

# CABLINE®-UM

Part No. Plug: 20877-0\*\*T-0#, Receptacle: 20879-0\*\*E-02

## Test Report

Product Specification no. PRS-2514

|      |        |                   |             |            |             |
|------|--------|-------------------|-------------|------------|-------------|
| 3    | T21120 | October 27, 2021  | T.Masunaga  | -          | H.Ikari     |
| 2    | T21031 | May 13, 2021      | T.Masunaga  | -          | H.Ikari     |
| 1    | T20060 | August 17, 2020   | T.Ono       | T.Masunaga | H.Ikari     |
| 0    | T19092 | September 3, 2019 | R.Morita    | T.Masunaga | H.Ikari     |
| Rev. | ECN    | Date              | Prepared by | Checked by | Approved by |

## 1. Purpose

To evaluate the performance of CABLINE-UM Connector in accordance with PRS-2514.

## 2. Specimen

- (1) CABLINE-UM PLUG CABLE ASS'Y (Part No. 20877-0\*\*T-0#)
- (2) CABLINE-UM RECEPTACLE ASS'Y (Part No. 20879-0\*\*E-02)

## 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 18. For the details of the testing conditions and requirements, see PRS-2514.  
The “n” in the tables show the number of measurement points.

## 5. Conclusion

All the specimens met the requirements of PRS-2514.

Table 1 Test Sequence and Sample Quantity

| Test Item                 | Group  |         |        |        |        |        |        |                 |        |        |         |         |        |
|---------------------------|--------|---------|--------|--------|--------|--------|--------|-----------------|--------|--------|---------|---------|--------|
|                           | A      | B       | C      | D      | E      | F      | G      | H               | I      | J      | K       | L       | M      |
| Contact Resistance        | 2,6    |         |        | 1,3,5  | 1,5    | 1,3    | 1,5    | 1,5,7           | 1,3    | 1,3    |         |         |        |
| Insulation Resistance     |        |         |        |        | 2,6    |        | 2,6    | 2,8             |        |        |         |         |        |
| D. W. Voltage             |        |         |        |        | 3,7    |        | 3,7    | 3,9             |        |        |         |         |        |
| Temperature rising        |        |         |        |        |        |        |        |                 |        |        |         |         | 1      |
| Mating Force              | 1,5    |         |        |        |        |        |        |                 |        |        |         |         |        |
| Un-mating Force           | 3,7    |         |        |        |        |        |        |                 |        |        |         |         |        |
| Durability                | 4      |         |        |        |        |        |        | 4<br>(10cycles) |        |        |         |         |        |
| Contact Retention Force   |        | 1,3     |        |        |        |        |        |                 |        |        |         |         |        |
| Conn.Lock                 |        |         | 1      |        |        |        |        |                 |        |        |         |         |        |
| Cable Retention Force     | 8      |         |        |        |        |        |        |                 |        |        |         |         |        |
| Vibration                 |        |         |        | 2      |        |        |        |                 |        |        |         |         |        |
| Shock                     |        |         |        | 4      |        |        |        |                 |        |        |         |         |        |
| Thermal Shock             |        |         |        |        | 4      |        |        |                 |        |        |         |         |        |
| High Temperature Life     |        | 2       |        |        |        | 2      |        |                 |        |        |         |         |        |
| Humidity (Steady State)   |        |         |        |        |        |        | 4      |                 |        |        |         |         |        |
| Humidity (Cycling)        |        |         |        |        |        |        |        | 6               |        |        |         |         |        |
| Salt Water Spray          |        |         |        |        |        |        |        |                 | 2      |        |         |         |        |
| H <sub>2</sub> S Gas      |        |         |        |        |        |        |        |                 |        | 2      |         |         |        |
| Solder ability            |        |         |        |        |        |        |        |                 |        |        | 1       |         |        |
| Soldering Heat Resistance |        |         |        |        |        |        |        |                 |        |        |         | 1       |        |
| Specimen Quantity.        | 5 pcs. | 20 pos. | 5 pcs. | 5 pcs. | 5 pcs. | 5 pcs. | 5 pcs. | 5 pcs.          | 5 pcs. | 5 pcs. | 10 pcs. | 10 pcs. | 5 pcs. |

※Numbers indicate sequence in which tests are performed.

