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Japan

For the attention of: Ronald Pinto

Technical Report

Subject: EN 407: 2004 TESTING OF GLOVES REFERENCED "HK 12"
Our Ref: SPC0172794 / 0910 / 2 / Issue 2
Date: 1st May 2009

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The uncertainty of the results in this report is based on a standard uncertainty multiplied by a coverage factor $k=2$, which provides for a confidence level of approximately 95%.

Report signed by: P J Doughty
Position: PPE Technologist
Department: Safety Product Centre

WORK REQUESTED:

Samples of gloves referenced “HK 12”, were received by SATRA on 5th March 2009 for testing in accordance with EN 407: 2003.

CONCLUSIONS:

Standard & Clause	Test / Property	Results Achieved	Pass / Fail EN 407: 2004
EN 407: 2004 Clause 4.1 General	EN 420: 2003	PASS	PASS
EN 407: 2004 Clause 4.2 Sizes	EN 420: 2003 5.1 Length and fit	PASS	PASS
EN 407: 2004 Clause 4.3 Abrasion Resistance	EN 388: 2003 Clause 6.1 Abrasion resistance	Level 1	PASS
EN 407: 2004 Clause 4.4 Tear Resistance	EN 388: 2003 Clause 6.3 Tear resistance	Level 3	PASS
EN 407: 2004 Clause 5.1 Burning Behaviour	EN 407: 2004 Clause 5.1 Burning Behaviour	Level 4	PASS
Clause 5.2 Contact Heat	EN 407: 2004 Clause 5.2 Contact Heat	Level 2 (See Note 1)	PASS (See Note 1)
EN 407: 2004 Clause 5.3 Convective Heat	EN 407: 2004 Clause 5.3 Convective Heat	Level 3 (See Note 1)	PASS (See Note 1)
EN 407: 2004 Clause 5.4 Radiant Heat	EN 407: 2004 Clause 5.4 Radiant Heat	Level 3 (See Note 1)	PASS (See Note 1)
EN 388: 2003 Clause 6.2 Blade Cut Resistance	EN 388: 2003 Clause 6.2 Blade Cut Resistance	Level 3 (See Note 2)	N/A (See Note 2)
EN 388: 2003 Clause 6.4 Puncture Resistance	EN 388: 2003 Clause 6.4 Puncture Resistance	Level 4 (See Note 2)	N/A (See Note 2)

Note 1: A level of performance in this test can only be reported if a performance level of 3 or 4 is obtained for burning behaviour.

Note 2: This specific test is not required for compliance with EN 407: 2004

TESTING:

Testing was carried out in accordance with EN 407: 2004 between 19th and 23rd March 2009

RESULTS:



Table 1: EN 407: 2004 Clause 4.2 Sizes Requirements

Glove size	6	7	8	9	10	11
Minimum length (mm)	220	230	240	250	260	270
Performance level	1	2	3	4	5	
Diameter of dexterity pin (mm)	11.0	9.5	8.0	6.5	5.0	

Table 2: EN 407: 2004 Clauses 4.2 Abrasion Resistance and 4.3 Tear Resistance Requirements

Performance Level	1	2	3	4
EN 388: 2003 Clause 6.1 Abrasion resistance (cycles to failure)	100	500	2000	8000
EN 388: 2003 Clause 6.3 Tear resistance (lowest peak force – newtons)	10	25	50	75

Table 3 Requirements for EN 407: 2004 Clause 5.1 Burning Behaviour

Performance Level	1	2	3	4
After flame time (s)	≤ 20 s	≤ 10 s	≤ 3 s	≤ 2 s
After glow time (s)	No requirement	≤ 120 s	≤ 25 s	≤ 5 s
Other requirements	<ul style="list-style-type: none"> - If melting occurs, the material shall not drip - The innermost surface of the glove shall show no signs of melting - The seams shall not come apart after an ignition time of 15s in the test area 			

Table 4: Requirements for EN 407: 2004 Clause 5.2 Contact Heat

Performance Level	1	2	3	4
Contact Temperature T_c (°C)	100	250	350	500
Threshold Time t_1 (s)	≥ 15	≥ 15	≥ 15	≥ 15

