

MIL-L-63532C (AR)
 4 June 1984
 SUPERSEDING
 MIL-L-63532B (AR)
 22 November 1982

MILITARY SPECIFICATION

LINK, CARTRIDGE, METALLIC BELT, 5.56MM, M27

This specification is approved for use by the US Army Armament, Munitions and Chemical Command, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This Specification covers the requirements, quality assurance provisions and packaging for one type of metallic belt link, 5.56MM, M27.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specification and standards. Unless otherwise specified (see 6.2), the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS

2.1 MILITARY

MIL-W-13855	-	Weapons, Small Arms, General Specification for
DOD-P-16232	-	Phosphate Coatings, Heavy, Manganese or Zinc Base (for ferrous metals)
MIL-A-48078	-	Ammunition, Standard Quality Assurance Provisions, General Specification for
MIL-W-63150	-	Standard Quality Assurance provisions for Weapons and Support Material

FSC 1305

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, US Army Armament Research and Development Center, Attn. DRSMC-QA, Dover, New Jersey 07801 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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STANDARDS

MILITARY

MIL-STD-105	-	Sampling Procedures and Tables for-Inspection by Attributes
MIL-STD-109	-	Quality Assurance Terms and Definitions
MIL-STD-1168	-	Lot Numbering of Ammunition

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

PRODUCT DRAWINGS

U.S. ARMY ARMAMENT RESEARCH AND DEVELOPMENT CENTER (ARDC)

9344346	-	Carton for Link, Cartridge Metallic Belt, 5.56mm, M27
10534146	-	Dummy Cartridge, 5.56MM, Inert Loaded, M232
11691287	-	Link, Cartridge, Metallic Belt, 5.56MM M27

PACKAGING DATA SHEETS

P9347167	-	Preservation, Packaging, Packing and Marking for Link, Cartridge: Metallic Belt, 5.56mm, M27 (Carton Pack)
P9381501	-	Preservation, Packaging, Packing and Marking for Link, Cartridge: Metallic Belt, 5.56mm, M27 (Bulk Pack)

INSPECTION EQUIPMENT DRAWINGS

EL11691287	-	Inspection Equipment List
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AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 18	-	Tests for Rockwell Hardness of Metallic Materials
ASTM B 117	-	Salt Spray (Fog) Testing

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.1.3 Order of precedence. In the event of a conflict between the text of this specification and the reference cited herein, the text of this specification shall take precedence.

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3. REQUIREMENTS

3.1 Material. Material shall be in accordance with the applicable drawings (dwgs.) and specifications.

3.2 Components. The link shall comply with all requirements specified on dwg. 11691287, all associated drawings and all requirements specified in applicable specifications.

3.3 Snap-on assembly. The maximum force needed to snap together a link and a cartridge shall be no greater than 45 pounds.

3.4 Cartridge stripping. The force required to completely strip a dummy cartridge (M232) from a link using a centrally applied load (without-impact) shall be not less than 5.5 pounds nor more than 16.0 pounds. Links shall assemble and disassemble without scratching or removing metal (shaving) from the cartridge cases.

3.5 Disassembly torque. The torque required to separate a link from a cartridge in a belt shall be more than 6 inch pounds but less than 14 inch pounds.

3.6 Belt strength. A belt consisting of six (6) links and six (6) dummy cartridges (M232) shall be capable of withstanding a tensile load of 33 pounds without separation.

3.7 Assembleability and free hinge. When assembled into a 200 round belt with dummy cartridges (M232), the links shall hinge without binding, grabbing or freezing.

3.8 Dynamic requirement. A belt consisting of one hundred one (101) links and one hundred (100) dummy cartridges (M232) shall withstand a free drop of one end of the belt. Full or partial separation of the links from the cartridges shall be permitted in no more than ten (10) links from the free end. Partial separation is defined as the desengagement of the link's front, rear or connecting loop, or any combination thereof from the cartridge.

* 3.9 Functioning. The links shall be capable of being assembled with approved 5.56MM M855 ball and M856 tracer cartridges and function in an M249 machine gun without malfunctioning, cracking, breaking or separating.

3.10 Marking. Marking of the links shall be in accordance with dwg 11691287.

3.11 First article inspection. This specification contains technical provisions for first article inspection. Requirements for the submission of the first article samples by the contractor shall be as specified in the contract.

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3.12 Workmanship. Workmanship shall be in accordance with MIL-W-13855.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection and standard quality assurance provisions. Unless otherwise specified herein or in the contract, the provisions of MIL-A-48078 shall apply and are hereby made a part of this specification.

