

INCH-POUND

MIL-P-62420(AT)
8 June 1990
SUPRRSEDES
(see 6.6)

MILITARY SPECIFICATION
PERISCOPE, TANK

This specification is approved for use by the U.S. Army Tank-Automotive Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the laser protected tank periscope, bodies and housing assemblies. Unless otherwise specified herein, these items shall be referred to as "periscopes". These periscopes are used as unity vision devices in combat type vehicles.

2. APPLICABLE DOCUMENTS

2.1 Government Documents

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any pertinent

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SPECIFICATIONS

FEDERAL

P-C-437	Cleaning Compound, High Pressure (Steam) Cleaner.
W-F-800	Fuel Oil, Diesel.

MILITARY

MIL-G-3056	Gasoline, Automotive, Combat, Metric.
MIL-T-5624	Turbine Fuel, Aviation, Grades JP-4, JP-5 and JP-5/JP-8ST.
MIL-H-6083	Hydraulic Fluid, Petroleum Base, for Preservation and Operation.
MIL-O-13830	Optical Components for Fire Control Instruments; General Specification Governing the Manufacture, Assembly, and Inspection of.
MIL-F-139326	Fire Control Materiel Manufacture and Inspection, General Specification for.
MIL-F-13927	Fungus Resistance Test; Automotive Components.
MIL-P-14232	Parts, Equipment and Tools for Army Material, Packaging Of.
MIL-H-46170	Hydraulic Fluid, Rust Inhibited, Fire Resistant Synthetic Hydrocarbon Base.
MIL-F-62422	Filter, Laser Hazard Protection.
MIL-F-62543(S)	Filter, Laser Protection.

STANDARDS

MILITARY

MIL-STD-109	Quality Assurance Terms and Definitions.
MIL-STD-129	Marking for Shipment and Storage.
MIL-STD-130	Identification Marking of U.S. Military Property.
MIL-STD-810	Environmental Test Methods and Engineering Guidelines.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Navy Publication and Printing Service Office. Standardization Documents Order Desk, Bldg 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings, and publication. The following other Government documents, drawings, and publications form apart of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

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DRAWINGS

ARMY

10513617	- Housing Assembly.
12357792	- Periscope, Tank: M27E4.
12357793	- Body, Bonded.
12357794	- Periscope, Tank: M37E1.
12357840	- Periscope, Tank: Laser Protective - M1 Commander Short.
12357841	- Periscope, Tank: Laser Protective - M1 Commander Tall.
12357842	- Body, Bonded: M1 Commander, Short.
12357043	- Body, Bonded: M1 Commander, Tall.
12357846	- Periscope, Tank: Laser Protective - M1 Driver Short.
12357847	- Body, Bonded: M1 Driver.
12357848	- Periscope, Tank Laser Protective - M1 Driver Wide.
12357850	- Periscope, Tank: M26E1.
12357851	- Body, Bonded.
12357908	- Periscope, Tank: Laser Protective - 15° Uplook.
12357909	- Periscope, Tank: Laser Protective - 20° Uplook.
12357910	- Body, Bonded.
12357918	- Periscope. Tank: M17B4.
12370033	- Periscope, Tank: Driver's M45B4.
12370034	- Body, Bonded.
12370322	- Periscope, Tank: M47EI.
12370329	- Body Assembly.
12370393	- Periscope, Tank: M17CE1.

(Unless otherwise indicated, U.S. Army drawings are available from the U.S. Army Tank-Automotive Command, ATTN: Contracting Officer, Warren, MI 48397-5000.)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D975-81	- Standard Specification for Diesel Fuel Oils.
ASTM D1655	- Standard Specification for Aviation Turbine Fuels.
ASTM E308-85	- Standard Method for Computing the Colors of Objects by Using the CIE System.

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(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia. PA 19103.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS.

3.1 First article. When specified (see 6.2), samples shall be submitted for first article inspection in accordance with 4.4.

3.2 Materials. Materials shall be as specified herein and in referenced documents (see 4.7.1).

3.2.1 Recycled, virgin and reclaimed materials. There are no requirements for the exclusive use of virgin materials. The use of recycled or reclaimed (recovered) materials is acceptable provided that all other requirements of this specification are met (see 6.4.2).

3.3 Design and construction. The laser protected tank periscopes shall be manufactured in accordance with the applicable drawing to the periscope specified (see 6.2) and all drawings pertaining thereto from the following (see 4.7.1):

10513617	12357850
12357792	12357851
12357793	12357908
12357794	12357909
12357840	12357910
12357841	12357918
12357842	12370033
12357843	12370034
12357846	12370322
12357847	12370329
12357848	12370393

3.4 Performance.

3.4.1 Optical characteristics

3.4.1.1 Resolution. The periscope shall permit resolution of a test pattern subtending one (1) minute of arc within the resolving area as specified in the applicable drawing listed in 3.3 (see 4.7.6.1).

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3.4.1.2 Spherical power. Spherical power shall be within the range of minus (-) 0.50 to plus (+) 0.25 diopter (see 4.7.6.2).

