EQUILAM NORTH AMERICA LLC

C.C.T Series

Cyclic Corrosion Test Chambers

Salt Spray · Condensed Humidity · Natural Dry · Soak · Dry-Off · CTH

BUILT FOR REAL-WORLD CORROSION

Six modes, one program

Salt spray, condensed humidity, natural dry, soak, dry-off and CTH as standard, alternated in automatic cycles.



Composite cabinet

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

Fully composite construction with no metal parts: no galvanic couple forms, so test results are free of distortion.

Air jacket

Indirect heating per ASTM B117

Monoblock

Tank and Bubble Tower integrated

Equilam North America C.C.T chambers provide one of the closest laboratory simulations of natural corrosion: some studies indicate that their results approach those of outdoor exposure. Specimens are exposed to different environments (modes) in a repetitive, programmable sequence, with additional modes available as options.

The cabinet is built inside and outside from a special polymer with high chemical and thermal resistance, an inert material. Metallic chambers, such as stainless steel, form a galvanic couple with the specimens and can distort results; the C.C.T has no metal part and no heating element in contact with the test environment.

PATENTED NON-METALLIC CHAMBER TECHNOLOGY

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

01 / TEST MODES

Six modes included as standard

Continuous salt spray does not reproduce natural weathering cycles such as hot and cold, wet and dry, or salt deposition followed by drying. Every C.C.T chamber includes six modes that can be combined freely in programmed corrosion cycles.

Mode	Exposure	Reference methods
1 · Salt spray (salt fog)	Corrosive (saline or acid) fog at high humidity, with the solution specified by the standard or company specification	ASTM B117 · ISO 9227 · JIS Z 2371 · DIN 50021
2 · Condensed humidity	Warm saturated humidity, 100% RH, condensing on the specimens	ISO 6270-2 CH · DIN 50017 · ASTM D2247 · ASTM D1735
3 · Natural dry	The lid opens and specimens remain at laboratory temperature and humidity. After salt spray or humidity, the cabinet is purged automatically before the lid opens	Cyclic test programs
4 · Soak	Holds the chamber temperature for a period set by the operator	Cyclic test programs
5 · Dry-off	Injection of hot, dry air into the cabinet, up to 60 °C with RH ≤ 30%	Cyclic test programs
6 · CTH	Controlled temperature versus relative humidity, within the green area of the CTH chart (section 05)	Cyclic test programs

Cycle sequence, duration of each mode, ramps and number of cycles are defined by the applicable standard or customer specification.

Programs run with the standard modes

ASTM B117 · ISO 9227 · JIS Z 2371 · DIN 50021 · ISO 6270-2 CH · ASTM D2247 · ASTM D1735 · ASTM G85 A1. Other standards: consult Equilam NA.

Industries served

Automotive and auto parts, heavy vehicles, aviation and defense, renewable energy, construction, paints and coatings, plastics, electronics, oil and gas and metallurgy.

Salt spray and cyclic corrosion

Salt spray (ASTM B117, ISO 9227) remains the reference for comparative quality control. Where correlation with outdoor exposure is required, cyclic programs alternate wet, dry, hot and humid phases in the same chamber, so the corrosion produced is closer to service conditions.

01 / TEST MODES

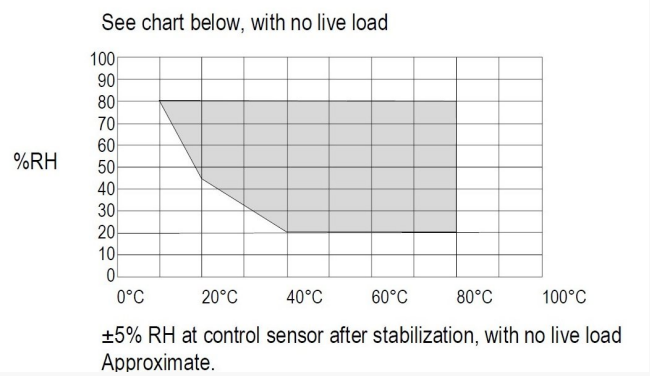
Optional modes

Additional modes extend the C.C.T to acidified, SO2, Prohesion, climatic and spray programs. Each option is supplied according to the test program; other modes on request.

