

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p>10121</p> <p>Accredited to ISO/IEC 17025:2017</p>	<h3>Millbrook Proving Ground Ltd</h3>	
	<p>Issue No: 008 Issue date: 01 December 2021</p>	<p>Contact: Mr Alan Pennington Tel: +44 (0)1772 425483 Fax: +44 (0)1772 621466 E-Mail: alan.pennington@utac.com Website: www.utac.com</p>
<p>Aston Way Leyland Preston Lancashire PR26 7TZ</p>		
<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
AEROSPACE COMPONENTS, EQUIPMENT, MATERIALS AND STRUCTURES	<u>ENVIRONMENTAL TESTS</u> (non-explosive items)	
AGRICULTURAL EQUIPMENT	CLIMATIC Single Parameters	
COMPUTERS & PERIPHERALS	HIGH TEMPERATURE (Constant and cyclic)	BS EN 60068-2-2:2007 GM Specification GMW 14651 Clause 4.10 GM Specification GMW 14444 Clause 3.4.1
CONSTRUCTION PLANT AND EQUIPMENT	Max temp: + 120 °C Max chamber size: 3 m x 4 m x 6 m	
ELECTRICAL CABLES	LOW TEMPERATURE (Constant and cyclic)	BS EN 60068-2-1:2007 GM Specification GMW14109 Excluding 4.6.2
ELECTRICAL/ELECTRONIC PRODUCTS AND COMPONENTS	Min temp: - 40 °C Max chamber size: 3 m x 4 m x 6 m	
ELECTRO-MECHANICAL DEVICES	TEMPERATURE CHANGE (Thermal Shock) (Manual Transference Only)	BS EN 60068-2-14:2009
HYDRAULIC EQUIPMENT AND FITTINGS	Max temp: + 120 °C Min temp: - 40 °C Limiting chamber size: 1.0 m x 1.0 m x 1.0 m	
INSTRUMENTS: INDICATING/RECORDING		
MARINE EQUIPMENT MINING PLANT AND EQUIPMENT	HIGH HUMIDITY (Steady State)	BS EN 60068-2-78:2002 (superseded) IEC 60068-2-78:2001 (superseded)
MOTOR VEHICLES	Temp range: + 25 °C to + 55 °C Humidity range: 20 % to 98 % rh Max chamber size: 3 m x 4 m x 6 m	



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<p>Continued from Page 1</p> <p>MOTORS: ELECTRICAL AND HYDRAULIC</p> <p>PLASTICS AND PRODUCTS</p> <p>PRINTED CIRCUIT BOARDS</p> <p>STRUCTURES, COMPONENTS AND FITTINGS</p> <p>TELECOMMUNICATION EQUIPMENT</p>	<p><u>ENVIRONMENTAL TESTS</u> (non-explosive items) (cont'd)</p> <p>HIGH HUMIDITY (Cyclic)</p> <p>Temp range: + 25 °C to + 55 °C Humidity range: 20% to 98% rh Max chamber size: 3 m x 4 m x 6 m</p> <p><u>SAMPLE DEFORMATION</u></p> <p>GOM Tritop Photogrammetric evaluation</p> <p><u>INGRESS PROTECTION</u></p> <p>WATER</p> <p>IPX3 Protected against spraying water</p> <p>IPX4 Protected against splashing water</p> <p>IPX5 Protected against water jets</p> <p>IPX6 Protected against heavy seas</p> <p>IPX7 Protected against the effects of immersion</p> <p>IPX8 Protected against submersion</p>	<p>BS EN 60068-2-30:2005 GM Specification GMW 14444 Clause 3.4.1</p> <p>Documented In-House Procedure SEA018</p> <p>BS EN 60529:1992 +A2:2013</p>



