

# EVAFLEX<sup>®</sup> 5

## [With SHIELD FFC]

Part No. 20818-0\*\*E

### Test Report

Product Specification no. PRS-2671

0	T20068	September 3, 2020	S.Shigekoshi	M.Muro	Y.Shimada
Rev.	ECN	Date	Prepared by	Checked by	Approved by

## 1. Purpose

To evaluate the performance of EVAFLEX 5Connector in accordance with PRS-2671.

## 2. Specimen

EVAFLEX 5 (Part No. 20818-0\*\*E)

## 3. Test Sequence

All the evaluations were performed in accordance with Table 1. Test Sequence.

## 4. Result

See Table 2 to 4, Graph 1 to 11. For the details of the testing conditions and requirements, see PRS-2671.

The “n” in the tables show the number of measurement points.

## 5. Conclusion

All the specimens met the requirements of PRS-2671.

**Table 1. Test Sequence and Sample Quantity**

Test Item	Group													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
Contact Resistance			2,6			1,3,5	1,3	1,3	1,5	1,5,7	1,3	1,3		
Insulation Resistance									2,6	2,8				
D. W. Voltage									3,7	3,9				
Temp. Rise	1													
Differential Impedance		1												
Mating Force			1,5											
Un-mating Force			3,7											
Durability			4							4 10 cyc				
Contact Retention Force				1										
FFC Retention Force					1									
Vibration						2								
Shock						4								
Thermal Shock							2							
High Temperature Life								2						
Humidity (Steady State)									4					
Humidity (Cycling)										6				
Salt Water Spray											2			
H <sub>2</sub> S Gas												2		
Solderability													1	
Soldering Heat Resistance														1
Sample QTY.	5	5	5	20	5	5	5	5	5	5	5	5	10	10

