Salt Spray Tester

AHL-90

Operation Manual

Item	Test	Result
1	Assembly Inspection	
2	The level of inspection tester	
3	Check tightness	
4	Welding Fast Check	
5	Check high and low water mark	
6	Over-temperature protection inspection	
7	Check sequence of movement	
8	Display instructions Check	

2. Test Record Form

Test Date:I	DayMonth	Year	
Test Time:	_Day to	Day ,H	ours in all.
If the test interrupte	ed , the reason as fo	ollows:	
specifi	cations	Setting	Test Record
Item			
Test chamber temp	erature	35℃±1℃	$^{\circ}$
Saturated air barre	temperature	47℃±1℃	${\mathbb C}$
Over-	Test Room	65 ℃ ±2 ℃	${\mathbb C}$
temperature	Saturation	75 ℃±2℃	$^{\circ}$
protection	barrel		
Relative Humidity is	n Test Room	More than 85%	%
Compressed Air Pr	ess	1±0.1kg/CM ²	kg/CM ²
Spray volume		1∼2ml/80CM²/h	ml/80CM ² /h
Heating time		Less than 40 minutes	minutes
Salt bucket capacit	у	9.5L	L
Consumption of sa	line solution	10L→more than	1L spray hours
		15~20 hours	
Ambient Temperatu	ıre	5-30℃	$^{\circ}$ C

Tested by::	
Test Date::	

3. Accessories Check:

Item	Accessories Name	quantity	Confirmation
1	Main Power Line	1	
2	1 / 4 pressure hose (including connector)	1	
3	FPC V-shape Shelf	6	
4	Glass Rod	8	
5	Brine mixing bucket	1	
6	Alarm Label (group)	1	
7	Operation Manual	1	
8	5/8" inlet and outlet Hose 5M	1	
9	Tube Bank	3	
10	Ø5 exhaust-pipe 3M	1	
11	NaCl2	2	

Product specifications sheet

1. Product Name: Salt Spray Tester

⟨AHL-90⟩

Test chamber internal dimensions: 90*60*50cm (W*D*H)

External Dimensions: 146*91*128cm (W*D*H)

Power supply: AC 1φ 220V 20A 50HZ

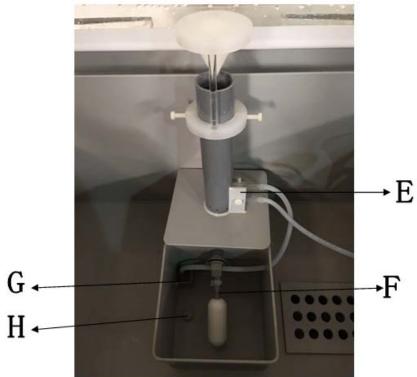
- 2. Temperature setting:
 - 1. Test room: 35°C
 - 2. Saturated air barrel: 47°C
- 3. Over-temperature protection setting:
 - 1. Test room: 65°C
 - 2. Saturated air barrel: 75℃
- 4. Air pressure settings:
 - 1. Spray pressure:-1.0±0.1kgf/cm²
 - 2. Air Compressor Filter Regulator: -2.0~2.5kgf/cm²
- 5. The standard conditions of use:
 - 1. Ambient temperature: 5~30°C
 - 2. The use of water quality:
- (1) Test solution preparation --- distilled water (pure water) (The PH value should be between $6.5 \sim 7.2$).
- (2) The others water: tap water

Manual of Salt Spray Tester

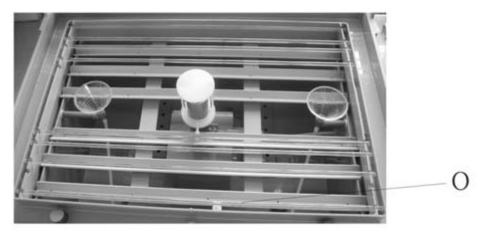
Section 1: The tester introduction and instructions