Table.2-1 Test result

| Test Item                                          | Contents of Measurement |                                  | Specifications                        | Set         | n          | Data                                                                   |                                                                        |        |        |         | Judge  |        |
|----------------------------------------------------|-------------------------|----------------------------------|---------------------------------------|-------------|------------|------------------------------------------------------------------------|------------------------------------------------------------------------|--------|--------|---------|--------|--------|
|                                                    |                         |                                  |                                       |             |            | AVE.                                                                   | MAX.                                                                   | MIN.   | s      | X±3s    |        |        |
| A Group<br>Durability<br><br>Cable Retention Force | Contact Resistance (mΩ) | Initial                          | AWG#40<br>600mΩMAX.                   | 5           | 200        | 428.369                                                                | 467.39                                                                 | 401.93 | 13.719 | 469.526 | OK     |        |
|                                                    |                         | After Testing                    | AWG#40<br>ΔR=40mΩ<br>MAX.             |             |            | 0.336                                                                  | 4.94                                                                   | -3.81  | 1.917  | 6.087   | OK     |        |
|                                                    | GND Resistance (mΩ)     | Initial                          | 50mΩMAX.                              | 5           | 5          | 10.658                                                                 | 11.08                                                                  | 10.09  | 0.494  | 12.140  | OK     |        |
|                                                    |                         | After Testing                    | ΔR=40mΩ<br>MAX.                       |             |            | -0.190                                                                 | 0.66                                                                   | -0.98  | 0.643  | 1.739   | OK     |        |
|                                                    | 30P                     | Mating Force (N)                 | Initial                               | 34.0N MAX.  | 5          | 5                                                                      | 10.810                                                                 | 11.34  | 10.17  | 0.494   | 12.292 | OK     |
|                                                    |                         |                                  | After Testing                         | 34.0N MAX.  |            |                                                                        | 9.380                                                                  | 9.73   | 8.94   | 0.343   | 10.409 | OK     |
|                                                    |                         | Unmating Force (N)               | Initial                               | 3.0N MIN.   | 5          | 5                                                                      | 8.954                                                                  | 9.89   | 8.29   | 0.640   | 7.034  | OK     |
|                                                    |                         |                                  | After Testing                         | 3.0N MIN.   |            |                                                                        | 8.826                                                                  | 9.81   | 7.88   | 0.882   | 6.180  | OK     |
|                                                    |                         | Cable Retention Force            |                                       | 14.70N MIN. | 5          | 5                                                                      | It does not pull out, even if applies the power of 100N to a terminal. |        |        |         |        | OK     |
|                                                    |                         | 40P                              | Mating Force (N)                      | Initial     | 40.0N MAX. | 5                                                                      | 5                                                                      | 14.330 | 15.85  | 13.47   | 0.957  | 17.201 |
|                                                    | After Testing           |                                  |                                       | 40.0N MAX.  | 5          | 5                                                                      | 12.740                                                                 | 13.28  | 12.03  | 0.540   | 14.360 | OK     |
|                                                    | Unmating Force (N)      |                                  | Initial                               | 4.0N MIN.   | 5          | 5                                                                      | 10.906                                                                 | 11.43  | 10.45  | 0.427   | 9.625  | OK     |
|                                                    |                         |                                  | After Testing                         | 4.0N MIN.   | 5          | 5                                                                      | 10.036                                                                 | 10.54  | 9.19   | 0.558   | 8.362  | OK     |
|                                                    | Cable Retention Force   |                                  | 19.60N MIN.                           | 5           | 5          | It does not pull out, even if applies the power of 100N to a terminal. |                                                                        |        |        |         | OK     |        |
|                                                    | 60P                     |                                  | Mating Force (N)                      | Initial     | 52.0N MAX. | 5                                                                      | 5                                                                      | 19.012 | 20.36  | 18.01   | 0.930  | 21.802 |
|                                                    |                         | After Testing                    |                                       | 52.0N MAX.  | 5          | 5                                                                      | 17.424                                                                 | 18.47  | 16.07  | 0.887   | 20.085 | OK     |
|                                                    |                         | Unmating Force (N)               | Initial                               | 6.0N MIN.   | 5          | 5                                                                      | 13.856                                                                 | 14.50  | 13.17  | 0.587   | 12.095 | OK     |
|                                                    |                         |                                  | After Testing                         | 6.0N MIN.   | 5          | 5                                                                      | 13.234                                                                 | 13.89  | 12.40  | 0.614   | 11.392 | OK     |
|                                                    |                         | Cable Retention Force            |                                       | 29.40N MIN. | 5          | 5                                                                      | It does not pull out, even if applies the power of 100N to a terminal. |        |        |         |        | OK     |
|                                                    |                         | B Group<br>High Temperature Life | (RECE)<br>Contact Retention Force (N) | Initial     | 0.2N MIN.  | —                                                                      | 20                                                                     | 1.255  | 1.53   | 0.87    | 0.151  | 0.802  |
| After Testing                                      | 0.2N MIN.               |                                  |                                       | —           | 20         | 0.970                                                                  | 1.45                                                                   | 0.71   | 0.174  | 0.448   | OK     |        |
| C Group<br>Conn. Lock                              |                         | Initial                          | The lock does not damage and cancel   | 5           | 5          | No Abnormality                                                         |                                                                        |        |        |         | OK     |        |

Table.2-2 Test result

| Test Item                          | Contents of Measurement  |                  | Specifications                                                  | Set | n   | Data                        |        |        |        |         | Judge |
|------------------------------------|--------------------------|------------------|-----------------------------------------------------------------|-----|-----|-----------------------------|--------|--------|--------|---------|-------|
|                                    |                          |                  |                                                                 |     |     | AVE.                        | MAX.   | MIN.   | s      | X±3s    |       |
| D Group<br>Vibration<br>↓<br>Shock | Contact Resistance (mΩ)  | Initial          | AWG#40<br>600mΩMAX.                                             | 5   | 200 | 428.258                     | 459.94 | 398.51 | 14.214 | 470.900 | OK    |
|                                    |                          | After Vibration  | AWG#40<br>ΔR=40mΩ<br>MAX.                                       |     |     | 1.139                       | 4.96   | -4.62  | 2.023  | 7.208   | OK    |
|                                    |                          | After Shock      | AWG#40<br>ΔR=40mΩ<br>MAX.                                       |     |     | 2.128                       | 4.99   | -2.93  | 1.830  | 7.618   | OK    |
|                                    | GND Resistance (mΩ)      | Initial          | 50mΩMAX.                                                        | 5   | 5   | 11.314                      | 12.35  | 10.30  | 0.911  | 14.047  | OK    |
|                                    |                          | After Vibration  | ΔR=40mΩ<br>MAX.                                                 |     |     | -0.118                      | 0.78   | -0.44  | 0.510  | 1.412   | OK    |
|                                    |                          | After Shock      | ΔR=40mΩ<br>MAX.                                                 |     |     | -0.104                      | 1.62   | -0.70  | 0.996  | 2.884   | OK    |
|                                    | Electrical discontinuity | During Vibration | 1μsec. MAX.                                                     | 5   | 5   | No Electrical discontinuity |        |        |        |         | OK    |
|                                    |                          | During Shock     |                                                                 |     |     | No Electrical discontinuity |        |        |        |         | OK    |
|                                    | Appearance               | After Vibration  | No abnormality adversely affecting the performance shall occur. | 5   | 5   | No Abnormality              |        |        |        |         | OK    |
|                                    |                          | After Shock      |                                                                 |     |     | No Abnormality              |        |        |        |         | OK    |
| E Group<br>Thermal Shock           | Contact Resistance (mΩ)  | Initial          | AWG#40<br>600mΩMAX.                                             | 5   | 200 | 422.614                     | 457.96 | 383.34 | 14.462 | 466.000 | OK    |
|                                    |                          | After Testing    | AWG#40<br>ΔR=40mΩ<br>MAX.                                       |     |     | 2.018                       | 4.98   | -2.11  | 1.585  | 6.773   | OK    |
|                                    | GND Resistance (mΩ)      | Initial          | 50mΩMAX.                                                        | 5   | 5   | 11.178                      | 11.64  | 10.75  | 0.340  | 12.198  | OK    |
|                                    |                          | After Testing    | ΔR=40mΩ<br>MAX.                                                 |     |     | -0.002                      | 0.33   | -0.37  | 0.299  | 0.895   | OK    |
| F Group<br>High Temperature Life   | Contact Resistance (mΩ)  | Initial          | AWG#40<br>600mΩMAX.                                             | 5   | 200 | 424.754                     | 454.92 | 390.23 | 15.551 | 471.407 | OK    |
|                                    |                          | After Testing    | AWG#40<br>ΔR=40mΩ<br>MAX.                                       |     |     | -0.026                      | 4.75   | -4.99  | 2.052  | 6.130   | OK    |
|                                    | GND Resistance (mΩ)      | Initial          | 50mΩMAX.                                                        | 5   | 5   | 11.192                      | 12.20  | 10.26  | 0.714  | 13.334  | OK    |
|                                    |                          | After Testing    | ΔR=40mΩ<br>MAX.                                                 |     |     | 0.270                       | 0.80   | -0.20  | 0.447  | 1.611   | OK    |

