NOVASTACK® 35-PH

Part No. Plug: 20842-0**E-21 Receptacle: 20843-0**E-21

Test Report

Product Specification no. PRS-2463

Rev.	ECN	Date	Prepared by	Checked by	Approved by
3	T21132	November 1, 2021	H. Higuchi	S. Suzuki	Y. Hashimoto
2	T19084	July 30, 2019	R. Shioya	A. Kagoshima	Y. Shimada
1	T18114	October 10, 2018	R. Hoshino	T. Fukushima	T. Hirakawa
0	T18023	March 27, 2018	T. Fukushima	S. Hamada	T. Hirakawa

1. Purpose

To evaluate the performance of NOVASTACK35-PHConnector in accordance with PRS-2463.

2. Specimen

(1) NOVASTACK 35-PH PLUG ASS'Y （Part No. 20842-0**E-21）
(2) NOVASTACK 35-PH RECEPTACLE ASS'Y （Part No. 20843-0**E-21）

3. Test Sequence

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

4. Result

See Table 2-1 to 2-3, Graph 1 to 26. For the details of the testing conditions and requirements, see PRS-2463.
The “n” in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2463

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	1,5	1,3	1,3	1,5	1,5	1,3	1,3				
Insulation Resistance				2,6			2,6	2,6						
D. W. Voltage				3,7			3,7	3,7						
Temperature Rising											1			
Mating Force	1,5													
Un-mating Force	3,7													
Durability	4													
Contact Retention Force		1												
Vibration			2											
Shock			4											
Thermal Shock				4										
High Temperature Life					2									
Low Temperature Life						2								
Humidity (Steady State)							4							
Humidity (Cycling)								4						
Salt Water Spray									2					
H2S Gas										2				
Solder ability												1		
Soldering Heat Resistance													1	
Soldering iron														1
Sample QTY.	5 pcs.	20 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	10 pcs.	10 pcs.	10 pcs

※Numbers indicate sequence in which tests are performed.

Table.2-1 Test result

Group	Contents of measurement		Spec.	Unit	Q'ty	n	Data AVE.	Data MAX.	Data MIN.	Data S	Data X±3s	Judge.
A	Durability											
	Contact resistance											
	Signal contact	Initial	80 MAX.	mΩ	5	200	16.193	18.18	14.55	0.765	18.487	OK
		After 30 cycles	⊿R 20 MAX.				-0.890	2.43	-4.19	1.289	2.977	OK
	Power contact	Initial	80 MAX.			10	10.185	11.17	9.31	0.499	11.683	OK
		After 30 cycles	⊿R 20 MAX.				0.086	1.32	-1.13	0.580	1.825	OK
	Mating force											
	10P	Initial	10 MAX.	N	5	-	6.623	6.84	6.35	-	-	OK
		After 30 cycles					5.161	5.34	4.98	-	-	OK
	30P	Initial	30 MAX.				13.904	14.17	13.68	-	-	OK
		After 30 cycles					10.410	10.77	10.06	-	-	OK
	40P	Initial	40 MAX.				20.382	23.64	18.94	-	-	OK
		After 30 cycles					13.334	14.08	12.40	-	-	OK
	50P	Initial	50 MAX.				23.374	24.05	22.15	-	-	OK
		After 30 cycles					15.721	16.18	15.45	-	-	OK
	Unmating force											
	10P	Initial	1.5 MIN.	N	5	-	6.508	6.76	6.15	-	-	OK
		After 30 cycles					5.938	6.34	5.66	-	-	OK
	30P	Initial	4.5 MIN.				10.533	11.09	10.14	-	-	OK
		After 30 cycles					9.907	10.14	9.72	-	-	OK
	40P	Initial	6 MIN.				13.612	14.32	12.65	-	-	OK
		After 30 cycles					13.385	14.32	12.23	-	-	OK
	50P	Initial	7.5 MIN.				16.659	17.06	16.00	-	-	OK
		After 30 cycles					15.534	15.77	15.38	-	-	OK
B	Contact retention force											
	Plug Power contact		0.1 MIN.	N	10	-	0.986	1.18	0.89	-	-	OK
	Receptacle Signal contact		0.1 MIN.	N	20	-	1.424	1.83	1.14	-	-	OK
	Receptacle Power contact		0.1 MIN.	N	10	-	6.212	6.64	5.77	-	-	OK
C	Vibration → Shock											
	Contact resistance											
	Signal contact	Initial	80 MAX.	mΩ	5	200	17.211	22.02	15.43	1.077	20.442	OK
		After vibration	⊿R 20 MAX.				0.722	3.73	-3.09	1.166	4.219	OK
		After shock					1.018	6.22	-2.51	1.504	5.529	OK
	Power contact	Initial	80 MAX.			10	10.232	11.57	8.36	0.766	12.531	OK
		After vibration	⊿R 20 MAX.				0.271	2.27	-1.12	0.956	3.139	OK
		After shock					1.538	5.28	-1.33	1.639	6.456	OK
	Electrical discontinuity											
		During test	1 MAX.	μs	5	-	No discontinuity					OK
	Appearance											
		After test	*	-	5	-	No abnormality					OK

*Appearance Spec. : No abnormality adversely affecting the performance shall occur.

