AMPLATCH* System 50 Connector Receptacle and Paddleboard

1. INTRODUCTION

1.1. Purpose

Testing was performed on the AMPLATCH* System 50 Connector Receptacle and Paddleboard to determine its conformance to the requirements of Product Specification 108-1109 Revision A. Although not specifically tested, paddleboard is considered qualified to that specification due to its identical termination slot design including slot width, length, material thickness, and all other dimensions in the wire termination area.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the AMPLATCH System 50 Connector Receptacle and Paddleboard. Testing was performed at the Engineering Assurance Product Test Laboratory between 10Oct92 and 18Dec92. The test file number for this testing is CTL 5534-005-002. Additional testing was performed at the Engineering Assurance Product Test Laboratory between 15Mar00 and 30Oct01 to evaluate the use of phosphor bronze contacts. The test file numbers for this testing are CTL 5534-006, CTL 5534-008, CTL 5534-009 and CTL 5534-010. This documentation is on file at and available from the Engineering Assurance Product Test Laboratory.

1.3. Conclusion

The AMPLATCH System 50 Connector Receptacle and Paddleboard listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-1109 Revision A.

1.4. Product Description

The AMPLATCH* System 50 receptacle connector is designed to be crimped to .025 inch centerline, flat PVC ribbon cable with conductor sizes 30 AWG solid, 30 AWG stranded, or 32 AWG stranded. The crimped assemblies mate to .015 inch square or round posts on an .050 X .100 inch grid pattern with equivalent post length of .125 inch. The contacts are phosphor bronze. The housing material is black thermoplastic, UL94V-0.

The AMPLATCH* System 50 paddleboard connector is designed to be crimped to .025 inch centerline, flat PVC ribbon cable with conductor sizes 30 AWG solid, 30 AWG stranded, or 32 AWG stranded. The crimped assemblies are soldered directly to printed circuit boards. The contacts are phosphor bronze. The housing material is black thermoplastic, UL94V-0.

* Trademark
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LOC B

1.5. Test Specimens

Test specimens were representative of normal production lots. Specimens identified with the following part numbers were used for test:

Test Group	Quantity	Part Number	Description
CTL 5534-005-002			
1,2,3	5 each	1-111196-6	100 position receptacle with BeCu contacts and 32 AWG stranded wire
1,2,3	5 each	1-111196-6	100 position receptacle with 30 AWG solid wire
4	5 each	1-111196-6	100 position receptacle
1,2,3	10 each	1-104068-7	100 position header
CTL 5534-006			
2	5 each	1-1364054-1	50 position receptacle with PhBr contacts and 30 AWG solid PVC wire
1,2	5 each	1-1364054-1	50 position receptacle with PhBr contacts and 32 AWG stranded PVC wire
1,2	15 each	104068-5	50 position header
CTL 5534-008			
1	5 each	1-111196-7	68 position receptacle with PhBr contacts and 30 AWG stranded PVC wire
1	5 each	1-104068-8	68 position header
CTL 5534-009			
2	5 each	1-111196-7	68 position receptacle with PhBr contacts and 30 AWG stranded PVC wire
2	5 each	1-104068-8	68 position header
CTL 5534-010			
1	5 each	1-111196-7	68 position receptacle with PhBr contacts and 30 AWG stranded PVC wire
1	5 each	1-104068-8	68 position header

Figure 1

1.6. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

- Temperature: 15 to 35°C
- Relative Humidity: 25 to 75%

1.7. Qualification Test Sequence

Test or Examination	Test Group (a)			
	1	2	3	4(b)
	Test Sequence (c)			
Initial examination of product	1	1	1	1
Low level contact resistance	3,7	2,5	2,5	
Insulation resistance				2,6
Withstanding voltage				3,7
Vibration	5			
Mechanical shock	6			
Durability	4	3(d)	3(d)	
Mating force	2			
Unmating force	8			
Thermal shock				4
Humidity-temperature cycling				5
Temperature life		4(d)		
Mixed flowing gas			4(d)	
Final examination of product	9	6	6	8

NOTE

(a) See paragraph 4.1.A.
(b) Test group is unmated and unterminated.
(c) Numbers indicate sequence in which tests are performed.
(d) Precondition specimens with 10 durability cycles.

