

MINIFLEX® 5-BFN II L

Part No. 20586-0**E-01

Test Report

Product Specification no. PRS-2056

6	T24021	May 20, 2024	E.Tanaka	M.Muro	T.Masunaga
5	T22009	January 7, 2022	S.Shigekoshi	M.Muro	H.Ikari
4	T19118	October 3, 2019	Y. Sasa	T. Masunaga	H. Ikari
3	T17148	September 4, 2017	H. Aoki	-	Y. Shimada
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of MINIFLEX 5-BFN II L Connector in accordance with PRS-2056.

2. Specimen

(1) MINIFLEX 5-BFN II L (Part No. 20586-0**E-01)

(2) FPC : Made by TAIYO TECHNOLEX CO.,LTD.

Thickness Lead : $t=0.3\pm 0.03$ (Actual measurement : 0.29~0.30mm)

Made by NIPPON ELECTRON, Ltd.

Thickness Lead : $t=0.3\pm 0.03$ (Actual measurement : 0.29~0.30mm)

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 14. For the details of the testing conditions and requirements, see PRS-2056.

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

5. Conclusion

All the specimens met the requirements of PRS-2056.

Table 1 Test Sequence

Test Items	Group															
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
C/T Resistance	2,7			1,3,5	1,3	1,3	1,3	1,5	1,5	1,3	1,3	1,3	1,3			
D.W.Voltage								2,6	2,6							
Insulation Resistance								3,7	3,7							
Temp. rising																1
Act Locking Force	1,5															
Act Un-locking Force	3,6															
FPC Retention Force		1,3														
Durability	4	2														
C/T Retention Force			1													
H/D Retention Force			2													
Vibration				2												
Shock				4												
Fretting Corrosion					2											
Thermal Shock						2										
High Temp. Life							2									
High Temp & High Hum energizing								4								
High Temp & High Hum Life									4							
Cold Temp. Life										2						
Gas (H ₂ S)											2					
Gas (SO ₂)												2				
Salt Water Spray													2			
Solderability														1		
Soldering Heat Resist.															1	
Specimen Quantity.	10 pcs.	10 pcs.	20 pos.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.

※Numbers indicate sequence in which tests are performed.

Table 2-1 Test Result

Test Item	Contents of Measurement		Specifications	Sample q'ty	n	Data					Judge		
						AVE.(X)	MAX.	MIN.	s	X±3s			
A Group Durability	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.351	29.80	22.20	1.874	31.973	Pass		
		After 20th	ΔR=20mΩ MAX.			0.270	3.46	-2.79	1.858	5.844	Pass		
	Act Locking Force(N)	32P	Initial	13.76N MAX. (0.43N/Pos.×32P)	10	10	3.588 (0.112)	3.85 (0.12)	3.41 (0.11)	0.154 (0.005)	4.050 (0.127)	Pass	
			20th cycles				2.703 (0.084)	2.82 (0.09)	2.54 (0.08)	0.093 (0.003)	2.982 (0.093)	Pass	
		34P	Initial	14.62N MAX. (0.43N/Pos.×34P)	10	10	3.818 (0.112)	4.04 (0.12)	3.62 (0.11)	0.144 (0.004)	4.250 (0.125)	Pass	
			20th cycles				2.879 (0.085)	3.00 (0.09)	2.61 (0.08)	0.114 (0.003)	3.221 (0.095)	Pass	
		40P	Initial	17.20N MAX. (0.43N/Pos.×40P)	10	10	4.388 (0.110)	4.62 (0.12)	4.21 (0.11)	0.132 (0.003)	4.784 (0.120)	Pass	
			20th cycles				3.293 (0.082)	3.45 (0.09)	3.10 (0.08)	0.118 (0.003)	3.647 (0.091)	Pass	
		50P	Initial	21.50N MAX. (0.43N/Pos.×50P)	10	10	4.793 (0.096)	4.97 (0.10)	4.61 (0.092)	0.134 (0.003)	5.195 (0.104)	Pass	
			20th cycles				3.717 (0.074)	3.86 (0.077)	3.56 (0.071)	0.126 (0.003)	4.095 (0.082)	Pass	
		54P	Initial	23.22N MAX. (0.43N/Pos.×54P)	10	10	5.261 (0.097)	5.42 (0.10)	4.96 (0.09)	0.174 (0.003)	5.783 (0.107)	Pass	
			20th cycles				3.993 (0.074)	4.14 (0.08)	3.83 (0.07)	0.096 (0.002)	4.281 (0.079)	Pass	
		Act Un-Locking Force(N)	32P	Initial	0.80N MIN. (0.025N/Pos.×32P)	10	10	2.087 (0.065)	2.18 (0.07)	1.98 (0.06)	0.066 (0.002)	1.889 (0.059)	Pass
				20th cycles				1.826 (0.057)	1.97 (0.06)	1.71 (0.05)	0.097 (0.003)	1.535 (0.048)	Pass
	34P		Initial	0.85N MIN. (0.025N/Pos.×34P)	10	10	2.205 (0.065)	2.27 (0.07)	1.98 (0.06)	0.095 (0.003)	1.920 (0.056)	Pass	
			20th cycles				1.850 (0.054)	1.92 (0.06)	1.68 (0.05)	0.066 (0.003)	1.652 (0.049)	Pass	
	40P		Initial	1.00N MIN. (0.025N/Pos.40P)	10	10	2.644 (0.066)	2.91 (0.07)	2.46 (0.06)	0.166 (0.004)	2.146 (0.054)	Pass	
			20th cycles				2.132 (0.053)	2.18 (0.05)	2.06 (0.05)	0.045 (0.001)	1.997 (0.050)	Pass	
	50P		Initial	1.25N MIN. (0.025N/Pos.×50P)	10	10	3.353 (0.067)	3.54 (0.07)	3.17 (0.06)	0.136 (0.002)	2.945 (0.059)	Pass	
			20th cycles				2.883 (0.058)	3.00 (0.06)	2.76 (0.06)	0.071 (0.001)	2.670 (0.053)	Pass	
54P	Initial		1.35N MIN. (0.025N/Pos.×54P)	10	10	3.502 (0.065)	3.67 (0.07)	3.35 (0.06)	0.107 (0.002)	3.181 (0.059)	Pass		
	20th cycles					2.955 (0.055)	3.05 (0.06)	2.85 (0.05)	0.071 (0.001)	2.742 (0.051)	Pass		

