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SHIRLEY TESTING SERVICES

EC TYPE-EXAMINATION CERTIFICATE

NOTIFIED BODY IDENTIFICATION NO. 0338

Certificate Number: **52005/1** **Date of Issue:** **03/06/2004**

Technical File Reference: **XMT, XUT**

This is to certify that in the opinion of BTTG Shirley Testing Services, the Personal Protective Equipment referred to on this certificate satisfies EC Directive 89/686/EEC with respect to EC Type-Examination according to Article 10 and has been manufactured in accordance with the Basic Health and Safety Requirements subject to any comments set out in the accompanying report.

Manufacturer:

PRAYBOURNE LTD
ALLIANCE HOUSE
FISHING LINE ROAD
ENFIELD
REDDITCH
WORCS B97 6EE

Item(s) of PPE:		Fabric:
Megatherm Men's Long Sleeve Thermal Top	**Style: XMT01** }	
Megatherm Men's Thermal Longjohn	**Style: XMT03** }	**T352; 62% Polyester / 38% Viloft (330 g.m^{-2})**
Megatherm Ladies' Long Sleeve Thermal Top	**Style: XMT50** }	
Megatherm Ladies' Thermal Longjohn	**Style: XMT52** }	
Ultratherm Men's Long Sleeve Thermal Top	**Style: XUT01** }	
Ultratherm Men's Thermal Longjohn	**Style: XUT03** }	**T351; 50% Polyester / 50% Viloft (220 g.m^{-2})**
Ultratherm Ladies' Long Sleeve Thermal Top	**Style: XUT50** }	
Ultratherm Ladies' Thermal Longjohn	**Style: XUT52** }	

This certificate forms part of, and must be read in conjunction with, BTTG Shirley Testing Services Confidential Test Report No. 52005/1 dated 03 June 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
Shirley Testing Services

P F Hamlyn
Quality Manager

BTTG

SHIRLEY TESTING SERVICES

CONFIDENTIAL TEST REPORT

Date: 03 June 2004
Our Ref : 52005/1
Your Ref : XMT, XUT

Manufacturer:

PRAYBOURNE LTD
ALLIANCE HOUSE
FISHING LINE ROAD
ENFIELD
REDDITCH
WORCS B97 6EE

Job Title: EC Type-Examination of Men's and Ladies' Thermal Underwear

Client's order no: EC Type-Examination Application dated 19/03/2004

Date of receipt: 22/03/2004

Description of sample(s): Thermal Underwear:

Megatherm Men's Long Sleeve Thermal Top	Style: XMT01
Megatherm Men's Thermal Longjohn	Style: XMT03
Megatherm Ladies' Long Sleeve Thermal Top	Style: XMT50
Megatherm Ladies' Thermal Longjohn	Style: XMT52
Ultratherm Men's Long Sleeve Thermal Top	Style: XUT01
Ultratherm Men's Thermal Longjohn	Style: XUT03
Ultratherm Ladies' Long Sleeve Thermal Top	Style: XUT50
Ultratherm Ladies' Thermal Longjohn	Style: XUT52

Work requested: EC-Type Examination to the Essential Health and Safety Requirements of EC Directive 89/686/EEC in accordance with Article 10 of EC Directive 89/686/EEC using ISO 9920:1995 (Ergonomics of the thermal environment – Estimation of the thermal insulation and evaporative resistance of a clothing ensemble) and EN 340:1993

BTTG

Date: 03 June 2004
Our Ref : 52005/1
Your Ref : XMT, XUT

Toledo Knitting Ltd

EC TYPE-EXAMINATION OF MEN'S AND LADIES' THERMAL UNDERWEAR

1. Samples Received

The following garments were submitted for assessment against the Essential Health and Safety requirements of the Directive using ISO 9920:1995 and the harmonised European Standard EN 340:1993:

Garment	Code	Fabric
Megatherm Men's Long Sleeve Thermal Top	Style: XMT01	T352; 62% Polyester / 38% Viloft (330 $g.m^{-2}$)
Megatherm Men's Thermal Longjohn	Style: XMT03	
Megatherm Ladies' Long Sleeve Thermal Top	Style: XMT50	
Megatherm Ladies' Thermal Longjohn	Style: XMT52	
Ultratherm Men's Long Sleeve Thermal Top	Style: XUT01	T351; 50% Polyester / 50% Viloft (220 $g.m^{-2}$)
Ultratherm Men's Thermal Longjohn	Style: XUT03	
Ultratherm Ladies' Long Sleeve Thermal Top	Style: XUT50	
Ultratherm Ladies' Thermal Longjohn	Style: XUT52	

2 Type-Examination Procedure

As required by Article 10(4) of EC Directive 89/686/EEC the manufacturer's technical file and the garments submitted were examined in accordance with the specified procedures against the manufacturer's Technical Specification, which consisted of the International Standard ISO 9920:1995 together with the harmonised European standard EN 340:1993. The suitability of ISO 9920:1995 and EN 340:1993 were checked with respect to the Essential Health and Safety Requirements of EC Directive 89/686/EEC because standards that are not harmonised do not confer Presumption of Conformity with the Directive.

The manufacturer's Technical Specification, consisting of the International Standard ISO 9920:1995 together with EN 340:1993, was found to address the Essential Health and Safety Requirements for this category of PPE.

2.1 Examination of Technical File

The technical file submitted contained the following information: -

(a) Garment specifications including line drawings (Appendix 1)
(b) Fabric and garment specifications
(c) Size range
(d) Examples of labels
(e) User instructions
(f) Description of Quality System

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2.2 Examination of Garments

In the opinion of Shirley Testing Services, the garments submitted had been manufactured in accordance with the information given in the technical file.

The Long Sleeve Tops (Men's & Ladies) were long sleeve undershirts in knitted fabric. The round neck was bound, the bottom had a plain hem, and the sleeves had a knitted cuff.

The Longjohns (Men's & Ladies) were a pair of full length pants in knitted fabric. The waists were elasticated and the leg ends had knitted cuffs. The Men's longjohn had a fly opening.

The garments were available in a size range of at least five sizes which did not conform to EN 340:1993 but to the manufacturer's size range.

2.3 Test Programme

The garments and constituent fabrics submitted were evaluated against the appropriate requirements specified in ISO 9920:1995 and EN 340:1993.

The Effective Thermal Insulation (I_{cle}) of the submitted garments was measured on each garment individually according to Annex C of ISO 9920:1995 by Thermal Environment Laboratory of Lund Institute of Technology (Test Report dated 2004-05-25) using a standing, static manikin.

The fabrics used in the manufacture of the garments was assessed at BTTG High Performance Materials.

The Dimensional Change of the fabrics was assessed according to EN 25077:1993 after five washes according to EN 26330:1993 Procedure 6A (40°C) followed by Procedure A (line dried) and reshaping prior to measuring (Report No. 52005/4/JS).

The Bursting Resistance of the fabrics was assessed according to EN ISO 13938-1:1999 (Report No. 52005/3/JS).

The results obtained are summarised in Table 1.

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TABLE 1

Test Results for Garments and Fabrics

Property	Test Method and Report Reference	Result		
Effective Thermal Insulation (I_{cl})	ISO 9920:1995 Annex C (Test Report dated 2004-05-25)	XMT01; XMT50 XMT03; XMT52 XUT01; XUT50 XUT03; XUT52	0.035 $m^2.°C.W^{-1}$ 0.032 $m^2.°C.W^{-1}$ 0.030 $m^2.°C.W^{-1}$ 0.027 $m^2.°C.W^{-1}$	
Dimensional Change of fabric	EN 25077:1993 / EN 26330:1993 (Report No. 52005/4/JS)		Warp	Weft
		T352 (Megatherm) XMT01; XMT50 XMT03; XMT52	-1.58 %	+0.08 %
		T351 (Ultratherm) XUT01; XUT50 XUT03; XUT52	-8.29 %	-4.78 %
Bursting Resistance of fabric	EN ISO 13938-1:1999 (Report No. 52005/3/JS)	T352 (Megatherm) XMT01; XMT50 XMT03; XMT52	1095 $kN.m^{-2}$	
		T351 (Ultratherm) XUT01; XUT50 XUT03; XUT52	970 $kN.m^{-2}$	

