

# CABLINE®-SS Connector

Solder Ground Bar Type

Part No. Plug: 20380 Receptacle: 20374

## Test Report

Product Specification no. PRS-1239

13	T22128	September 5, 2022	K. Hara	T. Tanigawa	H. Ikari
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
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 275mΩMAX	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 600mΩMAX	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	R	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	-	R	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	

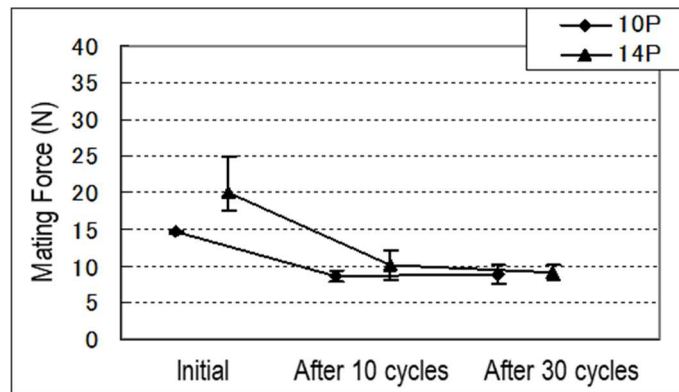
Table.2-3 Test result

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										

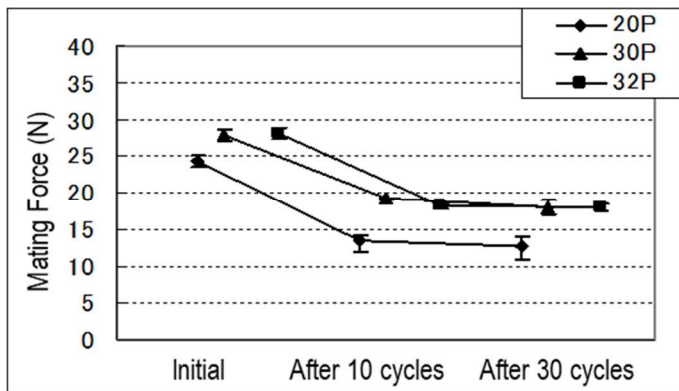
Table.2-4 Test result

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
		After Testing	AWG#42 ΔR=40mΩ			ΔR	-0.840	1.88	-2.95	1.103	2.469	Pass
						R	617.986	639.28	583.48	13.680	659.026	Pass
	Ground Resistance(mΩ)	Initial	50mΩMAX.	5	-		17.066	18.93	15.60	-	-	Pass
		After 10 cycles	AWG#42 ΔR=40mΩMAX			R	17.112	17.76	16.13	-	-	Pass
		After Testing	ΔR=40mΩMAX.			ΔR	0.046	0.81	-1.52	-	-	Pass
						R	21.384	23.90	19.34	-	-	Pass
	Insulation Resistance (MΩ)	Initial	1,000MΩMIN.	5	100	50,000MΩMIN.					Pass	
		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						