※Numbers indicate test sequences

**Table 2. Test Result**

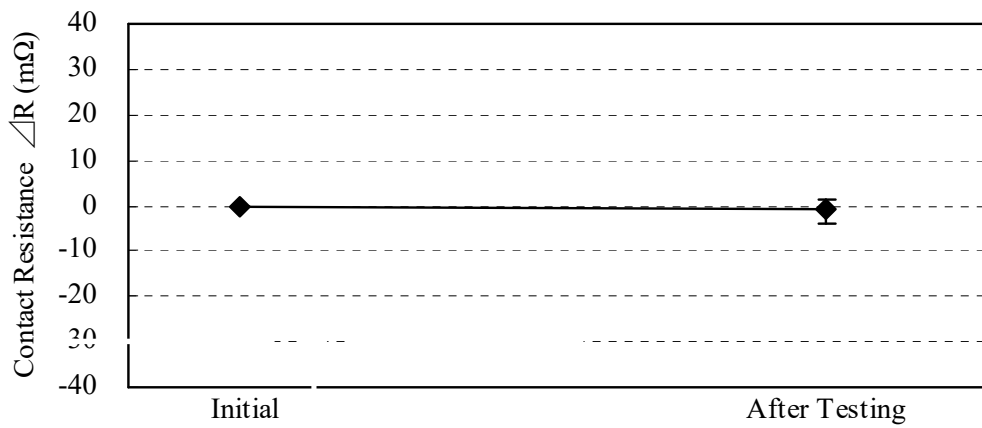
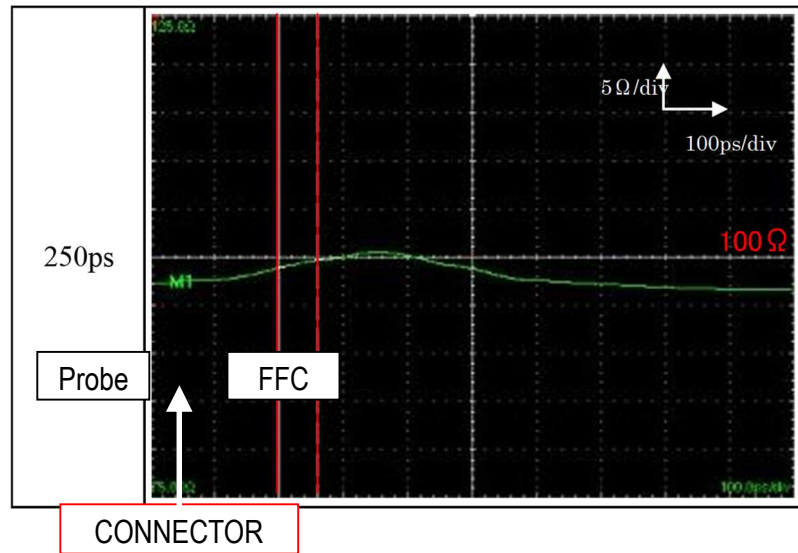
Test Item	Measurements		Spec.	Set	n	Data					Judge	
						AVG (X)	MAX.	MIN.	s	X±3s		
A Group Temperature Rise	0.3A/Pin(51P)		$\Delta T=30K(^{\circ}C)$ MAX.	5	-	$\Delta T=14.0K(^{\circ}C)$ MAX					○	
	0.5A/Pin(30P) (15A/CONN.)		$\Delta T=30K(^{\circ}C)$ MAX.	5	-	$\Delta T=26.5K(^{\circ}C)$ MAX					○	
	0.6A/Pin(20P) (12A/CONN.)		$\Delta T=30K(^{\circ}C)$ MAX.	5	-	$\Delta T=27.2K(^{\circ}C)$ MAX					○	
B Group Differential Impedance	MAX. Side		100±10Ω	5	-	100.122	100.51	99.70	0.352	101.178	○	
	MIN. Side			5	-	100.032	100.38	98.83	0.675	98.007	○	
C Group Durability	Contact Resistance (mΩ)	Initial	60mΩ MAX.	5	255	33.199	37.46	28.13	2.101	39.502	○	
		I/W 30cycles	$\Delta R=40m\Omega$ MAX.	5	255	-0.987	1.39	-3.96	1.057	2.184	○	
	41P	Insertion Force (N)	Initial	29.2N MAX.	5	-	14.906	15.50	14.20	0.478	16.340	○
			I/W 30cycles		5	-	9.568	10.25	9.14	0.497	11.059	○
		Withdrawal Force (N)	Initial	4.25N MIN.	5	-	12.829	13.88	11.93	0.717	10.678	○
			I/W 30cycles		5	-	8.782	9.50	8.05	0.532	7.186	○
	51P	Insertion Force (N)	Initial	30N MAX.	5	-	17.588	18.19	17.12	0.483	19.037	○
			I/W 30cycles		5	-	10.635	11.49	10.01	0.615	12.480	○
		Withdrawal Force (N)	Initial	5N MIN.	5	-	16.187	17.90	14.81	1.129	12.800	○
			I/W 30cycles		5	-	10.477	12.37	9.34	1.252	6.721	○
D Group Contact Retention Force		0.5N MIN.	-	20	1.283	1.47	1.08	0.196	0.695	○		
E Group FFC Retention Force	41P	FFC Retention Force	22N MIN.	5	-	36.509	37.50	36.08	0.575	34.784	○	
		Appearance	No abnormality	5	-	No abnormality					○	
	51P	FFC Retention Force	25N MIN.	5	-	44.908	45.73	44.01	0.763	42.619	○	
		Appearance	No abnormality	5	-	No abnormality					○	
F Group Vibration ↓ Shock	Contact Resistance (mΩ)	Initial	60mΩ MAX.	5	255	32.829	37.97	27.90	2.040	38.949	○	
		After Vibration	$\Delta R=40m\Omega$ MAX.	5	255	0.241	4.60	-3.85	1.506	4.759	○	
		After Shock		5	255	-3.207	4.60	-7.78	3.187	6.354	○	
	Discontinuity	During Vibration	1μs MAX.	5	-	No discontinuity					○	
		During Shock		5	-	No discontinuity					○	
	Appearance	After Vibration	No abnormality	5	-	No abnormality					○	
		After Shock		5	-	No abnormality					○	

