EQUILAM NORTH AMERICA LLC

SSe Series

Salt Spray Test Chambers

Salt Spray (Salt Fog) · ASTM B117 · ISO 9227 · JIS Z 2371 · ASTM G85 A1

BUILT TO THE TEST METHOD

No metal in the test cabinet

Non-metallic composite construction, indirect water-jacket heating and fog distribution as described in the standards.



Composite cabinet

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

Water jacket

Indirect, uniform heating

Monoblock

Tank and Bubble Tower integrated

Equilam North America SSe chambers perform neutral salt spray and acidified salt spray tests, the traditional laboratory methods for accelerated corrosion testing of metal parts with organic or inorganic coatings. They are used for quality control, qualification testing and comparison between specimens.

Because these tests are comparative, the construction of the chamber is decisive for repeatability and reproducibility. Every SSe chamber follows the construction characteristics described in ASTM B117, ASTM B368, ASTM G85 A1, ISO 9227 and JIS Z 2371.

PATENTED NON-METALLIC CHAMBER TECHNOLOGY

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

01 / APPLICATIONS

Salt spray testing for coated metals

SSe chambers expose specimens to a controlled, high-humidity salt fog for the period specified by the applicable standard or company specification. After exposure, specimens are evaluated for degree of oxidation, type of corrosion and any further assessment the standard requires.

Test	Solution	Chamber temperature	Reference methods
Neutral salt spray (NSS)	Neutral salt solution, pH 6.5 to 7.2	35 °C (95 °F)	ASTM B117 · ISO 9227 NSS · JIS Z 2371 NSS
Copper-accelerated acetic acid salt spray (CASS)	Cupric acetic salt solution, pH 3.0 to 3.3	49 °C (120 °F)	ASTM B368 · ISO 9227 CASS · JIS Z 2371 CASS
Acetic acid salt spray (AASS)	Acetic acid salt solution, pH 3.0 to 3.3	35 °C (95 °F)	ASTM G85 A1 · ISO 9227 AASS · JIS Z 2371 AASS

Some industry-specific standards derive from the traditional methods listed above. Test duration is defined by the applicable standard or customer specification.

Industries served

Automotive, renewable energy, construction, plastics, aviation, oil and gas, paints and varnishes, electronics, chemicals, metallurgy and other industrial sectors.

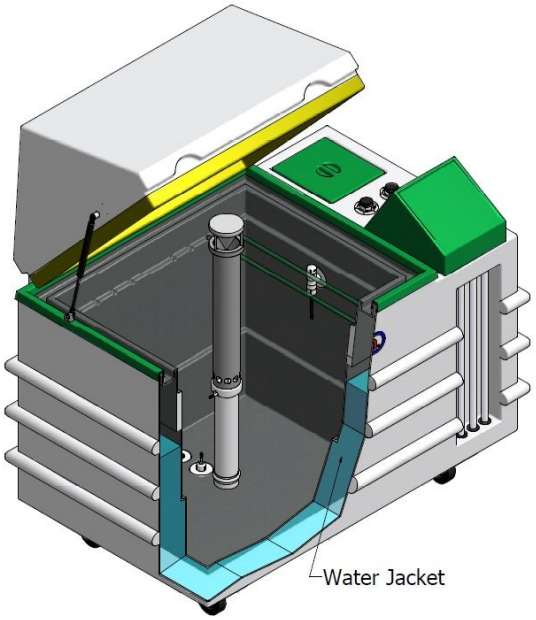
Salt spray and cyclic corrosion

Traditional accelerated methods do not reproduce natural weathering cycles such as hot and cold, wet and dry, pollutants and solar radiation. Where closer correlation with field exposure is required, Equilam C.C.T. and C.C.T. CORR AUTO cyclic corrosion chambers combine salt spray, condensing humidity, temperature and relative humidity control, drying, soak and immersion in programmable cycles.

02 / CONSTRUCTION

Non-metallic, water-jacketed cabinet

The SSe test cabinet is built inside and outside from a non-metallic composite material (U.S. Patent No. 10,371,623). There are no metal parts in the inner cabinet, so galvanic corrosion cannot distort test results.



Cutaway illustration showing the water jacket around the inner cabinet.

Water-jacket heating

Water surrounds the entire inner cabinet and heats it indirectly, giving high temperature stability and uniformity. The composite was developed to increase thermal conductivity.

No heaters inside the cabinet

The standards call for indirect heating by water or air jacket. Electric heating elements inside the test cabinet are not used.

