NOVASTACK®4

Part No. 20641 ,20642

Test Report

Product Specification no. PRS-1998

Rev.	ECN	Date	Prepared by	Checked by	Approved by
8	T21152	November 5, 2021	Y.Kuribayashi	S.Suzuki	Y.Hashimoto
7	T18007	January 25, 2018	K.Tanaka	-	M.Takemoto
6	T17129	August 10, 2017	K.Tanaka	-	M.Takemoto
5	T17084	May 22, 2017	K.Tanaka	-	M.Takemoto

1. Purpose

To evaluate the performance of NOVASTACK®4 Connector in accordance with PRS-1998.

2. Specimen

(1) NOVASTACK 4 PLUG ASS'Y （Part No. 20641-0**E）

(2) NOVASTACK 4 RECEPTACLE ASS'Y （Part No. 20642-0**E）

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 21. For the details of the testing conditions and requirements, see PRS-1998.

The “n” in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-1998.

Table1 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
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		1,3												
Vibration			2											
Shock			4											
Thermal Shock				4										
High Temperature Life		2			2									
Low Temperature Life						2								
Humidity (Steady State)							4							
Humidity (Cycling)								4						
Salt Water Spray									2					
H_2S Gas										2				
Solder Ability											1			
Soldering Heat Resistance												1		
Soldering Iron													1	
Sample q'ty	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.	5 pcs.

※The number of group is test sequence.

Table.2-1 Test result

Test Item	Contents of Measurement			Specifications	Sample q'ty	n	Data					
							AVE.	MAX.	MIN.	s	X±3s	Judge ment
A Group Durability	Contact Resistance(mΩ)		Initial	80mΩMAX.	5	150	26.087	29.51	23.41	1.451	30.441	OK
			After 30cycles	ΔR=20mΩMAX.			1.197	5.72	-3.81	2.153	7.654	OK
	6P	Mating Force(N)	Initial	10.0 N MAX.	5	–	6.290	6.620	6.010	–	–	OK
			After 30cycles	10.0 N MAX.	5	–	1.807	2.130	1.580	–	–	OK
		Un-mating Force(N)	Initial	1.2 N MIN.	5	–	3.906	4.040	3.780	–	–	OK
			After 30cycles	1.2 N MIN.	5	–	1.943	2.000	1.890	–	–	OK
	10P	Mating Force(N)	Initial	12.0 N MAX.	5	–	8.322	8.61	8.09	–	–	OK
			After 30cycles	12.0 N MAX.	5	–	4.330	4.61	4.08	–	–	OK
		Un-mating Force(N)	Initial	2.0 N MIN.	5	–	4.634	4.78	4.40	–	–	OK
			After 30cycles	2.0 N MIN.	5	–	3.340	3.84	3.14	–	–	OK
	24P	Mating Force(N)	Initial	28.8 N MAX.	5	–	16.905	17.55	16.40	–	–	OK
			After 30cycles	28.8 N MAX.	5	–	6.408	6.66	6.22	–	–	OK
		Un-mating Force(N)	Initial	4.8 N MIN.	5	–	7.932	8.23	7.43	–	–	OK
			After 30cycles	4.8 N MIN.	5	–	5.986	6.21	5.69	–	–	OK
	30P	Mating Force(N)	Initial	36.0 N MAX.	5	–	25.219	26.22	24.47	–	–	OK
			After 30cycles	36.0 N MAX.	5	–	10.603	12.16	9.03	–	–	OK
		Un-mating Force(N)	Initial	6.0 N MIN.	5	–	11.153	11.37	10.73	–	–	OK
			After 30cycles	6.0 N MIN.	5	–	8.810	9.03	8.46	–	–	OK
	34P	Mating Force(N)	Initial	40.8 N MAX.	5	–	28.346	29.83	26.81	–	–	OK
			After 30cycles	40.8 N MAX.	5	–	10.898	11.04	10.55	–	–	OK
		Un-mating Force(N)	Initial	6.8 N MIN.	5	–	12.426	13.81	11.45	–	–	OK
			After 30cycles	6.8 N MIN.	5	–	9.998	10.24	9.80	–	–	OK
	40P	Mating Force(N)	Initial	48.0 N MAX.	5	–	31.408	32.11	30.62	–	–	OK
			After 30cycles	48.0 N MAX.	5	–	14.407	15.21	13.45	–	–	OK
		Un-mating Force(N)	Initial	8.0 N MIN.	5	–	15.442	16.18	13.96	–	–	OK
			After 30cycles	8.0 N MIN.	5	–	11.281	11.42	10.88	–	–	OK

