



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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ELECTRICAL

Valid To: November 30, 2019

Certificate Number: 2765.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location listed above, *as well as the four (4) satellite laboratory locations listed below*, to perform the following Product Safety, EMC, and Telecommunication tests:

Test:

Test Method(s) ²:

Product Safety

AS/NZS 60950-1; IEC/EN 60950-1, 1st and 2nd Editions;
AS 62040.1.1; AS 62040.1.2; IEC 62040-1;
AS/NZS 3100; AS/NZS 3105; AS NZS 3112; AS/NZS 3122;
AS/NZS 3133; AS/NZS 3136;
AS/NZS 60884.1:2013 Plugs and Socket-outlets for Household and
Similar Purposes, Part 1: General Requirements (*Appendix ZZ only*);
AS/NZS 3120:2011 Cord Extension Sockets;
AS/NZS 3140
(only clauses 8, 10, 14.2, 14.3, 14.4, & 15 to E27 Lampholder);
AS/NZS 3197;
EN 50155:2007
- test 12.2.6 Supply Overvoltage
- test 12.2.7 Surges, ESD and Transient Burst Susceptibility
- test 12.2.8 Radio Interference
- test 12.2.9 Insulation;
AS/NZS 60065; IEC 60065; EN 60065;
AS/NZS 60320-1 (*excluding 'Hot' and 'Very Hot' conditions*);
IEC 60320-2-2 Appliance Couplers for Household and Similar General
Purposes – Interconnection Couplers for Household and Similar
Equipment (*Australian/New Zealand National Variations only*);
AS/NZS 60598.1, IEC 60598-1, EN 60598-1, and Associated
Part 2 Series of the Standards for the Following Luminaires Type:
Part 2.1 Fixed General Purpose Luminaires
Part 2.2 Recessed Luminaires
Part 2.3 Luminaires for Road and Street Lighting
Part 2.4 Portable General Purpose Luminaires
Part 2.5 Floodlights
Part 2.6 Luminaires with Built-In Transformers or Convertors
for Filament Lamps
Part 2.8 Handlamps
Part 2.10 Portable Child-Appealing Luminaires
Part 2.17 Luminaires for Stage Lighting, Television, Film, and
Photographic Studios (Outdoor and Indoor)
Part 2.20 Lighting Chains
Part 2.22 Luminaires for Emergency Lighting (*excluding clause
22.16, Functional Safety*);

Test:

Product Safety
(Cont.)

Test Method(s) 2:

AS/NZS 61010.1, IEC 61010.1, EN 61010.1,
Part 031 Hand-Held Probe Assemblies for Electrical
Measurement and Test;
AS/NZS 61558-1, IEC 61558-1, EN 61558-1,
and Associated Part 2 Series of the Standards for the Following
Transformer Types:
Part 2.1 Separating Transformers and Power Supplies Incorporating
Separating Transformers for General Applications
Part 2.4 Isolating Transformers and Power Supply Units Incorporating
Isolating Transformers
Part 2.6 Safety Isolating Transformers and Power Supply Units
Incorporating Safety Isolating Transformers
Part 2.7 Transformers and Power Supplies for Toys
Part 2.16 Switch Mode Power Supply Units and Transformers for
Switch Mode Power Supply Units;
AS/NZS 3350-1; IEC 60335-1, 3rd Edition; EN 60335-1, 3rd Edition;
EN 60335-1, 4th Edition; AS/NZS 60335-1;
IEC 60335-1, 4th Edition;
IEC 60335-1, 5th Edition (*excluding clauses 22.16, cord reel test,
and 22.32, oxygen bomb test*), and the Associated Part 2 Series
of the Standards for the Following Equipment Types:
Part 2.2 Vacuum Cleaners and Water-Suction Cleaning Appliances
(*excluding clause 21, Mechanical Strength*)
Part 2.3 Electric Irons
Part 2.4 Spin Extractors
(*Australian/New Zealand National Variations only*)
Part 2.5 Dishwasher
Part 2.6 Ranges, Ovens, and Hobs
Part 2.7 Washing Machine
Part 2.8 Shavers, Hair Clippers, and Similar Appliances
Part 2.9 Portable Cooking Appliances
Part 2.10 Floor Treatment Machines and Wet Scrubbing Machines
Part 2.11 Tumble Dryers
Part 2.12 Warming Plates and Similar Appliances
Part 2.13 Deep Fat Fryers, Frying Pans, and Similar Appliances
Part 2.14 Kitchen Machines
Part 2.15 Appliances for Heating Liquids
Part 2.16 Food Waste Disposers
(*Australian/New Zealand National Variations only*)
Part 2.17 Blankets, Pads, Clothing, and Similar Flexible Heating
Appliances (*Australian/New Zealand National Variations only*)
Part 2.21 Storage Water Heaters
Part 2.23 Appliances for Skin and Hair Care
Part 2.24 Refrigerators and Ice Makers
Part 2.25 Microwave Ovens including Combination Microwave Ovens
(*Annex ZZ and Clause 32 only*)
Part 2.26 Clocks (*Annex ZZ only*)
Part 2.28 Sewing Machines
Part 2.29 Battery Chargers
Part 2.30 Room Heaters
Part 2.31 Range Hoods (*excluding clause 30, Resistance of Heat and
Fire [ISO 9772 Test Apparatus]*)
Part 2.32 Massage Appliances
Part 2.34 Motor-compressor (*Australian/New Zealand National
Variations only*)



Test:

*Product Safety
(Cont.)*

Test Method(s)?:

- Part 2.35 Instantaneous Water Heater
- Part 2.36 Commercial Electrical Cooking Ranges, Ovens, Hobs and Hob Elements
- Part 2.38 Commercial Electric Griddles and Griddle Grills
- Part 2.40 Electrical Heat Pumps, Air-conditioners, and Dehumidifiers
- Part 2.41 Pumps
- Part 2.43 Clothes Dryers and Towel Rails
- Part 2.45 Portable Heating Tools and Similar Appliances
- Part 2.47 Commercial Electric Boiling Pans
- Part 2.48 Commercial Electric Grillers and Toasters
- Part 2.51 Stationary Circulation Pumps for Heating and Service Water Installations (*Australian/New Zealand National Variations only*)
- Part 2.52 Oral Hygiene Appliances
- Part 2.53 Sauna Heating Appliances and Infrared Cabins (*Australian/New Zealand National Variations only*)
- Part 2.54 Surface Cleaning Appliances (*excluding clauses 21.101 through 21.105, Current-Carrying Hoses*)
- Part 2.55 Aquariums and Garden Ponds
- Part 2.59 Insect Killers
- Part 2.60 Whirlpool Baths and Whirlpool Spas
- Part 2.61 Thermal-storage Room Heaters (*Annex ZZ only*)
- Part 2.64 Commercial Electric Kitchen Machines
- Part 2.65 Air-Cleaning Appliances
- Part 2.66 Water-bed Heaters (*Australian/New Zealand National Variations only*)
- Part 2.67 Floor Treatment Machines for Commercial Use (*Australian/New Zealand National Variations only*)
- Part 2.68 Spray Extraction Machines for Commercial Use (*Australian/New Zealand National Variations only*)
- Part 2.69 Wet and Dry Vacuum Cleaners, including Power Brush, for Commercial Use (*excluding clause 21, Mechanical Strength*)
- Part 2.70 Milking Machines (*Annex ZZ only*)
- Part 2.71 Electrical Heating Appliances for Breeding and Rearing Animal (*Annex ZZ only*)
- Part 2.72 Floor Treatment Machines with or without Traction Drive for Commercial Use (*Australian/New Zealand National Variations only*)
- Part 2.73 Fixed Immersion Heaters
- Part 2.74 Portable Immersion Heaters
- Part 2.75 Commercial Dispensing Appliances and Vending Machines (*excluding Annex AA, Aging Test for Elastomeric Parts*)
- Part 2.77 Pedestrian Controlled Mains-Operated Lawnmowers (*Annex ZZ only*)
- Part 2.78 Outdoor Barbecues
- Part 2.79 High Pressure Cleaners and Steam Cleaners (*Australian/New Zealand National Variations only*)
- Part 2.80 Fans
- Part 2.81 Foot Warmers and Heating Mats (*Australian/New Zealand National Variations only*)
- Part 2.82 Amusement Machines
- Part 2.83 Heated Gullies for Roof Drainage (*Annex ZZ only*)
- Part 2.84 Toilets
- Part 2.85 Fabric Steamers
- Part 2.86 Electric Fishing Machines (*Annex ZZ only*)
- Part 2.87 Electric Animal-stunning Equipment (*Annex ZZ only*)



Test:

*Product Safety
(Cont.)*

Test Method(s) 2:

Part 2.89 Commercial Refrigerating Appliances (*excluding clauses 22.106 through 22.109, Flammable Refrigerants*)
Part 2.90 Commercial Microwave Ovens (*Annex ZZ only*)
Part 2.91 Walk-Behind and Hand-Held Lawn Trimmers and Lawn Edge Trimmers (*Annex ZZ only*)
Part 2.92 Pedestrian-Controlled Mains-Operated Lawn Scarifiers and Aerators (*Annex ZZ only*)
Part 2.94 Scissors Type Glass Shears (*Annex ZZ only*)
Part 2.95 Drivers for Vertically Moving Garage Doors for Residential Use
Part 2.96 Flexible Sheet Heating Elements for Room Heating (*Annex ZZ only*)
Part 2.97 Drives for Rolling Shutters, Awnings, Blinds, and Similar Equipment
Part 2.98 Humidifiers
Part 2.100 Hand-Held Mains-Operated Garden Blowers, Vacuums, and Blower Vacuums (*Annex ZZ only*)
Part 2.101 Vaporizers
Part 2.102 Gas, Oil, and Solid-Fuel Burning Appliances Having Electrical Connections
Part 2.103 Drives for Gates, Doors, and Windows
Part 2.105 Multifunctional Shower Cabinets (*Annex ZZ only*)
Part 2.106 Heated Carpets and for Heating Units for Room Heating Installed under Removable Floor Coverings (*Annex ZZ only*)
Part 2.107 Robotic Battery Powered Electrical Lawnmowers (*Australian/New Zealand National Variations only*)
Part 2.108 Electrolysers (*Annex ZZ only*)
Part 2.109 UV Radiation Water Treatment;
IEC/EN 61347-1 (*except 18.2, PCB Resistance to Fire*);
AS/NZS 61347.1 and the Associated Part 2 Series of the Standards for the Following Lamp Controlgear Types:
Part 2.3 A.C. Supplied Electronic Ballasts for Fluorescent Lamps (*except Annex J, Emergency Lighting*)
Part 2.9 Ballasts for Discharge Lamps
Part 2.11 Misc. Electronic Circuits used with Luminaires
Part 2.13 D.C. or A.C. Supplied Electronic Control gear for LED Modules;
AS/NZS 4703 Electrical Wiring in Furniture;
AS 4777.2; AS 4777.3;
AS/NZS 4777.2 - Grid connection of Energy Systems via Inverters;
AS/NZS 4763:2011 - Safety of Portable Inverters;
IEC 61727 – Photovoltaic (PV) systems – Characteristics of the utility interface
IEC 62109-1, EN 62109-1:
Safety of Power Converters for use in Photovoltaic Power Systems, Part 1 General Requirements;
IEC 62109-2, EN 62109-2:
Safety of Power Converters for use in Photovoltaic Power Systems, Part 2 Particular Requirements for Inverters;
IEC 62116 Utility-interconnected Photovoltaic Inverters – Test Procedure of Islanding Prevention Measures;
AS/NZS 62368.1; IEC 62368-1 Audio/video, information and communication technology equipment – Part 1: Safety requirements



<u>Test:</u>	<u>Test Method(s) 2:</u>
<i>Product Safety (Cont.)</i>	AS/NZS 1158.6 (Luminaires): <ul style="list-style-type: none"> - Clause 5.2 PE Cell type Luminaires - Clause 5.6 Ingress Protection Test - Clause 5.8 Impulse Voltage Test - Clause 5.10 Additional Tests (as required by AS/NZS 60598.1)
<i>Fire Hazard Testing</i>	IEC 60112, EN 60112, AS/NZS 60112: Proof and Comparative Tracking Indices of Solid Insulating Materials; IEC 60695.11.5, EN60695.11.5, AS/NZS 60695.11.5: Needle Flame Test; IEC 60695.10.2, EN 60695.10.2, AS/NZS 60695.10.2: Ball Pressure Test; IEC 60695.2.10, EN 60695.2.10, AS/NZS 60695.2.10: Glow-wire Apparatus and Common Test Procedure; IEC 60695.2.11, EN 60695.2.11, AS/NZS 60695.2.11: Glow-wire Flammability Test Method for End-Products; IEC 60695.2.12, EN 60695.2.12, AS/NZS 60695.2.12: Glow-wire Flammability Test Method for Materials; IEC 60695.2.13, EN 60695.2.13, AS/NZS 60695.2.13: Glow-wire Ignitability Test Method for Materials
<i>Performance (MEPS)</i>	AS/NZS 4665; AS/NZS 62087.1; AS/NZS 62087.2.1; AS/NZS 62087.2.2; AS/NZS 62301; AS 5102.1; AS 5102.2
<i>Electromagnetic Fields (EMF)</i>	EN 62233
<i>Telecommunications</i>	AS/ACIF S002; AS/CA S002; AS/ACIF S003; AS/CA S003.1; AS/CA S003.2; AS/CA S003.3; AS/ACIF S004; AS/ACIF S006; AS/ACIF S008 (excluding underground conduit, surge suppression devices, optical fibre and coaxial cable, pits); AS/CA S008 (excluding underground conduit, surge suppression devices, optical fibre and coaxial cable, pits); AS/ACIF S031, TBR 003/A1; AS/ACIF S038, TBR 004/A1; AS/ACIF S040; AS/ACIF S041; AS/ACIF S041.1; AS/ACIF S041.2; AS/ACIF S041.3; AS/CA S042.1; AS/ACIF S043.1; AS/ACIF S043.2; AS/ACIF S043.3; Industry Canada CS-03 parts I, V, and VIII; ANSI/TIA-968B

<u>Test:</u>	<u>Test Method(s) 2:</u>
<i>EMC – Emissions Radiated and Conducted (3m semi-anechoic chamber)</i>	AS/NZS CISPR 11, CISPR 11, EN 55011 (radiated 30MHz to 6GHz, conducted 150 kHz to 30MHz); AS/NZS CISPR 13; CISPR 13; EN 55013; AS/NZS CISPR 14; CISPR 14; EN55014; AS/NZS CISPR 15, CISPR 15, EN55015 (excluding radiated emissions below 30MHz); AS/NZS CISPR 22, CISPR 22, EN 55022 (radiated 30MHz to 6GHz, conducted 150kHz to 30MHz), (telecom ports 150 kHz to 30MHz); AS/NZS CISPR 32; CISPR32; EN 55032; CFR 47 FCC Part 15B (using ANSI C63.4:2014) (up to 40 GHz); ICES-003, Issue 6; IEC 61000-3-2; EN 61000-3-2; IEC 61000-3-3; EN 61000-3-3
<i>EMC – Immunity</i>	IEC 61000-4-2; EN 61000-4-2; AS/NZS 61000.4.2; IEC 61000-4-3; EN 61000-4-3; AS/NZS 61000.4.3; IEC 61000-4-4; EN 61000-4-4; AS/NZS 61000.4.4; IEC 61000-4-5; EN 61000-4-5; AS/NZS 61000.4.5; IEC 61000-4-6; EN 61000-4-6; AS/NZS 61000.4.6; IEC 61000-4-8; EN 61000-4-8; AS/NZS 61000.4.8; IEC 61000-4-9, EN 61000-4-9, AS/NZS 61000.4.9; IEC 61000-4-11; EN 61000-4-11; AS/NZS 61000.4.11; IEC 61000-4-13; EN 61000-4-13; AS/NZS 61000.4.13
<i>Generic/Product Family/Industry Standards (excluding SAR)</i>	IEC 61000-6-1; EN 61000-6-1; IEC 61000-6-2; EN 61000-6-2; IEC 61000-6-3; EN 61000-6-3; IEC 61000-6-4; EN 61000-6-4; IEC 60601-1-2 3 rd Edition; EN 60601-1-2:2007; IEC 60601-1-2 4 th Edition; AS/NZS 3200.1.2:2005; CISPR 14-2; EN 55014-2; AS/NZS CISPR 14-2; CISPR 24; EN 55024; EN 61326-1; EN 50121-3-2; EN 50121-4; EN 50130-4; EN 62233; EN 62311; ETSI EN 301 489-1; ETSI EN 301 489-3; ETSI EN 301 489-7; ETSI EN 301 489-17; ETSI EN 301 489-24; AS/NZS Gaming Machine National Standard 10.1, February 2010 - clause 2.3.58
<i>Radio (Transmitter and Receiver) (excluding SAR and HAC testing)</i>	FCC Part 15 Subpart C (using ANSI C63.10:2013); RSS-Gen; RSS-210; RSS-247; AS/NZS 4268; ETSI EN 300 328 (excluding Adaptivity)
<i>Stand-by Mode (Clauses 19.11.4.1 to 19.11.4.7)</i>	IEC/EN 60335-1, 4 th and 5 th Editions; AS/NZS 60335.1:2002+A1+A2+A3+A4; AS/NZS 60335.1:2011+A1
<i>Aircraft EMC</i>	RTCA DO160F/G: Section 20: Radio Frequency Susceptibility (Radiated and Conducted) (excluding product categories B, D, F, G, and L)

Test:

Military EMC

Test Method(s) 2:

MIL-STD-461/462B (*up to 18 GHz and 200 V/m*)
CE01, CE03, CS01, CS06, RE01, RE02, RS01, RS02, RS03;
MIL-STD-461/462C (*up to 18 GHz and 200 V/m*)
CE01, CE03, CS01, CS06, RE01, RE02, RS01, RS02, RS03;
MIL-STD-461E/F (*up to 18 GHz and 200 V/m*)
CE101, CE102, CE106, CS101, CS106, CS114, CS115, CS116,
RE101, RE102, RS101, RS103