Construction feature	Technical purpose
Composite inner cabinet	Non-metallic composite (U.S. Patent No. 10,371,623) with no metal parts in contact with the test environment.
Insulated fiberglass outer cabinet	Thermal insulation reduces energy consumption and operating cost.
100° lid	Smooth inner finish with no structural elements inside. High scratch-resistant plastic: salt crystals scratch acrylic, and scratches create drip points over the specimens.
Lid side windows (optional)	Specimen viewing through side windows with side lighting, so no drip points form over the specimens.
Monoblock body	Solution tank and Bubble Tower (saturator) are integrated into a single unit.

03 / FOG GENERATION

Indirect atomization and uniform collection

ASTM, ISO and JIS require the salt solution to be atomized indirectly. Fog must never be sprayed directly onto the specimens; it must settle uniformly from top to bottom, and fog collection must be uniform and constant throughout the test.

Component	Function
Venturi atomizing nozzle	Produces fog, not droplets, on the Venturi principle described in ASTM B117. Spray distance is controlled by the saturator pressure. Peristaltic pumps are not recommended.
Fog dispersion tower with cone	Distributes fog uniformly from top to bottom through the whole cabinet, with the fog flow perpendicular to the specimens, exactly as described in the standards.
Floor exhaust and drain	Fog exhaust and the drain for precipitated solution are located on the chamber floor (ASTM B117), keeping fog collection uniform. Side-wall exhaust is not used because it distorts fog distribution.
Bubble Tower (air saturator)	Stainless steel, automatic. Humidifies and heats the compressed air supplied to the atomizer.
Solution tank	Automatic solution tank, integrated into the monoblock body.

Minimum cabinet volume

ASTM B117 notes that cabinets smaller than 0.4 m^3 (14.2 ft^3) can cause undesirable effects on fog distribution, temperature and turbulence, and leave too little distance between walls, nozzles and specimens. ISO 9227 recommends at least 400 liters, excluding the lid. Every SSe model offers at least 415 liters of internal volume.



Bubble Tower (air saturator), stainless steel.



Optional lid side windows.

04 / MODELS

SSe series reference models

Five reference sizes cover the SSe line. All models share the monoblock design: solution tank and Bubble Tower (saturator) integrated into a single unit.

Model	Interior W × D × H (mm)	Interior W × D × H (in)	Internal volume (L / cu.ft)	Chamber temperature range	Bubble Tower temperature range
SSe 15-450	820 × 650 × 780	32.3 × 25.6 × 30.7	415 14.7	Ambient +5 to 55 °C (Ambient +9 to 131 °F)	Ambient to 80 °C (Ambient to 176 °F)
SSe 28-810	1,190 × 820 × 830	46.9 × 32.8 × 32.7	810 28.6	Ambient +5 to 55 °C (Ambient +9 to 131 °F)	Ambient to 80 °C (Ambient to 176 °F)
SSe 45-1200	1,500 × 900 × 900	59.1 × 35.4 × 35.4	1,200 42.9	Ambient +5 to 55 °C (Ambient +9 to 131 °F)	Ambient to 80 °C (Ambient to 176 °F)
SSe 110-3100	2,500 × 1,250 × 991	98.4 × 49.2 × 39.0	3,097 109.4	Ambient +5 to 55 °C (Ambient +9 to 131 °F)	Ambient to 80 °C (Ambient to 176 °F)
SSe 135-4000	3,100 × 1,250 × 991	122.0 × 49.2 × 39.0	3,840 135.0	Ambient +5 to 55 °C (Ambient +9 to 131 °F)	Ambient to 80 °C (Ambient to 176 °F)

Standard voltage: 208 ~ 220 V, 1-phase, 60 Hz. Other voltages on request.

Interior dimensions exclude the lid. Source: Equilam North America, Salt Spray SSe Specifications, Rev.9.0.



Illustrative image, SSe series.

05 / WALK-IN

Walk-In WSSe reference sizes

The WSSe line extends salt spray testing to large components and assemblies. Internal dimensions exclude the V-shaped roof; approximate internal volumes include the roof space. Panelized construction allows custom dimensions.

Reference	Interior W × D × H (mm / in)	Door W × H (mm / in)	Approx. volume including roof (m³ / cu.ft)
WSSe 14	2,000 × 2,000 × 2,500 78.7 × 78.7 × 98.4	1,500 × 2,100 59.0 × 82.6	14.0 494.4
WSSe 18	3,000 × 2,000 × 2,500 118.1 × 78.7 × 98.4	1,500 × 2,100 59.0 × 82.6	18.2 642.7
WSSe 40	3,500 × 3,500 × 2,500 137.8 × 137.8 × 98.4	3,000 × 2,130 118.1 × 83.8	40.0 1,412.0
WSSe 55	5,000 × 3,500 × 2,500 196.9 × 137.8 × 98.4	3,000 × 2,130 118.1 × 83.8	55.0 1,942.0
WSSe 77	7,000 × 3,500 × 2,500 275.6 × 137.8 × 98.4	3,000 × 2,130 118.1 × 83.8	77.0 2,719.0

Reference sizes are examples. Source: Equilam North America, Salt Spray SSe Specifications, Rev.9.0, Walk-In table.



