

# CABLINE®-SS Connector

Solder Ground Bar Type

Part No. Plug: 20380 Receptacle: 20374

## Test Report

Product Specification no. PRS-1239

12	T22046	February 15, 2022	K.Hara	T.Tanigawa	H.Ikari
11	T19061	June 11, 2019	K.Hara	T.Masunaga	H.Ikari
10	T17151	September 11, 2017	R.Hoshino	H.Tagomori	M.Takemoto
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Rev.	ECN	Date	Prepared by	Checked by	Approved by

## 1. Purpose

To evaluate the performance of CABLINE-SS Connector in accordance with PRS-1239.

## 2. Specimen

- (1) CABLINE-SS PLUG ASS'Y (Part No. 20380-\*\*\*T-\*\*)
- (2) CABLINE-SS RECEPTACLE ASS'Y (Part No.20374-\*\*\*E-\*\* )

## 3. Test Sequence

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

## 4. Result

See Table 2-1 to 2-4, Graph 1 to 23. For the details of the testing conditions and requirements, see PRS-1239.  
The "n" in the tables show the number of measurement points.

## 5. Conclusion

All the specimens met the requirements of PRS-1239.

Table 1. Test Sequence and Sample Quantity

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

※Numbers indicate sequence in which tests are performed.

Table.2-1 Test result

Test Item	Contents of Measurement			Specifications	Set	N	Data					Judgment	
							AVE.	MAX.	MIN.	s	X±3s		
A Group Durability ↓ Cable Retention Force  Sn Type	AWG#34 Discrete cable	Contact Resistance(mΩ)	Initial	AWG#34 180mΩMAX	5	250		128.495	136.85	120.55	3.51	138.999	Pass
			After Testing	AWG#34 ΔR=40mΩMAX.			R	128.974	137.78	117.20	3.82	140.443	Pass
							ΔR	0.478	8.69	-8.32	3.55	11.127	
	AWG#36	Contact Resistance(mΩ)	Initial	AWG#36 230mΩMAX	5	250		171.335	174.21	168.04	1.541	175.957	Pass
			After Testing	AWG#36 ΔR=40mΩMAX.			R	171.546	173.94	169.86	175.002	175.00	Pass
							ΔR	0.211	2.25	-3.24	3.985	3.98	
		Ground Resistance(mΩ)	Initial	50mΩMAX.	5	-		16.656	17.00	16.32	0.239	17.372	Pass
			After Testing	ΔR=40mΩMAX.			R	17.225	18.07	16.30	0.482	18.670	Pass
							ΔR	0.569	1.17	-0.57	0.530	2.158	
	AWG#40	Contact Resistance(mΩ)	Initial	AWG#40 530mΩMAX	5	250		502.171	508.953	497.367	2.532	509.769	Pass
			After Testing	AWG#40 ΔR=40mΩMAX.			R	501.257	506.200	496.875	2.011	507.291	Pass
							ΔR	-0.915	4.659	-6.524	2.017	-6.964	
Ground Resistance(mΩ)		Initial	50mΩMAX.	5	-		13.147	13.815	12.378	0.609	14.974	Pass	
		After Testing	ΔR=40mΩMAX.			R	13.089	13.682	12.492	0.549	14.735	Pass	
						ΔR	-0.058	1.304	-1.316	1.098	-3.235		
AWG#42	Contact Resistance(mΩ)	Initial	AWG#42 700mΩMAX	5	250		618.595	639.39	589.70	12.116	654.943	Pass	
		After Testing	AWG#42 ΔR=40mΩMAX.			R	618.105	639.76	590.62	12.129	654.492	Pass	
						ΔR	-0.442	2.87	-3.22	1.395	3.743	Pass	
	Ground Resistance(mΩ)	Initial	50mΩMAX.	5	-		18.508	20.42	17.50	1.205	22.123	Pass	
		After Testing	ΔR=40mΩMAX.			R	21.191	23.64	18.66	2.109	27.518	Pass	
						ΔR	2.683	5.98	0.45	2.357	9.754	Pass	
10P	Mating Force(N)	Initial	29.0N MAX.	5	-		14.687	14.81	14.50	-	-	Pass	
		After Testing	29.0N MAX.				8.870	10.13	7.63	-	-	Pass	
	Un-mating Force(N)	Initial	4.00N MIN.	5	-		17.993	19.74	16.08	-	-	Pass	
		After Testing	2.87N MIN.				6.380	6.92	6.10	-	-	Pass	
	Cable Retention Force		4.90N MIN.	5	-		40.410	43.37	37.45	-	-	Pass	
14P	Mating Force(N)	Initial	29.8N MAX.	5	-		20.087	24.86	17.58	-	-	Pass	
		After Testing	29.8N MAX.				9.200	10.24	8.03	-	-	Pass	
	Un-mating Force(N)	Initial	4.40N MIN.	5	-		21.963	24.82	19.30	-	-	Pass	
		After Testing	3.23N MIN.				10.170	11.15	9.12	-	-	Pass	
	Cable Retention Force		6.86N MIN.	5	-		52.070	53.10	51.50	-	-	Pass	
20P	Mating Force(N)	Initial	31.0N MAX.	5	-		24.377	25.00	23.52	-	-	Pass	
		After Testing	31.0N MAX.				12.775	13.82	10.77	-	-	Pass	
	Un-mating Force(N)	Initial	5.00N MIN.	5	-		15.940	16.73	14.47	-	-	Pass	
		After Testing	3.76N MIN.				9.070	9.55	8.51	-	-	Pass	
	Cable Retention Force		9.8N MIN.	5	-		48.525	54.50	42.50	-	-	Pass	
30P	Mating Force(N)	Initial	33.0N MAX.	5	-		27.930	28.52	27.15	-	-	Pass	
		After Testing	33.0N MAX.				18.032	19.01	17.05	-	-	Pass	
	Un-mating Force(N)	Initial	6.00N MIN.	5	-		16.987	18.42	16.27	-	-	Pass	
		After Testing	4.65N MIN.				10.780	11.96	10.00	-	-	Pass	
	Cable Retention Force		14.7N MIN.	5	-		57.758	62.72	50.91	-	-	Pass	