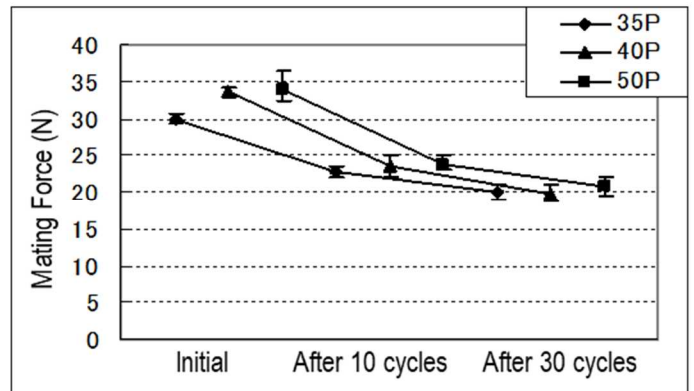
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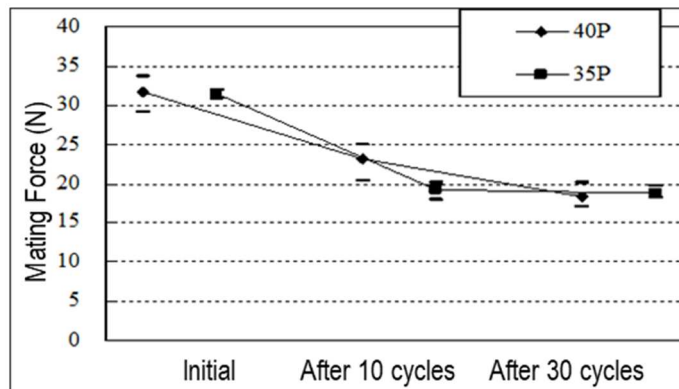
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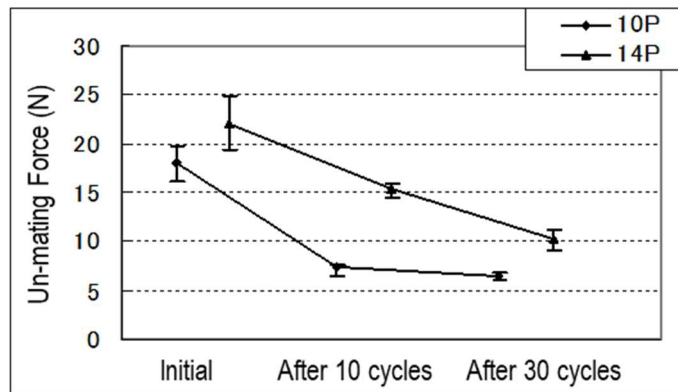
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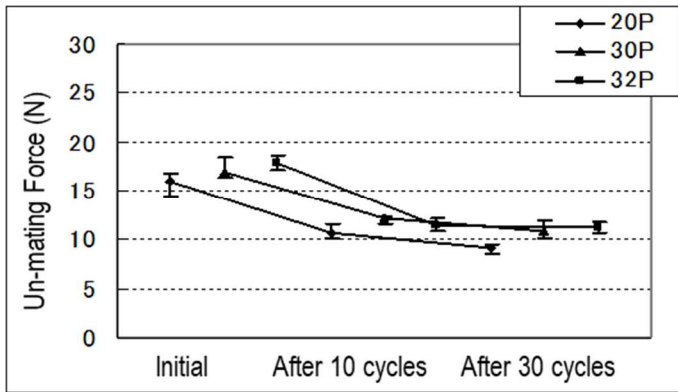
Graph1. A change of mating force (A Group: Durability)



