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FIRE TECHNOLOGY SERVICES

EC TYPE-EXAMINATION CERTIFICATE

NOTIFIED BODY IDENTIFICATION NO. 0339

Certificate Number: 52008/1 Date of Issue: 30 April 2004

Technical File Reference: XFR

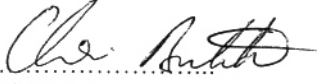
This is to certify that in the opinion of BTTG Fire Technology Services, the Personal Protective Equipment referred to on this certificate satisfies the relevant provisions of EC Directive 89/686/EEC when assessed against EN 531:1995 (Code Letters A, B1, C1) subject to any comments set out in the accompanying report.

Manufacturer: Praybourne Ltd
Alliance House
Fishing Line Road
Enfield
Redditch
WORCS B97 6EE

<u>Flame Retardant Underwear:</u>	<u>Available in the following fabric(s):</u>
XFRC01 Mens L/S Top XFRC03 Mens Long Pants XFRC50 Womens L/S Top XFRC52 Womens Long Pants	T301; 56% Protex / 38% Cotton / 6% Elastane (195 g.m ²)
XFRT01 Mens L/S Top XFRT03 Mens Long Pants XFRT50 Womens L/S Top XFRT52 Womens Long Pants	T361; 58% Protex / 38% Viloft / 4% Elastane (225 g.m ²)

<u>Flame Retardant Outerwear:</u>	<u>Available in the following fabric(s):</u>
XFRC22 Mens L/S Rollneck XFRC23 Mens S/S, L/S T-shirt	T304; 60% Protex / 40% Cotton (210 g.m ²)
XFRC21 Mens S/S, L/S Polo Shirt	T338; 60% Protex / 40% Cotton; Cross-tuck (210 g.m ²)
XFRC20 Mens Sweatshirt	T343; 60% Protex / 40% Cotton; Brushed (245 g.m ²)
XFRC14 Balaclava XFRC15 Neck Tube	T304; 60% Protex / 40% Cotton (210 g.m ²)

This certificate forms part of, and must be read in conjunction with, BTTG Fire Technology Services Confidential Test Report No. 52008/1 dated 30 April 2004. This certificate and the accompanying report relate specifically to the garments described and depicted in the manufacturers Technical File, copies of which are held by the manufacturer and BTTG, and not to any other garments.


C A Butcher
Certification Officer
Fire Technology Services


N I Sorensen
Manager, Certification
Fire Technology Services

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Praybourne Ltd

EC TYPE-EXAMINATION OF FLAME RETARDANT CLOTHING

1. Samples submitted

A range of clothing, representative of the range of Flame Retardant Underwear and Outerwear listed below, was submitted for examination. The harmonised European standard which had been taken into account in the design of the garments was EN 531:1995 (Code Letters A, B1, C1). The garments were stated to be available in the following fabrics:

Flame Retardant Underwear:

Body fabric stated to be:

XFRC01	Mens L/S Top	T301; 56% Protex / 38% Cotton / 6% Elastane (195 g.m ²)
XFRC03	Mens Long Pants	
XFRC50	Womens L/S Top	
XFRC52	Womens Long Pants	

XFRT01	Mens L/S Top	T361; 58% Protex / 38% Viloft / 4% Elastane (225 g.m ²)
XFRT03	Mens Long Pants	
XFRT50	Womens L/S Top	
XFRT52	Womens Long Pants	

Flame Retardant Outerwear:

XFRC22	Mens L/S Rollneck	T304; 60% Protex / 40% Cotton (210 g.m ²)
XFRC23	Mens S/S, L/S T-shirt	
XFRC21	Mens S/S, L/S Polo Shirt	T338; 60% Protex / 40% Cotton; Cross-tuck (210 g.m ²)
XFRC20	Mens Sweatshirt	T343; 60% Protex / 40% Cotton; Brushed (245 g.m ²)
XFRC14	Balaclava	T304; 60% Protex / 40% Cotton (210 g.m ²)
XFRC15	Neck Tube	

2. Type-Examination Procedure

As required by Article 10(4) of EC Directive 89/686/EEC the garments submitted and the manufacturer's technical file were examined in accordance with the specified procedures against the harmonised European standard EN 531:1995.