Table.2-2 Test result

Group	Contents of measurement		Spec.	Unit	Q'ty	n	Data AVE.	Data MAX.	Data MIN.	Data S	Data X±3s	Judge.
D	Thermal shock											
	Contact resistance											
	Signal contact	Initial	80 MAX.	mΩ	5	200	16.918	21.41	15.34	0.785	19.273	OK
		After test	⊿R 20 MAX.				1.723	6.39	-1.46	1.366	5.820	OK
	Power contact	Initial	80 MAX.			10	10.608	11.82	9.62	0.501	12.111	OK
		After test	⊿R 20 MAX.				0.320	1.61	-0.81	0.728	2.503	OK
	Insulation resistance											
		Initial	1000 MIN.	MΩ	5	-	1.07×10^4 Min.					OK
		After test	500 MIN.				1.62×10^4 Min.					OK
	Dielectric Withstanding Voltage											
		After test	**	-	5	-	No abnormality					OK
	Appearance											
		After test	*	-	5	-	No abnormality					OK
E	High temperature life											
	Contact resistance											
	Signal contact	Initial	80 MAX.	mΩ	5	200	16.530	18.44	15.15	0.764	18.822	OK
		After test	⊿R 20 MAX.				0.090	1.89	-1.84	0.844	2.623	OK
	Power contact	Initial	80 MAX.			10	8.834	11.51	7.90	0.971	11.748	OK
		After test	⊿R 20 MAX.				0.291	0.90	-0.70	0.358	1.364	OK
	Appearance											
		After test	*	-	5	-	No abnormality					OK
F	Low temperature life											
	Contact resistance											
	Signal contact	Initial	80 MAX.	mΩ	5	200	17.371	20.81	15.51	0.763	19.662	OK
		After test	⊿R 20 MAX.				0.166	3.79	-3.36	0.978	3.098	OK
	Power contact	Initial	80 MAX.			10	10.629	12.45	9.01	0.825	13.104	OK
		After test	⊿R 20 MAX.				0.397	3.11	-1.59	1.175	3.922	OK
	Appearance											
		After test	*	-	5	-	No abnormality					OK
G	Humidity(steady state)											
	Contact resistance											
	Signal contact	Initial	80 MAX.	mΩ	5	200	16.935	19.78	15.60	0.797	19.327	OK
		After test	⊿R 20 MAX.				2.182	6.55	-2.05	1.278	6.017	OK
	Power contact	Initial	80 MAX.			10	10.097	11.40	8.76	0.663	12.086	OK
		After test	⊿R 20 MAX.				1.675	3.70	0.02	1.129	5.063	OK
	Insulation resistance											
		Initial	1000 MIN.	MΩ	5	-	1.00×10^4 Min.					OK
		After test	500 MIN.				1.02×10^4 Min.					OK
	Dielectric Withstanding Voltage											
		After test	**	-	5	-	No abnormality					OK
	Appearance											
		After test	*	-	5	-	No abnormality					OK

*Appearance Spec.: No abnormality adversely affecting the performance shall occur.

** Dielectric Withstanding Voltage Spec.: No abnormalities such as creeping discharge, flashover, insulator breakdown occur.