Table.2-2 Test result

Test Item	Contents of Measurement		Specifications	Sample q'ty	n	Data					
						AVE.	MAX.	MIN.	s	X±3s	Judgement
B Group Contact Retention Force	Plug Contact Retention Force(N)		0.2N MIN.	—	25	0.168	0.22	0.12	—	—	OK
	Rece.Contact Retention Force(N)		0.2N MIN.	—	25	0.306	0.45	0.20	—	—	OK
C Group Vibration ↓ Shock	Contact Resistance(mΩ)	Initial	80mΩMAX.	5	150	27.378	30.94	23.32	1.437	31.690	OK
		After Vibration	ΔR=20mΩMAX			-0.283	3.32	-4.85	1.539	4.335	OK
		After Shock				-1.147	3.87	-4.75	1.675	3.877	OK
	Electrical Discontinuity	During Vibration/Shock	1μsec. MAX.	5	—	No discontinuity					OK
	Appearance	After test	*	5	—	No Abnormality					OK
D Group Thermal Shock	Contact Resistance(mΩ)	Initial	80mΩMAX.	5	150	25.330	29.97	22.13	1.459	29.707	OK
		After test	ΔR=20mΩMAX.			0.005	4.77	-2.88	1.284	3.857	OK
	Insulation Resistance(MΩ)	Initial	1500MΩMIN.	5	—	1.84×10^5MΩ MIN.					OK
		After test	500MΩMIN.			1.05×10^5MΩ MIN.					OK
	D.W.Voltage		**	5	—	No abnormality					OK
	Appearance	After test	*	5	—	No abnormality					OK
E Group High Temperature Life	Contact Resistance(mΩ)	Initial	80mΩMAX.	5	150	24.387	28.19	22.21	1.167	27.889	OK
		After test	ΔR=20mΩMAX.			1.446	4.17	-1.42	1.086	4.703	OK
F Group Low Temperature Life	Contact Resistance(mΩ)	Initial	80mΩMAX.	5	150	24.660	27.86	22.61	1.024	27.731	OK
		After test	ΔR=20mΩMAX.			0.239	3.55	-2.71	1.135	3.644	OK
G Group Humidity (Steady State)	Contact Resistance(mΩ)	Initial	80mΩMAX.	5	150	25.154	28.99	21.97	1.265	28.950	OK
		After test	ΔR=20mΩMAX.			0.217	4.43	-3.70	1.359	4.295	OK
	Insulation Resistance(MΩ)	Initial	1500MΩMIN.	5	—	1.14×10^5MΩMIN.					OK
		After test	500MΩMIN.			1.07×10^5MΩMIN.					OK
	D.W.Voltage		**	5	—	No abnormality					OK
	Appearance	After test	*	5	—	No abnormality					OK

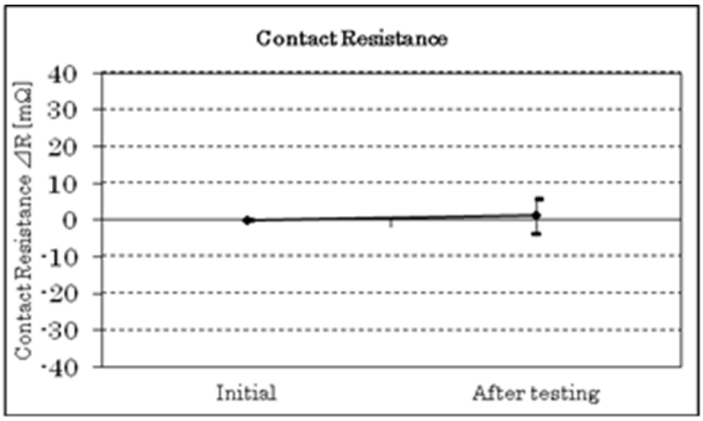
*Appearance Spec.: No abnormality adversely affecting the performance shall occur.