Table 2-2 Test Result

Test Item	Contents of Measurement		Specifications	Sample q'ty	n	Data					Judge	
						AVE.(X)	MAX.	MIN.	s	X±3s		
B Group FPC Retention Force(N)	32P	Initial	4.80N MIN. (0.15N/Pos.×32P)	10	10	11.426 (0.357)	11.78 (0.37)	11.13 (0.35)	0.240 (0.008)	10.706 (0.335)	Pass	
		20th cycles				9.984 (0.312)	10.25 (0.32)	9.60 (0.30)	0.226 (0.007)	9.306 (0.291)	Pass	
	34P	Initial	5.10N MIN. (0.15N/Pos.×34P)	10	10	11.972 (0.352)	12.37 (0.36)	11.58 (0.34)	0.208 (0.006)	11.348 (0.334)	Pass	
		20th cycles				10.468 (0.308)	11.17 (0.33)	10.03 (0.30)	0.373 (0.011)	9.349 (0.275)	Pass	
	40P	Initial	6.00N MIN. (0.15N/Pos.×40P)	10	10	14.173 (0.354)	14.54 (0.36)	13.81 (0.35)	0.285 (0.007)	13.318 (0.333)	Pass	
		20th cycles				12.543 (0.314)	13.02 (0.33)	12.02 (0.30)	0.410 (0.010)	11.313 (0.283)	Pass	
	50P	Initial	7.50N MIN. (0.15N/Pos.×50P)	10	10	17.398 (0.348)	17.62 (0.35)	17.18 (0.34)	0.159 (0.003)	16.921 (0.338)	Pass	
		20th cycles				15.181 (0.304)	15.44 (0.31)	14.92 (0.30)	0.175 (0.004)	14.656 (0.293)	Pass	
	54P	Initial	8.10N MIN. (0.15N/Pos.×54P)	10	10	18.638 (0.345)	19.20 (0.36)	18.07 (0.33)	0.293 (0.005)	17.759 (0.329)	Pass	
		20th cycles				16.820 (0.311)	17.36 (0.32)	16.23 (0.30)	0.422 (0.008)	15.554 (0.288)	Pass	
	C Group Retention Force	C/T		0.5N MIN.	10	20	1.294	1.35	1.20	0.041	1.171	Pass
		H/D		0.5N MIN.	10	20	0.883	0.97	0.81	0.050	0.733	Pass
D Group Vibration Shock	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.623	29.98	23.22	1.142	30.049	Pass	
		After Vibration	ΔR=20mΩ MAX.			-1.431	0.62	-2.64	0.782	0.915	Pass	
		After Shock				-1.008	1.70	-2.98	1.115	2.337	Pass	
	Discontinuity	During Vibration	1μsec. MAX.	10	10	No Discontinuity					Pass	
		During Shock				No Discontinuity					Pass	
	Appearance	After Vibration	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass	
After Vibration		No Abnormality					Pass					

