



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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ELECTRICAL

Valid To: May 31, 2024

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) ^{2,3}:

Product Safety

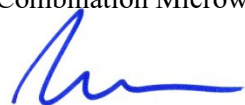
AS/NZS 60950.1; IEC/EN 60950-1, 1st and 2nd Editions;
AS 62040.1.1; AS 62040.1.2; IEC 62040-1;
AS/NZS 3100; AS/NZS 3105; AS NZS 3112; AS/NZS 3122;
AS/NZS 3133; AS/NZS 3136;
AS/NZS 60884.1 Plugs and Socket-outlets for Household and
Similar Purposes, Part 1: General Requirements (*Appendix ZZ only*);
AS/NZS 3120 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
- Supply Overvoltage
- Surges, ESD and Transient Burst Susceptibility
- Radio Interference
- Insulation;
- Visual Inspection
- Performance Test
- Power Supply Test
- Insulation Test;
- Visual Inspection
- Performance Test
- Power Supply Test
- Insulation Test;
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

Test:

*Product Safety
(Cont.)*

Test Method(s)^{2,3}:

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*);
AS/NZS 61010.1, IEC 61010-1, EN 61010-1,
Part 031 Hand-Held Probe Assemblies for Electrical Measurement and Test;
IEC 61010-2-201 Particular Requirements for Control Equipment;
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*)



Test:

Product Safety
(Cont.)

Test Method(s)^{2,3}:

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*)
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 2.49 Commercial Electric Appliances for Keeping Food and Crockery Warm
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

Test:

*Product Safety
(Cont.)*

Test Method(s)^{2,3}:

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*)
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;
AS 1271: Clause 2.6: Hydrostatic Test;
IS EN ISO 4126-1, Clause 6.3: Hydrostatic Test;
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;

Test:

*Product Safety
(Cont.)*

Test Method(s)^{2,3}:

AS/NZS 4763 - Safety of Portable Inverters;
AS 62040.1 – Uninterruptible power systems (UPS) –
Part 1: Safety requirements;
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;
AS/IEC 62619:
- Clause 4 Parameter measurement tolerances
- Clause 5 General safety considerations
- Clause 9 Information for safety
- Clause 10 Marking and designation;
IEC 62116 Utility-interconnected Photovoltaic Inverters –
Test Procedure of Islanding Prevention Measures;
IEC 62477-1 Safety requirements for power electronic converter systems
and equipment – Part 1: General;
IEC 60601-1: clauses 15.3.2, 15.3.3, and 15.3.6;
AS/NZS IEC 60601-1: clauses 15.3.2, 15.3.3, and 15.3.6;
BS EN 60601-1: clauses 15.3.2, 15.3.3, and 15.3.6;
AS/NZS 62368.1; IEC 62368-1 Audio/Video, information and
communication technology equipment – Part 1: Safety requirements;
AS/NZS 1158.6 (Luminaires):
- 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);
ST/AG/AC.10/11/Rev. 6:
- clause 38.3.4.2 Test T.2 Thermal Test
- clause 38.3.4.7 Test T.7 Overcharge;
AS/NZS 3820;
UN 38.3 (UN Manual Transport of Dangerous Goods):
- T.5 External Short Circuit Test
- T.7 Overcharge Test
- T.8 Forced Discharge Test;
Consumer Goods (Products Containing Button/Coin Batteries)
Safety Standard;
Consumer Goods (Products Containing Button/Coin Batteries)
Information Standard

Fire Hazard Testing

IEC 60112, EN 60112, AS/NZS 60112:
Proof and Comparative Tracking Indices of Solid Insulating Materials;
IEC 60695-11-5, EN 60695-11-5, 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;

Test:**Test Method(s)^{2,3}:**

*Fire Hazard Testing
(cont.)*

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

Performance (MEPS)

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

*Electromagnetic Fields
(EMF)*

EN 62233

Telecommunications

AS/CA S008 (excluding underground conduit, surge
suppression devices, optical fibre and coaxial cable, pits);
AS/CA S042.1