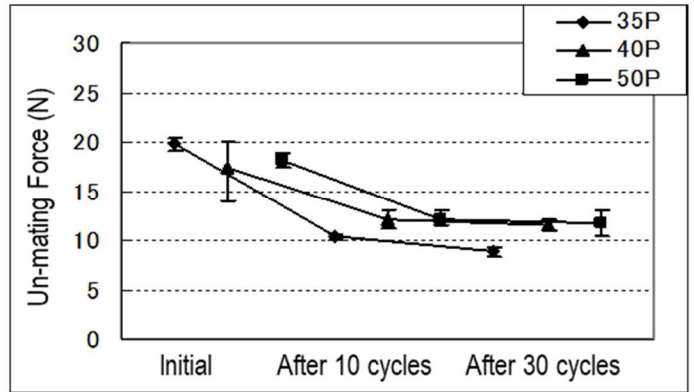
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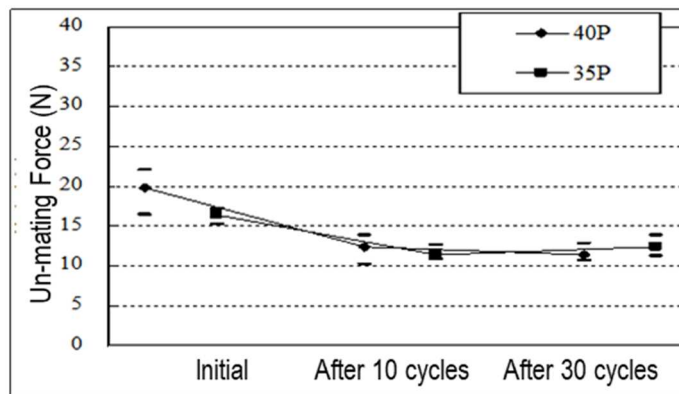
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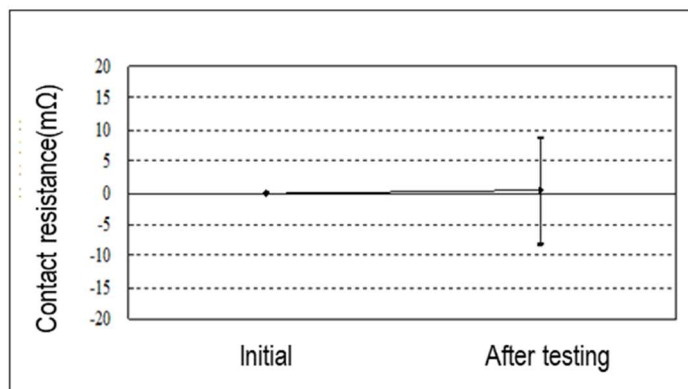
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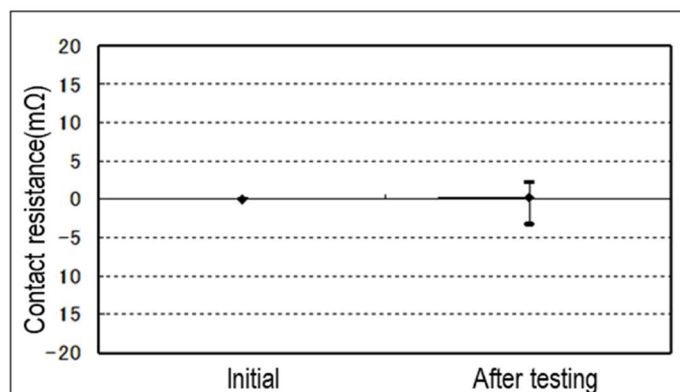
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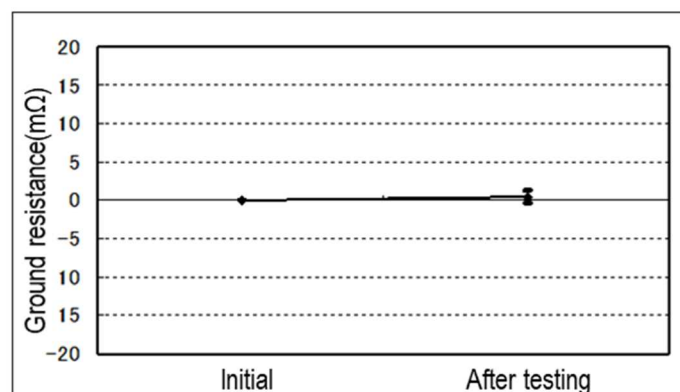
Graph 2. A change of un-mating force (A Group: Durability)