3.4.1.3 Astigmatism. Astigmatism shall not exceed 0.25 diopters (see 4.7.6.3).

3.4.1.4 Photopic transmission. The photopic transmission of laser protected periscopes shall be equal to or greater than 0.75 times the photopic transmission of the attached laser filter(s) as specified in MIL-F-62543 or MIL-F-62422 (see 4.7.6.4). The photopic transmission shall be measured at 0 ± 2 degrees incidence

3.4.1.5 Optical density. The optical density requirements for specific wavelength ranges shall be as specified in MIL-F-62543 or MIL-F-62422 (see 6.2). The optical density shall be measured at 0 ± 2 degrees incidence (see 4.7.6-5).

3.4.1.6 Angular deviation. With the periscope held on its mounting surface in a horizontal plane, an incident ray entering normal to the entrance window shall exit the exit window within ± 30 minutes of the angle specified on the applicable drawing (see 4.7.6.6).

3.4.2 Cleaning spray.

3.4.2.1 Vehicle exterior cleaning spray. The assembly shall meet the performance requirements of 3.4.1 and shall show no evidence of damage after the portion of the assembly above the sealing surface is exposed to a water jet or steam spray using agents conforming to P-C-437, immediately followed by a cold water rinse (see 4.7.7.1).

3.4.2.2 Vehicle interior cleaning spray. The assembly shall meet the performance requirements of 3.4.1 and show no evidence of damage after the portion of the assembly below the sealing surface is exposed to a jet spray of tap water (see 4.7.7.2).

3.4.3 Chemicals. The assembly shall meet the performance requirements of 3.4.1 after exposure to vapors of and in direct contact with the following materials for 48 hours minimum (see 4.7.8):

Fuel per VV-F-800 (DF-2, DF-1, or DF-A) or ASTM D975-81 (Commercial Diesel No. 1-D or No. 2-D); MIL-T-5624 (Grade JP-4 or JP-5), or ASTM D1655 (Commercial Turbine Jet-A or Jet A-1); and MIL-G-3056 (MOGAS) or Regular Automotive Leaded Gasoline. Hydraulic fluid per MIL-H-6083 and MIL-H-46170.

3.5 Environmental. Unless otherwise specified herein, the performance requirements of 3.4 thru 3.4.3 shall apply.

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3-5-1 Temperature.

3.5.1.1 Low temperature.- The periscope shall meet the requirements for resolution, submergence, light transmission, and optical density of 3.4.1.1, 3.5.6, 3.4.1.4 and 3.4.1.5, respectively, after exposure to the low temperature test as specified in MIL-STD-810, Method 502, Procedure 1. A temperature of -65°F shall be maintained for a period of 24 hours. At the conclusion of this time, the unit shall be returned to 73 ± 18°F. The unit shall show no indication of moisture buildup, bond separation or other forms of image degradation (see 4.7.9.1.1).

3.5.1.2 High temperature. The periscope shall meet the requirements for resolution, submergence, light transmission, and optical density of 3.4.1.1, 3.5.6, 3.4.1.4 and 3.4.1.5, respectively, after exposure to three 24 hour cycles of the hot, dry temperature profile as given in table I. Relative humidity shall be not greater than 10% during exposure. After exposure to the temperature profile but prior to testing for light transmission, resolution and submergence, the unit shall be stabilized at 140°F and show no indication of moisture buildup, bond separation, or other forms of image degradation (see 4.7.9-1-2).

TABLE 1. Hot climatic temperature test.

<u>Time</u>	<u>Degrees F</u>	<u>Time</u>	<u>Degrees F</u>
0100	95	1300	156
0200	94	1400	158
0300	94	1500	160
0400	92	1600	158
0500	92	1700	153
0600	91	1800	145
0700	97	1900	131
0800	104	2000	118
0900	111	2100	105
1000	124	2200	103
1100	133	2300	99
1200	145	2400	95

3.5.1.3 Mirror and window laminations. Mirror and window laminations shall not be damaged when subjected to the temperature specified in 3.5.1.1 and 3.5.1.2. The appearance of bubbles, blisters, or other indications of cement separation shall be considered evidence of bond failure (see 4.7.9.1.3).

3.5.2 Humidity. The periscope shall meet the requirements for resolution, light transmission, optical density, and submergence of 3.4.1.1, 3.4.1.4, 3.4.1.5, and 3.5.6, respectively, after exposure to two 24 hour cycles of the humidity profile of table V. After exposure, the unit shall exhibit no indication of moisture buildup or bond separation (see 4.7.9.2).

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3.5.3 Salt fog. The periscope shall meet the requirements for resolution, light transmission, optical density, and submergence of 3.4.1.1, 3.4.1.4, 3.4.1.5, and 3.5.6, respectively, after exposure to the salt fog test as specified in MIL-STD-810, Method 509. After exposure, the unit shall show no evidence of bond separation, corrosion, or other physical damage (see 4-7-9.3).

3.5.4 Vibration. The periscope shall meet the requirements for resolution, submergence, light transmission, and optical density of 3.4.1.1, 3.5.6, 3.4.1.4 and 3.4.1.5, respectively, after exposure to the vibration test (see 4.7.9.4).

3.5.5 Shock.

3.5.5.1 Basic Shock. The periscope shall meet the requirements for resolution, submergence, light transmission, and optical density of 3.4.1.1, 3.5.6, 3.4.1.4 and 3.4.1.5, respectively, after exposure to 18 shocks with a peak amplitude of 30 ± 3 gravity units (g) for 11 ± 1.1 millisecond (ms) duration. At the conclusion of the test, the unit shall show no evidence of physical damage (see 4.7.9.5.1).

