with a heat cured acrylic binder.

4.8 Width

4.8.1 Unless otherwise agreed between Authority and the Contractor, the minimum width of the cloth shall be as specified in Table 1, the measurement being carried out by Method 1 of BS 3424. The minimum width specified or agreed refers to the usable width. Unless otherwise stated in the tender or contract, this shall be the width of the cloth that meets all the requirements of the finished cloth and specification and excludes all selvedge material, marks, pinholes and coating tail offs.

4.9 Finishing

4.9.1 The shade and finish shall match the reference sample supplied and shall be uniform throughout.

4.9.2 The cloth shall conform to the finishing requirements in Table 1 below.

## 5 **PHYSICAL REQUIREMENTS**

- 5.1 The physical requirements of the finished cloth shall comply with the values specified in the following Table.

**TABLE 1 - Physical Requirements**

PROPERTY	REQUIREMENT		METHOD OF TEST
Mass/Unit area (g/m <sup>2</sup> )	Max 110		BS EN ISO 22286
Width cm	Min 137		As stated in Para 4.8
Breaking strength N			
Warp	Min 630		BS EN 1421
Weft	Min 550		
Tear strength N	Mean of maxima not less than a minimum of		BS 3424 Method 7B
across warp	35		
across weft	35		
Cold crack °C	Not higher than -40		BS 3424 Method 10A
Colour fastness to light	Not lower than 6		BS EN 105-B02
Resistance to petrol	See Annex C		ANNEX C
Infra-red reflectance (per cent)	Green	Brown	BS 3424 Method A5 ANNEX A ANNEX B
As received	Not greater than 65 and not less than 50		
After ageing		less than 17	
After exposure to light			
Gloss (per cent) 45°	Green and Brown each Not greater than 14		BS 3424 Method A3  BS 3900: Part D5
60° To the normal	Green and Brown each Not greater than 0.5		
Infrared: red ratio	Green only, not less than 5.0		ANNEX D
Spectral Reflectance	See Annex D		ANNEX D
Colour difference E	Green Not greater than 2.0	Brown Not greater than 3.5	UK/SC/4830

## **ANNEX A**

### **DETERMINATION OF INFRA-RED REFLECTANCE AFTER AGEING**

- A1 Fabric of suitable dimensions shall be aged for 24 hours at  $70 \pm 1^\circ\text{C}$  and over 95% RH.
- A2 The infrared reflectance of the aged sample shall be determined by the method specified in BS 3424 Method A5, in a suitably sealed oven of internal volume about 150 litres.
- A3 The oven shall be pre-heated to the operating conditions of  $70^\circ\text{C}$  and 95% RH prior to introducing the samples in such a manner that they are free from strain, freely exposed on all sides and not exposed to light. Any direct heat radiation onto the test samples shall be avoided. Suitable instruments for monitoring the temperatures and humidity inside the sample space of the oven must be provided. The pressure inside the oven shall not exceed atmospheric pressure.

## **ANNEX B**

### **DETERMINATION OF INFRA-RED REFLECTANCE AFTER EXPOSURE TO LIGHT**

- B1 Upon completion of the colour fastness to light determination the infrared reflectance of the exposed sample shall be determined by the method specified in BS 3424 Method A5, except that only one reading is to be made.

## **ANNEX C**

### **RESISTANCE TO PETROL**

- C1 Fabric of suitable dimensions shall be immersed in petrol, (BS 4040, 4 star) at room temperature, for one minute. The fabric shall then be folded so that the coated fabric is in contact with itself and placed under a load of  $5\text{g/cm}^2$  for 5 minutes. After removal of the load, there shall be no adhesion of one coated face to the other.

## **ANNEX D**

### **DETERMINATION OF SPECTRAL REFLECTANCE AND INFRA-RED RED RATIO**

- D1 The spectral reflectance of a single thickness of the green fabric shall be measured on the printed side of the material over the wavelength region 400-1200nm using a spectrophotometer fitted with an integrating sphere employing  $0^\circ$ /diffuse geometry and using a matt black backing of low infrared reflectance behind the fabric sample.
- D2 The optical standard shall be Barium Sulphate.
- D3 A suitable instrument is the Perkin-Elmer Lambda 9 or equivalent. The spectral reflectance curve is to fall within the envelope in FIG.1 of this Annex.
- D4 The near infra-red: photographic red reflectance ratio of the green fabric shall be calculated using the formulae:

$$\text{IR:Red Ratio} = \text{Effective near IR Reflectance/Effective Photographic Red Reflectance}$$

where the Effective near IR Reflectance =  $(\sum (R \times W))/S_{IR}$   
 and the Effective Photographic Red Reflectance =  $(\sum (R \times W))/S_R$   
 $\sum$  denotes summation over specified wavelengths.  
 $R$  denotes the diffuse reflectance at a particular wavelength.  
 $W$  denotes the weighting factor at the same wavelength.  
 $S_{IR}$  denotes the scaling factor for the infra-red region.  
 $S_R$  denotes the scaling factor for the red region

- D5 The values of R shall be determined using the methodology described above for determination of spectral reflectance. The required wavelengths together with the appropriate weighting factors and scaling factors are given in Table 2 below.

**TABLE 2**  
**CALCULATION OF EFFECTIVE REFLECTANCE**  
**(SEE ANNEX D)**

Photographic Red		Near Infrared	
Wavelength (nm)	Weighting Factor W	Wavelength (nm)	Weighting Factor W
570	13		
580	17	730	4.9
590	22	740	22.6
600	27	750	42.4
610	38	800	78.8
620	57	850	100
630	81	900	88
640	96	950	74
650	100		
660	92	1000	47.3
670	53	1050	28.5
680	16	1100	16.0
		1130	7.1
		1150	1.8
		1170	0.6
Scaling Factor $S_R$ 612		Scaling Factor $S_{IR}$ 512	

**FIG 1 SPECTRAL REFLECTANCE CHARACTERISTICS**

THE SPECTRAL REFLECTANCE CURVE IS TO FALL WITHIN THE ENVELOPE SHOWN

A TYPICAL CURVE IS GIVEN AS AN ILLUSTRATION