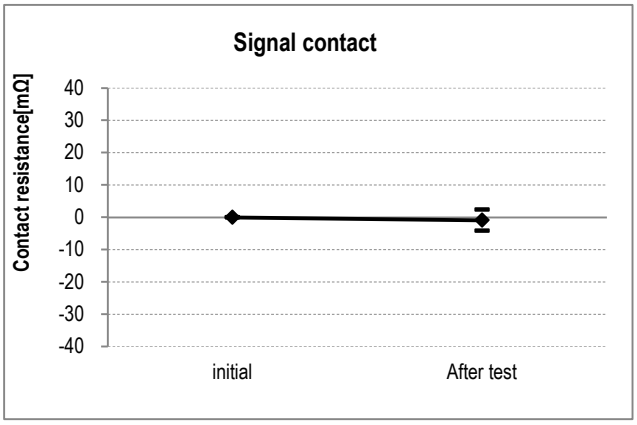
Table.2-3 Test result

Group	Contents of measurement		Spec.	Unit	Q'ty	n	Data AVE.	Data MAX.	Data MIN.	Data S	Data X±3s	Judge.
H	Humidity(cycling)											
	Contact resistance											
	Signal contact	Initial	80 MAX.	mΩ	5	200	14.207	16.89	12.12	0.874	16.828	OK
		After test	⊿R 20 MAX.				4.514	7.93	1.32	1.133	7.914	OK
	Power contact	Initial	80 MAX.			10	7.095	9.46	4.71	1.206	10.714	OK
		After test	⊿R 20 MAX.				4.343	7.65	1.71	1.296	8.232	OK
	Insulation resistance											
		Initial	1000 MIN.	MΩ	5	-	1.22×10^4 Min.					OK
		After test	500 MIN.				1.79×10^4 Min.					OK
	Dielectric Withstanding Voltage											
		After test	**	-	5	-	No abnormality					OK
	Appearance											
		After test	*	-	5	-	No abnormality					OK
J	Salt water spray											
	Contact resistance											
	Signal contact	Initial	80 MAX.	mΩ	5	200	17.495	21.40	15.98	0.750	19.745	OK
		After test	⊿R 20 MAX.				0.311	4.81	-4.01	1.118	3.663	OK
	Power contact	Initial	80 MAX.			10	10.389	11.56	9.58	0.530	11.980	OK
		After test	⊿R 20 MAX.				0.633	1.57	-0.41	0.532	2.228	OK
	Appearance											
		After test	*	-	5	-	No abnormality					OK
K	H2S Gas											
	Contact resistance											
	Signal contact	Initial	80 MAX.	mΩ	5	200	15.232	17.69	13.44	0.771	17.546	OK
		After test	⊿R 20 MAX.				3.547	8.47	0.58	1.296	7.434	OK
	Power contact	Initial	80 MAX.			10	7.982	9.74	5.35	0.980	10.923	OK
		After test	⊿R 20 MAX.				3.207	7.01	1.54	1.212	6.842	OK
	Appearance											
		After test	*	-	5	-	No abnormality					OK
L	Temperature rising											
	Signal contact	Side	⊿T 30	℃	5	-	25.620	26.90	24.50	-	-	OK
		Center	⊿T 30	℃	5	-	26.160	27.20	24.90	-	-	OK
	Power contact		⊿T 30	℃	5	-	23.040	24.10	22.10	-	-	OK
M	Solder ability											
	Solder wetting area											
		After test	95 MIN.	%	10	-	95 MIN.					OK
N	Resistance to reflow soldering heat											
	Appearance											
		After test	*	-	10	-	No abnormality					OK
P	Soldering iron											
	Appearance											
		After test	*	-	10	-	No abnormality					OK

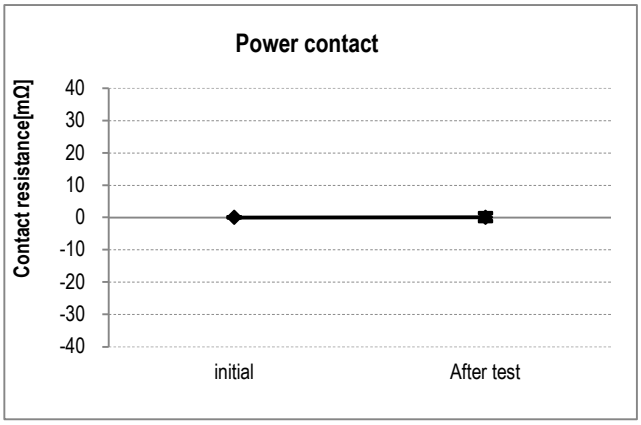
*Appearance Spec.: No abnormality adversely affecting the performance shall occur.

** Dielectric Withstanding Voltage Spec.: No abnormalities such as creeping discharge, flashover, insulator breakdown occur.