Table.2-3 Test result

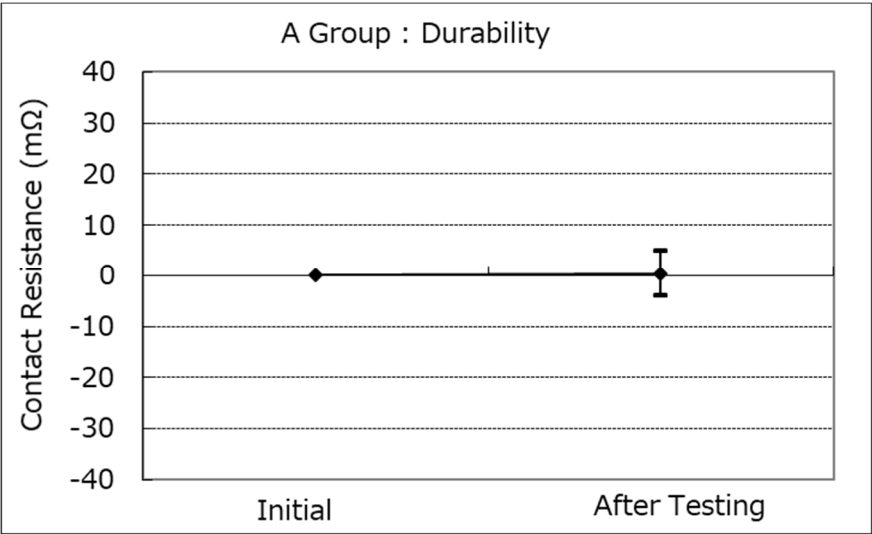
| Test Item                             | Contents of Measurement    |                  | Specifications                                                           | Set | n   | Data                       |        |        |        |            | Judge |
|---------------------------------------|----------------------------|------------------|--------------------------------------------------------------------------|-----|-----|----------------------------|--------|--------|--------|------------|-------|
|                                       |                            |                  |                                                                          |     |     | AVE.                       | MAX.   | MIN.   | s      | $X \pm 3s$ |       |
| G Group<br>Humidity<br>(Steady State) | Contact Resistance (mΩ)    | Initial          | AWG#40<br>600mΩMAX.                                                      | 5   | 200 | 424.602                    | 450.81 | 404.82 | 8.846  | 451.140    | OK    |
|                                       |                            | After Testing    | AWG#40<br>ΔR=40mΩ<br>MAX.                                                |     |     | -0.364                     | 4.55   | -4.74  | 1.890  | 5.306      | OK    |
|                                       | GND Resistance (mΩ)        | Initial          | 50mΩMAX.                                                                 | 5   | 5   | 11.250                     | 11.83  | 10.65  | 0.532  | 12.846     | OK    |
|                                       |                            | After Testing    | ΔR=40mΩ<br>MAX.                                                          |     |     | -0.160                     | 0.17   | -0.27  | 0.191  | 0.413      | OK    |
|                                       | Insulation Resistance (MΩ) | Initial          | 1000MΩMIN.                                                               | 5   | 100 | 1.6×10 <sup>5</sup> MΩMIN. |        |        |        |            | OK    |
|                                       |                            | After Testing    | 500MΩMIN.                                                                |     |     | 3.4×10 <sup>4</sup> MΩMIN. |        |        |        |            | OK    |
|                                       | D. W. Voltage              | Initial          | No abnormality<br>adversely affecting<br>the performance<br>shall occur. | 5   | 100 | No Abnormality             |        |        |        |            | OK    |
|                                       |                            | After Testing    |                                                                          |     |     | No Abnormality             |        |        |        |            | OK    |
|                                       | Contact Resistance (mΩ)    | Initial          | AWG#40<br>600mΩMAX.                                                      | 5   | 200 | 417.884                    | 459.06 | 390.43 | 16.233 | 466.583    | OK    |
|                                       |                            | After Durability | AWG#40<br>ΔR=40mΩ<br>MAX.                                                |     |     | -1.160                     | 3.88   | -4.91  | 1.899  | 4.537      | OK    |
|                                       |                            | After Testing    | AWG#40<br>ΔR=40mΩ<br>MAX.                                                |     |     | 0.167                      | 4.76   | -4.63  | 2.119  | 6.524      | OK    |
| H Group<br>Humidity<br>(Cycling)      | GND Resistance (mΩ)        | Initial          | 50mΩMAX.                                                                 | 5   | 5   | 11.448                     | 11.83  | 11.15  | 0.322  | 12.414     | OK    |
|                                       |                            | After Durability | ΔR=40mΩ<br>MAX.                                                          |     |     | -0.278                     | 0.16   | -0.64  | 0.328  | 0.706      | OK    |
|                                       |                            | After Testing    | ΔR=40mΩ<br>MAX.                                                          |     |     | -0.172                     | 0.08   | -0.37  | 0.163  | 0.317      | OK    |
|                                       | Insulation Resistance (MΩ) | Initial          | 1000MΩMIN.                                                               | 5   | 100 | 1.7×10 <sup>5</sup> MΩMIN. |        |        |        |            | OK    |
|                                       |                            | After Testing    | 500MΩMIN.                                                                |     |     | 2.2×10 <sup>4</sup> MΩMIN. |        |        |        |            | OK    |
|                                       | D. W. Voltage              | Initial          | No abnormality<br>adversely affecting<br>the performance<br>shall occur. | 5   | 100 | No Abnormality             |        |        |        |            | OK    |
|                                       |                            | After Testing    |                                                                          |     |     | No Abnormality             |        |        |        |            | OK    |