- **1. Inside of the test room** (First, balance the tester)
- A. Spray tower: Built-in glass spray nozzle placed in the internal, Spray through the nozzle guide and then dispersed through the cone-shaped device (made of PVC) dispersed within the test room.
- B. Isolation tank: Increased to filled with water, the internal temperature for the isolation and prevent the salt water leakage outside. (Also can be used to balance the level of the tester).
- C. Test chamber water level sensor: Used to measure the temperature with the test chamber.
- D. Collector: Each one on right and left side, (except for the type of ST-270), The collector is gathers the atomization spray nozzle blowout to fall the fog quantity, and then flows into the measuring cylinder outside of the test room via guide pipe. (**Remark**: The International Standard with the 80MM² collector to collect fog amount of 1-2ML each an hour, at least to collect more than 16 hours ,seeking mean value. (If each hour surpasses 1-2ML, adjusts the spray tower lowered to decrease the amount of fog. if each hour not to 1-2ML opposite.)
- E. Nozzle: Uses in the saturated air barrels has heated up the gas and brine, use of Henry's Law into a mist spray, such as the spray getting smaller and smaller, may come to clean water and air. (Note the nozzle is installed, can not be oblique, cleaning pass with a hard object can not be washed)
- F. Saline control switch: used to control the saline flow to maintain a high degree of saline water.
- G. Brine filter: used to filter impurities in the saline water, if atomizes getting smaller must clean.
- H. Brine outfall: Pull out the plug, saline water from the outfall discharged outside the tester.
- I. Drain: unplug and drain water from laboratory and sink.
- J . Tester fog outlet: salt fog outlet, not blocked.
- K. Tester heater: the heater heats the tester.
- L. Tester water inlet: use the tester water inlet, do not plug it.l. Isolation tank outlet: Pull out the plug, the water discharged through the inner tube.
- M. Water levels.
- N.Cover support balance pad.
- O. Test chamber support shelf: V-type shelf with PVC production load in less than 3kg. (AHL load of 10kg). Support rod for the glass products ϕ 10MM, uses in inclining the product for 15°C and 30°C uses , detailed look at the national standard.
- PS: Saline injection port: Will the preparation of the salt solution injected into this through the inner pipe flow into the brine heating tank. (NSS, ACSS salt concentration of 5%, the PH value of NSS between 6.5-7.2, the PH value of CASS, ACSS between 2.8-3.2, Experiments each liter saline to join the 0.26g cupric chloride ,10L saline can be used 4-7H)





Example, subject to the practice.



Example, subject to the practice.

2. Introduction and use of the support shelf and external

- S. Control panel.
- P. Measuring cylinder: it is introduced through the pipe through the collector.
- Q. Pressure gauge.
- R. Pressure regulating valve.



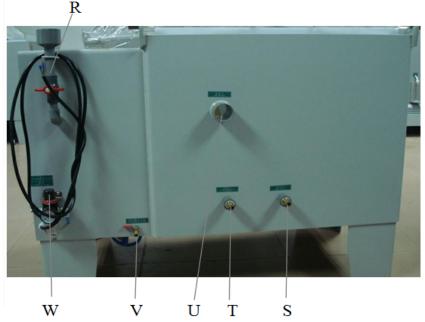
Example, subject to the practice.

3. The tester installs the water electricity introduction

- R. Saturation barrel manual water device: tap water or purified water, require clean.
- S. Tester cover supporting frames:: Support cover use, there is no above plus large-scale tester.
- T. Tester inlet: saturated barrels, test chamber heating the water from this port auto supply, require clean water free of impurities, the pressure is more than 1.5KG.
- U. Exhaust outlet: For the exhaust port, 50MM in diameter with the introduction of the black hose outdoors, requests straight along not the water, under the outfall, request not water.
- V. Saturation barrel outlet: Requested discharge at least once every month.

W. Air inlet: it is required that there are no impurities, and the pressure above 3KG/M2 should be clean, and the pressure above 5KG/M2 should be added to the large scale. The filter valve should be used to enter the saturated barrel of the machine, which should be discharged once every three days. Drainage valve in the filter valve below, can close the air source or upward press can be discharged.

X. Machine cover support frame: it is not used for support cover.

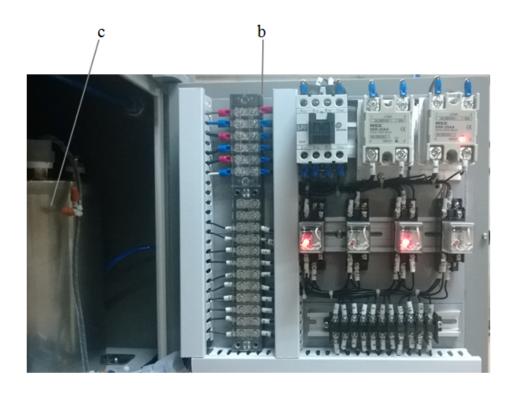


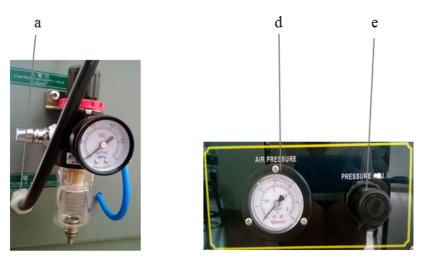


Example, subject to the practice.

