

NUMBER 108-10108

PRODUCT SPECIFICATION

CONTACTS, TYPE I, CRIMP TYPE, FOR ELECTRICAL CONNECTORS

1. SCOPE

This specification covers Type I crimp type electrical contacts for use with electrical connectors.

2. APPLICABLE DOCUMENTS

The following documents and specifications form a part of this specification to the extent specified herein:

MIL-G-45204	Gold Plating; Electrodeposited
MIL-W-16878D	Wire, Electrical Insulated, Copper, 600 Volt
MIL-STD-202C	Test Methods for Electronic and Electrical Component Parts
QQ-N-290	Nickel Plating; Electrodeposited

3. REQUIREMENTS

3.1. Requirements

The contacts furnished under this specification shall be a product which has been tested, and passed the qualification tests specified herein.

3.2. Materials

Unless otherwise specified, contacts shall be machined of solid rod stock using conductive material. All contacting surfaces except the interior of crimp barrels shall be smooth. Contacts shall be gold plated over a nickel sub-plate. Plating conforms to MIL-G-45204 for gold and QQ-N-290 for nickel.

3.3. Nonmagnetic Materials


All contact component parts shall be constructed of nonferrous or nonmagnetic material.

3.4. Performance

A. Contact Resistance

When tested in accordance with Para. 4.3.B. the resistance of mated pairs of pins and sockets shall be such that the potential drop at the specified test current will not be greater than the potential drop listed in Figure 1.

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				CHK <i>[Signature]</i> 1-25-73			
				APP <i>[Signature]</i> 1-25-73	LOC B	NO. A 108-10108	REV B
B	Rev per ECN C-036	MP	EA	1-25-73	SHEET 1 OF 7 NAME Contacts, Type I, Crimp Type, For Electrical Connectors		
LTR	REVISION RECORD	DR	CHK	DATE			

Contact	Wire Size	Test Current (Amperes)	Potential Drop Across Y-Y at 25°C
20	26	1.5	10.0
20	24	3.0	13.0
20	22	5.0	19.0
20	20	7.5	22.0
20	16	13.0	24.0
12	18	10.0	10.5
12	16	13.0	11.0
12	14	17.0	11.5
12	12	23.0	12.0
10	14	17.0	10.0
10	10	33.0	12.0
8	12	23.0	13.0
8	10	33.0	12.0
8	8	46.0	11.0

FIG. 1

Contact Resistance
(Maximum Potential Drop in Millivolts)

B. Contact Engaging and Separating Forces


When tested in accordance with Para. 4.3.C., ninety-six (96) percent of all values obtained shall not exceed the maximum force specified in Figure 2. None of the values shall be less than the minimum force indicated.

Contact Size	Force in Ounces Steel Pin (a)		Engagement Length of Test Pin ± .010
	Minimum	Maximum	
20	.75	18.00	.203
12	4.00	48.00	.375
10	5.00	48.00	.375
8	5.00	160.00	.375

(a) Test Pin to be in accordance with MS 3197.

FIG. 2

Contact Engaging and Separation Forces

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C. Durability Conditioning

Mating pin and socket contacts shall withstand the durability conditioning procedure outlined in Para. 4.3.D. Upon completion of this test, the contacts shall be capable of meeting the contact resistance requirements of Figure 1.

D. Crimp Tensile Strength

When tested in accordance with Para. 4.3.E. the strength of the individual contact to wire crimp joint shall conform to the strength values of Figure 3.

Wire Gauge	Crimp Joint Tensile Load, Pounds Minimum
26	5
24	10
22	15
20	19
18	38
16	50
14	70
12	110
10	150
8	225

FIG. 3
Contact Crimp Tensile Load

4. QUALITY ASSURANCE PROVISIONS


4.1. Test Conditions

Unless otherwise specified, tests and examinations shall be conducted under any combination of conditions within the following ranges. Any specified condition shall not affect the other two ambient ranges.