Table.2-2 Test result

Test Item	Contents of Measurement			Specifications	Set	N	Data					Judgment	
							AVE.	MAX.	MIN.	s	X±3s		
A Group Durability ↓ Cable Retention Force  Sn Type	32P	Mating Force(N)	Initial	33.4N MAX.	5	-	28.152	28.98	27.36	-	-	Pass	
			After Testing	33.4N MAX.			18.058	18.55	17.58	-	-	Pass	
		Un-mating Force(N)	Initial	6.20N MIN.	5	-	17.923	18.58	17.17	-	-	Pass	
			After Testing	4.84N MIN.			11.200	11.81	10.54	-	-	Pass	
		Cable Retention Force			15.68N MIN.	5	-	60.350	67.20	52.60	-	-	Pass
	35P	Mating Force(N)	Initial	34.0N MAX.	5	-	29.913	30.56	29.43	-	-	Pass	
			After Testing	34.0N MAX.			20.113	21.06	18.92	-	-	Pass	
		Un-mating Force(N)	Initial	6.5N MIN.	5	-	19.840	20.31	19.00	-	-	Pass	
			After Testing	5.07N MIN.			8.906	9.25	8.39	-	-	Pass	
		Cable Retention Force			17.15N MIN.	5	-	55.930	57.65	54.38	-	-	Pass
	40P	Mating Force(N)	Initial	35.0N MAX.	5	-	33.560	34.30	32.93	-	-	Pass	
			After Testing	35.0N MAX.			19.840	21.07	18.62	-	-	Pass	
		Un-mating Force(N)	Initial	7.00N MIN.	5	-	17.326	19.99	14.01	-	-	Pass	
			After Testing	5.50N MIN.			11.446	12.05	10.88	-	-	Pass	
		Cable Retention Force			19.6N MIN.	5	-	54.468	56.94	49.20	-	-	Pass
	50P	Mating Force(N)	Initial	38.0N MAX.	5	-	34.050	36.46	32.34	-	-	Pass	
			After Testing	38.0N MAX.			20.870	22.15	19.60	-	-	Pass	
		Un-mating Force(N)	Initial	8.00N MIN.	5	-	18.032	18.82	17.44	-	-	Pass	
			After Testing	6.41N MIN.			11.642	13.03	10.39	-	-	Pass	
		Cable Retention Force			24.5N MIN.	5	-	98.440	102.2	95.5	-	-	Pass
A Group Durability ↓ Cable Retention Force  Au Type	C/T Resistance(mΩ)		Initial	AWG#42 700mΩMAX	5	250		644.259	669.76	630.32	6.763	664.548	Pass
			After Testing	AWG#42 ΔR=40mΩMAX.			R	643.357	667.83	630.08	6.591	662.13	OK
							ΔR	-0.903	1.75	-7.09	1.709	4.224	OK
	GND Resistance(mΩ)		Initial	50mΩMAX.	5	-		15.902	17.16	14.17	-	-	OK
			After Testing	ΔR=40mΩMAX.			R	16.786	18.82	14.89	-	-	OK
							ΔR	0.884	1.72	-1.04	-	-	OK
	35P	Mating Force(N)	Initial	40.8N MAX.	5	-	31.460	31.95	30.77	-	-	OK	
			After Testing	34.0N MAX.			18.760	19.70	18.23	-	-	OK	
		Unmating Force(N)	Initial	5.26N MIN.	5	-	16.405	17.15	15.19	-	-	OK	
			After Testing	3.07N MIN.			12.466	13.72	11.27	-	-	OK	
		Cable Retention Force			17.15N MIN.	5	-	59.240	65.70	53.60	-	-	OK
	40P	Mating Force(N)	Initial	42.0N MAX.	5	-	31.630	33.71	29.01	-	-	OK	
			After Testing	35.0N MAX.			18.420	20.19	17.05	-	-	OK	
		Unmating Force(N)	Initial	6.0N MIN.	5	-	19.800	22.05	16.46	-	-	OK	
			After Testing	3.5N MIN.			11.450	12.84	10.58	-	-	OK	
Cable Retention Force			19.6N MIN.	5	-	54.468	56.94	49.20	-	-	OK		
B Group Contact Retention Force	Plug Contact Retention Force			0.6N以上	-	20	It does not pull out,even if it applies the power of 1.8N to a terminal.					OK	
	Rece Contact Retention Force			0.2N以上	-	20	1.019	1.27	0.78	0.121	0.656	OK	