3.5.5.2 Gun fire shock. The periscope shall meet the requirements for resolution, submergence, light transmission, and optical density of 3.4.1.1, 3.5.6, 3.4.1.4 and 3.4.1.5, respectively, after exposure to 18 shocks as specified in paragraph 4.7.9.5.2. At the conclusion of the test, the unit shall show no evidence of physical damage.

3.5.6 Submergence. No water leakage shall occur through the equipment seal and assembly as the equipment is retained on its mounting surface for a five (5) minute duration (see 4.7.9.6).

3.5.7 Fungus. The assembly shall not support fungal growth when exposed to inoculation by spraying external surfaces with spore suspension in accordance with specimen inoculation of MIL-F-13927 followed by exposure to ambient air temperatures of 80 to 84°F at relative humidities between 96 to 100% for a 28 day duration (see 4.7.9.7).

3.5.8 Weathering. After meeting the performance and environmental requirements, the periscope shall be capable of meeting the requirements of 3.5.8.1, 3.5.8.2, 3.5.8.3, 3.5.1.3 and 3.4.1.5, and shall be otherwise functional and undamaged subsequent to exposure as specified below (see 4.7.9.8):

- a. No less than 350 hours of simulated sunshine. Heat intensity shall be 160 ± 5 degrees Fahrenheit (°F) at the geometric center of the periscope.
- b. No less than 420 hours steady state hot-humid exposure at 110 ± 10 °F. relative humidity 70 ± 10 %.
- c. No less than 420 hours of cold exposure at $20 \pm$ °F.

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3.5.8.1 Resolution (modified). Following weathering exposure of 4.7.9.8, the periscope shall meet the requirement of 3.4.1.1, except that resolution shall be within 75 seconds of arc.

3.5.8.2 Spherical power (modified). Following weathering exposure of 4.7.9.8, the periscope shall meet the requirement of 3.4.1.2, except that spherical power shall be within the range of minus 0.60 to plus 0.30 diopter.

3.5.8.3 Astigmatism and light transmission (modified). Following the weathering exposure of 4.7.9.8, the periscope shall meet the requirements of 3.4.1.3 and 3.4.1.4 except that astigmatism and light transmission shall not degrade in excess of 20% of the value recorded prior to weathering tests.

3.6 Identification and marking. All items shall be individually identified and marked in accordance with MIL-STD-130 and as specified in the drawings.

3.1 Workmanship. Workmanship shall be of a quality consistent with the existing instrument production standards and practices. All finished surfaces shall be protected against corrosion or damage during manufacture prior to delivery. All fins and other excess material shall be removed from castings and forgings. All surfaces, including threads, shall be free from burrs and sharp edges. All material shall be sound, of uniform quality and condition, and free from seams, cracks, and other defects which may adversely affect the strength, endurance, or wear resistance of the part. Adhesives shall be carefully applied to all assemblies, especially where required for proper sealing and security. Materials shall not be treated in any manner to conceal defects therein.

3.7.1 Bubbles and inclusions. Bubbles and inclusions (excepting lint) shall not exceed 0.040 inch in maximum diameter and the total projected areas (perpendicular to the light path) of all bubbles and inclusions shall not exceed 0.50 percent (%) of the cross-sectional area of the bonded body perpendicular to the light path. Maximum permissible inclusion are listed below (excepting lint) (see 4.7.3):

Periscope	Diameter (inch)				
	.040	.030	.020	.10	.005
M1 driver (all)	3	10	12	48	92
M1 commander (all)	3	10	12	48	92
15° uplook	3	10	12	48	92
20° uplook	3	10	12	48	92
12357918	3	10	12	48	92
12357792, 12357794	5	10	21	81	332
12357850, 12370033					
12370322, 12370393					

More than the maximum combination of bubbles and inclusions shall not be permitted although a lesser number than permissible is found in one area.

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3.7.2 Lint. No lint particles shall exceed 0.25 inch in projected length (perpendicular to the light path). Not more than one such lint particle shall be permitted. No additional lint particles shall exceed 0.125 inch in projected length. The cross-sectional area of all lint particles shall be computed on the basis of 0.003 inch width and included in the computation of total projected area. The total projected length (inches) of all lint particles shall not exceed the following (see 4.7.4):

M1 short driver - 0.75 inch
 M1 wide driver - 1.35 inch
 M1 tall commander - 1.35 inch
 M1 short commander - 0.75 inch
 12357908, 12357909, 12357918 - 0.75 inch
 12357792, 12357794, 12357850, 12370033, 12370322, 12370393 - 1.35 inch

3.7.3 Cleanliness. The optical surfaces of completed instruments shall be clean and free of condensates and volatile substances when examined by method specified in 4.7.5. Dust retention grease shall not be used except with specific authorization of the responsible technical activity.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection. Unless otherwise specified in the contract or purchase order (see 6.2), the contractor is responsible for the performance of all inspection and test requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order (see 6.2), the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 General provisions. The component and subassembly inspection requirements of MIL-F-13926 form a part of the Quality Assurance provisions of this specification.

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4.2 Classification of inspections:

- First article inspection (see 4.4).
- Quality conformance inspection (QCI) (see 4.5).
- (1) (a) Examination (see 4.5.2).
- (b) Tests (sampling) (see 4.5.3).
- (2) 100% tests (see 4.5.5).
- c. Control tests (see 4.6).

