

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 0042 Accredited to ISO/IEC 17025:2005	Abtest Ltd Issue No: 032 Issue date: 08 November 2019 <table border="1"> <tr> <td data-bbox="395 436 842 719"> Tregwilym Industrial Estate Rogerstone Newport Wales NP10 9YA </td><td data-bbox="842 436 1493 719"> Contact: Huw Jones Tel: +44 (0)1443 290021 Fax: +44 (0)1633 892770 E-Mail: enquiries@ttelectronics.com Website: www.ttelectronics.com </td></tr> </table> Testing performed at the above address only	Tregwilym Industrial Estate Rogerstone Newport Wales NP10 9YA	Contact: Huw Jones Tel: +44 (0)1443 290021 Fax: +44 (0)1633 892770 E-Mail: enquiries@ttelectronics.com Website: www.ttelectronics.com
Tregwilym Industrial Estate Rogerstone Newport Wales NP10 9YA	Contact: Huw Jones Tel: +44 (0)1443 290021 Fax: +44 (0)1633 892770 E-Mail: enquiries@ttelectronics.com Website: www.ttelectronics.com		

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
GENERAL NON-EXPLOSIVE MATERIALS AND EQUIPMENT including: AEROSPACE STRUCTURES, MATERIALS AND EQUIPMENT AGRICULTURAL EQUIPMENT COMPUTERS AND PERIPHERALS CONSTRUCTION PLANT, EQUIPMENT, PRODUCTS AND MATERIALS DOMESTICAL APPLIANCES ELECTRICAL/ELECTRONIC COMPONENTS, CONNECTORS AND PRODUCTS ELECTRO-MECHANICAL DEVICES HYDRAULIC EQUIPMENT AND FITTINGS MARINE EQUIPMENT MECHANICAL PRODUCTS AND PLANT MICRO-ELECTRONIC CIRCUITS AND COMPONENTS MINING COMPONENTS AND EQUIPMENT MOTOR VEHICLE COMPONENTS AND COMPONENTS OFFICE EQUIPMENT PRINTED CIRCUIT BOARDS AND ASSEMBLIES RADAR EQUIPMENT RADIO AND TV EQUIPMENT	ENVIRONMENTAL TESTS (non-explosive items) CLIMATIC Single Parameters HIGH TEMPERATURE Max temp: +300°C Max chamber size: 0.6 m x 0.6 m x 0.6 m LOW TEMPERATURE Min temp: -80°C Max chamber size: 0.4 m x 0.5 m x 0.7 m	BS EN 60068-2-2 : 2007 Test Bb BS EN 60068-2-2:1993 Tests Ba,Bb BS 2011:B:1977(1980) Tests Ba, Bb IEC 68-2-2:1974(1976) Tests Ba,Bb DEF STAN 00-35 Part 3 Issue 4 Test CL1 DEF STAN 07-55:1975 Test B1 MIL STD 202G :2002 Method 108A MIL-STD 202F:1980 Method 108A MIL STD 810G:2002 Method 501.5 MIL STD 810F:2000 Method 501.4 MIL-STD 810E:1989 Method 501.3 MIL-STD 1344A:1977 Method 1005.1 MIL-C 38999J 4.7.33.1 RTCA/DO-160 D / E & F Section 4 BS EN 60068-2-1: 2007 Test Ab BS EN 60068-2-1:1993 Tests Aa, Ab BS 2011:A:1977 & 1990 Tests Aa, Ab IEC 68-2-1:1990 Test Aa, Ab DEF STAN 07-55:1975 Test B4 MIL STD 810G:2002 Method 502.5 MIL STD 810F Method 502.4



