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**MAG-MATE\* Standard Terminals**

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**1. SCOPE**

## 1.1. Content

This specification covers the performance requirements for standard MAG-MATE\* terminals. These terminals are designed for general use as a magnet wire to external circuit interface and are compatible with copper wire in sizes 17 through 32 AWG or aluminum wire in sizes 17 through 28 AWG. Coating of organic polymer material having NEMA temperature ratings of 105 to 200°C.

## 1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

## 1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on 14Oct85. Addition testing was completed on 05Oct07 and 30Jun08. The Qualification Test Report number for this testing is 501-30. This documentation is on file at and available from Engineering Practices and Standards (EPS).

**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 the referenced documents, this specification shall take precedence.

## 2.1. Tyco Electronics Documents

- ! 109-197: Test Specification (AMP Test Specifications vs EIA and IEC Test Methods)
- ! 114-2046: Application Specification (MAG-MATE\* Series 300 Terminals)
- ! 501-30: Qualification Test Report (MAG-MATE\* Standard Terminals)

## 2.2. Industry Document

EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications

**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

Materials used in the construction of this product shall be as specified on the applicable product drawing.

## 3.3. Performance and Test Description

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

## 3.4. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
<b>ELECTRICAL</b>		
Low Level Contact Resistance (LLCR).	See Figure 3.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 4.
Current cycling.	Termination resistance at specified test current. See Figures 3 and 4.	EIA-364-55. Subject specimens to 480 cycles of 15 minutes ON and 15 minutes OFF. Read initially and after 96, 192, 384 and final cycles.
<b>MECHANICAL</b>		
Insertion force.	66.7 N [15 lbf] maximum for poke-in connection. 355.9 N [80 lbf] maximum for termination into plastic housing.	EIA-364-5. Measure the force necessary to insert poke-in connection or terminate terminal into plastic housing cavity (polyester 30% glass-filled) at a maximum rate of 10 mm [.39 in] per minute.
Extraction force.	22.2 N [5 lbf] minimum for poke-in connection. 22.2 N [5 lbf] minimum for standard terminal cavity retention. 89 N [20 lbf] minimum for latch-in type terminal cavity retention.	EIA-364-5. Measure the force necessary to pull poke-in connection out of terminal or terminal out of cavity (polyester 30% glass-filled) at a maximum rate of 10 mm [.39 in] per minute.

Figure 1 (continued)

Test Description	Requirement	Procedure
<b>ENVIRONMENTAL</b>		
Thermal shock.	See Note.	EIA-364-32, Test Condition III. Subject specimens to 25 cycles between -65 and 125°C with 30 minute dwells at temperature extremes and less than 1 minute transition time between temperatures. Measure LLCR initially and after testing.
Humidity/temperature cycling.	See Note.	EIA-364-31, Method III. Subject specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH. Measure LLCR initially and after testing.
Temperature life.	See Note.	EIA-364-17, Method A. Subject specimens to 118°C for 33 days. Measure LLCR initially and after testing.

**NOTE**

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

Figure 1 (end)

## 3.5. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)		
	1	2	3
	Test Sequence (b)		
Initial examination of product	1	1	1
LLCR	2,6		
Current cycling		2	
Insertion force (c)			2
Extraction force (c)			3
Thermal shock	5		
Humidity/temperature cycling	4		
Temperature life	3		
Final examination of product	7	3	4

**NOTE**

- (a) See paragraph 4.1.A.  
 (b) Numbers indicate sequence in which tests are performed.  
 (c) Both poke-in and cavity measurement shall be performed.

Figure 2

#### 4. QUALITY ASSURANCE PROVISIONS

##### 4.1. Qualification Testing

###### A. Sample Selection

Terminal housings and contacts shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. All test groups shall each consist of 10 interconnect termination assemblies per magnet wire size. All terminals shall be terminated in accordance with Application Specification 114-2046.

###### 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.

##### 4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

##### 4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

Wire Size (AWG)	Current Cycling				Temperature Life Humidity/Temperature Thermal Shock	
	Copper		Aluminum		Copper	Aluminum
	Resistance (milliohms max)	Test Current (amperes) See Note	Resistance (milliohms max)	Test Current (amperes) See Note	Resistance (milliohms max)	
17	1.4	22.0	2.9	15.0	1.1	2.2
18	1.8	20.0	3.6	13.5	1.4	2.8
19	2.2	18.0	4.4	12.0	1.7	3.4
20	2.7	16.0	5.5	11.0	2.1	4.2
21	3.5	14.0	7.0	9.5	2.7	5.4
22	4.3	12.5	8.6	8.5	3.3	6.6
23	4.6	11.0	9.1	7.5	3.5	7.0
24	5.7	9.5	11.4	6.5	4.4	8.8
25	7.2	8.0	15.9	5.5	5.5	12.2
26	9.1	7.5	18.2	5.0	7.0	14.0
27	10.0	6.0	20.0	4.0	7.7	15.4
28	14.4	5.0	28.9	3.5	11.1	22.2
29	18.0	4.5			13.8	
30	23.0	3.5			17.7	
31	26.0	2.0			20.0	
32	36.0	1.5			27.6	

**NOTE**

Current which produces 100°C initial temperature on the magnet wire. Average reading from 3 thermocouples equally spaced on 12 inch lengths of magnet wire.

Figure 3  
Resistance Values

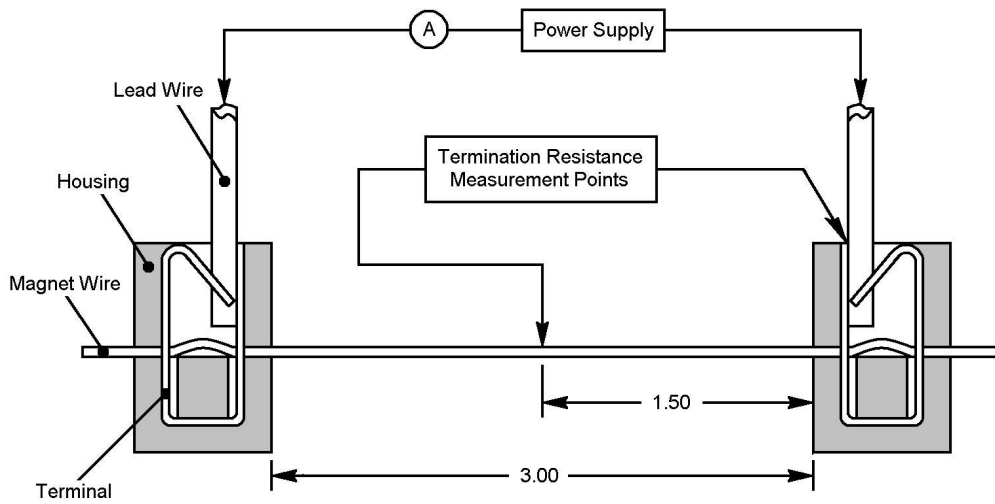


Figure 4  
Typical Temperature & Termination Resistance Measurement Points