Table 5: Requirements for EN 407: 2004 Clause 5.3 Convective Heat

Performance Level	1	2	3	4
Heat Transfer Index HTI (s)	≥ 4	≥ 7	≥ 10	≥ 18

Table 6: Requirements for EN 407: 2004 Clause 5.4 Radiant Heat

Performance Level	1	2	3	4
Heat Transfer t_{24} (s)	≥ 7	≥ 20	≥ 50	≥ 95

Table 7: Requirements for EN 388: 2003

Performance Level	1	2	3	4	5
6.2 Blade cut resistance (minimum cut resistance index)	1.2	2.5	5.0	10	20
6.4 Puncture resistance (lowest peak force – newtons)	20	60	100	150	N/A

Table 9: EN 407: 2004 Results

Test/property	Test results	Level achieved
EN 420: 2003 5.1 Glove length	Min glove length (mm) Size 9: 273 Size 10: 272	PASS PASS
EN 420: 2003 5.1 Comfort and fit	Wearer hand size 9 Left: 9L, 8C Right: 9L, 8.5C Comments on fit : Satisfactory Wearer hand size 10 Left: 10.5L, 8.5C Right: 10.5L, 8.5C Comments on fit : Satisfactory	PASS PASS
EN 420 : 2003 5.2 Dexterity	Smallest pin (mm) Size 9: 9.5 Size 10: 6.5	Level 2 Level 4
EN 388: 2003 6.1 Abrasion resistance	Failure between (cycles) - Lining 1) 0 & 100 2) 0 & 100 3) 0 & 100 4) 0 & 100 <i>Saint-Gobain A700 Abrasive paper used</i>	Level 0
EN 388: 2003 6.1 Abrasion resistance	Failure between (cycles) - Outer 1) 100 & 500 2) 100 & 500 3) 100 & 500 4) 100 & 500 <i>Saint-Gobain A700 Abrasive paper used</i>	Level 1
EN 388: 2003 6.3 Tear resistance	Max. tearing force (N) - Lining 1) > 79.7 2) > 79.6 3) 26.0 4) 28.8	Level 2
EN 388: 2003 6.3 Tear resistance	Max. tearing force (N) - Outer 1) > 114.0 2) > 111.7 3) > 86.2 4) 70.9	Level 3

Test/property	Test results	Level achieved
EN 407: 2004 5.1 Burning Behaviour	<p>Application Time: 3 s After flame time = 0 After glow time = 0 No dripping or melting. Seams are intact</p> <p>Application Time: 15 s After flame time = 0 s After glow time = 0 s No dripping and melting. Seams are intact</p>	Level 4
EN 407: 2004 5.2 Contact Heat	<p>Contact Temperature : 250 °C Threshold time t₁ (s) 1) 14.3 2) 15.4 3) 16.5 Mean Threshold Time = 15</p>	Level 2
EN 407: 2004 5.3 Convective Heat	<p>Heat Transfer Index HTI (s) - Palm & Back 1) 19.9 2) 18.8 3) 10.6 Rounded Mean = 16</p>	Level 3
EN 407: 2004 5.4 Radiant Heat	<p>Heat Transfer t₂₄ (s) 1) 42.0 2) 58.6 Rounded Mean = 50</p>	Level 3
EN 388: 2003 6.2 Blade cut resistance	<p>Cut index: Left: 3.56, 6.42, 3.86, 4.67, 6.67: Mean = 5.03 Right: 6.75, 4.40, 5.72, 8.35, 7.08: Mean = 6.46 <i>Deviation: Nominal width of blade is 0.3mm</i></p>	Level 3
EN 388: 2003 6.4 Puncture resistance	<p>Max. puncture force (N) 1) 202.1 2) 217.1 3) 225.2 4) 181.4</p>	Level 4

***** END OF TEST REPORT *****

Report by: M.J. Cooper
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1st May 2009

Signed: P J Doughty
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