Table 3. Test Result

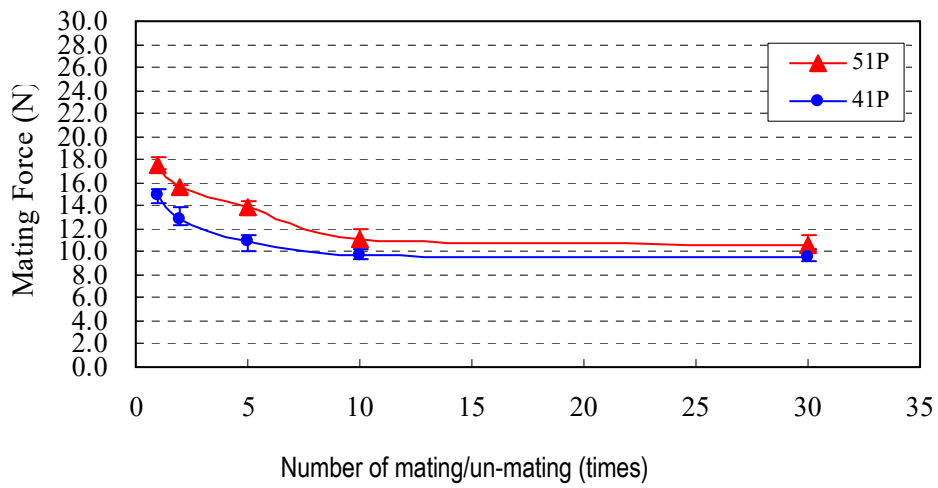
Test Item	Measurements		Spec.	Set	n	Data					Judge
						AVG (X)	MAX.	MIN.	s	X±3s	
G Group Thermal Shock	Contact Resistance (mΩ)	Initial	60mΩ MAX.	5	255	31.884	38.77	27.36	2.600	39.684	○
		After Testing	ΔR=40mΩMAX.	5	255	-2.121	3.78	-8.16	2.136	4.287	○
	Insulation Resistance C/T – C/T	Initial	100MΩ MIN.	5	5	4.0×10 <sup>9</sup> MΩ MIN.					○
		After Testing	100MΩ MIN.	5	5	4.0×10 <sup>9</sup> MΩ MIN.					○
	Insulation Resistance C/T - Shield	Initial	100MΩ MIN.	5	5	4.0×10 <sup>9</sup> MΩ MIN.					○
		After Testing	100MΩ MIN.	5	5	2.0×10 <sup>9</sup> MΩ MIN.					○
	Dielectric Strength C/T – C/T	Initial	No abnormality	5	5	No abnormality					○
		After Testing	No abnormality	5	5	No abnormality					○
	Dielectric Strength C/T - Shield	Initial	No abnormality	5	5	No abnormality					○
		After Testing	No abnormality	5	5	No abnormality					○
	Appearance		No abnormality	5	-	No abnormality					○
	H Group High Temperature Life	Contact Resistance (mΩ)	Initial	60mΩ MAX.	5	255	32.072	37.63	28.00	2.123	38.441
After Testing			ΔR=40mΩMAX.	5	255	2.053	6.28	-1.79	1.682	7.099	○
Appearance		No abnormality	5	-	No abnormality					○	
J Group Humidity (Steady State)	Contact Resistance (mΩ)	Initial	60mΩ MAX.	5	255	32.226	37.08	27.72	1.908	37.950	○
		After Testing	ΔR=40mΩMAX.	5	255	0.501	3.15	-2.29	1.139	3.918	○
	Insulation Resistance C/T – C/T	Initial	100MΩ MIN.	5	5	1.5×10 <sup>9</sup> MΩ MIN.					○
		After Testing	100MΩ MIN.	5	5	2.0×10 <sup>4</sup> MΩ MIN.					○
	Insulation Resistance C/T - Shield	Initial	100MΩ MIN.	5	5	1.5×10 <sup>9</sup> MΩ MIN.					○
		After Testing	100MΩ MIN.	5	5	1.0×10 <sup>9</sup> MΩ MIN.					○
	Dielectric Strength C/T – C/T	Initial	No abnormality	5	5	No abnormality					○
		After Testing	No abnormality	5	5	No abnormality					○
	Dielectric Strength C/T - Shield	Initial	No abnormality	5	5	No abnormality					○
		After Testing	No abnormality	5	5	No abnormality					○
	Appearance		No abnormality	5	-	No abnormality					○