Environmental
– *Climatic*

IEC/EN 50155:2007:
- test 12.2.3 Cooling
- test 12.2.4 Dry Heat
- test 12.2.5 Damp Heat, Cyclic
- test 12.2.12 Watertightness
- test 12.2.13 Equipment Stress Screening
- test 12.2.14 Low Temperature Storage;
MIL-STD-810D, E, F, G, and G with Change 1:
- method 501.6 High Temperature
- method 502.6 Low Temperature
- method 503.6 Temperature Shock
- method 507.6 Humidity
- method 504.2 Contamination by Fluids
- method 521.4 Icing/Freezing Rain
- method 524.1 Freeze / Thaw
MIL-STD-202G:
- method 103B Humidity Steady State
- method 107G Thermal Shock;
- method 106G, Moisture Resistance;
IEC/EN 60068-2-2;
IEC/EN 60068-2-30;
IEC/EN 60068-2-14;
IEC/EN 60068-2-1;
IEC/EN 60068-2-78;
IEC/EN 60068-2-38
IEC/EN 60068-2-39
IEC/EN 60068-2-66;
IEC/EN 60068-2-67;
DEF STAN 00-035:2006, 2017:
- test CL1 Constant High Temperature - Low Humidity
- test CL2 High Temperature and Low Humidity
- test CL4 Constant Low Temperature
- test CL5 Low Temperature
- test CL6 High Humidity and High Temperature
- test CL7 Constant High Temperature - High Humidity
- test CL10 Icing
- test CL14 Thermal Shock and Rapid Change of Temperature;
- test CL17 Elevated Ground-Temperature/Humidity Diurnal Cycles
- test CL24 Freeze-Thaw
- test CN4 Contamination by Fluids
DEF(AUST)5681:1998:
- section 7.2 Climatic Tests



Test:

Environmental
– Climatic
(Cont.)

Test Method(s) 2:

RTCA DO160G:
– section 4 Temperature and Altitude
– section 6 Humidity
– section 5 Temperature Variation
– section 11 Fluids Susceptibility;
ISTA 3A-test blocks 1, 2;
ISTA 2A-test blocks 1, 2;
ISTA 2B-test blocks 1, 2;
EN 50125-3:2003:
- section 4.3 Temperature
- section 4.4 Humidity
- section 4.8 Ice
AS/NZS 1158.6 (Luminaires):
- Clause 5.9 Thermal Endurance and Thermal Testing;
ISO/AS 7240 - climatic tests covered in parts 2 through to 28
including:
- dry heat
- cold
- damp heat cyclic
- damp heat, steady state;
GMW14650 cl. 4.2;
GMW14650 cl. 4.3;
GMW14650 cl. 4.5;
ISO 16750-4;
SAE-J1455:
- clause 4.1, Temperature
- clause 4.2, Humidity;
AREMA C&S Manual 2009 Part 11.5.1:
- section D.1
- section D.2
- section D.3;
ASTM F2825;
AS3789:2014:
- clause 5.7
- clause 5.8
- clause 5.14;
AS4607:1999
- clause 3.4
ST/AG/AC.10/11/Rev. 6:2015:
- clause 38.3.4.2 Test T.2 Thermal test;
BS/EN 45502-1:2015:
- clause 26.2;
ASTM D4332



Test:

*Environmental -
Mechanical**

Vibration, Variable

Frequency:

1 Hz to 3 kHz;

Max Force 10 kN;

Max. Velocity 180 cm/s;

Max. Acceleration 100 g;

Max. Displacement

50 mm

Vibration, Fixed Frequency:

0 to 3 Hz;

Max. Displacement

200 mm

Shock:

Max. acceleration 2,300 g

Static Load:

Max 10 kN

Drop:

Max 1500 mm, 100 kg

Immersion: Max. 4000 m

Acceleration Measurements

up to

± 2300g at 1 - 12 kHz

Test Method(s) ²:

IEC/EN/AS 60068-2-6;

IEC/EN/AS 60068-2-27;

IEC/EN/AS 60068-2-64;

MIL-STD-810D, E, F, G, and G with Change 1:

- method 514.6 Vibration

- method 516.6 Shock

- method 513.6 Acceleration

- method 519 Gunfire Shock;

MIL-STD-167-1A:

- type 1, Environmental;

MIL-STD-167-1 (ships):

- type 1, Environmental;

MIL-STD-202G:

- method 201A Vibration

- method 204D Vibration, High Frequency

- method 213B Shock

- method 214A Random Vibration;

- method 207B High Impact Shock

- method 212A Acceleration

- method 203C Random drop;

ISTA 3A-test blocks 3, 4, 6-9;

ISTA 2A-test blocks 4-6;

ISTA 1A;

ISTA 2B - test blocks 3, 4, 5, 6, 7;

ASTM D4169-09, -14, -16;

ASTM D4728;

ASTM D999;

ASTM D6179;

ASTM D880 Test Method for Impact Testing for Shipping

Containers and Systems;

ASTM D4003 Test Methods for Programmable Horizontal Impact

Test for Shipping Containers and Systems;

ASTM D5265 Test Method for Bridge Impact Testing;

ASTM D5276 Test Method for Drop Test of Loaded Containers by

Free Fall;

ASTM D5487 Test Method for Simulated Drop of Loaded

Containers by Shock Machines;

ASTM D6055 Test Methods for Mechanical Handling of Unitized

Loads and Large Shipping Cases and Crates;

ASTM D6179 Test Methods for Rough Handling of Unitized Loads

and Large Shipping Cases and Crates;

ASTM D6344 Test Method for Concentrated Impacts to Transport

Packages;

IEC 60255-21-1;

IEC 60255-21-2;

IEC 60255-21-3;

ISO 16750-3:2012;

Test:

*Environmental –
Mechanical *
(Cont.)*

Vibration, Variable

Frequency:

1 Hz to 3 kHz;

Max Force 10 kN;

Max. Velocity 180 cm/s;

Max. Acceleration 100 g;

Max. Displacement

50 mm

Vibration, Fixed Frequency:

0 to 3 Hz;

Max. Displacement

200 mm

Shock:

Max. acceleration 2,300 g

Static Load:

Max 10 kN

Drop:

Max 1500 mm, 100 kg

Immersion: Max. 4000 m

Acceleration Measurements

up to

± 2300g at 1 - 12 kHz

Test Method(s) 2:

DEF STAN 00-035:2006, 2017:

- test M1 Basic Vibration
- test M2 Complete Store Vibration
- test M3 General Purpose Shock Test
- test M4 Drop Topple and Roll
- test M5 Impact
- test M6 Operational Shock Simulation
- test M7 Shock Testing for Warship Equipment and Armament stores
- test M11 Wheeled Vehicle Transportation Bounce
- test M12 Bump
- test M13 Steady State Acceleration
- test M16 Stacking Static Load Test
- test M17 Bending Test
- test M18 Racking Test;

DEF(AUST)5681:1998:

- section 7.3 Transportation Environment Test;

RTCA DO160G

- section 7 Shocks and Crash Safety

- section 8 Vibration;

IEC/EN 61373:2010;

IEC/EN 50155:2007 - test 12.2.11 Vibration, Shock, and Bump;

AS/NZS 3439.5;

IEC/EN 60068-2-75;

IEC 62262;

AS/NZS 1158.6 (Luminaires):

- Clause 5.4 Wind Force Test;

AS/NZS 1158.6 (Luminaires) :

- Clause 5.5 Vibration Testing;

AS/NZS 1158.6 (Luminaires):

- Clause 5.7 Resistance to External Mechanical Impact;

ISO/AS 7240 mechanical tests covered in parts 2 through to 28

including:

- Shock
- Impact
- Vibration;

GMW14650 cl. 4.9;

GMW3172 cl. 9.3.2; GMW3172 cl. 9.3.3;

SAE-J1455:

- clause 4.9, Vibration
- clause 4.4, Shock;

ANSI C136.31-2010;

AREMA C&S Manual 2009 Part 11.5.1:

- sections D.4 & D.5;

IEC 60068-2-7; IEC 60068-2-31;

IEC 60068-2-55; IEC 60068-2-81;

IEC 61243-2:

- clauses 5.4.4, 5.4.5, 5.4.6, 5.4.7, & 5.4.8;

IATA PI968;

MIL-HDBK-2036:

- clause 5.1.2.12: (Inclination and attitude testing of ship or submarine-borne equipment);

Test:

*Environmental –
Mechanical *
(Cont.)*

*Environmental -
Harsh Atmospheres*

Test Method(s) 2:

EN 50125-3:2003:
- section 4.13 Vibration and Shock;
AS3789:2014
- clause 5.12
- clause 5.13
- clause 5.11;
ST/AG/AC.10/11/Rev. 6:2015:
- clause 38.3.4.3 Test T.3 Vibration
- clause 38.3.4.4 Test T.4 Shock
- clause 38.3.4.6 Test T.6 Impact;
BS/EN 45502-1:2015:
- clause 23.1, Free-fall
- clause 23.2, Vibration;
clause 23.7, Shock

