



**HIGH
PERFORMANCE
MATERIALS**

Confidential Report

Our Ref: 11/19077/B1

Notified Body
for PPE Directive,
Construction Products
Regulation & Marine Equipment
Directive
I.D. No. 0338 & 0339

**BTTG High Performance Materials
Unit 14, Wheel Forge Way,
Trafford Park, Manchester, M17 1EH**

Tel: +44 (0)161 873 6543 Fax: +44 (0)161 848 7378



1066



**HIGH
PERFORMANCE
MATERIALS**

**Unit 14, Wheel Forge Way
Trafford Park
Manchester, M17 1EH
England**

Tel: +44 (0)161 873 6543
Fax: +44 (0)161 848 7378
Web: <http://www.bttg.co.uk>
Email: info@bttg.co.uk

Date: 18 February 2014
Our Ref : 11/19077/B1/PJH
Your Ref :

Page 1 of 6

Client: Wujiang Sunfeng Textile Co. Ltd.
Shunli Textile Industrial Park
88 West Second Ring Road
Shengze, Wujiang
Suzhou, Jiangsu
China

Original testing: Wujiang Sanlian Printing & Dyeing Co. Ltd.

Job Title: Tests on woven material

Client's Order No: -

Date of Receipt: 7th January 2014
Date of Test Start: 8th January 2014

Description of Sample(s): One high-visibility orange coloured, woven fabric, identified as follows, was received for testing:

Product Name: Fluorescent Orange
Model Code: SO001
Product Description: Oxford Fabric
Material: 100% Polyester

Work Requested: We were asked to make the following tests as specified in ISO 20471: 2013, "High-visibility clothing. Test methods and requirements":

Chromaticity and luminance on new background material
Chromaticity and luminance after xenon test
Chromaticity and luminance after max number of wash cycles (5)
Colour fastness to rubbing[#]
Colour fastness to perspiration[#]
Colour fastness to laundering[#] (domestic 40°C)
Dimensional change to washing (4N/F (cool))
Tensile strength
Water vapour resistance

[#] subcontracted test



Date: 18 February 2014
Our Ref : 11/19077/B1/PJH
Your Ref :

Page 2 of 6

Wujiang Sunfeng Textile Co. Ltd.

Sample was identified as follows:

Product Name: Fluorescent Orange
Model Code: SO001
Product Description: Oxford Fabric
Material: 100% Polyester

Laboratory Work

Where appropriate, the tests were made in Standard Atmosphere ($65 \pm 4\%$ relative humidity at $20 \pm 2^\circ\text{C}$) the sample having been freely and continuously exposed to that atmosphere for at least 24 hours prior to testing. Specimens have been taken from the sample as described in the specified standards.

Note – All colour tests were performed on this sample, all physical tests for an identical quality, colour-way yellow, can be found on report reference 11/19077/A1, dated 18th February 2014.

Colour performance requirements of new materials

Chromaticity and luminance of new material

Chromaticity and luminance after xenon

Chromaticity and luminance after maximum number of wash cycles (5)

Xenon fading was carried out according to ISO 105 - B02: 1994 Method 3. For red and orange – red materials, exposure was continued until the blue scale control standard number 5 changed to step 3 of the grey scale.

The colour measurements obtained according to 7.2, (as new, after exposure) and also 7.5.1 of ISO 20471: 2013 (after max number of wash cycles), were plotted according to the co-ordinates specified in ISO 20471 Table 2.

Colour fastness of background material and all non-fluorescent material layers after test exposure

Colour fastness to rubbing

The colour fastness to dry rubbing of the sample was tested in accordance with ISO 105 - X12.

The staining of the sample was assessed in accordance with ISO 105 – A03, using grey scales: 5 represents no change of colour or staining and 1 represents severe change of colour or staining.

Colour fastness to perspiration

The sample was tested in accordance with ISO 105 - E04.

The change in colour of the specimen and the staining of the adjacent fabric, Multifibre DW, were assessed in accordance with ISO 105 – A02 and ISO 105 – A03, using grey scales: 5 represents no change of colour or staining and 1 represents severe change of colour or staining.

Date: 18 February 2014
Our Ref : 11/19077/B1/PJH
Your Ref :

Page 3 of 6

Wujiang Sunfeng Textile Co. Ltd.

Colour fastness to laundering

The sample was tested in accordance with ISO 105 – C06 (Test A2S at 40°C) with additional steel balls.

A souring treatment was not conducted. The ECE Phosphate Reference Detergent was used. The change in colour of the specimens and the staining of the adjacent fabric, Multifibre DW, were assessed in accordance with ISO 105 – A02 and ISO 105 – A03, using grey scales; 5 represents no change of colour or staining and 1 represents severe change of colour or staining.

The results for all tests are given in the tables on the following pages.

Date: 18 February 2014
Our Ref : 11/19077/B1/PJH
Your Ref :

Page 4 of 6

Wujiang Sunfeng Textile Co. Ltd.