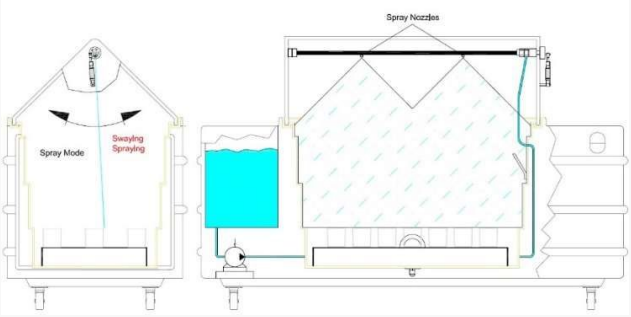
Code	Optional mode	Reference methods
EQOP.1001-600	Salt / SO2 spray (fog) test	ASTM G85 A4
EQOP.1002-600	Prohesion test: solution atomized at ambient temperature; compressed air does not pass through the saturator	ASTM G85 A5
EQOP.1003-600	SWAAT test (sea water acidified)	ASTM G85 A3
EQOP.1004-600	Cyclic acidified salt fog test	ASTM G85 A2
EQOP.2000-600	Temperature × relative humidity control: controller, coils, compressor and valves	Cyclic test programs
EQOP.2001-600	Cooling system down to -30 °C (-22 °F)	Cyclic test programs
EQOP.3000-600	Oscillating spray	Ford CETP 00.00-L-467
—	Immersion: solution pumped into the cabinet to submerge the specimens, heated or at ambient temperature	Company specifications

Programs run with the optional modes

Nissan CCT · VW PV1210 · VW PV1209 · VDA 621-415 · Honda CCT · SAE J2334. Other standards: consult Equilam NA.



TEMPERATURE × RH (EQOP.2000-600), NO LIVE LOAD



SPRAY AND IMMERSION, SCHEMATIC

Temperature × RH chart: ±5% RH at the control sensor after stabilization, with no live load; approximate. For ultra-low temperature steps down to -40 °C, see the Equilam C.C.T CORR AUTO series.

02 / TECHNICAL DATA

Operating ranges by mode

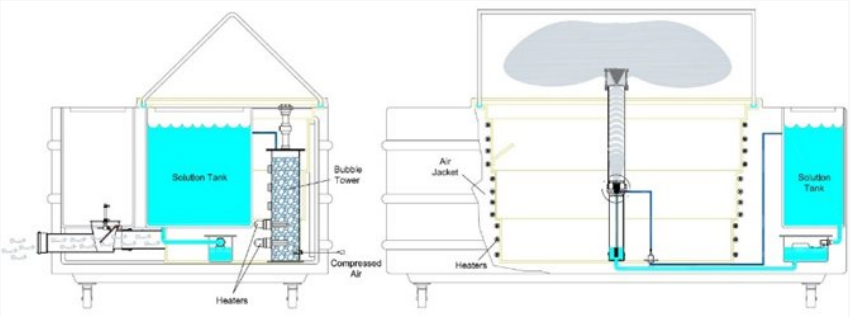
Temperatures are controlled by PT100 sensors (3-wire) with a controller resolution of 0.1 °C. Each mode has its own set point, timer and elapsed time on the touchscreen.

Parameter	Value
MODE: SALT SPRAY / SALT FOG	
Chamber temperature	Ambient +5 °C to 55 °C (Ambient +9 °F to 131 °F)
Bubble Tower temperature	Ambient +5 °C to 74 °C (Ambient +9 °F to 165 °F)
Temperature homogeneity	±1.0 °C (±1.8 °F), chamber and Bubble Tower
Bubble Tower pressure	29 to 196 kPa (4.2 to 28 psi)
Fog collection	1.0 to 2.0 mL/h, over a continuous 16-hour test
MODE: CONDENSED HUMIDITY	
Chamber temperature	Ambient +5 °C to 70 °C (Ambient +9 °F to 158 °F)
Relative humidity	97% ±3%, with condensation
MODE: DRY-OFF (HOT AIR INJECTION)	
Dry-off temperature	Ambient +5 °C to 60 °C (Ambient +9 °F to 140 °F), RH ≤ 30%
Dry air homogeneity	±0.5 °C
Timer	Mode, set point and elapsed time, hh:mm
MODE: NATURAL DRY AND SOAK	
Natural dry	Ambient temperature and humidity, lid open; automatic purge after salt spray or humidity modes
Soak	Temperature held for a period set by the operator
MODE: CTH (TEMPERATURE × RELATIVE HUMIDITY)	
Operating range	Temperature × relative humidity within the green area of the CTH chart (section 05)