**Table 4. Test Result**

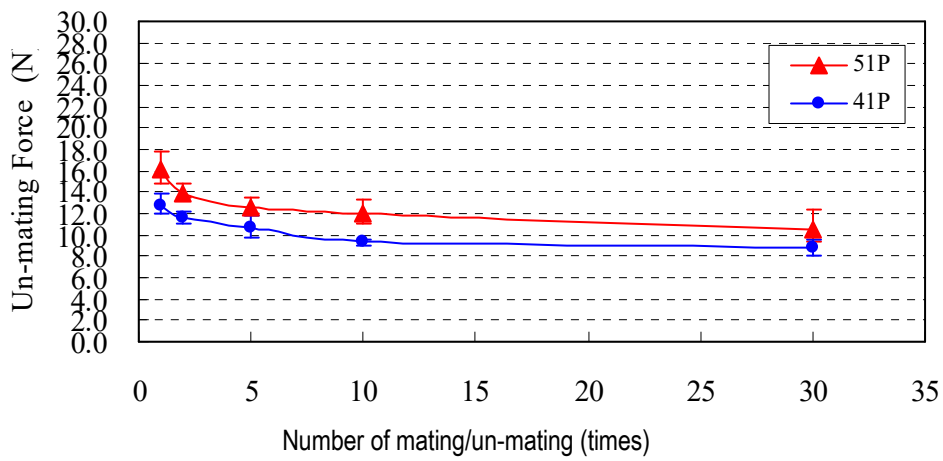
Test Item	Measurements		Spec.	Set	n	Data					Judge
						AVG (X)	MAX.	MIN.	s	X±3s	
K Group Humidity (Cycling)	Contact Resistance (mΩ)	Initial	60mΩ MAX.	5	255	31.023	38.71	27.10	2.649	38.970	○
		After Testing	ΔR=40mΩMAX.	5	255	1.336	7.52	-5.79	2.704	9.448	○
	Insulation Resistance C/T – C/T	Initial	100MΩ MIN.	5	5	6.0×10 <sup>4</sup> MΩ MIN.					○
		After Testing	100MΩ MIN.	5	5	2.0×10 <sup>4</sup> MΩ MIN.					○
	Insulation Resistance C/T - Shield	Initial	100MΩ MIN.	5	5	1.0×10 <sup>6</sup> MΩ MIN.					○
		After Testing	100MΩ MIN.	5	5	2.0×10 <sup>4</sup> MΩ MIN.					○
	Dielectric Strength C/T – C/T	Initial	No abnormality	5	5	No abnormality					○
		After Testing	No abnormality	5	5	No abnormality					○
	Dielectric Strength C/T - Shield	Initial	No abnormality	5	5	No abnormality					○
		After Testing	No abnormality	5	5	No abnormality					○
Appearance		No abnormality	5	-	No abnormality					○	
L Group Salt Water Spray	Contact Resistance (mΩ)	Initial	60mΩ MAX.	5	255	32.033	37.20	27.68	2.108	38.357	○
		After Testing	ΔR=40mΩMAX.	5	255	-1.083	1.65	-4.09	1.003	1.926	○
	Appearance		No abnormality	5	-	No abnormality					○
M Group H2S Gas	Contact Resistance (mΩ)	Initial	60mΩ MAX.	5	255	32.441	37.66	27.98	2.097	38.732	○
		After Testing	ΔR=40mΩMAX.	5	255	2.069	6.05	-2.20	1.530	6.659	○
	Appearance		No abnormality	5	-	No abnormality					○
P Group Solderability	Appearance		More than 95% of The dipped surface Shall be evenly wet.	10	-	100%					○
Q Group Soldering Heat Resistance	Appearance		No abnormality	10	-	No abnormality					○