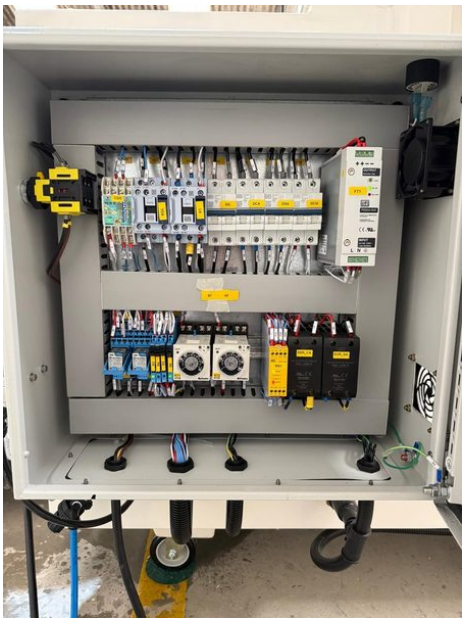
Illustrative image, WSSe series.

06 / CONTROL AND SAFETY

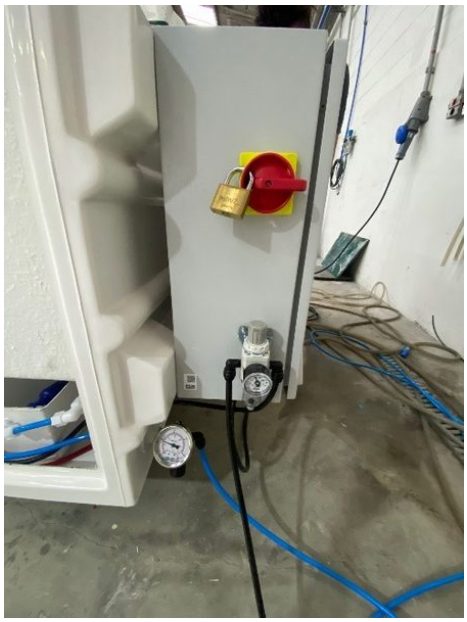
Operator safety and process status

The electrical panel and safety functions protect the operator and the test, and make the status of the chamber visible at a glance.

Function	Description
Electrical panel	UL-labeled panel protected against water splash and dust. All electrical components are UL labeled.
Emergency stop	Instant stop to prevent accidents.
Lockout switch	Padlockable switch for preventive and corrective maintenance.
Safety relay	Interrupts the electrical circuits whenever it detects faults or accident risks.
Lid sensor	When the lid is opened to inspect specimens, spraying and heating of the chamber and saturator are disabled automatically, saving energy and increasing operator safety.
Signal tower	Industrial color LED signal providing visual and audible indication of machine and process status.
Front level indicators	Solution tank, deionized water in the Bubble Tower and water jacket levels are on the front, easy for the operator to read, backed by electronic safety level sensors.



UL-labeled electrical panel.



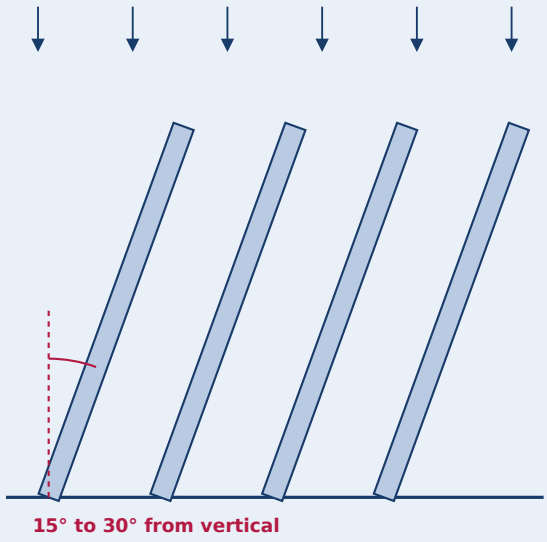
Padlockable lockout switch.



Front level indicators.

07 / SPECIMENS

Specimen placement and test quality



Illustrative arrangement

Support angle

Support or suspend specimens with the significant surface between 15° and 30° from vertical, in a consistent orientation to minimize variability.

No contact

Specimens must not touch each other or any metal.

Unobstructed exposure

Place each specimen so the fog settles on it freely.

No cross-dripping

Salt solution from one specimen must not drip onto another. Placement can also be defined by agreement between the parties involved.

