

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 <p>0112</p> <p>Accredited to ISO/IEC 17025:2017</p>	<h3>Smithers MSE Limited</h3> <p>Issue No: 072 Issue date: 22 July 2024</p>	
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<p>Testing performed at the above address only</p>		

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
PAPER and BOARD	<u>Physical Tests</u>	
	Air Permeance	BS ISO 5636-3:2013 (Bendtsen Method) BS ISO 5636-5:2013 (Gurley Method)
	Brightness / Reflectance	BS ISO 2470-1:2016 (C/2° indoor daylight conditions) BS ISO 2470-2:2008 (D65/10° outdoor daylight)
	Burst Strength	BS EN ISO 2758:2014 BS EN ISO 2759:2014
	Coefficient of Friction	ASTM D4917-07
	Colour	BS ISO 5631-1:2022 (C/2° indoor daylight conditions) BS ISO 5631-2:2022 (D65/10° outdoor daylight)
	Compressive strength (short span)	BS ISO 9895:2008 TAPPI T826 pm-92
	Edge Crush	BS EN ISO 3037:2022
	Flat Crush	BS EN ISO 3035:2011
	Grammage	BS EN ISO 536:2020
	Grammage of Components	BS ISO 3039:2010
	Moisture Content	BS EN ISO 287:2017
Opacity	BS ISO 2471:2008	



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PAPER and BOARD (cont'd)	<u>Physical Tests</u> (cont'd)	
	Ring Crush	TAPPI T818 om-87 TAPPI T822 om-93
	Roughness - Bendtsen	BS ISO 8791-2:2013
	Stiffness (Static)	BS ISO 2493-1:2010 BS ISO 2493-2:2020 TAPPI T451 cm-84
	Tear Strength (Internal)	BS EN ISO 1974:2012
	Tensile Strength and Stretch, and Tensile Energy Absorption (TEA)	ASTM D828-22 BS EN ISO 1924-2:2008 ISO 1924-2:2008
	Thickness and Bulk	BS EN ISO 534:2011
	Water Absorption (Cobb method)	BS EN ISO 535:2023
	Wet Strength	BS 2922:Part 1:1985(1995) BS ISO 3781:2011 ISO 3689:1983
	TISSUE	Whiteness (CIE, D65 Outdoor light)
Thickness		BS EN ISO 12625-3:2014
Tensile strength, stretch and TEA		BS EN ISO 12625-4:2022
Tensile strength wet (Finch Method)		BS EN ISO 12625-5:2016
Grammage		BS EN ISO 12625-6:2016
Water Absorbency (time & capacity)		BS EN ISO 12625-8:2010
FILMS & LAMINATES, and BOTTLES & CONTAINERS		Moisture Vapour Transmission Rates
	Oxygen Transmission Rates	ASTM D3985-17 ASTM F1927-20 ASTM F1307-20
FLEXIBLE SHEET MATERIAL USED FOR PACKAGING	Water Vapour Transmission Rate	BS 3177:1959 (1995)



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CONTAINERS & PACKAGINGS	<u>Physical Tests</u> (cont'd)	
	Burst/Seal (via air inflation)	ASTM F1140-13
PLASTIC FILMS & SHEETING	Compression Resistance	Documented In-House Method (67b Issue No 1) based on BS EN 22872:1993
	Coefficient of Friction	EN ISO 8295:2004 ASTM D1894-14
	Density	BS EN ISO 1183-1:2019 (Method A) ASTM D792-20
	Dimension (Length/Width)	BS 2782:Part 6:Method 632A:1993 ISO 4592:1992
	Falling Dart Impact Resistance	BS 2782:Part 3:Method 352E:1996 (Method A) ASTM D1709-16 (ae1) BS EN ISO 7765-1:2004
	Gravimetric thickness	BS 2782-6:Method 631A:1993 ISO 4591:1992
	Puncture resistance	ASTM F1306-21
	Tear Resistance	BS 2782:Part 3:Method 360A:1991 (1996) BS EN ISO 6383-2:2004
	Thickness by Mechanical Scanning	BS 2782:Part 6:Method 630A:1994 ISO 4593:1993
	Tensile Strength, Elongation and Elastic Modulus (Sheet)	BS 2782:Part 3:Method 320A:1976 (1996)
Tensile Strength, Elongation and Elastic Modulus (Films)	ASTM D882-18 BS EN ISO 527-1:2019 (General Principles) BS EN ISO 527-3:2018 BS 2782-3:1977 Methods 326A, 326B, and 326C	