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2.1 Examination of Technical File

The technical file submitted contained the following information:-

- (a) Garment specifications including line drawings (Appendix 1)
- (b) Fabric descriptions and test reports
- (c) Size ranges
- (d) Examples of User Information
- (e) Examples of labelling
- (f) Statement of End Use
- (g) Details of manufacturer's Quality Control system

2.2 Examination of garments

In the opinion of BTTG Fire Technology Services the garments submitted had been manufactured in accordance with the information given in the technical file. The garments were not sized according to the requirements of EN 531:1995 which refers to EN 340, which in turn refers to EN 13402, but to the manufacturer's size range.

The Balaclava, being constructed of knitted, stretchable fabric which would conform to the wearer's head, and the Neck Tube which was a loose fitting item, were available in one size only.

The garment descriptions were as follows:

Flame Retardant Underwear:

XFRC01, XFRT01	Mens L/S Top	Long sleeve top, ribbed collar, ribbed cuffs
XFRC03, XFRT03	Mens Long Pants	Long johns with fly, elasticated waist, ribbed ankles
XFRC50, XFRT50	Womens L/S Top	Long sleeve top, ribbed collar, plain sleeves
XFRC52, XFRT52	Womens Long Pants	Long johns with elasticated waist, ribbed ankles

Flame Retardant Outerwear:

XFRC22	Mens L/S Rollneck	Long sleeve top, roll neck collar, ribbed cuffs
XFRC23	Mens S/S, L/S T-shirt	Long sleeve and short sleeve top, ribbed collar, ribbed cuffs on L/S
XFRC21	Mens S/S, L/S Polo Shirt	Long sleeve and short sleeve top, three button placket, ribbed shirt collar, ribbed cuffs on L/S
XFRC20	Mens Sweatshirt	Long sleeve sweatshirt, ribbed cuffs, ribbed hem, ribbed collar
XFRC14	Balaclava	Straight balaclava with eye slit
XFRC15	Neck Tube	Straight tube

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2.3 Test Programme

The fabrics used in the manufacture of the garments had previously been evaluated against the appropriate requirements specified in EN 531:1995 at BTTG Fire Technology Services under the following Report Nos.:

<u>Fabric</u>	<u>Report No.</u>
T301; 56% Protex / 38% Cotton / 6% Elastane (195 g.m ⁻²)	004/1027/7
T361; 58% Protex / 38% Viloft / 4% Elastane (225 g.m ⁻²)	004/1340
T304; 60% Protex / 40% Cotton (210 g.m ⁻²)	12513/1/STC004
T338; 60% Protex / 40% Cotton; Cross-tuck (210 g.m ⁻²)	14526/FTS
T343; 60% Protex / 40% Cotton; Brushed (245 g.m ⁻²)	004/1247/1

The pretreatment of the fabrics for tests 5.2 and 6.2 was carried out according to ISO 6330:1984 and consisted of five cycles of washing according to Procedure 5A (40°C) followed by line drying according to Procedure A. All other tests were carried out on the fabrics in their "as received" condition.

The results obtained are summarised in Table 1.

In addition the flammability performance of certain additional features of the submitted garments, representative of the range of garments, was examined using test methods based on EN 532:1994 at BTTG Fire Technology Services. The flammability of the ribbed fabric used as trim (hems, cuffing and collars) had previously been evaluated according to EN 532:1994 at BTTG Fire Technology Services, following the same pretreatment as the main fabrics.

The results obtained are summarised in Table 2.

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TABLE 1

EN 531:1995 Test Results for main fabrics

T301: Report No. 004/1027/7
 T361: Report No. 004/1340
 T304: Report No. 12513/1/STC004
 T338: Report No. 14526/FTS
 T343: Report No. 004/1247/1