Table.2-4 Test result

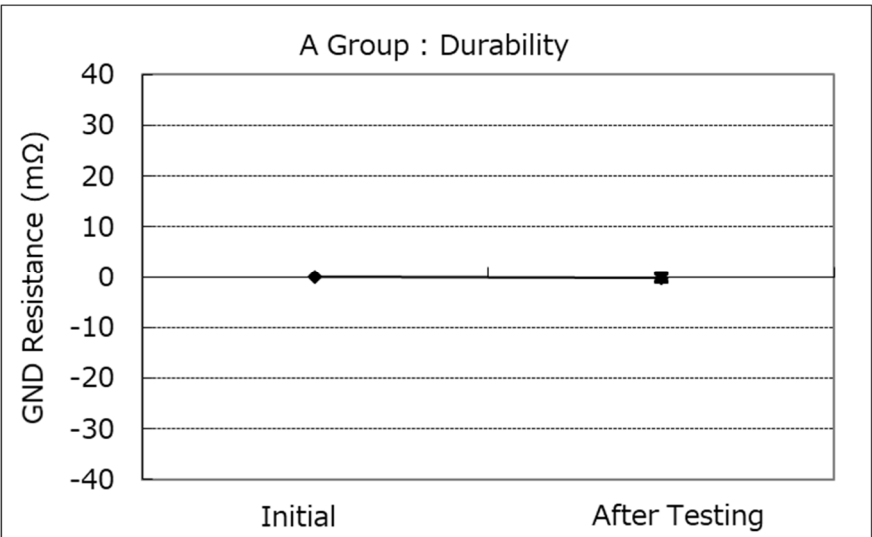
| Test Item                                  | Contents of Measurement             |               | Specifications                                                                | Set | n   | Data                                 |        |        |        |            | Judge |
|--------------------------------------------|-------------------------------------|---------------|-------------------------------------------------------------------------------|-----|-----|--------------------------------------|--------|--------|--------|------------|-------|
|                                            |                                     |               |                                                                               |     |     | AVE.                                 | MAX.   | MIN.   | s      | $X \pm 3s$ |       |
| I Group<br>Salt Water<br>Spray             | Contact<br>Resistance<br>(mΩ)       | Initial       | AWG#40<br>600mΩMAX.                                                           | 5   | 200 | 424.507                              | 464.99 | 394.52 | 14.495 | 467.992    | OK    |
|                                            |                                     | After Testing | AWG#40<br>$\Delta R=40m\Omega$<br>MAX.                                        |     |     | 1.766                                | 7.96   | -5.34  | 2.533  | 9.365      | OK    |
|                                            | GND<br>Resistance<br>(mΩ)           | Initial       | 50mΩMAX.                                                                      | 5   | 5   | 10.950                               | 11.22  | 10.65  | 0.268  | 11.754     | OK    |
|                                            |                                     | After Testing | $\Delta R=40m\Omega$<br>MAX.                                                  |     |     | 1.364                                | 1.73   | 0.93   | 0.346  | 2.402      | OK    |
| J Group<br>H2S Gas                         | Contact<br>Resistance<br>(mΩ)       | Initial       | AWG#40<br>600mΩMAX.                                                           | 5   | 200 | 429.509                              | 454.24 | 409.43 | 9.239  | 457.226    | OK    |
|                                            |                                     | After testing | AWG#40<br>$\Delta R=40m\Omega$<br>MAX.                                        |     |     | -0.692                               | 3.76   | -4.94  | 1.768  | 4.612      | OK    |
|                                            | GND 抵抗<br>GND<br>Resistance<br>(mΩ) | Initial       | 50mΩMAX.                                                                      | 5   | 5   | 11.674                               | 11.89  | 11.47  | 0.185  | 12.229     | OK    |
|                                            |                                     | After Testing | $\Delta R=40m\Omega$<br>MAX.                                                  |     |     | 0.090                                | 0.53   | -0.15  | 0.315  | 1.035      | OK    |
| K Group<br>Solderability                   | Appearance                          |               | More than 95%<br>of the dipped<br>surface shall be<br>evenly wet.             | 10  | 10  | Wet 95% MIN.                         |        |        |        |            | OK    |
| L Group<br>Soldering<br>Heat<br>Resistance | Appearance                          |               | No deformation nor<br>defect adversely<br>affecting the<br>performance occur. | 10  | 10  | No Abnormality                       |        |        |        |            | OK    |
| M Group<br>Temperature<br>Rising           | AWG#40<br>0.3A/Contact              |               | $\Delta T=30^{\circ}\text{C}$<br>MAX.                                         | 5   | 5   | $\Delta T=28.6^{\circ}\text{C}$ MAX. |        |        |        |            | OK    |

The Temperature Rising Test is a result when applied ratings current (0.3A/contact) between the neighboring contacts for 40pos. (With the whole connector 12.0A.)