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PACKAGING AND PACKAGING SYSTEMS	<u>Physical Tests</u> (cont'd) Seal Strength Tests of Flexible Barrier Materials Seal Integrity (porous materials) Seal Integrity (non-porous materials) Seal Strength for peelable lids (45° method) Pack integrity (external pressure bubble emission test) Pack Integrity (internal pressure bubble emissions test) Pack Integrity (leak test) Container Closure Seal Integrity Dye solution tightness General techniques of Ultraviolet-visible quantitative analysis	ASTM F88/F88M-23 ASTM F88/F88M-21 ASTM F1929-23 (Method A) ASTM F3039-23 ASTM F2824-10 (2015) ASTM D3078-02 (2013) Using an automated vacuum system. ASTM F2096-11 Documented in-house gas detection method (WI182, Revision 5). BS EN ISO 8871-5:2016 (Annex D) BS EN ISO 8871-5:2014 (Annex D) ISO 8871-5:2005 BS ISO 11040-4:2015 (Annex H) ISO 11040-4:2015(E) ASTM E169-16



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<p>PACKAGING AND PACKAGING MATERIALS FOR TERMINALLY STERILIZED MEDICAL DEVICES</p>	<p><u>Physical Tests</u> (cont'd)</p> <p>Requirements for materials, sterile barrier systems, and packaging systems</p> <p>General Requirements and Test Methods</p> <p>Sterilization wrap - Requirements and Test Methods</p> <p>Paper used for paper bags, reels and pouches as specified in EN 868-4 and EN 868-5 - Requirements and Test Methods</p> <p>Paper bags - Requirements and Test Methods</p> <p>Sealable pouches and reels of porous materials and plastic film construction - Requirements and Test Methods</p> <p>Paper for low temperature sterilization processes - Requirements and Test Methods</p> <p>Adhesive coated paper for low temperature sterilization processes - Requirements and Test Methods</p>	<p>BS EN ISO 11607-1:2020+A11 2022 Using test specifications listed elsewhere in this Schedule, as appropriate</p> <p>BS EN 868:Part 1:Annex C1, C3, Annex D (BS 6256), Annex F</p> <p>BS EN 868:Part 2:2017: paras 4.2.1.1-7, 4.2.2.1, 4.2.2.2, 4.2.2.3-4, 4.2.2.3.6-7</p> <p>BS EN 868:Part 3:2017: paras 4.2.2-16</p> <p>BS EN 868:Part 4:2017: paras 4.2.1.1-3, 4.2.2, 4.2.3.1-3, 4.4.1-3, 4.5.1-4, 4.6.1-2</p> <p>BS EN 868:Part 5:2018 paras 4.2.2.1, 4.2.2.2-5, 4.3.1-4, 4.5.1-3, 4.6.1.1-3, 4.6.2</p> <p>BS EN 868:Part 6:2017: paras 4.2.2-16</p> <p>BS EN 868:Part 7:2017: paras 4.3.2-19, 4.4</p>