4.3 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the following conditions:

- a. Temperature: 73 \pm 18°F.
- b. Relative humidity: Uncontrolled room ambient.
- c. Atmospheric pressure: Site pressure.

4.4 First article inspection. Unless otherwise specified (see 6.2), the Government shall select six (6) periscopes produced under the production contract for first article inspection. First article sample shall be inspected as specified in table II. Approval of the first article sample by the Government shall not relieve the contractor of his obligation to supply periscopes that are fully representative of those inspected as a first article sample. Any changes or deviations of the production units from the first article sample shall be subject to the approval of the contracting officer.

4.4.1 First article inspection failure. Deficiencies found during, or as a result of, the first article inspection shall be cause for rejection of the first article sample until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiency. Any deficiency found during, or as a result of the first article inspection shall be evidence that all items already produced prior to completion of the first article test are similarly deficient unless contrary evidence satisfactory to the contracting officer is furnished by the contractor. Such deficiencies on all items shall be corrected by the contractor. The Government will not accept products until first article inspection is completed to the satisfaction of the Government.

4.5 QCI. QCI shall include the examination of 4.5.2 and the tests of 4.5.3 and 4.5.5. Noncompliance with any of the specified requirements in sections 3 and 5 shall be cause for rejection.

4.5.1 Sampling inspection. Unless otherwise specified (see 6.2), the sampling plan specified herein shall be used. See 6.4.1 for definitions of sampling inspection terms.

4.5.1.1 Lot formation. An inspection lot shall consist of all periscopes of a single type, class, style and part identification number (PIN), from an identifiable production period, from one manufacturer, from one manufacturing location, submitted at the same time for acceptance.

4.5.1.2 Sample. The sample for QCI examination and tests shall be randomly selected from the inspection lot in accordance with table III.

Title	Require- ment	Inspection	First article						Q C I			Control tests
			Sample						Exam	Tests		
			1	2	3	4	5	6		Sampling	100%	
Group A:												
Materials, design and construction	3.2, 3.3	4.7.1	X	X	X	X	X	X	X			
Defects	3.6	4.7.2										
Bubbles and inclusions	3.7.1	4.7.3								X		
Lint	3.7.2	4.7.4	X	X	X	X	X	X		X		
Cleanliness	3.7.3	4.7.5									X	
Group B (Performance):												
Optical characteristics:	3.4.1											
Resolution	3.4.1.1	4.7.6.1	X	X	X	X	X	X		X		X
Spherical power	3.4.1.2	4.7.6.2	X	X	X	X	X	X		X		X
Astigmatism	3.4.1.3	4.7.6.3	X	X	X	X	X	X		X		X
Photopic transmission	3.4.1.4	4.7.6.4	X	X	X	X	X	X		X		X
Optical density	3.4.1.5	4.7.6.5	X	X	X	X	X	X			X	
Angular deviation	3.4.1.6	4.7.6.6	X	X	X	X	X	X		X		X
Cleaning spray:	3.4.2	4.7.7										
Vehicle exterior	3.4.2.1	4.7.7.1						X				X
Vehicle interior	3.4.2.2	4.7.7.2						X				X
Chemicals	3.4.4	4.7.8						X				
Group C (Environmental):												
Temperature:	3.5.1	4.7.9.1										
Low temperature	3.5.1.1	4.7.9.1.1		X								
High temperature	3.5.1.2	4.7.9.1.2		X								
Mirror and window laminations	3.5.1.3	4.7.9.1.3	X	X	X	X	X	X		X		X
Humidity	3.5.2	4.7.9.2				X						X
Salt fog	3.5.3	4.7.9.3					X					
Vibration	3.5.4	4.7.9.4						X				
Shock	3.5.5	4.7.9.5	X									X
Basic shock	3.5.5.1	4.7.9.5.1	X									
Gunfire shock	3.5.5.2	4.7.9.5.2	X									
Submergence	3.5.6	4.7.9.6	X	X		X	X	X			X	
Fungus	3.5.7	4.7.9.7						X				
Weathering	3.5.8	4.7.9.8		X								

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TABLE III. Sampling for QCI.
(NON-MAJOR ITEM)

QCI sampling Plan			
Inspection lot size	Sample size		
	Examination		Test
	Major	Minor	
2 to 8	*	5	*
3 to 15	13	5	13
16 to 25	13	5	13
26 to 50	13	5	13
51 to 90	13	7	13
91 to 150	13	11	13
151 to 280	20	13	20
281 to 500	29	16	29
501 to 1200	34	19	34
1201 to 3200	42	23	42
3,201 to 10,000	50	29	50
10,001 to 35,000	60	35	60
35,001 to 150,000	74	40	74
150,001 to 500,000	90	40	90
500,001 and over	102	40	102

* Indicates entire lot must be inspected (100% inspection).

4.5.2. Examination. The sample selected in accordance with 4.5.1.2 shall be examined and defect; classified as specified in table IV (see 4.7.2). The acceptance number in all cases is zero.

4.5.3 Test. The sample selected in accordance with 4.5.1.2 shall be subjected to the tests specified in table II. The acceptance number in all cases is zero.

