

# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

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

 <p><b>2645</b></p> <p>Accredited to <b>ISO/IEC 17025:2017</b></p>	<h3>Alphatech Limited</h3> <p><b>Issue No: 019    Issue date: 17 May 2021</b></p>	
	<p><b>Green House</b> Homefield Road Industrial Estate Haverhill Suffolk CB9 8QP</p>	<p><b>Contact: Mr Paul Lee</b> Tel: +44 (0)1440 714709 Fax: +44 (0)1440 714706 E-Mail: info@alphatech.co.uk Website: www.alphatech.co.uk</p>
<p><b>Testing performed at the above address only</b></p>		

### DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
AEROSPACE COMPONENTS AND EQUIPMENT	<u>ENVIRONMENTAL TESTS</u>  (non explosive items)	
COMPUTERS AND PERIPHERALS	<u>DYNAMIC</u>	
ELECTRICAL/ELECTRONIC PRODUCTS AND COMPONENTS	Vibration - Sinusoidal  Freq range: 2 to 2000 Hz	BS 2011:Fc:1983(1986) BS EN 60068-2-6:1996 BS EN 60068-2-6:2008 BS EN 60068-2-50:200 BS EN 60068-2-51:2000
ELECTRICAL/ELECTRONIC CONNECTORS	Peak thrust: 40 kN	DEF STAN 00-035: Part 3: Issue 3, Issue 4, Issue 5: Test M1
ELECTRO-MECHANICAL DEVICES	Max displacement: 76 mm pk-pk	ETSI EN 300 019-2-1:V2.1.2,V2.3.1 ETSI EN 300 019-2-2:V2.1.2,V2.4.1 ETSI EN 300 019-2-3:V2.2.2,V2.4.1 ETSI EN 300 019-2-4:V2.2.2,V2.5.1 ETSI EN 300 019-2-5:V3.0.0 ETSI EN 300 019-2-6:V3.0.0 ETSI EN 300 019-2-7:V3.0.1 ETSI EN 300 019-2-8:V2.1.2,V2.1.8
MARINE EQUIPMENT	Temp range: Ambient	IEC 68-2-6:1995 IEC 68-2-50:1983 IEC 68-2-51:1983
MEDICAL EQUIPMENT	Peak thrust: 8.9 kN Max displacement: 50 mm pk-pk	MIL-STD-167-1A:2005 MIL-STD-202F, G: Methods 201A, 204D
MICRO-ELECTRONIC CIRCUITS AND COMPONENTS	Temp range: -40 °C to +100 °C (max ramp rate 10 °C/min) Chamber size:	MIL-STD-202H: Methods 201, 204 MIL-STD-750D, E: Methods 2046.2, 2051.2 2056, 2057.2 MIL-STD-750-2A-cn3: Methods 2046.2 2051.2056.3, 2057.4 MIL-STD-810E:1989:Method 514.4 MIL-STD-810F:2000:Method 514.5 MIL-STD-810G:2008:Method 514.6 MIL-STD-810H:2008:Method 514.8
MOTOR VEHICLE ACCESSORIES AND COMPONENTS		
RADAR EQUIPMENT		
RADIO AND TELEVISION EQUIPMENT	0.75 m x 0.65 m x 0.65 m	
SATELLITES AND SUB-ASSEMBLIES		
SECURITY DEVICES AND ALARMS		