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<p>As listed on Pages 1 & 2</p> <p>INTERNAL MATERIALS - AUTOMOTIVE, AEROSPACE, RAIL, MARINE, etc</p> <p>COATED PARTS, FASTENERS, BODY & WHITE SECTIONS</p> <p>TRIM SECTIONS</p>	<p><u>MATERIALS TESTING</u></p> <p>FLAMMABILITY <i>Polymeric Interior Materials Horizontal Test Method</i></p> <p>CROCKING TESTING Greyscale evaluation against either ISO105-A02 or AATCC scales</p> <p>SCRATCH RESISTANCE</p> <p>TABER ABRASION</p> <p>SCUFFING RESISTANCE</p> <p>PAINT ADHESION</p>	<p>Documented In-House Procedure TC 1200 008 based on the following; SAE J 369:May 2003 Rev ISO 3795:1989 BS AU 169a:1992 GM Specification GMW 3232 FMVSS 302:1991 NES M0094:2018 GSO 98/1988 VW TL1010-2008 Chinese GB8410-2006 BMW Group Std GS97038: 2005-07 DIN 75200:1980 Volvo VCS 5031.19 iss 3</p> <p>Documented In-House Procedure TC1200-006 based on ISO 105 X12:2016</p> <p>Documented In-House Procedure TC1200-005 based on Ford FLTM BN108-13 <i>Visual Examination Only</i></p> <p>Documented In-House Procedure TC1200-003 based on Ford FLTM BN 108-02, ASTM D 4060-07 and SAE J948</p> <p>Documented In-House Procedure TC1200 004 based on Ford FLTM BN 108-04 SAE J365:2012</p> <p>Documented In-House Procedure TC 1200 007 based on Ford FLTM BI 106-01 <i>Excluding Method A</i></p>



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As listed on Pages 1, 2 & 3	<p><u>MATERIALS TESTING</u> (cont'd)</p> <p>SALT SPRAY TESTING <i>Max chamber size: 1.0m x 1.0m x 2.0m</i></p> <p>Temp Range: 25 °C to 45 °C</p> <p>TENSILE TESTING 180° Peel Adhesion Strength Test <i>Tension loads up to 5kN</i></p>	<p>ASTM B117-16 (superseded) DIN 50 021-SS:1988 ISO 9227:2012 (superseded) TP JLR.52.252 Issue 01</p> <p>Documented In-House Procedure TC 1200 002 based on Ford FLTM BN 151-05</p>
<p>BODYSHELLS</p> <p>CENTRE CONSOLES</p> <p>COMPUTERS & PERIPHERALS</p> <p>ELECTRICAL CABLES</p> <p>ELECTRICAL EQUIPMENT</p> <p>GEAR ASSEMBLIES</p> <p>PAS EQUIPMENT</p> <p>PLASTICS AND PRODUCTS</p> <p>PRINTED CIRCUIT BOARDS</p> <p>RESONATORS/EXPANSION TANKS</p> <p>ROOF CONSOLES</p> <p>ROOF LINERS</p> <p>SIGNALLING EQUIPMENT</p>	<p><u>VIBRATION TESTS</u> (non-explosive items)</p> <p>DYNAMIC</p> <p>VIBRATION (electromagnetic) Sine, random, broadband random, swept sine, fixed sine dwell, sine- on-random, random-on-random - with slip table facility</p> <p>Ambient and with temperature</p> <p>Freq range: 3 to 2500 Hz Max peak thrust: 40 kN Max payload (vertical): 454 kg</p> <p>Max temp: + 120 °C Min temp: - 40 °C Chamber size: Bespoke size</p>	<p>BS EN 60068-2-6:2008 BS EN 60068-2-64:2008 (superseded) IEC 60068-2-64:2008 IEC 60068-2-6:2007</p>



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<p>As listed on Page 4 +</p> <p>STEERING ASSEMBLIES</p> <p>SUB-SEA CONNECTORS</p> <p>TELECOMMUNICATION EQUIPMENT</p> <p>TURBOCHARGERS</p>	<p><u>VIBRATION TESTS</u> (non-explosive items) (cont'd)</p> <p>SHOCK / BUMP</p> <p>Classical shock with half sine, initial and terminal peak sawtooth, trapezoidal, and rectangular pulse shape</p> <p>- Horizontal & Vertical half sine, sawtooth Max item mass: 454 kg</p> <p>Severity: 1 g to 40 g Duration: 1 ms to 70 ms (severity dependent)</p> <p>- ambient & with temperature (prefabricated enclosure) Max temp: + 120 °C Min temp: - 40 °C</p>	<p>BS EN 60068-2-27:2009 IEC 60068-2-27:2008</p>



