

MHF® 7S Connector

Part No. Plug: 20980-001R-13 Receptacle: 20981-001E-02

Test Report

Product Specification no. PRS-2676

4	T22072	May 20, 2022	T. Takuno	K. Yufu	Y. Hashimoto
3	T22063	April 15, 2022	H.Lu	Y.Shimizu	M.Takemoto
2	T21114	October 27, 2021	Y. Imaji	H. Nakamura	Hiro Takahashi
1	T20104	December 15, 2020	Y. Imaji	H. Nakamura	Hiro Takahashi
Rev.	ECN	Date	Prepared by	Checked by	Approved by

MHF 7S Connector Test Report

1. Purpose

To evaluate the performance of MHF 7S Connector in accordance with PRS-2676.

2. Specimen

- (1) MHF 7S PLUG (Part No. 20980-001R-13)
- (2) MHF 7S RECEPTACLE (Part No. 20981-001E-02)
- (3) Applicable cable1 (Refer to PRS-2676 for specifications.)

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 10. For the details of the testing conditions and requirements, see PRS-2676.

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

Test results for applicable cable 1 are shown as representative.

5. Conclusion

All the specimens met the requirements of PRS-2676.

Table 1 Test Sequence and Sample Quantity

Tost	t Item								Group	1						
rest	i item	Α	В	С	D	Е	F	G	Н	J	K	L	М	N	Р	Q
Contact Resis	stance					1,3		1,3	1,3	1,5	1,3	1,5	1,3	1,3		
Insulation resi	istance									2,6		2,6				
Dielectric withs	tanding voltage	1								3,7		3,7				
VSWR			1													
Mating force/L	Jnmating force			1												
Cabel retention	force at 0 degree				1											
Durability						2										
Shearing stre	ngth						1									
Vibration								2								
Shock									2							
Thermal shoo	:k									4						
High tempera	ture life										2					
Humidity stea	dy state											4				
Salt Water Sp	oray												2			
H₂S Gas														2		
Solderability															1	
Soldering Hea	t Resistance															1
Sample	Plug	10	10	10	10	10	_	10	10	10	10	10	10	10	_	_
Quantity (pcs.)	Receptacle	10	10	10	10	10	20	10	10	10	10	10	10	10	10	10
Test boa	ard (pcs.)	10	10	10	10	10	20	10	10	10	10	10	10	10	10	10

