

# NOVASTACK® 35-PH

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

## Test Report

Product Specification no. PRS-2463

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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
Rev.	ECN	Date	Prepared by	Checked by	Approved by

## 1. Purpose

NOVASTACK35-PH コネクタの性能を PRS-2463 に基づいて評価する。

## 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

全ての評価は表 1 の試験順序に従って行った。

## 4. Result

表 2-1～2-3、グラフ 1～26 参照。試験条件の詳細は PRS-2463 参照。n 数は測定データを意味する。

## 5. Conclusion

全ての資料が製品規格 (PRS-2463) の必要条件を満足した。

Table 1 試験順序と試料数 / Test Sequence and Sample Quantity

試験項目 Test Item	グループ / Group														
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	
接触抵抗	2,6		1,3, 5	1,5	1,3	1,3	1,5	1,5	1,3	1,3					
絶縁抵抗				2,6			2,6	2,6							
耐電圧				3,7			3,7	3,7							
温度上昇											1				
挿入力	1,5														
抜去力	3,7														
耐久性	4														
端子保持力		1													
耐振動性			2												
耐衝撃性			4												
熱衝撃				4											
高温寿命					2										
低温寿命						2									
湿度 (定常状態)							4								
湿度 (サイクリング)								4							
塩水噴霧									2						
硫化水素ガス										2					
半田付け性												1			
半田耐熱性													1		
手半田														1	
試料数	5 pcs.	20 pcs.	5 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.

※グループ表中の番号は、試験順序を示す。

Table 2-1. 試験結果

Group	Contents of measurement	Spec.	Unit	Q'ty	n	Data					Judge.					
						AVE.	MAX.	MIN.	S	X±3s						
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	ΔR 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	ΔR 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					0.722	3.73	-3.09	1.166	4.219	OK				
		After shock	ΔR 20 MAX.				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						0.271	2.27	-1.12	0.956	3.139	OK			
		After shock	ΔR 20 MAX.					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. : 機能を損なう異常無き事。

Table 2-2. 試験結果

Group	Contents of measurement	Spec.	Unit	Q'ty	n	Data					Judge.	
						AVE.	MAX.	MIN.	S	X±3s		
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	ΔR 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	ΔR 20 MAX.				0.320	1.61	-0.81	0.728	2.503	OK
	Insulation resistance											
		Initial	1000 MIN.	MΩ	5	-	1.07×10 <sup>4</sup> Min.					OK
		After test	500 MIN.				1.62×10 <sup>4</sup> 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	ΔR 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	ΔR 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	ΔR 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	ΔR 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	ΔR 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	ΔR 20 MAX.				1.675	3.70	0.02	1.129	5.063	OK
	Insulation resistance											
		Initial	1000 MIN.	MΩ	5	-	1.00×10 <sup>4</sup> Min.					OK
		After test	500 MIN.				1.02×10 <sup>4</sup> Min.					OK
	Dielectric Withstanding Voltage											
	After test	**	-	5	-	No abnormality					OK	
Appearance												
	After test	*	-	5	-	No abnormality					OK	

