

NOVASTACK® 35-P HIGH CONDUCTIVITY TYPE

Part No. PLUG: 20708-0**E-01 Receptacle: 20709-0**E-01

Test Report

Product Specification no. PRS-2334

7	T19008	January 29, 2019	T.Kurokawa	Y.Baba	T.Hirakawa
6	T17185	December 7, 2017	M.Hirotani	Y.Baba	T.Hirakawa
5	T17169	October 26, 2017	M.Hirotani	Y.Baba	T.Hirakawa
4	T17142	August 31, 2017	T.Fukushima		T.Hirakawa
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

NOVASTACK 35-P (高電導タイプ) コネクタの性能を PRS-2334 に基づいて評価する。

To evaluate the performance of NOVASTACK 35-P (HIGH CONDUCTIVITY TYPE) Connector in accordance with PRS-2334.

2. Specimen

(1) NOVASTACK 35-P PLUG ASS'Y (Part No. 20708-0**E-01)

(2) NOVASTACK 35-P RECEPTACLE ASS'Y (Part No. 20709-0**E-01)

3. Test Sequence

全ての評価は表 1 の試験順序に従って行った。

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

4. Result

表 2-1~2-4、グラフ 1~38 参照。試験条件の詳細は PRS-2334 参照。

n 数は測定データを意味する。

See Table 2-1 to 2-4, Graph 1 to 38. For the details of the testing conditions and requirements, see PRS-2334.

The "n" in the tables show the number of measurement points

5. Conclusion

全ての資料が製品規格 (PRS-2334) の必要条件を満足した。

All the specimens met the requirements of PRS-2334.

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 Contact Resistance		2,6		1,3 ,5	1,5	1,3	1,3	1,5	1,5	1,3	1,3			
絶縁抵抗 Insulation Resistance					2,6			2,6	2,6					
耐電圧 D. W. Voltage					3,7			3,7	3,7					
温度上昇 Temperature rising	1													
挿入力 Mating Force		1,5												
抜去力 Unmating Force		3,7												
耐久性 Durability		4												
端子保持力 Contact Retention Force			1											
振動 Vibration				2										
衝撃 Shock				4										
熱衝撃 Thermal Shock					4									
高温寿命 High Temperature Life						2								
低温寿命 Low Temperature Life							2							
湿度 (定常状態) Humidity (Steady State)								4						
湿度 (サイクリング) Humidity (Cycling)									4					
塩水噴射 Salt Water Spray										2				
硫化水素ガス H2S Gas											2			
半田付け性 Solder ability												1		
半田耐熱性 Soldering Heat Resistance													1	
手半田 Soldering iron														1
試料数 Sample QTY.	5 pcs.	5 pcs.	20 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。 / Numbers indicate sequence in which tests are performed.

Table 2-1. 試験結果 / Table.2-1 Test result

Group	Contents of measurement	Spec.	Unit	Q'ty	n	Data					Judge.	
						AVE.	MAX.	MIN.	S	X±3s		
A	Temperature rising											
	10P	test (a)	ΔT 30 MAX.	℃	5	-	14.9 Max.					OK
		test (b)					23.8 Max.					OK
	14P	test (a)	ΔT 30 MAX.	℃	5	-	17.1 Max.					OK
		test (b)					20.1 Max.					OK
	18P	test (a)	ΔT 30 MAX.	℃	5	-	15.7 Max.					OK
		test (b)					15.4 Max.					OK
	20P	test (a)	ΔT 30 MAX.	℃	5	-	18.2 Max.					OK
		test (b)					18.6 Max.					OK
	24P	test (a)	ΔT 30 MAX.	℃	5	-	15.9 Max.					OK
		test (b)					15.8 Max.					OK
	30P	test (a)	ΔT 30 MAX.	℃	5	-	14.5 Max.					OK
		test (b)					19.8 Max.					OK
	34P	test (a)	ΔT 30 MAX.	℃	5	-	15.4 Max.					OK
		test (b)					20.3 Max.					OK
	40P	test (a)	ΔT 30 MAX.	℃	5	-	15.6 Max.					OK
		test (b)					21.8 Max.					OK
	50P	test (a)	ΔT 30 MAX.	℃	5	-	10.0 Max.					OK
		test (b)					19.0 Max.					OK
	60P	test (a)	ΔT 30 MAX.	℃	5	-	14.3 Max.					OK
test (b)		20.5 Max.					OK					

Table 2-2. 試験結果 / Table.2-2 Test result

Group	Contents of measurement	Spec.	Unit	Q'ty	n	Data					Judge.		
						AVE.	MAX.	MIN.	S	X±3s			
B	Durability												
	Contact resistance												
	Signal contact	Initial	30	MAX.	mΩ	5	100	15.768	18.78	13.24	1.341	19.792	OK
		After 20 cycles	ΔR 20	MAX.				-2.067	-0.03	-4.46	1.164	1.423	OK
	Power contact	Initial	30	MAX.			20	10.925	12.98	10.13	0.868	13.529	OK
		After 20 cycles	ΔR 20	MAX.				-0.305	1.08	-2.61	0.922	2.460	OK
	Mating force												
	10P	Initial	20	MAX.			N	5	-	10.660	10.86	10.42	-
		After 20 cycles			7.027	7.70				6.38	-	-	OK
	14P	Initial	28	MAX.	N	5	-	14.958	15.53	14.04	-	-	OK
		After 20 cycles						7.444	8.07	6.87	-	-	OK
	18P	Initial	36	MAX.	N	5	-	16.996	17.66	16.29	-	-	OK
		After 20 cycles						10.373	10.67	10.10	-	-	OK
	20P	Initial	40	MAX.	N	5	-	18.220	18.95	17.60	-	-	OK
		After 20 cycles						11.057	11.93	10.10	-	-	OK
	24P	Initial	48	MAX.	N	5	-	19.950	20.96	18.72	-	-	OK
		After 20 cycles						12.960	13.53	12.23	-	-	OK
	30P	Initial	30	MAX.	N	5	-	15.150	15.70	14.49	-	-	OK
		After 20 cycles						13.641	14.25	12.86	-	-	OK
	34P	Initial	34	MAX.	N	5	-	13.986	14.69	13.71	-	-	OK
		After 20 cycles						11.438	12.12	11.07	-	-	OK
	40P	Initial	40	MAX.	N	5	-	20.604	21.71	11.07	-	-	OK
		After 20 cycles						14.898	16.03	13.99	-	-	OK
	50P	Initial	50	MAX.	N	5	-	26.059	26.83	25.08	-	-	OK
		After 20 cycles						19.499	20.08	18.72	-	-	OK
	60P	Initial	60	MAX.	N	5	-	26.560	28.13	24.46	-	-	OK
		After 20 cycles						17.373	19.70	15.81	-	-	OK
	Unmating force												
	10P	Initial	3.0	MIN.	N	5	-	7.880	8.24	7.66	-	-	OK
		After 20 cycles						6.392	6.57	6.29	-	-	OK
	14P	Initial	4.2	MIN.	N	5	-	7.413	7.82	6.92	-	-	OK
		After 20 cycles						5.849	6.04	5.60	-	-	OK
	18P	Initial	5.4	MIN.	N	5	-	11.182	11.56	10.82	-	-	OK
After 20 cycles		9.084						9.37	8.86	-	-	OK	
20P	Initial	6.0	MIN.	N	5	-	11.947	12.63	10.49	-	-	OK	
	After 20 cycles						9.660	10.29	9.28	-	-	OK	
24P	Initial	7.2	MIN.	N	5	-	15.119	15.68	14.41	-	-	OK	
	After 20 cycles						12.665	13.35	12.19	-	-	OK	
30P	Initial	4.5	MIN.	N	5	-	11.585	12.01	10.93	-	-	OK	
	After 20 cycles						11.861	12.51	11.03	-	-	OK	
34P	Initial	5.1	MIN.	N	5	-	11.466	12.10	10.17	-	-	OK	
	After 20 cycles						11.272	11.86	10.05	-	-	OK	
40P	Initial	6.0	MIN.	N	5	-	15.016	15.59	14.52	-	-	OK	
	After 20 cycles						13.646	14.63	12.88	-	-	OK	
50P	Initial	7.5	MIN.	N	5	-	18.290	18.78	17.53	-	-	OK	
	After 20 cycles						18.290	19.27	16.98	-	-	OK	
60P	Initial	9.0	MIN.	N	5	-	21.702	23.86	19.68	-	-	OK	
	After 20 cycles						19.100	20.94	17.58	-	-	OK	

