AMP

QUALIFICATION TEST REPORT

CONNECTOR, INNERGY*,
WIRE TO WIRE

501-312 Rev. O

Product Specification: 108-1373 Rev. O
CTL No.: CTL3402-049-019
CTL3951-004-002
Date: August 7, 1995
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*Trademark

Corporate Test Laboratory Harrisburg, Pennsylvania

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(R3951ts)

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CORPORATE TEST LABORATORY

Qualification Test Report

1. Introduction

1.1 Purpose

Testing was performed on AMP* INNERGY WTW (wire to wire) Connector to determine its conformance to the requirements of AMP Product Specification 108-1373 Rev. O.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the INNERGY WTW Connector manufactured by the Communications Products Division, of the Utility, Networking & Communications Product Group. The testing was performed between February 20, 1995 and July 28, 1995.

1.3 Conclusion

The INNERGY WTW Connector meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1373 Rev. O.

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1.4 Product Description

The AMP INNERGY Connectors are hermaphroditic housings and contacts. The housings are also modular in design and permit the clustering of connectors of the same series. The housings are made of impact resistant thermoplastic. The terminals are tin plated copper.

1.5 Test Samples

The test samples were randomly selected from normal current production lots, and the following part numbers were used for test:

Test Group	Quantity	Part Nbr	Description
1,2,3	62	556137-1	INNERGY Housing
1,2,3	62	556136-1	Tin Contact

1.6 Qualification Test Sequence

	Test Groups		
Test or Examination	1	2	3
Examination of Product	1,10	1,9	1,8
Termination Resistance, Dry Circuit	3,7	2,7	
Dielectric Withstanding Voltage			3,7
Insulation Resistance			2,6
Temperature Rise vs Current		3,8	
Vibration	5	6	
Physical Shock	6		
Mating Force	2		
Unmating Force	8		
Contact Retention Force	9		
Durability	4		
Thermal Shock			4
Humidity-Temperature Cycling		4	5
Temperature Life		5	

The numbers indicate sequence in which tests were performed.

2. Summary of Testing

2.1 Examination of Product - All Groups

All samples submitted for testing were selected from normal current production lots. They were inspected and accepted by the Product Assurance Department of the Utility, Networking & Communications Product Group.

2.2 Termination Resistance, Dry Circuit - Groups 1,2

All termination resistance measurements, taken at 100 milliamperes DC minimum and 50 millivolts open circuit voltage, had a maximum increase in resistance (ΔR) of less than 0.22 milliohms

Test Group	Nbr of Data points	Condition	Min	Max	Mean
1	16	After Mechanical	-0.07	+0.10	+0.020
2	32	After Current Rating	+0.06	+0.17	+0.097

All values in milliohms

2.3 Dielectric Withstanding Voltage - Group 3

No dielectric breakdown or flashover occurred when a test voltage was applied between adjacent connectors.

2.4 Insulation Resistance - Group 3

All insulation resistance measurements were greater than 1,000 megohms.

2.5 Temperature Rise vs Current - Group 2

All samples had a temperature rise of less than 30°C above ambient when a specified current of 38 amperes AC was applied.

2.6 Vibration - Groups 1,2

No discontinuities of the contacts were detected during vibration (Group 1 only). Following vibration, no cracks, breaks, or loose parts on the connector assemblies were visible.

2.7 Physical Shock - Group 1

No discontinuities of the contacts were detected during physical shock. Following physical shock testing, no cracks, breaks, or loose parts on the connector assemblies were visible.

2.8 Mating Force - Group 1

All mating force measurements were less than 10 pounds per contact pair.

2.9 Unmating Force - Group 1

All unmating force measurements were greater than 2.0 pounds per contact pair.

2.10 Contact Retention Force - Group 4

No physical damage occurred to either the contacts or the housing, and no contacts dislodged from the housings, as a result of supplying an axial load of 40 pounds to the contacts.

2.11 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 25 times.

2.12 Thermal Shock - Group 3

No evidence of physical damage to either the contacts or the connector was visible as a result of the thermal shock exposure.

2.13 Humidity-Temperature Cycling - Groups 2,3

No evidence of physical damage to either the contacts or the connector was visible as a result of the humidity-temperature cycling exposure.

2.14 Temperature Life - Group 2

No evidence of physical damage to either the contacts or the connector was visible as a result of exposure to the elevated temperature exposure.

3. Test Methods

3.1 Examination of Product

Product drawings and inspection plans were used to examine the samples. They were examined visually and functionally.

3.2 Termination Resistance, Low Level

Termination resistance measurements at low level current were made using a four terminal measuring technique (Figure 1). The test current was maintained at 100 milliamperes DC with an open circuit voltage of 50 millivolts DC.