4.5.4 QCI failure. Any item that fails to conform to any specified requirement shall be rejected; any failure (one or more) of the selected sample in either the Major/Minor categories or test for the appropriate inspection lot size shall constitute a failure of the entire lot. The rejected item(s) may be repaired or corrected and resubmitted for inspection. If the contractor utilizes sampling inspection as an element of his inspection system, rejected inspection lots may be resubmitted for acceptance if the contractor performs 100 percent inspection on the lot for those characteristics which were defective and resulted in rejection of the lot and removes all defective units or obtains procuring activity approval to resample the lot due to the insignificance of the defects. Resubmitted lots shall be kept separate from new lots and shall be clearly identified as resubmitted lots.

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Category	Defect	Method of inspection
Major		
101	Workmanship affecting serviceability/performance (see 3-7).	Functional
Minor		
201	Part identification and marking not as specified (see 3.6).	Visual
202	Workmanship affecting appearance (see 3.7).	Visual

4.5.5 100% test. Each periscope shall be subjected to the tests specified in table 11.

4.5.5.1 Test failure. Failure of the item to pass the QCI tests shall be cause for the Government to refuse acceptance of the item. Any item containing one or more defects either shall not be submitted for Government acceptance or shall be corrected and re-examined or retested and resubmitted without defects for Government acceptance. Resubmitted items shall be kept separate from new items, and shall be clearly identified as resubmitted items.

4.6 Control tests. Control tests shall be conducted on one periscope per five hundred units consecutively produced. The periscope shall be subjected to the tests specified in table II. Not more than two tests shall be performed in a six month period, nor less than one test in a twelve month period.

4.6.1 Control test failure. Failure of any periscop to pass any of the specified control tests shall be cause for the Government to refuse acceptance of the production quantity represented, until action taken by the contractor to correct defects and prevent recurrence has been approved by the Government.

4.7 Methods of inspection.

4.7.1 Materials, design and construction. Conformance to 3.2 and 3.3 shall be determined by inspection of contracts records providing proof or certification that design, construction, processing, and materials conform to requirements. Applicable records shall include drawings, specifications, design data, receiving inspection records, processing and quality control standards, vendor catalogs and certifications, industry standards. test reports, and rating data.

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4.7.2 Defects. Conformance to 3.6 and 3.7 shall be determined by examination for the defects listed in table IV. Examination shall be visual, tactile, or by measurement with standard inspection equipment.

4.7.3 To determine conformance to 3.7.1, samples of material for the body shall be inspected for bubbles and inclusions under brilliant illumination such as provided with a standard 500 watt lantern slide projector, or equivalent. The viewing shall be through one of the faces of the blank, to which a heavy coat of mineral oil has been applied to produce a transparent surface. The blank shall be backed by a dull background such as black felt or black masking paper during this inspection. The distribution and size of bubbles and inclusions shall conform to 3.7.1.

4.7.4 Lint. To determine conformance to 3.7.2, the test for lint shall be performed on the samples of material at the same time that the test for bubbles and inclusions, 4.7.3, is being performed. The length of the lint particles shall conform to the requirements of 3.7.2. The total projected area of any lint particles shall be computed as stated in 3.7.2 and added to the total area found in 4.7.3.

4.7.5 Cleanliness. To determine conformance to 3.7.3, each optical system shall be examined through the objective and eyepiece ends with the unaided eye. Inspection for moisture shall be made by the technique of shadowing. Inspection for dust particles shall be made by viewing a uniformly illuminated field having a brightness of approximately 300 apparent foot candles.

4.7.6 Characteristics. The test to determine compliance with the resolution, spherical power, and astigmatism requirements of 3.4.1.1, 3.4.1.2 and 3.4.1.3, respectively, shall be performed utilizing a holding medium to support the periscope during the test, a dioptometer with a magnification of at least three power (3X) and a resolving power wall chart. The resolving power chart shall represent the angular subtense for the seconds of arc specified in 3.4.1.1, and shall contain four line sets as shown in figure 1. The dioptometer's eyepiece shall be focused to its reticle to accommodate the individual inspectors eye. Using the dioptometer, the target shall be resolved in each of the four meridians and the diopter reading for each meridian shall be recorded. This operation shall be repeated in nine regions of the clear aperture, three readings approximately 1 1/2 inches from each end and three readings in the center.

4.7.6.1 To determine conformance to 3.4.1.1, the total spread of the four readings obtained in each of the nine areas, as specified in 4.7.6, shall not exceed 0.25 diopter.

4.7.6.2 Spherical power. The average of the horizontal and vertical target focus readings obtained in each of the nine areas, as outlined in 4.7.6, shall be between -0.5 to +0.25 diopters for compliance with the spherical power requirement of 3.4-1.2-

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4.7.6.3 Astigmatism. The algebraic difference in focus between the horizontal and vertical target focus readings obtained in each of the nine areas, as outlined in 4.7.6, shall not exceed .25 diopter for compliance with the astigmatism requirement of 3.4.1.3.

4.7.6.4 Photopic Transmission (PT) Measurement. To determine conformance 3.4.1.4, the periscope shall be tested in accordance with the following:

a. a. One of the following systems shall be utilized:

- (1). A constant current tungsten lamp
A monochromator
A detector
- (2). A double beam spectrophotometer
- (3). A Pritchard type photometer

b. Measurement. The preferred wavelength range for this measurement is 380 nanometer (nm) to 760 nm; any range that includes the range 400 nm to 700 nm is acceptable. Photopic transmission shall be derived from multiplying measured spectral transmission data, taken every 5 nm at 0 ± 2 degrees incidence near the center of the periscope, by the photopic luminous efficiency values that make up the standard human eye curve established by the Commission International del clair (CIE) (see ASTM E308-85)

c. Calculation.