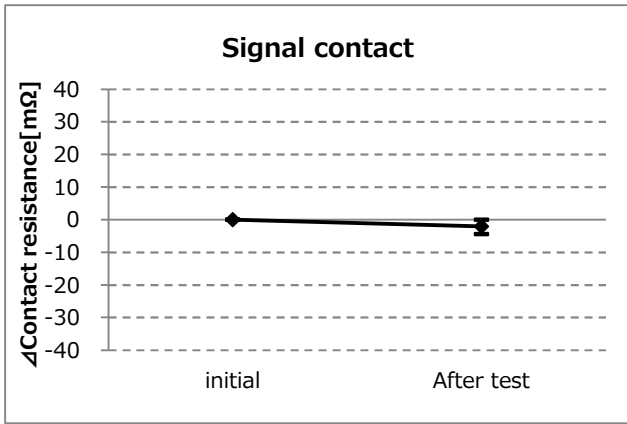
Table 2-3. 試験結果 / Table.2-3 Test result

Group	Contents of measurement	Spec.	Unit	Q'ty	n	Data					Judge.			
						AVE.	MAX.	MIN.	S	X±3s				
C	Contact retention force													
	Receptacle contact	0.1 MIN.	N	20	-	0.531	0.62	0.41	-	-	OK			
D	Vibration → Shock													
	Contact resistance													
	Signal contact	Initial	30 MAX.	mΩ	5	100	15.228	16.81	13.88	0.663	17.217	OK		
		After vibration	ΔR 20 MAX.				0.325	3.11	-2.67	1.258	4.100	OK		
		After shock					0.376	3.36	-2.77	1.147	3.816	OK		
	Power contact	Initial	30 MAX.				20	11.643	12.32	10.98	0.385	12.798	OK	
		After vibration	ΔR 20 MAX.					1.606	3.94	-0.85	1.351	5.658	OK	
		After shock						0.977	4.03	-1.87	1.635	5.882	OK	
	Electrical discontinuity													
		During test	1 MAX.	μs	5	-		No discontinuity					OK	
	Appearance													
	After test	No abnormality	-	5	-	No abnormality					OK			
E	Thermal shock													
	Contact resistance													
	Signal contact	Initial	30 MAX.	mΩ	5	100	16.353	18.40	14.77	0.824	18.825	OK		
		After test	ΔR 20 MAX.				0.096	1.91	-1.72	0.685	2.151	OK		
	Power contact	Initial	30 MAX.			20	11.558	12.55	10.87	0.528	13.143	OK		
		After test	ΔR 20 MAX.				0.183	1.08	-0.42	0.477	1.612	OK		
	Insulation resistance													
		Initial	1000 MIN.			MΩ	5	-	1.34 × 10 ⁴ Min.					OK
		After test	500 MIN.	2.24 × 10 ⁴ Min.					OK					
	Dielectric Withstanding Voltage													
		After test	No abnormality	-	5	-	No abnormality					OK		
F	High temperature life													
	Contact resistance													
	Signal contact	Initial	30 MAX.	mΩ	5	100	16.510	18.92	14.54	0.835	19.014	OK		
		After test	ΔR 20 MAX.				-0.306	1.34	-2.14	0.736	1.901	OK		
	Power contact	Initial	30 MAX.			20	12.035	13.95	10.99	1.000	15.033	OK		
		After test	ΔR 20 MAX.				-1.235	-0.35	-2.85	0.726	0.943	OK		
	Appearance													
		After test	No abnormality			-	5	-	No abnormality					OK
G	Low temperature life													
	Contact resistance													
	Signal contact	Initial	30 MAX.	mΩ	5	100	16.413	17.58	14.90	0.634	18.314	OK		
		After test	ΔR 20 MAX.				-0.795	0.48	-2.07	0.493	0.682	OK		
	Power contact	Initial	30 MAX.			20	12.014	12.44	11.63	0.281	12.856	OK		
		After test	ΔR 20 MAX.				-0.455	0.73	-1.16	0.622	1.412	OK		
	Appearance													
		After test	No abnormality			-	5	-	No abnormality					OK