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GENERAL NON-EXPLOSIVE MATERIALS AND EQUIPMENT including: (cont'd) SAFETY APPLIANCE AND EQUIPMENT SATELLITES AND SUB-ASSEMBLIES SECURITY DEVICES AND ALARMS STRUCTURES AND COMPONENTS TELECOMMUNICATION EQUIPMENT	ENVIRONMENTAL TESTS (non-explosive items) (cont'd) CLIMATIC Single Parameters (cont'd) LOW TEMPERATURE (cont'd) TEMPERATURE CHANGE (Thermal Shock) Max temp: +300°C Chamber size: 0.6 m x 0.6 m x 0.6 m Min temp: -80°C Chamber size: 0.4 m x 0.5 m x 0.7 m	MIL-STD 810E:1989 Method 502.3 MIL-C 38999J 4.7.39 RTCA/DO-160 D / E & F, Section 4 MIL STD 1344A:1977 Method 1002.2 DEF STAN 00-35 Part 3 Issue 4 Test CL4 BS EN 60068-2-14:2000 BS 2011:N:1985(1987) Tests Na, Nb, Nc IEC 68-2-14:1984 Tests Na, Nb, Nc DEF STAN 00-35 Part 3 Issue4 Test CL14 DEF STAN 07-55:1975 Test B14 MIL-STD 202F:1980 Method 107G MIL STD 810G:2008 Method 503.5 MIL STD 810F:2000 Method 503.4 MIL-STD 810E:1989 Method 503.3 MIL STD 883G Methods 1010.8,1011.9 MIL-STD 883D:1991 Methods 1010.7, 1011.9 MIL-STD 1344A:1977 Method 1003.1 MIL-C 38999J 4.7.4 RTCA/DO-160 D / E & F, Section 5 DEF STAN 00-35 Part 3, Issue 4 Test CL5 DEF STAN 07-55:1975 Test B5 MIL STD 202G:2002 Method 107G



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GENERAL NON-EXPLOSIVE MATERIALS AND EQUIPMENT including: (cont'd) As listed on Pages 1 and 2	ENVIRONMENTAL TESTS (non-explosive items) (cont'd) CLIMATIC Single Parameters (cont'd) HIGH HUMIDITY - steady state Temp range: +10°C to +100°C Humidity range: 10% rho 98% rh Limited from 5 °C to 80 °C dew point Max chamber size: 0.8 m x 0.8 m x 0.5 m HIGH HUMIDITY - cyclic Temp range: -25°C to +100°C Humidity range: 10% rh to 95% rh Max chamber size: 0.5 m x 0.5 m x 0.5 m	BS EN 60068-2-78 :2002 Test Cab IEC 60068-2-78 :2001 Test Cab BS EN 60068-2-56:1990 BS 2011:Ca:1977(1987) BS 2011:Cb:1990 IEC 68-2-3:1969 IEC 68-2-56:1988 DEF STAN 00-35 Part 3 Issue 4 Test CL7 DEF STAN 07-55:1975 Test B7 MIL-STD 202G:2002 Method 103B MIL-STD 202F:1980 Method 103B MIL-STD 1344A:1977 Method 1002.2 MIL-C 38999J 4.7.25 BS EN 60068-2-30:2005 BS EN 60068-2-30:1999 BS EN 60068-2-30:1981 IEC 60068-2-30 :1980 BS 2011:Db:1981 IEC 68-2-30:1980 DEF STAN 07-55:1975 Tests B6, B8 MIL-STD 202G:2002 Method 106G MIL-STD 202F:1980 Method 106F MIL-STD 810F:2002 Method 507.4 MIL-STD 810E:1989 Method 507.3 MIL-STD 883D:1991 Method 1004.7 MIL-STD 1344A:1977 Method 1002.2 MIL-C 38999J 4.7.25 RTCA/DO-160 D, E & F Section 6 MIL-STD 883G: 2006 Method 1004.7 BS EN 60068-2-38:1999 Test Z/AD