The photopic transmission (PT) is derived from:

$$X = \sum_{380}^{760} T(w) S(w)V(w)dw \quad Y = \sum_{380}^{760} S(w) V(w) dw$$

$$P.T. = X/Y$$

where,

w = wavelength
(w) = Filter transmission characteristics
S(w) = CIE source A characteristic (1931)
V(w) = Photopic visibility function (1931)
dw = intervals

NOTE: S(w) may be omitted if one uses an equal energy per wavelength source.

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4.7.6.5 Optical density measurement using a spectrophotometer. To determine conformance to 3.4.1.5, the periscope shall be tested in accordance with the following:

a. Apparatus. One of the following systems shall be used:

- (1). A constant current tungsten lamp
A monochromator
A detector
- (2). A double beam spectrophotometer

Either system shall be traceable to the National Bureau of Standards through a calibrated absorption type neutral density filter.

b. Calculations.

- (1). Transmission (T) at each wavelength is:

$$T = \frac{\text{Radiance in the optical train.}}{\text{Radiance without periscope in optical train}}$$

- (2). The optical density (O.D.) is:

$$\text{O.D.} = \log (1/T)$$

4.7.6.6 Angular deviation. To determine conformance to 3.4.1.6 and the applicable drawing, the periscope shall be mounted vertically with a collimated reticle entering normal to the entrance window. The reticle shall be viewed through the exit window with an observation telescope consisting of an objective, reticle and eyepiece capable of measuring the angular difference between the exit image and the entrance window normal. The reticle shall be graduated along horizontal and vertical axes with short lines which are separated so as to subtend an angular distance of 5 minutes from the objective. The number of graduation necessary shall be determined by the range of deviations to be measured.

4.7.7 Cleaning spray.

4.7.7.1 Vehicle exterior cleaning spray. To determine conformance to 3.4.2.1, the portion of the assembly above the sealing surface shall be exposed to a water jet or steam spray using agents conforming to P-C-437. The jet shall be applied perpendicular to and at a distance no closer than one foot nor farther than 2 feet from the component surface at a cleaning rate of 1.0 square foot per minute for a period of 10 minutes. The water jet shall be derived from a nozzle having an orifice diameter of 0.25 inch and a nozzle pressure of 110 pounds per square inch gage (mid). After the periscope has been air dried, subject the assembly to the performance tests of 3.4.1.

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4.7.7.2. Vehicle interior cleaning spray. To cleaning conformace to 3.4.2.2, the portion of the assembly below the sealing surface shall be exposed to a jet spray of tap water applied perpendicular to and at a distance no closer than one foot nor farther than 2 feet from the component surface at a cleaning rate of 1.0 square foot per minute for a period of 10 minutes. The water jet shall be derived from a nozzle having an orifice diameter of 0.25 inch and a nozzle pressure of not more than 25 psig. After the periscope has been air dried, subject the assembly to the performance tests of 3.4.1.

4.7.8 Chemicals. To determine conformance to 3.4.3, expose the assembly to the vapors of and direct contact with the chemicals specified in 3.4.3 for a period of 48 hours minimum. After exposure, subject the assembly to the performance tests of 3.4.1.

4.7.9 Environmental. Unless otherwise specified herein, the applicable test methods and procedures of MIL-STD-810 shall apply.

4.7.9.1 Temperature.

4.7.9.1.1 Low Temperature. To determine conformance with 3.5.1.1. the periscope shall be placed in a temperature chamber and subjected to the conditions of 3.5.1.1. The periscope shall be returned to normal ambient temperature at the conclusion of this period. The unit shall show no indication of moisture buildup or bond separation. The periscope shall then be tested per 4.7.6.1, 4.7.6.4, 4.7.6.5 and 4.7.9.6.

4.7.9. High Temperature. To determine conformance to 3.5.1.2, the periscope shall be subjected to the conditions specified in 3.5.1.2. At the conclusion of the test cycles, the periscope shall be stabilized at 140°F and visually examined for moisture buildup or bond separation. The periscope shall then be returned to normal ambient temperature and tested per 4.7.6.1, 4.7.6.4. 4.7.6.5 and 4.7.9.6.

4.7.9.1.3 Mirror and window laminations. The laminations of the mirrors and windows shall be visually examined for compliance with 3.5.1.3. The appearance of any bubbles, blisters, cracks or separations shall be considered evidence of bond failure.

4.7-9.2 Humidity. To determine conformance to 3.5.2, the periscope shall be exposed to two 24-hour cycles of the humidity profile given in table V. Prior to the test, the unit shall be conditioned at 100°F and 50% maximum relative humidity for 24 hours. After the test, the unit shall be conditioned at 73°F and 50% maximum relative humidity for 24 hours. After exposure, the unit shall exhibit no indication of moisture buildup, bond separation, or other foresh of image degradation. The periscope shall then be tested per 4.7.6.1, 4.7.6.4, and 4.7.6.5.

