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INCH-POUND

MIL-S-13303G (AR)
AMENDMENT 5
9 February 2001
SUPERSEDING
AMENDMENT 4
10 April 1991

MILITARY SPECIFICATION

SIGNALS, SMOKE, GROUND, HAND HELD PARACHUTE, GREEN SMOKE, M128A1 RED SMOKE, M129A1, AND YELLOW SMOKE, M194 PARTS AND LOADING, ASSEMBLING AND PACKING

This amendment forms a part of MIL-S-13303G (AR), dated 14 September 1984, and is approved for use by the U.S. Army Armament Research, Development and Engineering Center and is available for use by all Department and Agencies of the Department of Defense.

PAGE 1

* 2.1, Delete "MIL-C-10464" in its entirety and substitute the following:

"MIL-C-70759 – Container, Ammunition, Plastic, PA142, for Pyrotechnic Hand Held Signal Series"

PAGE 2

2.1, Under Standards, add the following:

"COMMERCIAL
ASTM E8 – Tension Testing of Metallic Materials"

* 2.1:

Delete "FED-STD-151" in its entirety.

Drawings, delete "7548414 and 7548415" and substitute in their entirety and substitute the following:

"12900001 – Packing and Marking for Container, PA142 for Signal, Ground
12900009 – Packing and Marking for Container, Metal M548, for Signals, Ground"

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3.3, Delete in its entirety and substitute the following:

"3.3 Cracks. The tube casing shall be free of cracks under visual inspection after hydrostatic testing."

* 3.4.1, Delete in its entirety and substitute the following:

"3.4.1 Premature burst. The assembly shall not burst within one hundred (100) feet from the launcher.

3.4.1.1 Premature ejection. The illuminant assembly shall not eject at an altitude of less than one hundred (100) feet from the ground within a horizontal distance of two hundred and fifty (250) feet from the launcher, or at an altitude of less than fifty (50) feet from the ground at a horizontal distance in excess of two hundred and fifty (250) feet from the launcher.

3.4.1.2 Launch delay. The signal must completely exit the rocket barrel within two (2) seconds of the striking of the primer."

* 3.4.3, Delete "the requirement of 3.4.1" and substitute "the requirements of 3.4.1, 3.4.1.1 and 3.4.1.2."

* 3.4.4a, Delete in its entirety and substitute the following:

"a. The requirements of 3.4.1, 3.4.1.1, 3.4.1.2 and 3.4.2."

3.4.4e, Delete in its entirety.

3.4.4f:

Delete in its entirety and substitute the following:

"f. The burning time of the smoke assembly shall not be less than 6.0 seconds nor more than 18 seconds for the m128, and not less than 18.0 seconds nor more than 34 seconds for the M129, and not less than 9.0 seconds nor more than 18 seconds for the M194."

* Line 2, Delete "not less than 18.0 seconds nor more than 34 seconds for the M129" and substitute "not less than 18 seconds nor more than 40 seconds for the M129"

* Last line, add "(See note after 4.4.3.2.3.1.2)" after "M194"

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* 3.4.5a, Delete in its entirety and substitute the following:

"a. The requirements of 3.4.1, 3.4.1.1. 3.4.1.2 and 3.4.2."

3.4.5b, Delete in its entirety.

* Add new 3.4.5b as follows:

"b. The smoke assembly time shall not separate from the parachute. (Parachute opening delay shall be recorded for informational purposes as well as whether chute remains partially open)"

3.4.5c:

Delete in its entirety and substitute the following:

"c. The burning time of the smoke assembly shall not be less than 6.0 seconds nor more than 22 seconds for the M128, and not less than 18.0 seconds nor more than 40 seconds for the M129, and not less than 9.0 seconds nor more than 18 seconds for the M194."

* Line 2, Delete "not less than 18.0 seconds not more than 40 seconds for the M129" and substitute "not less than 20 seconds nor more than 60 seconds for the M129"

* Last line, add "(See note after 4.4.3.2.3.1.2)" after "M194"

PAGE 4

* 3.5, Delete "metal container" and substitute "plastic container"

* 3.6, Delete in its entirety.