Table 2-3 Test Result

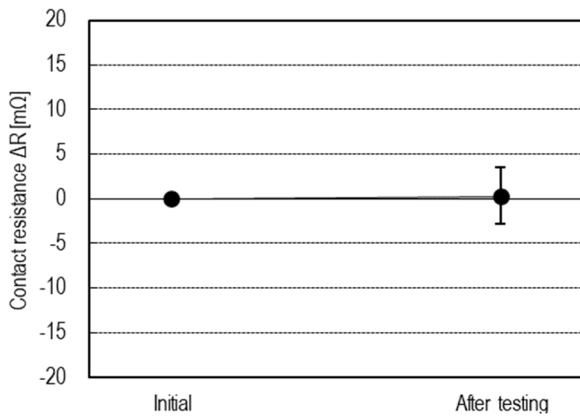
Test Item	Contents of Measurement		Specifications	Sample q'ty	n	Data					Judge	
						AVE.(X)	MAX.	MIN.	s	X±3s		
E Group	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.279	29.70	22.27	1.523	30.848	Pass	
		After Test	ΔR=20mΩ MAX.			-1.640	1.86	-4.08	1.387	2.521	Pass	
	Fretting Corrosion	Discontinuity	In Test	1μsec. MAX.	10	10	No Discontinuity					Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass	
F Group	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.702	29.03	23.88	0.990	29.672	Pass	
		After Test	ΔR=20mΩ MAX.			-1.310	1.37	-3.55	1.100	1.990	Pass	
	Thermal Shock	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
G Group	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	25.864	29.39	22.20	1.293	29.743	Pass	
		After Test	ΔR=20mΩ MAX.			1.797	7.49	-4.04	2.219	8.454	Pass	
	High Temp. Life	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
H Group	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	25.991	29.64	22.28	1.370	30.101	Pass	
		After Test	ΔR=20mΩ MAX.			1.738	5.46	-2.22	1.831	7.231	Pass	
	High Temp. & High Hum. energizing	D.W.Voltage	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur	10	100	No Abnormality					Pass
			After Test				No Abnormality					Pass
		Insulation Resistance (MΩ)	Initial	100MΩ MIN	10	100	MIN. 2.0×10 ⁴ MΩ					Pass
			After Test				MIN. 3.0×10 ³ MΩ					Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass	
J Group	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.399	29.64	22.81	1.251	30.152	Pass	
		After Test	ΔR=20mΩ MAX.			1.990	5.76	-2.40	1.746	7.228	Pass	
	High Temp. & High Hum. Life	D.W.Voltage	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur	10	100	No Abnormality					Pass
			After Test				No Abnormality					Pass
		Insulation Resistance (MΩ)	Initial	100MΩ MIN	10	100	MIN. 2.0×10 ⁴ MΩ					Pass
			After Test				MIN. 2.5×10 ³ MΩ					Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass	

(※1.) The results for Group F (Thermal shock) and Group G (high temperature life) were obtained using FPC made by Made by TAIYO TECHNOLEX CO.,LTD. while the results for the other groups were obtained using FPC made by Made by NIPPON MECTRON, Ltd..