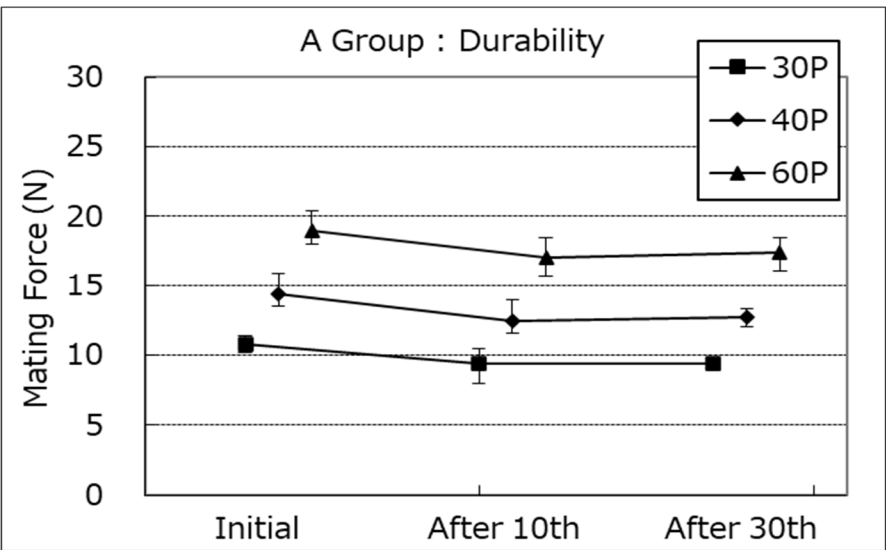
Graph.1



Graph.2

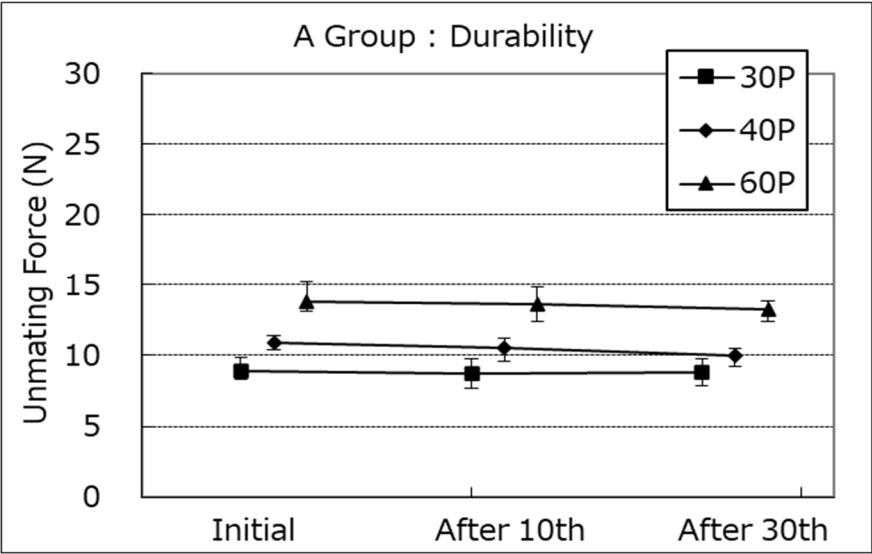


Graph.3

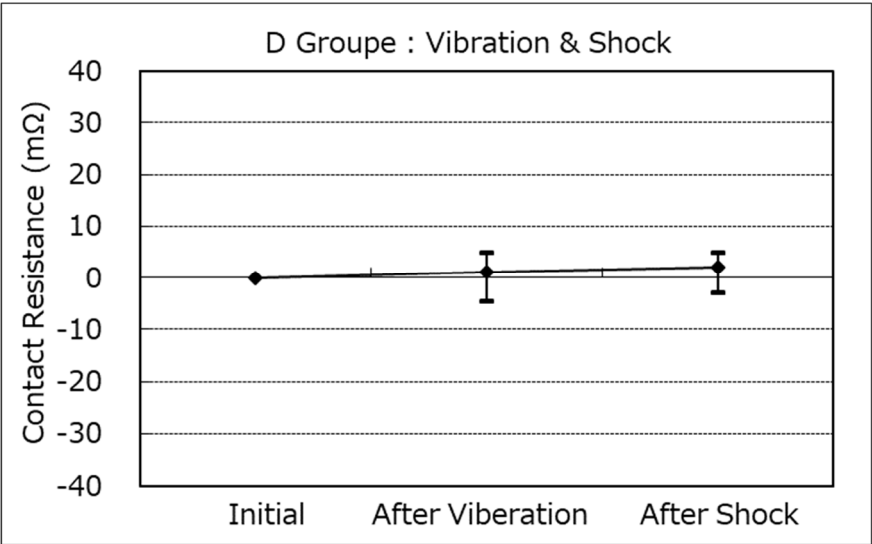




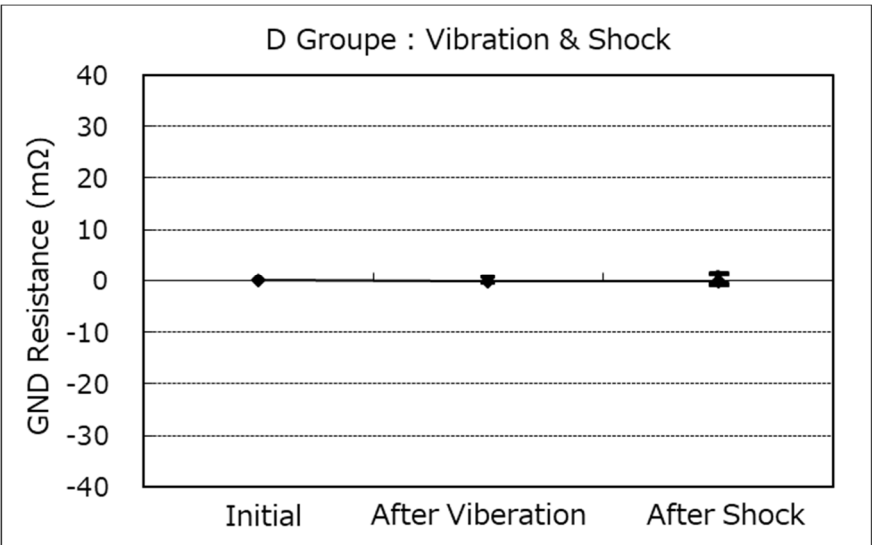
Graph.4