02 / TECHNICAL DATA

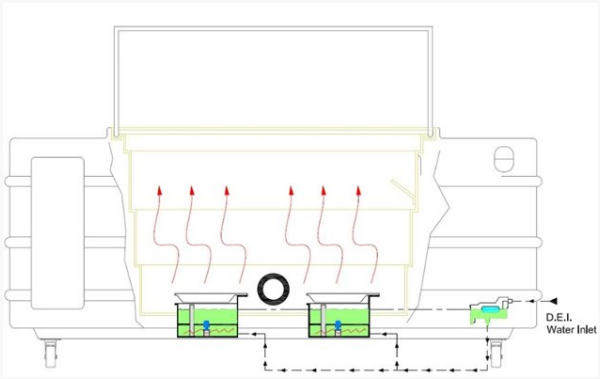
How each mode works

The three conditioning systems of the C.C.T share the same cabinet: atomization from the central tower, heated water pans for condensed humidity, and a blower with heaters for hot, dry air.



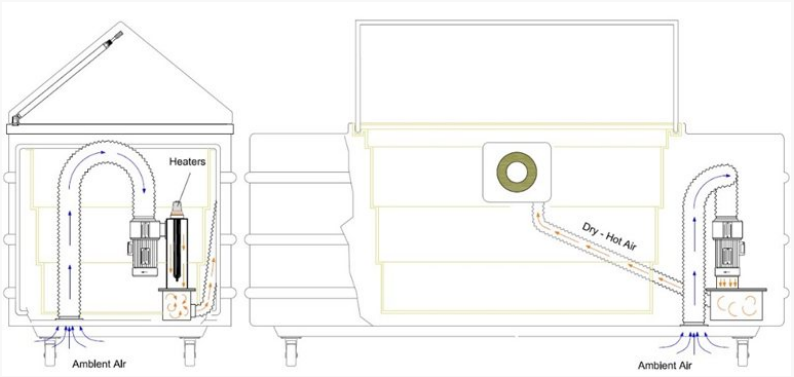
Salt spray

Solution tank, stainless steel Bubble Tower and central atomization tower; the air jacket heats the cabinet indirectly.



Condensed humidity

Heated water pans fed by the deionized water inlet saturate the cabinet, and humidity condenses on the specimens.



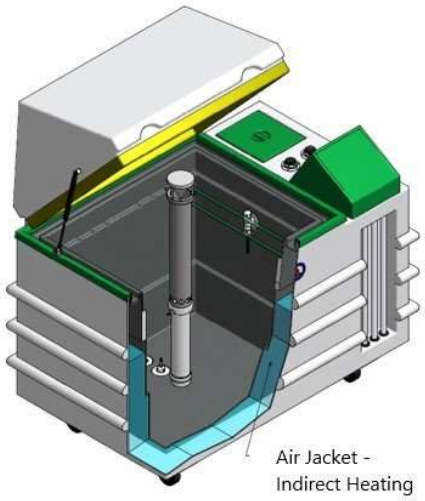
Dry-off

A blower draws ambient air through heaters and injects dry, hot air into the cabinet.

03 / CONSTRUCTION

Non-metallic, air-jacketed cabinet

The C.C.T test cabinet is built from a special polymer with high chemical and thermal resistance (U.S. Patent No. 10,371,623); the outer cabinet is fiberglass. There are no metal parts in the inner cabinet, so galvanic corrosion cannot distort test results.



Cutaway illustration showing the air jacket around the inner cabinet.

Air-jacket heating

Indirect heating of the inner cabinet through an air jacket (ASTM B117), with heaters in the base, for high temperature homogeneity.

No heaters inside the cabinet

Metallic heating elements inside the test cabinet are not used, so they cannot affect corrosivity.

Pneumatic lid with safety system

Gas-spring lid with lid safety system.