*EMC – Emissions
Radiated and Conducted
(3m semi-anechoic
chamber)*

CFR 47, FCC Part 15B (using ANSI C63.4-2014) (up to 40 GHz);
CFR 47, FCC Part 18 (using MP 5:1986);
AS 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; EN 55014;
AS/NZS CISPR 15, CISPR 15, EN 55015
(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; CISPR 32; EN 55032; ICES-003, Issue 7;
IEC 61000-3-2; EN 61000-3-2; IEC 61000-3-3; EN 61000-3-3

EMC – Immunity

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

*Generic/Product
Family/Industry Standards
(excluding SAR)*

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 3rd Edition; EN 60601-1-2; IEC 60601-1-2 4th Edition;
AS/NZS 3200.1.2; CISPR 14-2; EN 55014-2; AS/NZS CISPR 14-2;
CISPR 35; 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, clause 2.3.58

Test:**Test Method(s)^{2,3}:***Radio**(Transmitter and Receiver)
(excluding SAR and HAC
testing, and DFS)*

CFR 47, FCC Part 15C (using ANSI C63.10-2013);
CFR 47, FCC Part 15E (using ANSI C63.10-2013);
RSS-Gen; RSS-210; RSS-247 (*without DFS*); RSS-248;
RSS-102 Measurement (RF Exposure); IEEE C95.3;
AS/NZS 4268;
ETSI EN 300 328 (*excluding Adaptivity*)

*Stand-by Mode**(Clauses 19.11.4.1 to
19.11.4.7)*

IEC/EN 60335-1;
AS/NZS 60335.1

Aircraft EMC

RTCA DO160F/G:

Section 20.4: Radio Frequency Susceptibility (Conducted);
Section 20.5: Radio Frequency Susceptibility
(*Radiated – 2 MHz to 18 GHz up to 100 V/m*);
Section 21: Emission of Radio Frequency Energy

Military EMC

MIL-STD-461/462B (*up to 18 GHz and 100 V/m*)
CE01, CE03, CS01, CS06, RE01, RE02, RS01, RS02, RS03;
MIL-STD-461/462C (*up to 18 GHz and 100 V/m*)
CE01, CE03, CS01, CS06, RE01, RE02, RS01, RS02, RS03;
MIL-STD-461E/F (*up to 18 GHz and 100 V/m*)
CE101, CE102, CE106, CS101, CS106, CS114, CS115, CS116,
RE101, RE102, RS101, RS103;
MIL-STD-461G (*up to 18 GHz and 100 V/m*)
CE101, CE102, CE106, CS101, CS114, CS115, CS116,
RE101, RE102, RS101, RS103

*Environmental**– Climatic*

IEC/EN 50155:

- Cooling
- Dry Heat
- Damp Heat, Cyclic
- Watertightness
- Equipment Stress Screening
- Low Temperature Storage;

MIL-STD-810,

- method 501 High Temperature
- method 502 Low Temperature
- method 503 Temperature Shock
- method 507 Humidity
- method 504 Contamination by Fluids
- method 521 Icing/Freezing Rain
- method 524 Freeze / Thaw;

AECTP 300

- method 302 High Temperature
- method 303 Low Temperature
- method 304 Thermal Shock
- method 306 Humid Heat
- method 314 Contamination by Fluids
- method 311 Icing
- method 315 Freeze/Thaw;

MIL-STD-202:

- method 103B Humidity Steady State
- method 107G Thermal Shock
- method 106G, Moisture Resistance;

Environmental

IEC/EN 60068-2-2; IEC/EN 60068-2-30;



Test:

– Climatic
(Cont.)

Test Method(s)^{2,3}:

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:
- 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:
- section 7.2 Climatic Tests;
RTCA DO160:
- 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:
- 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;
AS 7240.2 - Fire Detection and Alarm Systems Fire detection control
and indicating equipment;
ISO 7240-2;
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 Part 11.5.1:
- section D.1
- section D.2
- section D.3;
ASTM F2825;

Test:

Environmental
– Climatic
(Cont.)