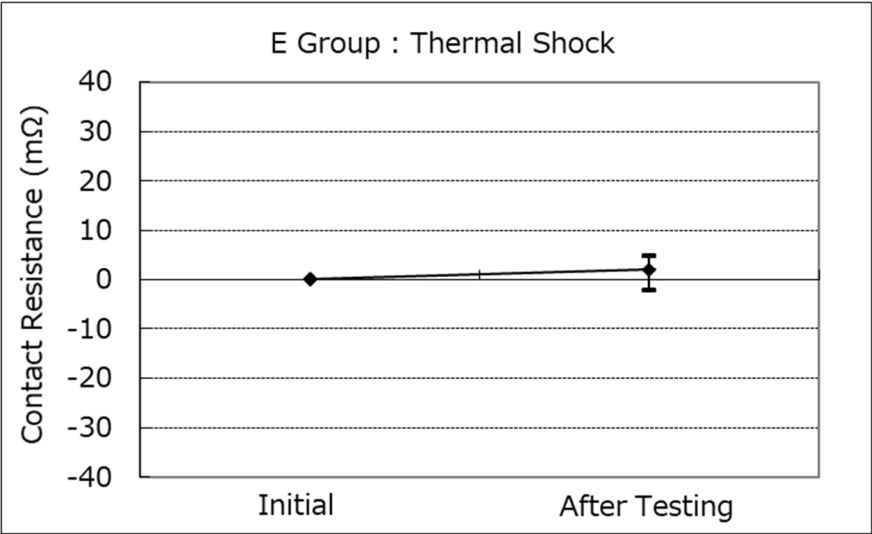
Graph.5



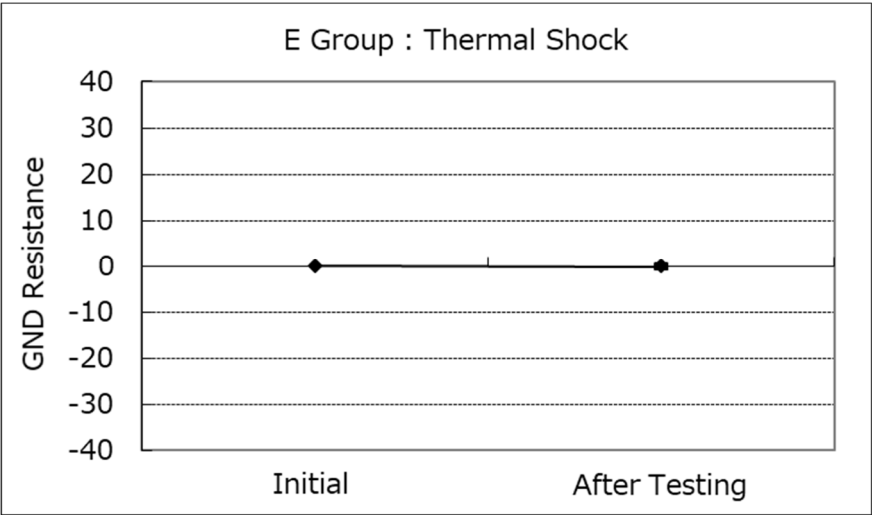
Graph.6



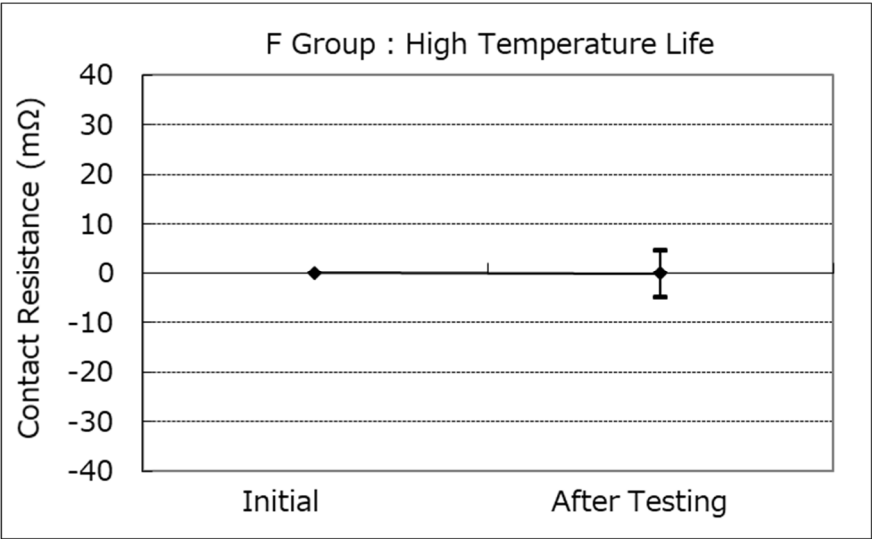
Graph.7



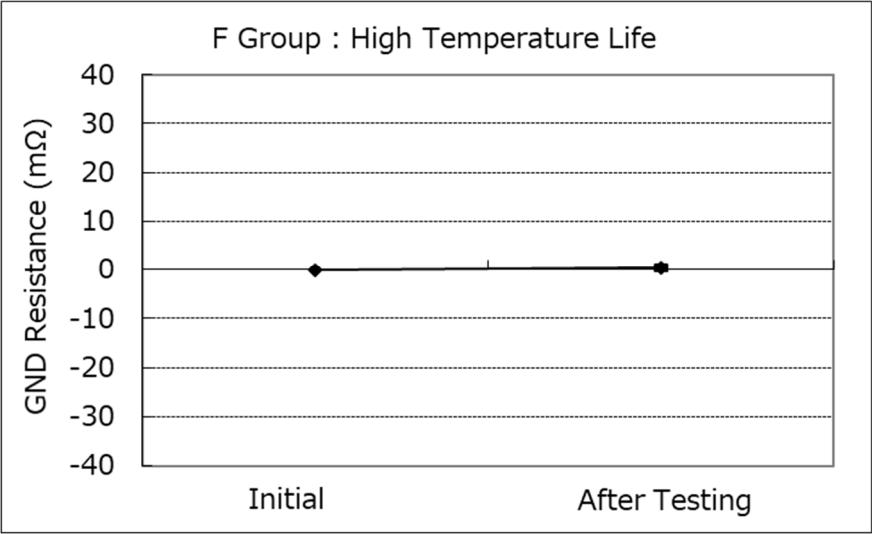