\*Appearance Spec. : 機能を損なう異常無き事。

\*\*Dielectric Withstanding Voltage Spec.: 沿面放電、空中放電、絶縁破壊等の異常無き事。

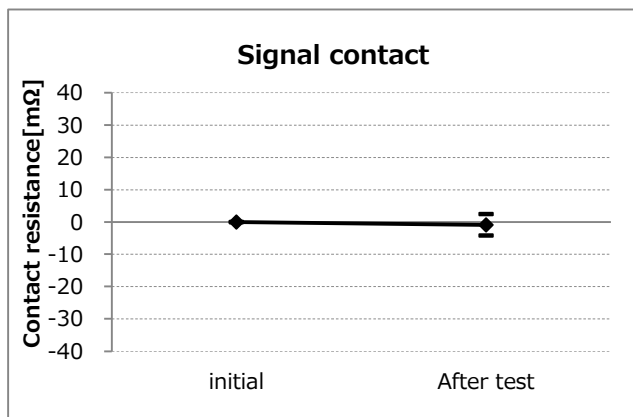
Table 2-3. 試験結果

Group	Contents of measurement		Spec.	Unit	Q'ty	n	Data					Judge.
							AVE.	MAX.	MIN.	S	X±3s	
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	ΔR 20 MAX.				4.514	7.93	1.32	1.133	7.914	OK
	Power contact	Initial	80 MAX.	mΩ	5	10	7.095	9.46	4.71	1.206	10.714	OK
		After test	ΔR 20 MAX.				4.343	7.65	1.71	1.296	8.232	OK
	Insulation resistance											
		Initial	1000 MIN.	MΩ	5	-	1.22×10 <sup>4</sup> Min.					OK
		After test	500 MIN.				1.79×10 <sup>4</sup> 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	ΔR 20 MAX.				0.311	4.81	-4.01	1.118	3.663	OK
	Power contact	Initial	80 MAX.	mΩ	5	10	10.389	11.56	9.58	0.530	11.980	OK
		After test	ΔR 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	ΔR 20 MAX.				3.547	8.47	0.58	1.296	7.434	OK
	Power contact	Initial	80 MAX.	mΩ	5	10	7.982	9.74	5.35	0.980	10.923	OK
		After test	ΔR 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	ΔT 30	℃	5	-	25.620	26.90	24.50	-	-	OK
		Center	ΔT 30	℃	5	-	26.160	27.20	24.90	-	-	OK
Power contact		ΔT 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	