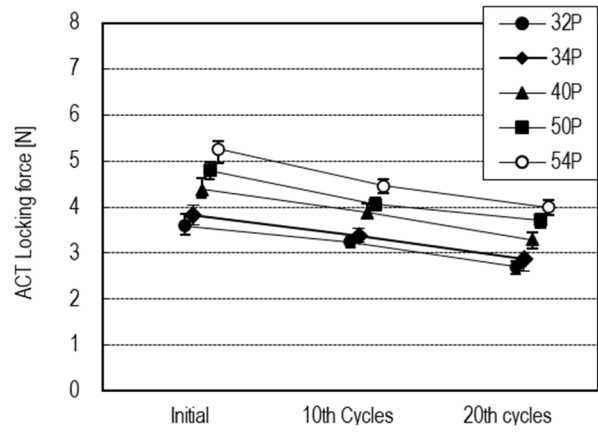
Table 2-4 Test Result

Test Item	Contents of Measurement		Specifications	Sample q'ty	n	Data					Judge
						AVE.(X)	MAX.	MIN.	S	X±3s	
K Group Cold Temp. Life	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.365	29.45	22.88	1.224	30.037	Pass
		After Test	ΔR=20mΩ MAX.			0.043	2.99	-2.98	1.476	4.471	Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
L Group Gas(H ₂ S)	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.433	29.40	23.05	1.134	29.835	Pass
		After Test	ΔR=20mΩ MAX.			0.223	3.90	-2.71	1.398	4.417	Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
M Group Gas(SO ₂)	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.624	30.15	23.04	1.242	30.350	Pass
		After Test	ΔR=20mΩ MAX.			0.359	3.84	-3.19	1.716	5.507	Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
N Group Salt Water Spray	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.312	29.28	22.50	1.317	30.263	Pass
		After Test	ΔR=20mΩ MAX.			1.219	5.64	-2.50	2.006	7.237	Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
P Group Solderability	Zerex Time (sec.)	C/T	3sec. MAX	10	10	MAX. 0.1sec.					Pass
		H/D		10	10	MAX. 0.2sec.					Pass
	Appearance	C/T	Wetness 95% MIN.	10	10	95%MIN.was wet.					Pass
		H/D		10	10	95%MIN.was wet.					
Q Group Soldering Heat Resistance	Reflow twice		No Abnormality	10	10	No Abnormality					Pass
	Soldering iron										
R Group Temp. rising	0.5A/Contact 7.0A/Connector		ΔT=30°C MAX.	10	10	MAX. 26.2°C					Pass

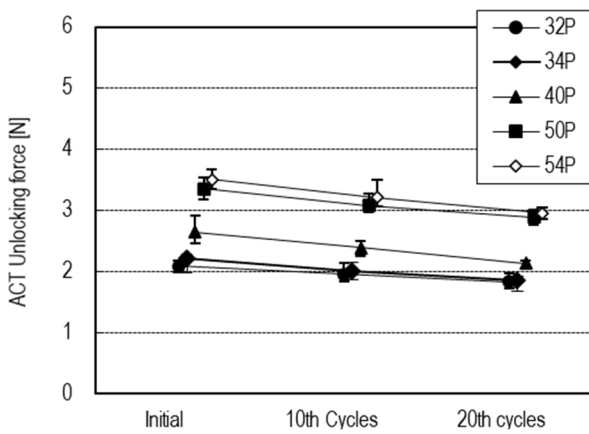
* To evaluate about Temp. Rising Test with FPC made by TAIYO TECHNOLEX CO.,LTD.
(Thickness Lead : t=0.3mm, Length : L=70mm). It is a result of when applied ratings current (0.5A/Contact) between the neighboring contacts for 14pos. (With the whole connector 7.0A).



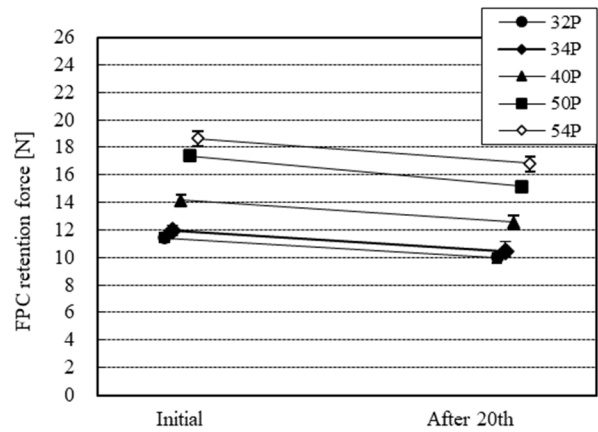
Graph 1. A change of Contact Resistance
A group : Durability