* Add new paragraph 3.9 as follows:

"3.9 Airtightness. The metal container shall withstand, without leakage, an air pressure differential of three (3) pounds per square inch (psi) when tested as specified in 4.5.12."

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Table I, Under Assembly, delete "Functioning, minus 65ºF, … 16(a) … 3.4.5 … 4.5.2.3.2."

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* Table I:

Delete "(Dwg. 7548414)" and substitute "(Dwg. 12900001)" in two places

Delete "Wood Packing Box (Dwg. 7548415)" in its entirety and substitute "Container, Metal, M548 (Dwg. 12900009)"

* Table I:

Under Assembly (Dwg. 8797996/9255782), Delete "Examination for defects 96" and substitute "Examination for defects 80"

Add the following:

"Container, Metal, M548 (Dwg. 12900009)
Examination for defects 4(b)

(b) If any of the four (4) M548 containers are found defective, it should be replaced with an acceptable container prior to functioning tests."

PAGE 13

4.4.2.3, Delay assembly:

Add Critical defect 1 as follows:

"1. Delay charge missing 100% 3.2 Visual"

Major 101, Delete "Igniter composition above flush" and substitute "Delay composition above flush or more than max. below flush,"

Major 102, Delete in its entirety.

PAGE 19

4.4.2.9, Grain propellant:

Add Critical 2 as follows:

"2. Overall density test 100% 3.2 4.5.5.1"

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Major 103, Delete in its entirety.

Add under Notes:

"a. Grain shall be assembled and loaded by same manufacturing methods as intended for production.

b. 25 samples to be tested: accept 0, reject 1.

c. 150 grains to be assembled and tested in 50 signals: accept 0, reject 1."

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4.4.2.11:

Delete Major defect 103 in its entirety.

Add new Major defect 104 as follows:

"104 Quickmatch missing or not partially embedded in the priming charge … 0.40% … 3.2 … Visual"

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4.4.2.15, Delete in its entirety and substitute new paragraph 4.4.2.15 included.

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.15	Tail Assembly				8797947
					NEXT HIGHER ASSEMBLY 8797996/9255782
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	VERIFICATION LEVEL	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD
Critical					
1	Tail fin missing, cracked or inverted		100%	3.2	Visual
Major					
101	Length, max		0.40%	3.2	Gage
102	Location of tail vanes with diameter and each other, including maximum vane extension from centerline		0.40%	3.2	Gage
103	Inside diameter of upper tail ring, min		0.40%	3.2	Gage
104	Perpendicularity of ends with diameter		0.40%	3.2	Gage
105	Position of rib inside diameter with upper tail ring diameter		0.40%	3.2	Gage
106	Weld missing		0.40%	3.2	Gage
107	Weld flash excessive to extent that function will be impaired		0.40%	3.2	Visual
108	Weld peel test	(a)	---	3.2	4.4.10
109	Mechanical properties test (See Dwg. 8797951)	(b)	---	3.2	4.5.8
Minor					
201	Clearance between lower tail ring and tail vane		0.65%	3.2	Gage
202	Poor workmanship		1.00%	3.8	Visual

NOTES: 32 samples/lot, 1 upper tail ring weld and 1 lower tail ring weld per assembly (64 weld total); accept 0, reject 1. (b) Five (5) tail vanes/test samples shall be selected from each heat treated batch for mechanical properties testing.

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4.4.2.17, Delete in its entirety and substitute the following:

"Critical				
1	Hydrostatic pressure test	100%	3.2 (Note 1)	4.5.6
2	Presence of cracks	100%	3.2	Visual
Major				
101	Perpendicularity of ends	0.40%	3.2	Gage
102	Total length, max.	0.40%	3.2	Gage
103	Inside diameter at ends, max.	0.40%	3.2	Gage
Minor				
201	Poor workmanship	1.00%	3.8	Visual

Note 1 – Tubing stock used to manufacture the casing tube shall be 100% hydrostatically tested as specified in 4.5.6. All remaining classified defects shall be checked on the finished item."