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As listed on Page 1  TELECOMMUNICATIONS EQUIPMENT	<u>ENVIRONMENTAL TESTS</u> (cont'd)  (non explosive items) (cont'd)  <u>DYNAMIC</u> (cont'd)  Vibration - Sinusoidal (cont'd)	MIL-STD-883F, G, H, J, K: Methods 2005.2, 2006.1, 2007.3 MIL-STD-1344A:1977: Method 2005.1 RTCA/DO-160D, E, F, G: Section 8 UN Reg: ST/SG/AC.10/11/Rev.4, 5, 6, 7: Test T3 BS EN 50125-2:2003
	Vibration - Random  Freq range: 2 - 2000 Hz RMS thrust: 40 kN  Max displacement: 76 mm pk-pk  Temp range: Ambient  Axes: Vertical only  Freq range: 2 - 2000 Hz RMS thrust: 8.9 kN Max displacement: ± 25.4 mm Temp range: -40 °C to +100 °C (max ramp rate 10 °C/min) Chamber size: 0.75 m x 0.65 m x 0.65 m	BS 2011:Fd:1973(1984) Tests Fd, Fda, Fdb and Fdc BS EN 60068-2-64: 1995, 2008, 2008+A1 2019 BS EN 61373:1999, 2010 DEF STAN 00-035 Part 3 Issue 3, Issue 4, Issue 5: Test M1 ETSI EN 300 019-2-1:V2.1.2,V2.3.1 ETSI EN 300 019-2-2:V2.1.2,V2.4.1 ETSI EN 300 019-2-3:V2.2.2,V2.4.1 ETSI EN 300 019-2-4:V2.2.2,V2.5.1 ETSI EN 300 019-2-5:V3.0.0 ETSI EN 300 019-2-6:V3.0.0 ETSI EN 300 019-2-7:V3.0.1 ETSI EN 300 019-2-8:V2.1.2,V2.1.8 IEC 68-2-34:1973 IEC 68-2-37:1973 MIL-STD-202F, G:Method 214A MIL-STD-202H, G:Method 214 MIL-STD-810E: Method 514.4 MIL-STD-810F: Method 514.5 MIL-STD-810G: Method 514.6 MIL-STD-810H: Method 514.8 MIL-STD-883F, G, H, J, K: Method 2026 RTCA/DO-160D, E, F, G Section 8 BS EN 50125-2:2003



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As listed on Page 1	<p><u>ENVIRONMENTAL TESTS</u> (cont'd)</p> <p>(non explosive items) (cont'd)</p> <p><u>DYNAMIC</u> (cont'd)</p> <p>Shock (vibrator induced, and in vertical axis only)</p> <p>(Half sine, trapezoidal)</p> <p>Severity: 1 g to 100 g Duration: 0.2 ms to 100 ms (severity dependent) Max mass: 500 kg Temp range: Ambient</p> <p>(Terminal peak saw tooth) Severity: 1 g to 75 g Duration: 1 ms to 100 ms (severity dependent) Max mass: 500 kg</p> <p>Temp range: Ambient</p> <p>(Half sine, sawtooth, trapezoidal)</p> <p>Max severity: 50 g Max mass: 75 kg Temp range: -40 °C to +100 °C Chamber size: 0.75 m x 0.65 m x 0.65 m</p> <p>Shock (MTS System)</p> <p>(Half sine)</p> <p>Max severity: 200 g Max duration: 16 ms (severity dependent) Max mass: 500 kg Temp range: Ambient</p>	<p>BS 2011: Ea:1988 BS EN 60068-2-27:1993, 2009 BS EN 61373:1999, 2010 DEF STAN 00-035:Part 3: Issue3, Issue 4, Issue 5: Test M3 ETSI EN 300 019-2-1:V2.1.2,V2.3.1 ETSI EN 300 019-2-2:V2.1.2,V2.4.1 ETSI EN 300 019-2-3:V2.2.2,V2.4.1 ETSI EN 300 019-2-4:V2.2.2,V2.5.1 ETSI EN 300 019-2-5:V3.0.0 ETSI EN 300 019-2-6:V3.0.0 ETSI EN 300 019-2-7:V3.0.1 ETSI EN 300 019-2-8:V2.1.2,V2.1.8 IEC 68-2-27:1987 MIL-STD-202F, G: Method 213B MIL-STD-202H: Method 213 MIL-STD-750D, E: Method 2016.2 MIL-STD-750-2A-CN3: Method 2016.2 MIL-STD-810E: Method 516.4 MIL-STD-810F: Method 516.5 MIL-STD-810G: Method 516.6 MIL-STD-810H: Method 516.8 MIL-STD-1344A:1997 Method 2004.1 RTCA/DO-160D, E, F, G: Section 7 UN Reg: ST/SG/AC. 10/11/Rev. 4, 5, 6, 7: Test T.4</p> <p>BS EN 50125-2:2003</p>