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

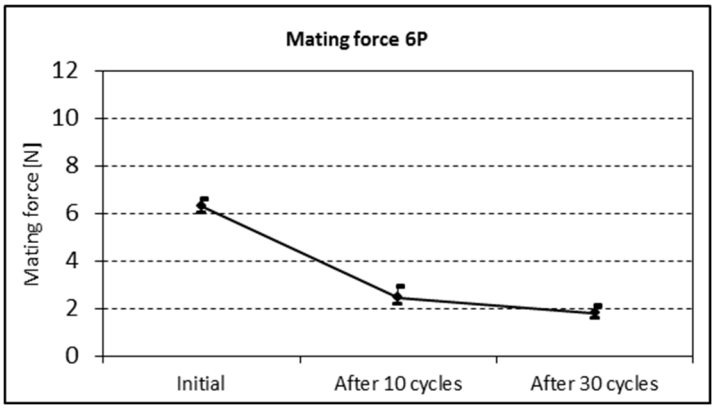
Table.2-3 Test result

Test Item	Contents of Measurement		Specifications	Sample q'ty	n	Data					
						AVE.	MAX.	MIN.	s	X±3s	Judgement
H Group Humidity	Contact Resistance(mΩ)	Initial	80mΩMAX.	5	150	24.696	26.96	21.56	1.199	28.294	OK
		After test	ΔR=20mΩMAX			1.089	4.11	-1.74	1.244	4.821	OK
	Insulation Resistance(mΩ)	Initial	1500MΩMIN.	5	–	1.57×10⁵MΩMIN.					OK
		After test	500MΩMIN.			1.05×10⁵MΩMIN.					OK
	Appearance	After test	*	5	–	No abnormality					OK
J Group Salt Water Spray	Contact Resistance(mΩ)	Initial	80mΩMAX.	5	150	26.230	28.72	23.96	0.936	29.037	OK
		After test	ΔR=20mΩMAX			-0.369	3.04	-2.88	1.246	3.370	OK
	Appearance	After test	*	5	–	No abnormality					OK
K Group Gas(H_2S)	Contact Resistance(mΩ)	Initial	80mΩMAX.	5	150	25.330	26.84	23.42	0.738	27.543	OK
		After test	ΔR=20mΩMAX			0.188	3.43	-2.88	1.327	4.170	OK
	Appearance	After test	*	5	–	No abnormality					OK
L Group Solder Ability	Appearance		95% and over shall be wet	10	–	95% and over was wet					OK
M Group Soldering Heat Resistance	Appearance		*	10	–	No abnormality					OK
N Group Soldering Iron	Appearance		*	10	–	No abnormality					OK
P Group Temperature Rising	30P		⊿T=30℃MAX.	5	–	⊿T=15.5℃ MAX.					OK

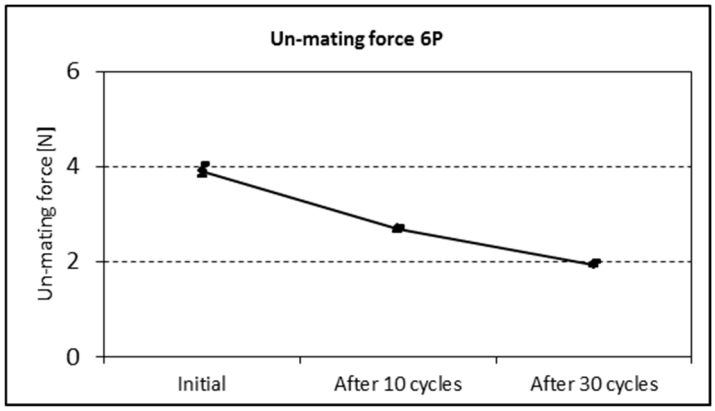
*Appearance Spec.: No abnormality adversely affecting the performance shall occur.



