

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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



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Accredited to
ISO/IEC 17025:2017

Smithers MSE Limited

Issue No: 061 Issue date: 09 July 2021

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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 5631-1:2015 (C/2° indoor daylight conditions) BS ISO 5631-2:2015 (D65/10° outdoor daylight)
	Compressive strength (short span)	BS ISO 9895:2008 TAPPI T826 pm-92
	Edge Crush	BS EN ISO 3037:2013
	Flat Crush	BS EN ISO 3035:2011
	Grammage	BS EN ISO 536:2020
	Grammage of Components	BS ISO 3039:2010
Methylene Blue Penetration	BS 6254:1989 (1994) BS 6255:1989 (1994) BS 6256:1989 (1994)	



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PAPER and BOARD (cont'd)	<u>Physical Tests</u> (cont'd)		
	Moisture Content	BS EN ISO 287:2017	
	Opacity	BS ISO 2471:2008	
	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 D828-16 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 535:2014	
	Wet Strength	BS 2922:Part 1:1985(1995) BS ISO 3781:2011 ISO 3689:1983	
	TISSUE	Whiteness (CIE, D65 Outdoor light)	BS ISO 11475:2017
		Thickness	BS EN ISO 12625-3:2014
		Tensile strength, stretch and TEA	BS EN ISO 12625-4:2016
Tensile strength wet (Finch Method)		BS EN ISO 12625-5:2016	
Grammage		BS EN ISO 12625-6:2016	
FILMS & LAMINATES, and BOTTLES & CONTAINERS	Water Absorbency (time & capacity)	BS EN ISO 12625-8:2010	
	Moisture Vapour Transmission Rates	ASTM F1249-13	
	Oxygen Transmission Rates	ASTM D3985-17 ASTM F1927-14 ASTM F1307-14	



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	<u>Physical Tests</u> (cont'd)	
FLEXIBLE SHEET MATERIAL USED FOR PACKAGING	Water Vapour Transmission Rate	BS 3177:1959 (1995)
CONTAINERS & PACKAGINGS	Burst/Seal (via air inflation)	ASTM F1140-13
	Compression Resistance	Documented In-House Method (67b Issue No 1) based on BS EN 22872:1993
PLASTIC FILMS & SHEETING	Coefficient of Friction	EN ISO 8295:2004 ASTM D1894-14
	Density	BS EN ISO 1183-1:2019 (Method A) ASTM D792-13
	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 F1306-16
	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	ASTM F88/F88M-15
	Seal Integrity (porous materials)	ASTM F1929-15 (Method A)
	Seal Integrity (non-porous materials)	ASTM F3039-15
	Seal Strength for peelable lids (45° method)	ASTM F2824-10 (2015)
	Pack integrity (external pressure bubble emission test)	ASTM D3078-02 (2013) Using an automated vacuum system.
	Pack Integrity (internal pressure bubble emissions test)	ASTM F2096-11
	Pack Integrity (leak test)	Documented in-house gas detection method (WI182, issue 3).
	Container Closure Seal Integrity	BS EN ISO 8871-5:2016 (Annex D) BS EN ISO 8871-5:2014 (Annex D) ISO 8871-5:2005
	Dye solution tightness	BS ISO 11040-4:2015 (Annex H) ISO 11040-4:2015(E)
	General techniques of Ultraviolet-visible quantitative analysis	ASTM E169-16
Operation Force (break loose and glide)	BS EN ISO 7886-1:2018 (Annex E) BS EN ISO 7886-1:1997 (Annex G) ISO 7886-1:1993	
Dose accuracy	BS EN ISO 11608-1:2015 ISO 11608-1:2014(E)	



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



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PLASTICS MATERIALS IN CONTACT WITH FOODSTUFFS	<u>Chemical Tests</u>	
	Overall migration into olive oil	BS EN 1186-2:2002 BS EN 1186-4:2002 BS EN 1186-6:2002 BS EN 1186-8:2002 BS EN 1186-13:2002 (Method A)
	Overall migration into aqueous simulants	BS EN 1186-3:2002 BS EN 1186-5:2002 BS EN 1186-7:2002 BS EN 1186-9:2002
	Overall migration into iso-octane and ethanol	BS EN 1186-14:2002 BS EN 1186-15:2002
	pH	BS 2924:Part 1:1983 (1993) BS ISO 6588-1:2012 BS ISO 6588-2:2012
	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