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<p>PRESSURE-SENSITIVE ADHESIVE COATED LABELS</p>	<p><u>Performance requirements</u></p> <p>Immersion resistance to salt water (marine immersion)</p> <p>Adhesion</p> <p>Weathering (resistance to light and saline solution)</p> <p>Laboratory temperature cycling</p> <p>Legibility</p> <p>Print key effectiveness</p> <p>Abrasion resistance</p> <p>Evaluation of label performance on specific substrates</p>	<p>BS 5609:1986 Specification for printed pressure-sensitive, adhesive-coated labels for marine use, including requirements for label base material</p> <p>Section 1 - General</p> <p>Section 2 - Pressure-sensitive, adhesive-coated label base material</p> <p>Section 3 - Printed pressure-sensitive, adhesive-coated labels</p> <p>Appendix A to K</p>
<p>PACKAGING MATERIAL and PACKAGINGS (PAPER, BOARD, PLASTICS, etc.)</p>	<p><u>Environmental Tests</u></p> <p>High/Low Temperature</p> <p>Range: - 20 °C to + 60 °C Max chamber size: 2 m x 2 m x 2 m</p> <p>Range: - 20 °C to + 100 °C Max chamber size: 0.66 m x 0.74 m x 0.62 m</p> <p>Range: - 40 °C to + 100 °C Max chamber size: 0.56 m x 0.55 m x 0.53 m</p> <p>Thermal Shock (Auto transfer) Temp Range: - 35 °C to + 80 °C Chamber size: 0.45 m x 0.40 m x 0.60 m</p> <p>Humidity Range: 20 %RH to 95 %RH (Between 20 °C and 55 °C)</p>	<p>BS EN 60068-2-1:2007 BS EN 60068-2-2:2007 ASTM F2825-18</p> <p>BS EN 60068-2-14:2009</p> <p>BS EN 60068-2-30:2005 BS EN 60068-2-38:2009 BS EN 60068-2-78:2013 ASTM F2825-18</p>



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PLASTICS MATERIALS IN CONTACT WITH FOODSTUFFS	<u>Chemical Tests</u>	
	Overall migration into vegetable oils	BS EN 1186-2:2022 BS EN 1186-13:2002 (Method A)
	Overall migration into evaporable simulants	BS EN 1186-3:2022 BS EN 1186-14:2002 BS EN 1186-15:2002
	pH	BS 2924:Part 1:1983 (1993) BS ISO 6588-1:2021 BS ISO 6588-2:2021
WATERS Influence of Materials on Water Intended for Human Consumption	Chlorides and Sulphates	In-house method based on following withdrawn standards: - BS 2924:Parts 3 and 4:1990 (1995) ISO 9197/1:1989 ISO 9198:1989
	Odour and flavour caused by leaching from non-metallic materials	BS 6920:2014 Part 1 BS 6920:2000 (+A1 2014): Part 2.2 BS 6920:2000: Part 3
	Colour caused by leaching from non-metallic materials	BS 6920:2014: Part 1 BS 6920:2000 (+A1 2014): Part 2.3 BS 6920:2000: Part 3
	Turbidity caused by leaching from non-metallic materials	BS 6920:2014: Part 1 BS 6920:2000 (+A1 2014): Part 2.3 BS 6920:2000: Part 3
	Promotion of growth of aquatic micro-organisms by non-metallic materials by measurement of mean dissolved oxygen difference, MDOD	BS 6920:2014: Part 1 BS 6920:2000 (+A1 2014): Part 2.4 BS 6920:2000: Part 3
	Leaching of Substances of Concern to Public Health from non-metallic materials	BS 6920:2014: Part 1 BS 6920:2000 (+A1 2014): Part 2.5 BS 6920:2000: Part 3
	Preparation of Leachates for Analysis for Metals from non-metallic materials – extraction only	BS 6920:2014: Part 1 BS 6920:2000 (+A1 2014): Part 2.6 BS 6920:2000: Part 3



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<p>PACKAGING FOR THE TRANSPORT OF DANGEROUS GOODS</p> <p><u>UN Chapter 6.1 and Chapter 6.3 (for Division 6.2) Packagings</u></p> <p>Drums: Metals Wood Fibreboard Plastics</p> <p>Jerricans: Metal Plastics</p> <p>Boxes: Metal Wood Fibreboard Plastics</p> <p>Bags: Plastics Textile Paper</p> <p>Composite packaging: Plastics receptacle Glass, porcelain or stone Receptacle</p> <p><u>UN Chapter 6.5 Packagings</u></p> <p>Intermediate Bulk Containers (IBCs) Rigid Flexible</p>	<p><u>Performance Tests</u></p> <p>Drop tests (with preconditioning at - 18 °C (plastics), and 23 °C / 50 %RH (fibreboard), as required)</p> <p>Stack tests (at ambient temperature, 40 °C (plastics), and 23 °C/50 %RH (fibreboard) as required)</p> <p>Leakproofness tests</p> <p>Internal pressure (hydraulic) tests</p> <p>Steel rod impact tests</p> <p>Drop tests</p> <p>Stack tests Leakproofness tests Internal pressure (hydraulic tests) Top lift tests Bottom lift tests Tear tests Topple tests Righting tests</p>	<p><u>For Chapter 6.1:</u> Operational Instructions for UN Test Stations issued by VCA under the authority of DfT</p> <p><u>For Chapter 6.3 (Division 6.2):</u> UN Recommendations on the Transport of Dangerous Goods (19th Edition)</p> <p>Operational Instructions for UN Test Stations issued by VCA under the authority of DfT</p>



