

MIL-C-22520F
AMENDMENT 1
25 April 1977

MILITARY SPECIFICATION

CRIMPING TOOLS, TERMINAL, HAND OR POWER
ACTUATED, WIRE TERMINATION, AND TOOL KITS
GENERAL SPECIFICATION FOR

This amendment forms a part of Military Specification MIL-C-22520F, dated 19 March 1976, and is approved for use by all Departments and Agencies of the Department of Defense.

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1.2 Classification. line 2, delete the words "classes and".

1.2.1 Classes. Delete entirely and substitute:

"1.2.1 Crimping tools. Crimping tools covered by this specification are for use by the military and shall be the only crimping tools to be qualified, procured and issued for military maintenance use. Equipment manufacturers are directed to 6.7."

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2.2 Other publications. Delete "SD-6 - Provisions Governing Qualification." and delete related application for copies address.

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3.2.2 Provision governing qualification. Delete entirely.

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3.5.4.2 Type 2 tools. Delete first sentence and substitute "When tested in accordance with 4.7.4.2, the opposing die faces shall meet and the dies shall fully close before the ratchet releases."

3.5.10 Voltage drop. Delete and substitute:

"3.5.10 Voltage drop.

3.5.10.1 Type 1 tools. The voltage drop across the crimped joint shall not exceed the value specified in table IA, when tested as specified in 4.7.10.1.

3.5.10.2 Type 2 tools. The voltage drop shall meet the requirements of the specification to which the crimped item is qualified, not exceeding the values specified in table IB, when tested as specified in 4.7.10.2."

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TABLE IA. Voltage drop and tensile strength (type 1 tools). Delete and substitute:" TABLE IA. Voltage drop and tensile strength (type 1 tools).

Wire barrel size	Wire size range	Test current (amps)	Maximum voltage drop		Minimum tensile strength (pounds)			
			Silver- or tin-plated copper wire	Nickel-plated copper wire	Silver- or tin-plated copper wire		Nickel-plated copper wire	
			(milli-volts)	(milli-volts)	Initial	After low temp. crimp	Initial	After low temp. crimp
12	12	23.0	3.0	14.0	110.0	93.0	100.0	85.0
	14	17.0	3.5	13.5	70.0	61.0	60.0	53.0
16	16	13.0	3.5	16.0	50.0	45.0	37.0	33.0
	20	7.5	4.0	15.5	20.0	14.0	19.0	13.0
20	20	7.5	4.0	15.5	20.0	14.0	13.0	9.0
	24	3.0	4.0	15.5	8.0	5.0	6.0	4.0
22	22	5.0	4.0	22.5	12.0	7.0	8.0	5.0
	26	2.0	4.0	17.0	5.0	4.0	3.0	2.5
24	24	3.0	4.0	15.5	8.0	5.0	5.0	3.0
	28	1.5	5.0	18.5	3.0	1.5	2.0	1.0
26	26	2.0	4.0	17.0	4.5	2.3	2.8	1.4
	30	1.0	6.0	21.0	1.5	0.8	1.5	0.8
28	28	1.5	5.0	18.5	2.7	1.4	1.7	0.9
	32	0.5	8.0	19.0	1.0	0.5	1.0	0.5

TABLE IB. Voltage drop and tensile strength (type 2 tools). Delete and substitute:" TABLE IB. Voltage drop and tensile strength (type 2 tools, applicable to terminals and splices, only).

Terminal and splice size	Wire size range	Test current (amps)	Maximum voltage drop -- millivolt drop of equivalent length of wire plus this value		Minimum tensile strength (pounds)
			Terminal	Splice	
12-10	10	55.0	1	2	150.0
	12	41.0	1	2	110.0
16-14	14	32.0	1	2	70.0
	16	22.0	1	2	50.0
22-18	18	16.0	1	2	38.0
	22	9.0	1	2	15.0
24-20	20	11.0	1	2	19.0
	24	4.5	2	4	10.0
26-24	24	4.5	2	4	10.0
	26	3.0	3	6	7.0

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TABLE II. Qualification inspection. Delete and substitute:" TABLE II. Qualification inspection.