PAGE 28

4.4.2.18, Add to Major 102: "or improperly attached to chain bead assembly, when applicable."

PAGE 31

4.4.2.21, Assembly (signal body & delay assembly), delete Major 101 in its entirety and substitute:

"101 Component missing or damaged to the extent that function may be impaired or chain bead assembly improperly fastened to smoke assembly 0.40% 3.2 Visual"

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4.4.2.22:

Assembly (prior to assembly rocket assembly, in rocket barrel), add: "Critical 2 Initiating charge missing, 100% 3.2 Visual"

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* Add Critical defect 3 as follows:

"3. Primer above flush 100% 3.2 Gage"

Major 103: Delete in its entirety and substitute: "Major 103 Initiating charge over max. (See note) 0.40% 3.2 Balance."

* Add Major defect 104 as follows:

"104 Depth of primer incorrect .40% 3.2 Gage"

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4.4.2.26:

Container (prior to sealing), Delete Major defect 103 in its entirety.

* Delete Dwg. Number "7548414" and substitute "12900001"

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* 4.4.2.27:

Delete Dwg "7548414" and substitute "12900001"

Under next higher assembly, add: "12900009"

Critical 1, delete in its entirety.

Critical 2, add "Cover" before "Embossing…"

Major defects 101 and 104, delete in their entirety.

Add Major defect 105 as follows:

"105 Label missing or improperly applied - 0.40% 3.2 Visual"

Minor defect 203, delete in its entirety.

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* 4.4.2.28, Delete in its entirety and substitute new paragraph included.

PAGE 38A

Add new paragraph 4.4.2.29 as included page 38a.

PAGE 38B

* Add new paragraph 4.4.2.30 as included page 38b.

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		DRAWING NUMBER
4.4.2.28	Packing and Marking for Container, Metal M548 for Signals, Ground	SHEET 1 OF 1	12900009
			NEXT HIGHER ASSEMBLY

CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	VERIFICATION LEVEL	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD
Critical	None defined				
Major					
101	PA142 Container quantity incorrect, or improperly inserted		0.40%	3.2	Visual
102	Air tightness test (after sealing)	1/		3.9	4.5.12
103	Metal container damaged (dents, splits, etc.)		0.40%	3.2	Visual
Minor					
201	Contents loose		0/65%	3.2	Visual
202	Marking misleading or unidentifiable		0.65%	3.2	Visual
203	Metallic seal missing, unsealed, or improperly engaged		0.65%	3.2	Visual
204	Poor workmanship		1.00%	3.8	Visual

NOTES: 1/ One container out of each 20 containers packed out/sealed shall be tested. If the container fails the test, it should be removed from the lot and all containers back to the last successful test should be leak tested.

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CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.29	Signal Body				8797963
					NEXT HIGHER ASSEMBLY 8797920
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	VERIFICATION LEVEL	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD
Critical	None defined				
Major					
101	Small inside diameter		0.40%	3.2	Gage
Minor					
201	Large outside diameter, max.		0.65%	3.2	Gage
202	Large inside diameter, min		0.65%	3.2	Gage
203	Overall length		0.65%	3.2	Gage
204	Poor workmanship		1.00%	3.8	Visual

NOTES:

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CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.30	Protector Assembly				8797941
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	VERIFICATION LEVEL	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD
Critical	None defined				
Major					
101	Outside diameter, max.		100%	3.2	Gage
Minor	None defined				
NOTES:					

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4.4.3.1,

Line 4, delete "Delay Composition (See 3.3)" and substitute "Delay Composition (9251412)"

Line 12, Delete "Fiberboard" and substitute "Hardboard".