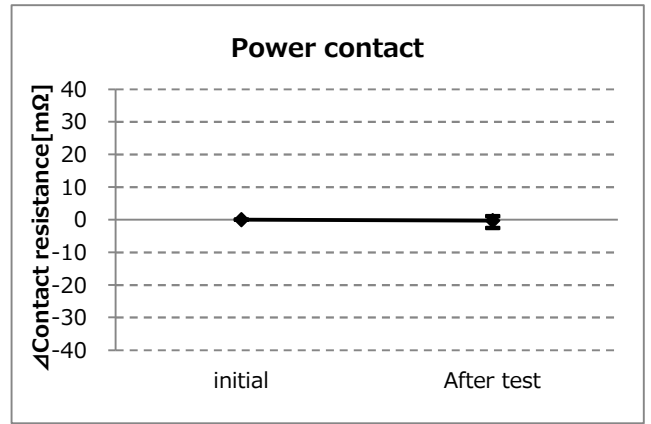
Table 2-4. 試験結果 / Table.2-4 Test result

Group	Contents of measurement	Spec.	Unit	Q'ty	n	Data					Judge.		
						AVE.	MAX.	MIN.	S	X±3s			
H	Humidity(steady state)												
	Contact resistance												
	Signal contact	Initial	30	MAX.	mΩ	5	100	16.431	17.92	14.80	0.678	18.463	OK
		After test	ΔR	20				MAX.	-0.176	1.15	-1.82	0.585	1.580
	Power contact	Initial	30	MAX.			20	12.041	12.93	11.33	0.456	13.408	OK
		After test	ΔR	20				MAX.	0.020	1.16	-0.96	0.672	2.036
	Insulation resistance												
		Initial	1000	MIN.	MΩ	5	-	1.05 × 10 ⁴ Min.					OK
		After test	500	MIN.				2.99 × 10 ³ Min.					OK
	Dielectric Withstanding Voltage												
		After test	No abnormality	-	5	-	No abnormality					OK	
Appearance													
	After test	No abnormality	-	5	-	No abnormality					OK		
J	Humidity(cycling)												
	Contact resistance												
	Signal contact	Initial	30	MAX.	mΩ	5	100	16.250	18.90	13.99	1.189	19.818	OK
		After test	ΔR	20				MAX.	-0.188	2.30	-2.36	0.992	2.788
	Power contact	Initial	30	MAX.			20	11.730	13.16	10.33	0.940	14.550	OK
		After test	ΔR	20				MAX.	-0.289	1.09	-1.44	0.734	1.913
	Insulation resistance												
		Initial	1000	MIN.	MΩ	5	-	1.12 × 10 ⁴ Min.					OK
		After test	500	MIN.				2.46 × 10 ³ Min.					OK
	Dielectric Withstanding Voltage												
		After test	No abnormality	-	5	-	No abnormality					OK	
Appearance													
	After test	No abnormality	-	5	-	No abnormality					OK		
K	Salt water spray												
	Contact resistance												
	Signal contact	Initial	30	MAX.	mΩ	5	100	15.805	18.83	14.07	1.098	19.099	OK
		After test	ΔR	20				MAX.	-0.600	3.63	-3.91	1.684	4.451
	Power contact	Initial	30	MAX.			20	12.211	13.90	10.58	1.056	15.378	OK
		After test	ΔR	20				MAX.	-0.503	3.43	-3.74	1.759	4.774
Appearance													
	After test	No abnormality	-	5	-	No abnormality					OK		
L	Gas												
	Contact resistance												
	Signal contact	Initial	30	MAX.	mΩ	5	100	16.278	17.98	15.17	0.646	18.215	OK
		After test	ΔR	20				MAX.	1.121	3.93	-0.95	1.111	4.453
	Power contact	Initial	30	MAX.			20	12.674	14.13	11.47	0.972	15.590	OK
		After test	ΔR	20				MAX.	0.917	2.52	-0.01	0.911	3.652
Appearance													
	After test	No abnormality	-	5	-	No abnormality					OK		
M	Solder ability												
	Solder wetting area												
	After test	95	MIN.	%	10	-	95 MIN.					OK	
N	Resistance to reflow soldering heat												
	Appearance												
	After test	No abnormality	-	10	-	No abnormality					OK		
P	Soldering iron												
	Appearance												
	After test	No abnormality	-	10	-	No abnormality					OK		

