

# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

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



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ISO/IEC 17025:2005

### Smithers Pira (part of Smithers Rapra and Smithers Pira Ltd)

Issue No: 052

Issue date: 09 March 2018

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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 conditions)
	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 conditions)
	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 536:2012
Grammage of Components	BS ISO 3039:2010	



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PAPER and BOARD (cont'd)	<u>Physical Tests</u> (cont'd)	
	Methylene Blue Penetration	BS 6254:1989 (1994) BS 6255:1989 (1994) BS 6256:1989 (1994)
	Moisture Content	BS EN ISO 287:2009
	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 2493-2:2011 TAPPI T451 cm-84
	Tear Strength (Internal)	BS EN ISO 1974:2012
	Tensile Strength and Stretch, and Tensile Energy Absorption (TEA)	ASTM D828-97(2002) 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)
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
	Water Absorbency (time & capacity)	BS EN ISO 12625-8:2010



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FILMS & LAMINATES, and BOTTLES & CONTAINERS	<u>Physical Tests</u> (cont'd)	
	Moisture Vapour Transmission Rates	ASTM F1249-13
FLEXIBLE SHEET MATERIAL USED FOR PACKAGING	Oxygen Transmission Rates	ASTM D3985-05 (2010) ASTM F1927-14 ASTM F1307-14
	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 1183-1:2012 (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)



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PLASTIC FILMS & SHEETING (cont'd)	<u>Physical Tests</u> (cont'd)	
	Tensile Strength, Elongation and Elastic Modulus (Films)	ASTM D882-12 BS EN ISO 527-1:2012 (General Principles) BS EN ISO 527-3:1995 BS 2782-3:1977 Methods 326A, 326B, and 326C
PACKAGING AND PACKAGING SYSTEMS	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 (W1182, issue 3).
	Container Closure Seal Integrity	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 E169-04 (reapproved 2014)
	Operation Force (break loose and glide)	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>Uncoated non-woven materials of polyolefines - Requirements and Test Methods</p> <p>Adhesive coated non-woven materials of polyolefines - Requirements and Test Methods</p>	<p>BS EN ISO 11607-1:2009 + A1:2014 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 5:2009: 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> <p>BS EN 868:Part 9:2009: paras 4.3.1-7, 4.4</p> <p>BS EN 868:Part 10:2009: paras 4.3.1-7, 4.3.9-11, 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><u>Environmental Tests</u></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>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</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</p>



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<p>PLASTICS MATERIALS IN CONTACT WITH FOODSTUFFS</p>	<p><u>Chemical Tests</u></p> <p>Overall migration into olive oil</p> <p>Overall migration into aqueous simulants</p> <p>Overall migration into iso-octane and ethanol</p> <p>pH</p> <p>Chlorides and Sulphates</p>	<p>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)</p> <p>BS EN 1186-3:2002 BS EN 1186-5:2002 BS EN 1186-7:2002 BS EN 1186-9:2002</p> <p>BS EN 1186-14:2002 BS EN 1186-15:2002</p> <p>BS 2924:Part 1:1983 (1993) BS ISO 6588-1:2012 BS ISO 6588-2:2012</p> <p>BS 2924:Parts 3 and 4:1990 (1995) ISO 9197/1:1989 ISO 9198:1989</p>



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<p>PACKAGING FOR THE TRANSPORT OF DANGEROUS GOODS</p> <p><u>UN Chapter 6.1 and Class 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>For Class 6.1: Operational Instructions for UN Test Stations issued by VCA under the authority of DfT</p> <p>For Class 6.2: UN Recommendations on the Transport of Dangerous Goods (18<sup>th</sup> Edition)</p> <p>Operational Instructions for UN Test Stations issued by VCA under the authority of DfT</p>





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<p>PACKAGING FOR THE TRANSPORT OF DANGEROUS GOODS (cont'd)</p> <p><u>UN Chapter 6.6 Packagings</u></p> <p>Large Packagings Rigid Flexible</p>	<p><u>Performance Tests (cont'd)</u></p> <p>Drop tests</p> <p>Stack tests</p> <p>Top lift tests</p> <p>Bottom lift tests</p> <p><u>Conditioning for testing</u></p>	<p>UN Recommendations on the Transport of Dangerous Goods (18<sup>th</sup> Edition)</p>
<p>COMPLETE, FILLED TRANSPORT PACKAGES</p>	<p>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</p> <p><u>Performance Tests</u></p>	<p>BS EN 22233:1993 ISO 2233:1986 BS EN 24180:1993 ISO 4180:1980 ASTM D4332-89 ASTM D4332-14</p>
<p>COMPLETE, FILLED TRANSPORT PACKAGES</p>	<p>Stacking (static load) Max load: 5500 kg</p> <p>Vertical Impact (Drop test) Max height: 4.5 m Max mass: 2250 kg</p> <p>Horizontal Impact (Inclined plane) Max mass: 2000 kg Max impact velocity: 4.7 m/s</p>	<p>BS EN 22234:1993 ISO 2234:1985 BS EN 24180:1993 ISO 4180:1980</p> <p>BS EN 22248:1993 ISO 2248:1985 BS EN 24180:1993 ISO 4180:1980 ASTM D5276-92 ASTM D5265-09 ASTM D6344-09</p> <p>BS EN 22244:1993 ISO 2244:1985 BS EN 24180:1993 ISO 4180:1980 ASTM D880-86 (Methods A, B)</p>



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COMPLETE, FILLED TRANSPORT PACKAGES (cont'd)	<p><u>Performance Tests (cont'd)</u></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>Sequential Tests (based on above facilities) Vibration/drop/stack/compression/ etc</p>	<p>BS EN 22247:1993 ISO 2247:1985 BS EN 24180:1993 ISO 4180:1980 ASTM D999-91 (Method A2)</p> <p>BS EN 22872:1993 ISO 2872:1985 BS EN 24180:1993 ISO 4180:1980 ASTM D642-15</p> <p>BS EN 22876:1993 ISO 2876:1985 BS EN 24180:1993 ISO 4180:1980</p> <p>BS EN 24180:1993 ISO 4180:1980</p> <p>BS EN 28768:1993 ISO 8768:1986 BS EN 24180:1993 ISO 4180:1980</p> <p><u>ISTA Procedures</u></p> <p>1A:2014 1B: 2014 1C: 2014 1D: 2014 1E: 2014 1G: 2014 1H: 2014 2A:2011 2B:2011 2C:2011 3A:2008 3E:2009 3F:2008 3K 2011 4AB:2009 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 (cont'd)</u></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"> <li>- Sine, random, mixed mode</li> <li>- Ambient temperature</li> <li>- Vertical</li> </ul> <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"> <li>- Classical shock with half sine or trapezoidal pulse shapes</li> <li>- Ambient temperature</li> <li>- Vertical</li> </ul> <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 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</p> <p>BS EN 60068-2-6:2008 BS EN 60068-2-64:1995 ASTM D999-08 ASTM D3580-95 (reapproved 2010) ASTM D4169-05, -08, -09, -14, -16 ASTM D4728-06 ISTA Procs 1, 2, 3 Series, 5B, 7A-D</p> <p>BS EN 60068-2-27:1993 DEF STAN 00-35:1997:Test M3 MIL-STD 202:1995: Method 213 MIL-STD 810F:2001 Method 516.5 (Procs ii &amp; iii)</p>



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