AS/NZS/IEC/EN 60068.2.52 Salt Mist Test;
ASTM B117 Salt Spray;
AS/NZS/IEC/EN 60529;
RTCA DO160G:
- section 14 Salt Spray;
IEC 60068-2-11;
IEC/EN 50155:2007:
- test 12.2.10 Salt Mist Test;
MIL-STD-810D, E, F, G, and G with Change 1:
- method 506.6 Rain, Procedure III
- method 509.6 Salt Fog
- method 512.6 Immersion;
DEF STAN 00-035:2006, 2017:
- test CN2 Salt (corrosive) Atmosphere
- test CL29 Immersion
- test CL27 Driving Rain;
- test CL25 Dust and Sand, Turbulent Dust
- test CL28 Water Drip
- test CL29 Immersion and Pressurized Water Chamber Test;
DEF(AUST)5681:1998
- section 7.4 Pressure Tests
- section 7.5 Ingress Tests, cl. 7.5.1, 7.5.2, 7.5.3, 7.5.4
- section 7.6 Chemical/Corrosion Tests;
ISO 20653;
SAE-J1455:
- clause 4.3, Salt Spray
- clause 4.4, Immersion;
IEC 60068-2-18;
EN 50125-3:2003 :
- section 4.6 Rain;
MIL-STD-202G:
- method 101E Salt Atmosphere (corrosion)
- method 104A Immersion;
ASTM D951

Test:

*Environmental -
Altitude and Pressure*

Test Method(s) 2:

MIL-STD-810D, E, F, G, and G with Change 1:
- method 500.6 Low Pressure (Altitude);
IEC/EN 60068-2-13 Low Air Pressure;
SAE-J1455:
- clause 4.8, Altitude;
DEF STAN 00-035:2006, 2017:
- test CL21 Low Air Pressure and Air Transportation
- test CL9 Rapid and Explosive Decompression
- test CL11 Pressure and Temperature
- test CL12 Low Temperature and Low Pressure
- test CL15 Air Pressure (above atmospheric)
- test CL13 Pressure, Temperature and Humidity
- test CL20 Rapid Change of Pressure
- test CL30 Sealing (pressure differential);
ISTA 2A, test block 5;
ISTA 3A, test block 5;
IEC 60068-2-40;
IEC 60068-2-41;
IEC 60068-3-3;
ASTM F2096-11, Test Method A;
ASTM D6653;
DEF(AUST)5681:1998:
- section 7.3 Transportation Environment Test;
EN 50125-3:2003:
- section 4.2 Pressure;
MIL-STD-202G:
- method 105C Barometric Pressure (reduced);
AS/NZS 3707:2001;
ST/AG/AC.10/11/Rev. 6:2015:
- clause 38.3.4.1 Test T.1 Altitude simulation;
BS/EN 45502-1:2015:
- clause 25.1

*Environmental -
Acoustics**

Measurements of
Sound Pressure level
up to 130 dB at
5-20,000 Hz

IEC 60704-2-14;
IEC 60704-1;
MIL-STD-1474D;
MIL-STD-1474E;
MIL-STD-740B;
MIL-STD-740-1;
MIL-STD-740-2;
ISO 3744;
IEC 60068-2-65;
AS3789:2014:
- clause 5.18;
AS4607:1999:
- clause 3.10.4

Test:

*Environmental –
UV & Solar Radiation*

Test Method(s)²:

MIL-STD-810D, E, F, G, and G with Change 1:
- method 505.6, Solar Radiation (Sunshine) Procedure I and
Procedure II;
IEC 60068-2-5, Edition 2.0 2010-04;
ISO 4892-2:2006(E);
ISO 11341:2004;
ISO 105-B02-2014(E);
ISO 105-B04-1994;
ASTM D4459-12;
ASTM D1248-12;
ASTM D2565-99 (2008);
ASTM D4434 / D4434M-11;
ASTM D4798 / D4798M-11;
ASTM D4799 / D4799M -08 (2013) e1;
ASTM D6695-08;
ASTM C1257-06a (2012);
ASTM C1442-14;
ASTM C1501-14;
ASTM C1519-10;
ASTM C732-06 (2012);
ASTM C734-06 (2012);
ASTM C793-05 (2010);
ASTM D1148-13;
ASTM D3424-11;
ASTM D3451-06 (2012);
ASTM D4329-13;
ASTM D4587-11;
ASTM D4674-02a (2010);
ASTM D5208-14;
ASTM D5894-10;
ASTM D6577-06 (2011) e1;
ASTM D750-12;
ASTM D904-99 (2013);
ASTM D925-14;
ASTM F1945-05 (2011);
ASTM G151-10;
ASTM G154-12a;
ASTM G155-13;
DEF STAN 00-035, Part 3, Issue 4, -CL-2, -CL-3, -CL-6;
ISO 4892-3;
ISO 15003, Section 5.11;
EN 50125-3:2003:
- section 4.9 Solar Radiation;
ASTM G53

¹ This accreditation covers testing performed at the main laboratory listed above, and the following satellite laboratories listed below:



<u>Test:</u>	<u>Test Method(s) 2:</u>
<i>EMC – Emissions</i>	AS/NZS CISPR 11; CISPR 11; EN 55011; AS/NZS CISPR 12; CISPR 12; EN 55012; AS/NZS CISPR 13, CISPR 13, EN 55013; <i>(excluding broadcast satellite receivers and the disturbance voltage at antenna terminals test for other than 75 Ω coaxial equipment);</i> AS/NZS CISPR 14.1; CISPR 14-1; EN 55014-1; AS/NZS CISPR 15; CISPR 15; EN 55015; AS/NZS CISPR 22; CISPR 22; EN 55022; AS/NZS CISPR 32, CISPR32, EN 55032; AS/NZS 4251.1 <i>(except measurements below 2 kHz);</i> 47 CFR, FCC Part 15 Subpart B (using ANSI C63.4:2014) <i>(up to 40 GHz);</i> 47 CFR, FCC Part 18 (using FCC MP-5:1986); ICES-003, Issue 6; IEC 61000-3-2; IEC 61000-3-3; EN 61000-3-2; EN 61000-3-3
<i>EMC – Immunity</i>	IEC 61000-4-2; EN 61000-4-2; AS/NZS 61000.4.2; IEC 61000-4-4; EN 61000-4-4; AS/NZS 61000.4.4; IEC 61000-4-5; EN 61000-4-5; AS/NZS 61000.4.5; IEC 61000-4-6; EN 61000-4-6; AS/NZS 61000.4.6; IEC 61000-4-8; EN 61000-4-8; AS/NZS 61000.4.8; IEC 61000-4-9; EN 61000-4-9; AS/NZS 61000.4.9; IEC 61000-4-11; EN 61000-4-11; AS/NZS 61000.4.11
<i>Generic/Product Family Standards</i>	IEC 61000-6-1; EN 61000-6-1; IEC 61000-6-2; EN 61000-6-2; IEC 61000-6-3; EN 61000-6-3; IEC 61000-6-4; EN 61000-6-4; IEC 60601-1-2 Ed. 3.0; EN 60601-1-2: 2007; IEC 60601-1-2 4 th Edition; AS/NZS 3200.1.2:2005; CISPR 14-2; EN 55014-2; AS/NZS CISPR 14-2; CISPR 24; EN 55024; EN 61326-1; EN 50121-3-2; EN 50121-4; EN 50130-4; EN 62233; Gaming Machine National Standard 10.3, clauses 2.3.52 through 2.3.57, and 2.3.59; ETSI EN 301 489-1; ETSI EN 301 489-3; ETSI EN 301 489-7; ETSI EN 301 489-17; ETSI EN 301 489-24
<i>Military EMC</i>	MIL-STD-461E/F (RS101)
<i>Radio (Transmitter and Receiver) (excluding SAR and HAC)</i>	FCC Part 15 Subpart C (using ANSI C63.10:2013); RSS-Gen; RSS-210; RSS-247; AS/NZS 4268; ETSI EN 300 328 <i>(excluding Adaptivity)</i>

Test:

Product Safety

Test Method(s) ²:

AS/NZS 60065 (*clause 10 only*);
EN 60335-1, IEC 60335-1, AS/NZS 60335.1:
(*excluding clauses 22.16, cord reel test, and 22.32, oxygen bomb test*),
and the Associated Part 2 Series of the Standards for the following
equipment types:
Part 2.2 Vacuum cleaner and water-suction cleaning appliances
(AS/NZS National Variations only)
Part 2.3 Electric Irons (AS/NZS National Variations only)
Part 2.4 Spin Extractors (AS/NZS National Variations only)
Part 2.5 Dishwasher
Part 2.6 Ranges, Hobs, Ovens and Similar Appliances
(AS/NZS National Variations only)
Part 2.7 Washing Machine
Part 2.8 Shavers, Hair Clippers, and Similar Appliances;
Part 2.9 Grills, Toasters and Similar Cooking Appliance
(AS/NZS National Variations only)
Part 2.10 Floor Treatment Machines and Wet Scrubbing Machines
(AS/NZS National Variations only)
Part 2.11 Tumble Dryers
Part 2.12 Warming Plates and Similar Appliances
(AS/NZS National Variations only)
Part 2.13 Deep Fat Fryers, Frying Pans, and Similar Appliances
Part 2.14 Kitchen Machines (AS/NZS National Variations only)
Part 2.15 Appliances for Heating Liquids
Part 2.16 Food Waste Disposers (AS/NZS National Variations only);
Part 2.17 Blankets, Pads, Clothing, and Similar Flexible Heating Appliances
(AS/NZS National Variations only)
Part 2.21 Storage Water Heaters
Part 2.23 Appliances for Skin and Hair Care
Part 2.24 Refrigerators and Ice Makers
(AS/NZS National Variations only)
Part 2.25 Microwave Ovens including Combination Microwave Ovens
(AS/NZS National Variations only)
Part 2.26 Clocks (AS/NZS National Variations only)
Part 2.27 Appliances for Skin Exposure to Ultraviolet and Infrared
Radiation (AS/NZS National Variations only)
Part 2.28 Sewing Machines (AS/NZS National Variations only)
Part 2.29 Battery Chargers
Part 2.30 Room Heaters
Part 2.31 Range Hoods and other Cooking Fume Extractors
(AS/NZS National Variations only)
Part 2.32 Massage Appliances (AS/NZS National Variations only)
Part 2.34 Motor-compressors (AS/NZS National Variations only)
Part 2.35 Instantaneous Water Heaters (AS/NZS National Variations only)

