

NICOMATIC Test report summary CMM Family

CRIMP TENSILE STRENGTH FORCE (AWG12 to AWG28)



I. Introduction

A. Purpose

The CMM connectors' family are manufactured to meet or exceed the requirements of **MIL-DTL-55302G** standard. Here we are also following **WHMA-A-620B** standard for requirements.

B. Scope

To determine the mechanical strength of the crimped contact-to-conductor joint.

The following data has been taken from NICOMATIC Qualification test reports QTR0938, QTR0949, QTR0965, QTR1008, QTR1038, QTR1039, QTR1061, QTR1063, QTR1102, QTR1121 and QTR1414.

C. Conclusion

The CMM connectors' family are qualified regarding CRIMP TENSILE STRENGTH FORCE (AWG12 to AWG28) according MIL-DTL-55302G and WHMA-A-620B.

II. Test Method and Requirements

A. List of Test Samples

a. LF Contacts

- 12960 LF male contacts AWG22
- C13064-P LF female contacts AWG22
- 12969 LF male contacts AWG24 to AWG28
- C12468 LF female contacts AWG24 to AWG28

b. HP Series 22

- 22-3310 HP22 male contacts AWG16 to AWG20
- 22-4310 HP22 female contacts AWG16 to AWG20
- 22-3308 HP22 male contacts AWG18
- 22-4308 HP22 female contacts AWG18
- 22-3305 HP22 male contacts AWG20
- 22-4305 HP22 female contacts AWG20

c. HP Series 30

- 30-3320 HP30 male contacts AWG12
- 30-4320 HP30 female contacts AWG12
- 30-3315 HP30 male contacts AWG14







- 30-4315 HP30 female contacts AWG14
- 30-3310 HP30 male contacts AWG16 to AWG20
- 30-4310 HP30 female contacts AWG16 to AWG20
- 30-3308 HP30 male contacts AWG18 to AWG20
- 30-4308 HP30 female contacts AWG18 to AWG20
- 30-3305 HP30 male contacts AWG20
- 30-4305 HP30 female contacts AWG20

B. Requirements

According to MIL-DTL-55302G standard:

TABLE IV. Crimp tensile strength.

Wire size (AWG) type-E as specified in NEMA-HP3, type	Minimum tensile strength (pounds)
20	20.0
22	12.0
24	8.0
26	5.0
28	3.0
30	1.5

According to WHMA-A-620B standard:

Tableau 19-12 Valeurs minimales à respecter lors du Test de Traction

Taille du conducteur		Contacts usinés				Epissures Serties		Contacts et Terminaisons emboutis	
		Fil plaqué	\rgent/étain	Fil plac	Fil plaqué Nikel				
AWG	(mm ²)	Lbs	(N)	Lbs	(N)	Pounds	(N)	Pounds	(N)
30	0.050	1.5	6.7	1.5	6.7	1.5	6.7	1.5*	6.7*
28	0.080	3	13.4	2	8.9	2	8.9	2*	8.9*
26	0.130	5	22.3	3	13.4	3	13.4	7	31.2
24	0.200	8	35.6	6	26.7	5	22.3	10	44.5
22	0.324	12	53.4	8	35.6	8	35.6	15	66.8
20	0.519	20	89.0	19	84.6	13	57.9	19	84.6
18	0.823	32	142	NE	NE	20	89.0	38	169.1
16	1.310	50	222.3	37	164.6	30	133.5	50	222.5
14	2.080	70	311.5	60	266.9	50	222.5	70	311.5
12	3.310	110	489.5	100	445.0	70	311.5	110	489.5
40	5.004	150							.50.0





C. Test Method and Results

d. Test Procedure according to MIL-DTL-55302G

The test shall be performed in accordance with test procedure EIA-364-08. Samples for test shall be placed in a standard tensile testing machine and the load applied at an approximate rate as specified to pull the wire out of the sample or break the wire sample. Values shall be as shown in table IV. Note that these values are for NEMA HP3, type E wire used in conjunction with the proper crimp contact. Seven samples of each wire size (both pin and receptacle types) shall be tested.

e. Test Procedure according to EIA-364-08

- Place crimped sample into test fixture of tensile tester.
- Activate tensile equipment so that an axial force is exerted at a speed of 25 \pm 6 millimetres per minute (1 \pm ¼ inch per minute) until separation occurs between contact and conductor.
- Record tensile data and examine sample.
- Separation

Types of separation resulting from this test are as follows:

- Slip (pull out).
- Conductor broken in crimp area (some or all).
- Contact broke in crimp area (some or all).
- Conductor broken outside crimp area.
- Contact broken outside crimp area.