^{*}Numbers indicate test sequences

•	Table 2-1	Test Result	t	
	_	Linit	A\ /⊏	MAN

	Testitems	Measu	rements	Spec.	n	Unit	AVE.	MAX.	MIN.	S	Judg	
	Dielectric			Casa . Na ab			nin a dia ahana	- Anglesson is		alaum aaaun	Π	
Α	withstanding	Initial		Spec : No ab	normanues	such as cree	ping discharge	e, īlasnover, lī	isulator break	kaown occur.	-	
	voltage			_	10	-	Results : No	abnormality			OK	
						1	<u> </u>				ļ.	
В	VSWR	0.1∼3GHz		1.30 MAX.	10	-	1.076	1.09	1.07	0.005	OK	
	(Mating condition)	3 ~ 6 GHz		1.35 MAX.	10	-	1.082	1.09	1.07	0.008	OK	
		6 ~ 9 GHz		1.40 MAX.	10	-	1.087	1.11	1.07	0.011	OK	
		9~12 GHz		1.45 MAX.	10	-	1.095	1.13	1.05	0.018	OK	
		12~15 GHz		1.50 MAX.	10	-	1.083	1.12	1.05	0.017	OK	
С	Mating force	Initial		30 N MAX.	10	N	17.52	19.5	15.9	1.18	OK	
	Iviality lorce	30 cycles		30 N MAX.	10	N	8.74	9.9	7.6	0.82	OK	
		Initial		20 N MAX.	10	N	8.19	9.3	7.4	0.54	OK	
	Unmating	imidai		5 N MIN.	10	11	0.10	3.0	7.4	0.04	Oiv	
	force	30 cycles		20 N MAX.	10	N	5.08	5.8	4.5	0.40	OK	
		00 0,0.00		3 N MIN.		1,	0.00	0.0	1.0	0.10	011	
				Τ -							ı	
D	Cable	Electrical dis	Electrical discontinuity		ec.: No electrical discontinuity greater than 1µsec.							
	retention			-	10	-	Results : No	· · · · · · · · · · · · · · · · · · ·			OK	
	force at	Appearance	Initial	*1	10				g the performance		OK	
	0 degree	1	After testing	*1	10		No abnormality	adversely affectir	g the performance	e occurred.	OK	
	•	ļ	•			-	-				!	
_	In the					1	!					
Е	Durability	Contact resi	stance of con	tact								
E	Durability	Contact resis	stance of con		10		7.21	l 70	l 6.7	I 0.47	OK	
E	Durability	Contact resis	Initial	tact 20 MAX.	10	mΩ	7.21	7.9	6.7	0.47	ОК	
E	Durability	Contact resis	Initial After testing	20 MAX.	10	mΩ	10.06	12.7	8.0	1.53	-	
E	Durability		Initial After testing ⊿R	20 MAX. - 20 MAX.							-	
E	Durability	Contact resis	Initial After testing ⊿R stance of grou	20 MAX. 20 MAX. und contact	10 10	mΩ mΩ	10.06	12.7 5.1	8.0	1.53 1.49	- OK	
E	Durability	Contact resis	Initial After testing ⊿R stance of grou	20 MAX. - 20 MAX.	10 10	$m\Omega$ $m\Omega$	10.06 2.85 5.96	12.7 5.1 6.3	8.0 0.8 5.8	1.53 1.49 0.17	- OK	
E	Durability	Contact resis	Initial After testing ⊿R stance of ground initial After testing	20 MAX. 20 MAX. und contact 20 MAX.	10 10 10 10	$\begin{array}{c c} m\Omega \\ m\Omega \\ \end{array}$	10.06 2.85 5.96 6.27	12.7 5.1 6.3 6.6	8.0 0.8 5.8 6.0	1.53 1.49 0.17 0.17	OK	
E	Durability	Contact resis	Initial After testing ⊿R stance of ground Initial After testing ⊿R	20 MAX. - 20 MAX. und contact 20 MAX. - 20 MAX.	10 10 10 10 10	$m\Omega$ $m\Omega$	10.06 2.85 5.96 6.27 0.31	12.7 5.1 6.3 6.6 0.6	8.0 0.8 5.8 6.0 0.0	1.53 1.49 0.17 0.17 0.19	- OK	
E	Durability	Contact resis	Initial After testing ⊿R stance of ground initial After testing ⊿R Initial	20 MAX. 20 MAX. und contact 20 MAX. 20 MAX. - 20 MAX.	10 10 10 10 10 10	$\begin{array}{c c} m\Omega \\ m\Omega \\ \end{array}$	10.06 2.85 5.96 6.27 0.31 No abnormality	12.7 5.1 6.3 6.6 0.6 adversely affectir	8.0 0.8 5.8 6.0 0.0 g the performance	1.53 1.49 0.17 0.17 0.19 e occurred.	- ОК ОК - ОК	
E	Durability	Contact resis	Initial After testing ⊿R stance of ground Initial After testing ⊿R	20 MAX. - 20 MAX. und contact 20 MAX. - 20 MAX.	10 10 10 10 10	$\begin{array}{c c} m\Omega \\ m\Omega \\ \end{array}$	10.06 2.85 5.96 6.27 0.31 No abnormality	12.7 5.1 6.3 6.6 0.6 adversely affectir	8.0 0.8 5.8 6.0 0.0	1.53 1.49 0.17 0.17 0.19 e occurred.	- ОК ОК - ОК	
	Durability	Contact resis	Initial After testing ⊿R stance of ground initial After testing ⊿R Initial After testing	20 MAX. - 20 MAX. und contact 20 MAX. - 20 MAX. +1 *1	10 10 10 10 10 10 10	mΩ mΩ mΩ mΩ mΩ	10.06 2.85 5.96 6.27 0.31 No abnormality	12.7 5.1 6.3 6.6 0.6 adversely affectinadversely affectin	8.0 0.8 5.8 6.0 0.0 g the performance	1.53 1.49 0.17 0.17 0.19 e occurred.	OK OK	
E		Contact resis	Initial After testing ⊿R stance of ground initial After testing ⊿R Initial After testing Direction 1	20 MAX. 20 MAX. und contact 20 MAX. 20 MAX. - 20 MAX.	10 10 10 10 10 10	$\begin{array}{c c} m\Omega \\ m\Omega \\ \end{array}$	10.06 2.85 5.96 6.27 0.31 No abnormality	12.7 5.1 6.3 6.6 0.6 adversely affectir	8.0 0.8 5.8 6.0 0.0 g the performance	1.53 1.49 0.17 0.17 0.19 e occurred.	- ОК ОК - ОК	
	Receptacle	Contact resis	Initial After testing ⊿R stance of ground initial After testing ⊿R Initial After testing Direction 1 Direction 2	20 MAX. - 20 MAX. und contact 20 MAX. - 20 MAX. +1 *1	10 10 10 10 10 10 10	mΩ mΩ mΩ mΩ mΩ	10.06 2.85 5.96 6.27 0.31 No abnormality s	12.7 5.1 6.3 6.6 0.6 adversely affectir	8.0 0.8 5.8 6.0 0.0 g the performance the performance that the performan	1.53 1.49 0.17 0.17 0.19 e occurred.	- OK OK OK	