- Temperature: 20° to 30°C
- Relative Humidity: 30 to 80 percent
- Barometric Pressure: 24 to 31 inches of mercury

A. Wire

Wire in accordance with MIL-W-16878, Type B or E shall be used to conduct all tests.

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4.2. Testing

A. Test Sample

The sample shall consist of 30 pin contacts and 30 socket contacts, of the size desired, representative of the production equipment.

B. Qualification Testing

Contacts shall be subjected to the qualification testing as indicated in Figure 4.

4.3. Test Methods

A. Examination of Product

Contacts shall be thoroughly examined to insure that all requirements of Para. 3 have been met, excepting performance. Final examination of product shall include a thorough examination to insure that the contact is free from mechanical defects, that there are no cracks around the crimp area. Inspection shall be made with a device having magnification power of approximately 3 diameters.


B. Contact Resistance Test

The potential drop of each mated pair of pins and sockets shall be measured at the test currents specified in Figure 1 at ambient temperatures of $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$. The potential drop shall be measured across the entire contact mated length to a point on the attached wire. Measurements shall be taken after the temperature of the wire has stabilized.

C. Contact Engaging and Separating Forces

Sockets shall be mounted in a suitable position or fixture for applying gradually increasing loads for the engagement and separation of test pins from the sockets. Maximum and minimum test pins shall be in accordance with MS 3197. Insertion of test pins shall be to a depth shown in Figure 3 when measured from the front of the socket contact. The test pin shall not bottom in the socket. Performing this test in the sequence set forth below, measurements shall conform to the requirements of contact engagement and separation forces specified in Para. 3.4.B.

- (1) Insert and separate a maximum diameter pin in and from each socket contact, then insert and remove a minimum diameter pin in the same sockets. During separation of the minimum test pin, the forces shall conform with the minimum specified in Para. 3.4.B.
- (2) Insert and separate a maximum diameter pin in and from each socket contact three times. During the third cycle the engagement forces shall not exceed the maximum specified in Para. 3.4.B.

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D. Durability Conditioning

Contacts shall be subjected to 500 cycles for contact size 20 and 100 cycles for all others, of engagement and separation at a rate not to exceed 600 cycles per hour. Engagement and separation shall be similar to that required in actual service. After 500 cycles, wired unmated pin and socket assemblies shall be subjected to a salt spray test in accordance with MIL-STD-202, Method 101, Test Condition B. Immediately following exposure, all exposed surfaces shall be washed thoroughly with tap water and dried in a circulating oven at a temperature of $38^{\circ}\text{C} \pm 3^{\circ}$. The contacts shall be removed from the oven and mated as in service. Contact resistance shall be measured and the values shall conform to the requirements of Para. 3.4.C. There shall be no damage from corrosion following this test.

E. Tensile Strength

Specimens of contacts crimped to wires shall be placed in a standard tensile-testing machine and an axial load shall be applied. The holding surfaces or clamps of tensile machine may be serrated to provide sufficient gripping or holding strength. The rate of travel of the head of the testing machine shall be approximately 1 inch per minute. (See Para. 3.4.D.)


Test	Paragraph	All Contact Sizes	
		Wire Size	
		Minimum, 15 Samples	Maximum, 15 Samples
Examination of Product	4.3.A.	X	X
Contact Resistance	4.3.B.	X	X
Contact Engaging and Separating Forces	4.3.C.	X	X
Durability Conditioning	4.3.D.	X	X
Examination of Product	4.3.A.	X	X
Tensile Strength Test	4.3.E.	X	X

FIG. 4
Qualification and Periodic Test

4.4. Quality Conformance Inspection

A. Lot Inspection

Sample units from each lot of contacts produced shall be subjected to the inspection of Figure 5 in the order shown.

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(1) Inspection Lot

An inspection lot shall consist of all contacts covered by one drawing, produced under essentially the same conditions, and offered for inspection at one time.