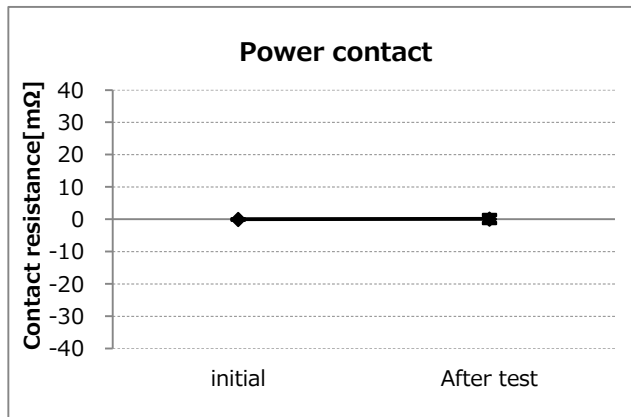
\*Appearance Spec. : 機能を損なう異常無き事。

\*\*Dielectric Withstanding Voltage Spec.: 沿面放電、空中放電、絶縁破壊等の異常無き事。

Group A / Durability

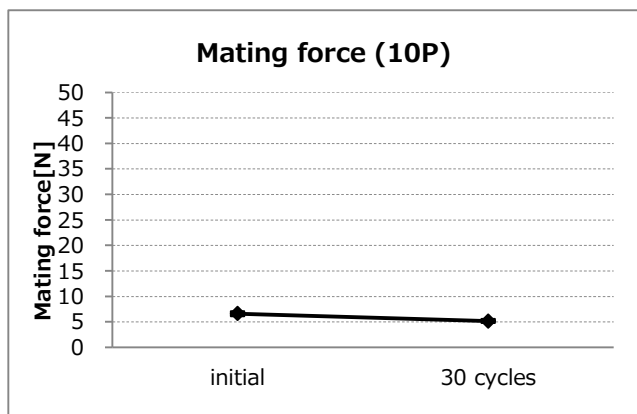


Graph-1. A change of signal contact resistance

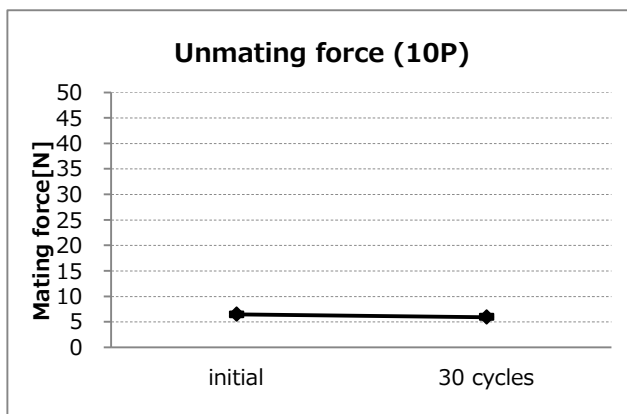


Graph-2. A change of power contact resistance

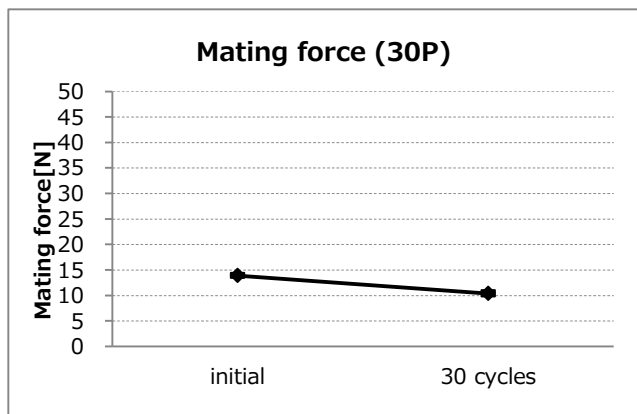
Group A / Durability



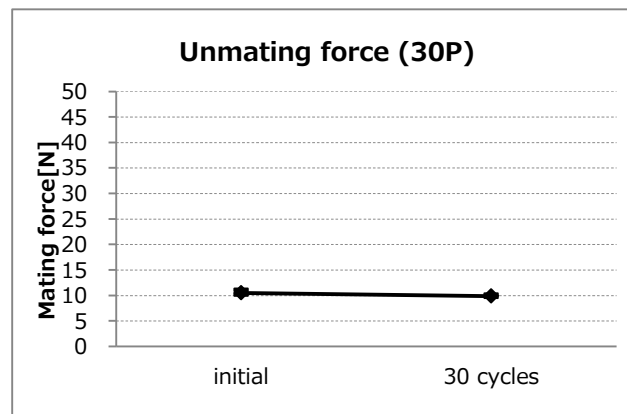
Graph-3. A change of mating force



Graph-4. A change of unmating force

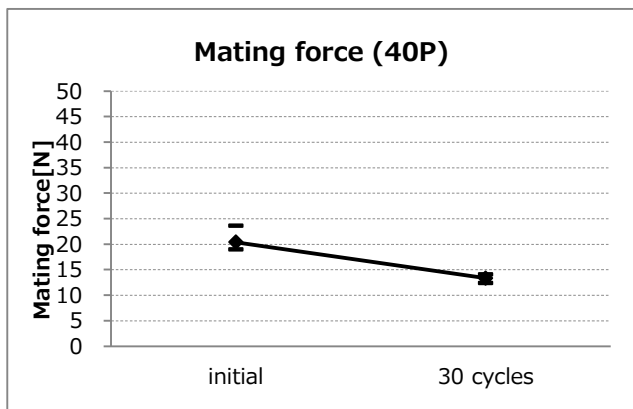