* Table III, Add the following characteristics:

"Premature ejection (See 3.4.1.1)	Special (See 6.8)
Launch delay (See 3.4.1.2)	Major
Parachute separation at cold temperature	Major"

PAGE 40

4.4.3.2, Functioning, Add to Table III:

"Cork sealing disc in end of barrel loose Major (See label dwgs. 8797931-2, 3 and 10)"

Table III, Delete "Smoke emission time over max (See 3.4.4e & 3.4.5b) Major"

* Table III, Delete the last defect classification and substitute the following:

"Assembly bursts at a distance of more than one hundred (100) feet from the launcher but less than the distance specified in 3.4.1.1 Special"

Delete Note and substitute:

"Note: The functioning test shall consist of three (3) distinct phases: Hot temperature – fixture fired; plus 70 degrees – fixture fired; and cold temperature – fixture fired. Reduced sampling will be authorized only when three (3) consecutive lots have met the acceptance criteria specified in all three (3) phases. Compliance with the criteria in any one phase will not result in reduced sampling for that phase."

4.4.3.2.1.1 First three lots, Line three, delete "twenty-five (25)" and substitute "fifty (50)"

* 4.4.3.2.1.1, Delete "a critical defect" and substitute "a critical or special defect"

4.4.3.2.1.2, After three consecutive lots, Line three, "ten (10)" and substitute "twenty (20)"

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* 4.4.3.2.1.2, Delete “a critical defect” and substitute “a critical or special defect”

4.4.3.2.2.1, First three lots,

Line four, Delete “one hundred and twenty-five (125)” and substitute “one hundred (100)”

* Line five, Delete “a critical defect occurs” and substitute “a critical or special defect occurs”

Line seven, Delete “eight (8)” and substitute “six (6)”

* 4.4.3.2.2.2, Delete “a critical defect occurs” and substitute “a critical or special defect occurs”

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4.4.3.2.3.1.1, First three lots:

Line three, delete “thirty-two (32)” and substitute “fifty (50)”

Line four, delete “The lot shall … (see Table III).” And substitute “The lot shall be rejected if, during the test a critical defect occurs, the average angle from vertical exceeds the requirements, or if four (4) or more assemblies exhibit any of the remaining major defects listed in Table III. (See note after the following paragraph).”

* Line five, Delete “a critical defect occurs” and substitute “a critical or special defect occurs”

4.4.3.2.3.1.2, After three consecutive lots:

Line three, delete “ten (10” and substitute “thirty-two (32)”

Line four, delete “If any critical defects occur, the lot shall be rejected.” And substitute “The lot shall be rejected if during the test, a critical defect occurs, the average angle from the vertical exceeds the requirement or if three (3) or more assemblies exhibit any of the remaining major defects listed in Table III. (See note).

Note: A smoke assembly which ignites and burns normally but subsequently fails to meet minimum burning time requirements due to ground impact, will not be classified defective. Firing records will be annotated accordingly.”

* Line four, “if any critical defect occurs” and substitute “if any critical or special defect occurs”

4.4.3.2.3.2, Hand fired, delete in its entirety.

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4.4.3.3, Propellant ballistic test, delete in its entirety and substitute the following:

"4.4.3.3 Propellant ballistic test.- Critical defect. 50 signals per propellant sub-lot of loose propellant composition are to be ballistically tested in fully loaded signals at hot temperature in accordance with 4.5.2.1 and 4.5.11. Upon successfully meeting the requirements (see 3.4.1) the propellant composition used and the method of manufacture of the propellant assembly shall be considered adequate for production. All production will then utilize the spacer, propellant part no. 8797936 in the aft end and the slotted spacer propellant no. 9328587 in the forward (delay assembly end) section of the tube, casing, part no. 8797921."

4.4.3.3.1, Overall density, delete in its entirety.

4.4.3.3.2, Density of any section, delete in its entirety.

4.4.3.4, Swivel pull test, delete in its entirety.

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4.5.1.5, Add new paragraph:

"4.5.1.5 Propellant assembly, propellant grain. The moisture content of the propellant assembly shall be determined in accordance with the procedure specified in MIL-P-223 or an approved alternate."

