

Salt Spray Chamber Student Manual

Objective

To observe the effects of a corrosive environment on a variety of metallic materials.

Apparatus

The test apparatus consists of the following components:

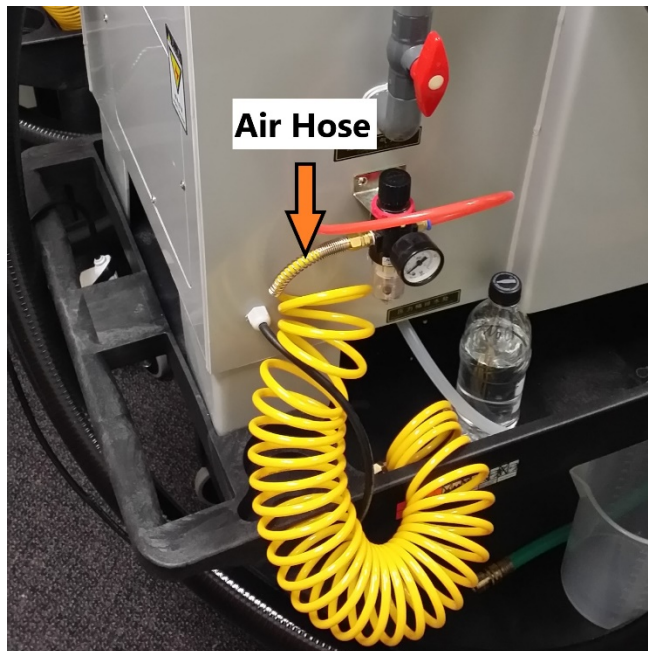
- Spray Chamber
- Pressure Regulator
- Pressure Adjustment Valve
- Pressure Water Tank
- Pressure Water Inlet
- Brine Tank
- Brine Tank Inlet
- Exhaust Pipe
- Exhaust Bucket
- Water Seal Tank
- Brine Outlet Valve
- Chamber Drainage Valve
- Pressure Water Drainage Valve
- Spray Metering Tube



Procedure

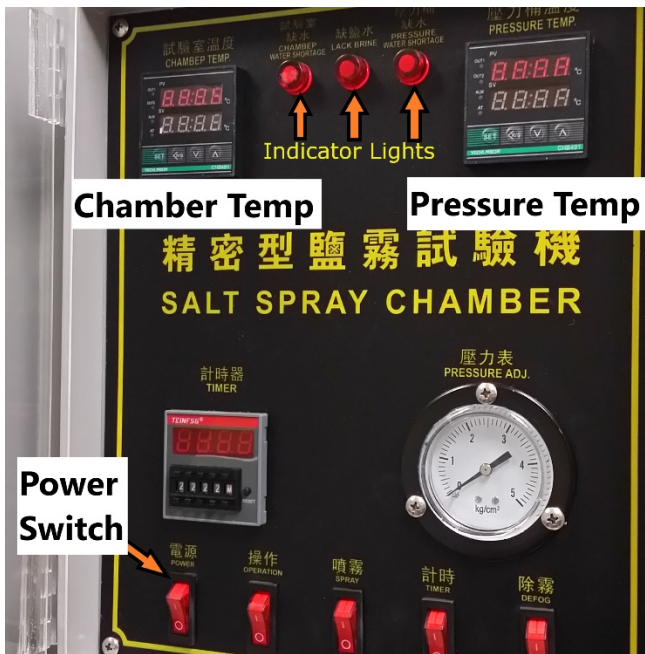
Start up

- Plug in 110 V power supply
- Place Hose from Exhaust into the exhaust bucket or floor drain
- Connect air hose to compressor, keeping inlet pressure set to 2 kgf/cm²

