EQUILAM NORTH AMERICA LLC

C.C.T CORR AUTO Series

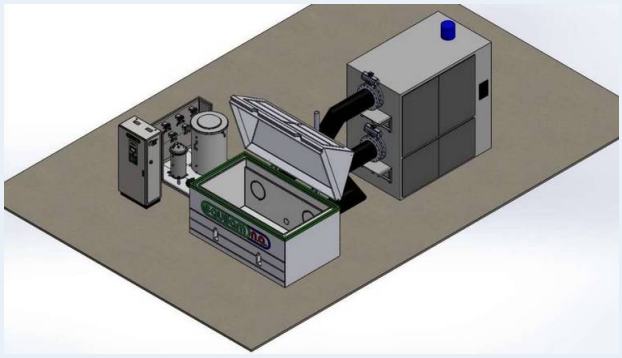
Automotive Cyclic Corrosion Test Chambers

Salt Spray · Spray / Stress · Immersion · Condensed Humidity · Water Fog · Climate Control
Low Temperature −30 °C · Ultra-Low Temperature −40 °C · Bench and Walk-In

BUILT FOR AUTOMOTIVE CORROSION PROGRAMS

From 80 °C down to −40 °C, one program

Salt spray, spray, immersion, condensed humidity, climate control and low or ultra-low temperature, alternated in programmable cycles with ramps and soaks.



Illustrative image: C.C.T CORR AUTO 45-1200

Composite cabinet

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

Reinforced polymer inside and outside, with no metal parts in the inner cabinet: no galvanic couple, no distorted results.

Air jacket

Indirect heating per ASTM B117

A heated air jacket surrounds the whole test cabinet for high temperature stability and homogeneity.

Bench and Walk-In

Monoblock bench models, panelized walk-ins

From 415 L bench chambers to 77 m³ walk-in and drive-in rooms; custom sizes available.

Equilam North America C.C.T CORR AUTO chambers provide accelerated corrosion testing that closely simulates real-world weathering; research indicates results comparable to outdoor exposure.

PATENTED NON-METALLIC CHAMBER TECHNOLOGY

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

01 / TEST MODES

Test modes for automotive cyclic programs

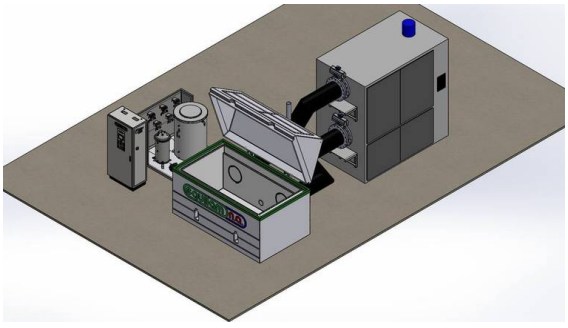
Continuous salt spray does not reproduce natural weathering cycles such as hot and cold, wet and dry, or salt deposition followed by drying. The C.C.T CORR AUTO combines the modes below in programmed cycles, each step with its own time, ramp or plateau.

Mode	Exposure	Reference methods
1 · Salt spray (salt fog)	Controlled fog of corrosive agents (acid, basic or saline solutions) at high humidity, ambient +5 °C to 55 °C, with the solution specified by the standard or company specification	ASTM B117 · ISO 9227 · JIS Z 2371 · MIL standards · company standards
2 · Spray / stress (optional)	Saline (or other) solution applied through oscillating or fixed spray nozzles mounted in the upper part of the chamber, wetting the specimens homogeneously	Ford CETP 00.00-L-467 · automotive cyclic programs
3 · Immersion (optional)	Solution pumped into the test cabinet to submerge the specimens, heated or at room temperature	Company specifications
4 · Condensed humidity	Hot saturated humidity, 40 °C to 70 °C, RH 95% to 100%, condensing on the specimens	ISO 6270-2 CH · ASTM D2247
5 · Water fog (optional)	Fog produced with deionized water while the cabinet is kept hot and at high humidity	ASTM D1735
6 · Climate control	Ramp and soak control of temperature versus relative humidity, 10 °C to 80 °C and 10% to 85% RH	Cyclic test programs
7 · Low temperature	Cooling to −30 °C (−22 °F), with ramp and plateau programming	Cyclic test programs
8 · Ultra-low temperature	Linear cooling and heating from 80 °C down to −40 °C (176 °F to −40 °F)	VW PV1209 · cyclic test programs

Cycle sequence, duration of each mode, ramps and number of cycles are defined by the applicable standard or customer specification. The low-temperature (−30 °C) or ultra-low-temperature (−40 °C) version is selected when the chamber is configured.