Graph.2 A change of contact resistance: Durability

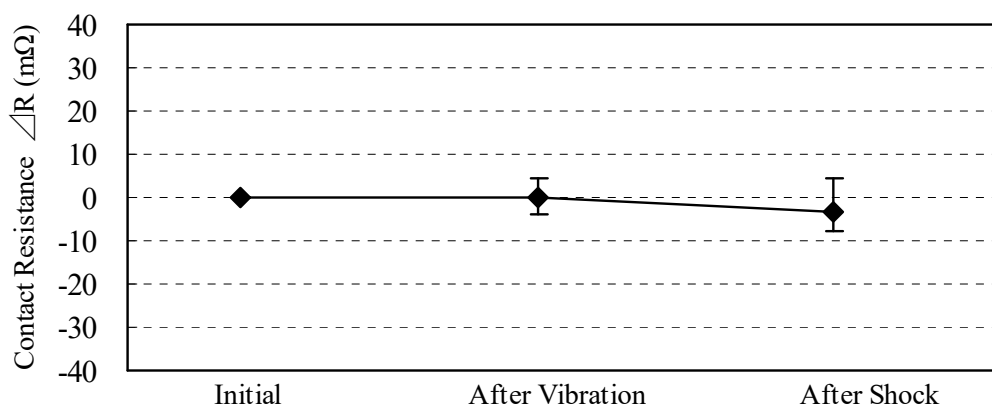


Graph.3 Mating Force

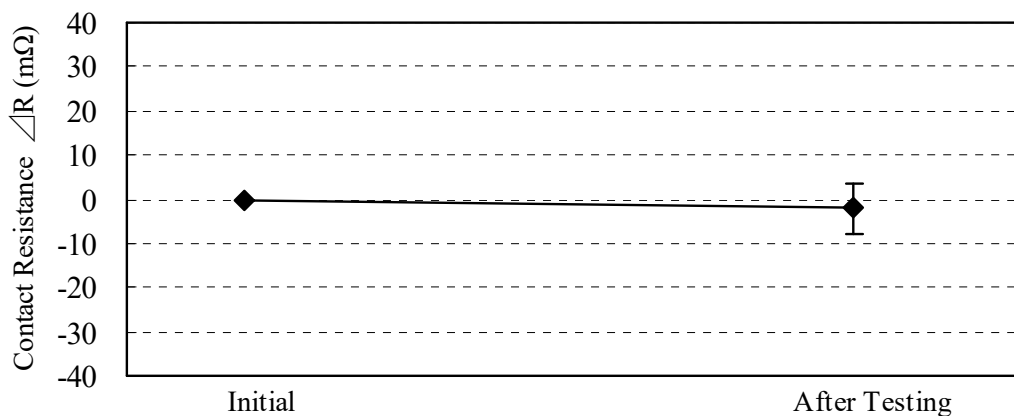


Graph.4 Un-mating Force

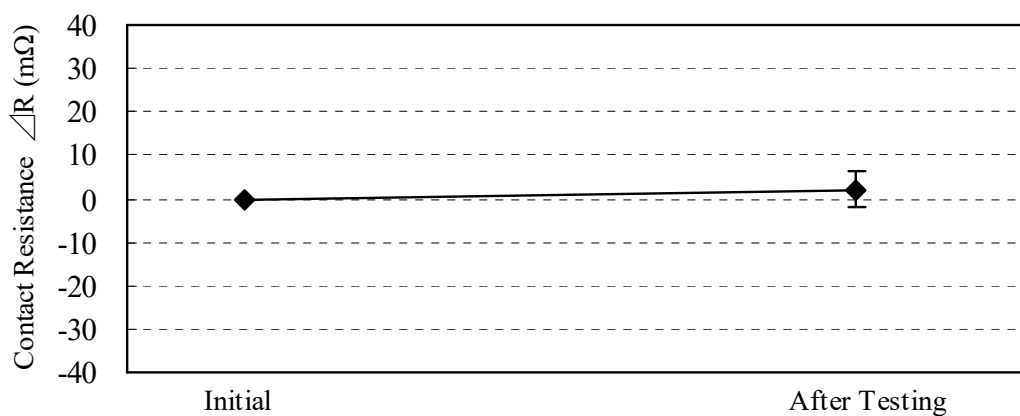




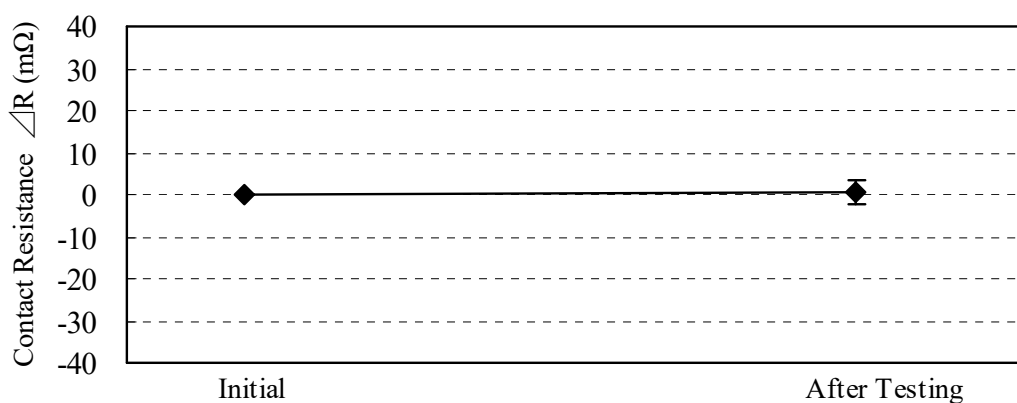
Graph.5 A change of contact resistance: Vibration and Shock