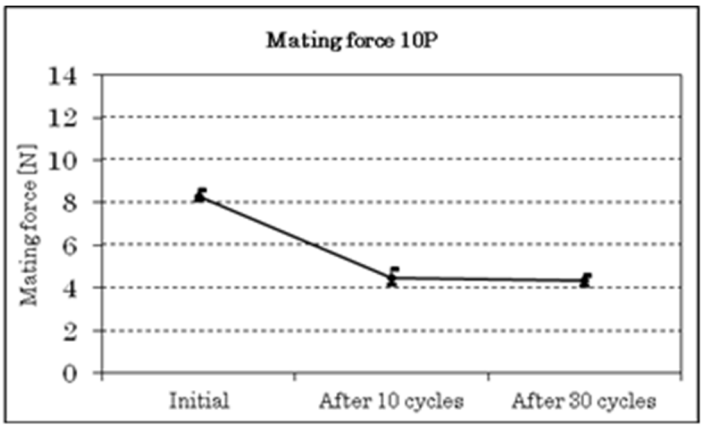
Graph1. A change of contact resistance (A Group: Durability)



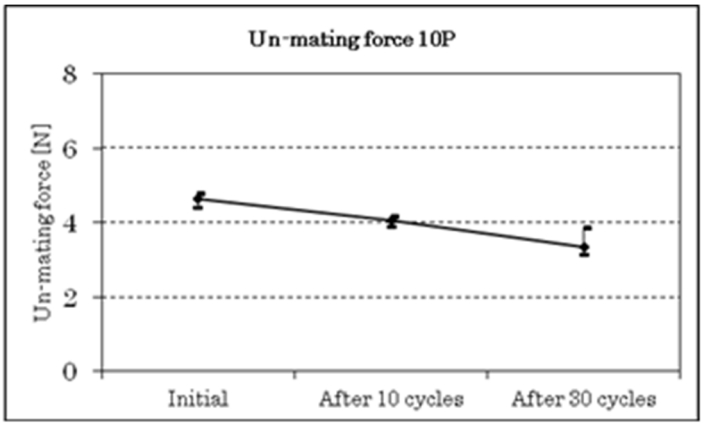
Graph2. A change of mating force【6P】 (A Group: Durability)



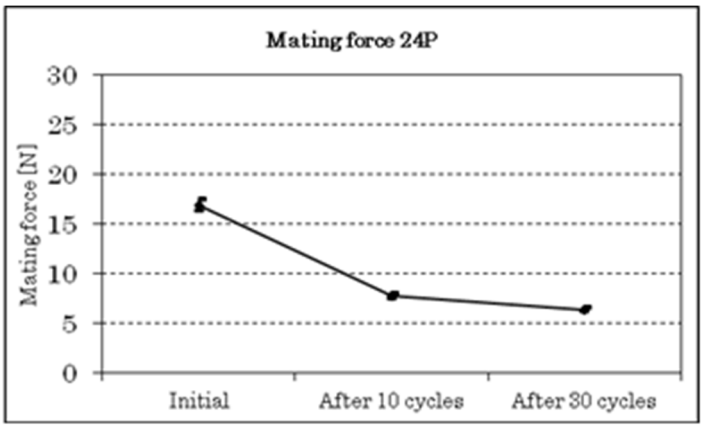
Graph3. A change of un-mating force【6P】 (A Group: Durability)