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<p>PACKAGING FOR THE TRANSPORT OF DANGEROUS GOODS</p> <p><u>UN Chapter 6.1 and Class 6.2 / 6.3 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 Class 6.1:</u> Operational Instructions for UN Test Stations issued by VCA under the authority of DfT</p> <p><u>For Class 6.2 / 6.3:</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 22233:1993 (withdrawn) ISO 2233:1986 (withdrawn) BS EN 24180:1993 (withdrawn) ISO 4180:1980 (withdrawn) ASTM D4332-14 ASTM F2825-18
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 24180:1993 (withdrawn) ISO 4180:1980 (withdrawn) BS EN 22248:1993 ISO 2248:1985 BS EN 24180:1993 (withdrawn) ISO 4180:1980 (withdrawn) ASTM D5276-92 ASTM D5276-98 (reapproved 2017) ASTM D5276-19 ASTM D5265-09 ASTM D6344-09 BS EN 22244:1993 (withdrawn) ISO 2244:1985 (withdrawn) BS EN 24180:1993 (withdrawn) ISO 4180:1980 (withdrawn) ASTM D880-86 (Methods A, B)



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COMPLETE, FILLED TRANSPORT PACKAGES (cont'd)	<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>Sequential Tests (based on above facilities) Vibration/drop/stack/compression/ etc</p>	<p>BS EN 22247:1993 (withdrawn) ISO 2247:1985 (withdrawn) BS EN 24180:1993 (withdrawn) ISO 4180:1980 (withdrawn) ASTM D999-91 (Method A2)</p> <p>BS EN 22872:1993 ISO 2872:1985 BS EN 24180:1993 (withdrawn) ISO 4180:1980 (withdrawn) ASTM D642-20</p> <p>BS EN 22876:1993 ISO 2876:1985 BS EN 24180:1993 (withdrawn) ISO 4180:1980 (withdrawn)</p> <p>BS EN 24180:1993 (withdrawn) ISO 4180:1980 (withdrawn)</p> <p>BS EN 28768:1993 ISO 8768:1986 BS EN 24180:1993 (withdrawn) ISO 4180:1980 (withdrawn)</p> <p>ASTM D6653M-13</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 4AB:2009 6-AMAZON.COM-SIOC 2018 6-AMAZON.COM OverBoxing 2018 7D:2007</p>



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COMPLETE, FILLED TRANSPORT PACKAGES (cont'd)	<p><u>Performance Tests</u> (cont'd)</p> <p>Sequential Tests (based on above facilities) Vibration/drop/stack/compression/ etc (cont'd)</p>	<p>Documented In-House Method TM 001:Issue 3:September 2001 ASTM D4169-05 ASTM D4169-08 ASTM D4169-09 ASTM D4169-14 ASTM D4169-16 ASTM D7386-08 ASTM D7386-12 ASTM D7386-16 ASTM D6179-20</p>
PACKAGING, PACKAGED ITEMS, GENERAL EQUIPMENT, ELECTRO-MECHANICAL ASSEMBLIES, NON-EXPLOSIVE STORES	<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>BS EN 60068-2-6:2008 BS EN 60068-2-64:1995 ASTM D999-08 (reapproved 2015) ASTM D3580-95 (reapproved 2010) ASTM D4169-05, -08, -09, -14, -16 ASTM D4728-06 ASTM D4728-17 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</u> (cont'd)	<u>International Civil Aviation Organization (ICAO), Durability of Machine Readable Passports, Version 3.2 30.8.2006</u>
	<u>Test Sequences</u>	
	Sheet binding sequence	Section 7.3
	Storage climate sequence	Section 7.4
	Operational climate sequence	Section 7.5
	Impact sequence	Section 7.6
	Back pocket sequence	Section 7.7
	Torsion fatigue sequence	Section 7.8
	Delamination sequence	Section 7.9
	Bending fatigue sequence	Section 7.10
	Thermal cycling sequence	Section 7.11
	Colour fastness sequence	Section 7.12
	Resistance to chemicals sequence	Section 7.13
	Pen sequence	Section 7.14
	Data-page abrasion sequence	Section 7.15
	X-ray sequence (subcontracted)	Section 7.16
	<u>Stress Methods</u>	<u>BS ISO/IEC 18745-1:2018</u>
	Conditioning stress method	Section 8.1
	Thermal cycling stress method	Section 8.2
	Storage temperature stress method	Section 8.3
Operational climate stress method	Section 8.4	
Impact stress method	Section 8.5	
Book bend stress method (back pocket)	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</u> (cont'd) <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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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		