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TABLE V. Humidity profile test requirment

Time (hrs)	Air Temperature		Relative Humidity
	Degrees F	Degrees C	Percent %
0100	100	37.8	95
0200	100	37.8	95
0300	100	37.8	95
0400	100	37.8	95
0500	100	37.8	95
0600	100	37.8	95
0700	105	40.5	81
0800	110	43.3	68
0900	120	48.9	55
1000	130	54.4	44
1100	140	60	37
1200	140	60	37
1300	150	65.6	30
1400	160	71.1	23
1500	160	71.1	23
1600	150	65.6	30
1700	150	65.6	30
1800	140	60	37
1900	130	54.4	44
2000	120	48.9	55
2100	105	40.5	81
2200	100	37.8	95
2300	100	37.8	95
2400	100	37.8	95

4-7-9-3 Salt fog. To determine conformance with 3.5.3, the periscope shall be tested in accordance with the salt fog test described in Method 509. Procedure I of MIL-STD-810. Subsequently, the periscope shall be tested in accordance with 4.7.6.1, 4.7.6.4 and 4.7.6.5 and checked for any delaminations or physical damage.

4.7.9.4 Vibration. To determine conformance to 3.5.4, the periscope shall be rigidly mounted to a vibration table and subjected to sinusoidal vibration along each axis in accordance with figure 3 and table VI. The sweep time shall be 15 minutes for the sweep frequency range of 5-500-5 Hz. Sweep time shall be increased by 3 minutes if test frequencies go to 2 Hz. The frequency of applied vibration shall be swept over the specified range in accordance with figure 4. The specified sweep time is that of an ascending plus descending sweep and is twice the ascending time shown in figure 4 for the specified range. The sinusoidal cycling time shall be a total of 3 hours in each of three perpendicular axes at an ambient temperature of 140°F. At the conclusion of the test, the periscope shall be returned to room ambient temperature (see 4.3) and tested in accordance with 4.7.6.1, 4.7.6.4, 4.7.6.5 and 4.7.9.6.

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TABLE VI. Vibration levels.

<u>Frequency (Hz)</u>	<u>Amplitudes (g)</u>		<u>Longitudinal</u>
	<u>Vertical</u>	<u>Latitudinal</u>	
5-25	± 1.0	± 1.0	± 1.0
25-37	0.03" (peak to peak)	± 1.0	± 1.0
37-500	± 2.0	± 1.0	± 1.0

4.7.9.5 Shock. A shock testing machine capable of producing the magnitude and duration of shock specified in 4.7.9.5.1 and 4.7.9.5.2 shall be used.

4.7.9.5.1 Basic shock. To determine conformance to 3.5.5.1, the periscope shall be rigidly mounted to a shock table and three half sine wave shocks in each direction shall be applied along three mutually perpendicular axes of the periscope (total of 18 shocks). Peak amplitude shall be 30 ± 3 g for 11 ± 1.1 ms duration in accordance with figure 2. The periscope shall then be tested in accordance with 4.7.6.1, 4.7.6.4, 4.7.6.5 and 4.7.9.6.

4.7.9.5.2 Gun fire shock. To determine conformance with 3.5.5.2, the periscope shall be rigidly mounted to a shock table and three half sine wave shocks in each direction shall be applied along three mutually perpendicular axes of the periscope (total of 18 shocks) in accordance with figure 2 and table VII. Peak amplitude shall be 100 g for 11 ms duration. The periscope shall then be tested in accordance with 4.7.6.1, 4.7.6.4, 4.7.6.5 and 4.7.9.6.

TABLE VII. Gun fire shock levels.

<u>Amplitude (g)</u>	<u>Duration (ms)</u>	<u>Axis</u>
100 \pm 10	1.0 \pm 0.1	Vertical
55 \pm 5.5	1.7 \pm 0.2	Latitudinal
255 \pm 22.5	0.5 \pm 0.05	Longitudinal

4.7.9.6 Submergence. To determine conformance with 3.5.6, the mounting surface of the periscope shall be submerged in the water, three (3) inches (76 mm) $+0.75/-0.0$ depth measured between the water surface and sealing mu-face, and remain for five (5) minutes and then checked for any leakage through its seals or bonds. Verify that there is insufficient leakage to form a drop (see 6.4.4).

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4.7.9.7 Fungus. To determine conformance to 3.5.7, the periscope shall be tested in accordance with MIL-STD-810 Method 508.3, except use the specified conditions of 3.5.7. In lieu of the performance of MIL-STD-810 fungus test, a certificate of compliance with supporting data may be provided attesting that the assembly is constructed of materials that will not support fungal growth (see 6.2).

4.7.9.8 Weathering tests. This test shall be conducted upon completion of all the other tests specified in 4.7.8 through 4.8.9.7. The periscope shall be subject to the environmental condition specified in 3.5.8. Based on these condition and the weathering tests specified below, the test cycle shall be approved by the aquisitioning activity prior to test initiation. The periscope shall show no evidence of failure and shall meet the requirements of 3.5.8.1, 3.5.8.2, 3.5.8.3, 3.5.1.3 and 3.4.1.6 when retested in accordance with 4.7.6.1 (modified), 4.7.6.2 (modified), 4.7.6.3 (modified), optical density 4.7.6.5, and mirror and window lamination 4.7.9.1.3.

- a. Simulated sunshine shall be cycled in accordance with Method 505.2, Procedure I of MIL-STD-810 except the diurnal cycle hot-dry temperature shall have a peak temperature of $160 \pm 5^{\circ}\text{F}$ at the geometric center of the periscope. Heat intensity shall be controlled by adjustment of the light source to periscope distance and shall not be achieved varying voltage to the source.
- b. Environmental conditions a and b of 3.5.8 shall be cycled so that no one condition shall not exceed 10 hours duration, and condition c shall not be maintained for more than 70 continuous hours.
- c. No test exposure shall be followed by a like exposure.