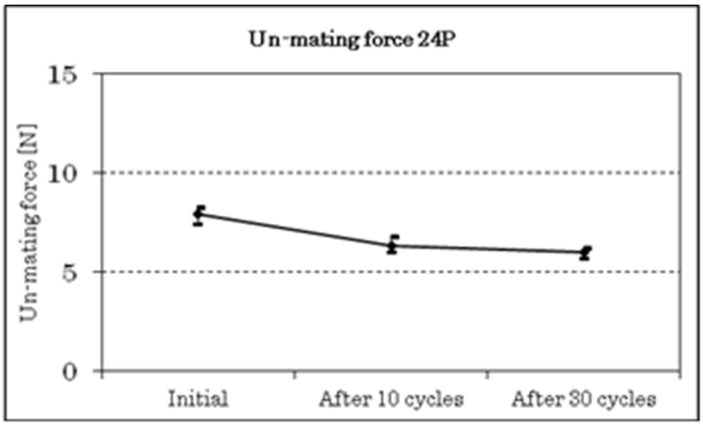
Graph4. A change of mating force【10P】 (A Group: Durability)



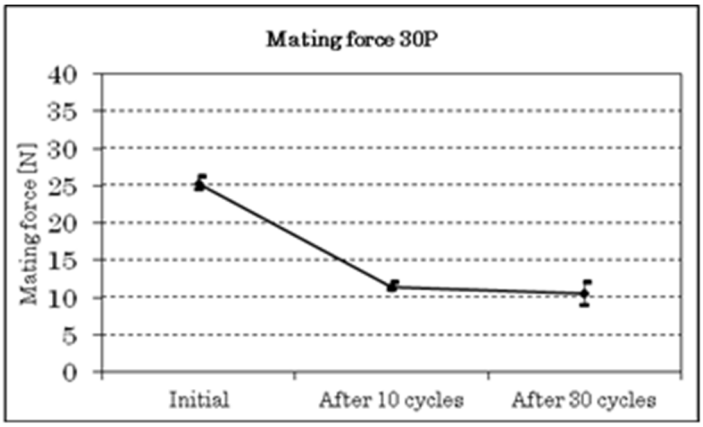
Graph5. A change of un-mating force【10P】 (A Group: Durability)



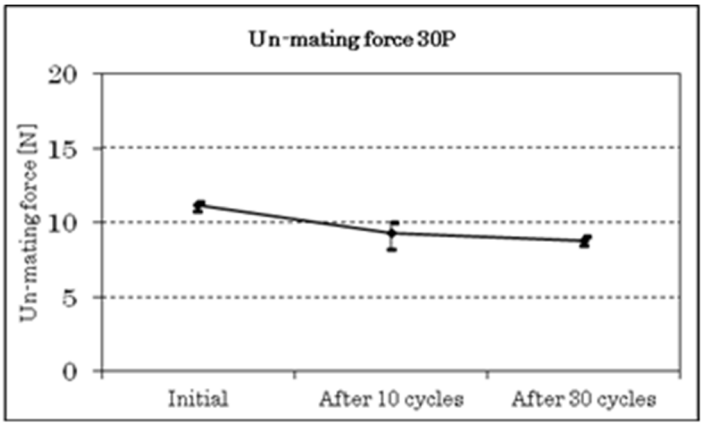
Graph6. A change of mating force【24P】 (A Group: Durability)



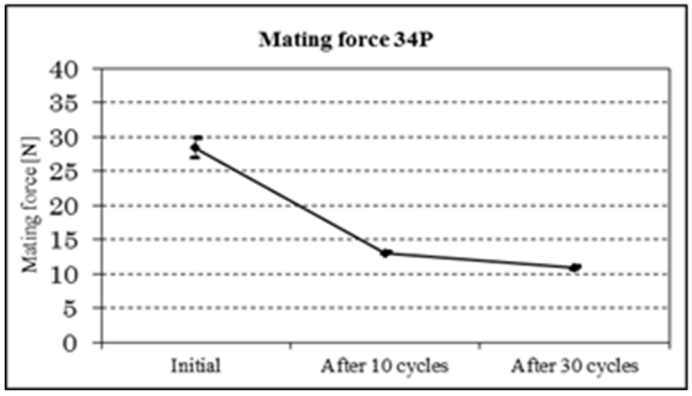
Graph7. A change of un-mating force【24P】 (A Group: Durability)