(2) Sampling Plan

Statistical sampling and inspection shall be in accordance with MIL-STD-105. Normal inspection at the 4.0% AQL level will be used.

(3) Rejected Lots


If an inspection lot is rejected, the lot will be withdrawn and reworked to correct the defects. The lot will then be reinspected using tightened inspection.

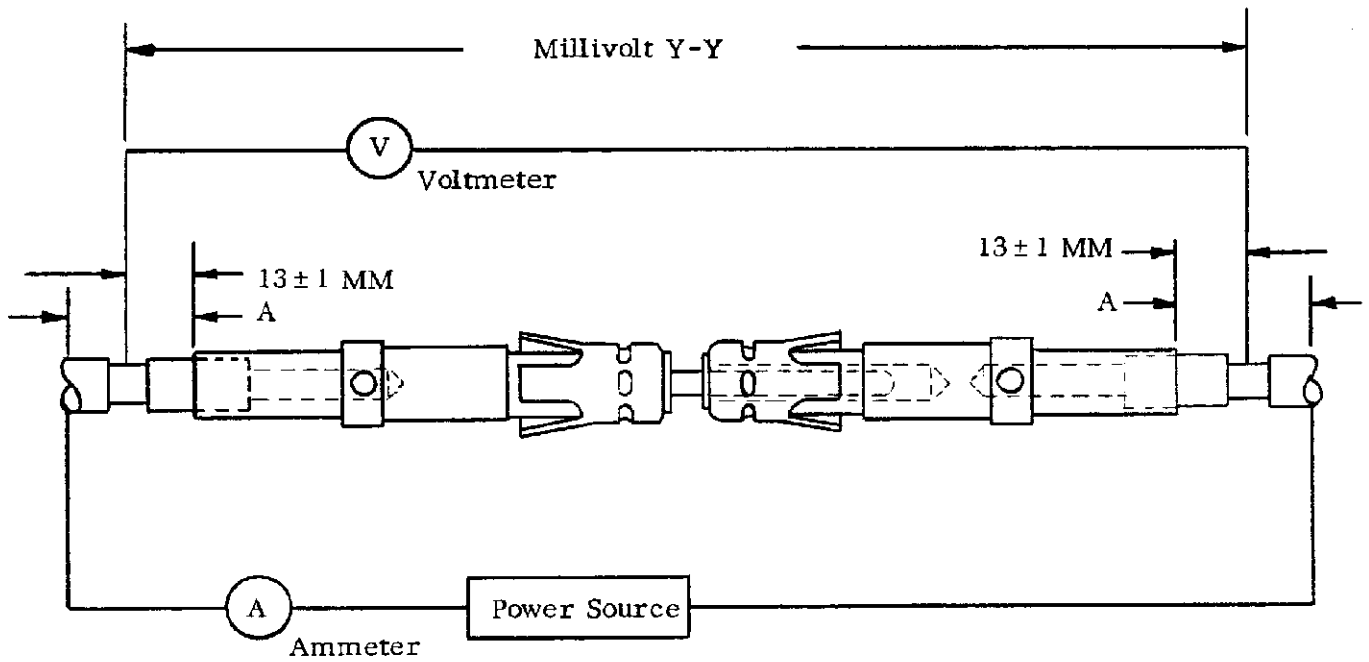
Examination or Test	Paragraph	AQL %	Level
Examination of Product	4.3.A.	4.0	II
Contact Engaging and Separation Forces	4.3.C.	4.0	II

FIG. 5
Lot Inspection

4.5. Periodic Testing


At 24 month intervals, from the date of qualification, contacts shall be selected from production in the quantities shown in Para. 4.2.A. and subjected to the test sequence shown in Figure 4.

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- A - 3 Foot minimum length of continuous lead (for heat dissipation).
- Y-Y - Measure across the contact wire crimp. Insulation may be cut back for making this measurement.
- V - Suitable instrument for measuring MV drop.

FIG. 6
Measuring Contact Resistance

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