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SEATS AND THEIR COMPONENTS	<p><u>SEAT PERFORMANCE TESTS</u></p> <p>OCCUPANT INGRESS/EGRESS</p> <p>Automated using purpose-built robots</p> <p>PRESSURE MAPPING</p> <p>AIRBAG DEPLOYMENT</p> <p>Temperature range: - 40 °C to + 125 °C</p> <p>PERFORMANCE CHECKS</p> <p>a) Manual Seats</p> <ul style="list-style-type: none"> - Force (Operating Efforts) - Displacement - Free Play - Co-ordinates (H-Point) using FARO arm <p>b) Powered Seats</p> <ul style="list-style-type: none"> - Current - - Co-ordinates (H-Point) using FARO arm <p>DURABILITY</p> <p>Manual & Powered Seats</p> <ul style="list-style-type: none"> - Track - Height - Recline - Lumbar - Head-rest - Tilt 	<p>Ford SDS ST-0035 JLR ST-7033 JLR ST-7044</p> <p>Documented In-House Procedure TC 1000 002</p> <p>Ford AA-0001, 0002, 0013, 0015, and 0034 Nissan 5-24</p> <p>Ford ST-0007, 0011 Nissan 5-4-1, 5-4-2, 5-4-3, 5-6-5. 5-14-1 JLR 08-7010 JLR ST-7015, 7023, 7026, 7027, 7046, 7052, 7058, 7099, 7120</p> <p>GM Specification GMW14109 Excluding 4.6.2</p> <p>Ford ST-. 0094</p> <p>Ford ST-0036, 0052, 0077, 0080, 0085, 0813 JLR ST-6037, 6039, 6051, 6052, 6055, 7033, 7036, 7042, 7043, 7044, 7081, 7082, 7085, 7106 Nissan 3-1-1, 3-1-2, 3-1-3, 3-7-1, 3-7-2, 3-13, 3-14, 3-15, 3-16, 3-17, 3-18</p>



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SEATS AND THEIR COMPONENTS (cont'd)	<p><u>SEAT PERFORMANCE TESTS</u> (cont'd)</p> <p>MECHANICAL FATIGUE</p> <p>Using purpose-built reaction frames, with sinusoidal, random, synthesised, and road load data control inputs Max force: 200 kN Max frequency: 50 Hz</p> <p>(force/stiffness dependent)</p> <p>TRIM</p> <p>Seat system material wear</p> <p>STRENGTH</p> <p>Static/low frequency (using purpose-built reaction frames)</p> <p>Temperature range: - 40 °C to + 125 °C (using standard or prefabricated chambers) Max single force: 250 kN</p> <p>Properties measured: displacement, mechanical strain, acceleration, pressure, force</p> <p>HEATED SEAT DURABILITY AND PERFORMANCE CHECKS</p> <p>Temperature range: - 40 °C to + 125 °C (using standard chambers)</p>	<p>Ford ST-0019</p> <p>Ford SDS Specs Nissan NDS Specs</p> <p>Ford ST-0020, 0021, 0086 JLR ST-7106, 7110</p> <p>JLR ST-7026</p>



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<p>AEROSPACE COMPONENTS, EQUIPMENT, MATERIALS AND STRUCTURES</p> <p>AGRICULTURAL EQUIPMENT</p> <p>COATED PARTS, FASTENERS BODY IN WHITE SECTIONS</p> <p>CONSTRUCTION PLANT AND EQUIPMENT</p> <p>ELECTRICAL/ELECTRONIC PRODUCTS AND THEIR COMPONENTS</p> <p>INSTRUMENTS: INDICATING AND RECORDING</p> <p>MARINE EQUIPMENT</p> <p>MINING PLANT & EQUIPMENT</p>	<p><u>DURABILITY TESTS</u></p> <p>STATIC TESTS</p> <p>Static/Low Frequency (Purpose Built Reaction frames) Ambient or high/low temperatures using either standard or prefabricated chambers</p> <p>Max specimen size: 20 m x 5 m x 5 m (L x W x H) Max Single Force: 250 kN (Hydraulic actuators) Max Temp: 120 °C Min Temp: - 40 °C</p> <p>Properties measured: Displacement, Mechanical Strain, Acceleration, Pressure, Force</p>	<p>Documented In-House Procedures (as agreed with customers)</p>