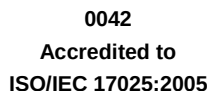
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GENERAL NON-EXPLOSIVE MATERIALS AND EQUIPMENT including: (cont'd) As listed on Pages 1 and 2	ENVIRONMENTAL TESTS (non-explosive items) (cont'd) CLIMATIC Single Parameters (cont'd) LOW PRESSURE Including Pressure Change and Temperature Min pressure: 6 mbar Max chamber size: 0.7 m x 0.6 m x 0.6 m DUST, SAND Chamber size: 0.9 m x 0.9 m x 0.9 m ICING WATER Drip, Spray, Splash, Rain Plan area: 0.45 m x 0.30 m x 0.15 m	 BS EN 60068-2-13:1999 BS 2011:M:1984 IEC 68-2-13:1983 MIL-STD 202G:2002 Method 105C MIL-STD 202F:1980 Method 105C MIL STD 810 G:2008 MIL STD 202F:2000 Method 500.4 MIL STD 810E:1989 Method 500.3 MIL-STD 883G:2006 Method 1001 MIL-STD 883F:2004 Method 1001 MIL-STD 883E:1996 Method 1001 MIL-STD 883D:1991 Method 1001 MIL-STD 1344A:1977 Method 1004.1 MIL-C 38999J 4.7.8 BS EN 60529:1991 & 1992 DEF STAN 00-35 Part 3 Issue 4 Test CL25 DEF STAN 07-55:1975 Test D1 RTCA/DO-160 D to F, Section 24 Cat A BS EN 60068-2-18:2001 IEC 60068-2-18:2000 BS 2011:R:1990 IEC 68-2-18: BS 3G100:Section 3:Sub-Section 3.11:Grade A and B DEF STAN 07-55:1975 Tests D2, D3, D4, D5 DEF STAN 00-35 Section 3 Issue 4 Tests CL 26, CL27, CL28, CL 29



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Assessment Manager: BM

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As listed on Pages 1 and 2	CLIMATIC Single Parameters (cont'd)	
	Immersion	BS EN 60529:1991 MIL-STD 202G:2002 MIL-STD 202F:1980 Method 104A
	Tank size: 0.16 m deep x 0.19 m diameter	MIL-STD 810G:2002 Test Method 506.5 MIL-STD 810F:2000 Test Method 506.4
	Fine Mist	MIL-STD 810E:1989, proc 2 only Method 506.3 RTCA/DO-160 D, E & F Section 10
	Chamber size: 0.9 m x 1.3 m x 0.8 m	
	SALT MIST	BS EN 60068-2-11:1999 Test Ka
	Max chamber size: 0.9 m x 1.3 m x 0.8 m	BS 2011:Ka:1982 IEC 68-2-11:1981 DEF STAN 07-55:1975 Test C5 DEF STAN 00-35 Part 3 Issue 4 Test CN 2
	SALT CORROSION	BS EN 60068-2-52:1996 Test Kb BS 2011:Kb:1987 IEC 68-2-52:1984 DEF-STAN 00-35 Part 3 Issue 4 Test CN5 DEF-STAN 00-35 Part 3 Issue 4 Test CN2 DEF STAN 07-55:1975 Test C2 ASTM B117:2011 ASTM B117:2003 ASTM B117:1994 MIL-STD 202G:2002 Method 101E MIL-STD 202F:1980 Method 101D MIL-STD 810G:2008 Method 509.5 MIL-STD 810F:2002 Method 509.4 MIL-STD 810E:1989 Method 509.3 MIL-STD 883G 2006 Method 1009.8 MIL-STD 883F 2004 Method 1009.8 MIL-STD 883E 1994 Method 1009.8
	Max chamber size: 0.9 m x 1.3 m x 0.8 m	