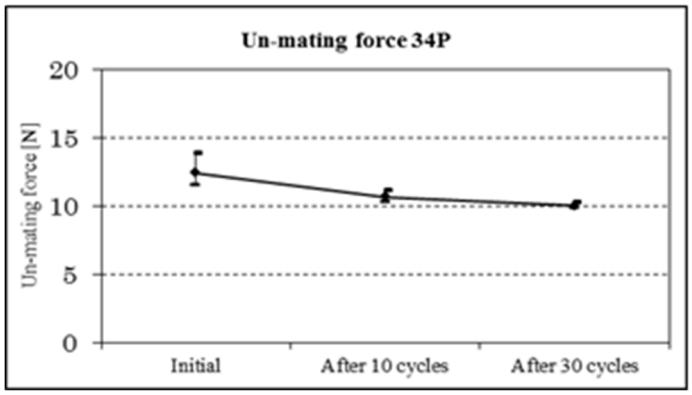
Graph8. A change of mating force【30P】 (A Group: Durability)



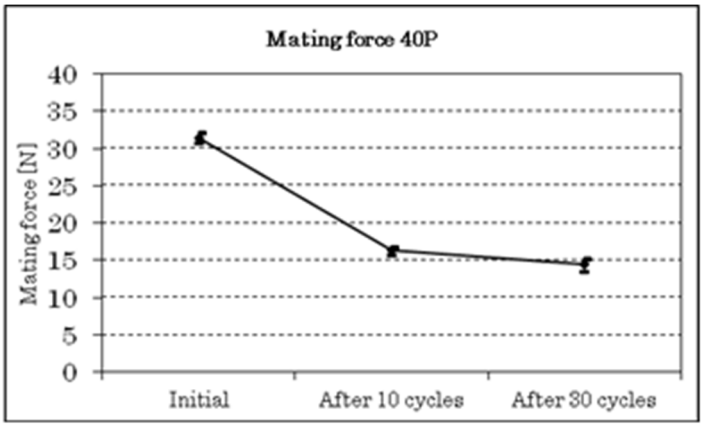
Graph9. A change of un-mating force【30P】 (A Group: Durability)



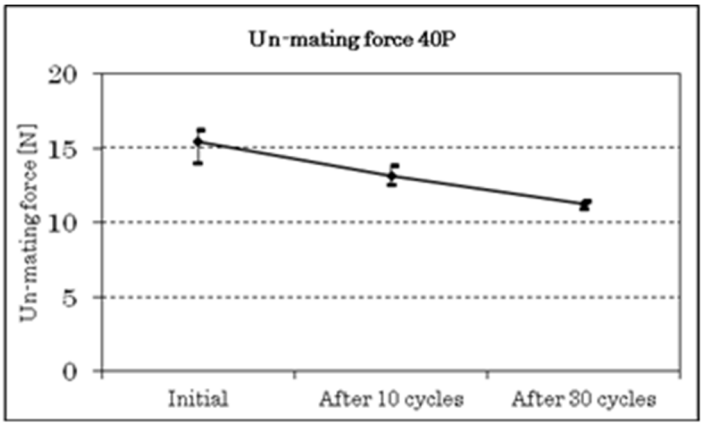
Graph10. A change of mating force【34P】 (A Group: Durability)



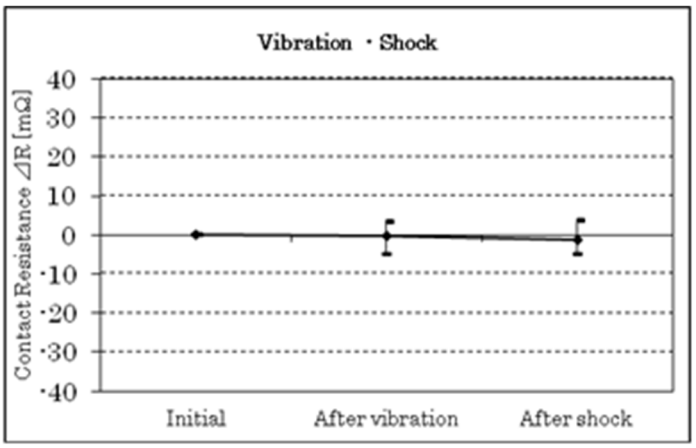
Graph11. A change of un-mating force【34P】 (A Group: Durability)