^{*1:} No abnormality adversely affecting the performance shall occur.

Table 2-2 Test Result

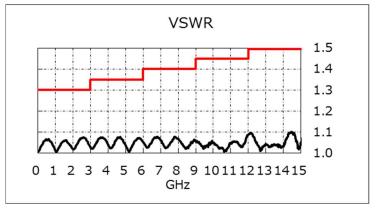
	Test items	Measu	rements	Spec.	n	Unit	AVE.	MAX.	MIN.	S	Judge	
G	Vibration	1			I.	I .					1	
		Contact resis	stance of con	tact								
			Initial	20 MAX.	10	mΩ	7.38	9.0	6.8	0.64	OK	
			After testing	-	10	mΩ	7.12	8.9	6.6	0.67	-	
			⊿R	20 MAX.	10	mΩ	-0.26	-0.1	-1.0	0.27	OK	
		Contact resistance of ground contact										
			Initial	20 MAX.	10	mΩ	5.93	6.1	5.4	0.21	OK	
			After testing	-	10	mΩ	6.06	6.3	5.6	0.22	-	
			⊿R	20 MAX.	10	mΩ	0.13	0.4	0.0	0.13	OK	
		Electrical dis	scontinuity	Spec.: No e	lectrical disc	ontinuity grea	ter than 1µsed	shall occur.		•	-	
				-	10	-	Results : No	discontinity			OK	
		Appearance	Initial	*1	10		No abnormality	adversely affectin	g the performance	e occurred.	OK	
		Appearance	After testing	*1	10		No abnormality	adversely affectin	g the performance	e occurred.	OK	
Н	Shock											
		Contact resis	stance of con	tact								
		Contact resis	stance of con	tact 20 MAX.	10	mΩ	7.16	7.4	6.8	0.24	OK	
		Contact resis			10	mΩ mΩ	7.16 7.01	7.4 7.5	6.8 6.6	0.24 0.27	OK -	
		Contact resis	Initial			ļ				-	-	
			Initial After testing	20 MAX. - 20 MAX.	10	mΩ	7.01	7.5	6.6	0.27	-	
			Initial After testing ⊿R	20 MAX. - 20 MAX.	10	mΩ	7.01	7.5	6.6	0.27	- OK	
			Initial After testing ⊿R stance of grou	20 MAX. 20 MAX. und contact	10	mΩ mΩ	7.01 -0.15	7.5 0.2	6.6	0.27	- OK	
			Initial After testing ⊿R stance of groundinitial	20 MAX. 20 MAX. und contact	10 10	$m\Omega$ $m\Omega$	7.01 -0.15	7.5 0.2 6.6	6.6 -0.7	0.27 0.25 0.19		
		Contact resis	Initial After testing ⊿R stance of ground initial After testing ⊿R	20 MAX. 20 MAX. und contact 20 MAX. - 20 MAX.	10 10 10 10 10	$\begin{array}{c c} m\Omega \\ m\Omega \\ \hline m\Omega \\ m\Omega \\ \hline m\Omega \\ m\Omega \end{array}$	7.01 -0.15 6.20 6.61	7.5 0.2 6.6 7.0 0.7	6.6 -0.7 6.0 6.1 0.1	0.27 0.25 0.19 0.27	- OK OK -	
			Initial After testing ⊿R stance of ground initial After testing ⊿R	20 MAX. 20 MAX. und contact 20 MAX. - 20 MAX.	10 10 10 10 10	$\begin{array}{c c} m\Omega \\ m\Omega \\ \hline m\Omega \\ m\Omega \\ \hline m\Omega \\ m\Omega \end{array}$	7.01 -0.15 6.20 6.61 0.41	7.5 0.2 6.6 7.0 0.7 c. shall occur.	6.6 -0.7 6.0 6.1 0.1	0.27 0.25 0.19 0.27	- OK OK - OK -	
		Contact resis	Initial After testing ⊿R stance of ground initial After testing ⊿R scontinuity	20 MAX. 20 MAX. und contact 20 MAX. - 20 MAX.	10 10 10 10 10 lectrical disc	$\begin{array}{c c} m\Omega \\ m\Omega \\ \hline m\Omega \\ m\Omega \\ \hline m\Omega \\ \hline m\Omega \\ \hline continuity greater \\ \end{array}$	7.01 -0.15 6.20 6.61 0.41 ter than 1µsec Results : No	7.5 0.2 6.6 7.0 0.7 c. shall occur.	6.6 -0.7 6.0 6.1 0.1	0.27 0.25 0.19 0.27 0.17	- ОК ОК	