Climate mode with fast transitions

In climate control mode, electric heaters allow fast temperature ramps, as required by automotive cyclic corrosion tests with short transition times. Spray (stress) is available in a fixed or suspended oscillating configuration, mounted at the top of the chamber.



Illustrative image: C.C.T CORR AUTO 110-3100 configured for VW PV1209 (−40 °C to 85 °C), with refrigeration and conditioning units.

02 / TECHNICAL DATA

Operating ranges by mode

Each mode is programmed with its own set point and time, as a ramp or a plateau. Wet-bulb and dry-bulb sensors inside the test cabinet monitor relative humidity; a temperature sensor on the specimen is available as an option to ensure realistic specimen temperature.

Parameter	Value
MODE: SALT SPRAY / SALT FOG	
Chamber temperature	Ambient +5 °C to 55 °C (Ambient +9 °F to 131 °F)
Test method	Per ASTM B117, ISO 9227, JIS Z 2371, MIL standards or company specification
Corrosive agent	Acid, basic or saline solutions, as specified by the applicable standard
MODE: CONDENSED HUMIDITY	
Chamber temperature	40 °C to 70 °C (104 °F to 158 °F)
Relative humidity	95% to 100%, with condensation on the specimens
MODE: CLIMATE CONTROL (TEMPERATURE × RELATIVE HUMIDITY)	
Temperature range	10 °C to 80 °C (50 °F to 176 °F)
Relative humidity range	10% to 85% RH, within the area of the T × RH chart (Table 1)
Humidity measurement	Wet-bulb and dry-bulb sensors inside the test cabinet
Specimen sensor (optional)	Temperature sensor on the specimen for realistic temperature performance
MODE: LOW TEMPERATURE	
Minimum temperature	−30 °C (−22 °F)
Programmable range	80 °C to −20 °C (176 °F to −4 °F), cooling and heating with ramps and plateaus
Thermal load	The customer must provide the thermal load (specimens and fixtures) so that the temperature ramp and plateau can be calculated
MODE: ULTRA-LOW TEMPERATURE	
Minimum temperature	−40 °C (−40 °F)
Programmable range	80 °C to −40 °C (176 °F to −40 °F), linear cooling and heating with ramps and plateaus
Thermal load	The customer must provide the thermal load (specimens and fixtures) so that the temperature ramp and plateau can be calculated
RELATIVE HUMIDITY CONTROL SYSTEMS	
Option 1	Relative humidity measured inside the test chamber
Option 2 (economic)	Relative humidity measured in the injection air entering the test cabinet

Other temperature performance on request. Charts on the next page.

02 / TECHNICAL DATA

Operating charts

The charts below show the operating envelope of the humidity and climate modes and an example of an ultra-low-temperature cycle with linear ramps.

