EQUILAM NORTH AMERICA LLC

Salt Spray GMW 3172 Series

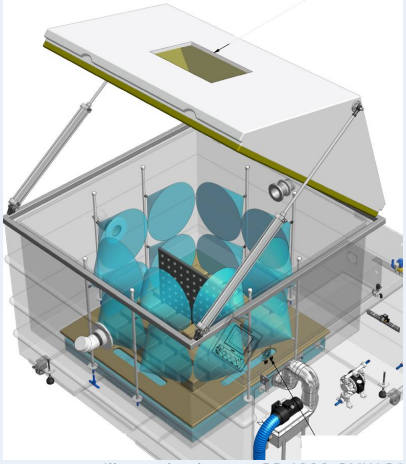
Direct Pressurized Salt Spray Test Chambers

Built for GMW 3172 Item 9.4.8 · Heat / Dry · Direct Salt Spray · Fan Cooling
Programmable 24 h cycles · 20, 30 and 40-day programs · Bench and Walk-In

BUILT FOR GM E/E COMPONENT VALIDATION

Spray, not fog. Pressurized salt spray aimed at the part.

GMW 3172 Item 9.4.8 sprays a 5 % NaCl solution under pressure directly onto under-hood, plenum and door wet-area components, between 70 °C heat soaks and 25 °C drying. A salt fog cabinet for ASTM B117, ISO 9227 or JIS Z 2371 cannot reproduce it.



Illustrative image: SS 4000 GMW 3172 bench chamber

Direct pressurized spray

Stainless BHMW 2.8W nozzles

Horizontal spray headers wet every face of the DUT at 40 to 60 cm; recirculating pump at 32 L/min.

Heat, spray, cool

Three programmable modes

Heat/dry to 90 °C, room-temperature spray with heat off, fan cooling to ambient, each on its own timer.

Bench and Walk-In

From 1.3 m³ to walk-in rooms

SS 1300, SS 3500 and SS 4000 bench models; Walk-In 21 and 40 for large modules and assemblies.

Equilam North America GMW 3172 chambers run the full Item 9.4.8 sequence automatically, so the 20, 30 or 40-day program needs no manual transfer of specimens between ovens, spray booths and drying racks.

PATENTED NON-METALLIC CHAMBER TECHNOLOGY

U.S. Patent No. 10,371,623

01 / THE TEST

Spray, not fog: Item 9.4.8 needs its own chamber

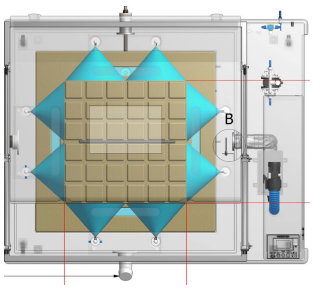
ASTM B117, ISO 9227 and JIS Z 2371 expose specimens to an **indirect fog**: an atomizer produces a mist that drifts through the cabinet and settles on the samples, and the specimens must not be hit by the spray directly. GMW 3172 Item 9.4.8 does the opposite: a salt solution is **sprayed under pressure directly onto the specimens**, which are heated and dried in between to reproduce road splash on under-hood and wet-area electronics.

Attribute	ASTM B117 · ISO 9227 · JIS Z 2371	GMW 3172 Item 9.4.8
Exposure	Indirect salt fog; mist settles on the specimens	**Direct pressurized spray aimed at the specimens**
Delivery system	Compressed-air atomizer with saturation tower; baffles prevent direct impact	Stainless spray nozzles on horizontal headers, fed by a recirculating pump
Wetting	Fallout of about 1 to 2 ml per 80 cm² per hour, collected and checked	Full cone pattern that wets the complete area of each specimen
Temperature	Constant 35 °C for the whole test	Cycled: 70 °C heat soak, spray with heat off, 25 °C drying
Solution	5 % NaCl, atomized at chamber temperature	5 % NaCl in DI water at room temperature, pH 6.5 to 7.2
Specimen position	Panels inclined, shielded from direct spray	40 to 60 cm from the nozzles; vehicle orientation and connectors facing the spray
Specimens	Panels, coated and plated parts	E/E components with production harness and connectors, unpowered during the cycle
Program	Continuous exposure for the specified hours	24 h cycles repeated for 20, 30 or 40 days
Chamber	Salt fog cabinet	Spray chamber with heat/dry, spray and fan cooling modes

Summary for chamber selection. The issue of GMW 3172 named in the customer requirement governs the test.