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PACKAGING FOR THE TRANSPORT OF DANGEROUS GOODS (cont'd) <u>UN Chapter 6.6 Packagings</u> Large Packagings Rigid Flexible	<u>Performance Tests</u> (cont'd) Drop tests Stack tests Top lift tests Bottom lift tests <u>Conditioning for testing</u>	UN Recommendations on the Transport of Dangerous Goods (19 th Edition)
COMPLETE, FILLED TRANSPORT PACKAGES	Max temp: 60 °C Min temp: - 40 °C Humidity: 90 %rh @ 38 °C Max chamber size: 4.0 m x 2.5 m x 3.0 m (high) Laboratory conditions: 23 °C, 50 % RH <u>Performance Tests</u>	BS EN ISO 2233:2001 ASTM D4332-22 ASTM F2825-18 BS EN ISO 187:2022
COMPLETE, FILLED TRANSPORT PACKAGES	Stacking (static load) Max load: 5500 kg Vertical Impact (Drop test) Max height: 4.5 m Max mass: 2250 kg Horizontal Impact (Inclined plane) Max mass: 2000 kg Max impact velocity: 4.7 m/s	BS EN 22234:1993 (withdrawn) ISO 2234:1985 (withdrawn) BS EN 22248:1993 ISO 2248:1985 ASTM D5276-92 ASTM D5276-98(2017) ASTM D5276-19(2023) ASTM D5265-23 ASTM D6344-04(2017) ASTM D5487-16(2022) ASTM D880-92(2021)



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<p>COMPLETE, FILLED TRANSPORT PACKAGES (cont'd)</p>	<p><u>Performance Tests</u> (cont'd)</p> <p>Fixed Low Frequency Vibration Frequency range: 1 Hz to 6 Hz Max amplitude: 25.4 mm Max mass: 1000 kg</p> <p>Compression Max force: 22000 kgf</p> <p>Rolling Max mass: 500 kg</p> <p>Water Immersion Tank size: 0.87 m x 0.87 m x 1.15 m</p> <p>Toppling Max mass: 500 kg</p> <p>Effects of High Altitude on Packaging Systems by Vacuum Method</p> <p><u>Sequential Tests</u> (based on above facilities) Vibration/drop/stack/compression/ etc</p>	<p>ISO 2247:1985 (withdrawn) ASTM D999-08 (2023)</p> <p>BS EN 22872:1993 ISO 2872:1985 ASTM D642-20</p> <p>BS EN 22876:1993 ISO 2876:1985</p> <p>ISO 4180:1980 (withdrawn)</p> <p>BS EN 28768:1993 ISO 8768:1986</p> <p>ASTM D6653/D6653M-13 (2021)</p> <p><u>ISTA Procedures</u> 1A:2014 1B: 2014 1C: 2014 1D: 2014 1E: 2014 1G: 2014 1H: 2014 2A:2011 2B:2011 2C:2011 3A:2018 3B:2017 3E:2017 3F:2017 3K 2011 3L:2023 4AB:2009 6-AMAZON.COM-SIOC 2018 6-AMAZON.COM OverBoxing 2018 7D:2007</p>