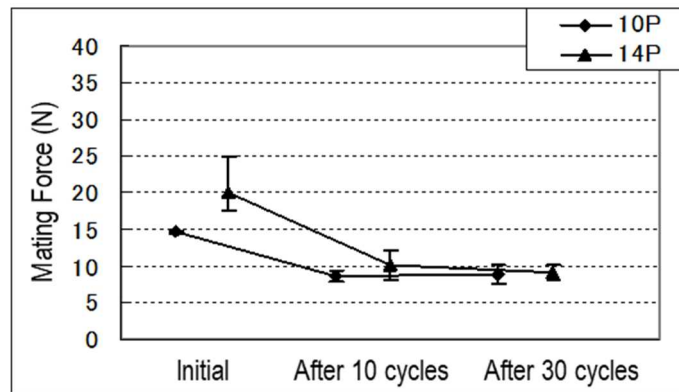
Table.2-3 Test result

Test Item	Contents of Measurement		Specifications	Set	N	Data					Judgment				
						AVE.	MAX.	MIN.	s	X±3s					
C Group Vibration ↓ Shock	Contact Resistance(mΩ)	Initial	AWG#42 700mΩMAX.	5	250		619.130	639.97	589.92	13.022	658.196	Pass			
		After Vibration	AWG#42 ΔR=40mΩMAX.			R	619.499	639.85	589.89	13.032	658.595	Pass			
		After Shock	AWG#42 ΔR=40mΩMAX.			R	618.706	639.21	588.80	13.007	657.727	Pass			
						ΔR	-0.424	2.69	-3.10	0.778	1.910				
		Ground Resistance(mΩ)	Initial			AWG#42 50mΩMAX.	5	-		16.533	17.98	15.75	0.887	19.194	Pass
			After Vibration			ΔR=40mΩMAX.			R	17.278	18.25	16.40	0.761	19.561	Pass
	ΔR			0.744	2.04				-0.30	0.872	3.36				
	After Shock		ΔR=40mΩMAX.	R	17.451	18.54			16.73	0.74	19.671	Pass			
	Electrical discontinuity	During Vibration	1μsec. MAX.	5	-	No Electrical discontinuity					Pass				
		During Shock				No Electrical discontinuity					Pass				
	Appearance	After Vibration	No abnormality adversely affecting the performance shall occur.	5	-	No Electrical discontinuity					Pass				
		After Shock				No Electrical discontinuity					Pass				
D Group Thermal Shock	Contact Resistance(mΩ)	Initial	AWG#42 700mΩMAX.	5	250		619.564	638.29	592.72	12.040	655.684	Pass			
		After Testing	AWG#42 ΔR=40mΩMAX.			R	618.777	637.35	589.99	12.125	655.152	Pass			
						ΔR	-0.787	3.83	-3.92	1.586	3.971				
	Ground Resistance(mΩ)	Initial	50mΩMAX.	5	-		16.657	17.16	16.07	0.417	17.91	Pass			
		After Testing	ΔR=40mΩMAX.			R	21.285	22.73	20.06	1.156	24.753	Pass			
						ΔR	4.626	5.90	3.72	0.848	7.17				
E Group HighTemp Life	Contact Resistance(mΩ)	Initial	AWG#42 700mΩMAX.	5	250		619.542	639.01	586.76	11.469	653.939	Pass			
		After Testing	AWG#42 ΔR=40mΩMAX.			R	618.847	638.47	587.56	11.343	652.876	Pass			
						ΔR	-0.683	2.94	-3.47	1.268	3.121				
	Ground Resistance(mΩ)	Initial	50mΩMAX.	5	-		20.436	20.86	20.04	-	-	Pass			
		After Testing	ΔR=40mΩMAX.			R	24.683	25.53	23.44	-	-	Pass			
						ΔR	4.247	5.12	2.58	-	-				
F Group Humidity (Steady State)	Contact Resistance(mΩ)	Initial	AWG#42 700mΩMAX.	5	250		620.149	641.68	584.67	14.365	663.244	Pass			
		After Testing	AWG#42 ΔR=40mΩ			R	618.914	639.15	582.73	14.383	662.063	Pass			
						ΔR	-1.235	3.22	-2.91	1.168	2.269				
	Ground Resistance(mΩ)	Initial	50mΩMAX.	5	-		17.102	17.69	16.42	-	-	Pass			
		After Testing	ΔR=40mΩMAX.			R	17.872	19.61	17.33	-	-	Pass			
						ΔR	0.770	3.19	-0.29	-	-				
	Insulation Resistance (MΩ)	Initial	1,000MΩMIN.	5	100	30,000MΩMIN.					Pass				
		After Testing	500MΩMIN.			5,000MΩMIN.									
	D. W. Voltage	Initial	No creeping discharge, flashover, no insulator breakdown shall occur.	5	100	No Abnormality					Pass				
After Testing		No Abnormality													

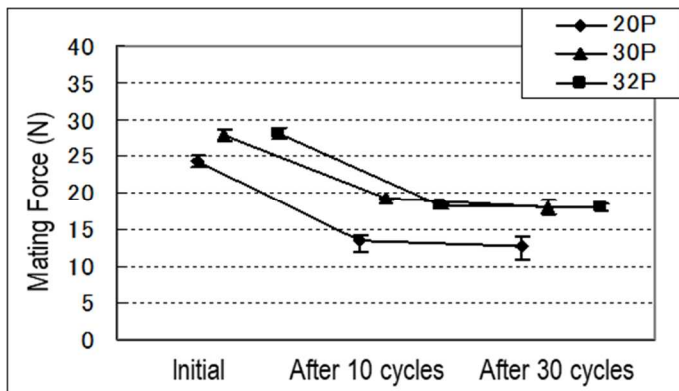
Table.2-4 Test result

Test Item	Contents of Measurement		Specifications	Set	N	Data					Judgment	
						AVE.	MAX.	MIN.	s	X±3s		
G Group Humidity (Cycling)	Contact Resistance(mΩ)	Initial	AWG#42 700mΩMAX	5	250		619.861	641.46	585.25	13.736	661.069	Pass
		After 10 cycles	AWG#42 ΔR=40mΩMAX			R	619.021	642.42	585.10	13.769	660.322	Pass
						ΔR	-0.840	1.88	-2.95	1.103	2.469	Pass
		After Testing	AWG#42 ΔR=40mΩ			R	617.986	639.28	583.48	13.680	659.026	Pass
						ΔR	-1.876	4.17	-3.98	1.632	3.020	Pass
		Ground Resistance(mΩ)	Initial			50mΩMAX.	5	-		17.066	18.93	15.60
	After 10 cycles		AWG#42 ΔR=40mΩMAX	R	17.112	17.76			16.13	-	-	Pass
				ΔR	0.046	0.81			-1.52	-	-	Pass
	After Testing		ΔR=40mΩMAX.	R	21.384	23.90			19.34	-	-	Pass
				ΔR	4.318	6.92			1.39	-	-	Pass
	Insulation Resistance (MΩ)		Initial	1,000MΩMIN.	5	100			50,000MΩMIN.			
		After Testing	500MΩMIN.	3,000MΩMIN.								
D. W. Voltage	Initial	No creeping discharge, flashover, no insulator breakdown shall occur.	5	100	No Abnormality					Pass		
	After Testing				No Abnormality							
H Group Salt Water Spray	Contact Resistance(mΩ)	Initial	AWG#42 700mΩMAX	5	250		618.606	641.20	584.58	13.003	657.615	Pass
		After Testing	AWG#42 ΔR=40mΩMAX.			R	619.723	645.17	586.25	13.643	663.613	Pass
						ΔR	1.843	6.44	-2.54	2.174	3.322	Pass
	Ground Resistance(mΩ)	Initial	50mΩMAX.	5	-		19.620	20.90	17.59	-	-	Pass
		After Testing	ΔR=40mΩMAX.			R	26.101	29.10	23.97	-	-	Pass
						ΔR	6.481	8.21	4.86	-	-	Pass
J Group Gas(H2S)	Contact Resistance(mΩ)	Initial	AWG#42 700mΩMAX	5	250		620.341	635.30	587.14	11.783	655.690	Pass
		After Testing	AWG#42 ΔR=40mΩMAX.			R	619.680	634.70	586.62	12.032	655.776	Pass
						ΔR	-0.660	3.47	-3.69	1.351	3.593	Pass
	Ground Resistance(mΩ)	Initial	50mΩMAX.	5	-		17.820	18.56	17.04	-	-	Pass
		After Testing	ΔR=40mΩMAX.			R	21.887	23.28	20.16	-	-	Pass
						ΔR	4.067	5.19	2.30	-	-	Pass
K Group Low Temp. Life	Contact Resistance(mΩ)	Initial	AWG#42 700mΩMAX	5	250		642.659	661.25	630.85	7.595	665.444	Pass
		After Testing	AWG#42 ΔR=40mΩMAX.			R	624.594	661.79	630.33	7.302	664.500	Pass
						ΔR	-0.064	3.48	-2.25	1.314	3.878	Pass
	Ground Resistance(mΩ)	Initial	50mΩMAX.	5	-		14.981	15.71	13.86	-	-	Pass
		After Testing	ΔR=40mΩMAX.			R	16.403	17.27	14.84	-	-	Pass
						ΔR	1.422	1.74	0.97	-	-	Pass
L Group Solderability	Appearance		More than 95% of the dipped surface shall be evenly wet.	10	-	95% MIN.					OK	
M Group Soldering Heat Resistance	Reflow	Appearance	No abnormality adversely affecting the performance shall not occur.	10	-	No Abnormality					OK	
	Soldering iron											
N Group Temp. Rising	AWG #42		ΔT=30°C MAX.	5	-	ΔT=23.0°C					OK	
	AWG #40					ΔT=28.5°C						
	AWG #36					ΔT=28.9°C						
	AWG #34					ΔT=29.5°C						