4.2 Classification of inspections. The following types of inspections shall be conducted on this item:

- a. First Article Inspection
- b. Quality Conformance Inspection

4.3 First article inspection.

4.3.1 Submission. The contractor shall submit a first article sample as designated by the Contracting Officer for evaluation in accordance with the provisions of 4.3.2. The first article shall consist of the following items in sample quantities as indicated.

<u>Part Description</u>	<u>Drawing</u>	<u>Quantity</u>
Link, Cartridge, Metallic, Belt, 5.56MM, M27	11691287	10,000

4.3.2 Inspections to be performed. See MIL-A-48078 and Table 1 herein.

4.3.3 Rejection. Rejection of the first article sample shall be in accordance with Table 1 and MIL-A-48078.

TABLE I - FIRST ARTICLE INSPECTION

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CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	SHEET 1 OF 1		DRAWING NUMBER	
				AQL OR 100%	REQUIREMENT PARAGRAPH	11691287	NEXT HIGHER ASSEMBLY
CATEGORY						PARAGRAPH REFERENCE / INSPECTION METHOD	
	Link, Cartridge, Metallic Belt, 5.56MM: M27	Link, Cartridge, Metallic Belt, 5.56MM: M27					
	(Dwg. 11691287)						
	Examination for defects		200	See	3.2	4.4.2.1	
	Salt Spray 1/		10	4.4.2.1	3.2	4.5.1	
	Phosphate Coating 1/		30	0-1	3.2	4.5.4	
	Hardness		30	0-1	3.2	4.5.2	
	Decarburization		10	0-1	3.2	4.5.3	
	Snap-on Assembly		80	2-3	3.3	4.5.5	
	Cartridge Stripping		200	2-3	3.4	4.5.6	
	Disassembly Torque		80	2-3	3.5	4.5.7	
	Belt Strength (a)		300	1-2	3.6	4.5.8	
	Assembleability and Free Hinge (b)		1600	1-2	3.7	4.5.9	
	Dynamic requirement (c)		1010	0-1	3.8	4.5.10	
	Functioning 2/, 3/		2400	0-1	3.9	4.5.11	
	(a) 50 belts of 6 links each						
	(b) 8 belts of 200 links each						
	(c) 10 belts of 101 links each						

NOTES:

- 1/ In-process test requirement to be performed on first article samples in accordance with applicable paragraphs listed herein and applicable specifications. (Certified test report shall be provided).
- 2/ Samples for this test shall be in the following configurations:
8 plastic ammunition containers each with 200 rounds
8 belts of 100 rounds each
- 3/ Two weapons shall be used. Half of the sample shall be fired in each weapon.

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4.4 Quality conformance inspection.

4.4.1 Inspection lot formation. Inspection lots shall comply with the lot formation provisions of MIL-A-48078 and MIL-STD-1168, Inspection lots shall not exceed 500,000 links.

4.4.1.1 Heat treat lot. The heat treat lot shall be limited to one heat of steel and shall consist of links heat treated in a batch type furnace at one charge or in a continuous type furnace during an uninterrupted period extending over not more than one eight hour shift.

4.4.2 Examination. See MIL-A-48078.

a. Sampling plans. Unless otherwise specified in the Classification of Defects, sampling plans and procedures for major and minor defects shall be in accordance with MIL-STD-105, Inspection Level II.

b. Inspections to be performed. See paragraphs 4.4.2.1, 4.4.2.2 and 4.4.2.3.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

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PARAGRAPH	TITLE	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	DRAWING NUMBER
4.4.2.1	Link, Cartridge, Metallic Belt, 5.56MM: M27			1 OF 2	11691287 NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST				PARAGRAPH REFERENCE / INSPECTION METHOD
Critical:	None defined				
Major:					
101.	Height of tab (A-7)*		.40%	3.2	SMTE
102.	Diameter, connecting loop (B-1)		.40%	3.2	SMTE
103.	Position of front, rear, and connecting loops, functional (C-4)		.40%	3.2	Gage #8649422
104.	Feedway clearance height (B-5)		.40%	3.2	SMTE
105.	Width, connecting loop opening (B-2)		.40%	3.2	SMTE
106.	Width, front loop opening (C-5)		.40%	3.2	SMTE
107.	Width, rear loop opening (C-2)		.40%	3.2	SMTE
108.	Length overall (D-3)		.40%	3.2	SMTE
109.	Width, connecting loop (B-4)		.40%	3.2	SMTE
110.	Symmetry of the width of the opening between front and rear loops to connecting loop width (D-4)		.40%	3.2	SMTE
111.	Missing or defective protective finish		.40%	3.2	Gage #8649427
112.	Presence of cracks, tears, and malformations (See Figures 1 & 2)		.40%	3.2	Visual
113.	Improper tab radii (A-7)		.40%	3.2	Visual under 5x magnification
114.	Functioning <u>l</u> / * Illustrates drawing coordinates	1200	.40% 0-1 4.5 .11	3.2 3.2	Visual 3.9
NOTE:	1/ When specified in the contract (see 6.2), a function test will be required as part of the quality conformance inspection.				

