

# **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	
AWG	(mm²)	Fil plaqué Argent/étain		Fil plaqué Nickel		Pounds	(N)	Pounds	(N)
		Lbs	(N)	Lbs	(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

## 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 ( $1 \pm \frac{1}{4}$  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.

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)		
HP Series 30	Male	30-3320	12	489.5	568	MIL-W-22759/11	19	2.16	2.82		
	Female	30-4320					19	1.78	2.29		
	Male	30-3315	14	311.5	412.4		19	1.39	1.9		
	Female	30-4315					19	1.22	1.73		
	Male	30-3310	16	222.3	240		19	0.96	1.47		
	Female	30-4310					19	0.96	1.47		
	Male	30-3310	18	142	182		19	1.22	1.73		
	Female	30-4310			200		19	1.22	1.73		
	Male	30-3308			130		19	1.22	1.73		
	Female	30-4308			130		19	1.22	1.73		
	Male	30-3310	20	89	141		19	1.22	1.73		
	Female	30-4310			130		19	1.22	1.73		
	Male	30-3308			141		19	1.22	1.73		
	Female	30-4308			141		19	1.22	1.73		
	HP Series 22	Male	22-3310	16	222.3		236.9	MIL-W-22759/11	19	1.39	1.9
		Female	22-4310						19	1.39	1.9
Male		22-3310	18	142	199.3	19	1.22		1.73		
Female		22-4310			432	19	1.22		1.73		
Male		22-3308			149.5	19	0.96		1.47		
Female		22-4308			287	19	0.96		1.47		
Male		22-3310	20	89	149.5	19	0.96		1.47		
Female		22-4310			287	19	0.96		1.47		
Male		22-3305			287	19	0.96		1.47		
Female		22-4305			287	19	0.96		1.47		
CMM/DMM LF	Male	12960	22	53.4	91.45	MIL-W-22759/11	19	0.76	1.24		
	Female	C13064-P					19	0.6	1.09		
	Male	12969	24	35.6	67		19	0.508	0.96		
	Female	C12468			19		0.38	0.83			
	Male	12969	26	22.3	33.65		7	0.38	0.83		
	Female	C12468			7		0.38	0.83			