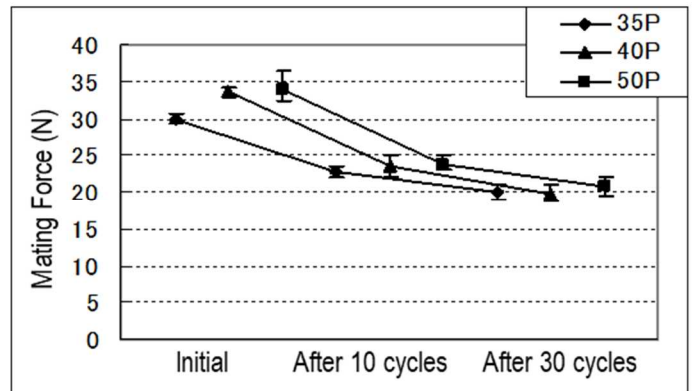
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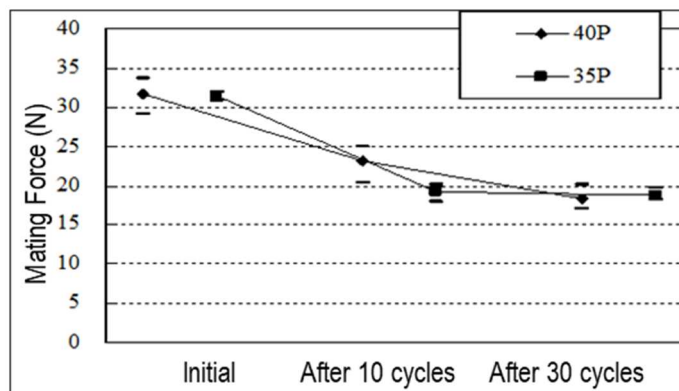
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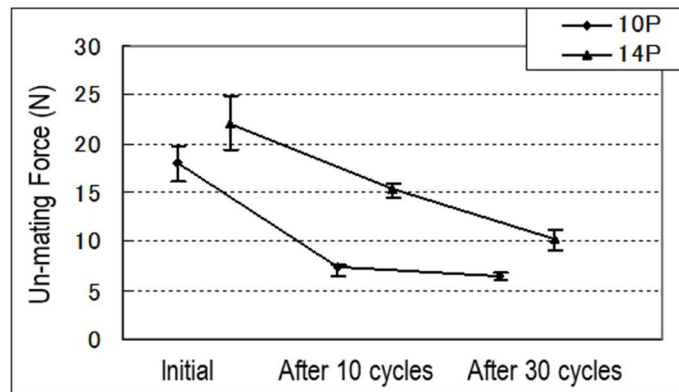
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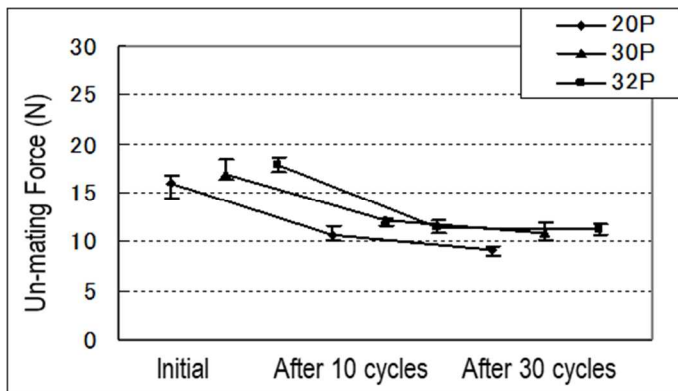
Graph1. A change of mating force (A Group: Durability)