B Group / Durability

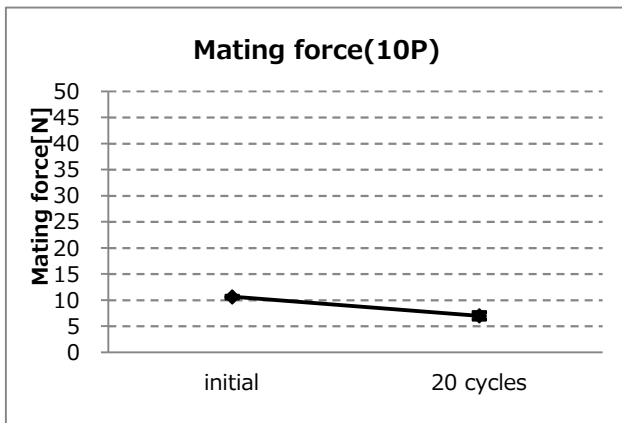


Graph-1. A change of signal contact resistance

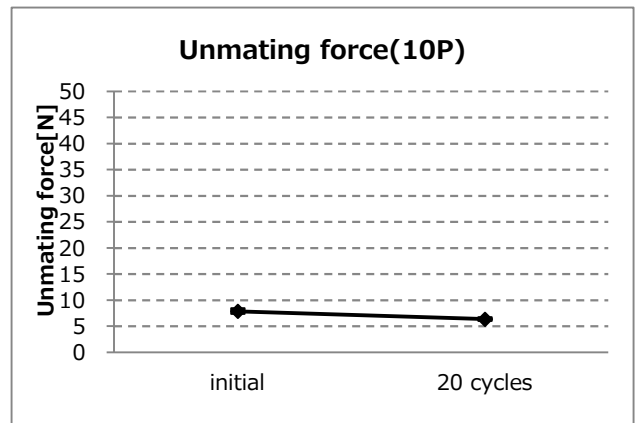


Graph-2. A change of power contact resistance

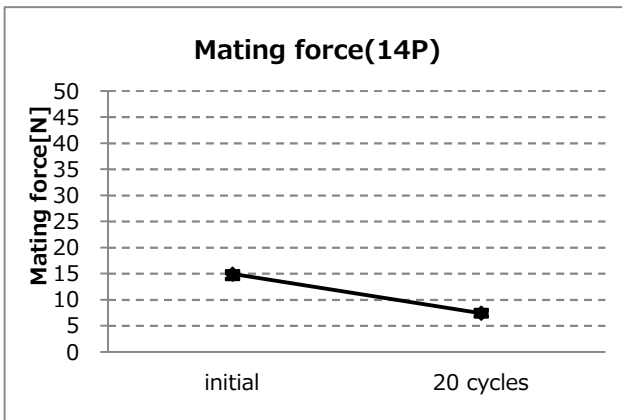
B Group / Durability



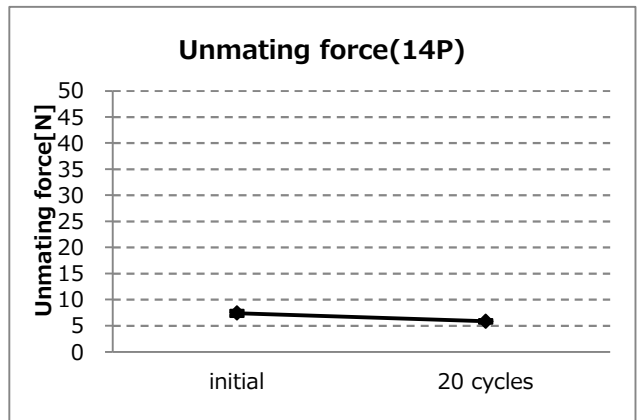
Graph-3. A change of mating force (10P)



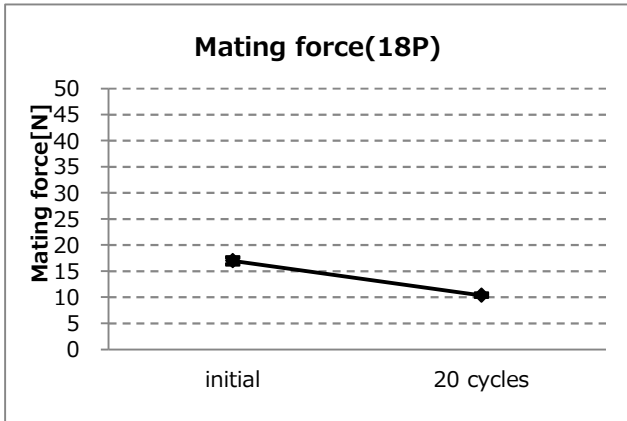
Graph-4. A change of unmating force (10P)



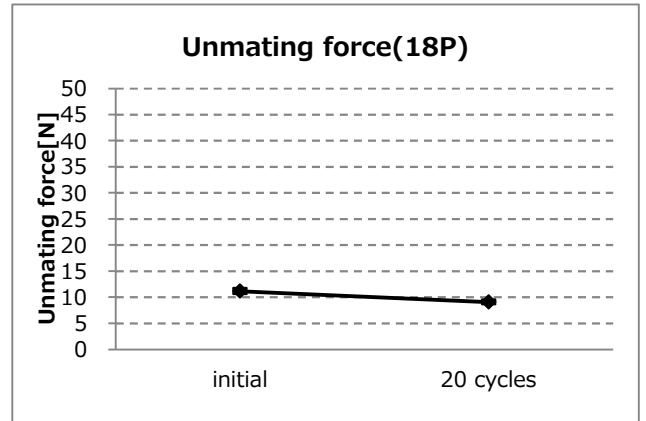
Graph-5. A change of mating force (14P)



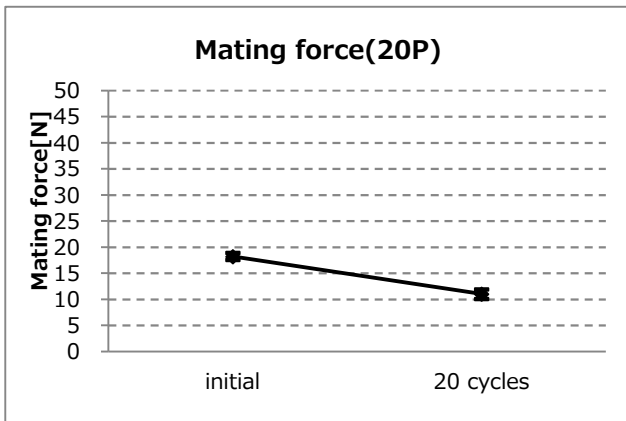
Graph-6. A change of unmating force (14P)



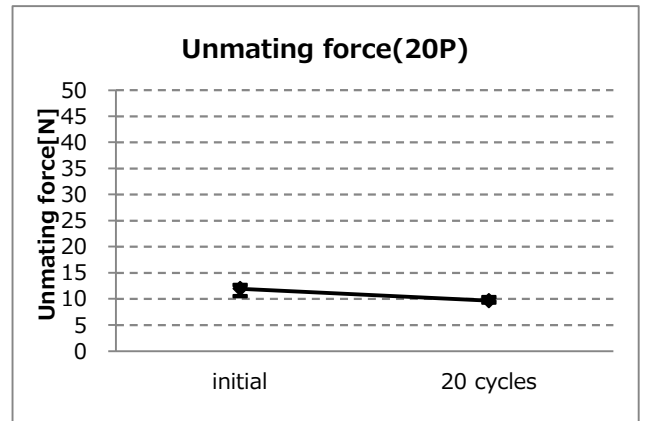
Graph-7. A change of mating force (18P)



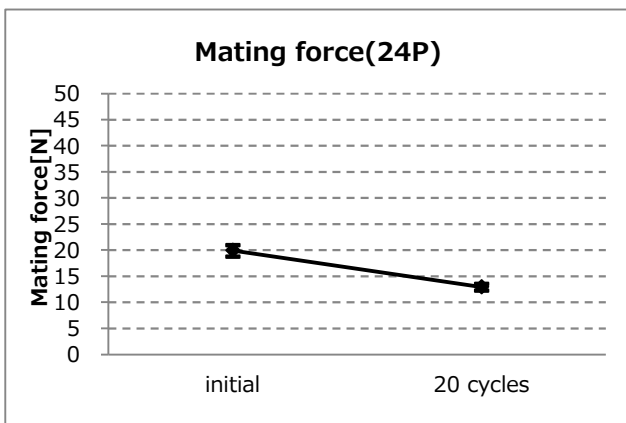
Graph-8. A change of unmating force (18P)



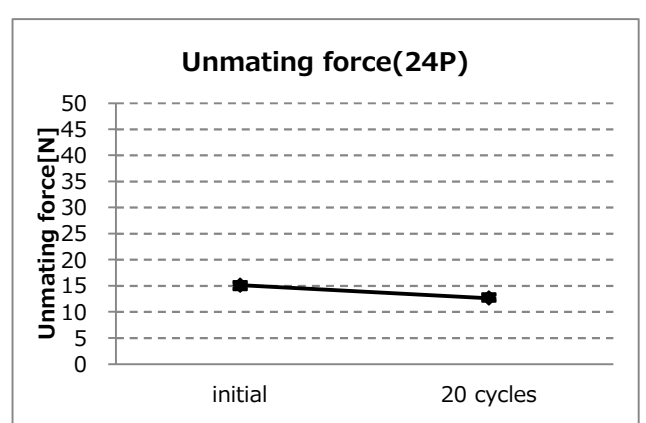
Graph-9. A change of mating force (20P)