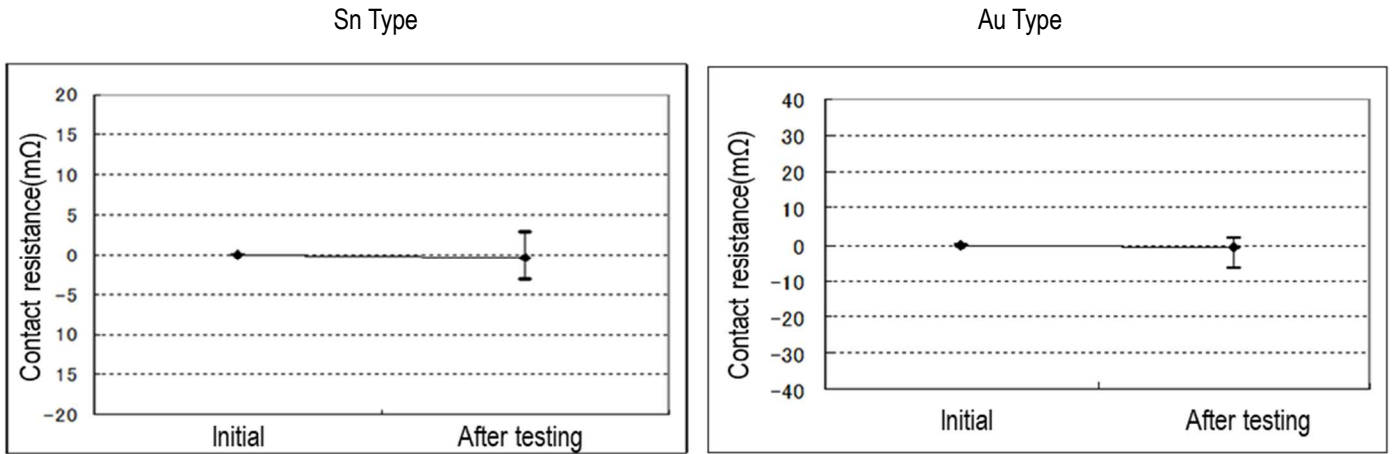
Graph3. A change of contact resistance AWG # 34 (A Group: Durability)



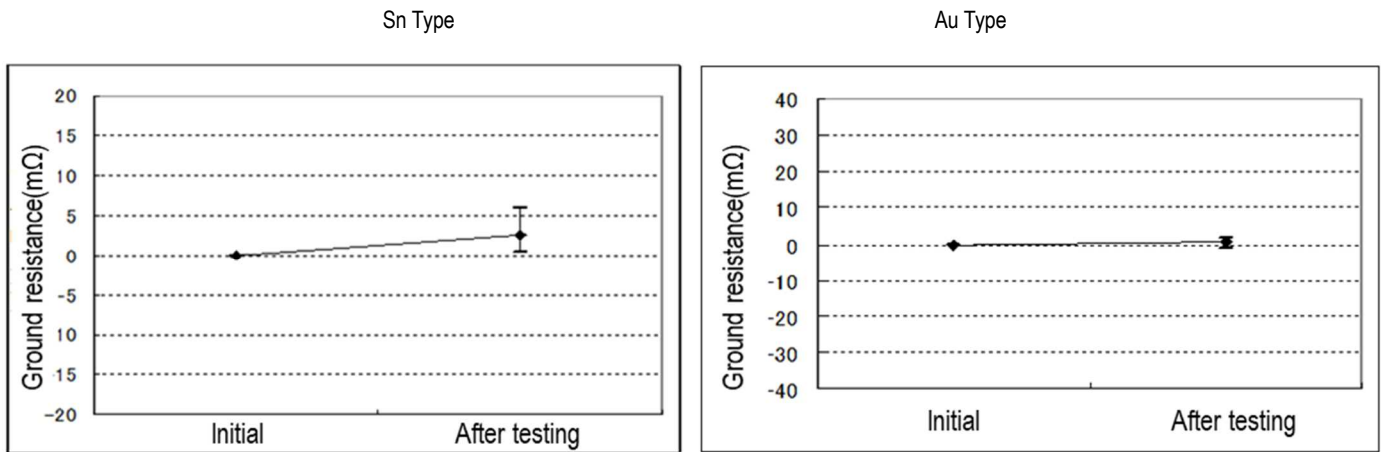
Graph4. A change of contact resistance AWG # 36 (A Group: Durability)