Add the following note after 4.5.2.1, 4.5.2.2 and 4.5.2.3.1:

"Samples must be fired within three (3) minutes if removal from the conditioning chamber."

* 4.5.2.1, Line four, delete "metal" and substitute "plastic"

* 4.5.2.3.1, Line four, delete "metal" and substitute "plastic"

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4.5.2.3.2, Hand fired, Delete in its entirety.

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* 4.5.3, Line one, delete "The packed sealed container" and substitute "The packed plastic container (dwg. 12900001)"

* 4.5.4 Container tear strip test. Delete in its entirety.

4.5.6, Hydrostatic test of casing tube, Delete in its entirety and substitute the following:

"4.5.6 Hydrostatic test of casing tube. In lieu of testing each individual casing tube, the tubing stock, which is used to manufacture the casing tube, shall be 100% tested in a hydrostatic test device (See 4.4.4). The minimum pressure shall be applied for not less than 5 seconds. The tubing shall be observed for evidence of failure to comply with the requirements. Any full length of tubing that bursts, cracks, or shows evidence of distortion shall be classified as defective and removed from production."

4.5.8, Hardness of tail vane, Delete in its entirety and substitute the following:

"4.5.8 Mechanical properties of tail vane. The tail vane/test samples shall be tested for mechanical properties in accordance with ASTM E8. If any tail vane/test sample fails to comply with the criteria specified on the applicable drawing, the heat treated batch represented by the sample shall be rejected."

4.5.11, Swivel pull test, Delete in its entirety and substitute the following:

"4.5.11 Propellant ballistic test. The signal shall use propellant spacer part no. 8797936, in the forward and aft end while following the test procedure of 4.5.2.1. Simulated or dummy payloads may be used."

* Add new paragraphs 4.5.12, 4.5.12.1, and 4.5.12.2 as follows:

"4.5.12 Airtightness. The metal container shall be conditioned to ambient temperature and pressure prior to testing. The container shall be tested in accordance with 4.5.12.1 or with permission of the procurement agency with 4.5.12.2. A wetting agent may be used to minimize air bubbles clinging to the exterior surface. A stream or recurring succession of bubbles from any surface, seam or junction shall be evidence for a defective container. Any container that fails to comply with the requirement shall be classified defective and removed from the lot.

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4.5.12.1 Vacuum method. The container shall be tested for leakage by immersing the closed container in the inverted position under water in a vacuum vessel and lower the pressure in the vessel to three pounds per square inch (psi) minimum below ambient pressure. Observation for leakage of air from the container interior shall be made for a minimum of three seconds after reduction of pressure.

4.5.12.2 Hot water method. The container shall be tested for leakage by immersing the closed container in the inverted position to a depth of one inch below the surface of the water. The temperature of the water and the length of time of immersion shall be that which will assure an increase in pressure. Observation for leakage of air from the container interior shall be made during the period of pressure buildup and for 30 seconds after the 3 psi pressure differential has been reached."

* 5.1.1, Delete "7548414" and substitute "12900001"

* 5.2.1, Delete "7548415" and substitute "12900009"

* 5.3, Delete "7548414 and 7548415" and substitute "12900001 and 12900009"

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6.5, Hand firing, Delete in it entirety.

* Add 6.8 as follows:

"6.8 Definitions.

a. Special defect. A defect, other than critical that judgment and experience indicates may, depending upon the degree of variance from the design requirement:

1. Results in hazardous or unsafe condition for individuals using, maintaining or depending upon the product.
2. Prevent performance of the tactical function of a major end item.

b. Premature burst. A signal which ejects, ignites and burns at a distance less than that specified in the requirement paragraph (See 3.4.1).

c. Premature ejection. A signal in which the illuminant assembly ejects but fails t ignite (See 3.4.1.1)."

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MIL-S-13303G (AR)
AMENDMENT 5

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