Group A / Durability

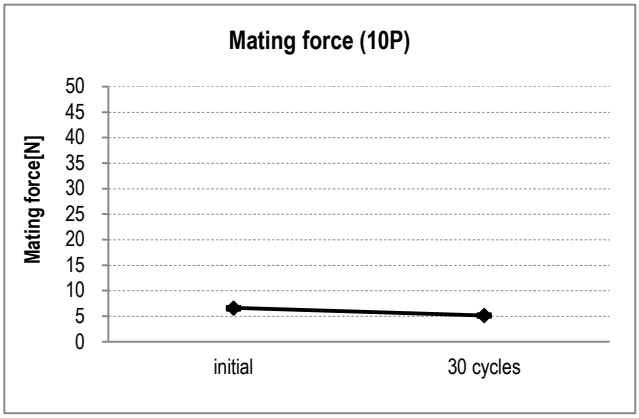


Graph-1. A change of signal contact resistance

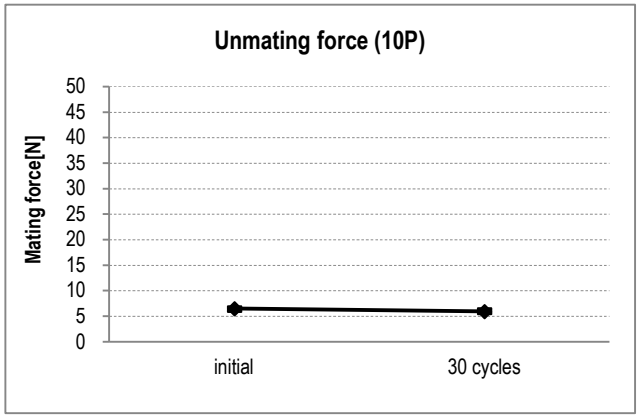


Graph-2. A change of power contact resistance

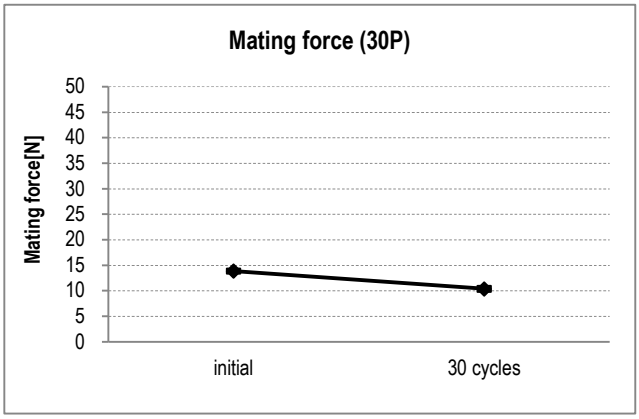
Group A / Durability



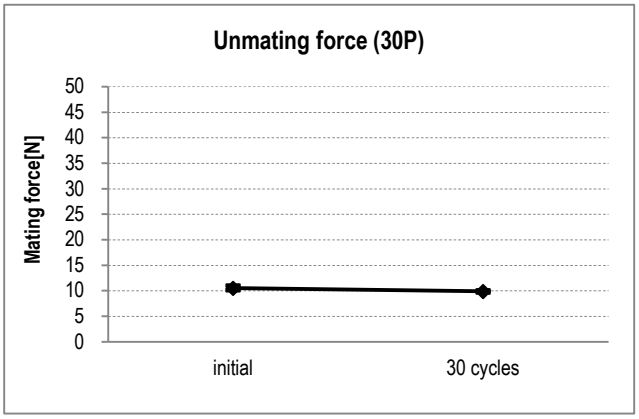
Graph-3. A change of mating force



Graph-4. A change of unmating force

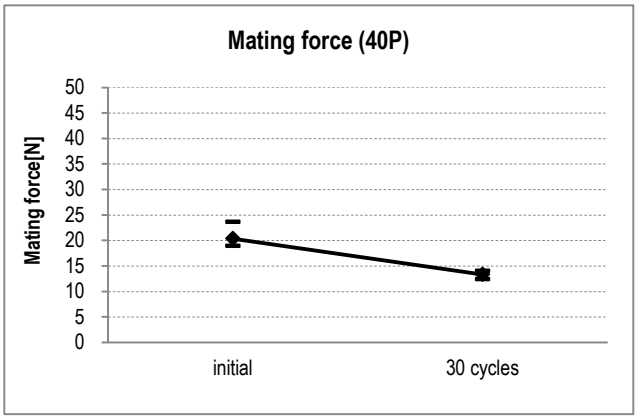


Graph-5. A change of mating force

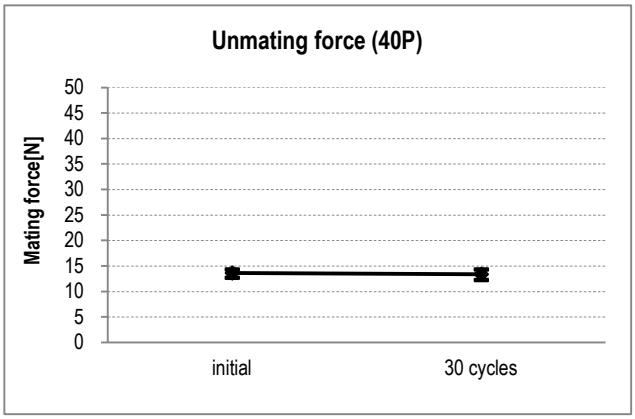