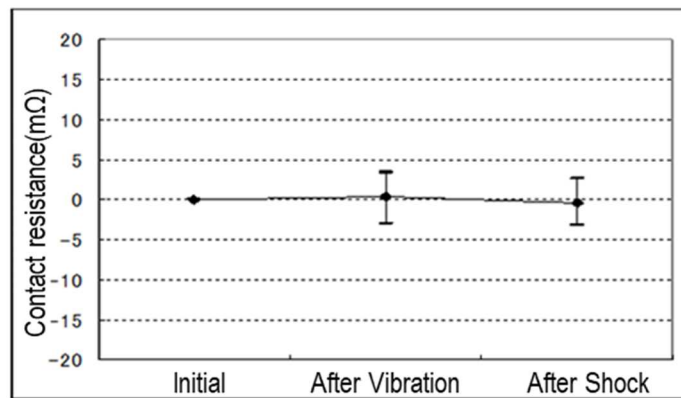
Graph5. A change of ground resistance AWG # 36 (A Group: Durability)



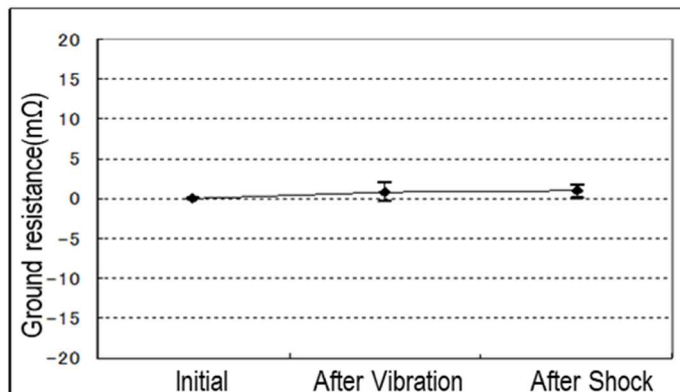
Graph6. A change of contact resistance AWG # 42 (A Group: Durability)



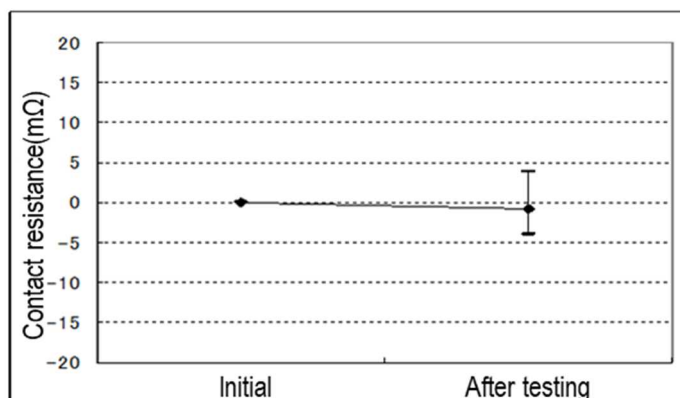
Graph 7. A change of ground resistance AWG # 42 (A Group: Durability)



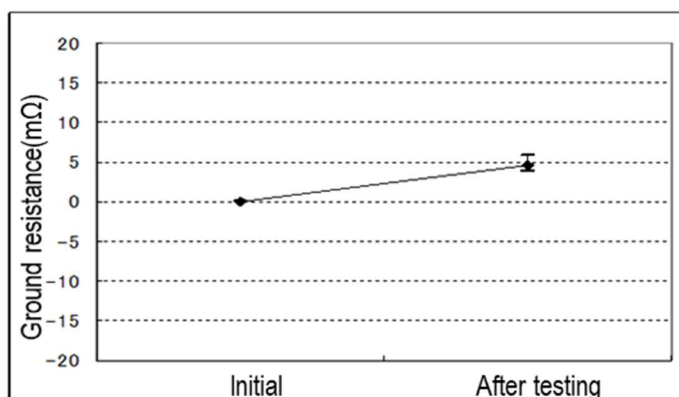
Graph8. A change of contact resistance (C Group: Vibration/Shock)