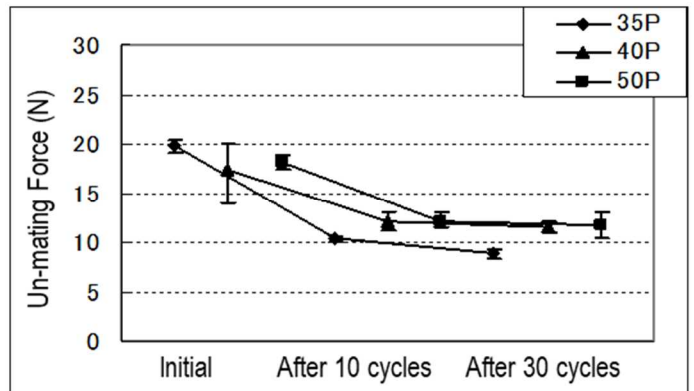
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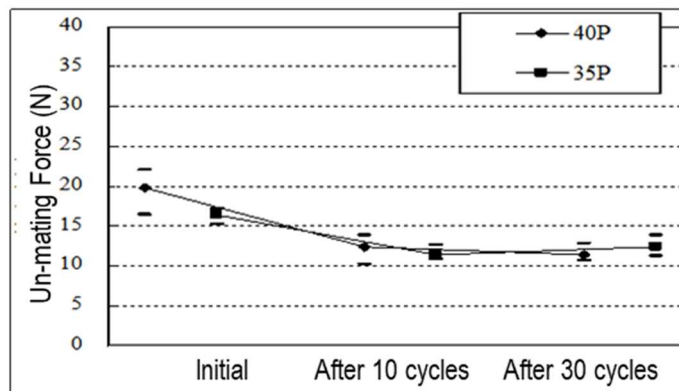
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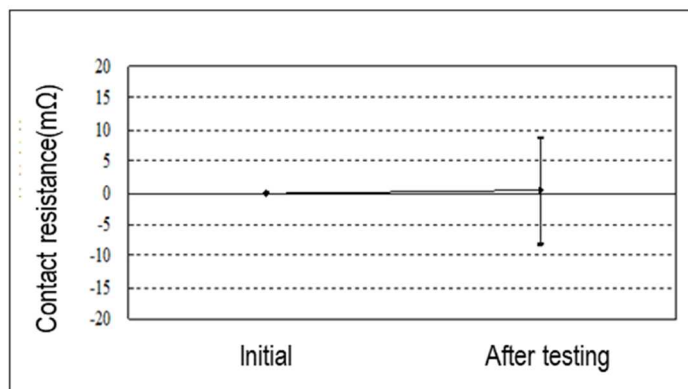
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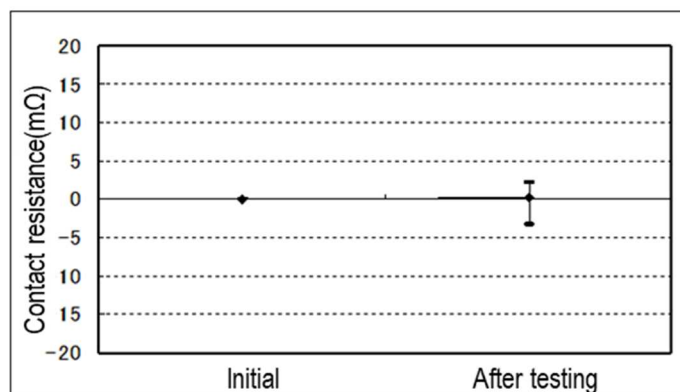
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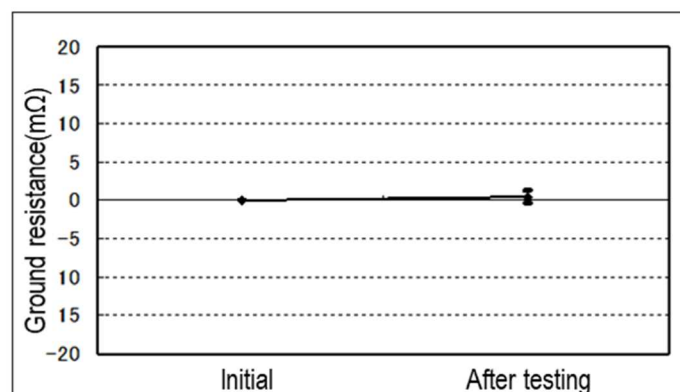
Graph 2. A change of un-mating force (A Group: Durability)



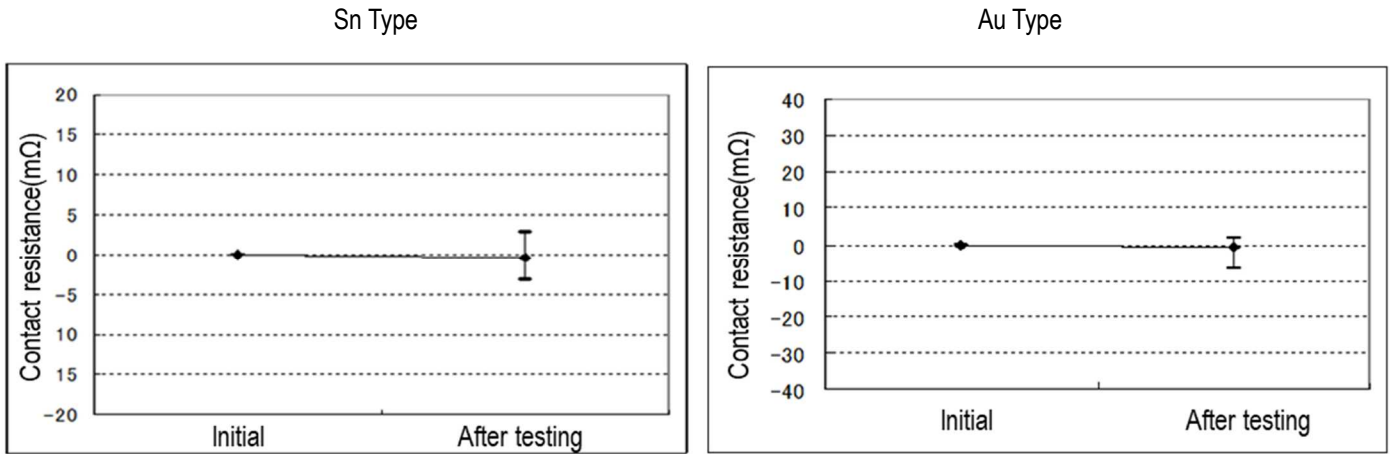
Graph3. A change of contact resistance AWG # 34 (A Group: Durability)