Graph-6. A change of unmating force

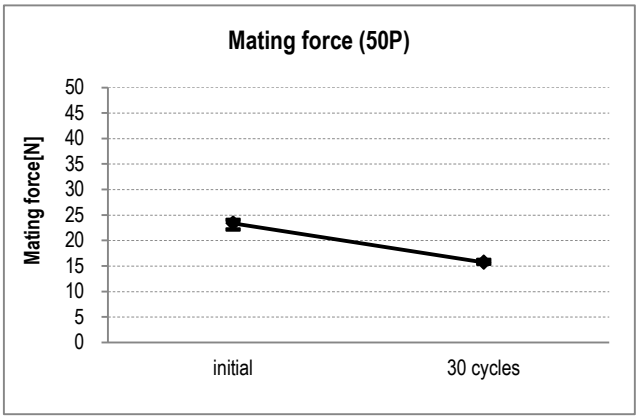
Group A / Durability



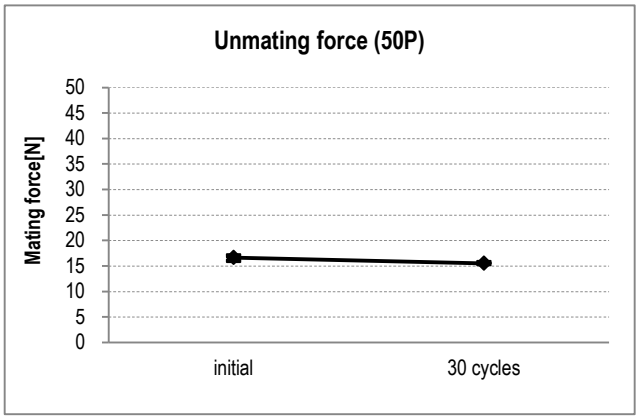
Graph-7. A change of mating force



Graph-8. A change of unmating force

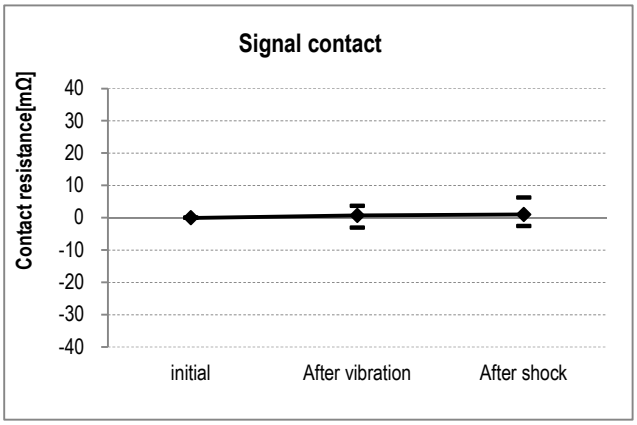


Graph-9. A change of mating force

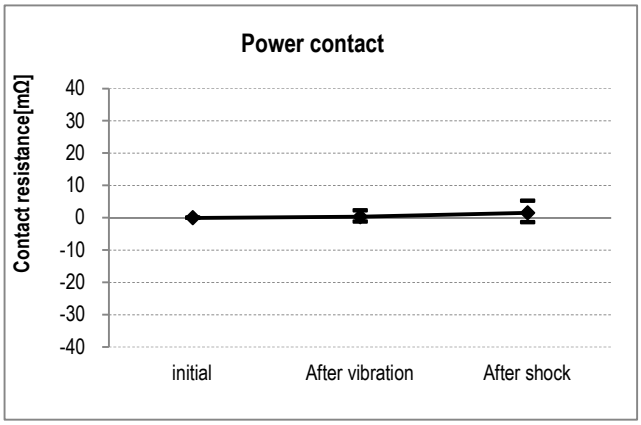


Graph-10. A change of unmating force

Group C / Vibration and shock

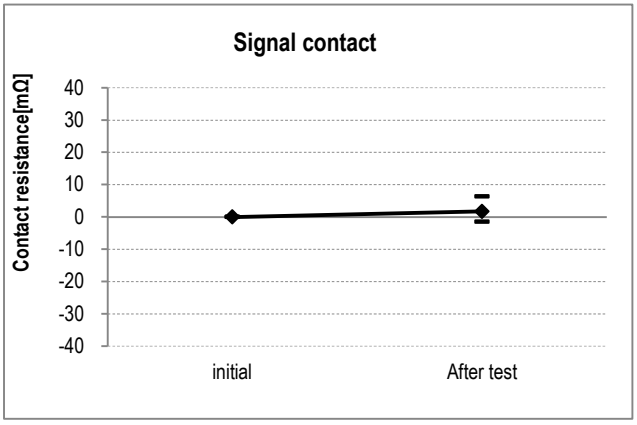


Graph-11. A change of signal contact resistance