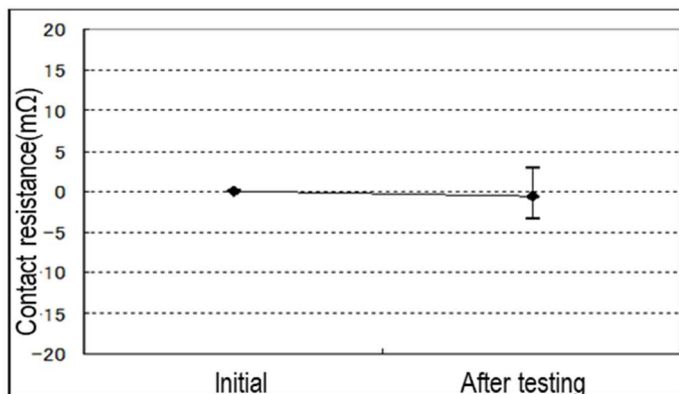
Graph9. A change of ground resistance(C Group: Vibration/ Shock)



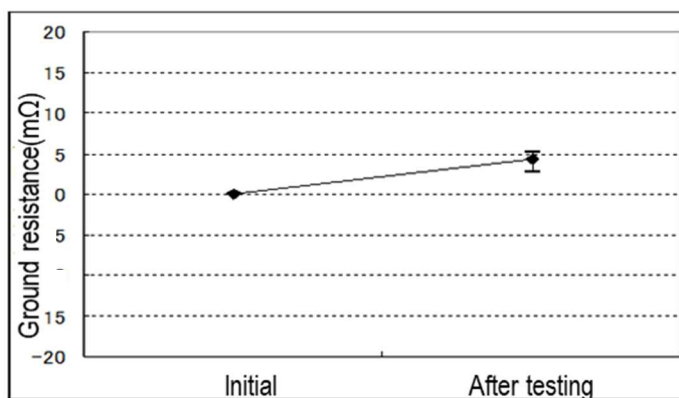
Graph10. A change of contact resistance (D Group: Thermal shock)



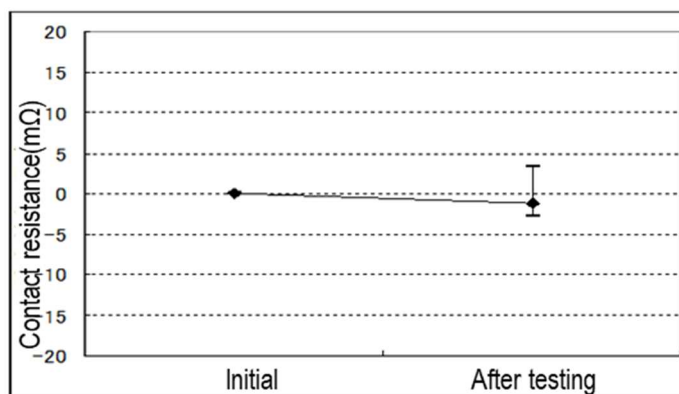
Graph11. A change of ground resistance (D Group: Thermal shock)



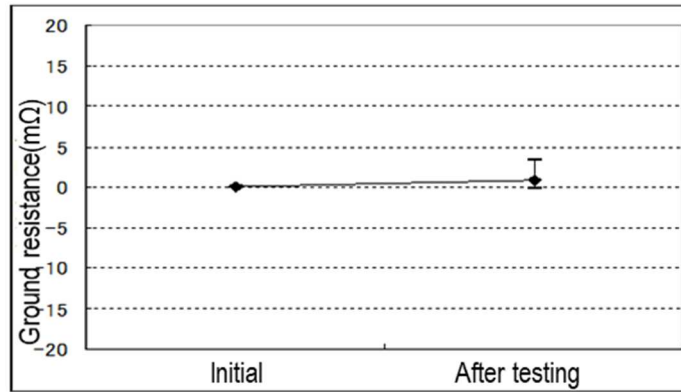
Graph12. A change of contact resistance (E Group: High temperature life)