Test input	Quality requirement
Salt (NaCl)	Purity limits and maximum concentrations of undesirable elements per ASTM B117, ISO 9227 and JIS Z 2371. Equilam CORRO SALT is available.
Water	ASTM D1193 Type IV (max. 5 µS/cm). A deionizer is recommended to reach the required quality.
Compressed air	Free of grease, oil and dirt, filtered before use, and held at sufficient pressure at the base of the Bubble Tower for the working pressures.

Preventing chemical cross-contamination

A neutral salt spray cabinet used for an acid test (AASS or CASS), for any solution other than those specified in ASTM B117, ISO 9227 NSS or JIS Z 2371 NSS, or for any other purpose becomes chemically contaminated, and the reverse also applies. It must then be fully cleaned until the pH required by the standards is reached and its corrosivity verified. This cleaning is difficult, and full decontamination is almost impossible to achieve (ISO 9227). Equilam recommends separate chambers for neutral and acid tests.

08 / OPTIONAL ACCESSORIES

Options and accessories

SSe chambers can be completed with calibration services, specimen supports, measurement instruments and additional functions according to the test program.

Code	Option
CALIBRATION AND CERTIFICATION	
EQOP.0036	Compliance certificate of traceability per ISO 17025, temperature (electronic)
EQOP.0092	Compliance certificate of traceability per ISO 17025, pressure (electronic)
EQOP.0043	Chamber corrosivity determination certificate: calibration of controllers, electronic, pneumatic and volumetric components with ISO 17025 traceability; chamber corrosivity calibration per ISO 9227 with 18 reference specimens; statistical calculation; chamber validation per ISO 9227
EQOP.0056	Field Evaluation certificate by SGS or CSA
—	UL 508A certification of the electrical panel
—	Start-up and commissioning
SPECIMEN SUPPORTS	
EQOP.0002	Rack with 15° or 20° inclination in accordance with ASTM B117 and ISO 9227
EQOP.0005	Rack to accommodate special parts
EQOP.0121	Grid-type test bracket for a distributed load of 120 kg (265 lb)
EQOP.0169	Inclined specimen holder for screws, with nylon threaded bushings defined by the customer (max. Ø 22 mm)
EQOP.0035	Cable port, Ø 2 in (other diameters on request)
MEASUREMENT AND TEST SUPPLIES	
EQOP.0008	Two glass fog collectors with protective plastic box, ILAC / ISO 17025 calibration certificate
EQOP.0016	Digital pH meter with standard solution
EQOP.0017	Digital conductivity meter with standard solution
EQOP.0018	Density meter for salt solution concentration per ASTM B117, ILAC / ISO 17025 calibration certificate
EQOP.0019	50 lb bucket of EQCORR salt with chemical analysis certificate per ASTM B117, ASTM B368, ISO 9227, JIS Z 2371 and MIL-STD-810G
EQOP.0038	Test panels 76 × 127 mm per ASTM B117 (100 pieces)
EQOP.0075	Test panels 70 × 150 mm per ISO 9227 (100 pieces)

08 / OPTIONAL ACCESSORIES

Options and accessories (continued)

Code	Option
WATER AND SOLUTION	
EQOP.0013	Deionizer EQDP010 with activated charcoal filter and conductivity monitor: green LED below 5.0 µS/cm (ASTM D1193 Type IV), red LED at 5.0 µS/cm or above. Max. flow 100 L/h (26 gal/h)
EQOP.0034	Long-term solution tank, 270 L (71.3 gal), with automatic solution mixing and feeding
EQOP.0161	Manual solution mixing
EQOP.0162	Deionized water inlet to the solution tank
EXHAUST AND DRAINAGE	
EQOP.0011	Fiberglass fume hood with axial fan: 1,610 × 1,210 × 701 mm, 340 mm suction pipe, 1,940 cfm, fiberglass fan 208/220 V, 3-phase, 60 Hz
EQOP.0111	Gas scrubber exhaust system
EQOP.0068	Pump to drain precipitated solution
CONTROL AND DATA	
EQOP.0044	Supervisory software (data acquisition) via PC, RS-485 or USB. Computer not included
EQOP.0047	Digital relative humidity (%RH) indication on the control panel
CHAMBER FUNCTIONS	
EQOP.0007	Side window in the lid (per side), preventing drip points over the specimens
—	Purge system: removes fog from the test cabinet with dry air before the lid is opened, avoiding contamination of the installation area
—	Condensing humidity mode
—	Drying mode at laboratory temperature and relative humidity
—	Internal lighting

Coupons per inclined rack depend on the 15° to 30° inclination and coupon height, because spacing must prevent corrosion products from dripping from one coupon onto another.

Other options on request · EQUILAM NORTH AMERICA

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