Figure 2

2. SUMMARY OF TESTING

2.1. Initial Examination of Product - All Test Groups

All specimens submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by Product Assurance. Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2. Low Level Contact Resistance - Test Groups 1, 2 and 3

All low level contact resistance measurements, taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage were less than 30 milliohms (Figure 3).

Test Group	Number of Data Points	Condition	Termination Resistance		
			Min	Max	Mean
CTL 5534-005-002					
1	60	Initial	7.2	9.4	8.210
		After mechanical	7.5	11.9	8.67
2	60	Initial	7.2	9.8	8.03
		After temperature life	7.0	16.1	8.25
3	60	Initial	7.2	10.5	8.41
		After mixed flowing gas	7.2	12.7	8.64
CTL 5534-006					
1	250	Initial (PhBr, 32 AWG stranded PVC)	7.294	16.357	10.709
		After mechanical	7.330	29.600	12.059
2	250	Initial (PhBr, 30 AWG solid PVC)	9.676	12.761	10.898
		After temperature life	9.695	12.990	10.982
	250	Initial (PhBr, 32 AWG stranded PVC)	7.287	15.368	10.095
		After temperature life	7.214	20.066	10.239
CTL 5534-008					
1	340	Initial (PhBr, 30 AWG stranded PVC)	9.302	14.136	10.414
		After mechanical	9.131	12.073	10.205
CTL 5534-009					
2	340	Initial (PhBr, 30 AWG, stranded PVC)	9.335	12.245	10.410
		After temperature life	9.531	13.422	10.902
CTL 5534-010					
1	340	Initial (PhBr, 30 AWG solid PVC)	9.020	11.860	10.270
		After mechanical	9.230	11.310	10.160

NOTE *All values in milliohms.*

Figure 3

2.3. Insulation Resistance - Test Group 4

All insulation resistance measurements were greater than 5000 megohms.

2.4. Withstanding Voltage - Test Group 4

No dielectric breakdown or flashover occurred.

2.5. Vibration - Test Group 1

No discontinuities were detected during vibration testing. Following vibration testing, no cracks, breaks, or loose parts on the specimens were visible.

2.6. Mechanical Shock - Test Group 1

No discontinuities were detected during mechanical shock testing. Following mechanical shock testing, no cracks, breaks, or loose parts on the specimens were visible.

2.7. Durability - Test Groups 1, 2 and 3

No physical damage occurred as a result of mating and unmating the specimens 150 times.

2.8. Mating Force - Test Group 1

All mating force measurements were less than 1.11 N [4 oz].

2.9. Unmating Force - Test Group 1

All unmating force measurements were greater than 0.14 N [.5 oz].

2.10. Thermal Shock - Test Group 4

No evidence of physical damage was visible as a result of thermal shock testing.

2.11. Humidity-temperature Cycling - Test Group 4

No evidence of physical damage was visible as a result of humidity-temperature cycling.

2.12. Temperature Life - Test Group 2

No evidence of physical damage was visible as a result of temperature life testing.

2.13. Mixed Flowing Gas - Test Group 3

No evidence of physical damage was visible as a result of exposure to the pollutants of mixed flowing gas.

2.14. Final Examination of Product - All Test Groups

Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

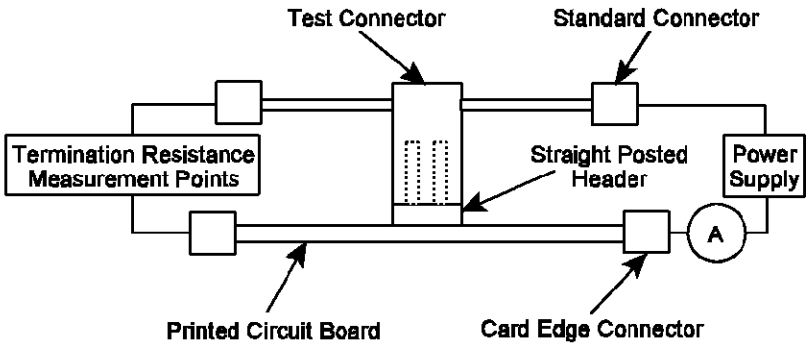
3. TEST METHODS

3.1. Initial Examination of Product

Specimens were visually examined for evidence of physical damage detrimental to product performance.