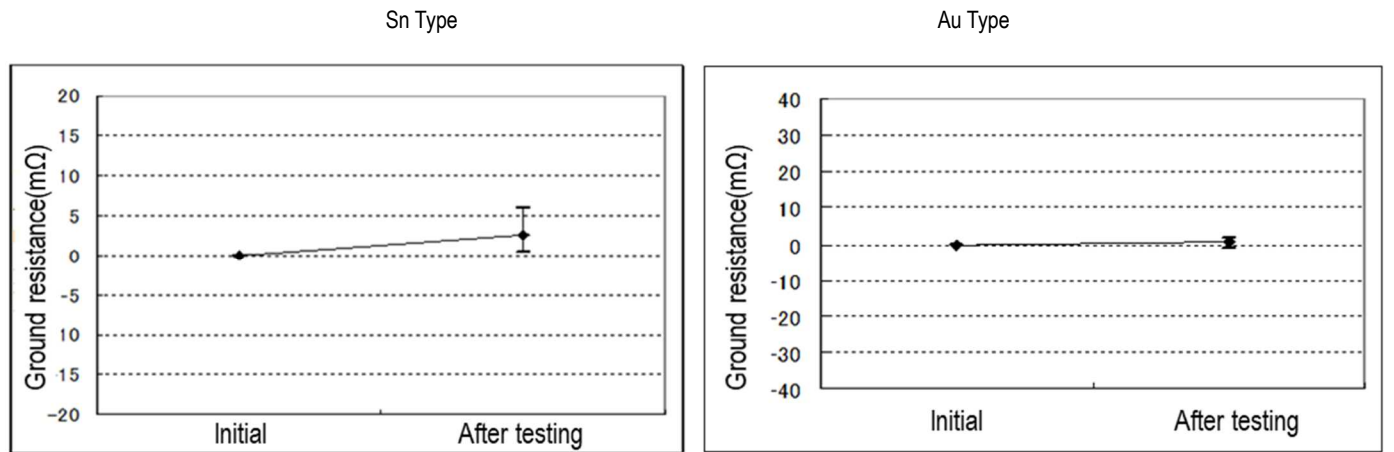
Graph4. A change of contact resistance AWG # 36 (A Group: Durability)



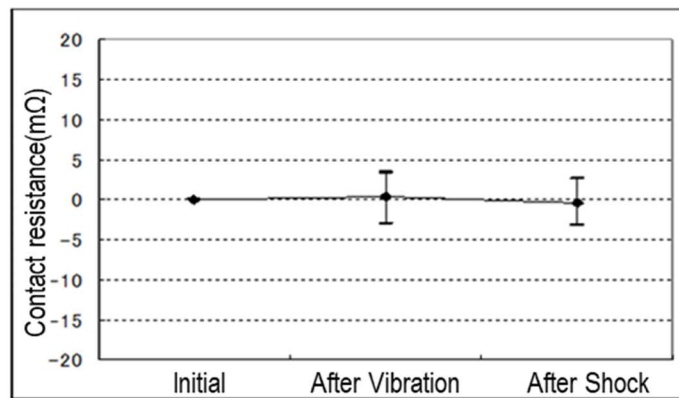
Graph5. A change of ground resistance AWG # 36 (A Group: Durability)



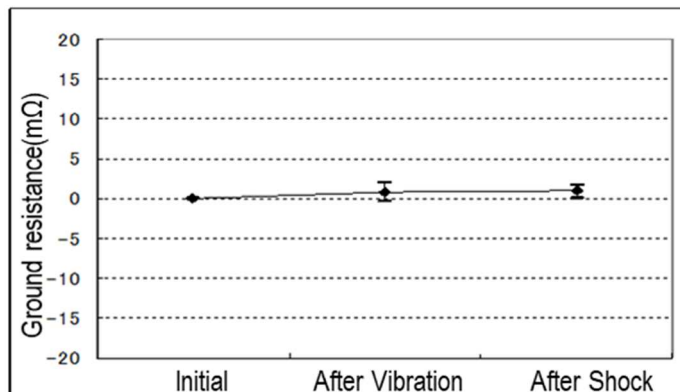
Graph6. A change of contact resistance AWG # 42 (A Group: Durability)



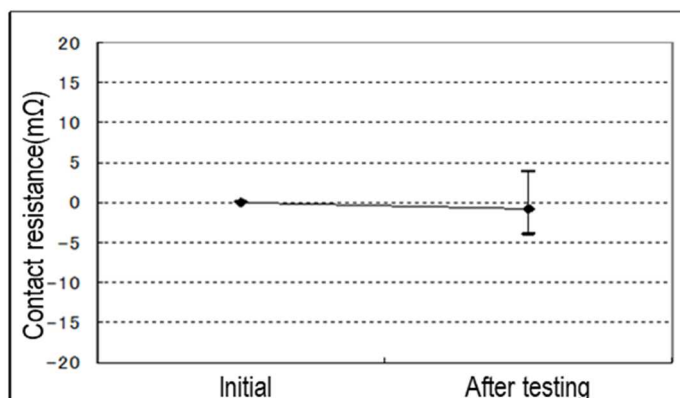
Graph 7. A change of ground resistance AWG # 42 (A Group: Durability)



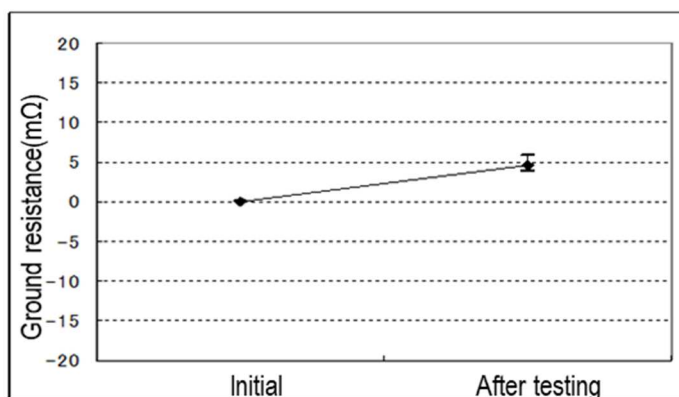
Graph8. A change of contact resistance (C Group: Vibration/Shock)