4. Tester operation and control

- a. Power Line: For details sees the tester specification.
- b. Control circuit: only for reference, any questions may consult the company's technician.
- c. Control of internal structure: only for reference, detailed consultation with our technician.
- d. Pressure Gauge: Showing spray pressure and equipped with pressure regulating valve used.
- e. Pressure Regulating Valve: Control the spray pressure, the international standard for the 1 ± 0.1 KG/ CM2. Each time the starting pressure will surpass 1kg, do not hurry to transfer, half an hour later will move again, pull up the pressure regulating valve. Clockwise to increase, counterclockwise to reduce, Should be adjusted gradually, There are flowing out faster.





F. Control Operation Panel

- 1. Controller: controls machine operation.
- 2. Turn on the power and light up.
- 3. Power switch: power on and off device.



Turn on the power, the meter display is the boot screen.

Touch screen controller for Salt Spray Test Chamber

Operation Manual

I, Main Screen:



Fig.1-1

General Icon description (Icons are different by models of Salt spray test chambers)

Icon on means power on, default is restoration, means running from beginning;

Icon shows status running or pause, flash means running status;

Icon displays means malfunction or alarm, also shows alarm dialog box;

lcon shows short water in tank, refill water then to start running;

Icon on means lock the screen, to avoid mis-operation, click icon to unlock/lock;

LAB Temp
Temperature Set Value, click can reset;

SB Temp: Saturation temperature set value, click can reset;

TW Icon show temperature standby;

 $\uparrow \downarrow \equiv$ Icon indicates temperature increasing, decreasing, dwell

Running Time Program total running time

Salt Spray Time(Test time) Already running time and total running time

Buttons Description



Click this button to pop up the hardware input and output monitoring screen, see part

Ш



This button is to open the process editing window button, edit process related

operations, see part IV;



This button opens a file editing window to view alarm bog information, see part V;



This button opens the system settings, set the system basic information, see part VI;



This button opens the curve monitoring screen to export curve data related operations,

see part VII;



Run, stop button, run program, a prompt box pops up for user to confirm, see the

prompt screen;

Exhaust fog

Defogging button, automatically defog or stops defog according to settings;

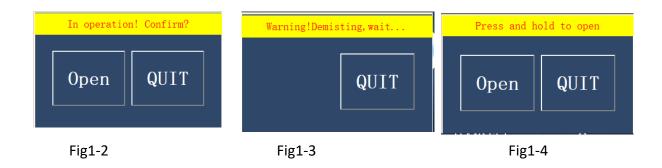


salt spray.

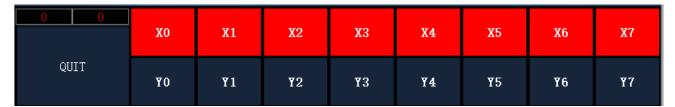
Open Cover, this icon has 2 different statuses, running and stop; under stop status,

keep press this icon, buzzer sounds and tells you to open cover, safety attention and avoid crash; under running status, click this icon displays dialog box Fig1-2, tells you defogging, fig1-3, after defogging turns to Fig1-4, finished defogging, keep press icon, buzzer sounds then open cover, salt spray stops as open cover during running, after close cover, manually click, spray not opened to continue

Close Cover, keep press this icon, buzzer sounds, tells you close the cover, safety attention and avoid crash;



III Monitoring



This interface is used to monitor the perforance of the input and output points of the PLC, the corresponding redness indicates that the point has an input or output signal.

Green and red display numbers are internal calculation parameters of the system, this parameter is only for factroy use, the user does not need to pay attention to it.