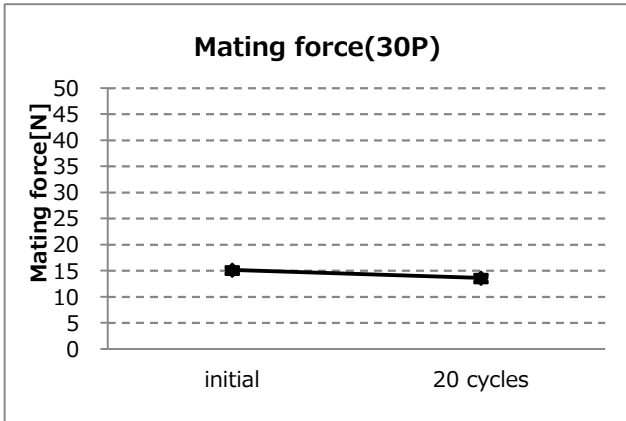
Graph-10. A change of unmating force (20P)



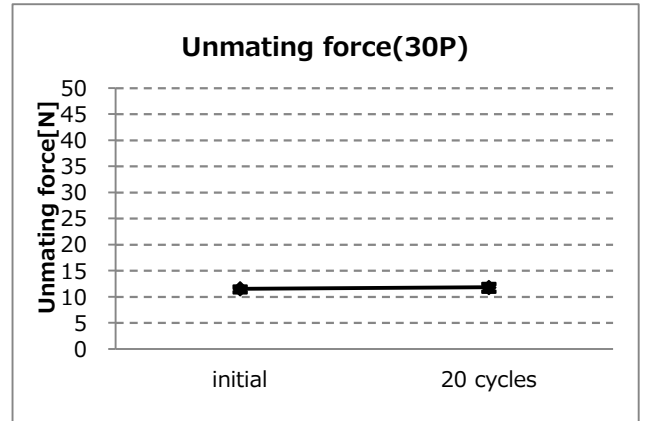
Graph-11. A change of mating force (24P)



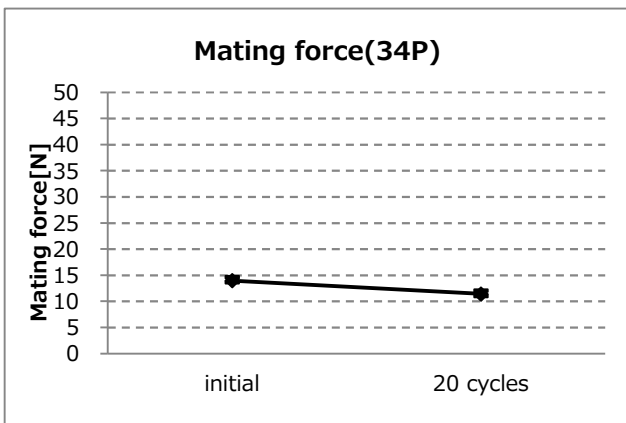
Graph-12. A change of unmating force (24P)



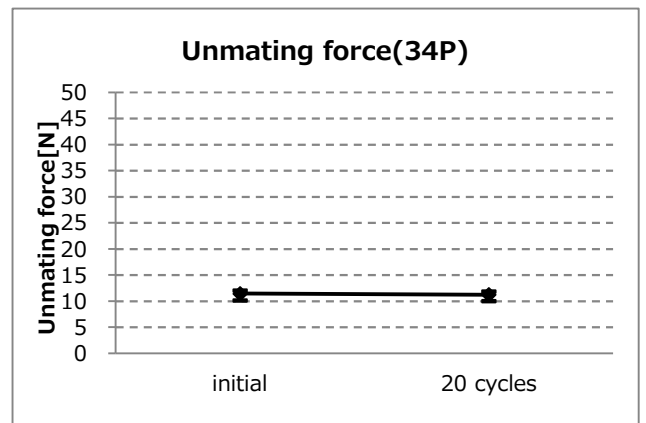
Graph-13. A change of mating force (30P)



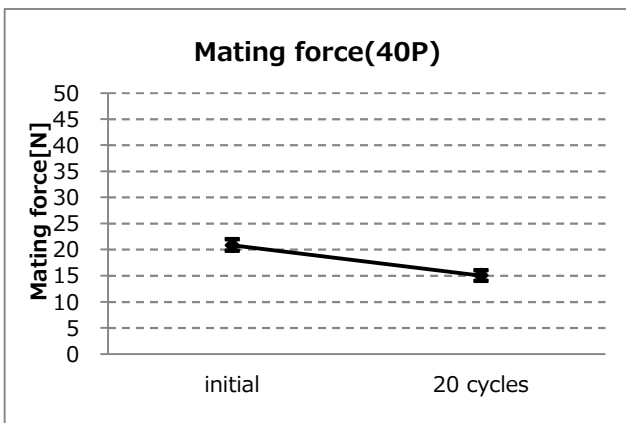
Graph-14. A change of unmating force (30P)



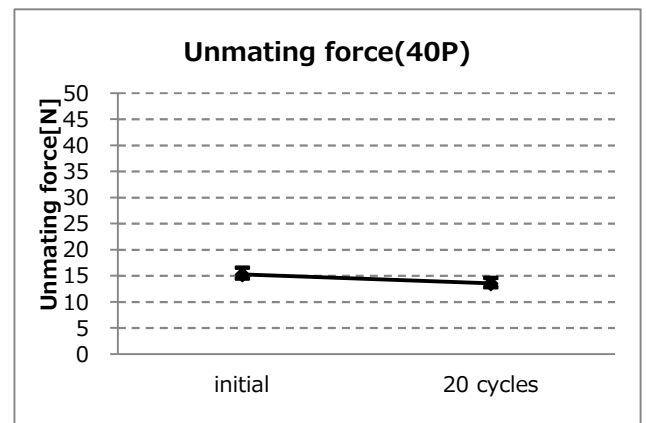
Graph-15. A change of mating force (34P)