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GENERAL NON-EXPLOSIVE MATERIALS AND EQUIPMENT including: (cont'd) As listed on Pages 1 and 2	ENVIRONMENTAL TESTS (non-explosive items) (cont'd) CLIMATIC Single Parameters (cont'd) SALT CORROSION (cont'd) MODIFIED SALT SPRAY (FOG) – SO₂ ACID CORROSION Max Chamber size: 0.9 m x 1.3 m x 0.8 m INDUSTRIAL ATMOSPHERE Sulphur Dioxide – App A: gas injection only Hydrogen Sulphide Flowing mixed gases Chlorine, Sulphur Dioxide, Hydrogen Sulphite, Nitrogen Dioxide Max chamber size: 0.8 m x 0.5 m x 0.5 m TEMPERATURE/HUMIDITY/LOW PRESSURE Typical chamber size: 0.6 m x 0.6 m x 0.6 m	MIL-STD 883D:1991 Method 1009.8 MIL-STD 1344A:1977 Method 1001.1 MIL-C 38999J 4.7.12.1 RTCA/DO-160 D to F Section 14 ASTM G85-09, Annex A4 DEF-STAN 00-35 Part 3 Issue 4 Test CN3 DEF STAN 00-35:1995 Part 3:Test CN3 BS EN 60068-2-43:2003, Test Kc. BS 2011:Kc:1977 (SO₂) IEC 68-2-42:1982(SO₂) BS EN 60068-2-42:2003, Test Kd. BS 2011:Kd:1977 (H₂S) IEC 68-2-43:1976(H₂S) BS 7561:1992 BS EN 60068-2-60:1996 Methods 1, 2, 3 and 4 IEC 68-2-60:1995 Methods 1, 2, 3 and 4 Test procedures 1 and 2 BT specification D22116:1990 BS EN ISO 9227:2006 BS EN 60068-2-41:1999 BS 2011:Z/AD:1977 BS EN 60068-2-61:1994 BS 2011:Z/ABDM:1983 BS 2011:Z:BM:1977(1986) IEC 68-2-41:1976



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GENERAL NON-EXPLOSIVE MATERIALS AND EQUIPMENT including: (cont'd) As listed on Pages 1 and 2	ENVIRONMENTAL TESTS (non-explosive items) (cont'd) BUMP/TEMPERATURE/HUMIDITY Vibration/Shock/Bump (dynamic range as above) Temp range: -40°C to +125°C Humidity range: 70% rh to 98% rh Chamber size: 0.6 m x 0.6 m x 0.6 m Highly Accelerated Life Test (HALT) and Highly Accelerated Stress Screening (HASS) Analysed frequency range: 1 Hz to 10 kHz Temp range: -80°C to +200°C Max rate of change: 60°C/min Max item mass: 100 kg Max item size: 0.6 m x 0.6 m x 0.6 m MISCELLANEOUS RESISTANCE TO SOLVENTS AND CONTAMINATING FLUIDS Solvents and fluids as specified	Abtest test procedure TP064 iss 2 BS EN 60068-2-45:1993 BS 2011:XA:1981 IEC 68-2-45:1980 DEF-STAN 00-35 Part 3 Issue 4 Test CN4 DEF STAN 07-55:1975 Test C4 RTCA/DO-160D to F Section 11 MIL-STD 202G:2002 Method 215K

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GENERAL NON-EXPLOSIVE MATERIALS AND EQUIPMENT including: (cont'd) As listed on Pages 1 and 2	ENVIRONMENTAL TESTS (non-explosive items) (cont'd) FUNCTIONAL TESTS/ANCILLARY MEASUREMENTS DC VOLTAGE 10 μ V to 12 kV AC VOLTAGE 10 μ V to 6 kV DC CURRENT 10 μ A to 2 kA AC CURRENT 10 μ A to 2 kA DC RESISTANCE 1 $\mu\Omega$ to 1 T Ω CAPACITANCE 10 pF to 100 mF INDUCTANCE 1 μ H to 100 H FREQUENCY 1 Hz to 1.3 GHz LINEAR 1 μ m to 200 mm MASS 10 mg to 120 kg FORCE 0.05 N to 12 kN (tensile) 0.05 N to 1.2 kN (compression) RUBBER HARDNESS 30 IRHD to 100 IRHD	Documented In-House Procedures (as agreed with client) MP 001:Issue 1:1997 MP 002:Issue 1:1997 MP 003:Issue 1:1997 MP 004:Issue 1:1997 MP 005:Issue 1:1997 MP 006:Issue 1:1997 MP 007:Issue 1:1997 MP 008:Issue 1:1997 MP 014:Issue 1:1997 MP 015:Issue 1:1997 MP 016:Issue 1:1997 MP 019:Issue 2:2007
END		