IV Technology



Technology Setting Description



This is to set salt spray period;

This is to set pause time in a period; for example set peroid 10M, pause time set 5M, so the spray time is 5M and pause 5M;

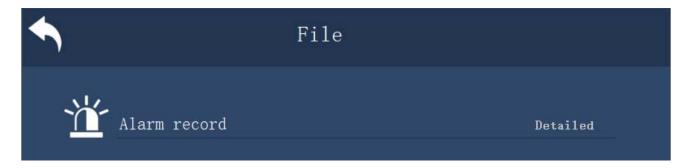
This is to set defogging time, means after finsihed salt spray test, auto defogging time; also support maually click defog button to defog or stop defog;



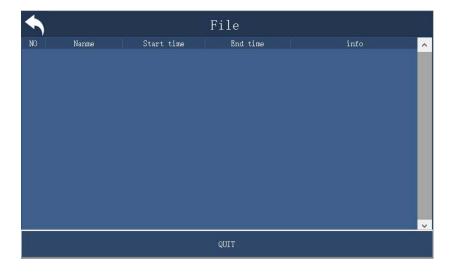
This is to set whole salt spray running time, auto power off once reached the set time;

温度待机温度 Standby Temperature Setting, for example, if set this temperature at 1 $^{\circ}$ C, and SV at 50 $^{\circ}$ C, once PV reaches 49 $^{\circ}$ C, salt spray time counts down; if do not need this standby function, can set standby temperature with higher value;

V. File

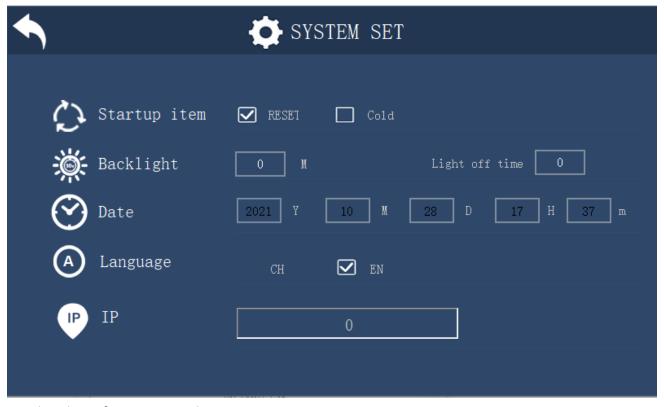


This is only an alarm record in the file management menu, click details to enter sub-menu;



This interface mainly displays the alarm information list, including alarm name, alarm start time, ending time, alarm description, this information mainly records the alarm information that occurs during the operation of the machine, for technician to diagnostic machine.

VI System Setting



Setting interface Instructions

This interface mainly includes settings of power off mode, backlight time, light off time.

Recover, Cold Boot

Power failure mode, once power off durig operation, and once power supply, if choose recover then the machine will not auto running; while if choose cold boot, then machine will auto running; while at present, only support recover.

Backlight time

The screen turns off backlight after waiting for a set time without operation.

Time and Date

Set time and date

VII Curve



Curve interface Description



X-axis coordinate zoom in, click this button, X axis coordinates magnified twice, X-fold in lower right corner;

X-axis coordinate zoom out, click this button, x axis coordinate is zoom out half, X-fold in lower right corner.

Y axis zoom in, click this button, Y axis coordinates magnified twice, Y fold in upper left corner;

Y axis zoom out, click this button, Y axis zoom out half, Y-fold in upper left corner;



Move to the left, click this button, move the curve forward by one unit;

Move to the right, click this button, move the curve backward by on unit;



page up to left, click this button to turn the curve forward;

Page up to right, click this button to trun the curve backward;



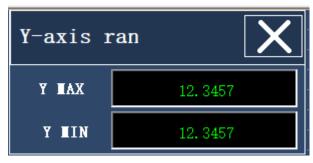
Area line Y-axis display range setting button, see Fig7-1;



Curve data query, positioning button, see Fig7-2;



Export curve data to the U disc button, see fig7-3



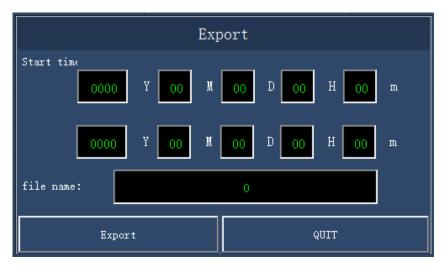
Y axis coordinate range setting window

Fig7-1



Query and pivot.