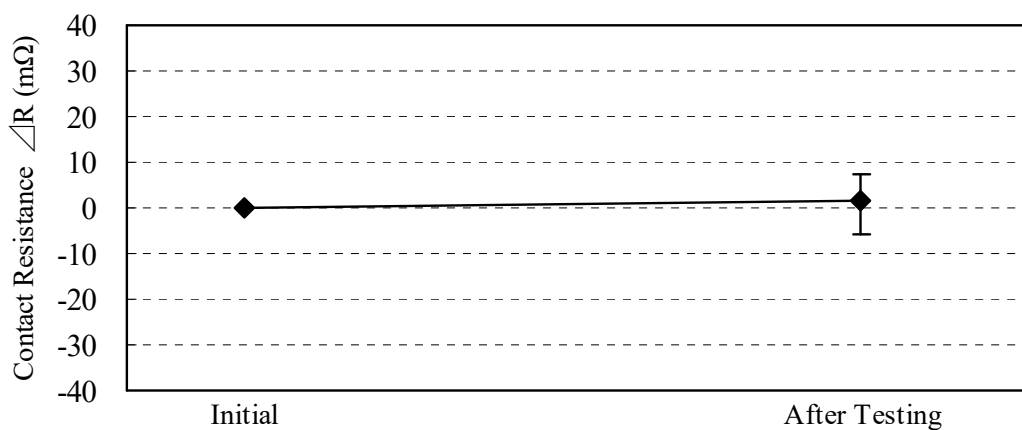
Graph.6 A change of contact resistance: Thermal Shock



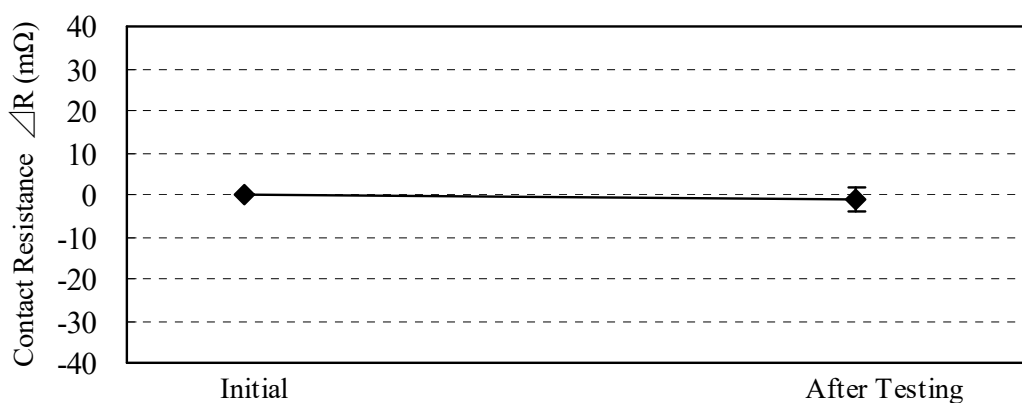
Graph.7 A change of contact resistance: High temperature life



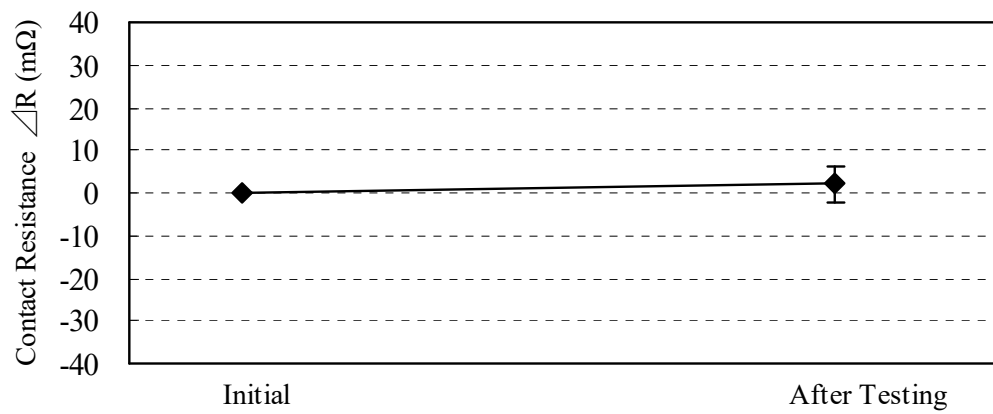
Graph.8 A change of contact resistance: Humidity(Steady State)



Graph.9 A change of contact resistance: Humidity(Cycle)



Graph.10 A change of contact resistance: Salt water Spray



Graph.11 A change of contact resistance: Gas ( $H_2S$ )