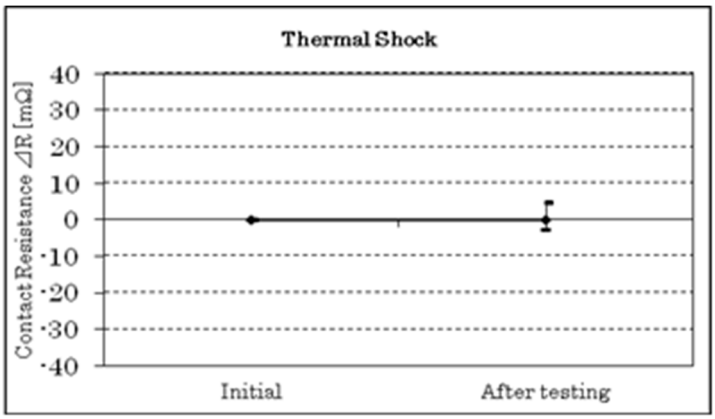
Graph12. A change of mating force【40P】 (A Group: Durability)



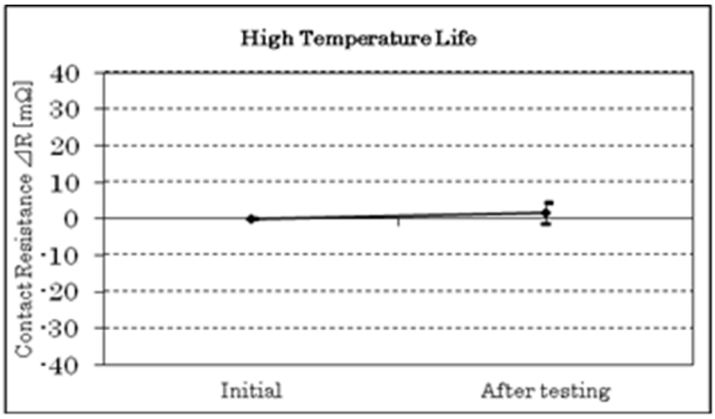
Graph13. A change of un-mating force【40P】 (A Group: Durability)



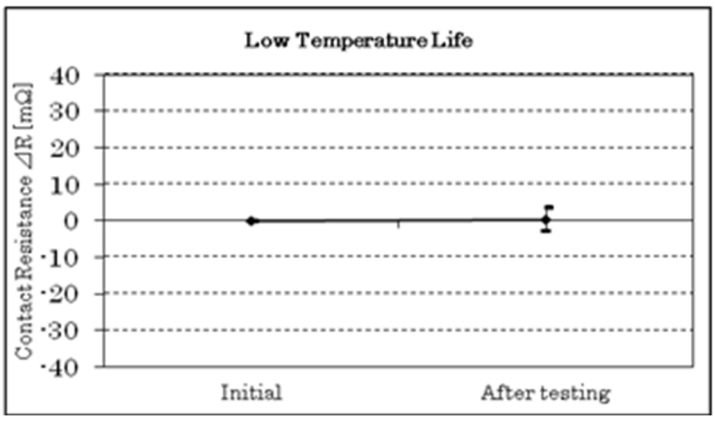
Graph14. A change of contact resistance (C Group : Vibration・shock)