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As listed on Page 1	<u>ENVIRONMENTAL TESTS</u> (cont'd)  (non explosive items) (cont'd)  <u>DYNAMIC</u> (cont'd)  Bump (vibrator induced, and in vertical axis only)  Severity: 1 g to 100 g  Duration: 1 ms to 50 ms (severity dependent)  Max mass: 500 kg Temp range: Ambient  Max severity: 50 g Max mass: 75 kg Temp range: -40 °C to +100 °C Chamber size: 0.75 m x 0.65 m x 0.65 m	BS 2011:Ec:1977(1983) BS EN 60068-2-29:1993 DEF STAN 00-35:Part 3: Issue 3 Test M12 DEF STAN 00-035:Part 3: Issue 4, Issue5: Test M3 ETSI EN 300 019-2-2:V2.1.2 ETSI EN 300 019-2-3:V2.2.2 ETSI EN 300 019-2-4:V2.2.2 ETSI EN 300 019-2-5:V3.0.0 ETSI EN 300 019-2-6:V3.0.0 ETSI EN 300 019-2-7:V3.0.1 ETSI EN 300 019-2-8:V2.1.2 IEC 68-2-29:1987
	Rough Handling Shock  Drop and Topple  Max item mass: 45 kg Max item size: 1 m x 1 m x 1 m	BS 2011:Ec:1977 BS EN 60068-2-31:1993, 2008 DEF STAN 00-035:Part3:Issue 3, Issue 4, Issue 5:Test M4 DEF STAN 07-55:1975:Test A4 IEC 68-2-31:1969
	Free Fall  Max item mass: 45 kg Max item size: 0.5 m x 0.5 m x 0.5 m Max drop height: 1.5 m	BS 2011:Ed:1992:Procedure 1 BS EN 60068-2-31: 2008 Excluding repeated free fall procedure 2 BS EN 60068-2-32:1993 DEF STAN 00-035:Part3:Issue 3, Issue 4, Issue 5:Test M5 Vertical Impact Only DEF STAN 07-55:1975:Test A9 IEC 68-2-32:1975 MIL-STD-810G:Method 516.6 Proc IV MIL-STD-810H:Method 516.8 Proc IV



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As listed on Page 1	<p><u>ENVIRONMENTAL TESTS</u> (cont'd) (non explosive items) (cont'd)</p> <p><u>CLIMATIC</u></p> <p>High Temperature (Constant and cyclic)  Max temp: +180 °C</p> <p>Max chamber size: 0.85 m x 0.83 m x 0.85 m</p> <p>Max temp +80 °C Max chamber size: 1.20 m x 1.10 m x 2.40 m</p>	<p>BS 2011:B:1977(1980) BS EN 60068-2-2:1993, 2007 Tests Ba, Bb, Bd DEF STAN 00-35:Part3: Issue 3: Test CL1 DEF STAN 00-035:Part3: Issue 4, Issue 5: Test CL2 ETSI EN 300 019-2-1:V2.1.2,V2.3.1 ETSI EN 300 019-2-2:V2.1.2,V2.4.1 ETSI EN 300 019-2-3:V2.2.2,V2.4.1 ETSI EN 300 019-2-4:V2.2.2,V2.5.1 ETSI EN 300 019-2-5:V3.0.0 ETSI EN 300 019-2-6:V3.0.0 ETSI EN 300 019-2-7:V3.0.1 ETSI EN 300 019-2-8:V2.1.2,V2.1.8 IEC 68-2-2: 1974 (1976) IEC 60068-2-2:1974 MIL-STD-810F:Method 501.4 MIL-STD-810G:Method 501.5 MIL-STD-810H:Method 501.7</p>
	<p>Low Temperature (Constant and cyclic)  Min temp: -70 °C</p> <p>Max chamber: 0.85 m x 0.83 m x 085 m</p> <p>Min temp: -60 °C Max chamber: 1.20 m x 1.10 m x 2.40 m</p>	<p>BS 2011:A:1990 BS EN 60068-2-1:1993, 2007 Tests Aa, Ab, Ad DEF STAN 00-35:Part3: Issue 3: Test CL4 &amp; CL5 DEF STAN 00-035:Part3: Issue 4, Issue 5: Test CL5 ETSI EN 300 019-2-1:V2.1.2,V2.3.1 ETSI EN 300 019-2-2:V2.1.2,V2.4.1 ETSI EN 300 019-2-3:V2.2.2,V2.4.1 ETSI EN 300 019-2-4:V2.2.2,V2.5.1 ETSI EN 300 019-2-5:V3.0.0 ETSI EN 300 019-2-6:V3.0.0 ETSI EN 300 019-2-7:V3.0.1 ETSI EN 300 019-2-8:V2.1.2,V2.1.8 IEC 68-2-1: 1990 IEC 60068-2-1:1993 MIL-STD-810F:Method 502.4 MIL-STD-810G:Method 502.5 MIL-STD-810H:Method 502.7</p>