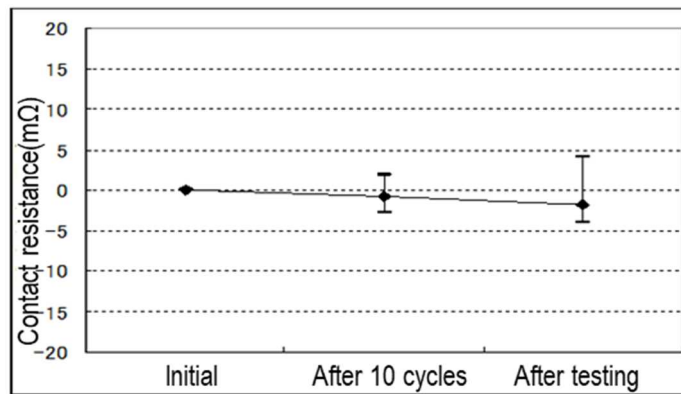
Graph13. A change of ground resistance (E Group: High temperature life)



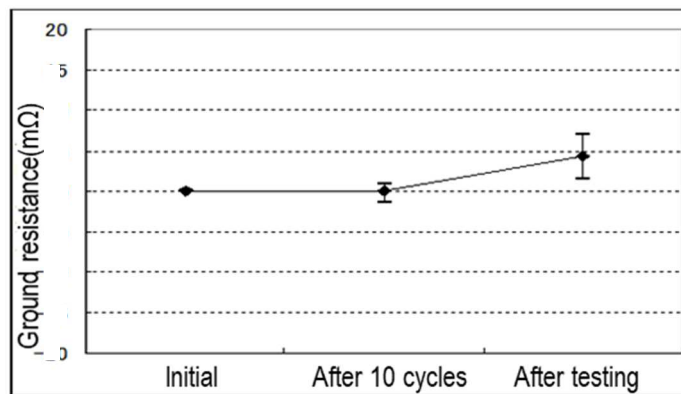
Graph14. A change of contact resistance (F Group: Humidity (Steady state))



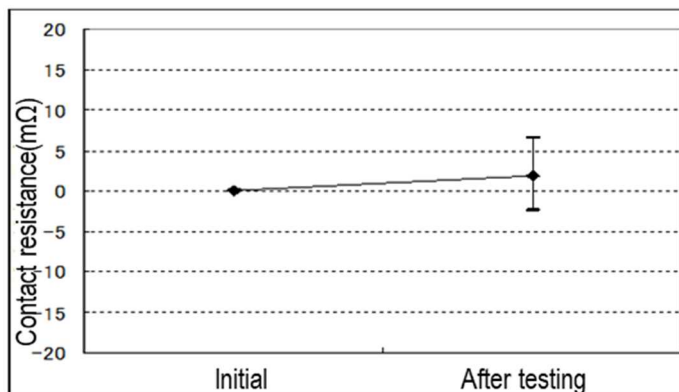
Graph15. A change of ground resistance (F Group: Humidity (Steady state))



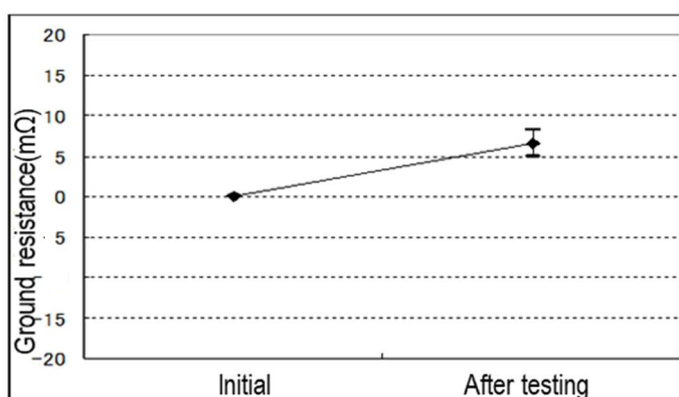
Graph 16. A change of contact resistance (G Group: Humidity (Cycling))



