

Application note: N° F071

May 2016

Salt spray test chamber in accordance with DIN EN ISO 9227 and VDA-New standards



Test Standards and Norms:

Alongside international standards and norms, such as ASTM B 117 und DIN EN ISO 9227, there are a myriad of house-standards and policies from well-known automotive manufactures which must be applied to. These house-standards and policies also must be observed and a meticulous protocol of the test parameters and tolerances must be kept.



The Saltwater-Spray-Test is the most used method of an accelerated corrosion measuring operation.

Improved corrosion resistance is an essential criterion to insure the quality of galvanic coated assembly parts. The diverse environmental influences and field corrosion processes require more complex corrosion resistance tests for their depiction to the automobile industry.

This test is implemented in the automotive industry to improve the durability of assembly parts and insuring their protection against environmental influences. With a test-duration of only 2 weeks,

the assembly parts are tested on their corrosion resistance of a simulated period of 10 years.

The principle of the salt spray method is considerably simple:

The injected salt solution produces a corrosions-prompting environment for the assembly parts placed inside of the chamber. Under the conditions of an accelerated corrosion process the protection properties of the coating material is depreciated and drastically reduced.

The test results can be reliably reproduced due to constant parameters, such as the concentration of the water based salt solution, tempera-

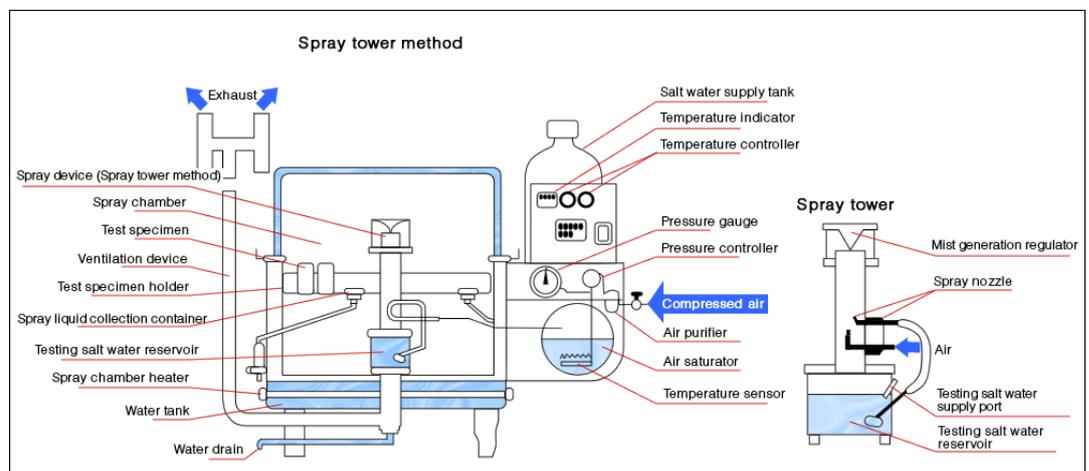
ture, humidity, pressure and pH value.

The chamber must be equipped with compressed air to spray the corrosive mist through the jet nozzles. The chamber is equipped with several lateral nozzles which consistently disperses the corrosive mist. This system also ensures a correct dispersal in even larger chambers. An integrated industrial heating system ensures the correct temperature within the chamber during the test cycle.

The test items must be so positioned to prevent either exposure to precipitation drops or otherwise contact between the specimens.

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Why the need to measure humidity?

The new guideline for corrosion testing in the automobile industry, known as "VDA-New", requires that this test be

administered in 3 cycles: Salt-water-Spray-Test, Appraisal and Cold-Phase under controlled relative humidity and

temperature.

The test procedure consists of several cycles and repetitions:

norm	description	test duration	temperature/ humidity	comment
VDA-NEU	cyclic corrosion test at Daimler			consisting of cycles: A B A C A B B
cycle A	salt fog (1% NaCl) temperature (35°C - 50 °C)/ humidity (50 %rh - 95 %rh) alternation	3h 21h	35±2°C (35 - 50 °C)/ (50 - 95 %rh)	
cycle B	temperature (35°C - 50 °C) humidity (50 %rh - 95 %rh) alternation	24h	(35 - 50 °C)/ (50 - 95 %rh)	including 3h appraisal phase
cycle C	freezing temperature (35°C - 50 °C) humidity (50 %rh - 95 %rh) alternation	9h 15h	-15 °C (35 - 50 °C)/ (50 - 95 %rh)	

source: WKM

What solution can Rotronic offer?

Rotronic provides a range of instruments for environmental monitoring and control.

Rotronic HC2-IC industrial temperature and humidity probes in combination with a Teflon filter for sensor protection, are successfully working in this tough application.

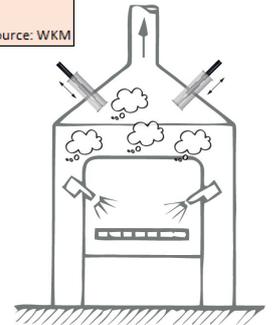
In general the influence of NaCl (neutral salt solution) is critical on the accuracy of humidity measurement as well as the probe material.

The probes are inserted in the chamber just for the test and removed afterwards, so that it only remains for the time of measurement in the salt fog. Furthermore the probes should be protected in the chamber from direct spraying, e.g. by using special mounting tubes. Regularly exchanging the filters allows faster measurements and is reducing hysteresis effects.

With a flexible HF5 transmitter, the outputs can be set to the customers requirements.

With both digital and a range of analogue outputs available as well as several probe mounting options, products can be selected for all applications.

Measurement data can be viewed on HF5 with display or remotely via HW4.



HF 5 Wall mount transmitter in combination with:

Rotronic products:

Humidity and Low Dew Point Probe:

- HC2-LDP**
 -40...85 °C,
 -70...85 °C Td
 Ø G12 Thread
 ± 2K Td (-50...20°C Td)
- HC2-ICxxx / HC2-ICxxx-A**
 -100...200 °C,
 0...100 %rh,
 Ø15 mm or Ø15/25 mm
 ±0.8 %rh and ±0.1K...

Transmitters:

- HF5 series**
 For interchangeable probes,
 Various analogue and digital outputs, Display,
 All psychrometric calculations available...
- HF8 series**
 For 2 interchangeable probes,
 Various analogue and digital outputs, Display, relay outputs.
 All psychrometric calculations available...

Data loggers:

- HL-NT range** (not compatible with HC2-LDP)
 For interchangeable probes (up to 7 probes with docking station)
 32 MB flash card
 Large LC display,
 Conforms to FDA 21 CFR Part 11 and GAMP4...



LDP Low Dew Point Probe



HC2-IC402-A Probe