Property	Test Method	Performance Required	Performance Attained	Performance Level																														
5.2 Dimensional Change	ISO 5077:1984	Not to exceed $\pm 3\%$ (- = shrinkage)	<table border="1"> <thead> <tr> <th>Fabric</th> <th>Length</th> <th>Width</th> </tr> </thead> <tbody> <tr> <td>T301</td> <td>-3.0%</td> <td>-2.4%</td> </tr> <tr> <td>T361</td> <td>-7.7%</td> <td>-2.5%</td> </tr> <tr> <td>T304</td> <td>-2.1%</td> <td>-1.5%</td> </tr> <tr> <td>T338</td> <td>-2.8%</td> <td>-2.4%</td> </tr> <tr> <td>T343</td> <td>-2.8%</td> <td>-2.9%</td> </tr> </tbody> </table>	Fabric	Length	Width	T301	-3.0%	-2.4%	T361	-7.7%	-2.5%	T304	-2.1%	-1.5%	T338	-2.8%	-2.4%	T343	-2.8%	-2.9%	PASS FAIL* PASS PASS PASS												
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6.2 Flame Spread	EN 532:1994	No flaming to edge No holing No flaming debris Afterflame $\leq 2s$ Afterglow $\leq 2s$	No flaming to edge No hole formation No flaming debris No afterflame T301 – no afterglow T361 – mean afterglow = 0.8s T304 – mean afterglow = 1.2s T338 – mean afterglow = 1.8s T343 – no afterglow	PASS A (all fabrics)																														
6.3 Convective Heat	EN 367:1992	<table border="1"> <thead> <tr> <th>Level</th> <th>HTI</th> </tr> </thead> <tbody> <tr> <td>B1</td> <td>3-6</td> </tr> <tr> <td>B2</td> <td>7-12</td> </tr> <tr> <td>B3</td> <td>13-20</td> </tr> <tr> <td>B4</td> <td>21-30</td> </tr> <tr> <td>B5</td> <td>31→</td> </tr> </tbody> </table>	Level	HTI	B1	3-6	B2	7-12	B3	13-20	B4	21-30	B5	31→	<table border="1"> <thead> <tr> <th>Fabric</th> <th>HTI results</th> <th>mean HTI</th> </tr> </thead> <tbody> <tr> <td>T301</td> <td>5.2, 5.1, 5.1</td> <td>5</td> </tr> <tr> <td>T361</td> <td>6.5, 6.4, 6.5</td> <td>6</td> </tr> <tr> <td>T304</td> <td>5.2, 5.3, 5.4</td> <td>5</td> </tr> <tr> <td>T338</td> <td>4.8, 4.7, 4.8</td> <td>5</td> </tr> <tr> <td>T343</td> <td>6.1, 6.1, 6.1</td> <td>6</td> </tr> </tbody> </table>	Fabric	HTI results	mean HTI	T301	5.2, 5.1, 5.1	5	T361	6.5, 6.4, 6.5	6	T304	5.2, 5.3, 5.4	5	T338	4.8, 4.7, 4.8	5	T343	6.1, 6.1, 6.1	6	PASS LEVEL B1 (all fabrics)
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6.4 Radiant Heat	EN 366:1993 Method B at 20kW/m ²	<table border="1"> <thead> <tr> <th>Level</th> <th>t₂, s</th> </tr> </thead> <tbody> <tr> <td>C1</td> <td>8-30</td> </tr> <tr> <td>C2</td> <td>31-90</td> </tr> <tr> <td>C3</td> <td>91-50</td> </tr> <tr> <td>C4</td> <td>151→</td> </tr> </tbody> </table>	Level	t ₂ , s	C1	8-30	C2	31-90	C3	91-50	C4	151→	<table border="1"> <thead> <tr> <th>Fabric</th> <th>t₂ results, s</th> <th>mean t₂</th> </tr> </thead> <tbody> <tr> <td>T301</td> <td>12, 12, 12</td> <td>12s</td> </tr> <tr> <td>T361</td> <td>14, 14, 14</td> <td>14s</td> </tr> <tr> <td>T304</td> <td>14, 14, 13</td> <td>14s</td> </tr> <tr> <td>T338</td> <td>12, 12, 11</td> <td>12s</td> </tr> <tr> <td>T343</td> <td>18, 18, 19</td> <td>18s</td> </tr> </tbody> </table>	Fabric	t ₂ results, s	mean t ₂	T301	12, 12, 12	12s	T361	14, 14, 14	14s	T304	14, 14, 13	14s	T338	12, 12, 11	12s	T343	18, 18, 19	18s	PASS LEVEL C1 (all fabrics)		
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* See Assessment (3) below.