Table 2-3 Test Result

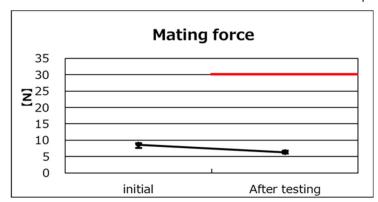
T	Γest items	Measur	rements	Spec.	n	Unit	AVE.	MAX.	MIN.	S	Judge
J T	hermal sho	ck		•	•	•	•		•		•
		Contact resis	stance of con	tact							
			Initial	20 MAX.	10	mΩ	7.03	7.5	6.6	0.31	OK
			After testing	-	10	mΩ	7.07	8.1	6.7	0.48	-
			⊿R	20 MAX.	10	mΩ	0.04	0.7	-0.4	0.29	OK
		Contact resis	stance of grou	und contact							
			Initial	20 MAX.	10	mΩ	6.25	6.6	6.0	0.16	OK
			After testing	-	10	mΩ	7.15	7.8	6.7	0.31	-
			⊿R	20 MAX.	10	mΩ	0.90	1.2	0.3	0.28	OK
		Insulation	Initial	500 MIN.	10	МΩ	10,000 (mini	mum value)			OK
		resistance	After testing	100 MIN.	10	МΩ	10,000 (mini	mum value)			OK
		Dielectric	Initial	*2	10		No abnorma	lity			OK
		withstanding voltage	After testing	*2	10		No abnorma	lity			OK
		A	Initial	*1	10		No abnormality	adversely affectin	g the performance	e occurred.	OK
		Appearance	After testing	*1	10		No abnormality	adversely affectin	g the performanc	e occurred.	ОК
				<u> </u>	ļ	!					ļ
К Н	igh tempera	ature life									
	<u> </u>		stance of con	tact							
			Initial	20 MAX.	10	mΩ	7.16	8.2	6.6	0.44	ОК
			After testing	-	10	mΩ	6.86	7.4	6.4	0.34	-
			⊿R	20 MAX.	10	mΩ	-0.31	-0.1	-0.8	0.22	ОК
		Contact resis	stance of gro	und contact		I	_	<u> </u>			
			Initial	20 MAX.	10	mΩ	5.84	6.0	5.6	0.13	ОК
			After testing	-	10	mΩ	6.75	7.0	6.5	0.16	_
			⊿R	20 MAX.	10	mΩ	0.91	1.1	0.7	0.11	ОК
			Initial	*1	10						OK
		Appearance			10		No abnormality adversely affecting the performance occurred. No abnormality adversely affecting the performance occurred.				
			After testing *1 10 No abnormality adversely affecting the performance occurred.								OK
L H	umidity(Ste	adv Stata)									
` <u>''</u>	• •	Contact resis	stance of con	tact							
			Initial	20 MAX.	10	mΩ	7.22	7.5	6.9	0.19	ОК
			After testing	LU IVITVA.	10	mΩ	7.26	7.5	7.0	0.19	OIL
			⊿R	20 MAX.	10	mΩ	0.04	0.3	-0.1	0.17	- OK
		Contact resis			10	11177	0.04	0.3	-0.1	0.12	UK
					10		E 72	60		0.40	OK
			Initial	20 MAX.	10	mΩ	5.73	6.0	5.5	0.18	+
			After testing		10	mΩ	6.04	6.3	5.8	0.18	-
		la a da C	⊿R	20 MAX.	10	mΩ	0.31	0.4	0.2	0.06	OK
		Insulation	Initial	500 MIN.	10	MΩ	10,000 (mini	,			OK
		resistance Dielectric	After testing	100 MIN.	10	MΩ	10,000 (mini	,			OK
		withstanding	Initial	*2	10		No abnorma				OK
		voltage	After testing	*2	10		No abnorma	•			OK
		Appearance	Initial	*1	10		No abnormality				OK
			After testing	*1	10		No abnormality	adversely affectin	g the performanc	e occurred.	OK