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3. Assessment

Having concluded that the technical specification used by the manufacturer (ISO 9920:1995 and EN 340:1993) is suitable with respect to the Basic Health and Safety requirements of EC Directive 89/686/EEC and having taken into account the content of the technical file submitted with the PPE, it is the opinion of BTTG Shirley Testing Services (Notified Body Identification No 0338) that the following garments,
Megatherm Men's Long Sleeve Thermal Top XMT01, Megatherm Men's Thermal Longjohn XMT03, Megatherm Ladies' Long Sleeve Thermal Top XMT50, Megatherm Ladies' Thermal Longjohn XMT52, Ultratherm Men's Long Sleeve Thermal Top XUT01, Ultratherm Men's Thermal Longjohn XUT03, Ultratherm Ladies' Long Sleeve Thermal Top XUT50, Ultratherm Ladies' Thermal Longjohn, XUT52
satisfy the relevant provisions of EC Directive 89/686/EEC applicable to thermal underwear subject to the following comments:

These garments provide thermal protection against cold temperatures when worn with appropriate outer clothing, for instance outer garments conforming to ENV 342:1998 "Protective clothing – Ensembles for protection against cold". Compatible garments such as gloves, boots and headwear should be worn if necessary.

According to Clause 3 of ISO 9920:1995, if the Effective Thermal Insulation (*I*clu) of all of the other garments is known, then the Basic Insulation (*I*cl) of the whole ensemble can be calculated by adding the values together:

$$I_{cl} = \Sigma I_{clu}$$

If the Effective Thermal Insulation (*I*clu) of any of the other garments is not known then it can be estimated using Annexes A or B of ISO 9920:1995.

Annex C of ENV ISO 11079:1998 "Evaluation of cold environments – Determination of required clothing insulation (IREQ)" suggests that the Basic Insulation (*I*cl) of an ensemble should be reduced by 20% for dynamic work and by 10% for stationary work to convert the values into the Resultant Basic Thermal Insulation (*I*cl,r) of the ensemble.

Using the Resultant Basic Thermal Insulation (*I*cl,r) of an ensemble, the exposure times and recommended working temperatures can be calculated for different levels of physiological output using either ENV ISO 11079:1998 or Annex C of ENV 342:1998.

Reported by: ..... C A Butcher
Certification Officer

Countersigned by: ..... P F Hamlyn
Quality Manager

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.

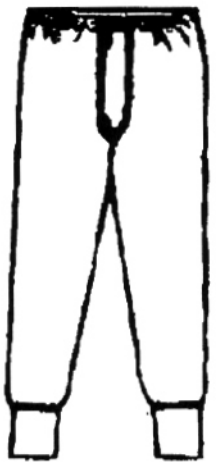
Date: 03 June 2004
Our Ref : 52005/1
Your Ref : XMT, XUT

Toledo Knitting Ltd

APPENDIX 1.