Male 30-3320 12 489.5 568 19 2.16 2.82	Type of contact	Contact Gendre	Ref contact	Wire size (AWG)	Crimp Tensile strength requirement for Silver / Tin Plating (N)	Crimp Tensile strength Measured (N)	Cable type	Strands nbr	Conductor Ø (mm)	Insulator Ø (mm)
Female 30-4320 12 489.5 568 19 2.16 2.82			20 2220	(AWG)	ioi siivei / iiii Flating (N)	<u>(10)</u>			<u>(111111)</u>	<u>(11111)</u>
Male 30-3315 14 311.5 412.4 19 1.78 2.29 Female 30-4315 16 222.3 240 19 1.39 1.9 Female 30-4310 16 222.3 240 19 1.39 1.9 Female 30-4310 18 142 200 Female 30-4308 18 142 200 Female 30-4308 18 142 200 Female 30-4310 18 130 130 Female 30-4310 16 20-3308 18 142 130 Female 30-4310 16 20-3308 18 141 141 Female 30-4310 16 222.3 23.09 141 Female 22-4310 16 222.3 23.69 19 1.39 1.9 Female 22-4310 16 222.3 23.69 19 1.39 1.9 Female 22-4310 16 222.3 23.09 19 1.22 1.73 Female 22-4310 18 142 22.33 23.69 19 1.22 1.73 Female 22-4310 18 142 22.33 23.69 19 1.22 1.73 Female 22-4310 18 142 22.33 18 142 22.33 19 Female 22-4310 18 142 22.33 23.69 19 1.22 1.73 Female 22-4310 18 142 22.33 23.69 19 1.9 1.22 1.73 Female 22-4310 22-3308 18 142 22.33 23.69 19 0.96 1.47 Female 22-4310 22-3308 18 142 22.33 23.69 19 0.96 1.47 Female 22-4310 22-3308 18 142 22.33 18 142 199.3 19 1.22 1.73 Female 22-4310 18 142 199.3 19 1.22 1.73 Female 22-4310 18 142				12	489.5 568			19	2.16	2.82
Female 30-4315 14 311.5 412.4 19 1.78 2.29							MIL-W-22759/11			
Male 30-3310 16 222.3 240 19 1.39 1.9				14	311.5	412.4		19	1.78	2.29
Female 30-4310 10 222.5 240 19 1.39 1.9 1.39 1.9 1.59 1.59 1.9 1.59 1.59 1.9 1.5										
Maile 30-3310 Female 30-4310 Mill-W-22759/11 19 1.22 1.73				16	222.3	240		19	1.39	1.9
Female 30-4310 18					142			19	1.22	1.73
Series 30 Male 30-3308 Female 30-4308 Male 30-3308 Female 30-4308 Male 30-3308 Female 30-4308 Male 30-3308 Female 30-4308 Male 30-3305 Female 30-4308 Male 30-3305 Female 30-4305 Male 22-3310 Female 22-4310 Male 22-3310 Female 22-4310 Male 22-3310 Female 22-4310 Male 22-3308 Female 22-4310 Male 22-3305 Female 22-4310 Male 22-3305 Female 22-4305 Male 22-3305 Male 22-3305 Male 22-3305 Male 22-3305 Male 22-3305 Male 22-305 Male	HP		 							
Female 30-4308	Series 30	Male	30-3308	18						
Female 30-4310 Male 30-3308 Female 30-4308 Male 30-3305 Female 30-4305		Female	30-4308			200				
Female 30-4310 19 0.96 1.47		Male	30-3310		89	130	1			
Female 30-4308 Male 30-3305 Female 30-4305 Male 22-3310 Female 22-4310 Male 22-3310 Female 22-4310 Male 22-3310 Female 22-4310 Male 22-3308 Male 22-3308 Male 22-3308 Male 22-3306 Female 22-4310 Male 22-3305 Female 22-4310 Male 22-3305 Female 22-4305 Male 22-3305 Female 22-4305 Female 22-4305 Male 22-3305		Female	30-4310			130		19	0.96	1.47
Name 30-4308 Male 30-4308 Male 22-3310 Male 22-3310 Male 22-3310 Male 22-3310 Male 22-3310 Male 22-3308 Male 22-3308 Male 22-3308 Male 22-3310 Male 22-3308 Male 22-3308 Male 22-3308 Male 22-3300 Male		Male	30-3308	20		130				
Female 30-4305		Female	30-4308	20		150				
Male 22-3310 16 222.3 236.9 19 1.39 1.9		Male				1.41				
Female 22-4310 Male 22-3310 Female 22-4310 Male 22-3308 Series 22 Female 22-4308 Male 22-3300 Female 22-4300 Male 22-3300 Female 22-4300 Male 22-3300 Female 22-4305 Female C13064-P Male 12969		Female				141				
HP Male 22-4310 18 142 199.3 199		Male		16	222.3	236.9		19	1 39	1 9
Female 22-4310 18 142 199.3		Female		10	222.5	20013	MIL-W-22759/11			
Female 22-4310 18 142 19 1.22 1.73				18	142			19	1.22	1.73
HP Male 22-3308 Female 22-4308 Male 22-3310 Female 22-4310 Male 22-3305 Female 22-4305 Male 12960 Female C13064-P Male 12969 Male 1										
Series 22 Female 22-4308										
Female 22-4310 20 89 287 19 0.96 1.47	Series 22									
Female 22-4310 20 89 287 19 0.96 1.47				20	89	149.5		19	0.96	1.47
Male 22-3305 287										
Male 12960 22 53.4 91.45 19 0.76 1.24						287				
Female C13064-P 22 53.4 91.45 19 0.76 1.24		-	<u> </u>							
Male 12969 24 35.6 67 19 0.6 1.09				22	53.4	91.45	MIL-W-22759/11 -	19	0.76	1.24
CMM/DMM Female C12468 24 35.6 67 19 0.6 1.09 LF Male 12969 26 22.3 33.65										
LF Male 12969 26 22.3 33.65 MIL-W-22/59/11				24	35.6			19	0.6	1.09
26 1 27.3 1 33.65 1 19 1 0.508 1 0.96										
				26	22.3	33.65		19	0.508	0.96
Male 12969				28			1			
Female C12468 28 13.4 14.35 7 0.38 0.83					13.4	14.35		7	0.38	0.83