Graph-5. A change of mating force

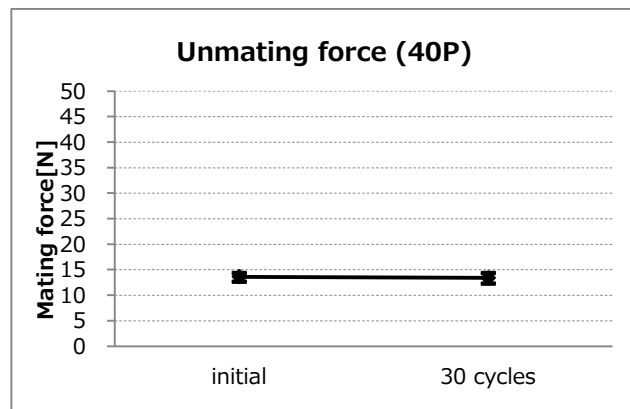


Graph-6. A change of unmating force

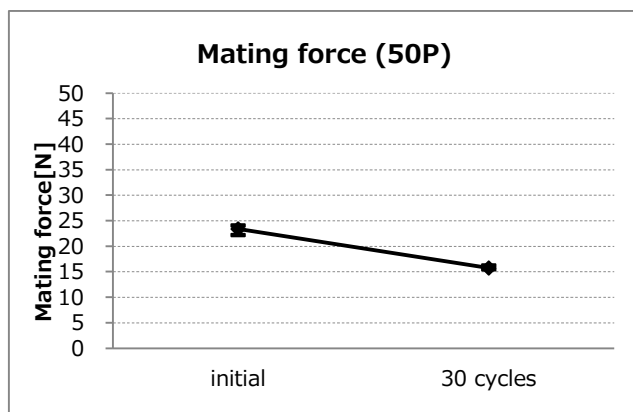
Group A / Durability



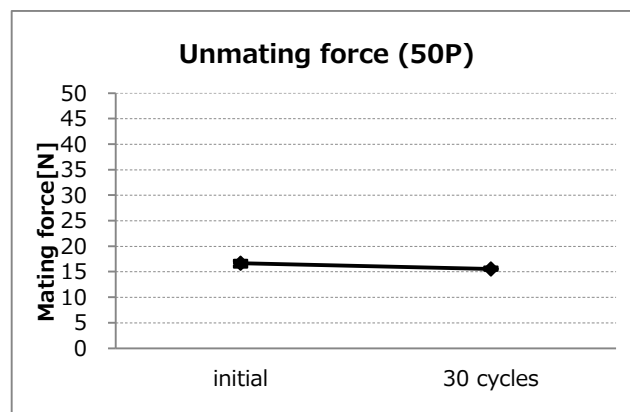
Graph-7. A change of mating force



Graph-8. A change of unmatting force

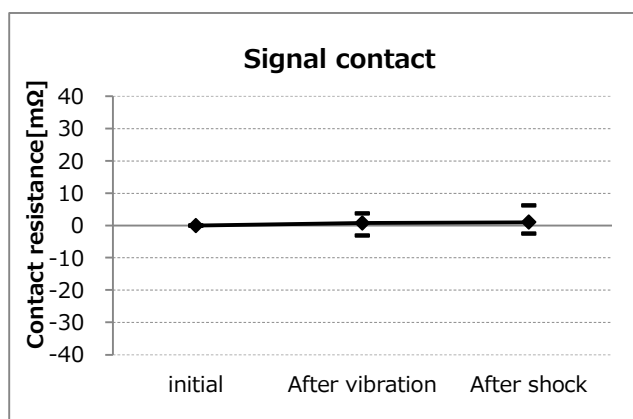


Graph-9. A change of mating force

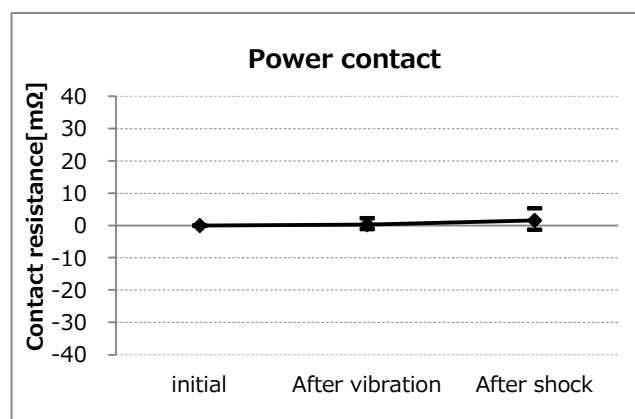


Graph-10. A change of unmatting force

Group C / Vibration and shock



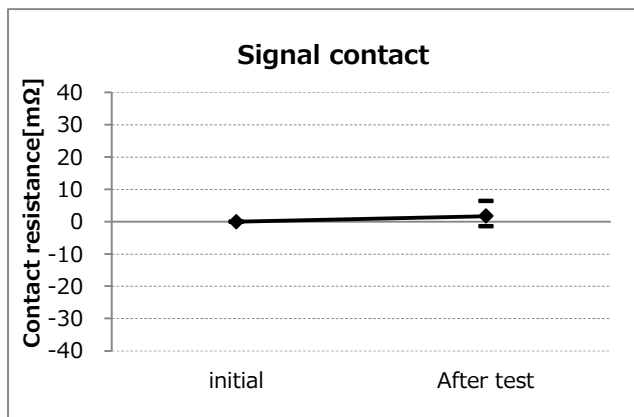
Graph-11. A change of signal contact resistance