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

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PARAGRAPH 4.4.2.1	TITLE Link, Cartridge, Metallic Belt, 5.56MM: M27	SHEET 2 OF 2		DRAWING NUMBER J1691287
				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH
<u>Minor:</u>				PARAGRAPH REFERENCE / INSPECTION METHOD
201.	Improper cartridge rim clearance surfaces (D-6) Missing or improper marking Improper radius, edges Evidence of poor workmanship (excluding major 112)		1.5% 1.5% 1.5% 2.5%	3.2 3.2 3.2 3.2
202.				
203.				
204.				
				Visual Visual Visual Visual
NOTES				

DRSMC-0A (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

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PARAGRAPH	TITLE	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE / INSPECTION METHOD
4.4.2.2	Link, Cartridge, Metallic Belt, 5.56MM: M27				1 of 1	DRAWING NUMBER 11691287 NEXT HIGHER ASSEMBLY
CATEGORY						
115. 116. 117. 118. 119. 120. 121. 122. 123. 124.	<u>Tests</u> Hardness Decarburization 3/ Phosphate Coating Snap-on Assembly Cartridge Stripping Disassembly Torque Belt Strength Assembleability & Free Hinge (a) Dynamic Requirements (b) (a) 4 belts of 200 links each (b) 5 belts of 101 links each Salt Spray	1/ 5 2/ 80 200 80 198 800 505 2/	.40% 0-1 0-1 3-4 2-3 3-4 2-3 0-1 0-1 2/	3.2 3.2 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.2	4.5.2 4.5.3 4.5.4 4.5.5 4.5.6 4.5.7 4.5.8 4.5.9 4.5.10 4.5.1	

NOTES: 1/ Samples shall be in accordance with MIL-STD-105 Level S-3 for each heat treat batch (See 4.4.1.1)
 2/ Sampling and rejection criteria shall be in accordance with DOD-P-16232.
 3/ In process requirement for each heat treat batch.

QUALITY CONFORMANCE INSPECTION

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CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE	NO. OF SAMPLE UNITS	EXAMINATION OR TEST	AQL OR 100%	REQUIREMENT PARAGRAPH	SHEET 1 OF 1	DRAWING NUMBER 9344346
CATEGORY							NEXT HIGHER ASSEMBLY
							PARAGRAPH REFERENCE / INSPECTION METHOD
4.4.2.3	Link, Cartridge, Metallic Belt, 5.56MM: M27 Packaging Data Sheet						
<u>Critical:</u>	None defined						
<u>Major:</u>	None defined						
<u>Minor:</u>							
201.	Improper level of packaging and packing			1.5	3.2		Visual
202.	Incorrect or illegible marking			1.5	3.2		Visual
203.	Container interior contaminated with dirt, lint, or other foreign matter			1.5	3.2		Visual
204.	Improperly oriented links in link cartons			1.5	3.2		Visual
205.	Improperly oriented link cartons in shipping containers			1.5	3.2		Visual
206.	Incorrect quantity of links per shipping container			1.5	3.2		Visual
207.	Improper closure of shipping container			1.5	3.2		Visual
208.	Workmanship			2.5	3.2		Visual
<u>Notes:</u>							

DRSMC-NA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

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4.4.3 Testing. Testing is described in the First Article and Quality Conformance Inspection Tables.

4.4.4 Inspection equipment. The inspection equipment required to perform the examinations and tests prescribed herein is described in the "Paragraph Reference/Inspection Method" column in the tables starting with paragraph 4.4.2.1. The contractor shall submit for approval, inspection equipment designs in accordance with the terms of the contract. See section 6 of MIL-A-48078 and paragraph 6.3 herein.

4.5 Test methods and procedures.

4.5.1 Salt spray. This test shall be conducted in accordance with ASTM B117. Observation shall be made for compliance with the applicable requirement in DOD-P-16232. Parts so tested shall not be returned to the lot.

4.5.2 Hardness. Hardness testing shall be conducted in accordance with ASTM E18. Observation shall be made for the applicable drawing requirement. Parts so tested may be returned to the lot provided the performance of the link is not affected by the test.

4.5.3 Decarburization. The cross section of the sample links shall be polished, etched with a 3 to 5% Nital solution and examined under a microscope of not less than 500 power. Observation shall be made for compliance with the applicable drawing requirement.