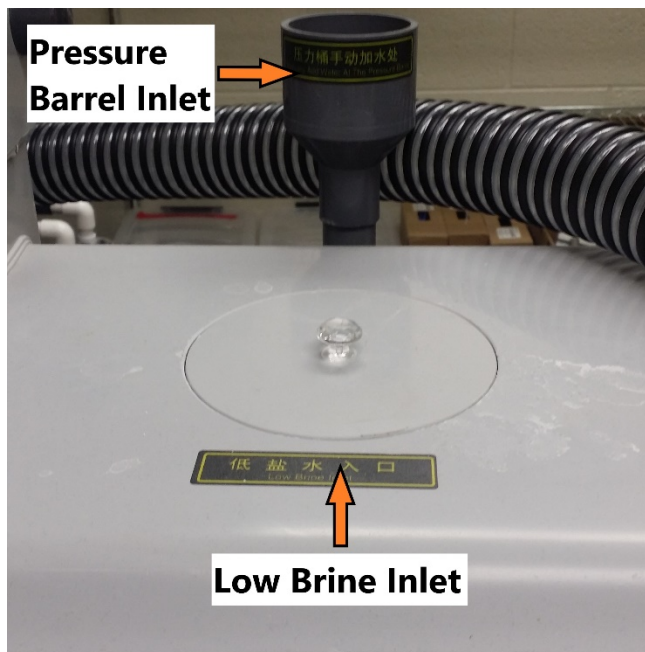


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- Turn on the power switch. The operating board has indicator 3 lights: “CHAMBEP WATER SHORTAGE”; “LACK BRINE”; “PRESSURE WATER SHORTAGE”.



- If CHAMBEP WATER SHORTAGE is lit, add water (this may be tap water) to the main chamber until the light turns off.
- If PRESSURE WATER SHORTAGE is lit, add water (this may be tap water) to the pressure barrel inlet until the light turns off. Be sure to pour it in slowly to avoid overflow.
- If LACK BRINE is lit, add sodium chloride solution to the LOW BRINE INLET until the light turns off. NOTE: The brine solution should be 50g NaCl per liter of deionized water (5 wt% NaCl).

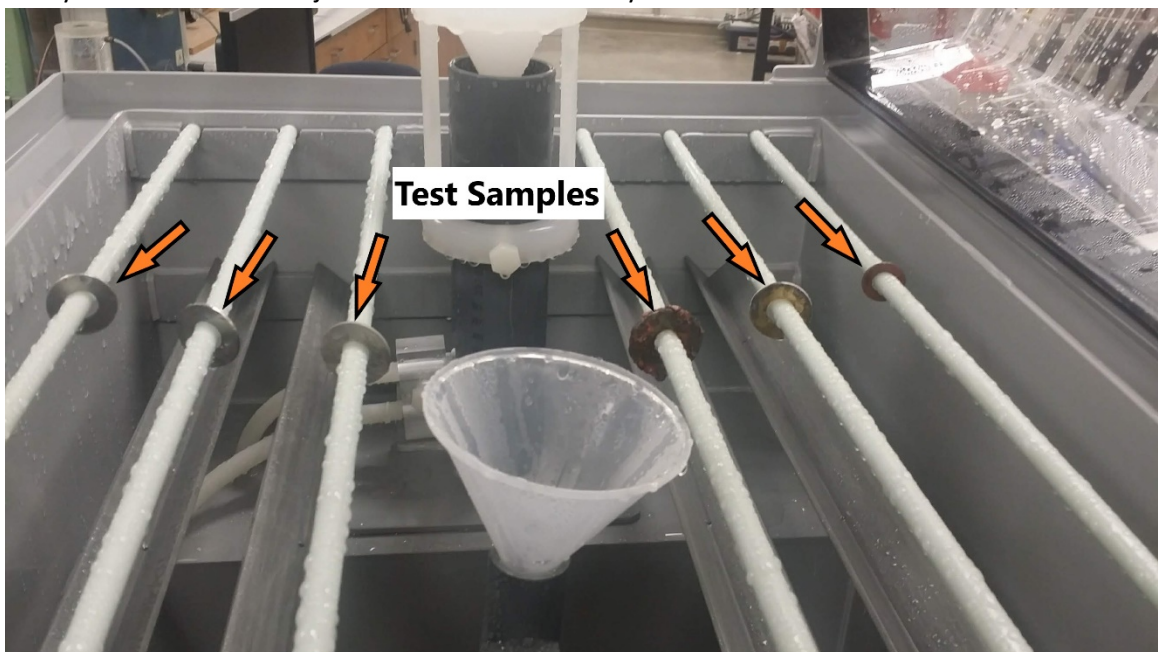


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- Lower the transparent lid on the chamber and pour water into the WATER SEAL TANK until the water line covers the edge of the lid on all sides (approx. 1-1.5 liters).



- Turn on the OPERATION switch. Set the CHAMBER TEMP (35 °C) and PRESSURE TEMP (47 °C).
- Make a mark on each of the test samples and place samples on the fiberglass rods in the chamber, making sure they are not touching each other, and close the lid. Set up the samples in a way that each of the major faces can be reached by the brine mist.