Construction feature	Technical purpose
Composite inner cabinet	Special polymer, inert, with no metal parts in contact with the test environment (U.S. Patent No. 10,371,623).
Fiberglass outer cabinet	High temperature and chemical resistance; thermal insulation reduces energy consumption.
100° lid	Smooth surface without seams (ASTM B117), designed so drops that form on the lid do not fall onto the specimens (ASTM B117-19, item 4.2).
Water seal	Seals the lid against the cabinet during the test.
Floor drain and exhaust	Combined drain and exhaust in the chamber floor (ASTM B117), with forced draft waste pipe.
Monoblock (unibody) body	Solution tank and Bubble Tower (saturator) integrated into a single cabinet, on feet with casters.
Lid side windows (optional)	Specimen viewing through side windows in the lid, without drip points over the specimens (EQOP.0007).

04 / FOG GENERATION

Indirect atomization and uniform collection

ASTM, ISO and JIS require the 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
Central atomization tower	Venturi nozzle with air tube, producing fog and not droplets; better fog distribution as described on page 4 of ASTM B117 and in Annex A of ISO 9227. Peristaltic pumps are not recommended.
Bubble Tower (air saturator)	Automatic, stainless steel, meeting the pressure tank safety standard (ASME Code), with electronic safety and minimum/maximum level sensors.
Compressed air regulator	Precision pressure regulator valve with filter and gauge.
Solution tank	Multi-day continuous tank (70 L / 18.5 gal, 4 to 5 days, on the C.C.T 45-1200) with min/max level indication, automatic and manual mixing set on the touchscreen PLC, anti-blocking filters and easy access for cleaning.
Water supply	Automatic deionized water inlet and automatic leveling device for the reservoir; low- and high-level water sensors.
External fog collection	Collected fog is measured from outside the chamber, without opening the lid.

Minimum recommended volume

Equilam NA recommends a test cabinet volume of at least 1,000 liters, excluding the lid. Smaller cabinets produce undesirable effects on fog distribution, dry-off and temperature, and generate turbulence.



Central atomization tower and fog collectors.



Bubble Tower, stainless steel.



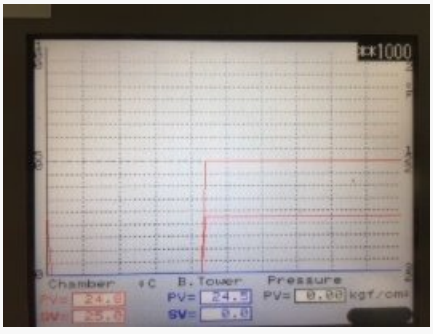
External fog collection.

05 / CYCLE CONTROL

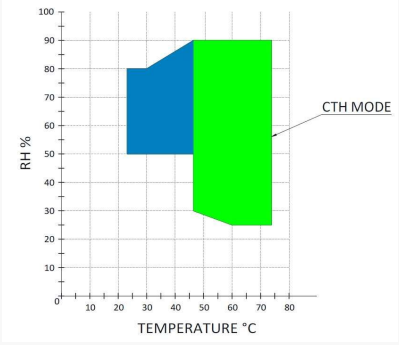
Programmable cycles with ramps and soaks

The programmable touchscreen PLC alternates the test modes automatically, with ramps and plateaus (soaks) that approach real weathering, and shows the test status on a single screen.

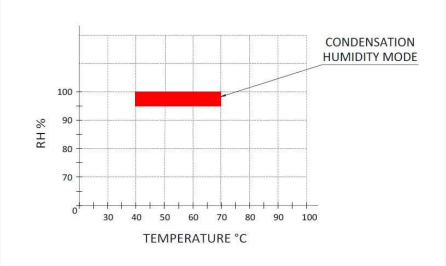
Function	Description
Programmed tests	20 programmed tests: sequence of modes, set points, ramps, soaks and number of cycles.
Trend plot	Trend plot of the test parameters on the touchscreen.
Critical parameters	Critical test parameters displayed on one screen.
Messages	Alarm messages, recommended maintenance and error messages displayed on the touchscreen.
Visual safety and alarm system	Alarms indicated on the touchscreen and on the signal lights.
RH control	Option 1: RH measured inside the test chamber. Option 2: RH measured in the injection air entering the cabinet (economic version).
CTH chart	Control within the green area of the chart. To reach the blue area, the laboratory must be held at or below 21 °C (69.8 °F) and 50% RH; otherwise the ECAX cooling and RH control system is required.
Data acquisition (optional)	Supervisory software (data logger) via PC, RS-485 or USB (EQOP.0044).