A salt fog cabinet cannot run Item 9.4.8

A B117 cabinet has no pressurized nozzles, no recirculating spray pump, no 70 °C heat-soak mode and no forced-air cooling. Running Item 9.4.8 in it means moving parts between ovens and spray booths every hour, which breaks the cycle timing and the repeatability the GM program requires.



Spray pattern seen from above

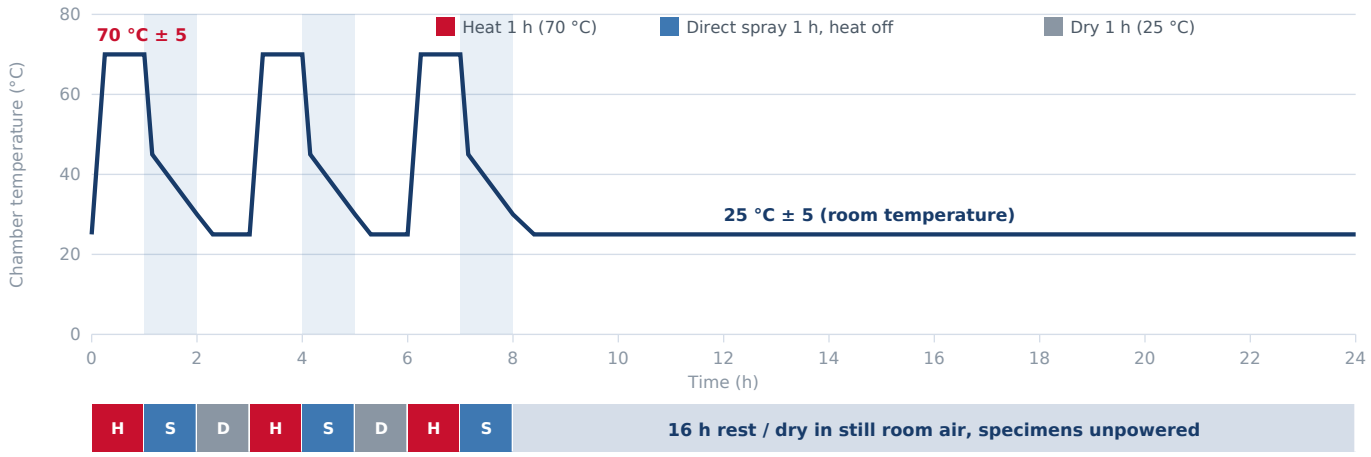
Opposed spray headers project full cones across the specimen base, so the faces, edges and connector interfaces of every DUT are wetted directly. The base height is adjustable to keep each specimen inside the 40 to 60 cm distance window.

Illustrative image: SS 4000, top view of the spray cones over the fixture base.

02 / TEST CYCLE

The 24 h Item 9.4.8 cycle, automated

Each day runs three heat and spray pairs followed by a long rest. The chamber controller sequences the modes and timers, so the cycle repeats unattended for the full test duration.



Cycle per GMW 3172, April 2018 issue. Temperature curve is schematic; actual decay during spray depends on load and room conditions.

Step	Chamber mode	Condition	Time
a · Heat	Heat / Dry	Specimens unpowered, heated to 70 °C ± 5 °C	1 h
b · Spray	Salt solution spray	Heat OFF; 5 % NaCl at room temperature sprayed directly on the specimens	1 h
c · Dry	Fan on / Cooling	Drying in 25 °C ± 5 °C still air	1 h
d · Repeat	Heat → Spray → Dry	Steps a, b and c once more	3 h
e · Final	Heat → Spray → Rest	Steps a and b, then drying in room-temperature still air	2 h + 16 h

Component location	IP water code	Test duration
Wet side of door interior	3 or 6K	20 days · 480 h
Non-interior, indirect exposure to salt spray	6K, 8 or 9K	30 days · 720 h
Non-interior, direct exposure to salt spray	6K, 8 or 9K	40 days · 960 h