4.5.4 Phosphate coating. The sample links shall be weighed to the nearest milligram (mg). The coating on the links shall then be completely removed from the links by means of a chromic acid stripping solution. The links shall then be rinsed, dried and re-weighed. If the difference between the total weight before and after removal of the phosphate coating divided by the number of links tested is less than 10.2 mg, the lot shall be rejected.

* 4.5.5 Snap-on assembly. Place the first sample link to be tested, loop gap down, so that the middle loop is resting in a normal assembly position on the cartridge case. Apply a gradual pressure on the sample link's middle loop (without impact loading) until of assembly of the link belt is completed. Record the maximum snap-on assembly force and determine compliance with the requirements of para. 3.3. Repeat the above procedure for all samples. Test cartridges shall not be used more than five (5) times.

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4.5.6 Cartridge stripping. A dummy (M232) cartridge shall be inserted into each test link and the linked cartridge shall be assembled into the test fixture. A gradual force shall then be applied on the base of the cartridge until the cartridge is completely stripped from the link. The force required to strip the cartridge shall be measured and a determination shall be made for compliance with the requirements of para. 3.4.

*

4.5.7 Disassembly torque. The sample links shall be assembled with cartridges into a belt with a minimum of five (5) links and cartridges and placed in the approved test fixture. A gradual torque shall be applied to the first cartridge until it separates from the belt. Record the maximum torque value and determine compliance with para. 3.5. A linked belt of at least five links shall be maintained at all times. Testing shall be repeated until all sample links are tested.

4.5.8 Belt strength. The links shall be assembled into belts of six links with six dummy (M232) cartridges and placed in the test fixture. The load shall be applied at a uniform rate and the belt shall remain under tension for a minimum of thirty (30) seconds. If any link in any belt separates the belt shall be rejected. The sample links used for this test shall not be returned to the lot.

4.5.9 Assembleability and free hinge. The sample links shall be assembled into 200 round belts using dummy (M232) cartridges. Each 200 round belt shall be laid out horizontally to its full length, with the open side of the link up. One end of the link shall be drawn upon the remainder of the belt until the belt is completely reversed (open side of the links down). One end of the reversed belt shall then be drawn back upon the remainder of the belt until the belt is returned to its original position (open side of the links up).

4.5.10 Dynamic requirements. The links shall be assembled into belts of one hundred one (101) links with one hundred dummy (M232) cartridges and placed in the test fixture. The end of the belt with the free front and rear loops shall be placed on the test equipment with the cartridge bases facing the operator. Assuring no movement of the belt prior to the test, the free end of the belt shall be allowed to drop freely. If partial or full separation is found in any area of the belt other than the ten (10) links from the free end the lot shall be rejected. Partial separation is defined as any disengagement of the link's front, rear or middle loop with the cartridge.

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4.5.11 Functioning. Each sample belt or container shall be fired using an M249 machine gun in bursts of 5-7 rounds at a rate of 85 shots per minute. Weapons shall be cooled to ambient temperature after each 200 rounds fired.

*

5. PACKAGING

5.1 Preservation and packaging. The links shall be preserved and packaged for shipment in accordance with P9347167 (Carton Pack) except when Bulk Packing is required P9381501 will be utilized for the levels as specified in the contract (see 6.1).

5.2 Packing. The links shall be packed in accordance with P9347167 (Carton Pack) except when Bulk Packing is required P9381501 will be utilized for the levels as specified in the contract (see 6.1).

5.3 Marking. Marking shall be in accordance with dwg. 9344346 and Packaging Data Sheets P9347167. When Bulk Packing is specified, P9381501 will be utilized.