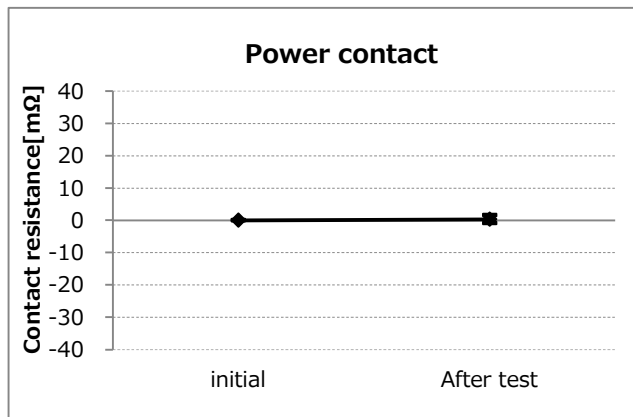
Graph-12. A change of power contact resistance



Group D / Thermal shock

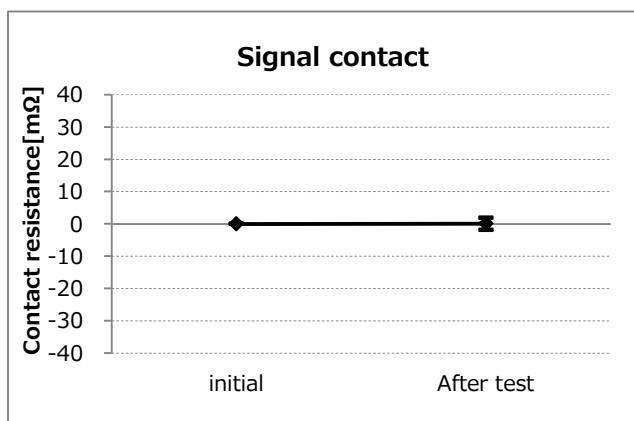


Graph-13. A change of signal contact resistance

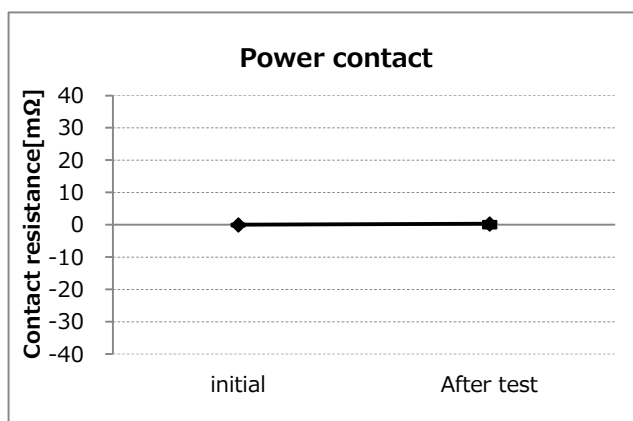


Graph-14. A change of power contact resistance

Group E / High temperature life

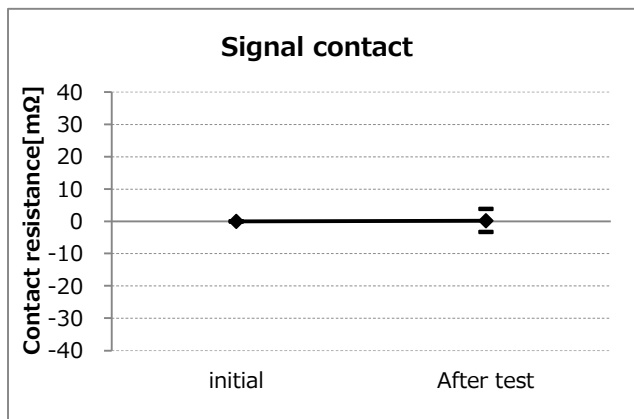


Graph-15. A change of signal contact resistance

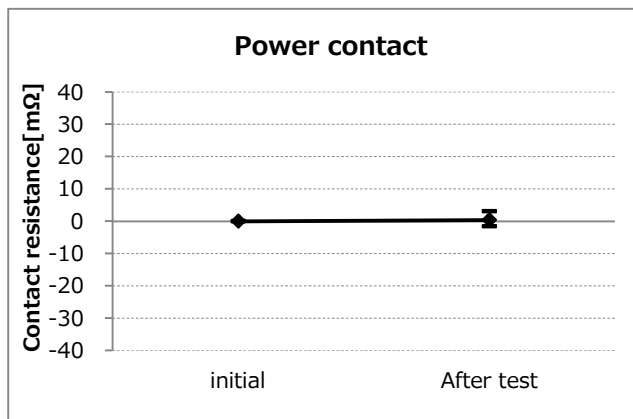


