

Salt Spray Cabinets: General

Principle:

Salt spray accelerated exposure testing evaluates the corrosion resistance of a material. These can be a coated metallic substrates, hybrid materials, or raw metallic substrates. Though not a true indication of real life corrosion exposure, salt spray has become the standardised method for accelerated corrosion testing.

Materials are exposed to a sodium chloride (NaCl) fog environment in an enclosed cabinet, with increased humidity and temperature. The salt solution is produced at specific concentrations, temperatures and pH, set out by international standard guidelines, such as ISO 9227 (2017), or ASTM B117 (2019). The test can be conducted for a set duration as required by industry.

Testing can be performed on full parts, or on specific exposed faces or areas. In such cases, the sample may be prepared either with additional surface protection to prevent additional reactions, or with a scribe to accelerate the corrosion.

During exposure, the test pieces are placed at specific angles (determined by application, standard, or client) to allow the salt spray to settle/interact on the test face. Inspections can be carried out at regular intervals to detect the onset of corrosion and subsequent progression.

CREST has 3 stand-alone Salt Spray Chambers, each with a capacity of 1000 L:

Current Model: Ascott S1000iP



Figure 1: Ascott S1000 iP salt spray unit.

2: Liebisch-MTR-1000

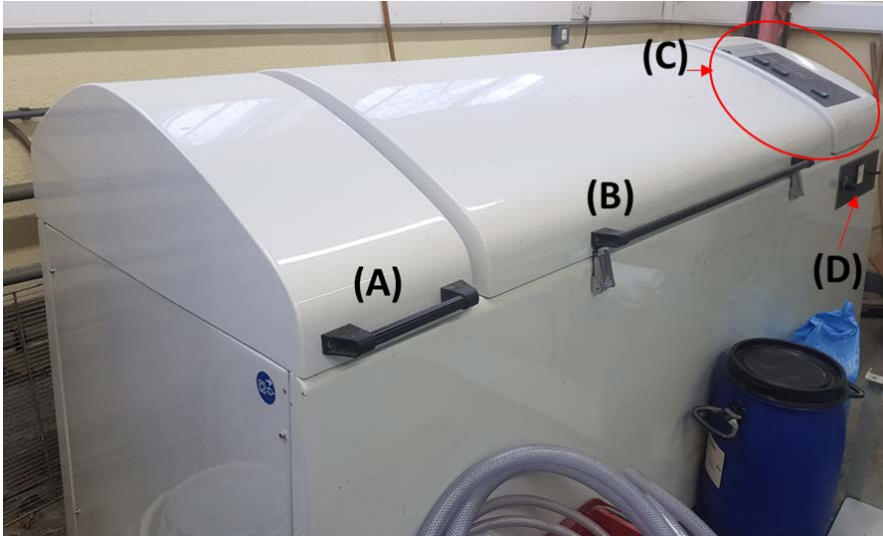


Figure 2: Liebisch – MTR-1000 Salt Spray cabinet with features highlighted; The salt solution tank (A), the Sample chamber (B), the control panel (C), and the pressure gauge (D).

3: Liebisch – STR-1000 Salt Spray Cabinet

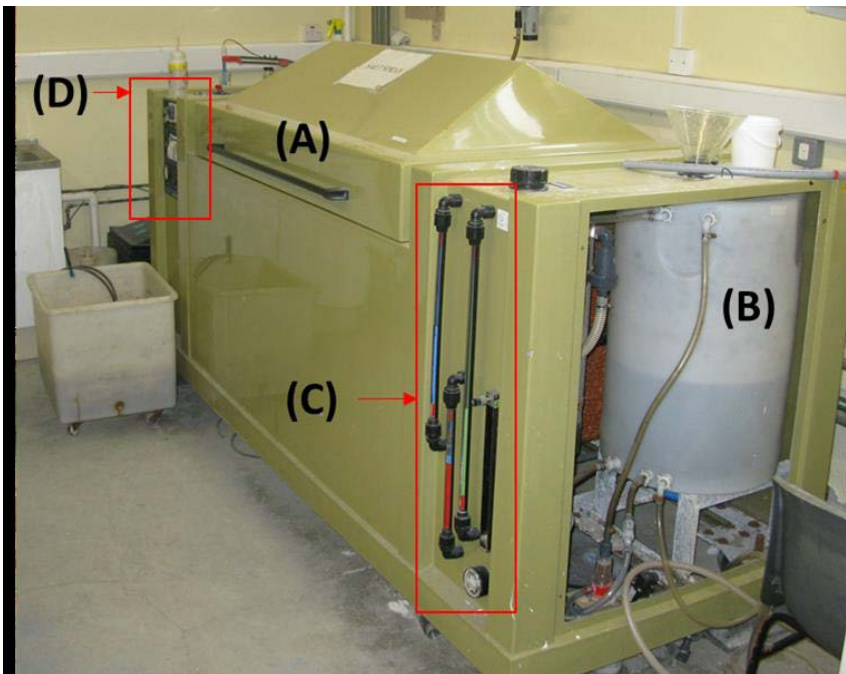


Figure 3: Green salt spray cabinet, with features highlighted; sample chamber (A), salt water tank (B), chamber gauges (C), and control panel (D)



Instrument Description

Sub Folder: Exposure



Types of Salt Spray:

CREST can carry out Neutral tests (NSS), cyclic (prohesion) acidic (AASS), and copper chloride (CASS) salt spray.

NSS is performed continuously while prohesion, AASS and CASS are available upon request.

a. Neutral Salt Spray:

Neutral Salt Spray testing is conducted according to ISO 9227:2017, ASTM B117:2019, or MIL-STD-810 Method 509.4. The test conditions consist of a Neutral salt fog atmosphere generated from 5 wt. % aqueous NaCl solution at 35°C (± 1).

Samples exposed to NSS are generally:

- Metals and their alloy,
- Metallic coatings (anodic and cathodic)
- Conversion coatings
- Anodic oxide coatings
- Organic coatings on metallic materials

b. Cyclic (prohesion) acidic (AASS)

Prohesion salt spray, a method of cyclic accelerated corrosion testing, is also available on request according to ASTM G85. This is a particularly useful for simulating exterior exposure, for paints on steel substrates.

c. Acidic Acid Salt Spray (AASS)

In ASS corrosion testing is performed in an acidified salt spray environment. A solution of sodium chloride acidified with acetic acid is used as the spray fog, as specified in ASTM G-85, and ISO 9227:2017.

The acetic acid salt spray (AASS) test is especially useful for testing

- Decorative coatings of copper/nickel/chromium,
- Nickel/chromium.



Instrument Description

Sub Folder: Exposure



d. Copper Accelerated Acetic Acid Salt Spray

Copper accelerated acetic acid salt spray is performed as specified in ASTM B368, ISO 9227:2017. The method may be used to evaluate the corrosion performance of materials such as:

- Decorative copper/nickel/chromium on steel
- Nickel/chromium coatings on steel
- Zinc alloys
- Aluminium alloys
- Plastics/organic coatings (for severe service)
- Anodized aluminium

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