Examination or test	Requirement paragraph	Test paragraph	Type 1		Type 2	
			Basic tools (4.3.1.1(a))	Turrets or positioners (4.3.1.1(b) and (c))	Basic tools (4.3.1.2(a))	Dies (4.3.1.2(b) and (c))
Visual and mechanical examination- - - - -	3.1,3.3,3.3.1, 3.3.2,3.4,3.6, 3.6.1,3.6.2, 3.6.3,3.7	4.5	X	X	X	X
Inspection gaging- - - -	3.5.1	4.7.1.1	X	X	X	X
Humidity (steady state)-	3.5.2	4.7.2	X	---	X	---
In-service gaging- - - -	3.5.1	4.7.1.2	X	X	X	X
Handle, indenter, and die return operation (full cycling) - - - -	3.5.3	4.7.3	X	---	X	---
Ratcheting mechanism - -	3.5.4	4.7.4	X	---	X	---
High compression force -	3.5.5	4.7.5	X	---	X	---
Inspection gaging- - - -	3.5.1	4.7.1.1	X	---	X	---
Compression force- - - -	3.5.6	4.7.6	X	---	X	---
Deformation of crimped connection - - - - -	3.5.7	4.7.7	X	X	X	X 1/
Cracking of crimped connection - - - - -	3.5.8	4.7.8	X	X	X	X 1/
Axial concentricity (straightness) - - - -	3.5.9	4.7.9	X	X	X	X
Voltage drop - - - - -	3.5.10	4.7.10	X	X	X	X 1/
Tensile strength - - - -	3.5.11	4.7.11	X	X	X	X 1/
Dielectric strength- - -	3.5.12	4.7.12	---	---	X 2/	X 2/
Low temperature crimp- -	3.5.13	4.7.13	X	---	X	---
Compression force- - - -	3.5.6	4.7.6	X	---	X	---
Voltage drop - - - - -	3.5.10	4.7.10	X	---	X	---
Tensile strength - - - -	3.5.11	4.7.11	X	---	X	---
Shock- - - - -	3.5.14	4.7.14	X	---	X	---
In-service gaging- - - -	3.5.1	4.7.1.2	X	---	X	---
Handle, indenter, and die return operation (full cycling) - - - -	3.5.3	4.7.3	X 3/	---	X 3/	---
Ratcheting mechanism - -	3.5.4	4.7.4	X	---	X	---
Life - - - - -	3.5.15	4.7.15	X	---	X	---
Voltage drop - - - - -	3.5.10	4.7.10	X	---	X	---
Tensile strength - - - -	3.5.11	4.7.11	X	---	X	---
Salt spray (corrosion) -	3.5.16	4.7.16	X	---	X	---
In-service gaging- - - -	3.5.1	4.7.1.2	X	---	X	---
Handle, indenter, and die return operation (full cycling) - - - -	3.5.3	4.7.3	X 3/	---	X 3/	---
Ratcheting mechanism - -	3.5.4	4.7.4	X	---	X	---
Visual and mechanical examination- - - - -	3.1,3.3,3.3.1, 3.3.2,3.4,3.6, 3.6.1,3.6.2, 3.6.3,3.7	4.5	X	X	X	X

1/ Applicable only to dies for crimping terminal lugs, splices, end caps, and ferrules.

2/ Applicable only to dies for crimping insulated terminal lugs, splices, end caps, and ferrules.

3/ 4.7.3.1 and 4.7.3.2 not applicable. "

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TABLE III. Group A inspection. Delete and substitute:TABLE III. Group A inspection.

Examination or test	Requirement paragraph	Test paragraph	Type 1		Type 2	
			Basic tools	Turrets or positioners	Basic tools	Dies
Visual and mechanical examination-	3.1, 3.3, 3.3.1, 3.3.2, 3.4, 3.6, 3.6.1, 3.6.2, 3.6.3, 3.7	4.5	X	X	X	X
Inspection gaging- - - - -	3.5.1	4.7.1.1	X	X	X	X
Handle, indenter, and die return operation (full cycling) - - - -	3.5.3	4.7.3	X 1/	---	X 1/	---
Ratcheting mechanism - - - - -	3.5.4	4.7.4	X	---	X	---
High compression force - - - - -	3.5.5	4.7.5	X	---	X	---
Deformation of crimped connection - -	3.5.7	4.7.7	X	X	X	X 2/
Axial concentricity (straightness) -	3.5.9	4.7.9	X	X		
Tensile strength - - - - -	3.5.11	4.7.11	X	X		

1/ 4.7.3.1 and 4.7.3.2 not applicable.

2/ Applicable only to dies for crimping terminal lugs, splices, and end caps. "

TABLE IV. Group B inspection. Delete and substitute:TABLE IV. Group B inspection.

Examination or test	Requirement paragraph	Test paragraph	Type 1		Type 2	
			Basic tools	Turrets or positioners	Basic tools	Dies
In-service gaging- - - - -	3.5.1	4.7.1.2	X	X	X	X
Compression force- - - - -	3.5.6	4.7.6	X	---	X	---
Deformation of crimped connection -	3.5.7	4.7.7	X	X	X	X 1/
Cracking of crimped connection - -	3.5.8	4.7.8	X	X	X	X 1/
Axial concentricity (straightness) -	3.5.9	4.7.9	X	X		
Voltage drop - - - - -	3.5.10	4.7.10	X	X		X 1/
Tensile strength - - - - -	3.5.11	4.7.11	X	X		X 1/
Low temperature crimp- - - - -	3.5.13	4.7.13	X	---	X	---
Compression force- - - - -	3.5.6	4.7.6	X	---	X	---
Voltage drop - - - - -	3.5.10	4.7.10	X	---		---
Tensile strength - - - - -	3.5.11	4.7.11	X	---		---
Shock- - - - -	3.5.14	4.7.14	X	---	X	---
In-service gaging- - - - -	3.5.1	4.7.1.2	X	---	X	---
Handle, indenter, and die return operation (full cycling) - - - -	3.5.3	4.7.3	X	---	X	---
Ratcheting mechanism - - - - -	3.5.4	4.7.4	X	---	X	---
Visual and mechanical examination -	3.1, 3.3, 3.3.1, 3.3.2, 3.4, 3.6, 3.6.1, 3.6.2, 3.6.3, 3.7	4.5	X	X	X	X