*Environmental -
Mechanical**

Vibration, Variable
Frequency:
1 Hz to 3 kHz;
Max Force 30 kN;
Max. Velocity 180 cm/s;
Max. Acceleration 100 g;
Max. Displacement
100 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)^{2,3}:

AS3789:
- clause 5.7
- clause 5.8
- clause 5.14;
AS4607:
- clause 3.4
ST/AG/AC.10/11/Rev. 6:
- clause 38.3.4.2 Test T.2 Thermal test;
BS/EN 45502-1:
- clauses 23.1, 23.2, 23.7, 23.8, 25.1, 26;
BS/EN 45502-2-3:
- clauses 23.1, 23.2, 23.7, 23.8, 25.1, 26;
AS/ISO 14708.1:
- clauses 23.2, 23.7, 25, 26;
ASTM D4332

AS/NZS 3013:
-Mechanical Test Method – Impact, Appendix D
-Mechanical Test Method – Cutting, Appendix E;
IEC/EN/AS 60068-2-6;
IEC/EN/AS 60068-2-27;
IEC/EN/AS 60068-2-64;
IEEE 344-8;
MIL-STD-810:
- method 514 Vibration
- method 516 Shock
- method 513 Acceleration
- method 519 Gunfire Shock;
AECTP 400 (Edition 3)
- method 401 Vibration
- method 403 Classical Waveform Shock
- method 404 Constant Acceleration
- method 405 Gunfire
- method 406 Loose Cargo
- method 414 Handling
- method 416 Rail Impact Procedure III
- method 417 SRS Shock
- method 419 Undex
- method 420 Buffet Vibration;
MIL-STD-167:
- Environmental;
MIL-STD-202:
- 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, 7, 8, 9;
ISTA 2A - test blocks 4, 5, 6;
ISTA 1A;
ISTA 2B - test blocks 3, 4, 5, 6, 7;
ASTM D4169;
ASTM D7386;
ASTM D4728;

Test:

*Environmental –
Mechanical **
(Cont.)

Vibration, Variable
Frequency:
1 Hz to 3 kHz;
Max Force 30 kN;
Max. Velocity 180 cm/s;
Max. Acceleration 100 g;
Max. Displacement
100 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)^{2,3}:

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;
DEF STAN 00-035:
- 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;
AECTP 400
- method 410 Materiel Stacking
- method 411 Materiel Bending
- method 412 Materiel Racking;
DEF(AUST)5681
- section 7.3 Transportation Environment Test;
RTCA DO160
- section 7 Shocks and Crash Safety
- section 8 Vibration;
IEC/EN 61373;
IEC/EN 50155- 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;

Test:

*Environmental –
Mechanical **
(Cont.)

Test Method(s)^{2,3}:

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;
AREMA C&S Manual 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);
AECTP 400 (Edition 3)
- method 418 Motion Platform;
EN 50125-3:
- section 4.13 Vibration and Shock;
AS3789:
- clause 5.12
- clause 5.13
- clause 5.11;
ST/AG/AC.10/11/Rev. 6:
- 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:
- clause 23.1, Free-fall
- clause 23.2, Vibration
- clause 23.7, Shock;
AZ/NZS 4387.5 to .8: Domestic Kitchen Assemblies:
- method 5: Determination of strength of hinged doors
- method 6: Determination of slam open of hinged doors
- method 7: Determination of wear and fatigue of hinged doors
- method 8: Determination of slam shut of hinged doors

*Environmental -
Harsh Atmospheres*

AS/NZS/IEC/EN 60068.2.52 Salt Mist Test;
ASTM B117 Salt Spray;
AS/NZS/IEC/EN 60529;
RTCA DO160:
- section 14 Salt Spray;
IEC 60068-2-11;
IEC/EN 50155:
- test 12.2.10 Salt Mist Test;
MIL-STD-810:
- method 506 Rain, Procedure III
- method 509 Salt Fog
- method 512 Immersion;

Test:

*Environmental -
Harsh Atmospheres
(Cont.)*

Test Method(s)^{2,3}:

AECTP 300:
- method 307 Immersion
- method 309 Salt Fog
- method 310 Rain/Watertightness;
DEF STAN 00-035:
- 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:
- 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:
- section 4.6, Rain;
MIL-STD-202:
- method 101E Salt Atmosphere (corrosion)
- method 104A Immersion;
ASTM D951

*Environmental -
Altitude and Pressure*

MIL-STD-810:
- method 500 Low Pressure (Altitude);
AECTP 300:
- method 312 Low Pressure
- method 317 Temperature/Humidity/Altitude
- method 318 Vibration/Temperature. Humidity/Altitude;
IEC/EN 60068-2-13 Low Air Pressure;
SAE-J1455:
- clause 4.8, Altitude;
DEF STAN 00-035:
- 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, Test Method A;
ASTM D6653;
DEF(AUST)5681:
- section 7.3 Transportation Environment Test;
EN 50125-3:
- section 4.2 Pressure;

Test:

*Environmental -
Altitude and Pressure
(Cont.)*

Test Method(s)^{2,3}:

MIL-STD-202G;
- method 105C Barometric Pressure (reduced);
AS/NZS 3707;
ST/AG/AC.10/11/Rev. 6:
- clause 38.3.4.1 Test T.1 Altitude simulation;
BS/EN 45502-1:
- 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-1474;
MIL-STD-1474;
MIL-STD-740;
MIL-STD-740-1;
MIL-STD-740-2;
ISO 3744;
IEC 60068-2-65;
AS3789:
- clause 5.18;
AS4607:
- clause 3.10.4

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

AUSTEST LABORATORIES

46 Glenola Farm Lane
Yarramalong, NSW 2259, AUSTRALIA
Mr. Brett Coleman Phone: +61 2 9680 9990

Test:

EMC – Emissions

Test Method(s)²:

AS CISPR 11; CISPR 11; EN 55011;
AS/NZS CISPR 12; CISPR 12; EN 55012;
AS/NZS CISPR 13, CISPR 13, EN 55013:
(excluding broadcast satellite receivers and the disturbance voltage
at antenna terminals test for other than 75 Ω coaxial equipment);
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, CISPR 32, EN 55032;
AS/NZS 4251.1 (except measurements below 2 kHz);
47 CFR, FCC Part 15 Subpart B (using ANSI C63.4:2014) (up to 40 GHz);
47 CFR, FCC Part 18 (using FCC MP-5:1986);
ICES-003, Issue 7;
IEC 61000-3-2; IEC 61000-3-3; EN 61000-3-2; EN 61000-3-3

Test:

*Generic/Product
Family Standards*

*Radio
(Transmitter and Receiver)
(excluding SAR and HAC
testing, and DFS)*

Test Method(s) ²:

IEC 61000-6-3; EN 61000-6-3;
IEC 61000-6-4; EN 61000-6-4

CFR 47, FCC Part 15C (using ANSI C63.10-2013);
CFR 47, FCC Part 15E (using ANSI C63.10-2013);
RSS-Gen; RSS-210; RSS-247 (without DFS); RSS-248;
RSS-102 Measurement (RF Exposure); IEEE C95.3;
AS/NZS 4268; ETSI EN 300 328 (excluding Adaptivity)

AUSTEST LABORATORIES

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Fax: +61 (0)3 9464 0687

Test:

Toy Testing

Test Method(s) ²:

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, 4.13, 4.14, 4.15.3, 4.17, 4.18, 4.19,
4.24, 4.33, 4.34, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11,
5.12.6, 5.14, 5.15, 5.18, 5.23, 5.24 (excluding 5.24.4), 5.35, & 5.37;
AS/NZS ISO 8124.2

Fire Detection

AS 7240.2 - Fire Detection and Alarm Systems Fire detection
control and indicating equipment;
ISO 7240-2

*Environmental
– Climatic*

IEC/EN 50155:
- 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-810:
- method 501 High Temperature
- method 502 Low Temperature
- method 503 Temperature Shock
- method 507 Humidity
- method 504 Contamination by Fluids
- method 521 Icing/Freezing Rain
- method 524 Freeze / Thaw;