Fig7-2



Export history data to U disc, insert U disc before exporting;

Fig7-3

- 1. Power supply: Refer to the items in page 4.
- 2. The tester should be placed about 40cm away from the wall on the back, and there should remain spaces for maintenance at both left side and right side.
- 3. The gray wire outside the tester is the main power line. A non-fuse switch or knife switch should be installed additionally in front of the power line. The 6m quickly compressed air pipe is combined with air connector (U).
- 4. The inflow port can use PVC 1/2"hard pipe or hose to connect with tap water.
 - The discharge port can use PVC 1/2"hard pipe or hose to discharge wastewater. The water pipe should be downward and lower than the exhaust pipe.
 - The exhaust port should use PVC 11/2"hose and extend to the outdoors to exhaust The installation of exhaust pipe can parallel upward or downward with the tester. (It should not affect the opening of the transparent test cover when installed upward) (When installing PVC hard pipes, the cutting places should not leave plastic debris, otherwise the electromagnetic valve is easy to be blocked and the inflow water will not flow smoothly).
- 5. The installation place of the tester should avoid direct sunshine, which may affect the test conditions.
- 6. The installation place of the tester should be away from other electrical facilities or inflammable matters to avoid hazard.
- The tester is made of PVC plastics, it should not be hit heavily to avoid crack. The
 applying temperature should not exceed the range of test standards, to avoid
 distortion or malfunction caused by overheating.
- 8. Setting the test time to be 0~999.9 hours.
- 9. Press down the spray key
 - A. Open the air inlet valve in front of the air compressor.
 - B. Adjust the reducing valve of the air compressor to that the press is 2~3kg/cm² (the pressure is increasing when turning clockwise while decreasing when turning anticlockwise).
 - C. Adjust the adjusting valve to that the pressure is 1kg/cm², the pressure can be known by the pressure meter. (The pressure is increasing when turning clockwise while decreasing when turning anticlockwise).
- 10. Press down the timer key, the time will be timed based on the settings, and it will shut down automatically when the timing is completed.
- 11. Close the switches in sequence after the test.
- 12. When there are abnormal conditions appeared during the tests, please treat them referring to the judgment sheet for abnormal functions.

Section 3 Operation Instruction

- 1. Preparing test solutions
 - Preparing method: Add 500g sodium chlorides into 9.5L pure distilled water, and then agitate them to be fully dissolved (The saline water concentration is 5% at that time)
- 2. Pour the solution into the filling opening of saline water, the solution will flow into the saline water preheating tank.

- 3. Add water into the wet bulb cup, the wet-bulb thermometer is covered with gauze, and the end of gauze is placed in the wet bulb cup.
- 4. Place test pieces or samples onto the shelf.
 - *The putting angles should according to the needed standard specifications.
- 5. Set the test temperature
 - *Set the temperatures according to the needed test standards.
 - A. Saline water test method: the test room temperature 35°C.
 - the temperature in the saturated air tank is 47° C.
 - B. Corrosion test method: the test room temperature 50° C.
 - the temperature in the saturated air tank is 63° C.
- 6. Press down the power switch, operate the press keys, and preheat at first to reach the setting temperature.
 - *Note: the test cover should be covered. (If the alarming light showing the water level is not enough is lighting, the water will be supplied automatically until the alarming light showing the normal condition is lighting, then the operation can be continued).
- 7. Set the test time.
- 8. Press down the timer key and two keys for the air compressor to start the test.
 - *If there is no gas appeared when pressing down the spray key, the switch on the air compressor, air inlet valve and adjusting valve should be inspected whether they are open or not.
 - *To see the finished products in the test room, press down the defog switch, and the fog will be rapidly exhausted to outdoors.
- 9. Close the switches in sequence after the test.
 - *If the interval to the next test is very long, the inside of the test room should be washed to keep the tester clean after the finishing of the test.