Test:

*Product Safety
(Cont.)*

Test Method(s) ²:

- Part 2.40 Electrical Heat Pumps, Air-conditioners, and Dehumidifiers
(AS/NZS National Variations only)
- Part 2.41 Pumps (AS/NZS National Variations only)
- Part 2.43 Clothes Dryers and Towel Rails
- Part 2.44 Ironers (AS/NZS National Variations only)
- Part 2.45 Portable Heating Tools and Similar Appliances
- Part 2.51 Stationary Circulation Pumps for Heating and Service Water
Installations (AS/NZS National Variations only)
- Part 2.52 Oral Hygiene Appliances (AS/NZS National Variations only)
- Part 2.53 Sauna Heating Appliances and Infrared Cabins
(AS/NZS National Variations only)
- Part 2.54 Surface Cleaning Appliances
(AS/NZS National Variations only)
- Part 2.55 Aquariums and Garden Ponds
(AS/NZS National Variations only)
- Part 2.56 Projectors (AS/NZS National Variations only)
- Part 2.59 Insect Killers (AS/NZS National Variations only)
- Part 2.60 Whirlpool Baths and Whirlpool Spas
- Part 2.61 Thermal-storage Room Heaters
(AS/NZS National Variations only)
- Part 2.65 Air-Cleaning Appliances (AS/NZS National Variations only)
- Part 2.66 Water-bed Heaters (AS/NZS National Variations only)
- Part 2.67 Floor Treatment Machines for Commercial Use
(AS/NZS National Variations only)
- Part 2.68 Spray Extraction Machines for Commercial Use
(AS/NZS National Variations only)
- Part 2.69 Wet and Dry Vacuum Cleaners, including Power Brush, for
Commercial Use (AS/NZS National Variations only)
- Part 2.70 Milking Machines (AS/NZS National Variations only)
- Part 2.71 Electrical Heating Appliances for Breeding and Rearing Animal
(AS/NZS National Variations only)
- Part 2.72 Floor Treatment Machines with or without Traction Drive for
Commercial Use (AS/NZS National Variations only)
- Part 2.73 Fixed Immersion Heaters (AS/NZS National Variations only)
- Part 2.74 Portable Immersion Heaters (AS/NZS National Variations only)
- Part 2.75 Commercial Dispensing Appliances and Vending Machines
(AS/NZS National Variations only)
- Part 2.76 Electric Fence Energizers (AS/NZS National Variations only)
- Part 2.77 Pedestrian Controlled Mains-Operated Lawnmowers
(AS/NZS National Variations only)
- Part 2.78 Outdoor Barbecues (AS/NZS National Variations only)
- Part 2.79 High Pressure Cleaners and Steam Cleaners
(AS/NZS National Variations only)
- Part 2.80 Fans
- Part 2.81 Foot Warmers and Heating Mats
(AS/NZS National Variations only)
- Part 2.82 Amusement Machines
- Part 2.83 Heated Gullies for Roof Drainage
(AS/NZS National Variations only)
- Part 2.84 Toilets (AS/NZS National Variations only)
- Part 2.85 Fabric Steamers (AS/NZS National Variations only)



Test:

*Product Safety
(Cont.)*

Test Method(s) ²:

Part 2.86 Electric Fishing Machines (AS/NZS National Variations only)
Part 2.87 Electric Animal-stunning Equipment
(AS/NZS National Variations only)
Part 2.89 Commercial Refrigerating Appliances
(AS/NZS National Variations only)
Part 2.90 Commercial Microwave Ovens
(AS/NZS National Variations only)
Part 2.91 Walk-Behind and Hand-Held Lawn Trimmers and Lawn Edge
Trimmers (AS/NZS National Variations only);
Part 2.92 Pedestrian-Controlled Mains-Operated Lawn Scarifiers and
Aerators (AS/NZS National Variations only)
Part 2.94 Scissors Type Glass Shears (AS/NZS National Variations only)
Part 2.95 Drivers for Vertically Moving Garage Doors for Residential Use
(AS/NZS National Variations only)
Part 2.96 Flexible Sheet Heating Elements for Room Heating
(AS/NZS National Variations only)
Part 2.97 Drives for Rolling Shutters, Awnings, Blinds, and Similar
Equipment (AS/NZS National Variations only)
Part 2.98 Humidifiers
Part 2.100 Hand-Held Mains-Operated Garden Blowers, Vacuums, and
Blower Vacuums (AS/NZS National Variations only)
Part 2.101 Vaporizers (AS/NZS National Variations only)
Part 2.102 Gas, Oil and Solid-Fuel Burning Appliances Having Electrical
Connections
Part 2.103 Drives for Gates, Doors, and Windows
(AS/NZS National Variations only)
Part 2.105 Multifunctional Shower Cabinets
(AS/NZS National Variations only)
Part 2.106 Heated Carpets and for Heating Units for Room Heating
Installed under Removable Floor Coverings
(AS/NZS National Variations only)
Part 2.107 Robotic Battery Powered Electrical Lawnmowers
(AS/NZS National Variations only)
Part 2.108 Electrolysers (AS/NZS National Variations only);
Part 2.109 UV Radiation Water Treatment
(AS/NZS National Variations only)
Part 2.110 Commercial Microwave Appliances with Insertion or
Contacting Appliances (AS/NZS National Variations only)
AS/NZS 60598.1, IEC 60598-1, EN 60598-1,
and the Associated Part 2 Series of the Standards for the following
Luminaires type:
Part 2.1: Fixed General Purpose Luminaires
Part 2.2: Recessed Luminaires
Part 2.4: Portable General Purpose Luminaires
Part 2.5: Flood Lights
Part 2.10: Portable Luminaires for Children
Part 2.20: Lighting Chains



Test:

*Product Safety
(Cont.)*

Test Method(s) ²:

AS/NZS 61558.1 / IEC 61558-1 / EN 61558-1
and the Associated Part 2 Series of the Standards for the following
Transformer types:
Part 2.1: Separating Transformers and Power Supplies Incorporating
Separating Transformers for General Applications
Part 2.4: Isolating Transformers and Power Supplies Incorporating
Isolating Transformers
Part 2.6: Safety Isolating Transformers and Power Supplies Incorporating
Safety Isolating Transformers
Part 2.16: Switch Mode Power supply units and Transformers for Switch
Mode Power supply units
IEC/EN 61347-1 (*except 18.2, PCB Resistance to Fire*);
AS/NZS 61347.1 and the Associated Part 2 Series of the Standards for the
following Lamp Control-gear Types:
Part 2.3: A.C. Supplied Electronics Ballasts for Fluorescent Lamps (*except
Annex J, Emergency Lighting*)
Part 2.11: Misc. Electronic Circuits used with Luminaires;
Part 2.13: D.C. or A.C. Supplied Electronic Control-gear for LED Modules;
IEC 62841-1 / AS/NZS 62841.1 (*excluding Annex I*)
and the Associated Part 2 Series and Part 3 Series of the Standards for
the following Equipment types:
Part 2.2: Hand-held Screwdrivers and Impact Wrenches
Part 2.4: Hand-held Sanders and Polishers other than Disk Type
Part 2.5: Hand-held Circular Saws
Part 2.8: Hand-held Shears and Nibblers
Part 2.9: Hand-held Tappers and Threaders
Part 2.11: Hand-held Reciprocation Saws
Part 2.14: Hand-held Planers
Part 3.1: Transportable Table Saws
Part 3.4: Transportable Bench Grinders
Part 3.6: Diamond Drills with Liquid System
Part 3.9: Transportable Mitre Saws
Part 3.10: Transportable Cut Off Machines
AS/NZS 60745.1;
AS/NZS 60745.2.1 (*excluding clause 17.2*);
AS/NZS 60745.2.2 (*excluding clause 17.2*);
AS/NZS 60745.2.3;
AS/NZS 60745.2.4;
AS/NZS 60745.2.6 (*excluding clause 17.2*);
AS/NZS 60745.2.8;
AS/NZS 60745.2.11;
AS/NZS 60745.2.17;
IEC 62262;
AS/NZS 60950.1 (*excluding clause 7*);
IEC/EN 60950-1, 1st and 2nd Editions (*excluding clause 7*);
IEC 61029-1;
IEC 61029-2-5;
IEC 61029-2-9;
AS/NZS 3112;
AS/NZS 3105;
AS/NZS 3122;



Test:

Test Method(s) ²:

*Product Safety
(Cont.)*

AS/NZS 3100;
AS/NZS 3197;
AS/NZS 3133;
AS/NZS 3136;
AS/NZS 1158.6;
AS/IEC/EN 60529

Fire Hazard Testing

IEC 60112, EN 60112, AS/NZS 60112:
Proof and Comparative Tracking Indices of Solid Insulating Materials;
IEC 60695.11.5, EN60695.11.5, AS/NZS 60695.11.5:
Needle Flame Test;
IEC 60695.10.2, EN 60695.10.2, AS/NZS 60695.10.2:
Ball Pressure Test;
IEC 60695.2.10, EN 60695.2.10, AS/NZS 60695.2.10:
Glow-wire Apparatus and Common Test Procedure;
IEC 60695.2.11, EN 60695.2.11, AS/NZS 60695.2.11:
Glow-wire Flammability Test Method for End-Products;
IEC 60695.2.12, EN 60695.2.12, AS/NZS 60695.2.12:
Glow-wire Flammability Test Method for Materials;
IEC 60695.2.13, EN 60695.2.13, AS/NZS 60695.2.13:
Glow-wire Ignitability Test Method for Materials

Energy Efficiency

AS/NZS 2007.1; AS/NZS 6400: Dishwasher;
AS/NZS 2040.1; AS/NZS 6400: Clothes Washing Machines;
AS/NZS 2442.1: Rotary Clothes Dryers;
AS/NZS 4665.1: External Power Supplies

Telecommunications

AS/ACIF S002;
AS/CA S002+A1, Analogue Interworking and Non-interference
Requirements for Customer Equipment for Connection to the Public
Switched Telephone Network;
AS/ACIF S003;
AS/CA S003.1+A1, Customer Access Equipment for Connection to a
Telecommunications Network;
AS/CA S003.2, Customer Access Equipment for Connection to a
Telecommunications Network;
AS/CA S003.3, Customer Access Equipment for Connection to a
Telecommunications Network;
AS/ACIF S004, Voice Frequency Performance Requirements for Customer
Equipment;
AS/ACIF S008 (*excluding underground conduit, surge suppression devices,
optical fibre and coaxial cable, pits*), Requirements for Customer
Cabling Products;
AS/ACIF S016, Requirements for Customer Equipment Connected to
Hierarchical Digital Interfaces;
AS/ACIF S031, Requirements for ISDN Basic Access Interface;
TBR 003/A1;
AS/ACIF S038, Requirements for ISDN Primary Rate Access Interface;
TBR 004/A1;

Test:

Test Method(s) ²:

*Telecommunications
(Cont.)*

AS/ACIF S040;
AS/ACIF S041;
AS/ACIF S041.1, Requirements for DSL Customer Equipment for Connection to the Public Switched Telephone Network Part 1: General;
AS/ACIF S041.2, Requirements for DSL Customer Equipment for Connection to the Public Switched Telephone Network Part 2: Modems for use in Connection with all DSL Services;
AS/ACIF S041.3, Requirements for DSL Customer Equipment for Connection to the Public Switched Telephone Network Part 3: Filters for use in Connection with all ADSL Services;
AS/ACIF S043.1, Requirements for Customer Equipment for Connection to a Metallic Local Loop Interface of a Telecommunications Network Part 1: General;
AS/ACIF S043.2, Requirements for Customer Equipment for Connection to a Metallic Local Loop Interface of a Telecommunications Network Part 2: Broadband;
AS/ACIF S043.3, Requirements for Customer Equipment for Connection to a Metallic Local Loop Interface of a Telecommunications Network Part 3: DC, Low Frequency AC, and Voiceband

Toy Testing

AS/NZS ISO 8124.1 Clauses 4.1, 4.2, 4.3.1, 4.4, 4.5
(excluding 4.5.6), 4.6, 4.7, 4.8, 4.9, 4.10 4.11 (excluding 4.11.2),
4.13, 4.14, 4.15.3, 4.17, 4.18, 4.20, 4.24, 5.1, 5.2, 5.3, 5.4, 5.5,
5.6, 5.7, 5.8, 5.9, 5.10, 5.11 (excluding 5.11.2), 5.14, 5.15, 5.18, 5.23,
& 5.24 (excluding 5.24.4);
AS/NZS ISO 8124.2

*Environmental
– Climatic*

IEC/EN 50155:2007:
- test 12.2.3 Cooling
- test 12.2.4 Dry Heat
- test 12.2.5 Damp Heat, Cyclic
- test 12.2.12 Watertightness
- test 12.2.13 Equipment Stress Screening
- test 12.2.14 Low Temperature Storage;
MIL-STD-810D, E, F, G, and G with Change 1:
- method 501.6 High Temperature
- method 502.6 Low Temperature
- method 503.6 Temperature Shock
- method 507.6 Humidity
- method 504.2 Contamination by Fluids
- method 521.4 Icing/Freezing Rain
- method 524.1 Freeze / Thaw;
MIL-STD-202G:
- method 103B Humidity Steady State
- method 107G Thermal Shock
- method 106G, Moisture Resistance;
IEC/EN 60068-2-1; IEC/EN 60068-2-2;
IEC/EN 60068-2-14; IEC/EN 60068-2-30;
IEC/EN 60068-2-38; IEC/EN 60068-2-67;
IEC/EN 60068-2-78;



Test:

Environmental
– *Climatic*

Test Method(s) ²:

DEF STAN 00-35:2006, 2017:

- test CL1 Constant High Temperature - Low Humidity
- test CL2 High Temperature and Low Humidity
- test CL4 Constant Low Temperature
- test CL5 Low Temperature Diurnal Cycle
- test CL6 High Humidity and High Temperature
- test CL7 Constant High Temperature - High Humidity
- test CL10 Icing
- test CL14 Thermal Shock and Rapid Change of Temperature;
- test CL17 Elevated Ground-Temperature/Humidity Diurnal Cycles
- test CL24 Freeze-Thaw;

DEF(AUST)5681:1998:

- Section 7.2 Climatic Tests;

RTCA DO160G

- Section 4 Temperature and Altitude
- Section 5 Temperature Variation
- Section 6 Humidity;

ISTA 3A - test blocks 1, 2;

ISTA 2A - test blocks 1, 2;

ISTA 2B - test blocks 1, 2;

GMW14650 cl. 4.2;

GMW14650 cl. 4.3;

GMW14650 cl. 4.4;

GMW3172

- clause 9.4.1 High Temperature Degradation
- clause 9.4.3 Power Temperature Cycle
- clause 9.4.5 Humid Heat Cyclic
- clause 9.4.6 Humid Heat Constant;

Ford CETP 00.00-E-412:

- clause 5.1 Low Temperature Exposure
- clause 5.2 Low Temperature Operation
- clause 5.3 High Temperature Exposure
- clause 5.4 High Temperature Operation
- clause 5.5 Powered Thermal Cycle
- clause 5.8 Humidity Temperature Cycle
- clause 5.20 85/85 High Temperature/Humidity Endurance;

ISO 16750-4;

SAE-J1455:

- clause 4.1, Temperature
- clause 4.2, Humidity;

SAE/USCAR-2:

- clause 5.6.2, Temperature Humidity Cycling
- clause 5.6.3, High Temperature Exposure;

CS.00056:

- clause 5.3.7 High Temperature and High Humidity Endurance;

EN 50125-3:2003:

- section 4.3 Temperature
- section 4.4 Humidity
- section 4.8 Ice

Test:

*Environmental -
Mechanical**
Vibration, Variable
Frequency:
1 Hz to 3 kHz;
Max Force 60 kN;
Max. Velocity 200 cm/s;
Max. Acceleration 100 g;
Max. Displacement
75 mm

Test Method(s) ²:

IEC/EN/AS 60068-2-6;
IEC/EN/AS 60068-2-27;
IEC/EN/AS 60068-2-64;
MIL-STD-810D, E, F, G and G with Change 1:
- method 514.6 Vibration
- method 516.6 Shock;
- method 520.4 Temperature, Humidity, Vibration and Altitude
MIL-STD-167-1A:
- type 1, Environmental;
MIL-STD-167-1 (ships):
- type 1, Environmental;
MIL-STD-202G:
- method 201A Vibration
- method 204D Vibration, High Frequency
- method 213B Shock
- method 214A Random Vibration;
ISTA 2A-test blocks 4-6;
ISTA 2B-test blocks 3-7;
ISTA 3A-test blocks 3, 4, 6-9;
ASTM D4169-09, -14, -16;
ASTM D4728-01;
ASTM D880; ASTM D4003;
IEC 60255-21-1; IEC 60255-21-2; IEC 60255-21-3;
ISO 16750-3:2012;
DEF STAN 00-35:2006, 2017:
- test M1 Basic Vibration
- test M3 Basic Pulse Shock
- test M4 Drop Topple and Roll
- test M6 Operational Shock Simulation
- test M11 Bounce
- test M12 Bump
- test M16 Stacking Test
- test M18 Racking Test;
DEF(AUST)5681:1998:
- Section 7.3 Transportation Environment Test;
RTCA DO160G –Section 7 Shocks and Crash Safety;
RTCA DO160G –Section 8 Vibration;
IEC/EN 61373:2010;
IEC/EN 50155:2007 - test 12.2.11 Vibration, Shock, and Bump;
IEC/EN 60068-2-75;
IEC 62262;
GMW14650 cl. 4.9; GMW3172 cl. 9.3.2; GMW3172 cl. 9.3.3;
SAE-J1455:
- clause 4.9, Vibration
- clause 4.4, Shock;
SAE/USCAR-2:
- clause 5.4.6, Vibration/Mechanical Shock;
CS.00056:
- clause 5.4.3.3 Vibration
- clause 5.4.4 Mechanical Shock;
GMW3172:
- clause 9.3.1 Vibration with Thermal Cycling
- clause 9.3.2 Mechanical Shock – Pothole;