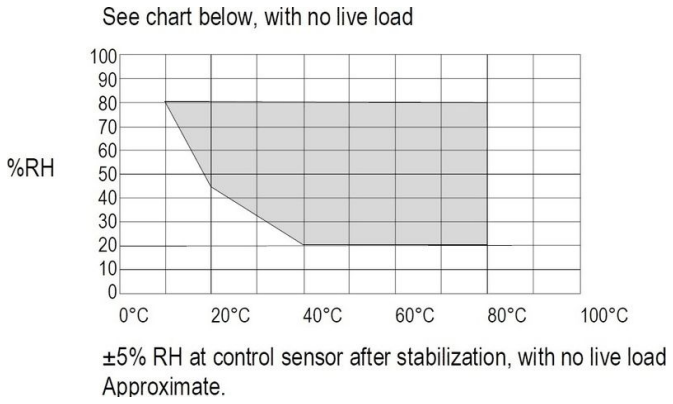
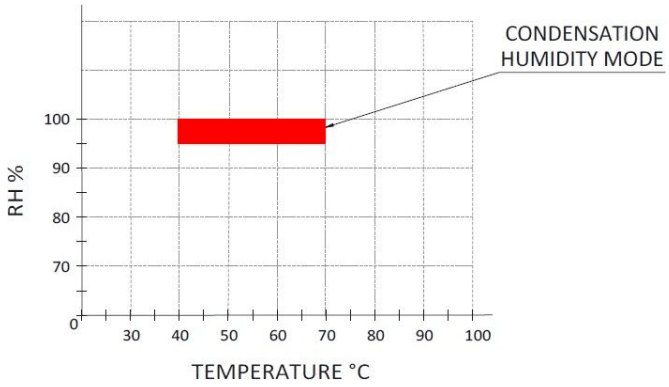
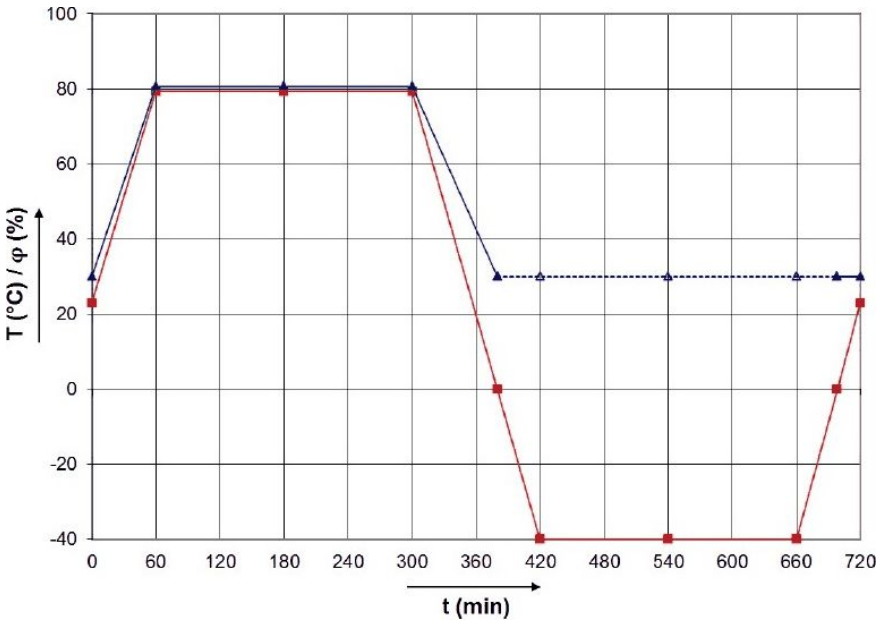


TABLE 1 · TEMPERATURE × RH, NO LIVE LOAD



CONDENSED HUMIDITY MODE · 40 °C TO 70 °C, 95–100% RH

Table 1: ±5% RH at the control sensor after stabilization, with no live load; approximate.



ULTRA-LOW TEMPERATURE · EXAMPLE CYCLE, 80 °C TO −40 °C (T IN °C, RH IN %, TIME IN MIN)

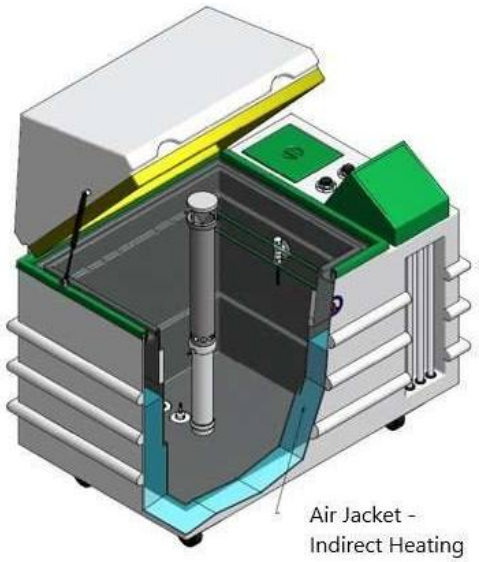
Low or ultra-low temperature

Low temperature: cooling and heating down to −30 °C (−22 °F). Ultra-low temperature: linear cooling and heating from 80 °C (176 °F) down to −40 °C (−40 °F). For other performance options, contact Equilam North America.

03 / CONSTRUCTION

Why Equilam North America

C.C.T CORR AUTO chambers are fabricated with reinforced polymer interiors and exteriors (U.S. Patent No. 10,371,623). There are no metal components in the inner enclosure, which prevents galvanic corrosion and distortion of the final results.



Cutaway illustration showing the air jacket around the inner cabinet.

Air-jacket heating

Indirect heating of the test cabinet through a heated air jacket surrounding the whole cabinet (ASTM B117), for high temperature stability and homogeneity (U.S. Patent No. 10,371,623).

No metal in the inner cabinet

Reinforced polymer inside and outside: galvanic corrosion cannot occur and cannot distort the final result.

100° lid with side windows

Lid at a 100° angle in a plastic highly resistant to scratching by salt crystals. Side windows (optional) allow specimen viewing without dripping on the samples.