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<p>COMPLETE, FILLED TRANSPORT PACKAGES (cont'd)</p> <p>PACKAGING, PACKAGED ITEMS, GENERAL EQUIPMENT, ELECTRO-MECHANICAL ASSEMBLIES, NON-EXPLOSIVE STORES</p>	<p><u>Performance Tests</u> (cont'd)</p> <p>Sequential Tests (based on above facilities) Vibration/drop/stack/compression/ etc (cont'd)</p> <p>Vibration</p> <ul style="list-style-type: none"> - Sine, random, mixed mode - Ambient temperature - Vertical <p>(Electro Magnetic)</p> <p>Frequency Range: 5 Hz to 2,000 Hz Max Sine Thrust: 21 kN Max Random Thrust:18 kN</p> <p>(Servo-hydraulic)</p> <p>Frequency range: 1.0 Hz to 300 Hz Max peak thrust: 10 kN Max payload: 1.5 tonne Max displacement: 100 mm pk-pk</p> <p>Frequency range: 1.0 Hz to 300 Hz Max peak thrust: 40 kN Max payload: 1.5 tonne Max displacement: 150 mm pk-pk</p> <p>Shock</p> <ul style="list-style-type: none"> - Classical shock with half sine or trapezoidal pulse shapes - Ambient temperature - Vertical <p>Max item mass: 1000 kg Max footprint: 1 m x 1 m Severity: up to 500 'g' Duration: 3 ms to 20 ms</p>	<p>Documented In-House Method TM 001:Issue 4:January 2023 ASTM D4169-05, -08, -09, -14 ASTM D4169-16, -22, 23, 23^{e1} ASTM D7386-08 ASTM D7386-12 ASTM D7386-16 ASTM D6179-20</p> <p>BS EN 60068-2-6:2008 BS EN 60068-2-64:1995 ASTM D999-08 (2023) ASTM D3580-22 ASTM D4169-05, -08, -09, ASTM D4169-14, -16, -22 ASTM D4728-17 (2022) ISTA Procs 1, 2, 3 Series, 5B, 6 Amazon SIOC & Over boxing, 7A-D</p> <p>BS EN 60068-2-27:1993 (withdrawn) DEF STAN 00-35:1997:Test M3 (withdrawn) MIL-STD 202:1995: Method 213 MIL-STD 810F:2001 Method 516.5 (Procs ii & iii) (withdrawn)</p>



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MACHINE READABLE TRAVEL DOCUMENTS Machine Readable Passports	<u>Physical / Mechanical Tests</u>	<u>International Civil Aviation Organization (ICAO), Durability of Machine Readable Passports, Version 3.2 30.8.2006:</u>
	<u>Stress Methods</u>	
	Conditioning stress	Section 5.1
	Thermal cycling	Section 5.2
	Storage temperature	Section 5.3
	Operational temperature	Section 5.4
	Impact stress	Section 5.5
	Book bend stress (back pocket)	Section 5.6
	Dynamic bend stress	Section 5.7
	Torsion stress	Section 5.8
	Sheet turning stress	Section 5.9
	Sheet pull stress	Section 5.10
	Abrasion stress	Section 5.11
	Pen stress	Section 5.12
	Resistance to chemicals - evaluation method	Section 5.13
	Artificial daylight exposure stress	Section 5.14
	X-ray stress (subcontracted)	Section 5.15
	<u>Evaluation Methods</u>	
	Functional PIC evaluation	Section 6.1
	Physical damage evaluation	Section 6.2
	Peel Strength evaluation	Section 6.3
Colour fastness evaluation	Section 6.4	
Datapage warpage evaluation	Section 6.5	
Book warpage evaluation	Section 6.6	



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MACHINE READABLE TRAVEL DOCUMENTS Machine Readable Passports (cont'd)	<u>Physical / Mechanical Tests (cont'd)</u> <u>Test Sequences</u> Sheet binding sequence Storage climate sequence Operational climate sequence Impact sequence Back pocket sequence Torsion fatigue sequence Delamination sequence Bending fatigue sequence Thermal cycling sequence Colour fastness sequence Resistance to chemicals sequence Pen sequence Data-page abrasion sequence X-ray sequence (subcontracted) <u>Stress Methods</u> Conditioning stress method Thermal cycling stress method Storage temperature stress method Operational climate stress method Impact stress method Book bend stress method (back pocket)	<u>International Civil Aviation Organisation (ICAO), Durability of Machine Readable Passports, Version 3.2 30.8.2006</u> Section 7.3 Section 7.4 Section 7.5 Section 7.6 Section 7.7 Section 7.8 Section 7.9 Section 7.10 Section 7.11 Section 7.12 Section 7.13 Section 7.14 Section 7.15 Section 7.16 <u>BS ISO/IEC 18745-1:2018</u> Section 8.1 Section 8.2 Section 8.3 Section 8.4 Section 8.5 Section 8.6