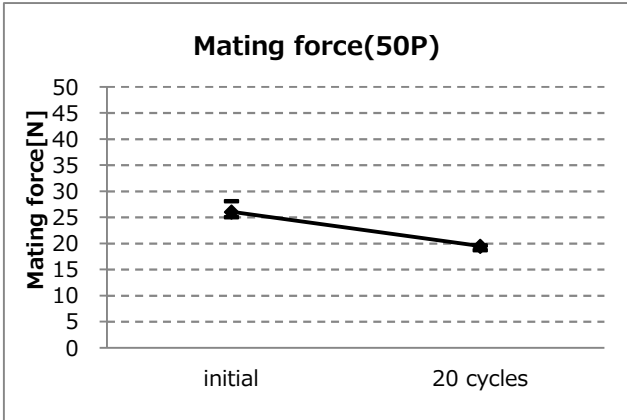
Graph-16. A change of unmating force (34P)



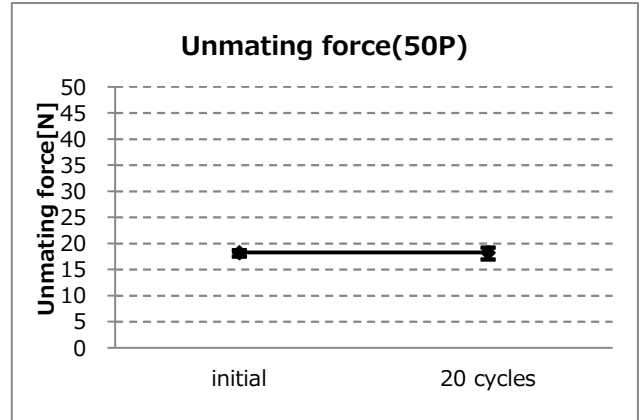
Graph-17. A change of mating force (40P)



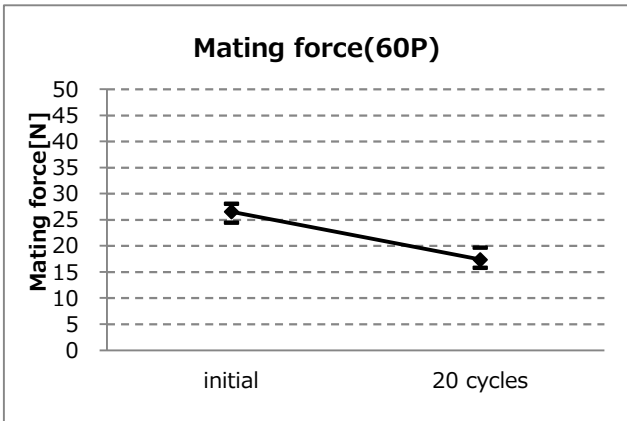
Graph-18. A change of unmating force (40P)



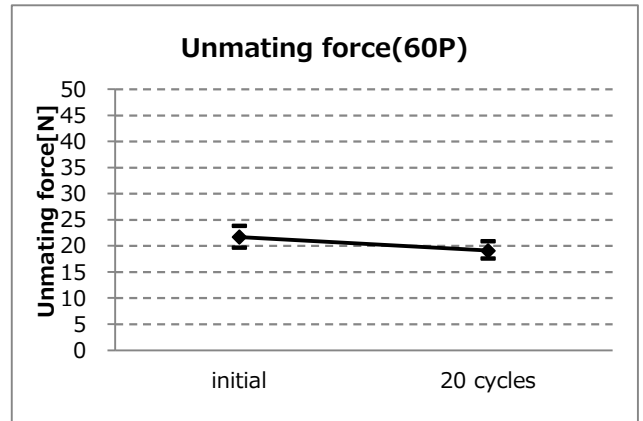
Graph-19. A change of mating force (50P)



Graph-20. A change of unmating force (50P)

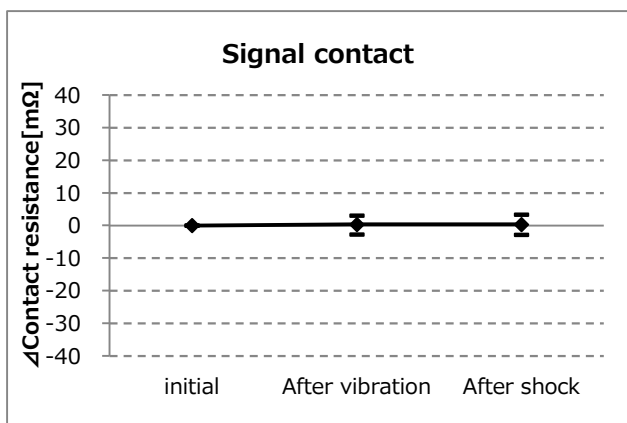


Graph-21. A change of mating force (60P)

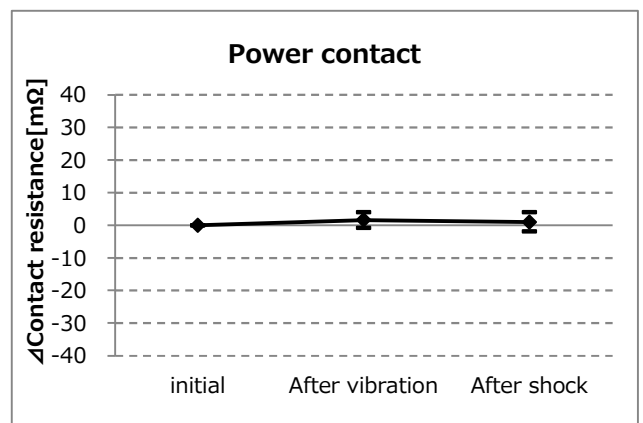


Graph-22. A change of unmating force (60P)