TREND PLOT ON TOUCHSCREEN



CTH: TEMPERATURE × RH



CONDENSED HUMIDITY MODE

06 / MODELS

C.C.T series reference models

Five reference sizes cover the C.C.T 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)
C.C.T 15-450	820 × 650 × 780	32.3 × 25.6 × 30.7	415 14.7
C.C.T 28-810	1,190 × 820 × 830	46.9 × 32.8 × 32.7	810 28.6
C.C.T 45-1200	1,500 × 900 × 900	59.1 × 35.4 × 35.4	1,200 42.9
C.C.T 110-3100	2,500 × 1,250 × 991	98.4 × 49.2 × 39.0	3,097 109.4
C.C.T 135-4000	3,100 × 1,250 × 991	122.0 × 49.2 × 39.0	3,840 135.0

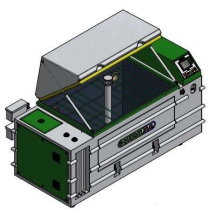
Interior dimensions exclude the lid. Models from 1,200 L meet the recommended minimum volume for cyclic testing. Source: Equilam North America, Specification Sheet CCT Vrs 1.0.

C.C.T 45-1200 general specification

Item	C.C.T 45-1200
Electrical supply	208 – 230 V, 1-phase, 50/60 Hz, 32 FLA (plug not included)
External dimensions W × D × H	2,800 × 1,250 × 1,200 mm (111 × 50 × 48 in), lid closed
Net weight (approx.)	245 kg (540 lb)
Shipping weight, crated (approx.)	400 kg (881 lb)



Illustrative image, C.C.T 45-1200 with ECAX system (optional).



Illustrative image, C.C.T 45-1200.

07 / WALK-IN

Walk-In W.C.C.T reference sizes

The W.C.C.T line extends cyclic corrosion testing to large components and assemblies. Panelized construction allows custom dimensions; internal dimensions exclude the V-shaped roof and approximate volumes include the roof space.

Reference	Interior W × D × H (mm / in)	Door W × H (mm / in)	Approx. volume including roof (m^3 / cu.ft)
W.C.C.T 14-500	2,000 × 2,000 × 2,500 78.7 × 78.7 × 98.4	1,500 × 2,100 59.0 × 82.6	14.0 494.4
W.C.C.T 18-700	3,000 × 2,000 × 2,500 118.1 × 78.7 × 98.4	1,500 × 2,100 59.0 × 82.6	18.2 642.7
W.C.C.T 40-15000	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
W.C.C.T 55-20000	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
W.C.C.T 77-30000	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; custom dimensions on request. Source: Equilam North America, Specification Sheet CCT Vrs 1.0, Walk-In table.



Illustrative image, W.C.C.T 14-500.



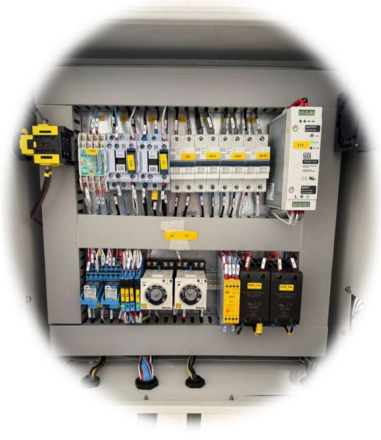
Illustrative image, W.C.C.T 55-20000.

08 / 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	Built to meet CE / UL508A, protected against water splash and dust. UL508A certification available as an option.
Front controls	Emergency stop, reset, alarm and operating LED.
Lockout switch	Padlockable safety key that protects the user during preventive and corrective maintenance.
Safety relay	Interrupts the electrical circuits whenever it detects faults or accident risks.
Lid safety system	When the lid is opened to inspect specimens, spraying and heating of the chamber and saturator are disabled automatically.
Alarms	Visual safety and alarm system on the touchscreen, with alarm, maintenance and error messages.
Front level indicators	Solution and Bubble Tower levels visible on the front, backed by electronic safety level sensors.



UL508A electrical panel.