Graph-16. A change of power contact resistance

Group F / Low temperature life

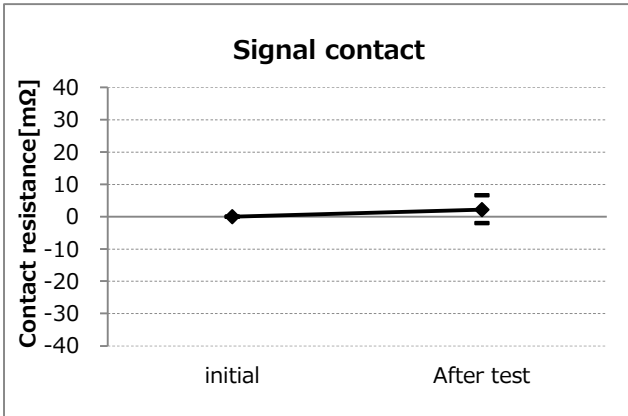


Graph-17. A change of signal contact resistance

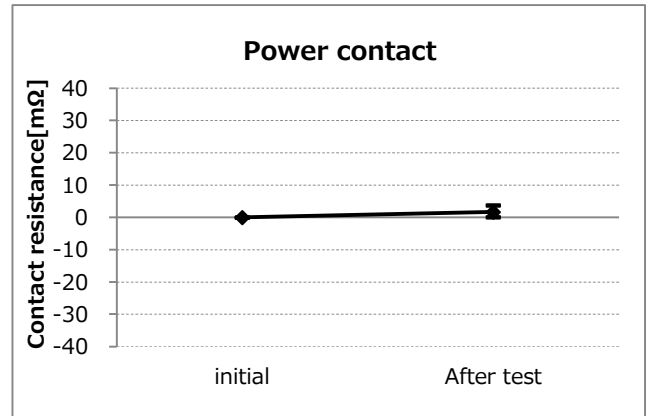


Graph-18. A change of power contact resistance

Group G / Humidity (steady state)

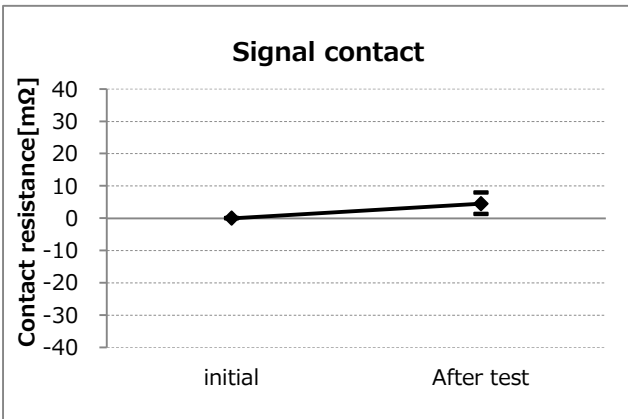


Graph-19. A change of signal contact resistance

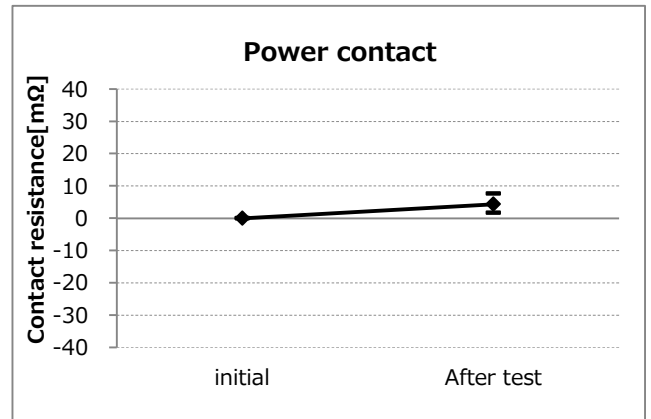


Graph-20. A change of power contact resistance

Group H / Humidity (cycling)