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- Turn on the SPRAY switch and adjust the PRESSURE VALVE to 1 Kgf/cm². (Do **not** set the pressure above 1 Kgf/cm², the high pressure will damage the tubing.)



- Set the TIMER for the desired run time and turn on the TIMER switch. (Note: changing the set time will reset the timer.)

Operation

- Check the status lights daily to ensure continuous operation over the period of the test.
- Check the level of fluid in the graduated cylinder at the front after 16 hours or so, to get the amount of spray being output over the collector area. (Average output ~ 1 – 2 ml/hr) (The collector has a surface area of 80 cm² and a diameter of about 10 cm.)



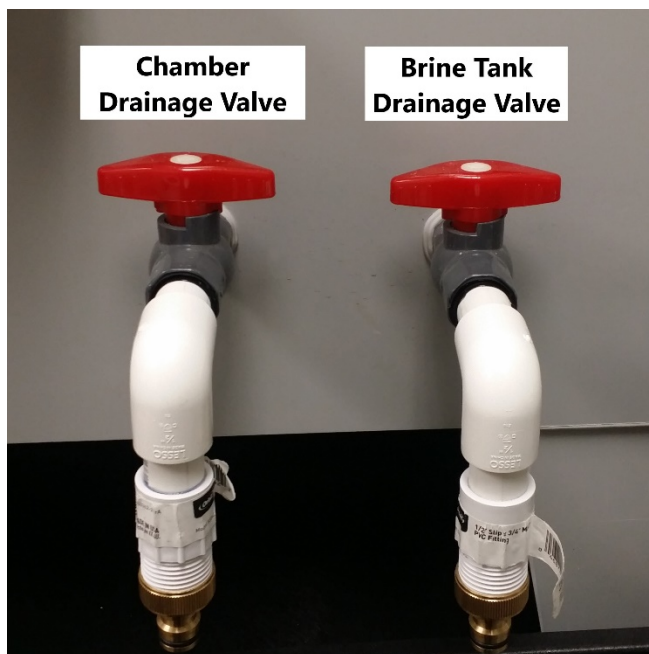
- Use the DEFOG switch to blow out the salt spray to check the samples. Make sure to turn off the SPRAY switch when using the DEFOG switch.

Shut-down

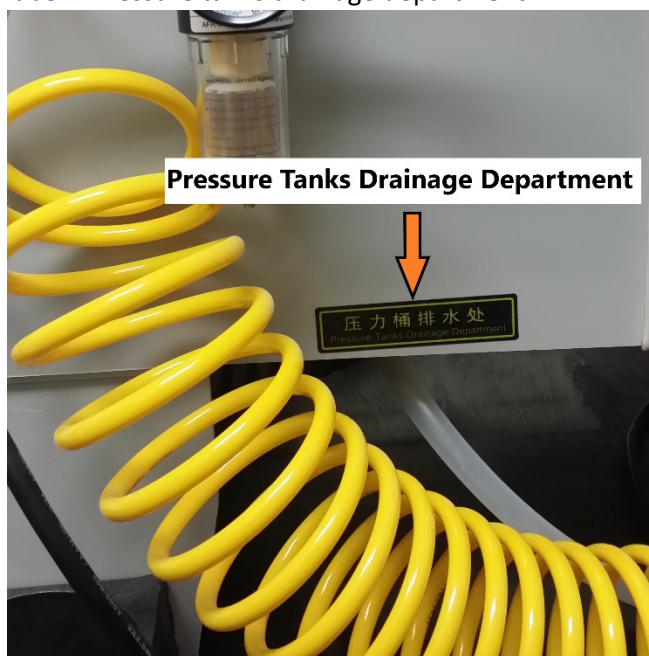
- To shut down the apparatus, flip each of the switches to the off position in reverse order (right to left).

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- Each of the water tanks (except the pressure water tank) has its own rubber stopper that must be removed in order to drain. Drainage valves for the main chamber and brine tank are located on the back of the apparatus. These have been equipped with quick release nozzles for convenience. The Drain hose has a compatible nozzle attached and is stored with the apparatus cart.



- The drainage valve for the pressure water tank is located beneath the tank where there is a label: "Pressure tanks drainage department"



- Once the water has been drained, flush the main chamber and brine tank with water and wipe the chamber surfaces clean with paper towels.
- Leave the main chamber open to air dry.