Graph.8



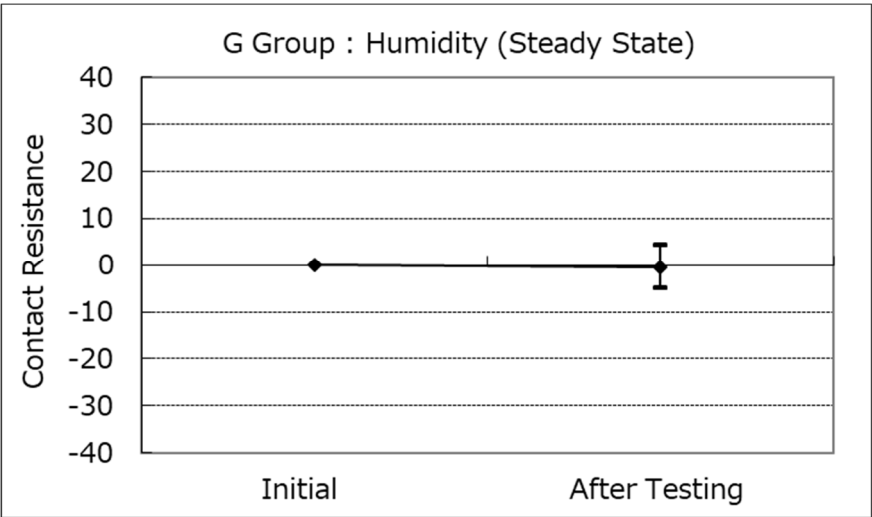
Graph.9



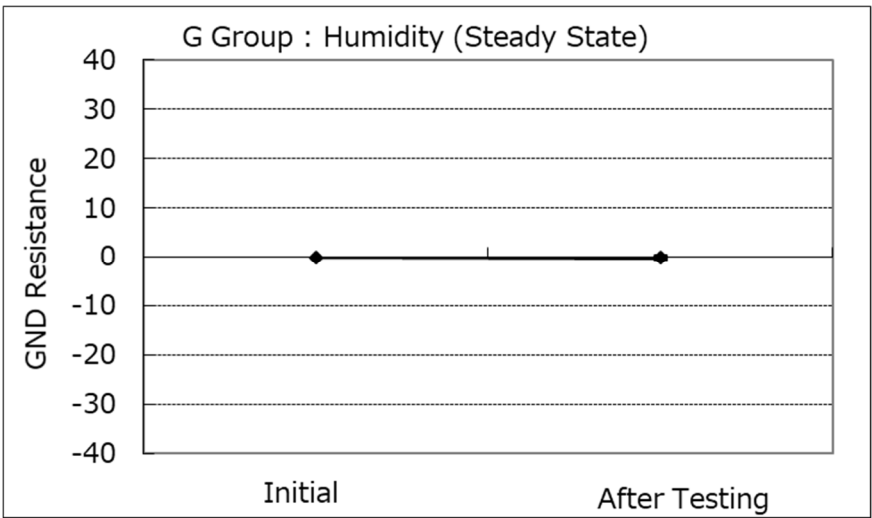
Graph.10



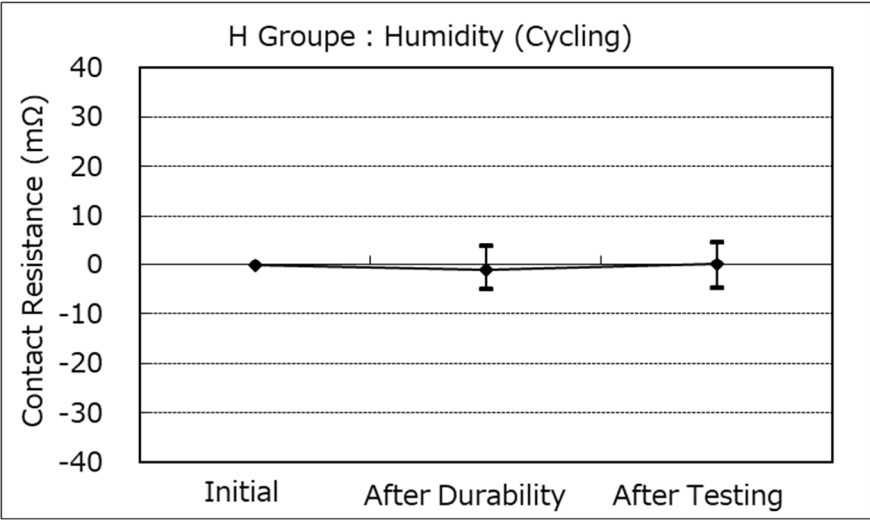
Graph.11



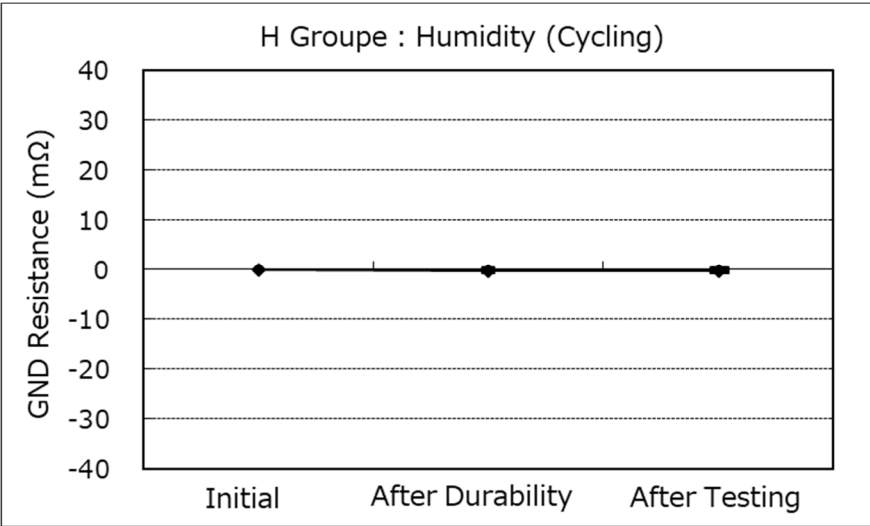