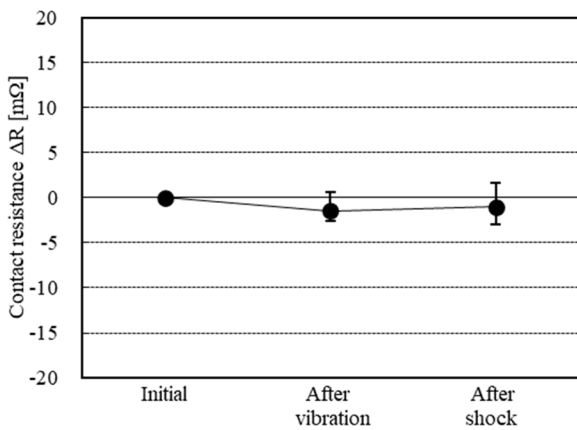
Graph 2. A change of Locking Force
A group : Durability



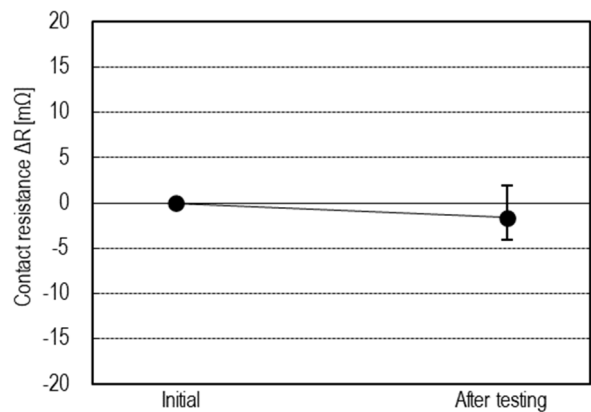
Graph 3. A change of Un-locking Force
A group : Durability



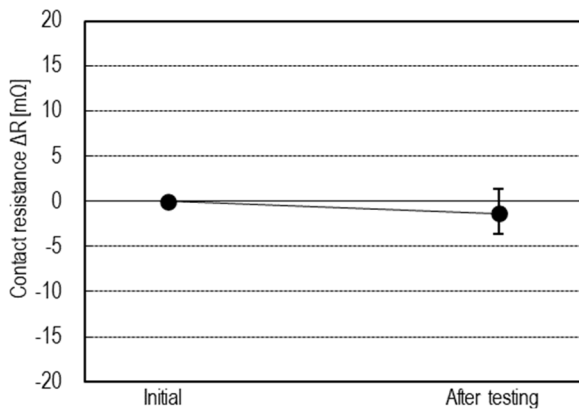
Graph 4. A change of FPC Retention Force
B group : FPC Retention Force



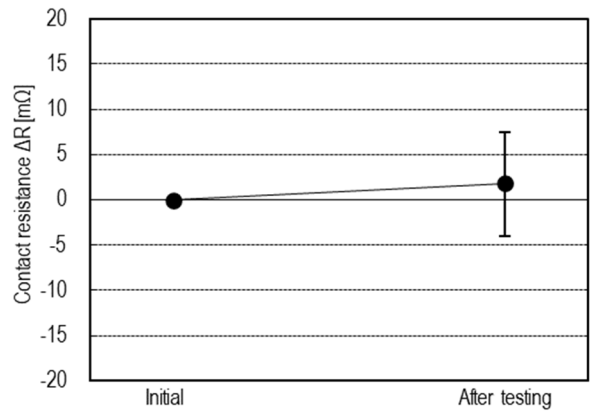
Graph 5. A change of Contact Resistance
D group : Vibration / Shock



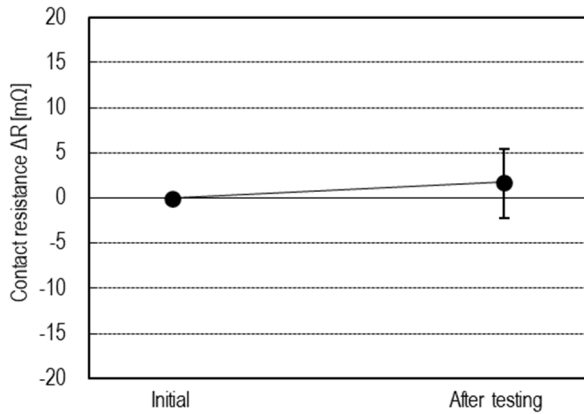
Graph 6. A change of Contact Resistance
E group : Fretting Corrosion