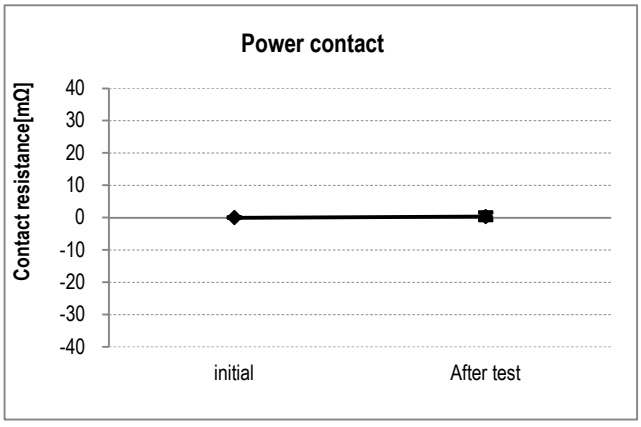


Graph-12. A change of power contact resistance

Group D / Thermal shock

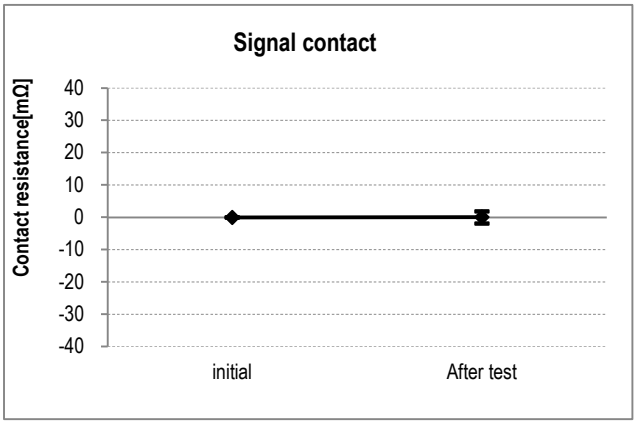


Graph-13. A change of signal contact resistance

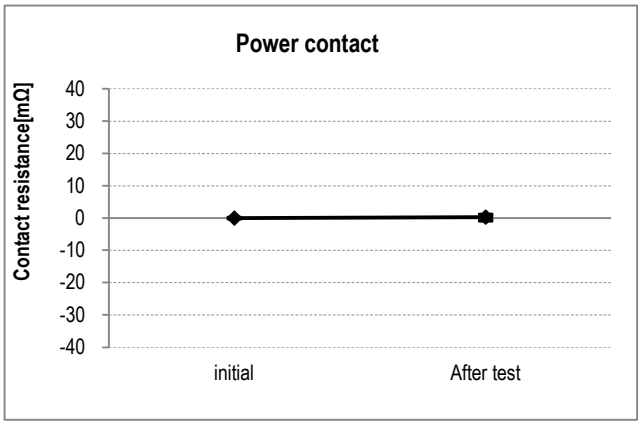


Graph-14. A change of power contact resistance

Group E / High temperature life

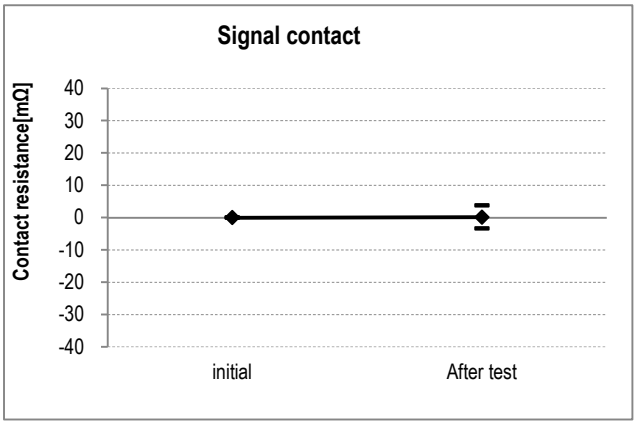


Graph-15. A change of signal contact resistance

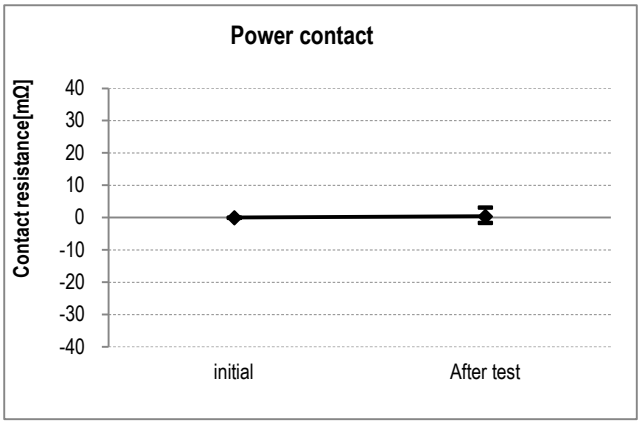