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TABLE 2

Flammability Testing of Additional Features of Garments

Item	Afterflame	Afterglow	Holing?	Flaming or molten debris?
<u>Report No. 52008/2/FTS</u>				
Seams (visible stitching)	0s	0s	No	No
Seams (concealed stitching)	0s	0s	No	No
Visible stitching at waistband / hem	0s	0s	No	No
Plastic button (polo shirt)	93s ¹	0s	—	No
<u>Report No. 004/1027/8</u>				
Ribbing for XFRC garments (T299)	0s	0s	No	No
<u>Report No. 004/1247/4</u>				
Ribbing for XFRT garments (T362)	0s	0s	No	No

Key
¹ Item totally consumed

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3. Assessment

Having assessed the garments against the relevant harmonised European standard, namely EN 531:1995 (Code Letters A, B1, C1) and having taken into account the content of the technical file submitted, it is the opinion of BTTG Fire Technology Services (Notified Body Identification No. 0339) that the Flame Retardant Underwear:

XFRC01	Mens L/S Top
XFRC03	Mens Long Pants
XFRC50	Womens L/S Top
XFRC52	Womens Long Pants
XFRT01	Mens L/S Top
XFRT03	Mens Long Pants
XFRT50	Womens L/S Top
XFRT52	Womens Long Pants

and the Flame Retardant Outerwear:

XFRC22	Mens L/S Rollneck
XFRC23	Mens S/S, L/S T-shirt
XFRC21	Mens S/S, L/S Polo Shirt
XFRC20	Mens Sweatshirt
XFRC14	Balaciava
XFRC15	Neck Tube

satisfy the relevant provisions of EC Directive 89/686/EEC subject to the following comments:

- i. The fabrics used in the construction of these garments fully comply with the flammability requirements of EN 531:1995. However the button on the XFRC21 Polo Shirts ignited (i.e. give an afterflame > 2 s) and was completely consumed when a test flame was applied directly to it. The end user must decide on the basis of a risk assessment whether the use of this non flame retardant item is acceptable.
- ii. The T361 fabric used in the construction of the XFRT garments failed to meet the requirements of EN 531:1995 for dimensional stability. However this is a stretchable knitted fabric which can easily be reshaped. The end user must decide on the basis of a risk assessment whether the stability to washing of these garments is acceptable

Reported by: *C A Butcher*

C A Butcher
Certification Officer

Manager, Certification..... *N I Sorenson*

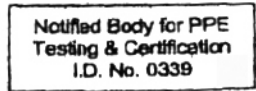
N I Sorenson
Fire Technology Services

Any opinion, interpretation or comments expressed in this report are outside the scope of UKAS accreditation.

Enquiries concerning the technical content of this report should be addressed to the Certification Officer named above.

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APPENDIX 1.

XFRC01, XFRT01 Mens L/S Top



XFRC03, XFRT03 Mens Long Pants



XFRC50, XFRT50 Womens L/S Top



XFRC52, XFRT52 Womens Long Pants



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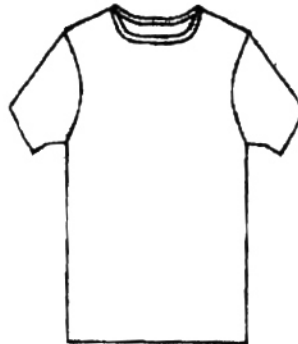
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APPENDIX 1. (cont'd)

XFRC22 Mens L/S Rollneck



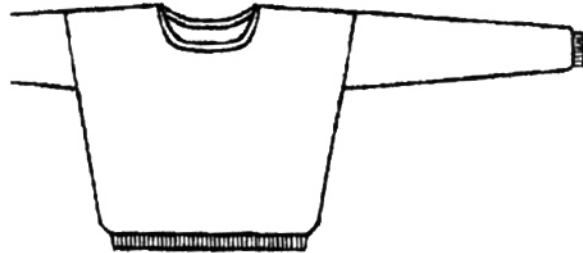
XFRC23 Mens S/S, L/S T-shirt



XFRC21 Mens S/S, L/S Polo Shirt



XFRC20 Mens Sweatshirt



XFRC14 Balaclava



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