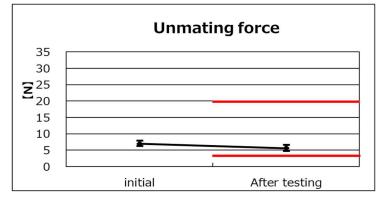
^{*2:} No abnormalities such as creeping discharge, flashover, and insulator breakdown

					Table 2-4	Test Resu	ult				
	Testitems	Measu	rements	Spec.	n	Unit	AVE.	MAX.	MIN.	S	Judg
М	Salt water sp	ray		·		•		•		•	
		Contact resis	stance of con	tact							
			Initial	20 MAX.	10	mΩ	7.17	8.1	6.7	0.41	OK
			After testing	-	10	mΩ	7.27	8.0	6.6	0.44	-
			⊿R	20 MAX.	10	mΩ	0.10	0.8	-1.1	0.55	OK
		Contact resis	stance of grou	ind contact		•	•	•	•		•
			Initial	20 MAX.	10	mΩ	5.80	6.6	5.5	0.33	OK
			After testing	-	10	mΩ	6.40	7.3	5.8	0.44	-
			⊿R	20 MAX.	10	mΩ	0.59	1.1	0.2	0.25	ОК
		Annogrango	Initial	*1	10		No abnormality	adversely affectin	g the performance	e occurred.	OK
		Appearance	After testing	*1	10		No abnormality	adversely affectin	g the performance	e occurred.	OK
			After testing	- 20 MAX	10	mΩ mQ	6.90	7.9 0.4	6.3 -1.3	0.44	- Ok
			Initial	20 MAX.	10	mΩ	7.25	8.4	6.3	0.57	OK
			⊿R	20 MAX.	10	mΩ	-0.35	0.4	-1.3	0.43	OK
		Contact resis	stance of grou	und contact		1		1	I.		ļ
			Initial	20 MAX.	10	mΩ	5.82	6.0	5.7	0.12	OK
			After testing	-	10	mΩ	6.14	6.5	5.9	0.21	-
			⊿R	100 MAX.	10	mΩ	0.32	0.5	0.2	0.11	OK
		Annogranos	Initial	*1	10		No abnormality	adversely affecting	g the performance	e occurred.	OK
		Appearance	After testing	*1	10		No abnormality	adversely affecting	g the performance	e occurred.	OK
	Test items	Measui	rements	Spec.	n	Unit	AVE.	MAX.	MIN.	S	Judg
Р	Solderabilit	V			e than 95% of	he dipped s	urface shall be	e evenly wet.	<u> </u>	<u>l</u>	
				-	10	-	No abnorma				OK
Q	ISoldering he	at resistance		Spec · No.	deformation no	or defect adv	ersely affecting	the performs	ince occur		
×.	Tooldoning in	at i colotal loc		Opco 140 (. Goldol adv	Cioony andouning		00001.		

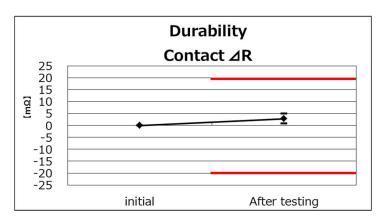


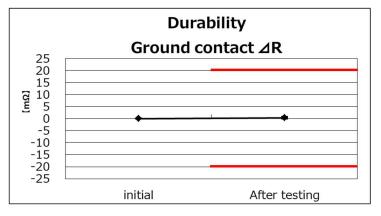
Graph 1. Group B VSWR



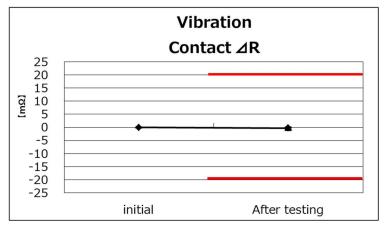


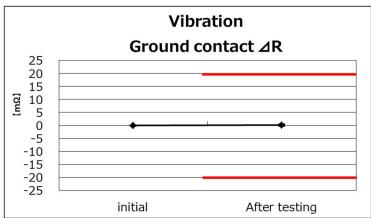
Graph 2. Group C Mating & Unmating force