Padlockable lockout switch.



Emergency stop, reset, alarm and operating LED.

09 / STANDARDS

International and automaker test programs

C.C.T chambers are designed to run the main cyclic corrosion programs of international standards bodies and of automotive, heavy-vehicle and aerospace manufacturers. Confirm the modes each program requires when configuring the chamber.

Group	Standards and specifications
Base methods	ASTM B117 · ISO 9227 · JIS Z 2371 · DIN 50021 · ISO 6270-2 CH · DIN 50017 · ASTM D2247 · ASTM D1735
ASTM G85 annexes	A1 (standard modes) · A2, A3, A4 and A5 (optional modes)
International cyclic	ASTM D5894 · IEC 60068-2-52 · ISO 11997-1 and 2 · ISO 12944 · ISO 16701 · ISO 19453-4 · SAE J2334 · VDA 232-102 · VDA 621-415
Automotive	BMW PA-P-029 · Ford CETP 00.00-L-467 · Ford TM 00.00-L-467 · GMW 14872 · Honda CCT · Honda Structural · Jaguar TPJLR.52.252 · Jaguar TPJLR.52.265 · Jaguar TPJLR.52.554 · Mercedes-Benz MBN 10518 · Nissan CCT I, II, IV · Renault D 17 2028 C · Tesla TP0000808 · Toyota TSH 1555G · VW PV1209 · VW PV1210
Heavy vehicles and equipment	John Deere JDQ 178 · Scania STD 4233 · Scania STD 4319 · Scania STD 4445 · Volvo STD 1027,1375 · Volvo STD 1027,14 · Volvo STD 423-0014 · Yamaha YGK-8-501
Military and aerospace	MIL-STD-810D Method 509.2 · MIL-STD-883 Method 1009.5 · RTCA/DO-160E

Source: Equilam North America, Main Technical Standards for Cyclic Corrosion, C.C.T models; Proposal C.C.T 45-1200 Rev.01/2026.

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).

10 / SPECIMENS

Specimen placement and test quality

Specimen arrangement and the quality of the test inputs have a direct effect on repeatability. Support racks and support bars are included; on the C.C.T 45-1200, 10 supports for Ø 12 mm (½ in) samples with a maximum load of 20 kg (44.1 lb) are supplied.

Support angle

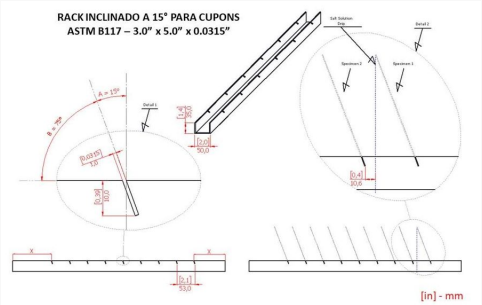
Support or suspend specimens with the significant surface between 15° and 30° from vertical, in a consistent orientation to minimize variability.

No contact

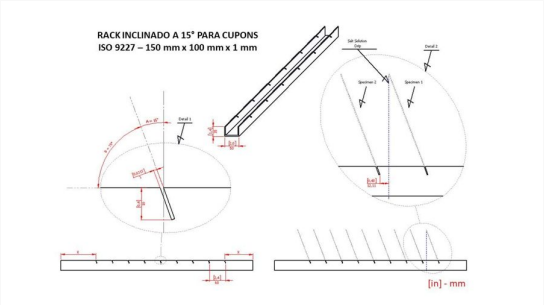
Specimens must not touch each other or any metal.

Unobstructed exposure and no cross-dripping

Place each specimen so the fog settles on it freely, and so that solution and corrosion products from one specimen never drip onto another.



Inclined coupon rack, ASTM B117.



Inclined coupon rack, ISO 9227.

Test input	Quality requirement
Salt (NaCl)	Purity limits and maximum concentrations of undesirable elements per ASTM B117, ISO 9227 and JIS Z 2371. Equilam EQCORR 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 oil and water, filtered before use, at constant pressure at the base of the Bubble Tower.

11 / INSTALLATION

Recommended laboratory facilities

Utility work for electrical power, plumbing, deionized water and solution, exhaust and compressed air is prepared by the customer before start-up. The values below refer to the C.C.T 45-1200; other models on request.