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MACHINE READABLE TRAVEL DOCUMENTS Machine Readable Passports (cont'd)	<u>Physical / Mechanical Tests</u> (cont'd)	
	<u>Stress Methods</u> (cont'd)	<u>BS ISO/IEC 18745-1:2018</u>
	Dynamic bend stress method	Section 8.7
	Torsion stress method	Section 8.8
	Sheet turning stress method	Section 8.9
	Sheet pull stress method	Section 8.10
	Abrasion stress method	Section 8.11
	Pen stress method	Section 8.12
	Resistance to chemicals stress method	Section 8.13
	Artificial daylight exposure stress method	Section 8.14
	X-Ray stress method (subcontracted)	Section 8.15
	<u>Evaluation Methods</u>	
	Functional PIC evaluation method	Section 9.1
	Physical damage evaluation method	Section 9.2
	Peel strength evaluation method	Section 9.3
	Colour fastness evaluation method	Section 9.4
Datapage and cover warpage evaluation method	Section 9.5	
Book warpage evaluation method	Section 9.6	



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MACHINE READABLE TRAVEL DOCUMENTS Machine Readable Passports (cont'd)	<u>Physical / Mechanical Tests</u> (cont'd) <u>Test Sequences</u> Sheet binding sequence Storage climate sequence Operational climate sequence Impact sequence Back pocket sequence Torsion fatigue sequence Delamination sequence Bending fatigue sequence Thermal cycling sequence Colour fastness sequence Resistance to chemicals sequence Pen sequence Datapage abrasion sequence X-ray sequence (subcontracted)	<u>BS ISO/IEC 18745-1:2018</u> Section 10.3 Section 10.4 Section 10.5 Section 10.6 Section 10.7 Section 10.8 Section 10.9 Section 10.10 Section 10.11 Section 10.12 Section 10.13 Section 10.14 Section 10.15 Section 10.16



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MACHINE READABLE TRAVEL DOCUMENTS Identification (ID) Cards	<u>Physical / Mechanical Tests (cont'd)</u> <u>Test Methods</u> Xenon arc light exposure Surface abrasion ICM adhesion Plasticised vinyl storage Wear and soil test Temperature and humidity ageing Temperature shock Temperature and humidity cycling ID-1 card flexure Temperature and humidity ageing followed by peel strength testing Cross-cut test	<u>BS ISO/IEC 24789-2:2011</u> Section 5.1 Section 5.2 Section 5.4 Section 5.5 Section 5.6 Section 5.7 Section 5.8 Section 5.9 Section 5.10 Section 5.11 Section 5.12



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MACHINE READABLE TRAVEL DOCUMENTS ID Cards (cont'd)	<u>Physical / Mechanical Tests (cont'd)</u> <u>Test Methods</u> Card warpage Dimensions of cards Peel strength Peel strength including the edge of the card Resistance to chemicals Card dimensional stability with temperature and humidity Adhesion or blocking Bending stiffness Dynamic bending stress Dynamic torsional stress Opacity X-rays (subcontracted) Embossing relief height of characters Resistance to heat	<u>BS ISO/IEC 10373-1:2020</u> Section 5.1 Section 5.2 Section 5.3 Section 5.4 Section 5.5 Section 5.6 Section 5.7 Section 5.8 Section 5.9 Section 5.10 Section 5.11 Section 5.12 Section 5.13 Section 5.14



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Testing performed at main address only

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
MACHINE READABLE TRAVEL DOCUMENTS ID Cards (cont'd)	<u>Physical / Mechanical Tests</u> (cont'd) <u>Test Methods</u> Dimensions of cards Peel strength Resistance to chemicals Card dimensional stability with temperature and humidity Adhesion or blocking Bending stiffness Dynamic bending stress Dynamic torsional stress Opacity X-rays Embossing relief height of characters Resistance to heat	<u>BS ISO/IEC 10373-1:2006 + A1:2012</u> Section 5.2 Section 5.3 Section 5.4 Section 5.5 Section 5.6 Section 5.7 Section 5.8 Section 5.9 Section 5.10 Section 5.12 Section 5.14 Section 5.15
END		