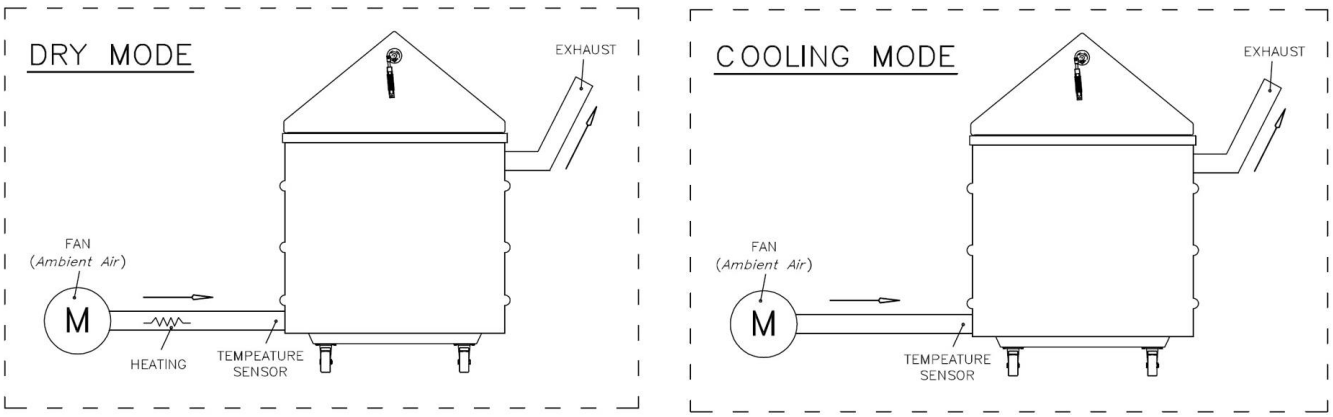
Applies to non-interior components: under the hood, in the plenum at the base of the windshield and inside the doors (wet area). A functional/parametric check follows the last cycle.

03 / TECHNICAL DATA

Operating modes

Three independent modes, each with its own timer, build the Item 9.4.8 sequence. Two independent PT100 sensors control and supervise the chamber temperature.

Parameter	Value
MODE 1: HEAT / DRY	
Chamber temperature	Ambient +5 °C (+9 °F) to +90 °C (+194 °F); SS 3500 to +80 °C (+176 °F)
Control resolution	0.1 °C, PT100 3-wire sensors
Timer	0 to 99 h 99 min
MODE 2: SALT SOLUTION SPRAY (HORIZONTAL)	
Spray nozzles	BHMW 2.8W stainless steel (316L) on horizontal headers
Nozzle layout	SS 1300 and SS 4000: 2 headers × 3 nozzles · SS 3500: 2 headers × 5 nozzles · Walk-In: horizontal batteries wetting four sides
Pumps	Pneumatic polypropylene pumps, low noise, with filter
Flow (recirculated)	32 L/min (8.4 gal/min); Walk-In 40: 60.6 L/min (16 gal/min). Non-recirculated on request
Solution	5 % NaCl in DI water, at room temperature
MODE 3: FAN ON / COOLING	
Chamber temperature	Ambient, forced room air
Exhaust	4 in (bench) · 6 in (Walk-In 21) · 12 in (Walk-In 40)
Timer	0 to 99 h 99 min

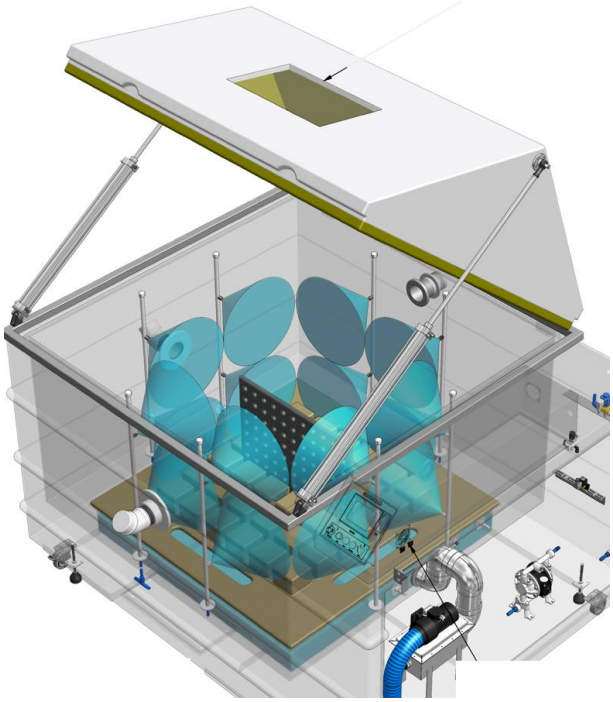


Air path in heat/dry mode (left) and fan cooling mode (right).