1/ Applicable only to dies for crimping terminal lugs, splices, and end caps. "

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4.7.3.2 Type 2 tools. Delete and substitute:

"4.7.3.2 Type 2 tools. The tool assembled with the dies specified in the applicable specification sheet shall be used to crimp 10 test ferrule assemblies as specified in figure 2 and the applicable specification sheet (see 3.1). Assemblies made up as specified in 4.7.6.2 may be considered as being included in the total number specified above. Upon completion of each operation of the tool and release of the applied pressure, the tool shall meet the requirements of 3.5.3."

4.7.4.1 Type 1 tools. Delete and substitute:

"4.7.4.1 Type 1 tools. The location of the indenter tips shall be determined at the point of ratchet release. The handle shall then be fully closed and the indenter tip location again measured. The difference between the two measurements shall meet the requirements of 3.5.4.1."

4.7.5 High compression force. Delete second sentence and substitute: "The force shall be applied while crimping the largest size wire barrel with the largest size wire crimped by the type 1 tool, or the test ferrule called out in the applicable specification sheet for the type 2 tool."4.7.6.2 Type 2 tools. Delete second and third sentences and substitute: "Test ferrules assemblies as specified in figure 2 and the applicable specification sheet shall be crimped."4.7.7 Deformation of crimped connection. Add the following: "When testing turrets, positioners, or dies in accordance with 4.3.1.1b and c, 4.3.1.2b and c, 4.7.8, 4.7.9.2, and 4.7.11, six wire assemblies shall be made. Three with the largest size wire barrel and wire size, and three with the smallest size wire barrel and wire size accommodated in the turret, positioner, or die. When only one wire barrel size is applicable, the largest and smallest size wire it accepts shall be crimped. Wire barrel size and wire size shall be in accordance with table I."

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4.7.10.2 Type 2 tools. Delete and substitute:

"4.7.10.2 Type 2 tool. The wired assemblies prepared for 4.7.7, if applicable, shall be tested in accordance with the voltage drop test of the specification to which the crimped item is qualified and shall meet the requirements specified therein and 3.5.10."

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4.7.12 Dielectric strength (type 2 tools) (when applicable, see 3.1). Delete and substitute:

"4.7.12 Dielectric strength (type 2 tools) (applicable only to dies for crimping insulated terminal lugs, splices, end caps, and ferrules). Four wired assemblies of the largest size and type accommodated by the tool shall be prepared and tested in accordance with the dielectric strength test of the specification to which the crimp item is qualified, and shall meet the requirements therein and 3.5.12."

4.7.13 Low temperature crimp. Delete second sentence and substitute: "Immediately after removing these from the test chamber, while the tool is at the low temperature, the tool shall be used to make its respective crimp. Four wire assemblies shall be made with the type 1 tool, two assemblies shall be made with the largest size wire barrel crimped by the tool with the largest size wire accommodated by the wire barrel and two assemblies with the smallest size wire barrel crimped by the tool with the smallest size wire accommodated by the wire barrel in accordance with table I. Two crimp assemblies shall be made with the type 2 tool using the test ferrule and cable shown in figure 2 and the applicable specification sheet (see 3.1) and shall meet the requirements specified in 3.5.6, 3.5.10, 3.5.11, and 3.5.12 (where applicable)."4.7.13.1 Test samples. Delete entirely.4.7.13.1.1 Contacts, uninsulated terminals, splices, and ferrules. Delete entirely.4.7.13.1.2 Insulated terminals, splices, and ferrules. Delete entirely.

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6.1 Intended use. Fourth line of first sentence after the word "terminals" add "and splices; MIL-S-81824 splices."

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6.3 Qualification. (a) Delete "Naval Ammunition Depot (NAD-70515), Crane, IN 47522." and substitute "Naval Weapons Support Center (NWSC 30633), Crane, IN 47522."

6.7 Performance of class II tools. Delete and substitute:

"6.7 Tools. Tools recommended by manufacturers and not conforming to this specification may be used by equipment manufacturers. Performance of crimp joint made with tools recommended by the manufacturer shall meet all the performance requirements of the specification to which the crimp item is qualified."

Custodians:

Army - EL
Navy - AS
Air Force - 85

Review activities:

Army - MI, MU, AV
Navy - SH, EC
Air Force - 12, 17, 99
DSA - ES

User activities:

Army - ME, AT, GL, WC
Navy - YD
Air Force - 19

Preparing activity:

Navy - AS

Agent:

DSA - ES

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