Graph.12



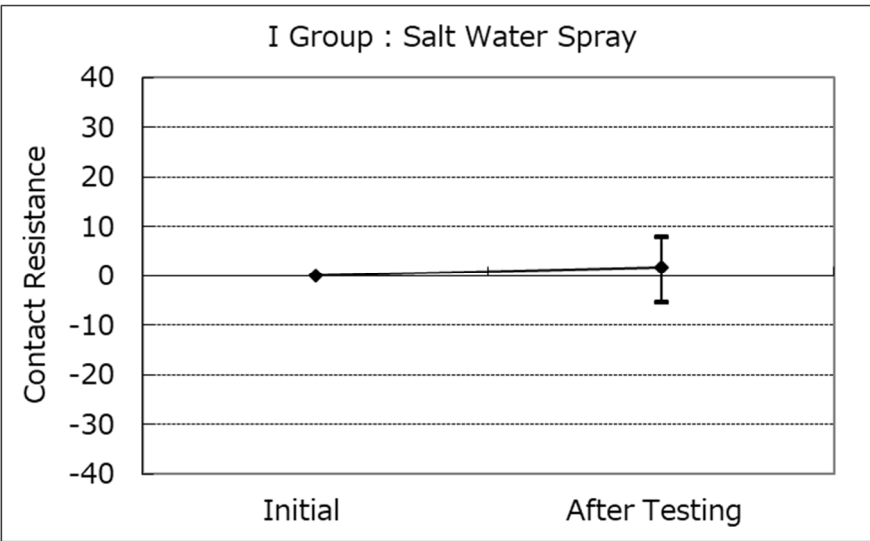
Graph.13



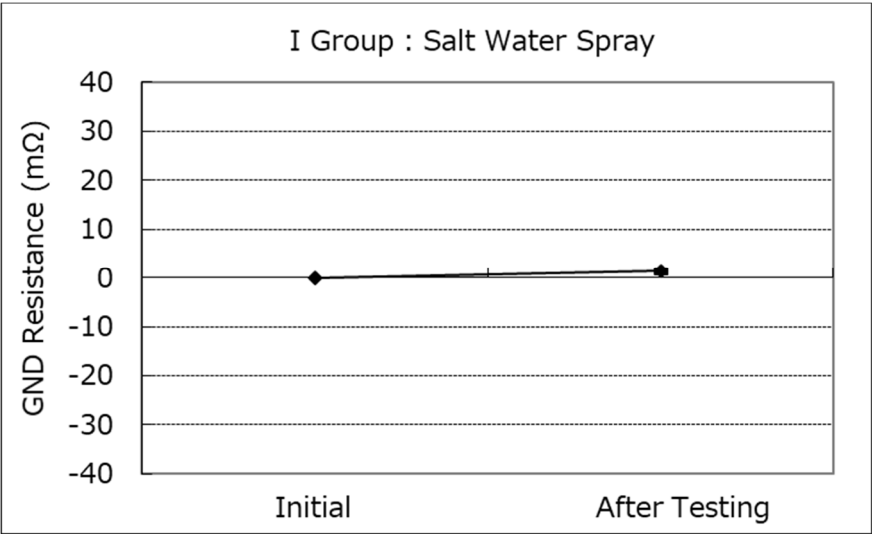
Graph.14



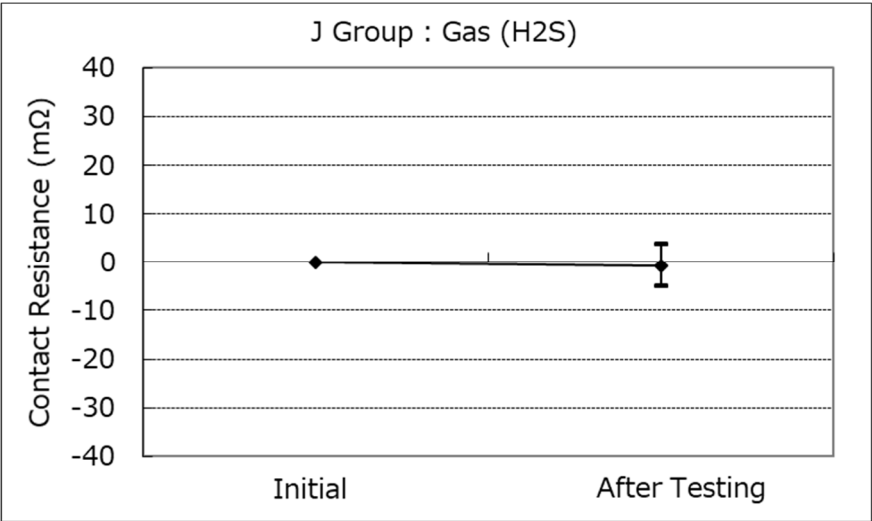
Graph.15



Graph.16



Graph.17



Graph.18