04 / CONSTRUCTION

Why Equilam North America

Equilam GMW 3172 chambers share the non-metallic construction of our salt spray and cyclic corrosion lines, with the spray, heat and cooling hardware the Item 9.4.8 cycle needs.



Illustrative image: SS 4000 with lid open, spray headers and fixture base.

Fiberglass cabinet, no metal inside

Biphenyl epoxy vinyl ester resin rated to 120 °C (248 °F). No galvanic couple can distort the result (U.S. Patent No. 10,371,623).

Double wall, insulated

75 mm thermal insulation (100 mm on SS 3500) for stable heat soaks and low surface temperature.

Pneumatic lid with window

Automatic lid opening at 80°; viewing window to check the spray without stopping the cycle.

PLC control

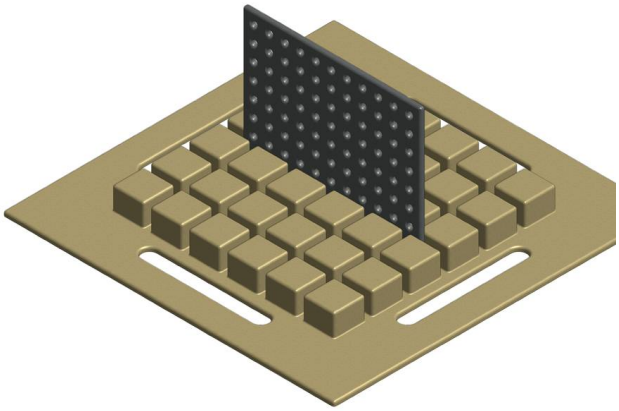
Panasonic PLC (color touch screen on SS 3500), mode timers and remote monitoring of fan, heat and spray.

Construction feature	Technical purpose
Cable ports	Waterproof ports at 45°: 2 × Ø 2 in (SS 1300, SS 4000) or 2 × Ø 4 in (SS 3500). The harness exits protected from the spray.
Adjustable fixture base	Fiberglass support with height adjustment to hold 40 to 60 cm between nozzles and specimens.
Temperature sensors	Two independent PT100 sensors; additional sensor port on the chamber wall.
Time-signal relays	2 relay outputs (250 VAC 5 A / 30 VDC 5 A) to synchronize external test equipment with the cycle.
Data acquisition	USB data acquisition with Windows-compatible software (laptop not included).
Leveling feet	Adjustable feet, 2 to 4 in, for a level spray plane.

05 / SPECIMENS

Fixturing the component under test

Item 9.4.8 tests a minimum of six units with their production-intent connectors and harness. Equilam fixture bases and racks are built in fiberglass to the customer DUT and keep every unit inside the spray window.



Fixture base and vertical rack

Perforated vertical panel for connector-facing units, molded pockets for units in vehicle orientation, and slots for harness routing. SS 3500 base: 2,500 × 1,000 mm, ten DUTs of 12 × 10 × 2 in per run.

Illustrative image: SS 4000 fixation system.

Requirement	How the chamber supports it
At least six units per test	Fixture base sized for the full sample set in one run
Two units in vehicle orientation (upward/downward)	Molded pockets and adjustable height on the base
One unit with connectors facing the nozzles	Vertical perforated panel in front of the spray headers
Production harness, no splices, ends protected	Waterproof 45° cable ports; wire ends stay outside the chamber
Functional check without disturbing the connectors	Harness routed so the post-test check uses the same connection

Custom racks for your component

Send the DUT drawing or a sample. Equilam designs the rack in fiberglass so that no metal reaches the spray zone and every face is inside the 40 to 60 cm window.

06 / MODELS

Reference models

Three bench models and two walk-in rooms. All run the same three modes; size follows the component and the number of units per test.