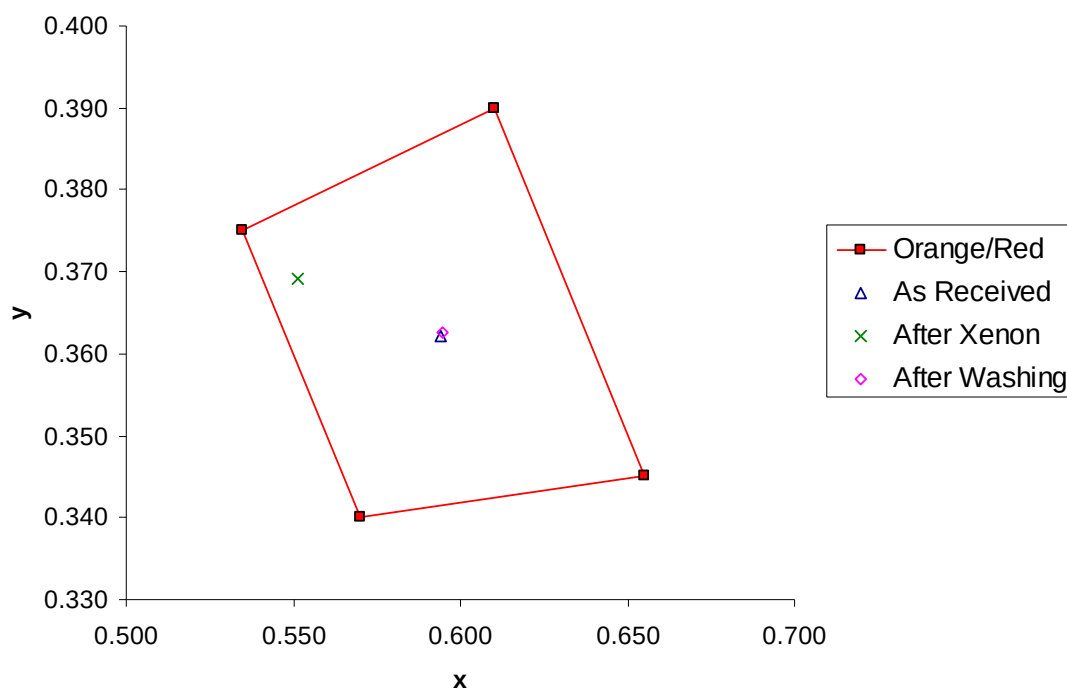
RESULTS

Chromaticity and Luminance Factor

Specification	Minimum Luminance Factor $\beta_{\min}$	Within coordinates	
		x	y
Fluorescent orange-red	0.40	0.610	0.390
		0.535	0.375
		0.570	0.340
		0.655	0.345

Ref:	Result			Pass/Fail	
Product Name: Fluorescent Orange Model Code: SO001	Luminance Factor β	Chromaticity coordinates		Luminance	Coordinates
		x	y		
As received	0.46	0.594	0.362	Pass	Pass
After fading	0.47	0.551	0.369	Pass	Pass
After (5) wash cycles	0.46	0.594	0.363	Pass	Pass

Chromaticity - ISO 20471:2013



Date: 18 February 2014
Our Ref : 11/19077/B1/PJH
Your Ref :

Page 5 of 6

Wujiang Sunfeng Textile Co. Ltd.

RESULTS

Sample Ref. Product Name: Fluorescent Orange
Model Code: SO001
Product Description: Oxford Fabric
Material: 100% Polyester

Colour Fastness to Rubbing

	Specification Staining	Result		Pass/Fail
		Length	Width	
Grade for dry rub	at least 4	4-5	4-5	Pass

Colour Fastness to Perspiration

S.D.C MULTIFIBRE TEST FABRIC (DW)

DW	DIACETATE	BLEACHED COTTON	NYLON 6.6	POLYESTER	ACRYLIC	WOOL	COLOUR CHANGE
pH 5.5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
pH 8.0	4-5	4-5	4-5	4-5	4-5	4-5	4-5

	Specification	Result	Pass/Fail
Colour Change	at least 4	4-5	Pass
Staining	at least 4	4-5	Pass

Background Material

Colour Fastness to Laundering at 40°C

S.D.C MULTIFIBRE TEST FABRIC (DW)

DIACETATE	BLEACHED COTTON	NYLON 6.6	POLYESTER	ACRYLIC	WOOL	COLOUR CHANGE
4-5	4-5	4-5	4-5	4-5	4-5	4-5

	Specification	Result	Pass/Fail
Colour Change	at least 4 to 5	4-5	Pass
Staining	at least 4	4-5	Pass

Date: 18 February 2014
Our Ref : 11/19077/B1/PJH
Your Ref :

Page 6 of 6

Wujiang Sunfeng Textile Co. Ltd.

CONCLUSIONS

The sample submitted for testing, identified as "Product Name: Fluorescent Orange, Model Code: SO001, Product Description: Oxford Fabric, Material: 100% Polyester" meets the requirements of ISO 20471: 2013 for a background material made of an orange woven fabric, when tested as specified in this report.

Note – All colour tests were performed on this sample, all physical tests for an identical quality, colour-way yellow, can be found on report reference 11/19077/A1, dated 18th February 2014.

An estimation of uncertainty of measurement has not been taken into account when making a judgement to any pass/fail criteria.

Reported by:

Mr P Hutchings
Operational Head

Countersigned by:

Mr C Butcher
Certification Manager

Enquiries concerning this report should be addressed to Customer Services.