*Environmental
– Climatic
(Cont.)*

AECTP 300:
- method 302 High Temperature
- method 303 Low Temperature
- method 304 Thermal Shock
- method 306 Humid Heat
- method 314 Contamination by Fluids
- method 311 Icing
- method 315 Freeze/Thaw;

MIL-STD-202:
- method 103B, Humidity Steady State
- method 107G, Thermal Shock
- method 106G, Moisture Resistance;

Test:

*Environmental
– Climatic
(Cont.)*

Test Method(s) ²:

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;
DEF STAN 00-35:
- 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:
- Section 7.2 Climatic Tests;
RTCA DO160:
- 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:
- 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

Shock:
Max. acceleration 100 g

Static Load:
Max 10 kN

Drop:
Max 2000 mm, 100 kg

Test Method(s) ²:

IEC/EN/AS 60068-2-6;
IEC/EN/AS 60068-2-27;
IEC/EN/AS 60068-2-64;
IEEE 344-8;
MIL-STD-810:
- method 514 Vibration
- method 516 Shock
- method 520 Temperature, Humidity, Vibration and Altitude;
AECTP 400:
- method 401 Vibration
- method 403 Classical Waveform Shock
- method 404 Constant Acceleration
- method 405 Gunfire
- method 406 Loose Cargo
- method 414 Handling
- method 416 Rail Impact Procedure III
- method 417 SRS Shock
- method 419 Undex
- method 420 Buffet Vibration;
MIL-STD-167:
- Environmental;
MIL-STD-202:
- 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 3-10;
ISTA 3B-test blocks 2-18;
ASTM D4169;
ASTM D7386;
ASTM D4728;
ASTM D880; ASTM D4003;
IEC 60255-21-1; IEC 60255-21-2; IEC 60255-21-3;
ISO 16750-3;
DEF STAN 00-35:
- test M1 Basic Vibration
- test M3 Basic Pulse Shock
- test M4 Drop Topple and Roll
- test M5 Impact (Vertical and Horizontal)
- test M6 Operational Shock Simulation
- test M11 Bounce
- test M12 Bump
- test M16 Stacking Test
- test M18 Racking Test;
AECTP 400:
- method 410 Materiel Stacking
- method 411 Materiel Bending
- method 412 Materiel Racking;
DEF(AUST)5681:
- Section 7.3 Transportation Environment Test;
RTCA DO160 –Section 7 Shocks and Crash Safety;
RTCA DO160 –Section 8 Vibration;

Test:

*Environmental –
Mechanical **
(Cont.)

Test Method(s) ²:

IEC/EN 61373;
IEC/EN 50155:
- 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;
Ford CETP 00.00-E-412:
- clause 5.11 Vibration-Sine
- clause 5.13 Mechanical Shock;
ASTM D999;
ASTM D6179;
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 DO160:
- Section 10 Waterproofness
- Section 11 Fluids Susceptibility
- Section 14 Salt Spray;
IEC 60068-2-11;
IEC 60068-2-18;
IEC/EN 50155: - test 12.2.10 Salt Mist Test;
MIL-STD-819:
- method 509 Salt Fog
- method 512 Immersion;
AECTP 300:
- method 307 Immersion
- method 309 Salt Fog
- method 310 Rain/Watertightness;
MIL-STD-202:
- method 101E Salt Atmosphere (corrosion)
- method 104A Immersion;
DEF STAN 00-35:
- test CN2 Salt (corrosive) Atmosphere
- test CN4 Contamination by Fluids
- test CL25 Dust and Sand, Turbulent Dust
- test CL27 Driving Rain
- test CL29 Immersion;

*Environmental -
Harsh Atmospheres*
(Cont.)