Bench model	Interior W × D × H (mm)	Interior W × D × H (in)	Volume (m³ / cu.ft)	Nozzles · tank	Electrical
SS 1300	1,300 × 780 × 900	51.2 × 30.7 × 35.4	1.3 / 45.9	6 · 75 L	208–230 V 1~ 50/60 Hz, 70 FLA
SS 3500	2,500 × 1,080 × 1,000	98.4 × 42.5 × 39.4	3.5 / 123.6	10 · 250 L	208–230 V 1~ 60 Hz, 55 FLA
SS 4000	1,800 × 1,800 × 1,050	70.9 × 70.9 × 41.3	4.0 / 142	6 · 75 L	208–230 V 1~ 60 Hz, 32 FLA

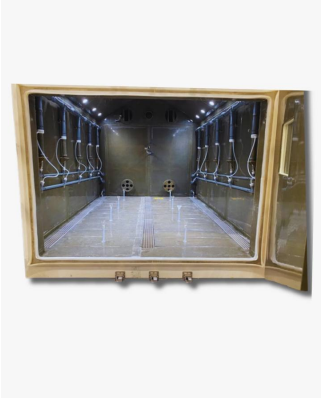
Bench model	External W × D × H, lid closed (mm)	Net weight	Max heat	Window
SS 1300	2,480 × 1,250 × 1,645	290 kg / 639 lb	+90 °C	On request
SS 3500	3,900 × 1,600 × 1,800	850 kg / 1,874 lb	+80 °C	20 × 40 in
SS 4000	2,460 × 1,960 × 2,150	680 kg / 1,500 lb	+90 °C	23 × 15 in

Interior heights exclude the lid; volumes include it.

Walk-in model	Interior W × D × H (mm)	External W × D × H (mm)	Spray flow	Exhaust	Electrical
Walk-In 21	3,500 × 2,000 × 2,500	4,000 × 2,300 × 3,950	32 L/min	6 in	480 V 3~ 60 Hz, 80 FLA
Walk-In 40	3,500 × 3,500 × 2,500	3,900 × 3,900 × 3,950	60.6 L/min	12 in	480 V 3~ 60 Hz, 100 FLA

Walk-ins: 1,400 L solution tank, heat/dry to +90 °C, horizontal spray batteries wetting four sides, Panasonic PLC, remote monitoring. Panelized construction; custom sizes on request.





Walk-in construction

Panelized fiberglass rooms with the same non-metallic interior as the bench models, for complete modules, harness assemblies and large under-hood components.

Illustrative images: Equilam walk-in chamber construction.

07 / INSTALLATION

Laboratory requirements and options

Utilities are prepared by the customer before start-up. Every chamber ships with an installation, maintenance and user manual.

Utility	Requirement
Compressed air	Oil- and water-free, constant pressure: 100 psi (SS 1300, SS 4000), 56 psi (SS 3500), 8 bar (Walk-In)
DI water	ASTM D1193 Type IV, 7 to 28 psi (0.5 to 2 kgf/cm²)
Chamber exhaust	PVC pipe without siphon: 4 in bench, 6 in or 12 in walk-in; fume hood if required
Drain	PVC tube to a common floor drain
Room conditions	17 °C to 25 °C (63 °F to 77 °F), max. 85 % RH without condensation
Service area	At least 60 cm (23.6 in) around the chamber for cleaning and maintenance
Solution control	pH, conductivity and NaCl concentration (densitometer)

Option	Description
Start-up and training	Installation, commissioning and operator training at the customer site
ISO 17025 certificates	Traceable calibration of temperature and pressure (electronic)
Custom DUT rack	Fiberglass rack designed for the customer component
DI water assembly	Activated carbon filter, DI column and LED water quality indicator; spare columns and filters
Solution handling	270 L long-term tank with automatic mix and feed; drain pump; non-recirculated spray
Laboratory items	Densitometer with ISO 17025 certificate; EQCORR salt with traceability certificate
Exhaust	Fiberglass fume hood and axial fan assembly, 1,940 CFM
Connectivity	Additional Ø 2 in cable ports; data acquisition software (RS-232 or USB)
Certification	NRTL and CSA (Canada) certificates

Preventing chemical cross-contamination

Each chamber is designed for one standard and one solution. Do not run CASS, Kesternich (SO2) or humidity tests in a salt spray chamber: residues are very hard to remove and will distort later results.

Contact · EQUILAM NORTH AMERICA

For configurations, custom fixtures and dimensions not listed in this document, contact equilamna.com | sales@equilamna.com | (754) 900-7816