Test:

*Environmental –
Mechanical *
(Cont.)*

Test Method(s) ²:

Ford CETP 00.00-E-412:
- clause 5.11 Vibration-Sine
- clause 5.13 Mechanical Shock;
ASTM D999-08;
ASTM D6179-07;
IEC 60068-2-31;
IEC 60068-2-81;
BS EN 50125-3:
- clause 4.13.1 Vibration
- clause 4.13.2 Shock

*Environmental -
Harsh Atmospheres*

AS/NZS 60068.2.52; IEC 60068.2.52; EN 60068.2.52,
Salt Mist Test;
ASTM B117 Salt Spray;
AS/NZS 60529; IEC 60529; EN 60529;
RTCA DO160G:
- Section 10 Waterproofness
- Section 11 Fluids Susceptibility
- Section 14 Salt Spray;
IEC 60068-2-11;
IEC 60068-2-18;
IEC/EN 50155:2007: - test 12.2.10 Salt Mist Test;
MIL-STD-810D, E, F, G and G with Change 1:
- method 509.6 Salt Fog
- method 512.5 Immersion;
MIL-STD-202G:
- method 101E Salt Atmosphere (corrosion)
- method 104A Immersion;
DEF STAN 00-35:2006, 2017:
- test CN2 Salt (corrosive) Atmosphere
- test CN4 Contamination by Fluids
- test CL25 Dust and Sand, Turbulent Dust
- test CL27 Driving Rain
- test CL29 Immersion;
DEF(AUST)5681:1998
- Section 7.4 Pressure Tests
- Section 7.5 Ingress Tests, cl. 7.5.1, 7.5.2, 7.5.3, 7.5.4
- Section 7.6 Chemical/Corrosion Tests;
ISO 20653;
ISO16750-4, clause 5.10 Dust;
SAE-J1455:
- clause 4.3, Salt Spray
- clause 4.4, Immersion;
SAE/USCAR-2
- clause 5.6.4, Fluid Resistance
- clause 5.6.5, Submersion
- clause 5.6.7, High Pressure Spray;
CS.00056
- clause 5.5.1, Dust Intrusion
- clause 5.5.3, Water or Steam Intrusion;



Test:

*Environmental -
Harsh Atmospheres
(Cont.)*

Test Method(s) ²:

GMW14650:
- clause 4.8 Fuel Resistance
- clause 4.12 Chemical Resistance to Fluids such as Cleaning Agents;
Ford CETP 00.00-E-412:
- clause 5.9, Water/Fluids Ingress
- clause 5.10.1, Dust Static
- clause 5.15, Salt Mist Atmosphere
- clause 5.16, Chemical Resistance;
Ford WSS-M2P122-EQ1:
- clause 3.15.1, Cyclic Corrosion Resistance;
Toyota TSH6524G:
- clause 4.3, Corrosion Resistance

*Environmental -
Altitude and Pressure*

MIL-STD-810D, E, F, G and G with Change 1:
- method 500.6 Low Pressure (Altitude);
IEC/EN 60068-2-13 Low Air Pressure;
SAE-J1455:
- clause 4.8, Altitude;
SAE/USCAR-2:
- clause 5.6.6, Pressure / Vacuum Leak;
DEF STAN 00-35:2006, 2017:
- test CL21 Low Air Pressure and Air Transportation
- test CL9 Rapid and Explosive Decompression
- test CL11 – High Temperature – Low Pressure
- test CL12 – Low Temperature – Low Pressure
- test CL15 – Air Pressure (above atmospheric)
- test CL13 Pressure, Temperature and Humidity
- test CL20 Rapid Change of Pressure
- test CL30 Sealing (pressure differential);
ISTA 2A, test block 5;
ISTA 3A, test block 5;
IEC 60068-2-40;
IEC 60068-2-41;
IEC 60068-3-3;
ASTM F2096-11, Test Method A;
DEF(AUST)5681:1998:
- section 7.3 Transportation Environment Test;
EN 50125-3:2003:
- section 4.2 Pressure;
MIL-STD-202G:
- method 105C Barometric Pressure (reduced)

*Environmental –
UV & Solar Radiation*

MIL-STD-810D, E, F, G and G with Change 1:
- method 505.5 Procedure I and Procedure II;
IEC 60068-2-5, Edition 2.0 2010-04;
ISO 4892-2:2006(E);
ISO 11341:2004;
ISO 105-B02-2014(E);
ISO 105-B04-1994;
ASTM D4459-12;
ASTM D1248-12;
ASTM D2565-99 (2008);
ASTM D4434 / D4434M-11;

Test:

*Environmental –
UV & Solar Radiation
(Cont.)*

Test Method(s) ²:

ASTM D4798 / D4798M-11;
ASTM D4799 / D4799M -08 (2013) e1;
ASTM D6695-08;
ASTM C1257-06a (2012);
ASTM C1442-14;
ASTM C1501-14;
ASTM C1519-10;
ASTM C732-06 (2012);
ASTM C734-06 (2012);
ASTM C793-05 (2010);
ASTM D1148-13;
ASTM D3424-11;
ASTM D3451-06 (2012);
ASTM D4329-13;
ASTM D4587-11;
ASTM D4674-02a (2010);
ASTM D5208-14;
ASTM D5894-10;
ASTM D6577-06 (2011) e1;
ASTM D750-12;
ASTM D904-99 (2013);
ASTM D925-14;
ASTM F1945-05 (2011);
ASTM G151-10;
ASTM G154-12a;
ASTM G155-13;
DEF STAN 00-35, Part 3, Issue 4. -CL-2, -CL-3, -CL-6;
ISO 4892-3;
ISO 15003, Section 5.11;
EN 50125-3:2003:
- section 4.9 Solar Radiation;
ASTM G53;
GMW14650:
- clause 4.1 Weatherometer Resistance



Test:

Test Method(s) ²:

Military EMC

MIL-STD-461/462B (*up to 18 GHz and 50 V/m*)
CE01, CE03, CS01, CS06, RE01, RE02, RS01, RS02, RS03;
MIL-STD-461/462C
CE01, CE03, CS01, CS06, RE01, RE02, RS01, RS02, RS03;
MIL-STD-461E / F (*up to 18 GHz and 50 V/m*)
CE101, CE102, CE106, CS101, CS106, CS114, CS115, CS116, RE101,
RE102, RS101, RS103

*EMC –
Conducted Emissions*

AS/NZS CISPR 14.1; CISPR 14-1; EN 55014-1;
AS/NZS CISPR 15; CISPR 15; EN 55015;
AS/NZS CISPR 32; CISPR 32; EN 55032

*Environmental
– Climatic*

IEC/EN 50155:2007:
- test 12.2.3 Cooling
- test 12.2.4 Dry Heat
- test 12.2.5 Damp Heat, Cyclic
- test 12.2.12 Watertightness
- test 12.2.13 Equipment Stress Screening
- test 12.2.14 Low Temperature Storage;
MIL-STD-810D, E, F, G, and G with Change 1:
- method 501.6 High Temperature
- method 502.6 Low Temperature
- method 507.6 Humidity
- method 504.2 Contamination by Fluids
- method 521.4 Icing/Freezing Rain
- method 524.1 Freeze / Thaw;
MIL-STD-202G:
- method 103B Humidity Steady State
- method 106G, Moisture Resistance;
IEC/EN 60068-2-2;
IEC/EN 60068-2-30;
IEC/EN 60068-2-14;
IEC/EN 60068-2-1;
IEC/EN 60068-2-78;
IEC/EN 60068-2-38; IEC/EN 60068-2-39;
IEC/EN 60068-2-66; IEC/EN 60068-2-67;
DEF STAN 00-035:2006, 2017:
- test CL1 Constant High Temperature - Low Humidity
- test CL2 High Temperature and Low Humidity
- test CL4 Constant Low Temperature
- test CL5 Low Temperature
- test CL6 High Humidity and High Temperature
- test CL7 Constant High Temperature - High Humidity
- test CL10 Icing
- test CL17 Elevated Ground-Temperature/Humidity Diurnal Cycles
- test CL24 Freeze-Thaw
- test CN4 Contamination by Fluids;

Test:

Environmental
– Climatic
(Cont.)