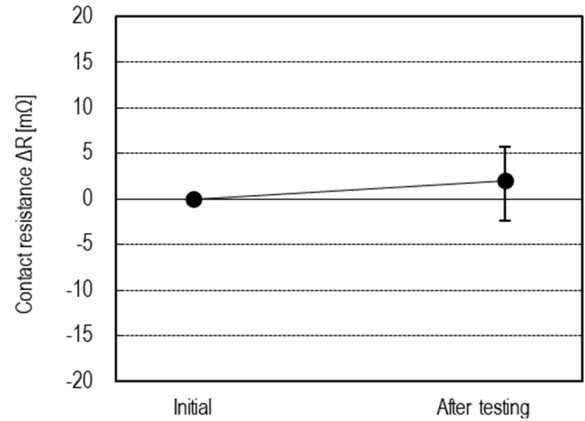
Graph 7. A change of Contact Resistance
F group : Thermal Shock



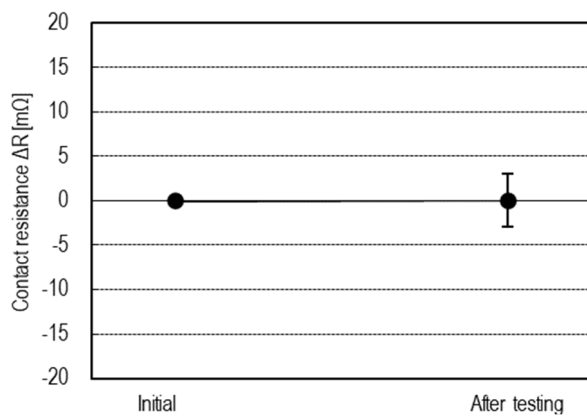
Graph 8. A change of Contact Resistance
G group : High Temp. Life



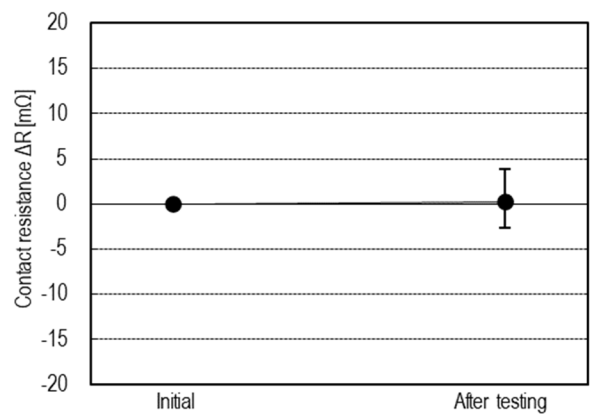
Graph 9. A change of Contact Resistance
H group : High Temp. & High Hum. Energizing



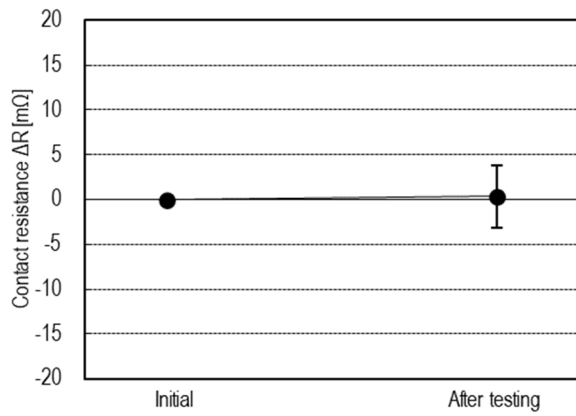
Graph 10. A change of Contact Resistance
J group : High Temp. & High Hum. Life



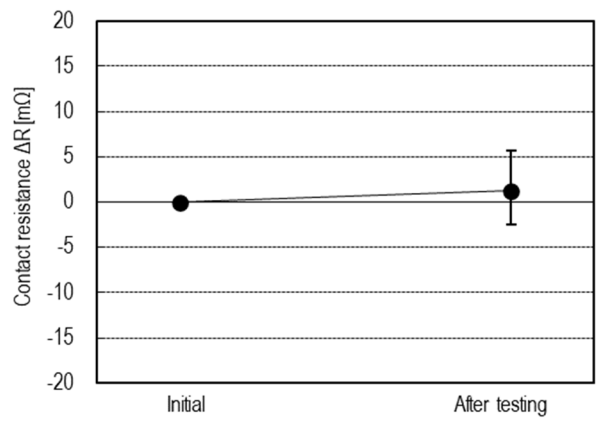
Graph 11. A change of Contact Resistance
K group : Cold Temp. Life



Graph 12. A change of Contact Resistance
L group : Gas (H2S)



Graph 13. A change of Contact Resistance
M group : Gas (SO₂)



Graph 14. A change of Contact Resistance
N group : Salt Water Spray