AMP ADVANCED CABLE SYSTEMS
3101 Fulling Mill Road, Middletown PA 17057

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Subject: Ribbon Coax Cable and Connector Safety Ratings

In follow-up to your inquiry concerning the safety ratings of our Ribbon Coax Cable assembly product, I have attached the Product Specification for the Ribbon cable connectors and Lead assembly. Please note the following:

Cable Characteristics:

- Withstanding voltage: 500 vac rms, 60 hz, one minute hold as per the attached product spec.
- NEC Electrical rating: The cable is listed as a UL Style 2741. There is no NEC CL2 classification for this cable.
- Flammability rating: The cable consists of a foamed Polypropylene dielectric with a PVC jacket. Aluminum Mylar is used as the cable shield. Each of the components has their own flammability rating.
- MSDS: Each of the raw material components of the cable does have its own MSDS. I can obtain these from the supplier if need be. When the cable is manufactured, it is the UL, CSA, NEC ratings that take effect.

Connector Characteristics: For P/N 350777-1 / 350786-1

- Dielectric Withstanding Voltage: 5.0KVAC or KVDC as per the attached product spec.
- material: As per the attached Product specification.
- Flammability: Per the attached specification.
- MSDS: A MSDS does not exist for either of these P/Ns, though a raw material MSDS does exist.

I hope this answers your questions. If you require further information or clarification, please do not hesitate to call me (610-436-6688). Thank you again for allowing me to meet your cable assembly needs.

430-8355

Sincerely,

Ken Makoid
Product Specialist - Advanced Cable Systems Division
AMP Incorporated

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3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)		
	1	2	3
	Test Sequence (b)		
Examination of product	1,9	1,9	1,8
Termination resistance	3,7	2,7	
Insulation resistance			2,6
Dielectric withstanding voltage			3,7
Temperature rise vs current		3,8	
Vibration	5	6(c)	
Physical shock	8		
Durability	4		
Mating force	2		
Unmating force	8		
Thermal shock			4
Humidity-temperature cycling		4(d)	5
Temperature life		5	

NOTE

(a) *See Para 4.1.A.*
(b) *Numbers indicate sequence in which tests are performed.*
(c) *Discontinuities shall not be measured. Energize at 18 °C level for 100% loadings per AMP Specification 109-151.*
(d) *Precondition samples with 5 cycles durability.*

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Samples shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test group 1 shall consist of 8, 4 position connector assemblies and 3, 12 position connector assemblies, all terminated to 14 AWG wire. Test group 2 shall consist of 8, 4 position in-line connector assemblies terminated to 20 AWG wire; 8, 4 position connector assemblies terminated to 10 AWG wire; 3, 12 position matrix connector assemblies terminated to 20 AWG wire; and 3, 12 position matrix connector assemblies terminated to 12 AWG wire. Test group 3 shall consist of 5, 12 position matrix connector assemblies terminated to 12 AWG wire.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 2.

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

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Test Description	Requirement	Procedure
Physical shock.	No discontinuities of 10 microseconds or longer duration. See Note.	AMP Spec 109-26-1, except 30 G's. Subject mated samples to 30 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 5.
Durability.	See Note.	AMP Spec 109-27. Manually mate and unmate samples for 50 cycles at a maximum rate of 600 cycles per hour.
Mating force.	1.5 pounds maximum per contact for split pins.	AMP Spec 109-42, Condition A. Measure force necessary to mate samples with locking latches disengaged to depth of .075 inch at maximum rate of .5 inch per minute.
Unmating force.	.5 pound minimum per contact for split pins.	AMP Spec 109-42. Condition A. Measure force necessary to unmate samples with locking latches disengaged at maximum rate of .5 inch per minute.
ENVIRONMENTAL		
Thermal shock.	See Note.	AMP Spec 109-22. Subject mated samples to 25 cycles between -55 and 85°C.
Humidity-temperature cycling.	See Note.	AMP Spec 109-23-3, Condition B. Subject mated samples to 10 cycles between 25 and 65°C at 95% RH.
Temperature life.	See Note.	AMP Spec 109-43. Subject mated samples to temperature life at 85°C for 500 hours.

NOTE *Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 2.*

Figure 1 (end)

3.3. Ratings

A. Voltage: 600 vac

B. Current: See Figure 4 for applicable current carrying capability. Maximum rated current that can be carried by this product is limited by the maximum operating temperature of the housings (105°C) and temperature rise of the contacts (30°C). Variables which shall be considered for each application are wire size, connector size, contact material, and ambient temperature.

C. Temperature: -55 to 85°C

3.4. Performance and Test Description

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per AMP Specification 109-1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and AMP Spec 114-1043.	Visual, dimensional and functional per applicable quality inspection plan.
	ELECTRICAL	
Termination resistance.	3.5 milliohms maximum initial. Maximum/minimum ΔR 5 milliohms.	AMP Spec 109-6-1. Subject mated contacts assembled in housing to 50 mv maximum open circuit at 100 ma maximum. See Figure 3.
Insulation resistance.	1000 megohms minimum initial. 100 megohms minimum final.	AMP Spec 109-28-4. Test between adjacent contacts of mated samples.
Dielectric withstanding voltage.	5 kv (rms) at sea level initial. 3.5 kv (rms) at sea level final.	AMP Spec 109-29-1. Test between adjacent contacts of mated samples.
Temperature rise vs current.	30°C maximum temperature rise at specified current.	AMP Spec 109-45-2. Measure temperature rise vs current. See Figure 4.
	MECHANICAL	
Vibration, sinusoidal.	No discontinuities of 10 microseconds or longer duration. See Note.	AMP Spec 109-21-1. Subject mated samples to 10-55-10 Hz traversed in 1 minute. 2 hours in each of 3 mutually perpendicular planes. See Figure 5.

Figure 1 (cont)

AMP Design Objectives **108-1090** Rev O

Connector, Universal MATE-N-LOK* II

DESIGN OBJECTIVES
The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore AMP Incorporated makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, AMP Incorporated may change these requirements based on the results of additional testing and evaluation. Contact AMP Engineering for further details.

1. SCOPE

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1.1. Content

This specification covers performance, tests and quality requirements for universal MATE-N-LOK* II connectors. These connectors provide a means of grouping multi-lead connections in home entertainment centers, appliances, vending machines, computers, and other commercial equipment.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in AMP 109 series specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and referenced documents, this specification shall take precedence.

2.1. AMP Documents

A. 109-1: General Requirements for Test Specifications
B. 109 Series: Test Specifications as indicated in Figure 1. (Comply with MIL-STD-202, MIL-STD-1344 and EIA RS-364)
C. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Military or Commercial Documents
D. 114-1043: Application Specification
E. 501- : Test Report

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2. Materials

A. Housing: Nylon, 6/6, UL94V-0
B. Pins, split: Brass and phosphor bronze, pre-tin
C. Sockets: Phosphor bronze, pre-tin