Test:

Test Method(s) ²:

DEF(AUST)5681:

- 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;

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

Test:

*Environmental -
Altitude and Pressure*

Test Method(s) ²:

MIL-STD-810:
- method 500 Low Pressure (Altitude);
AECTP 300
- method 312 Low Pressure
- method 317 Temperature/Humidity/Altitude
- method 318 Vibration/Temperature. Humidity/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:
- 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 D4169;
ASTM F2096, Test Method A;
DEF(AUST)5681:
- section 7.3 Transportation Environment Test;
EN 50125-3:
- section 4.2 Pressure;
MIL-STD-202:
- method 105C Barometric Pressure (reduced)

*Environmental –
UV & Solar Radiation*

MIL-STD-810:
- method 505 Procedure I and Procedure II;
AECTP 300:
- method 305 Solar Radiation;
IEC 60068-2-5;
ISO 4892-2; ISO 4892-2;
ISO 105-B02;
ISO 105-B04;
ASTM D4459;
ASTM D1248;
ASTM D2565;
ASTM D4434 / D4434M;
ASTM D4798 / D4798M;
ASTM D4799 / D4799M ;
ASTM D6695;
ASTM C1257;
ASTM C1442;
ASTM C1501;
ASTM C1519;
ASTM C732;
ASTM C734;
ASTM C793;

Test:

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

Test Method(s) ²:

ASTM D1148;
ASTM D3451;
ASTM D4329;
ASTM D4587;
ASTM D4674;
ASTM D5208;
ASTM D5894;
ASTM D6577;
ASTM D750;
ASTM D904;
ASTM D925;
ASTM G151;
ASTM G154;
ASTM G155;
DEF STAN 00-35, Part 3, -CL-2, -CL-3, -CL-6;
ISO 4892-3;
ISO 15003, Section 5.11;
EN 50125-3:
- section 4.9 Solar Radiation;
ASTM G53;
GMW14650:
- clause 4.1 Weatherometer Resistance

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Test:

Military EMC

Test Method(s) ²:

MIL-STD-461/462B (*up to 18 GHz and 100 V/m*)
CE01, CE03, CS01, CS06, RE01, RE02, RS01, RS02, RS03;
MIL-STD-461E / F (*up to 18 GHz and 100 V/m*)
CE101, CE102, CE106, CS101, CS106, CS114, CS115, CS116, RE101,
RE102, RS101, RS103;
MIL-STD-461G (*up to 18 GHz and 100 V/m*)
CE101, CE102, CE106, CS101, 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:
- 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;

Test:

Environmental
– Climatic
(Cont.)

Test Method(s) ²:

MIL-STD-810:

- method 501 High Temperature
- method 502 Low Temperature
- method 507 Humidity
- method 504 Contamination by Fluids
- method 521 Icing / Freezing Rain
- method 524 Freeze / Thaw;

AECTP 300

- method 302 High Temperature
- method 303 Low Temperature
- method 304 Thermal Shock
- method 306 Humid Heat
- method 314 Contamination by Fluids
- method 311 Icing
- method 315 Freeze/Thaw;

MIL-STD-202:

- 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:

- 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;

DEF(AUST)5681:

- section 7.2 Climatic Tests;

RTCA DO160:

- 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:

- 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;

Test:

– Climatic
(Cont.)

*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. acceleration: 2,300 g

Immersion: Max. 2.5 m

Acceleration Measurements

up to $\pm 2300g$ at 1 - 12 kHz

Test Method(s) ²:

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 Part 11.5.1:

- section D.1
- section D.2
- section D.3;

ASTM F2825;

AS3789:

- clause 5.7
- clause 5.8
- clause 5.14;

AS4607:

- clause 3.4;

ST/AG/AC.10/11/Rev. 6:

- clause 38.3.4.2 Test T.2 Thermal test;

BS/EN 45502-1:

- clause 26.2;

ASTM D4332

IEC/EN/AS 60068-2-6;

IEC/EN/AS 60068-2-27;

IEC/EN/AS 60068-2-64;

IEEE 344-8;

MIL-STD-810:

- method 514 Vibration
- method 516 Shock
- method 513 Acceleration
- method 519 Gunfire Shock;

AECTP 400 (Edition 3)

- method 401 Vibration
- method 403 Classical Waveform Shock
- method 404 Constant Acceleration