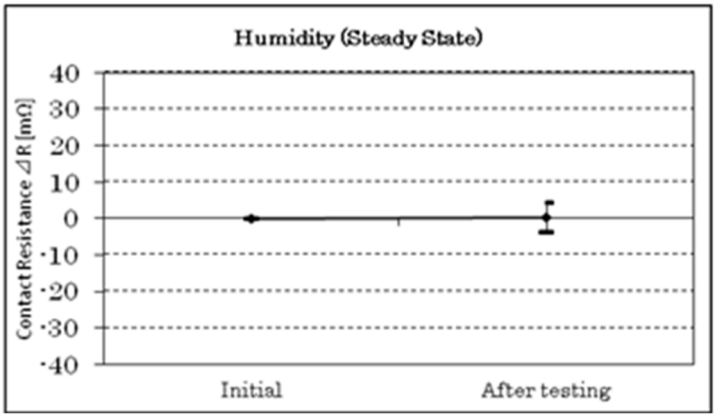
Graph15. A change of contact resistance (D Group: Thermal shock)



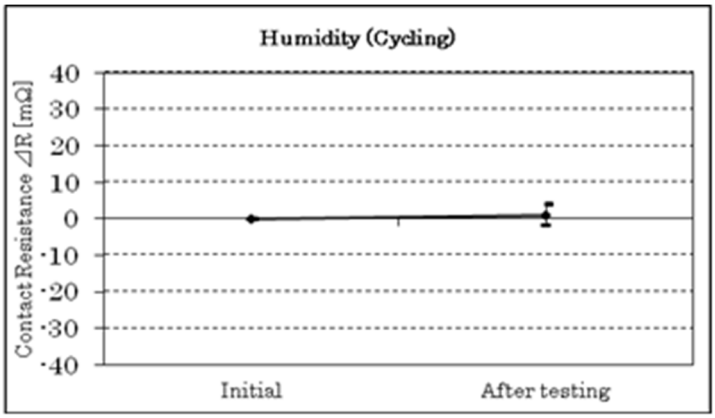
Graph16. A change of contact resistance (E Group: High temperature life)



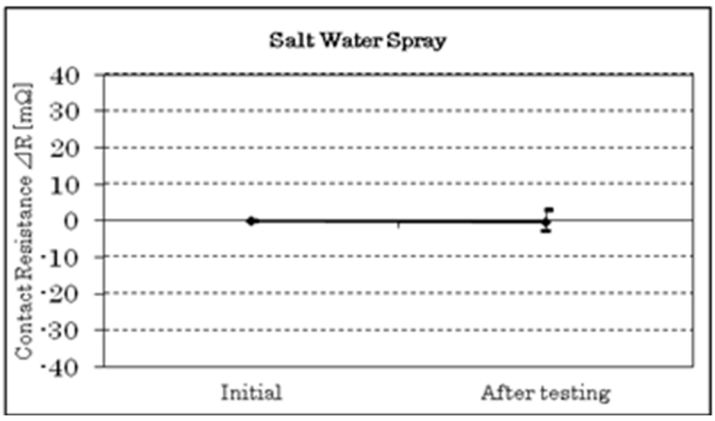
Graph17. A change of contact resistance (F Group: Low temperature life)



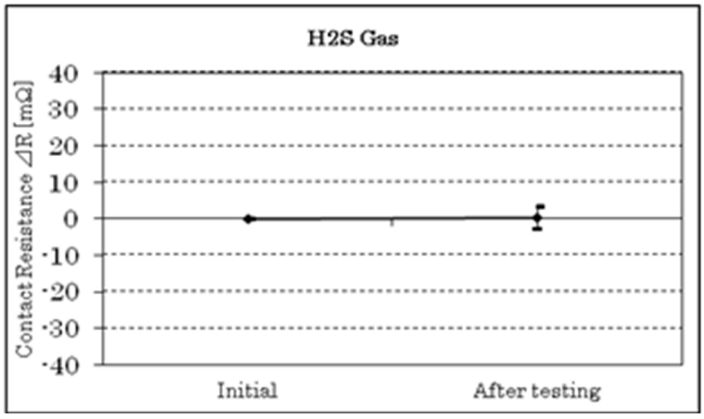
Graph18. A change of contact resistance (G Group: Humidity (Steady state))



Graph 19. A change of contact resistance (H Group: Humidity (Cycling))



Graph20. A change of contact resistance (J Group: Salt water spray)



Graph21. A change of contact resistance (K Group: Gas (H2S))