Graph 3. Group E Durability

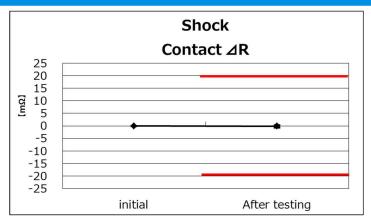


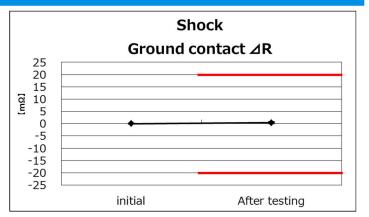


Graph 4. Group G Vibration

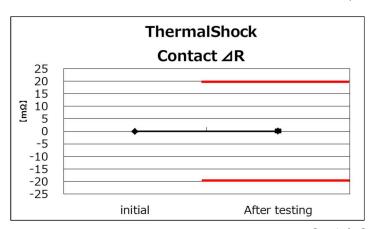
Confidential C

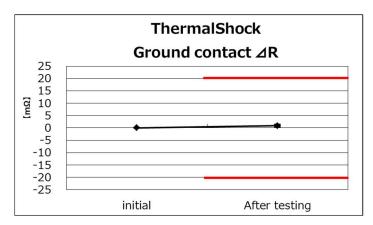




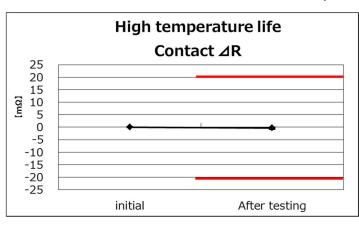


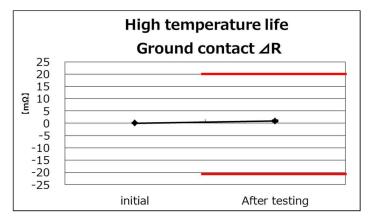
Graph 5. Group H Shock



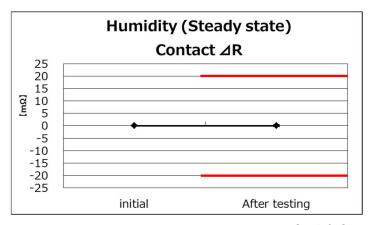


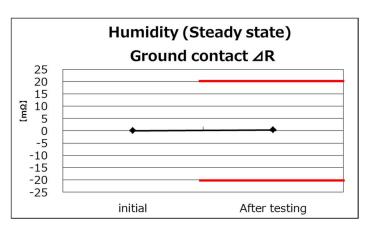
Graph 6. Group J Thermal shock





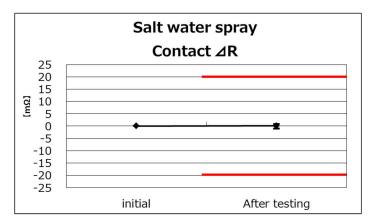
Graph 7. Group K High temperature life

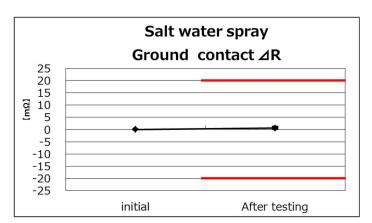




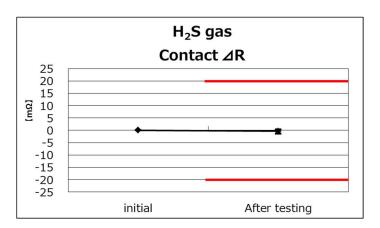
Graph 8. Group L Humidity steady state

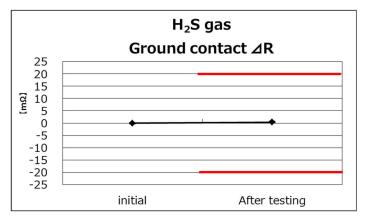
I-PEX





Graph 9. Group M Salt water spray





Graph 10. Group N H₂S gas