Conditions	Reasons	Treatment
The temperature in the test	Temperature setting for	Temperature setting for
room can't come up to the	the temperature controller	the temperature controller
setting temperature	in the test room is too low.	is set at the needed
		temperature.
	The temperature setting	
	for the test room security	The temperature setting
	protection switch is too	for the test room security
	low.	protection switch is set at
		the needed temperature.
	Malfunction of heating	
	system.	Ask the maintain staff to
	Malfunction of	repair according to the
	electromagnetic contactor.	layout chart, or contact
	Malfunction of controller	with the manufacture.
The temperature in the	Temperature setting for	Temperature setting for
saturated tank can't come up	the temperature controller	the temperature controller
to the setting temperature	in the saturated tank is too	is set at the needed
	low.	temperature.
	The temperature esting	The temperature setting
	The temperature setting for the saturated tank	The temperature setting for the security protection
	security protection switch	switch is set at the needed
	is too low.	temperature.
	is too low.	temperature.
	Malfunction of heating	Ask the maintain staff to
	system.	repair according to the
	Malfunction of	layout chart, or contact
	electromagnetic contactor.	with the manufacture.
	Malfunction of controller	
Spray amount is not enough	The spray adjustor is	The spray adjustor should
	placed too low.	be adjusted to higher
		place.
	The glass filter in the	
	preheating tank is blocked.	Clean the glass filter.
	The pressure setting is too	
	low.	Adjust the adjusting valve
		to 1kg/cm ² pressure, or
		adjust the reducing valve
		to 2~3kg/cm² pressure.
There is no spray	The air compressor is not	Switch on the air
	running, the pressure is	compressor. Adjust the

Conditions	Reasons	Treatment
	not enough.	adjusting valve to 1kg/cm ²
		pressure.
	Malfunction of	Notify the manufacturer to
	electromagnetic valve.	treat.
	Malfunction of pressure meter.	Notify the manufacturer to treat.
	Malfunction of	Notify the manufacturer to
	electromagnetic contactor.	treat.
	The nozzles are blocked.	Detach the nozzles and clean them.
Automatically shut down during the test	The main power supply is shut off.	Inspect the main power supply.
during the test	Shut on.	Supply.
	The setting time of timer is	Stop the timer and then
	reached.	restart.
Water level alarming light is	The water level is too low.	The water will inflow
lighting.		automatically to the place
		of full water level
The spray is normal while the	The air compressor has	Use it normally.
air compressor not running.	the function of	
	self-protecting.	

Section5 Maintenance

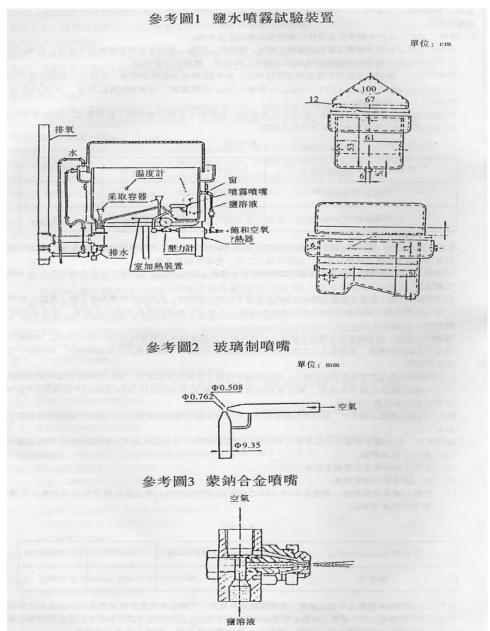
- 1. When the test time exceeds one month, please replace the water in the heating tank.
- 2. The saline water solution used for test should not be used when it has not been used for more than one week to avoid affecting the test quality.
- 3. When the test time exceeds 120 hours, discharge the cumulated water from air compressor.
 - *Loosen the knob under the air compressor.
- 4. When the test time exceeds 2000 hours, please replace the tester oils in the air compressor.
 - *When replacing the tester oils, the air compressor should not be started.
- If the interval to the next test is very long, the inside of the test room should be washed and the water in the heating tank should be discharged after the finishing of the test.
 - *Discharge the water in the heating tank—pull up the rubber stopper at the bottom.

 Discharge the water in the isolation tank—pull up the rubber stopper at the middle.

 Discharge the water in the preheating tank—pull up the inner rubber stopper.