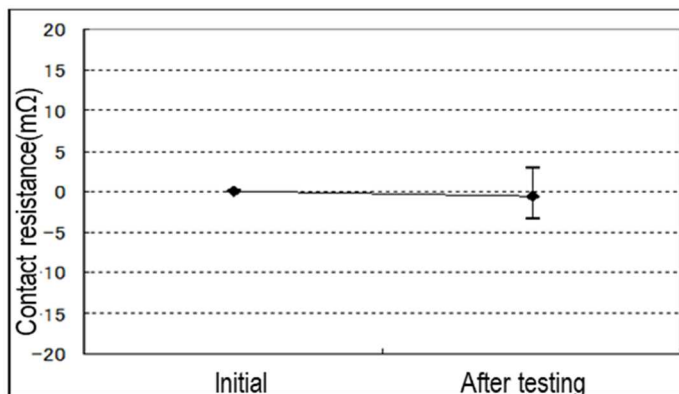
Graph9. A change of ground resistance(C Group: Vibration/ Shock)



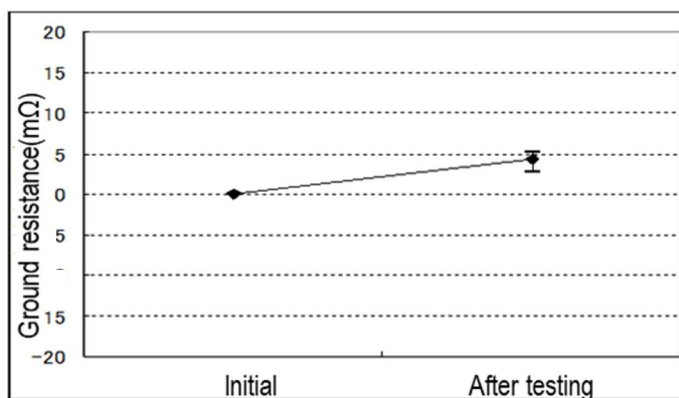
Graph10. A change of contact resistance (D Group: Thermal shock)



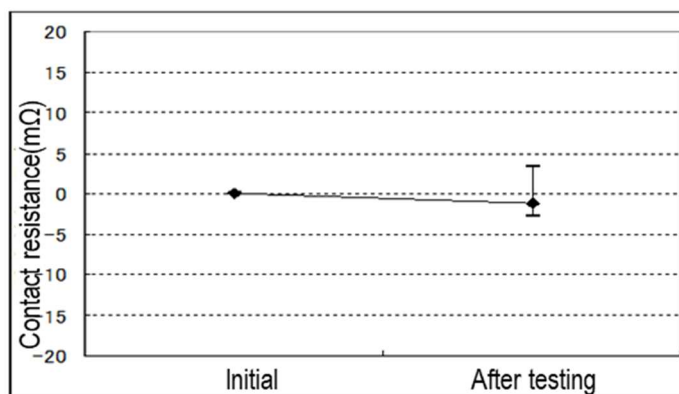
Graph11. A change of ground resistance (D Group: Thermal shock)



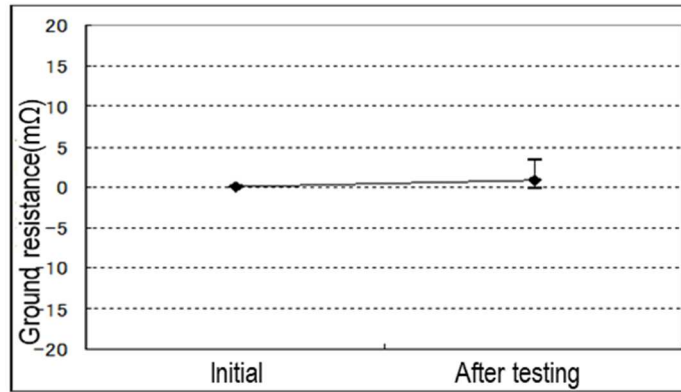
Graph12. A change of contact resistance (E Group: High temperature life)



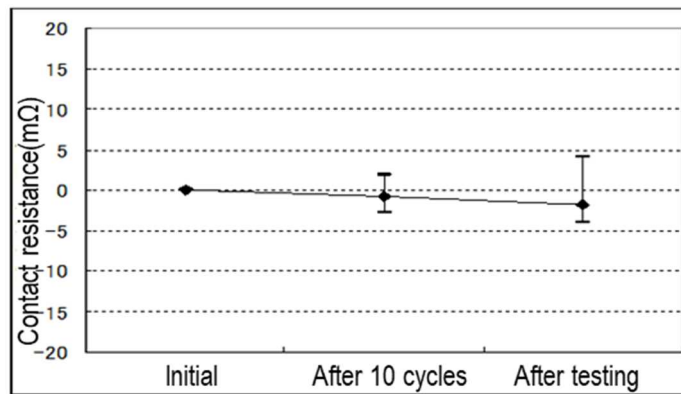
Graph13. A change of ground resistance (E Group: High temperature life)



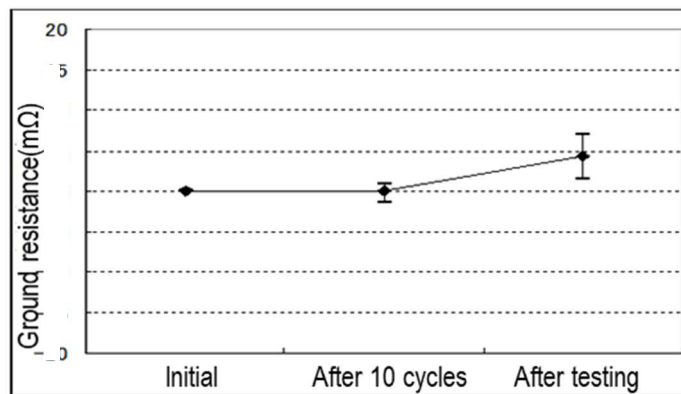
Graph14. A change of contact resistance (F Group: Humidity (Steady state))