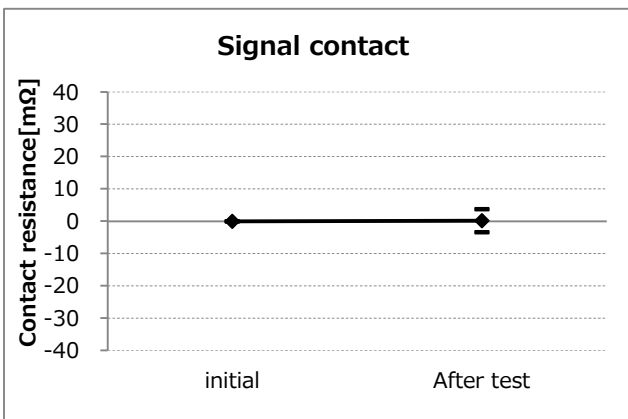


Graph-21. A change of signal contact resistance

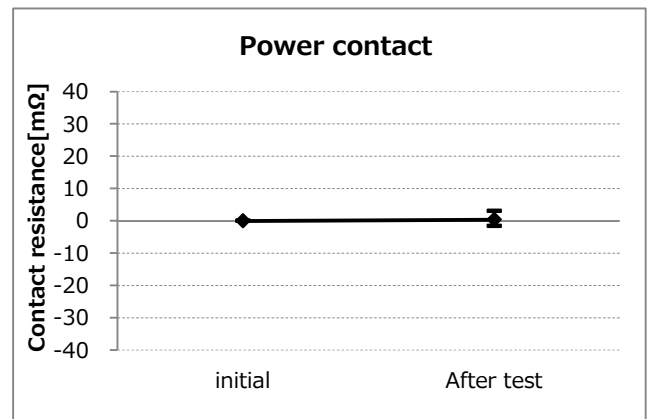


Graph-22. A change of power contact resistance

Group J / Salt water spray

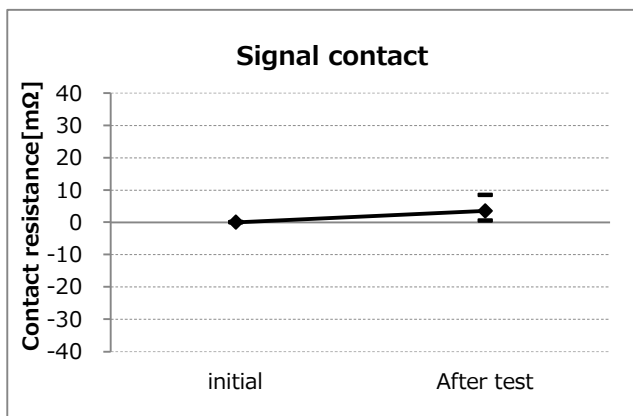


Graph-23. A change of signal contact resistance

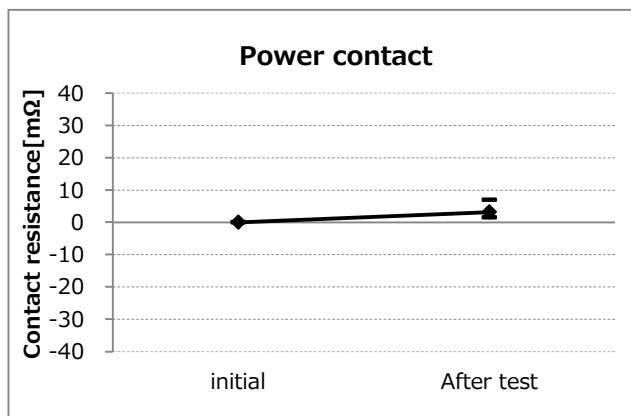


Graph-24. A change of power contact resistance

## Group K / H2S gas



Graph-25. A change of signal contact resistance



Graph-26. A change of power contact resistance