Temperature Chart

Ory Bulb	0.5	1.0	1.5	2.0	25	3.0	3.5	40	4.5	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34	36	38	40
c	%	%	%	%	%	%	%	%	%	%	%	%	1000	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
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32 34 36 38	97 97 97	93 93 94	90 90 90	88 87 87	84 84 84	81 81 81	77 77 78 79 79	74 75 75	71 72 73	68 70 70	62 64 65	58 59 60	53 54 56	48 50 51	43 45 46	38 41 42	34 35 35	30 32 34	25 29 30	22 24 25	18 21 23	13											
42 44 46 48 50	97 97 97	94	91 91 92	88 89 89	86 86	83 83 84	80 81 81	77 78 78	75 75 76	73 73 74	68 68 69	63 64 65	59 60 61	54 55 56	50 52 53	47 48 49	42 44 45	39 41 42	36 37 39	32 34 35	29 31 33		17 19 21	14	12								
52 54 56 58	97 97 97	95 95 95	92 92 93	90 90 90	87 87 88	85 85 85	82 83 83	80 80 80	78 78 79	76 76 77	71 72 72	67 68 68	63 64 64	59 60 61	56 57 57	52 53 54	49 50 51	45 46 47	42 43 44	39 40 42	36 38 39	30 31 32 33 35	26 27 29	21		13 15 16	11 12 14	11					
62 64 66 68 70	98 98 98	95 95 95	93 93	91 91 91	88 89 89	86 86 87	84 84 85	82 82 82	80 80 81	78 78 79	74 74 75	70 70 71	66 67 67	63 64 64	59 60 61	56 57 58	53 54 55	50 51 52	47 48 49	44 45 46	42 43 44	35 37 38 39 40	32 33 34	28 29 30	23 24 25 26 27	20 21 22	18 19	13	13	11			
72 74 76 78 80	98 98 98	96 96 96	94 94 94	92 92 92	90	87 88 88	85 86 86	83 84 84	82 82 82	80 80 81	76 76 77	72 73 73	69 70 70	66 66	63 63 64	60 60 61	57 57 58	54 54 55	51 52 52	48 49 50	46 47 47	41 42 43	37 38 38	33 34 34	28 29 30 30 31	25 26 27	22 23 24	19 20 21	16 17 18	14	12	10	
82 84 86 88	98 98	96 96	94	92	91	88	86 87 87	84 85 85	83 83	81 82 82	78 78 78	74 75 75	71 72 72	68 69	65 66	62 63	59 60 60	57 57 58	54 55 55	52 52 53	50 51	45 45 46	41 42	37 37 38	32 33 34 34 35	29 30 31	26 27 28	24	20 21 22	18 19 19	16 16 17	13 14 15	1:
92 94 96 98	99	97 97 97	95 95 95	93 93	91 91 92	90	88 88 88	86 86	84 84 85	83 83 83	79 80 80	76 76 77	73 74 74	70 70 71	67 68 68	65 65	62 62 63	59 60 60	57 57 58	54 55 55	52 53 53	48 48 49	44 44 45	41 41	36 36 37 38 38	33 34 34	31	27 28 28	24 25 26	22 22 23	19 20 21	17 18 19	16



参考图 1: 盐水喷雾试验装置 单位: cm Refer to Figure 1: The salt spray test equipment unit: cm

排气 Exhaust 水 Water 温度计 Thermometer 采取容器 Collection container 排水 Drainage 窗 Window 喷雾喷嘴 Spray Nozzle 盐溶液 salt solution

饱和空气 saturated air 加热器 Heater :

压力计 Gauge 室加热装置 test room heating device

参考图 2 Refer to Figure 2 玻璃喷嘴 glass nozzle 单位 unit: cm 空气 air

参考图 3 Refer to Figure 3 蒙钠合金喷嘴 Manganese Sodium Alloy Nozzle 空气 air 盐溶液 saline solution

Attached list 2 Recording form for salt spray test

Test Date	Day	Month	Year	Test No.	
Test Time	Day	to Day	In all	hours	
(Spray time)	If the t	est is interrupted, th	ne reason is:		
1. Quality of s	odium cl	nloride			
2. Quality of d	istilled w	ater			
3. Spray samp	oler:				ml/80cm /h
3.1 Spray a	mount				III/OOCIII /II
3.2 Specific	gravity	or concentration of	f collected solution		
at room tem	nperature)			
3.3 pH					
4. Sample:					
4.1 Type					
4.2 Shape					
4.3 Dimens	ion				
4.4 Number	•				
5. Compresse	d air pre	ssure			Kgf/cm ²
6. Relative hu	midity in	test room			
7. Temperatur	e in test	room			$^{\circ}$
8. Temperatur	e in pres	sure tank			$^{\circ}$
9. Temperatur	e in salir	ne water tank			$^{\circ}$
10. Others					
Judgment	1. Judge	e according to stan	dard charm		
:	2. Judge	according to other	method		
Tested by:					