Test Method(s)²:

DEF(AUST)5681:1998:
- section 7.2 Climatic Tests;
RTCA DO160G
- section 4 Temperature and Altitude
- section 6 Humidity
- section 5 Temperature Variation
- section 11 Fluids Susceptibility;
ISTA 3A-test blocks 1, 2;
ISTA 2A-test blocks 1, 2;
ISTA 2B-test blocks 1, 2;
EN 50125-3:2003:
- section 4.3 Temperature
- section 4.4 Humidity
- section 4.8 Ice;
AS/NZS 1158.6 (Luminaires):
- Clause 5.9 Thermal Endurance and Thermal Testing;
ISO/AS 7240 - climatic tests covered in parts 2 through to 28
including:
- dry heat
- cold
- damp heat cyclic
- damp heat, steady state;
GMW14650 cl. 4.2;
GMW14650 cl. 4.3;
GMW14650 cl. 4.5;
ISO 16750-4;
SAE-J1455:
- clause 4.1, Temperature
- clause 4.2, Humidity;
AREMA C&S Manual 2009 Part 11.5.1:
- section D.1
- section D.2
- section D.3;
ASTM F2825;
AS3789:2014:
- clause 5.7
- clause 5.8
- clause 5.14;
AS4607:1999
- clause 3.4
ST/AG/AC.10/11/Rev. 6:2015:
- clause 38.3.4.2 Test T.2 Thermal test;
BS/EN 45502-1:2015:
- clause 26.2;
ASTM D4332

Test:

*Environmental -
Mechanical**

Vibration, Variable

Frequency:

1 Hz to 3 kHz;

Max Force 10 kN;

Max. Velocity 1.8 mm/s;

Max. Acceleration 100 g;

Max. Displacement

50 mm

Shock:

Max. force: 20 kN

Immersion: Max. 2.5 m

Acceleration Measurements

up to

± 2300g at 1 - 12 kHz

Test Method(s) ²:

IEC/EN/AS 60068-2-6;

IEC/EN/AS 60068-2-27;

IEC/EN/AS 60068-2-64;

MIL-STD-810D, E, F, G, and G with Change 1:

- method 514.6 Vibration

- method 516.6 Shock

- method 513.6 Acceleration

- method 519 Gunfire Shock;

MIL-STD-167-1A:

- type 1, Environmental;

MIL-STD-167-1 (ships):

- type 1, Environmental;

MIL-STD-202G:

- method 201A Vibration

- method 204D Vibration, High Frequency

- method 213B Shock

- method 214A Random Vibration

- method 207B High Impact Shock;

ISTA 3A - test blocks 3, 4, 6-9;

ISTA 2A - test blocks 4-6;

ISTA 1A;

ISTA 2B - test blocks 3, 4, 5, 6, 7;

ASTM D4169-09, -14, -16;

ASTM D4728;

ASTM D999;

ASTM D6179;

ASTM D880 Test Method for Impact Testing for Shipping

Containers and Systems;

ASTM D4003 Test Methods for Programmable Horizontal Impact

Test for Shipping Containers and Systems;

IEC 60255-21-1;

IEC 60255-21-2;

IEC 60255-21-3;

ISO 16750-3:2012;

DEF STAN 00-035:2006, 2017:

- test M1 Basic Vibration

- test M2 Complete Store Vibration

- test M3 General Purpose Shock Test

- test M6 Operational Shock Simulation

- test M7 Shock Testing for Warship Equipment and
Armament stores

- test M11 Wheeled Vehicle Transportation Bounce

- test M12 Bump;

DEF(AUST)5681:1998:

- section 7.3 Transportation Environment Test;

RTCA DO160G:

- section 7 Shocks and Crash Safety

- section 8 Vibration;

IEC/EN 61373:2010;

IEC/EN 50155:2007 - test 12.2.11 Vibration, Shock, and Bump;

AS/NZS 3439.5;

IEC/EN 60068-2-75;

IEC 62262;

Test:

*Environmental -
Mechanical*
(Cont.)*

Vibration, Variable
Frequency:
1 Hz to 3 kHz;
Max Force 10 kN;
Max. Velocity 1.8 mm/s;
Max. Acceleration 100 g;
Max. Displacement
50 mm

Shock:
Max. force: 20 kN

Immersion: Max. 2.5 m

Acceleration Measurements
up to
± 2300g at 1 - 12 kHz

*Environmental -
Harsh Atmospheres*

Test Method(s)²:

ISO/AS 7240
mechanical tests covered in parts 2 through to 28 including:
- Shock
- Vibration;
GMW14650 cl. 4.9;
GMW3172 cl. 9.3.2; GMW3172 cl. 9.3.3;
SAE-J1455:
- clause 4.9, Vibration
- clause 4.4, Shock;
ANSI C136.31-2010;
AREMA C&S Manual 2009 Part 11.5.1
- sections D.4 & D.5;
IEC 60068-2-7;
IEC 60068-2-31;
IEC 60068-2-55;
IEC 60068-2-81;
IEC 61243-2:
- clauses 5.4.4, 5.4.5, 5.4.6, 5.4.7, & 5.4.8;
IATA PI968;
EN 50125-3:2003:
- section 4.13 Vibration and shocks;
AS3789:2014:
- clause 5.12
- clause 5.13
- clause 5.11;
ST/AG/AC.10/11/Rev. 6:2015:
- clause 38.3.4.3 Test T.3 Vibration
- clause 38.3.4.4 Test T.4 Shock;
BS/EN 45502-1:2015:
- clause 23.2, Vibration
- clause 23.7, Shock

AS/NZS/IEC/EN 60068.2.52 Salt Mist Test;
ASTM B117 Salt Spray;
AS/NZS/IEC/EN 60529;
RTCA DO160G:
- section 14 Salt Spray;
IEC 60068-2-11;
IEC/EN 50155:2007:
- test 12.2.10 Salt Mist Test;
MIL-STD-810D, E, F, G, and G with Change 1:
- method 506.6 Rain, Procedure III
- method 509.6 Salt Fog
- method 512.6 Immersion;
DEF STAN 00-035:2006, 2017:
- test CN2 Salt (corrosive) Atmosphere
- test CL29 Immersion
- test CL25 Dust and Sand, Turbulent Dust
- test CL28 Water Drip;
DEF(AUST)5681:1998:
- section 7.5 Ingress Tests, cl. 7.5.1, 7.5.2, 7.5.3, 7.5.4
- section 7.6 Chemical/Corrosion Tests;
ISO 20653;

Test:

*Environmental -
Harsh Atmospheres
(Cont.)*

Test Method(s) ²:

SAE-J1455:
- clause 4.3, Salt Spray
- clause 4.4, Immersion;
IEC 60068-2-18;
EN 50125-3:2003
- section 4.6 Rain;
MIL-STD-202G:
- method 101E Salt Atmosphere (corrosion)
- method 104A Immersion;
ASTM D951

*Environmental –
UV & Solar Radiation*

MIL-STD-810D, E, F, G, and G with Change 1:
- method 505.6, Solar Radiation (Sunshine) Procedure I and
Procedure II;
IEC 60068-2-5, Edition 2.0 2010-04;
ISO 4892-2:2006(E);
ISO 11341:2004;
ISO 105-B02-2014(E);
ISO 105-B04-1994;
ASTM D4459-12;
ASTM D1248-12;
ASTM D2565-99 (2008);
ASTM D4434 / D4434M-11;
ASTM D4798 / D4798M-11;
ASTM D4799 / D4799M -08 (2013) e1;
ASTM D6695-08;
ASTM C1257-06a (2012);
ASTM C1442-14;
ASTM C1501-14;
ASTM C1519-10;
ASTM C732-06 (2012);
ASTM C734-06 (2012);
ASTM C793-05 (2010);
ASTM D1148-13;
ASTM D3424-11;
ASTM D3451-06 (2012);
ASTM D4329-13;
ASTM D4587-11;
ASTM D4674-02a (2010);
ASTM D5208-14;
ASTM D5894-10;
ASTM D6577-06 (2011) e1;
ASTM D750-12;
ASTM D904-99 (2013);
ASTM D925-14;
ASTM F1945-05 (2011);
ASTM G151-10;
ASTM G154-12a;
ASTM G155-13;
DEF STAN 00-035, Part 3, Issue 4 -CL-2, -CL-3, -CL-6;
ISO 4892-3;
ISO 15003, Section 5.11;
EN 50125-3:2003:
- section 4.9 Solar Radiation;
ASTM G53



AUSTEST LABORATORIES
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<u>Test:</u>	<u>Test Methods ²:</u>
<i>EMC – Radiated Emissions (10m OATS, up to 1 GHz)</i>	AS/NZS CISPR 14.1; CISPR 14-1; EN 55014-1; AS/NZS CISPR 15; CISPR 15; EN 55015; AS/NZS CISPR 32; CISPR 32; EN 55032

**Also using customer supplied test methods directly related to the tests and parameters listed.*

² When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is expected to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA R101 - *General Requirements- Accreditation of ISO-IEC 17025 Laboratories.*

Testing Activities Performed in Support of FCC Declaration of Conformity and Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1 ³:

Rule Subpart/Technology	Test Method	Maximum Frequency
Unintentional Radiators Part 15B	ANSI C63.4:2014	40000 MHz
Industrial, Scientific, and Medical Equipment Part 18	FCC MP-5 (February 1986)	40000 MHz
Intentional Radiators Part 15C	ANSI C63.10:2013	40000 MHz

³ Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (<https://apps.fcc.gov/oetcf/eas/>) for a listing of FCC approved laboratories.





Accredited Laboratory

A2LA has accredited

AUSTEST LABORATORIES

Castle Hill, NSW, Australia

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Presented this 15th day of March 2018.

A handwritten signature in black ink, written over a horizontal line.

President and CEO
For the Accreditation Council
Certificate Number 2765.02
Valid to November 30, 2019

For the types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.