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As listed on Page 1	<u>ENVIRONMENTAL TESTS</u> (cont'd)  (non explosive items) (cont'd)  <u>CLIMATIC</u> (cont'd)  Change of Temperature (Thermal Shock)  Automatic transference Rapid - Air to Air  Temp range: -70 °C to +200 °C Max chamber: 0.47 m x 0.64 m x 0.4 m  Gradual - Single Chamber Temp range: -70 °C to +180 °C Max rate of change: 20 °C/min Max chamber: 0.57 m x 0.6 m x 0.75 m	BS 2011:N:1985(1987) Tests Na, Bb BS EN 60068-2-14:2009 Tests Na, Nb DEF STAN 00-035: Part 3: Issue 3: Issue 4: Issue 5: Test CL14 ETSI EN 300 019-2-1:V2.1.2,V2.3.1 ETSI EN 300 019-2-2:V2.1.2,V2.4.1 ETSI EN 300 019-2-3:V2.2.2,V2.4.1 ETSI EN 300 019-2-4:V2.2.2,V2.5.1 ETSI EN 300 019-2-5:V3.0.0 ETSI EN 300 019-2-6:V3.0.0 ETSI EN 300 019-2-7:V3.0.1 ETSI EN 300 019-2-8:V2.1.2,V2.1.8 IEC 68-2-14:1984 MIL-STD-810F:Method 503.4 MIL-STD-810G:Method 503.5 MIL-STD-810H:Method 503.7 RTCA/DO-160D, E, F, G: Section 5 UN Reg ST/SG/AC 10/11/Rev4, 5, 6, 7: Test T.2
	High Humidity (Constant and cyclic)  Humidity/temperature ranges: 15% RH to 95% RH 20 °C to 85 °C  Max chamber size: 0.85 m x 0.83 m x 0.85 m  Humidity/temperature ranges: 15% RH to 95% RH 20 °C to 60 °C	BS 2011:Ca:1977(1987) BS 2011:Cb:1990 BS 2011:Db:1981(1987) BS EN 60068-2-30:1999, 2005 BS EN 60068-2-78:2002, 2013 DEF STAN 00-35:Part 3: Issue 3: Test CL7 DEF STAN 00-035:Part 3: Issue 4, Issue 5: Test CL6 ETSI EN 300 019-2-1:V2.1.2,V2.3.1 ETSI EN 300 019-2-2:V2.1.2,V2.4.1 ETSI EN 300 019-2-3:V2.2.2,V2.4.1 ETSI EN 300 019-2-4:V2.2.2,V2.5.1 ETSI EN 300 019-2-5:V3.0.0 ETSI EN 300 019-2-6:V3.0.0 ETSI EN 300 019-2-7:V3.0.1 ETSI EN 300 019-2-8:V2.1.2,V2.1.8 IEC-68-2-3: 1969 IEC-68-2-30: 1980