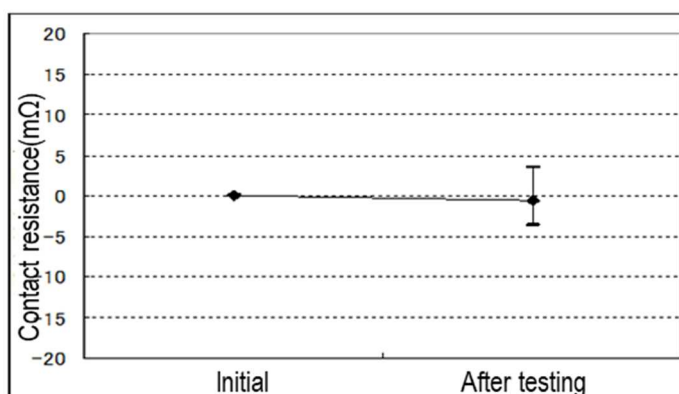
Graph17. A change of ground resistance (G Group: Humidity (Cycling))



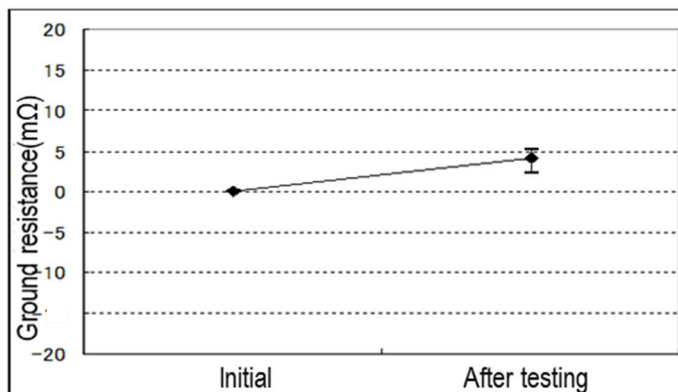
Graph18. A change of contact resistance (H Group: Salt water spray)



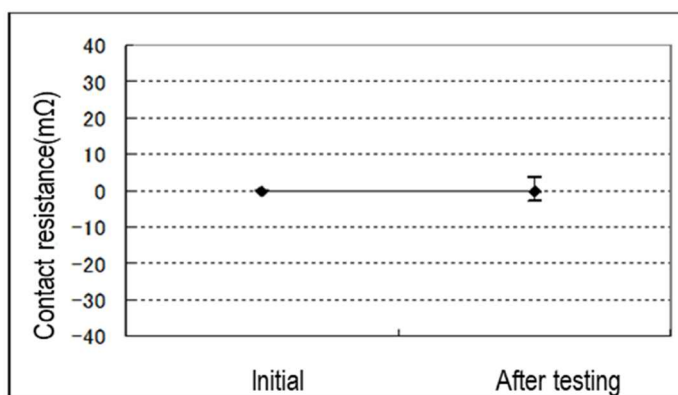
Graph19. A change of ground resistance (H Group: Salt water spray)



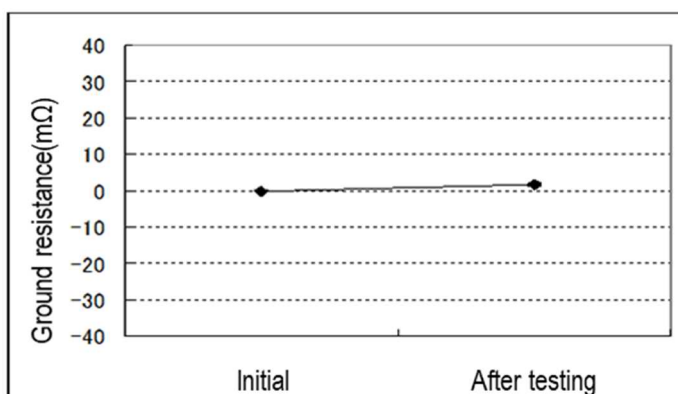
Graph20. A change of contact resistance (J Group: Gas (H<sub>2</sub>S))



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)