Graph-16. A change of power contact resistance

Group F / Low temperature life

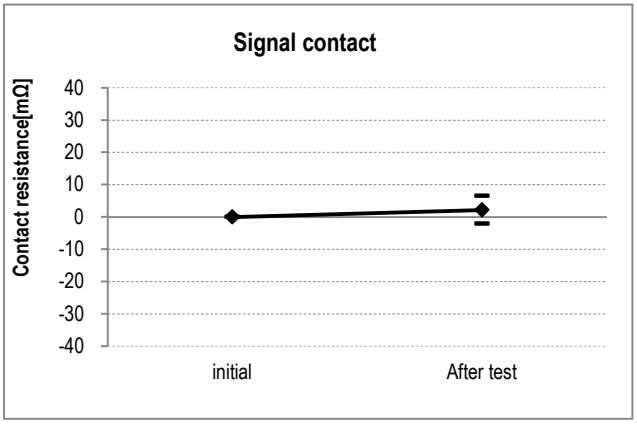


Graph-17. A change of signal contact resistance

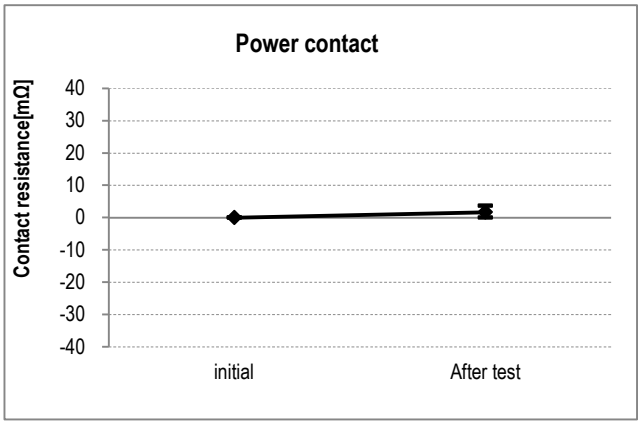


Graph-18. A change of power contact resistance

Group G / Humidity (steady state)

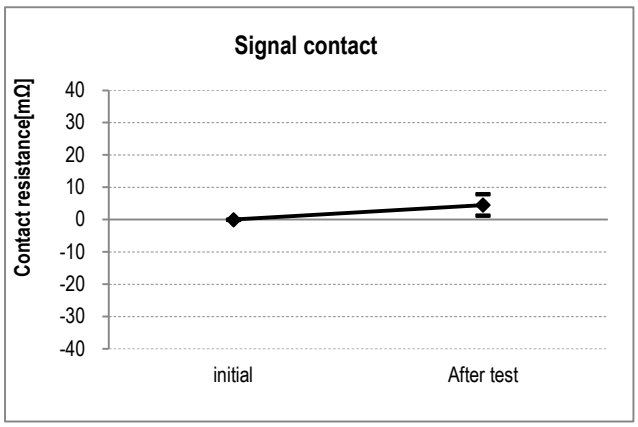


Graph-19. A change of signal contact resistance

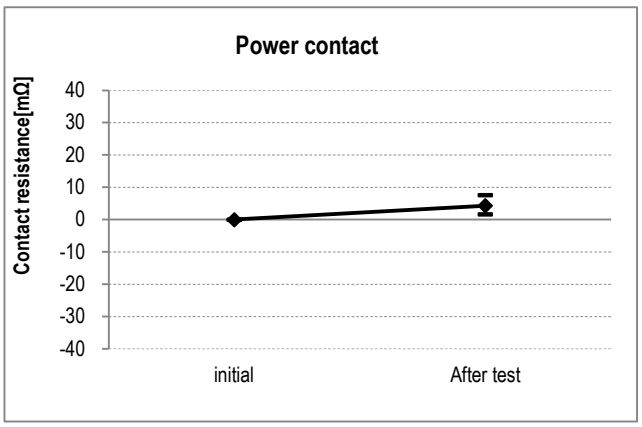


Graph-20. A change of power contact resistance

Group H / Humidity (cycling)