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As listed on Page 1	<u>ENVIRONMENTAL TESTS</u> (cont'd)  (non explosive items) (cont'd)  <u>CLIMATIC</u> ( High Humidity cont'd)  Max chamber size: 1.2 m x 1.10 m x 2.4 m	IEC-68-2-56: 1988 MIL-STD-810F:Method 507.4 MIL-STD-810G:Method 507.5 MIL-STD-810H:Method 507.6 RTCA/DO-160D, E, F, G: Section 6
	Salt Spray Corrosion   Chamber size: 1.46 m x 1.04 m x 0.72 m	ASTM B117-03, 07, 09, 11, 16, 18, 19 BS EN ISO 9227:2006, 2012, 2017: NSS Test BS EN 60068-2-11:1999: Test Ka BS EN 60068-2-52:1996, 2018 DEF STAN 00-35:Part 3 Issue 3: Test CN2 DEF STAN 00-035:Part 3 Issue 4, Issue 5: Test CN2 Salt Atmosphere and Mist, Fog and low cloud only MIL STD 810F:Method 509.4 MIL STD 810G:Method 509.5 MIL STD 810H:Method 509.7 RTCA/DO-160D, E, F, G:Section 14
	Pressure, Low (Altitude)  Min pressure : 4.49 kPa (equivalent altitude 70,000 ft) Max chamber size: 0.3 m diameter x 0.5 m deep	BS 2011:M:1984 BS EN 60068-2-13:1999 IEC 68-2-13:1983 MIL-STD-202F, G : Method 105C MIL-STD-750D: Method 1001.1 MIL-STD-750E: Method 1001.2 MIL-STD-810E:Method 500.3 MIL-STD-810F:Method 500.4 MIL-STD-810G:Method 500.5 MIL-STD-810H:Method 500.6 MIL-STD-883F, G, H, J, K: Method 1001 UN Reg: ST/SG/AC.10/11/Rev4, 5, 6, 7: Test T1



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As listed on Page 1	<p><u>Ingress Protection Tests</u></p> <p>IP1X Protected against solid objects &gt;50 mm diameter</p> <p>IP2X Protected against solid objects &gt;12.5 mm diameter</p> <p>IP3X Protected against solid objects &gt;2.5 mm diameter</p> <p>IP4X Protected against solid objects &gt;1.0 mm diameter</p> <p>IP5X Dust protected</p> <p>IP6X Dust tight</p> <p>IPX1 Protected against dripping water</p> <p>IPX2 Protected against dripping water when tilted up to 15 ° (angle)</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 powerful water jets</p> <p>IPX7 Protected against the effects of immersion</p> <p>IPX8 Protected against submersion</p> <p>IPX9K Protected against water with high pressure/steam jet cleaning</p>	<p>BS EN 60529:1992+A2:2013 BS EN 60529:1992(2000) BS ISO 20653 : 2006, 2013 DIN 40 050 Part 9 (1993) EN 60529:1991 IEC 60529:1989</p> <p>DIN 40 050 Part 9 (1993) only BS ISO 20653 : 2006, 2013 only</p>





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As listed on Page 1	<p><u>Highly Accelerated Life Testing (HALT)</u></p> <p>Using Qualmark Typhoon 2.5 Halt Chamber</p> <p>Analysed Frequency Range: 10 Hz to 5 kHz</p> <p>Max item mass: 220 kg</p> <p>Max item size: 500 mm cube</p> <p>Temperature Range: -90°C to +200°C</p> <p>Max rate of change: 60°C/min</p> <p><u>Highly Accelerated Stress Screen (HASS)</u></p> <p>Using Qualmark Typhoon 2.5 Halt Chamber</p> <p>Analysed Frequency Range: 10 Hz to 5 kHz</p> <p>Max item mass: 220 kg</p> <p>Max item size: 500 mm cube</p> <p>Temperature Range: -90°C to +200°C</p>	<p>Documented In-House Procedure AOI-24:2014</p> <p>Documented In-House Procedure AOI-24:2014</p>
	END	