- method 405 Gunfire

- method 406 Loose Cargo

- method 414 Handling

- method 416 Rail Impact Procedure III

- method 417 SRS Shock

- method 419 Undex

- method 420 Buffet Vibration;

MIL-STD-167:

- Environmental;

MIL-STD-202:

- method 201A Vibration
- method 204D Vibration, High Frequency
- method 213B Shock
- method 214A Random Vibration
- method 207B High Impact Shock;

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. acceleration: 2,300 g

Immersion: Max. 2.5 m

Acceleration Measurements
up to $\pm 2300g$ at 1 - 12 kHz

Test Method(s) ²:

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

ASTM D7386;

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;

DEF STAN 00-035:

- 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:

- section 7.3 Transportation Environment Test;

RTCA DO160:

- section 7 Shocks and Crash Safety

- section 8 Vibration;

IEC/EN 61373;

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

AS/NZS 3439.5;

IEC/EN 60068-2-75;

IEC 62262;

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;

AREMA C&S Manual 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:

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. acceleration: 2,300 g

Immersion: Max. 2.5 m

Acceleration Measurements

up to $\pm 2300g$ at 1 - 12 kHz

*Environmental -
Harsh Atmospheres*

Test Method(s) ²:

- section 4.13 Vibration and Shocks;
AS3789:

- clause 5.12

- clause 5.13

- clause 5.11;

ST/AG/AC.10/11/Rev. 6:

- clause 38.3.4.3 Test T.3 Vibration

- clause 38.3.4.4 Test T.4 Shock;

BS/EN 45502-1:

- clause 23.2, Vibration

- clause 23.7, Shock;

MIL-HDBK-2036:

- clause 5.1.2.12:

(Inclination testing of ship or submarine-borne equipment);

AECTP 400:

- method 418 Motion Platform

AS/NZS/IEC/EN 60068.2.52 Salt Mist Test;

ASTM B117 Salt Spray;

AS/NZS/IEC/EN 60529;

RTCA DO160:

- section 14 Salt Spray;

IEC 60068-2-11;

IEC/EN 50155:

- test 12.2.10 Salt Mist Test;

MIL-STD-810:

- method 506 Rain, Procedure III

- method 509 Salt Fog

- method 512 Immersion;

AECTP 300:

- method 307 Immersion

- method 309 Salt Fog

- method 310 Rain/Watertightness;

DEF STAN 00-035:

- test CN2 Salt (corrosive) Atmosphere

- test CL29 Immersion

- test CL25 Dust and Sand, Turbulent Dust

- test CL28 Water Drip;

DEF(AUST)5681:

- 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:

- section 4.6 Rain;

MIL-STD-202:

- method 101E Salt Atmosphere (corrosion)

- method 104A Immersion;

ASTM D951

AUSTEST LABORATORIES
Corner of Fox Creek Road and Lobethal Road
Cudlee Creek, SA 5232, AUSTRALIA
Mr. Brett Coleman Phone: +61 8 8288 7400

Test:

Test Method(s) ²:

EMC –	AS/NZS CISPR 14.1; CISPR 14-1; EN 55014-1;
Radiated Emissions	AS/NZS CISPR 15; CISPR 15; EN 55015;
(10m OATS, up to 1 GHz)	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, edition, version, etc. is not identified in the scope of accreditation, laboratories may use the version that immediately precedes the current version for a period of one year from the date of publication of the standard measurement method, per part C., Section 1 of A2LA R101 - *General Requirements-Accreditation of ISO-IEC 17025 Laboratories*.

³ The laboratory is only accredited for testing activities outlined within the test methods listed above. Reference to any other activity within these standards, such as risk management or risk assessment, does not fall within the laboratory's accredited capabilities.

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1 ⁴:

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
U-NII without DFS Intentional Radiators Part 15E	ANSI C63.10:2013	40000 MHz

⁴ 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 17025:2017 *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 April 2017).



Presented this 14th day of February 2022.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2765.02
Valid to April 30, 2024
Revised November 13, 2023

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