TEST METHOD AS PER STANDARDS

ISO 11997-1:1998(E)

It specifies a method of determining the resistance of coatings to one of three defined cycles of wet (salt fog)/dry/humidity conditions using specified solutions.

The method has been found to be useful in comparing the cyclic salt spray resistance of different coatings. It is most useful in providing relevant ratings for a series of coated panels exhibiting significant differences in cyclic salt spray resistance .

Summary of the test conditions

CYCLE A

This cycle is specified in Japanese Automobile Standards JASO M 609-91, Corrosion test method for automotive materials, and JASO M610-92, Cosmetic corrosion test method for automotive parts.

Salt solution – 50 +/- 10 g/l of sodium chloride to maintain PH of the test solution in between 6 to 7 .

Step	Time h	Temp. °C	Condition	Notes
1	2	35 ± 2	Salt spray	
2	4	60 ± 2	Dry: 20 % to 30 % RH	
3	2	50 ± 2	Wet: 95 % RH or over	
4	Go back to step 1			This makes a total cycle time of 8 h from step 1 to step 3.
	Transition time (i.e. time allowed to reach the temperature and relative humidity specified for a condition after changing to that condition):			From salt spray to dry: within 30 min From dry to wet: within 15 min From wet to salt spray: within 30 min The effect of the salt spray will, in principle, be instantaneous.

Repeat the cycle of 8 hours 240 h, 480 h, 720 h & 1440 h.

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CYCLE B

This is based on the VDA 621-415 cycle and is widely used in Europe. It has also been shown to give good correlation with natural weathering for thermosetting paints in vehicle corrosion.

Salt solution – 50 +/- 10 g/l of sodium chloride to maintain PH of the test solution in between 6 to 7 .

Step	Time h	Temp. °C	Condition	Notes
1	24	35 ± 2	Salt fog	
2	8	40 ± 2	100 % RH	Water condensing on test panels
3	16	23 ± 2	(50 ± 20) % RH	
4	8	40 ± 2	100 % RH	Water condensing on test panels
5	16	23 ± 2	(50 ± 20) % RH	
6	8	40 ± 2	100 % RH	Water condensing on test panels
7	16	23 ± 2	(50 ± 20) % RH	
8	8	40 ± 2	100 % RH	Water condensing on test panels
9	16	23 ± 2	(50 ± 20) % RH	
10	48	23 ± 2	(50 ± 20) % RH	
11	Go back to step 1			This makes the total cycle time 7 days from step 1 to step 10.

Repeat the test cycle for 840 h

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CYCLE C

This cycle was developed in the UK for use with water-soluble and latex paint systems, and has been shown to give good correlation with natural weathering.

Salt solution –Dissolve sodium chloride and ammonium sulfate in water to give concentrations of (0.31 ± 0.01) g/l and (4.1 ± 0.01) g/l respectively thus maintaining a PH of 6 to 7 .

Step	Time min	Temp °C	Condition	Notes
1	210	30 ± 2	Salt fog	
2	210	40 ± 2	Dry	Drying-air purge
3	1 470	40 ± 2	(75 ± 15) % RH	One method of achieving this condition is to alternate the dry and humid cycles for suitable (short) time periods to keep the RH between the limits specified.
4	102	30 ± 2	Dry	Drying-air purge
5	210	30 ± 2	Salt fog	
6	378	30 ± 2	95 % to 100 % RH	Water condensing on test panel
7	180	35 ± 2	Dry	Drying-air purge
8	120	25 ± 2	Dry	
9	Go back to step 1			This makes the total cycle time 48 h from step 1 to step 8.

Repeat the test cycle for 1000 h

TEST METHOD AS PER STANDARDS

CYCLE D

This cycle is specified in Japanese Standard JIS K 5621-2003, Anticorrosive paint for general use.

Salt solution – 50 +/- 10 g/l of sodium chloride to maintain PH of the test solution in between 6 to 7 .

Step	Time h	Temp. °C	Condition	Notes
1	0,5	30 ± 2	Salt spray	
2	1,5	30 ± 2	Wet: (95 ± 3) % RH	
3	2	50 ± 2	Hot dry	
4	2	30 ± 2	Warm dry	
5	Go back to step 1			This makes a total cycle time of 6 h from step 1 to step 4.
	Transition time (i.e. time allowed to reach the temperature and relative humidity specified for a condition after changing to that condition):			From salt spray to wet: within 10 min From wet to hot dry: within 15 min From hot dry to warm dry: within 30 min From warm dry to salt spray: instantaneous

Repeat the test cycle for 28 cycles (168 h).

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INSTRUMENTATION

The cabinet shall have a capacity of not less than 0,4 m3 in order to ensure even distribution of the spray. The design of the ceiling (for example a false ceiling) needed to prevent drops of solution falling onto the test panels

The temperature shall be controlled by a thermostat element placed within the cabinet at least 100 mm from the walls of the cabinet.

The compressed-air supply to one or more atomizer shall be passed through a filter to remove all traces of oil or solid matter .

Baffles may be used to prevent direct impingement of spray on the test specimens, and the use of adjustable baffles is helpful in obtaining uniform distribution of spray throughout the cabinet.

The forced air shall be passed through a filter to remove all traces of oil or solid matter and shall have a flow rate sufficient to ensure that, at the start of a dry phase, no drops of moisture are visible on the panels after the drying time specified. The panels shall not be dried by heaters inside the cabinet walls

The collecting devices shall be placed in the zone of the cabinet where the test panels are placed, one close to the spray atomizer(s) and one remote from the spray at omizer(s). They shall be placed so that only spray and not liquid falling from test panels or from parts of the cabinet is collected. Glass funnels with the stems inserted into graduated cylinders have been found to be suitable collecting devices. Funnels with a diameter of 100 mm have a collecting area of approximately 80 cm2.

The panels placed in the cabinet in such a way that they are not in the path of spray from the atomizer at angle of (20 ± 5)° to the vertical.

Fog collection rate is 1 ml to 2 ml /hour, when the salt fog is collected over a 24 h period.