Utility	Requirement
Electrical supply	208 – 230 V, 1-phase, 50/60 Hz, 32 FLA (C.C.T 45-1200), plug not included
Compressed air	Free of oil and water; constant pressure 4 kgf/cm² (56 ±0.7 psi); inlet Ø 10 mm (3/8 in)
Deionized water	ASTM D1193 Type IV; pressure 0.5 – 2 kgf/cm² (7 – 28 psi); inlet Ø ½ in
Water supply	For chamber cleaning
Corrosive agent	Per the applicable standard
Chamber exhaust	PVC pipe, 2 in, without siphon
Laboratory exhaust	Fume hood and motor, if necessary (EQOP.0011)
Drain	½ in PVC tube to a common floor drain
Measurement items	pH, conductivity and NaCl concentration (density meter), per ASTM B117 and ISO 9227
Laboratory conditions	20 °C ±5 °C and 50% RH ±10% recommended for optimal performance
Service area	Minimum 60 cm (23.6 in) around the chamber for cleaning, assembly and maintenance

Documentation, start-up and warranty

Every chamber is delivered with Installation, Maintenance and User Manuals. Start-up, commissioning and on-site staff training are available on request. Equilam NA products carry a one-year warranty against defects in material and workmanship from the date of shipment, under the Equilam NA Standard Terms and Conditions of Sale.

12 / OPTIONAL ACCESSORIES

Options and accessories

C.C.T chambers can be completed with calibration services, specimen supports, measurement instruments, water and exhaust systems and data acquisition according to the test program. Optional test modes are listed in section 01.

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: reproducibility and repeatability verified in 6 exposure zones of the test chamber, with a total of 18 standard specimens
EQOP.0056	CSA certificate, required for export to Canada
EQOP.0056.1	NRTL certificate
—	UL508A certification of the electrical panel
—	Start-up, commissioning and training
SPECIMEN SUPPORTS	
EQOP.0001	Rack with 15° or 20° inclination in accordance with ASTM B117 and ISO 9227
EQOP.0005	Special rack for customer-supplied test samples
EQOP.0118	Grid-type test bracket for a distributed load of 120 kg (265 lb)
EQOP.0169	Inclined specimen holder for 36 screws, with nylon threaded bushings defined by the customer (max. Ø 22 mm)
EQOP.0035	Cable port, Ø 2 in
CHAMBER FUNCTIONS	
EQOP.0007	Side window in the lid (each), preventing dripping on samples, per ASTM B117, ISO 9227, JIS Z 2371, MIL and DIN 50021
EQOP.0034	Solution tank for long-term testing, 270 L (71.3 gal), with automatic solution mixing and feeding
EQOP.0068	Pump to drain precipitated solution

12 / OPTIONAL ACCESSORIES

Options and accessories (continued)

Code	Option
MEASUREMENT AND TEST SUPPLIES	
EQOP.0008	Two fog collectors with calibration certificate
EQOP.0016	Digital pH meter with standard solution
EQOP.0017	Digital conductivity meter with standard solution
EQOP.0018	Density meter for saline solution concentration per ASTM B117, with certificate
EQOP.0019	Plastic bucket with 50 lb of EQCORR salt, chemical analysis certificate with ISO 17025 traceability per ASTM B117, ISO 9227, JIS Z 2371 and MIL-STD-810G
EQOP.0038	Test panels 76 × 127 mm (2.9 × 5 in) per ASTM B117 (100 pieces)
EQOP.0075	Test panels 70 × 150 mm (2.7 × 5.9 in) per ISO 9227 (100 pieces)
WATER, EXHAUST AND DATA	
EQOP.0013	Deionizer EQDP010 with activated charcoal filter and additional mixed-resin column (2.7 gal). 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); water inlet and outlet ½ in NPT
EQOP.0011	Fiberglass fume hood with axial fan: 1,610 × 1,210 × 701 mm (63.3 × 47.6 × 27.5 in); suction pipe Ø 340 mm (13.3 in); 1,940 cfm; fiberglass fan 208/220 V, 3-phase, 60 Hz
EQOP.0111	Gas scrubber exhaust system
EQOP.0044	Data acquisition software: supervisory software (data logger) via PC, RS-485 or USB. Laptop not included

Other options on request · EQUILAM NORTH AMERICA

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