3.2. Low Level Contact Resistance

Low level contact resistance measurements were made using a 4 terminal measuring technique (Figure 4). The test current was maintained at 100 milliamperes maximum with a 20 millivolt maximum open circuit voltage.



NOTE *No straight posted header is required with Paddleboard which solders directly to the printed circuit board.*

Figure 4
Low Level Contact Resistance Measurement Points

3.3. Insulation Resistance

Insulation resistance was measured between adjacent contacts of unmated and unterminated specimens. A test potential of 500 volts DC was applied for 2 minutes before the resistance was measured.

3.4. Withstanding Voltage

A test potential of 200 volts AC was applied between the adjacent contacts of unterminated specimens. This potential was applied for 1 minute and then returned to zero.

3.5. Vibration, Sinusoidal

Mated specimens were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 1.5 mm [0.06 in], double amplitude. The vibration frequency was varied uniformly between the limits of 10 and 2000 Hz and returned to 10 Hz in 15 minutes. This cycle was performed 12 times in each of 3 mutually perpendicular planes for a total vibration time of 12 hours. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.6. Mechanical Shock, Half-sine

Mated specimens were subjected to a mechanical shock test having a half-sine waveform of 50 gravity units (g peak) and a duration of 11 milliseconds. Three shocks in each direction were applied along the 3 mutually perpendicular planes for a total of 18 shocks. Specimens were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.7. Durability

Specimens were mated and unmated 150 times at a maximum rate of 150 cycles per hour.

3.8. Mating Force

The force required to mate individual specimens was measured using a tensile/compression device with a free floating fixture and a rate of travel of 12.7 mm [.5 in] per minute. The maximum average force per contact was calculated.

3.9. Unmating Force

The force required to unmate individual specimens was measured using a tensile/compression device with a free floating fixture and a rate of travel of 12.7 mm [.5 in] per minute. The minimum average force per contact was calculated.

3.10. Thermal Shock

Unmated specimens were subjected to 5 cycles of thermal shock with each cycle consisting of 30 minute dwells at -65 and 105°C. The transition between temperatures was less than 1 minute.

3.11. Humidity-temperature Cycling

Unmated specimens were exposed to 10 cycles of humidity-temperature cycling. Each cycle lasted 24 hours and consisted of cycling the temperature between 25 and 65°C twice while maintaining high humidity (Figure 5).

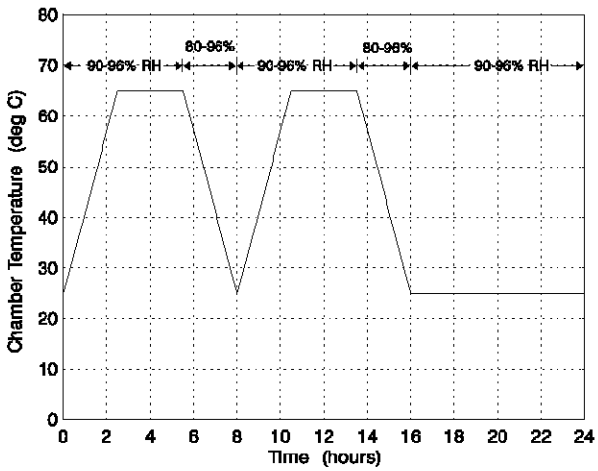


Figure 5
Typical Humidity-Temperature Cycling Profile

3.12. Temperature Life

Mated and terminated specimens were exposed to a temperature of 105°C for 500 hours. Specimens were preconditioned with 10 cycles of durability.

3.13. Mixed Flowing Gas, Class II

Mated specimens were exposed for 20 days to a mixed flowing gas Class II exposure. Class II exposure is defined as a temperature of 30°C and a relative humidity of 70% with the pollutants of Cl_2 at 10 ppb, NO_2 at 200 ppb and H_2S at 10 ppb. Specimens were preconditioned with 10 cycles of durability.

3.14. Final Examination of Product

Specimens were visually examined for evidence of physical damage detrimental to product performance.