Construction feature	Technical purpose
Reinforced polymer cabinet	Inside and outside, with no metal parts in the inner enclosure (U.S. Patent No. 10,371,623).
Indirect air-jacket heating	Heated air jacket around the entire test cabinet: high temperature stability and homogeneity, reliable results.
100° lid	Scratch-resistant plastic. Acrylic can be scratched by salt crystals, which causes undesirable dripping on the samples.
Lid side windows (optional)	Viewing of the specimens without dripping onto the samples.
Monoblock design (bench models)	Solution tank and Bubble Tower (saturator) integrated in a single unit.
Two RH control systems	RH measured inside the test chamber, or in the injection air entering the cabinet (economic).

Recommended test volume

Equilam NA recommends a test chamber volume of at least 1,000 liters, excluding the volume of the lid. Smaller cabinets induce turbulence, which compromises the accuracy of the final results.

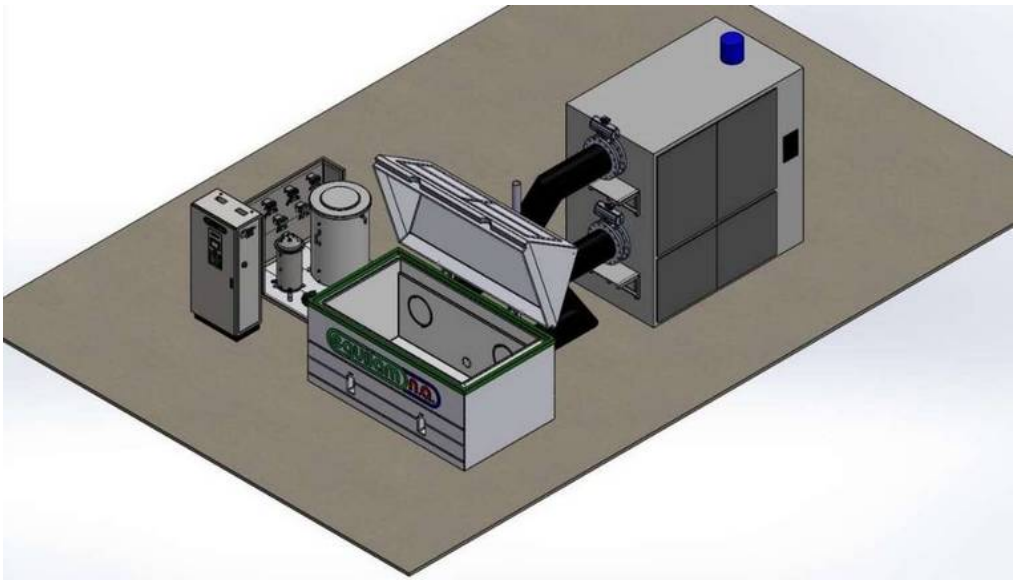
04 / MODELS

C.C.T CORR AUTO reference models

Five reference sizes cover the bench-type C.C.T CORR AUTO line. All models are monoblock: the solution tank and Bubble Tower (saturator) are built into a single unit.

Model	Interior W × D × H (mm)	Interior W × D × H (in)	Internal volume (L / cu.ft)
C.C.T CORR AUTO 15-450	820 × 650 × 780	32.3 × 25.6 × 30.7	415 / 14.7
C.C.T CORR AUTO 28-810	1,190 × 820 × 830	46.9 × 32.8 × 32.7	810 / 28.6
C.C.T CORR AUTO 45-1200	1,500 × 900 × 900	59.0 × 35.4 × 35.4	1,200 / 42.9
C.C.T CORR AUTO 110-3100	2,500 × 1,250 × 991	98.4 × 49.2 × 39.0	3,097 / 109.4
C.C.T CORR AUTO 135-4000	3,100 × 1,250 × 991	122.0 × 49.2 × 39.0	3,840 / 135.0

Interior dimensions exclude the lid; internal volumes include the lid.



Illustrative image: C.C.T CORR AUTO 45-1200 with control panel, saturator and refrigeration unit.

05 / WALK-IN

Walk-In W.C.C.T CORR AUTO

The W.C.C.T CORR AUTO line takes cyclic corrosion testing to complete vehicles, large components and assemblies. Construction is panelized, so custom dimensions are possible; the sizes below are examples.