Megatherm Men's Long Sleeve Thermal Top XMT01, Megatherm Ladies' Long Sleeve Thermal Top XMT50, Ultratherm Men's Long Sleeve Thermal Top XUT01, Ultratherm Ladies' Long Sleeve Thermal Top XUT50

Megatherm Men's Thermal Longjohn XMT03, Ultratherm Men's Thermal Longjohn XUT03



Megatherm Ladies' Thermal Longjohn XMT52, Ultratherm Ladies' Thermal Longjohn, XUT52

User Information - THERMAL UNDERWEAR, ULTRATHERM, MEGATHERM

Praybourne Ltd, Alliance House, Fishing Line Road, Enfield, Redditch B97 6EE

Cleaning Instructions: 40°c cycle wash, short spin, do not tumble dry, pull into shape. Thermal insulation may decrease after any cleansing procedure.

Test Results

Effective Thermal Insulation (Iclu) to ISO 9920: 1995 Annex D:

Top: 0.035 m2 K/W Code XMT01 Megatherm, XMT50 (Womens)

Pants: 0.032 m2 K/W Code XMT03 Megatherm XMT52 (Womens)

Top: 0.030 m2 K/W Code XUT01 Ultratherm, Code XUT50 (Womens)

Pants: 0.027 m2 K/W Code XUT03 Ultratherm, Code XUT52 (Womens)

Bursting Resistance to EN ISO 13938-1: 1999 1095 kN m², Codes XMT01,XMT03,XMT50,XMT52

Bursting Resistance to EN ISO 13938-1: 1999 970 kN m-² Codes XUT01,XUT03,XUT50,XUT52

Dimensional Change of fabric: five washes to ISO 6330 at 40° C: Warp – 1.58% Weft + 0.08% Codes XMT01,XMT03,XMT50,XMT52

Dimensional Change of fabric, five washes to ISO 6330 at 40° C: Warp – 8.3% Weft – 4.78%, Codes XUT01, XUT03, XUT50, XUT52

This PPE has been designed taking into account the Basic Health and Safety Requirements referred to in Annex 11 of Directive 89/686/EEC.

These garments provide thermal protection against cold temperatures, when worn with appropriate outer clothing, for instance outer garments conforming to ENV 342. Compatible garments such as Gloves, Boots and Headwear should be worn if necessary.

The Effective Insulation (/clu) of this garment is indicated on the label. It has been measured in accordance with ISO 9920:1995.

If the Effective Insulation of all the other garments is known, then the Basic Insulation (Icl) of the whole ensemble can be calculated by adding the values together: Icl = · Iclu.

If the effective Thermal Insulation (Iclu) of any of the other garments is not known then it can be estimated using Annexes A or B of ISO 9920:1995.

Annex C of ENV ISO 11079:1998 suggests that the /cl value of an ensemble should be reduced by 20% for dynamic work, and by 10% for stationery work, to convert the values into the Resultant Basic Thermal Insulation (/cl,r) of the ensemble, which can be used to calculate exposure times and temperatures using ENV ISO 11079:1998 or Annex C of ENV 342:1998

Recommended Exposure Times (from ENV 342:1998 Annex C)

Resultant Basic Thermal Insulation /cl,r, of whole ensemble	Very Light Activity 90 W/m²		Light Activity 115 W/m²		Moderate Activity 170 W/m²	
(m² .K/W)	8 hours	1 hour	8 hours	1 hour	8 hours	1 hour
0.31	10 °c	-4 °c	1 °c	-23 °c	-18 °c	-31 °c
0.38	4 °c	-12 °c	-6 °c	-33 °c	-29 °c	-44 °c
0.46	-1 °c	-21 °c	-13 °c	-43 °c	-39 °c	-57 °c
0.54	-7 °c	-30 °c	-20 °c	-53 °c	-49 °c	-70 °c
0.62	-13°c	-39 °c	-28 °c	-63 °c	-60 °c	--
0.70	-19 °c	-48 °c	-35 °c	--	--	--

The above information is only valid when worn together with adequate hand, foot and headwear, and an air velocity of 0.3 to 0.5 m/s. Higher air speeds will increase the minimum temperature (wind chill), or decrease the exposure time (see ENC ISO 11079:1998)*

Notified Body 0336, BTTG, Manchester M17 1GU, UK