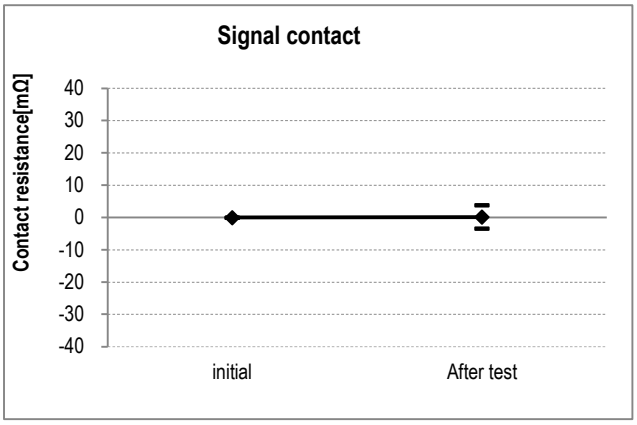


Graph-21. A change of signal contact resistance

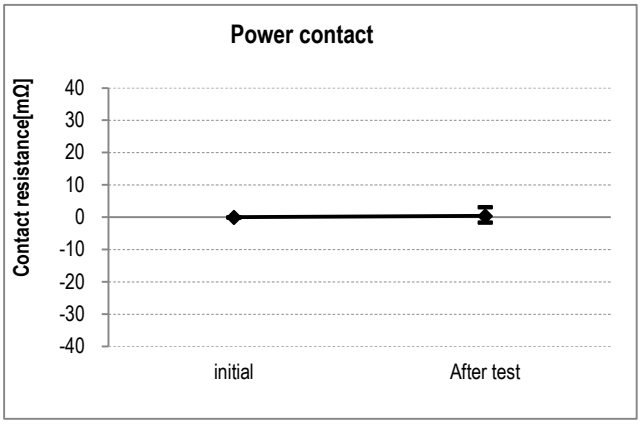


Graph-22. A change of power contact resistance

Group J / Salt water spray

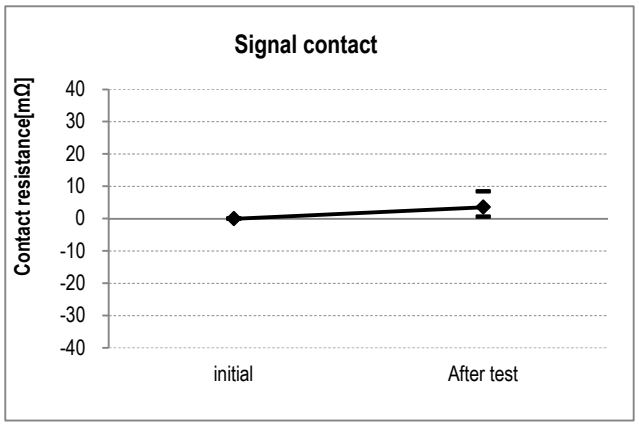


Graph-23. A change of signal contact resistance

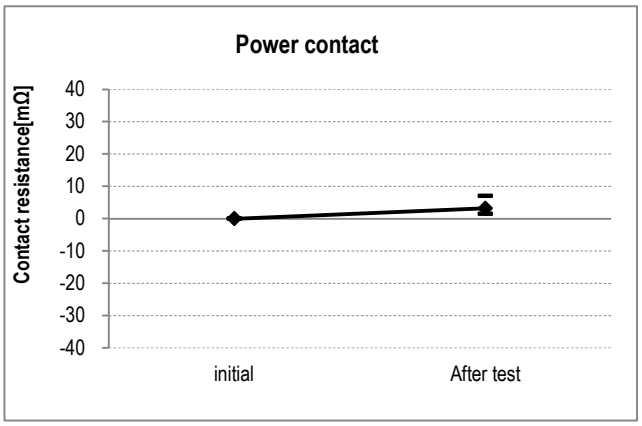


Graph-24. A change of power contact resistance

Group K / H2S gas



Graph-25. A change of signal contact resistance



Graph-26. A change of power contact resistance