Reference	Interior W × D × H (mm / in)	Door W × H (mm / in)	Volume (m³ / cu.ft)
W.C.C.T CORR AUTO 14-500	2,000 × 2,000 × 2,500 78.7 × 78.7 × 98.4	1,500 × 2,100 59.0 × 82.6	14 / 494.4
W.C.C.T CORR AUTO 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 CORR AUTO 40-15000	3,500 × 3,500 × 2,500 137.8 × 137.8 × 98.4	3,000 × 2,130 118.1 × 83.8	40 / 1,412
W.C.C.T CORR AUTO 55-20000	5,000 × 3,500 × 2,500 196.9 × 137.8 × 98.4	3,000 × 2,130 118.1 × 83.8	55 / 1,942
W.C.C.T CORR AUTO 77-30000	7,000 × 3,500 × 2,500 275.6 × 137.8 × 98.4	3,000 × 2,130 118.1 × 83.8	77 / 2,719

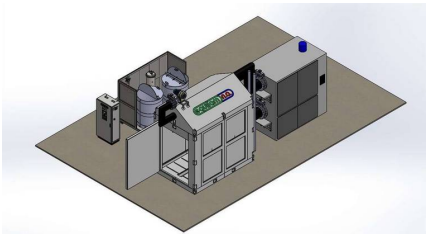
Interior heights exclude the V-shaped roof; volumes include it. Custom dimensions on request.



Illustrative image: Walk-In W.C.C.T CORR AUTO with control panel.



Illustrative image: Drive-In C.C.T CORR AUTO installation.



Illustrative image: W.C.C.T CORR AUTO 14-500.

Walk-in design rules

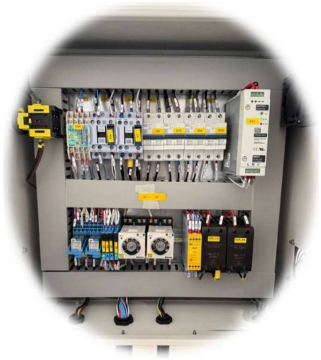
Walk-in chambers are built with a ceiling sloped between 90° and 125°. Correctly positioned and directed spray nozzles prevent pooling and dripping from the ceiling. Nozzles may be installed on the ceiling or on the floor, directed upward at 30° to 60° in a single pass; their number depends on the type, capacity and area of the test space. Small solution reservoirs with controlled level are installed inside the chamber.

06 / CONTROL AND SAFETY

Walk-in features and operator safety

The main features of a walk-in cabinet differ significantly from those of a laboratory cabinet. Electrical and safety functions protect the operator and the test, and make the status of the chamber visible at a glance.

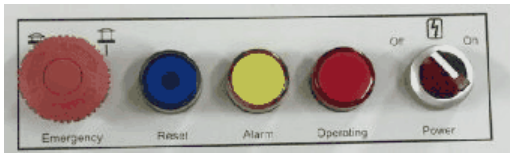
Function	Description
Electrical panel	UL-certified electrical panel with IP66 protection rating against solids and liquids.
Electrical components	All electrical components are UL-certified.
Bubble Tower	Air saturation (humidification) tower built in stainless steel.
Emergency stop	Instantaneous shutdown to prevent accidents.
Padlock key	Lockout switch for safe shutdowns during preventive and corrective maintenance.
Safety relay	Interrupts the electrical circuits whenever it detects faults or accident risks.
LED signaling	Industrial colored LED panel with visual and audible signals for machine and process status.
Front level indicators	Solution and deionized water levels in the saturation tower and water jacket clearly visible to the operator, backed by electronic safety levels.



Electrical panel.



Padlockable lockout switch.



Emergency stop, reset, alarm, operating and power signaling.

07 / STANDARDS

International and automaker test programs

C.C.T CORR AUTO 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
International cyclic	ASTM D5894 · ASTM G85 · 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
Humidity and salt spray	ASTM B117 · ISO 9227 · JIS Z 2371 · ISO 6270-2 CH · ASTM D2247 · ASTM D1735

Source: Equilam North America, Main Technical Standards for Cyclic Corrosion, C.C.T CORR AUTO Rev. 1/2025.

Preventing chemical cross-contamination

When a cyclic corrosion chamber has been used for an acid test, with any solution (chemical product or corrosive agent) other than the one specified by the current standard for your test, or for any other purpose, it becomes chemically contaminated; the reverse process also causes contamination. The C.C.T CORR AUTO chamber must then be thoroughly cleaned until the pH required by the technical standards is reached, and its corrosivity verified so that it does not significantly affect later results. This cleaning is difficult, and complete decontamination is nearly impossible.

Specimen racks and supports

Racks should be built from non-metallic materials; wooden racks must be coated so that no unwanted products interfere with the final result. Specimens should preferably be supported from the floor. Plastic profiles and slotted rubber are suitable for flat panels. Suspension from glass hooks or waxed string may be used, provided the specified specimen position is achieved, if necessary with secondary support at the bottom of the specimens.

Contact · EQUILAM NORTH AMERICA

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