6. NOTES

*

6.1 Intended use. The links governed by this specification are intended for use with M855 and M856 cartridges.

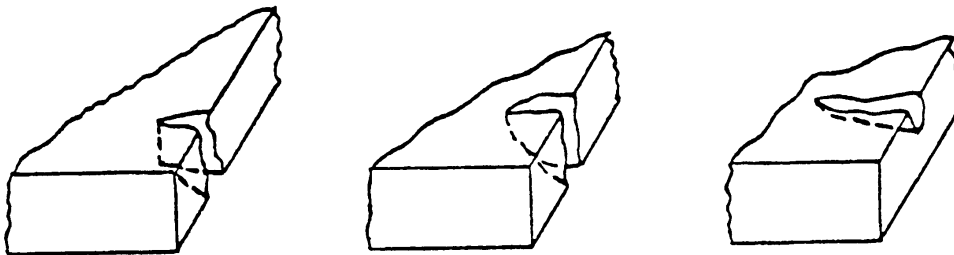
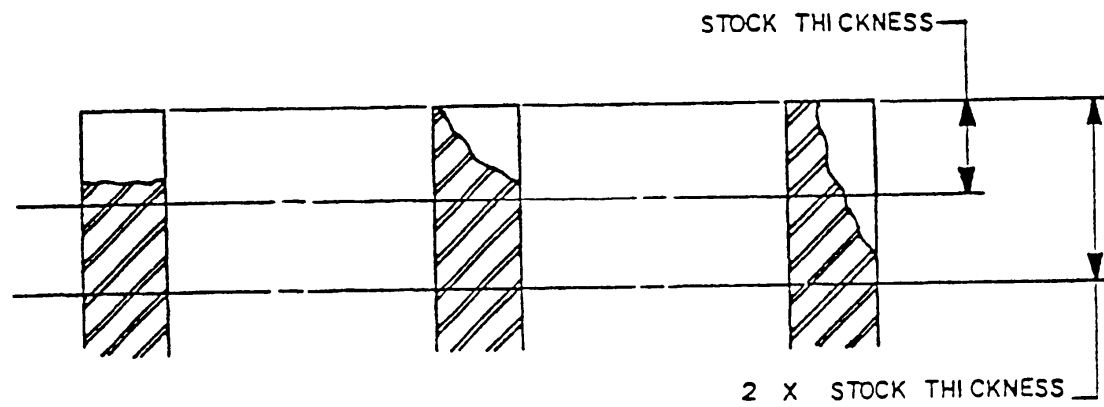
6.2 Ordering data. See MIL-A-48078.

6.3 Submission of inspection equipment for design approvals. See MIL-A-48078. Submit designs as required to Commander, US Army Armament Research and Development Command, ATTN: DRDAR-QAF-I, Dover, NJ 07801.

*

6.4 Changes from previous issues. The margins of this specification are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the previous issue.

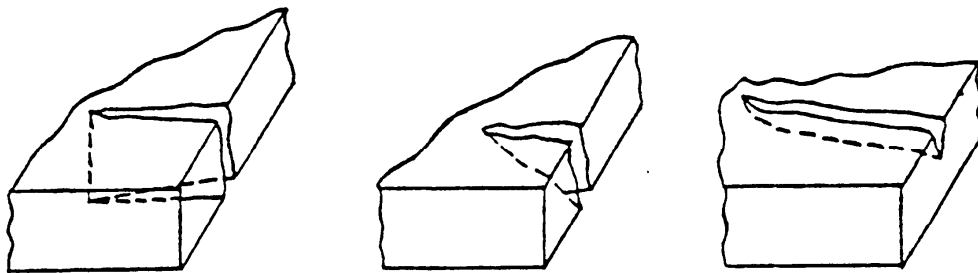
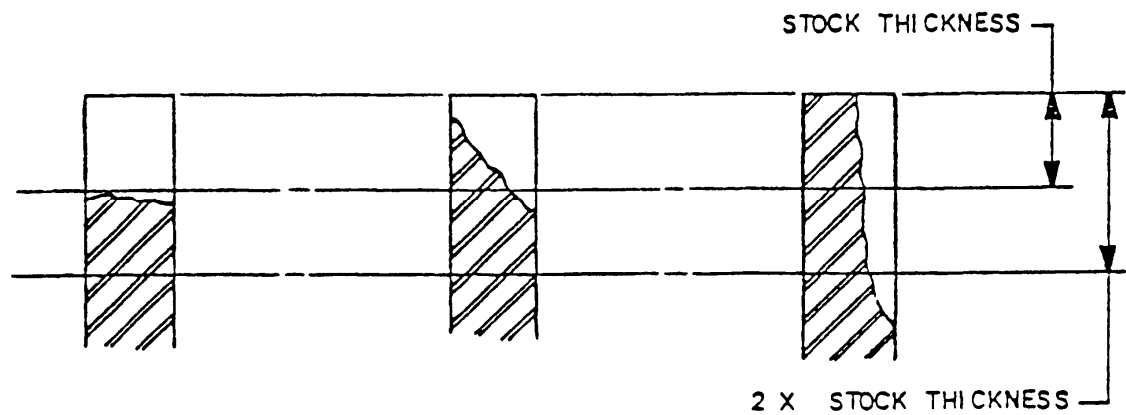
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ALL ACCEPTABLE

FIGURE 1

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ALL NOT ACCEPTABLE

FIGURE 2

MIL-L-63532C(AR)

Custodian:
Army-AR

Preparing activity:
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(Project: 1305-A991)

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