D Group / Vibration → Shock

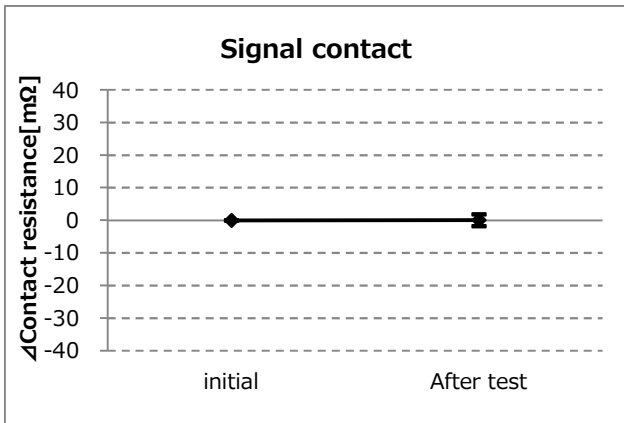


Graph-23. A change of signal contact resistance

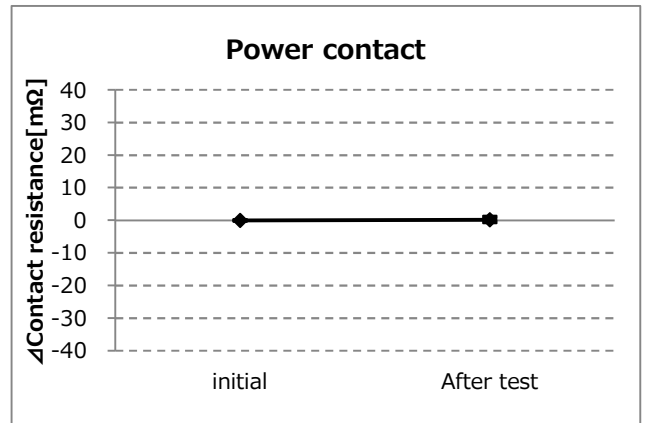


Graph-24. A change of power contact resistance

E Group / Thermal Shock

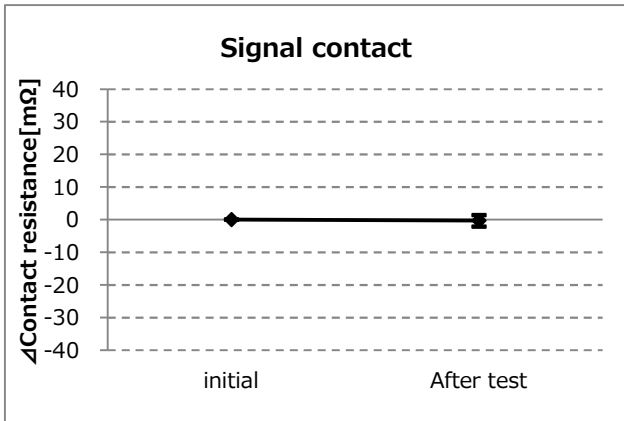


Graph-25. A change of signal contact resistance

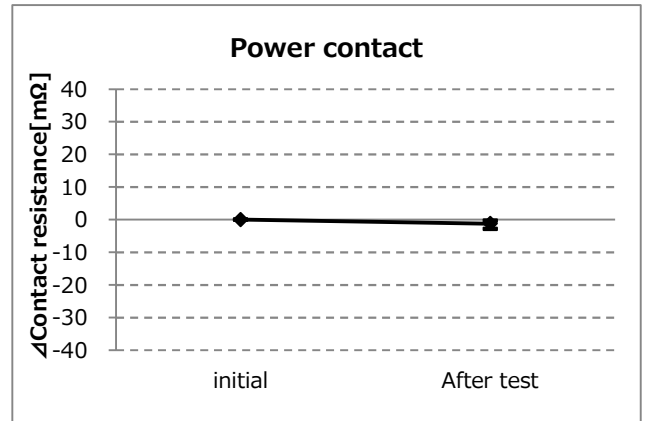


Graph-26. A change of power contact resistance

F Group / High Temperature Life

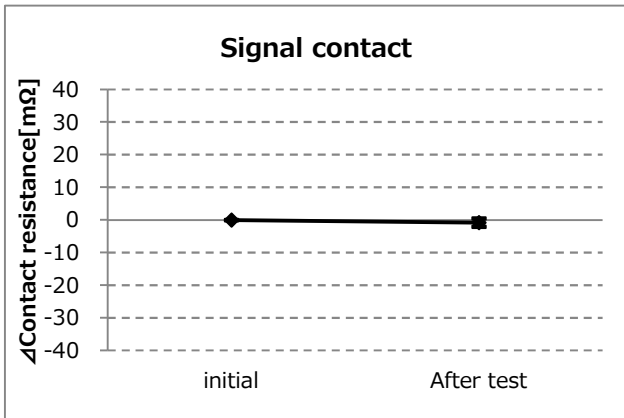


Graph-27. A change of signal contact resistance

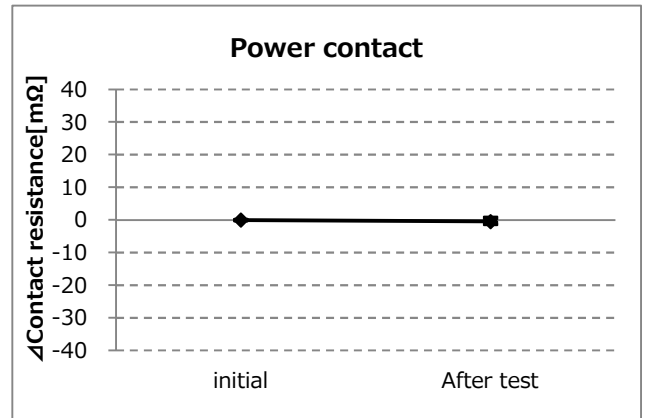


Graph-28. A change of power contact resistance

G Group / Low Temperature Life

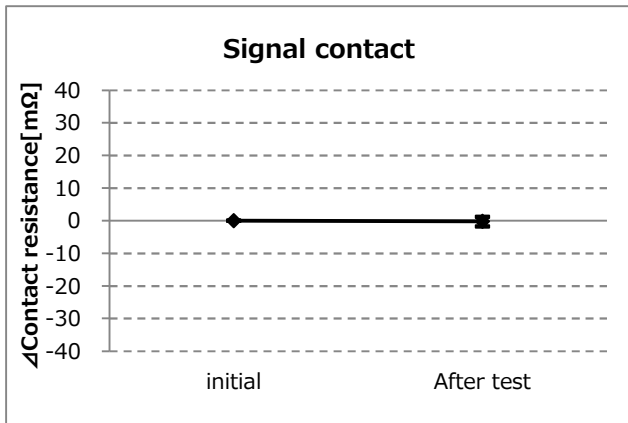


Graph-29. A change of signal contact resistance

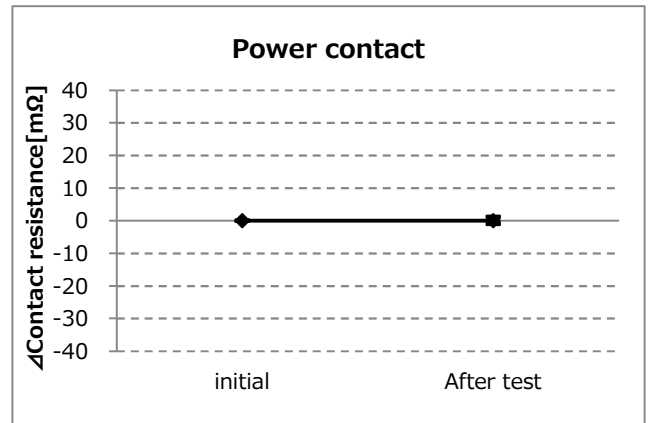


Graph-30. A change of power contact resistance

H Group / Humidity (Steady State)