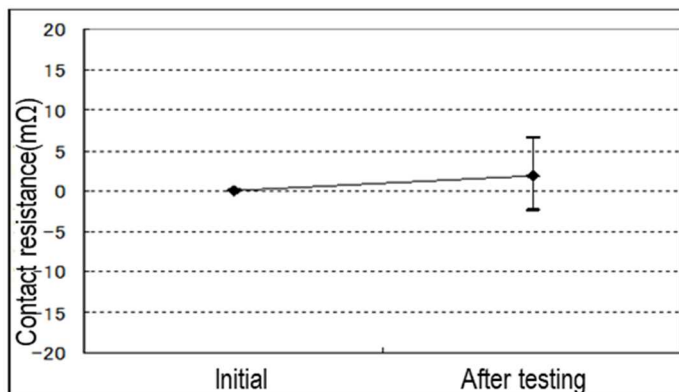
Graph15. A change of ground resistance (F Group: Humidity (Steady state))



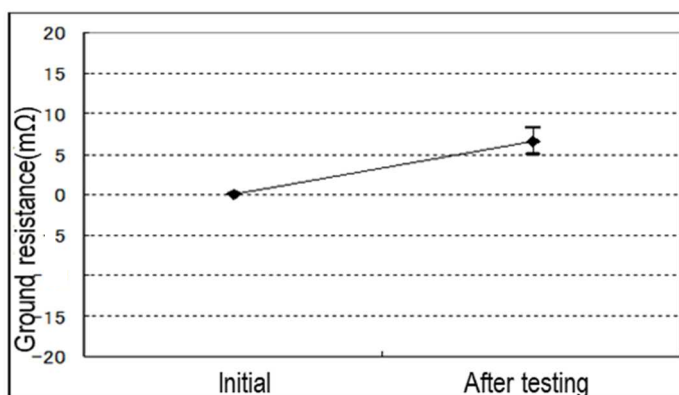
Graph 16. A change of contact resistance (G Group: Humidity (Cycling))



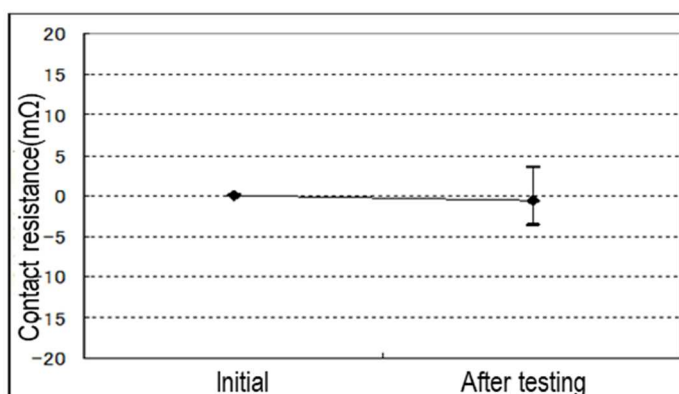
Graph17. A change of ground resistance (G Group: Humidity (Cycling))



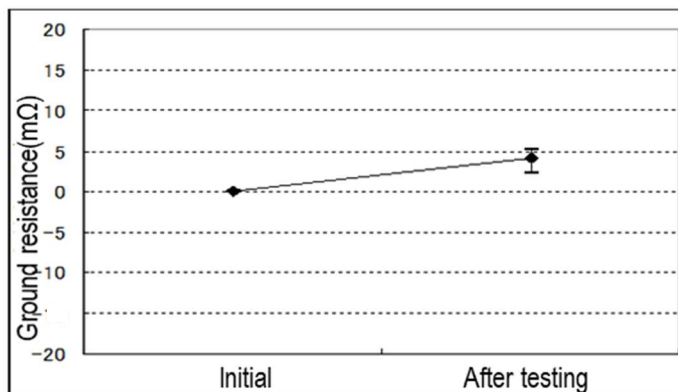
Graph18. A change of contact resistance (H Group: Salt water spray)



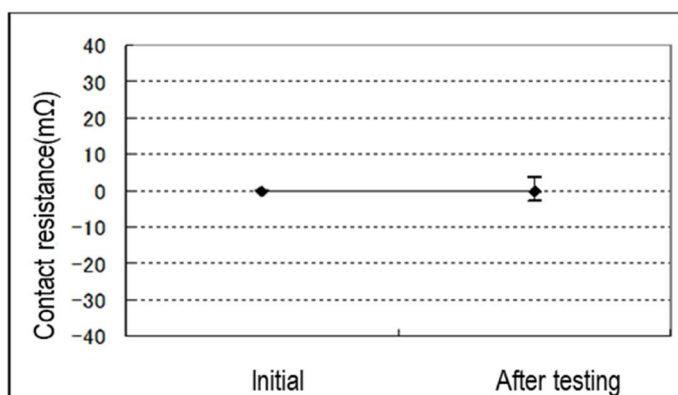
Graph19. A change of ground resistance (H Group: Salt water spray)



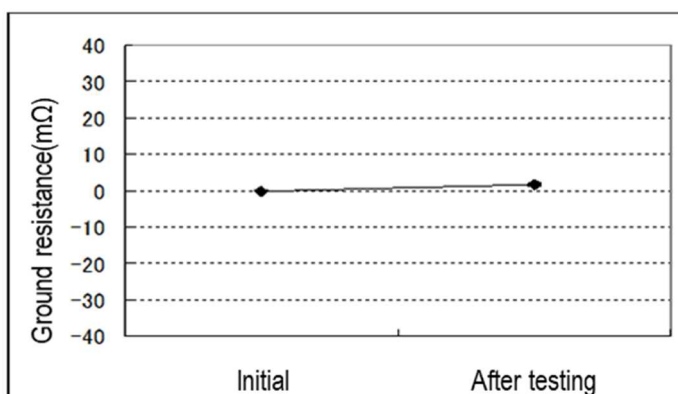
Graph20. A change of contact resistance (J Group: Gas (H<sub>2</sub>S))



Graph21. A change of ground resistance (J Group: Gas (H<sub>2</sub>S))



Graph22. A change of contact resistance (K Group: Cold Temperature Life)



Graph23. A change of ground resistance (K Group: Cold Temperature Life)