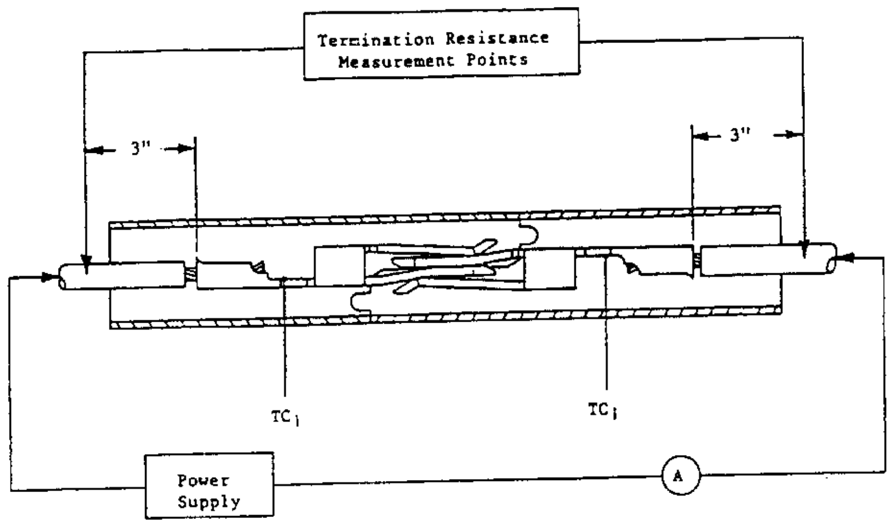


Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 2,500 volts AC was applied between the adjacent connectors. This potential was applied for one minute and then returned to zero.

3.4 Insulation Resistance

Insulation resistance was measured between adjacent connectors, using a test voltage of 500 volts DC. This voltage was applied for two minutes before the resistance was measured.

3.5 Temperature Rise vs Specified Current

Connector temperature was measured, while energized at the specified current of 38 amperes AC. Thermocouples were attached to the connectors to measure their temperatures. This temperature was then subtracted from the ambient temperature to find the temperature rise. When three readings at five minute intervals were the same, the readings were recorded.

3.6 Vibration, Sine

Mated connectors were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.06 inch, double amplitude. The vibration frequency was varied uniformly between the limits of 10 and 55 Hz and returned to 10 Hz in one minute. This cycle was performed 120 times in each of three mutually perpendicular planes, for a total vibration time of 6 hours. Connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit (Group 1 only). Connectors were energized with 27 amperes DC to produce a 18°C temperature rise (Group 2 only).

3.7 Physical Shock

Mated connectors were subjected to a physical 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 three mutually perpendicular planes, for a total of 18 shocks. The connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.8 Mating Force

The force required to mate individual connectors was measured using a tensile/compression device and a free floating fixture. The crosshead rate of travel was 0.5 inch/minute.

3.9 Unmating Force

The force required to unmate individual connectors was measured using a tensile/compression device and a free floating fixture. The crosshead rate of travel was 0.5 inch/minute.

3.10 Contact Retention

An axial load of 40 pounds was applied to each contact and held for 60 seconds. The force was applied in a direction to cause removal of the contacts from the housing.

3.11 Durability

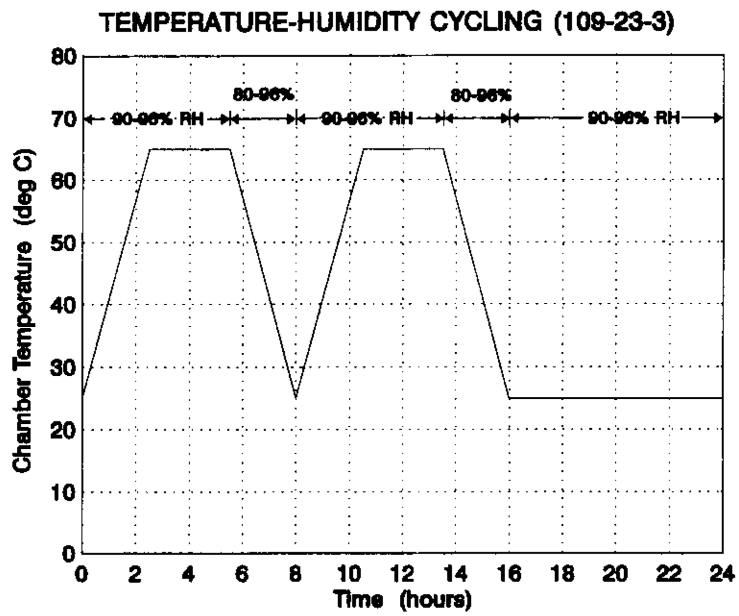
Connectors were mated and unmated 25 times at a rate not exceeding 400 cycles per hour.

3.12 Thermal Shock

Mated connectors were subjected to 5 cycles of temperature extremes with each cycle consisting of 30 minutes at each temperature. The temperature extremes were 0° and 105°C. The transition between temperatures was less than one minute.

3.13 Humidity-Temperature Cycling

Mated connectors 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 the relative humidity was held at 95% as illustrated in Figure 2.



3.14 Temperature Life

Mated connectors were exposed to a temperature of 105°C for 500 hours.

4. Validation

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8/2/95

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