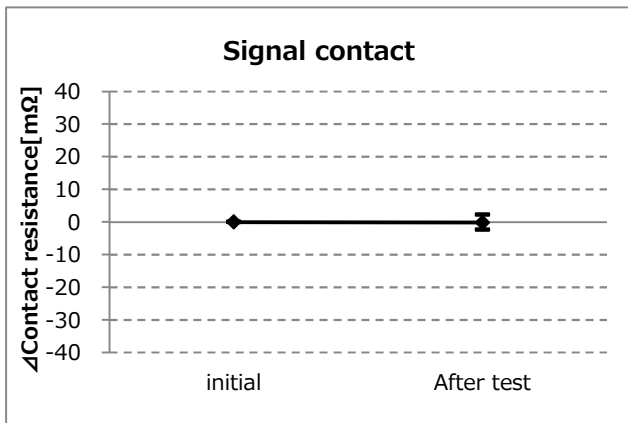


Graph-31. A change of signal contact resistance

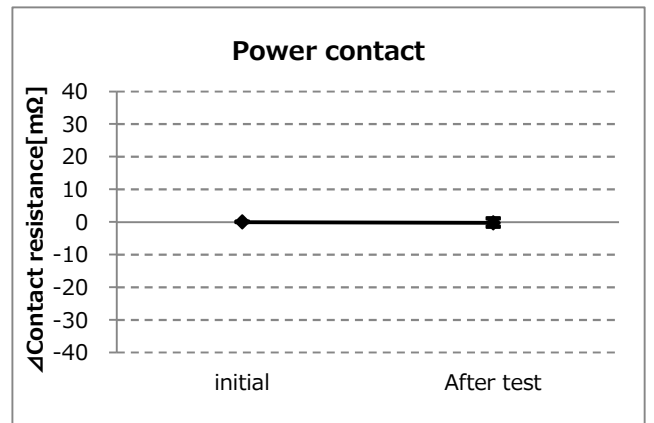


Graph-32. A change of power contact resistance

J Group / Humidity (Cycling)

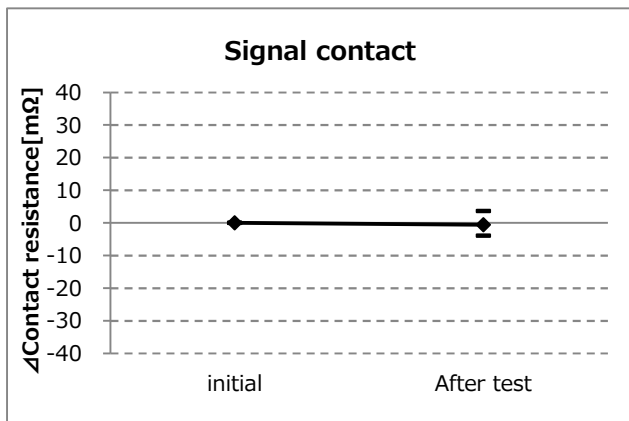


Graph-33. A change of signal contact resistance

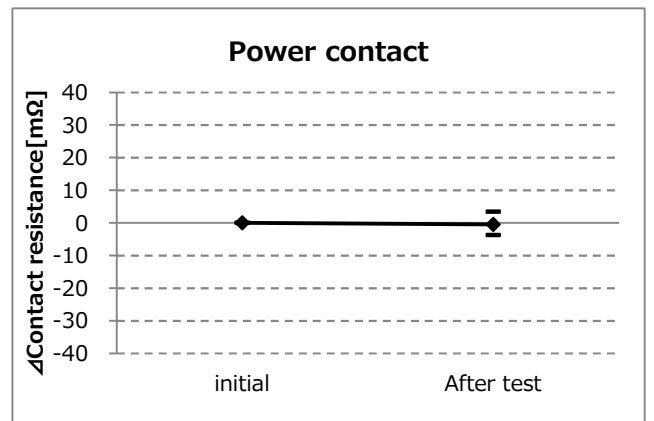


Graph-34. A change of power contact resistance

K Group / Salt Water Spray

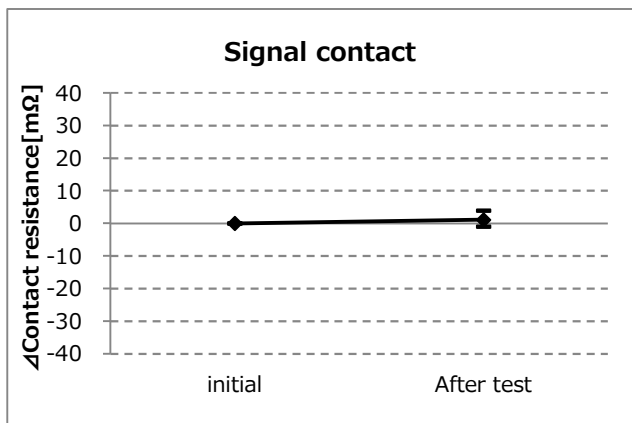


Graph-35. A change of signal contact resistance

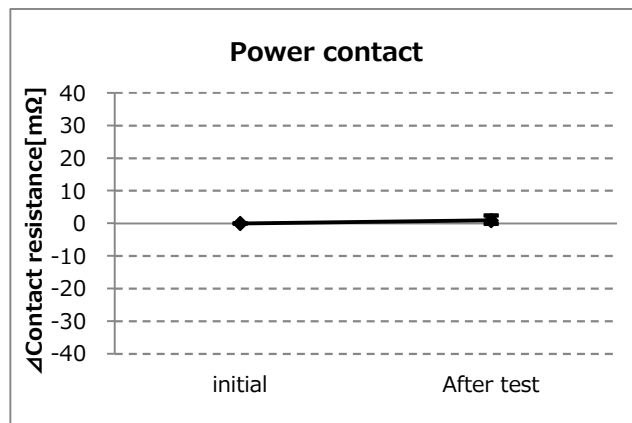


Graph-36. A change of power contact resistance

L Group / H2S Gas



Graph-37. A change of signal contact resistance



Graph-38. A change of power contact resistance