5. PREPARATION FOR DELIVERY

5.1 Prevention, packaging, packing and marking. Preservation. packaging, packing and marking for the desired level shall be in accordance with the applicable packaging requirements specified by the contracting authority (see 6.2 and 6.4).

6. NOTES

(This section contains information of a general or explanation nature that may be helpful, but is not mandatory.)

6.1 Intended use. Periscopes covered by this specification are intended for use as unity vision devices in combat type vehicles.

6.2 Ordering data. Acquisition documents must specify the following:

- a. Title, number and date of this specification.
- b. Item name and drawing number (see 3.3).
- c. Issue of DODISS to be cited in the solicitation. and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).

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- d. If first article is required (see 3.11.
- e. For optical density requirements specify per MIL-F-62543 or MIL-F-62422 (see 3.4.1.5).
- f. If responsibility for inspection and the place of inspection is other than as specified (see 4.1).
- g. If a certificate of compliance may be substituted for fungus testing (see 4.7.9.7).
- h. Selection of applicable level and packaging requirements (see 5.1).

6.3 First article When first article inspection is required, the contracting officer should provide specific guidance to offerers on whether the sample(a) should be preproduction sample, a first article sample, an initial production sample, a first production item or a standard production item from the contractor's current inventory and the number of samples to be inspected as specified in 6.2. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results. and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products. who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 Definitions6.4.1 Definition of terms used in sampling inspection.

a. Classification of defects A classification of defects is the enumeration of possible defects of the unit of product classified according to their seriousness. A defect is any nonconformance of the unit of product with specified requirements. Defects will normally be grouped into one or more of the following classes: critical, major and minor defects. Also, defects may be grouped into other classes, or into subclasses within these classes.

b. Critical defects. A critical defect is a defect that judgement and experience indicate would result in hazardous or unsafe conditions for individuals using, maintaining or depending upon the product, or a defect that judgement and experience indicate is likely to prevent performance of the tactical function of a major end item such as a ship, aircraft, tank, missile, or space vehicle.

c. Critical defective. A critical defective is a unit of product which contains one or more critical defects and may also contain major and/or minor defects.

d. Defective. A defective is a unit of product which contains one or more defects.

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e. Formation of lots or batches. The product shall be assembled into identifiable lots, sublots, batches, or in such other manner as may be prescribed (see 1). Each lot or batch shall, as far as is practicable, consist of units of product of a single type, grade, class, size, and composition, manufactured under essentially the same conditions, and at essentially the same time.

f. Lot or batch. The term lot or batch shall mean "inspection lot" or "inspection batch", i.e., a collection of units or product from which a sample is to be drawn and inspected and may differ from a collection of units designation as a lot or batch for other purposes (e.g., production, shipment, etc.).

g. Lot or batch size. The lot or batch size is the number of units of product in a lot or batch.

h. Major defect. A major defect is a defect, other than critical, that is likely to result in failure, or to reduce materially the usability of the unit of product for its intended purpose.

i. Major defective. A major defective is a unit of product which contains one or more major defects, and may also contain minor defects but contains no critical defect.

j. Minor defect. A minor defect is a defect that is not likely to reduce materially the usability of the unit of product for its intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the unit.

k. Minor defective. A minor defective is a unit of product which contains one or more minor defects but contains no critical or major defect.

l. Presentation of lots or batches. The formation of the lots or batches, lot or batch size, and the manner in which each lot or batch is to be presented and identified by the supplier shall be designated or approved by the responsible authority. As necessary, the supplier shall provide adequate and suitable storage space for each lot or batch, equipment needed for proper identification and presentation, and personnel for all handling of product required for drawing of samples.

m. Representative sampling. When appropriate, the number of units in the sample shall be elected in proportion to the size of sublots or subbatches, or parts of the lot or batch, identified by some rational criterion. When representative sampling is used, the units from each part of the lot or batch shall be selected at random.

n. Sample. A sample consists of one or more units of product drawn from a lot or batch, the units of the sample being selected at random without regard to their quality. The number of units or product in the sample is the sample size.

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o. Sampling. A sampling plan indicates the number of units of product from each lot or batch which are to be inspected (sample size or series of sample sizes) and the criteria for determining the acceptability of the lot or batch (acceptance and rejection numbers).

p. Time of sampling. Samples may be drawn after all the units comprising the lot or batch have been assembled, or samples may be drawn during assembly of the lot or batch.

q. Preservation, packaging, and packing which will afford adequate protection against corrosion, deterioration, and damage during shipment, handling, indeterminate storage, and worldwide redistribution.

r. Preservation, packaging, and packing which will afford adequate protection against corrosion, deterioration, and known storage conditions for periods normally not exceeding 1 year.

s. Preservation, packaging, and packing which will afford adequate protection against corrosion, deterioration, and damage during shipment from supply source to the first receiving activity for immediate use (vendor to user).

6.4.2 Recovered Materials. "Recovered materials" means materials that have been collected or recovered from solid waste (see 6.4.3).

6.4.3 Solid Waste. "Solid waste" means (a) any garbage, refuse, or sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility; and (b) other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining and agricultural operations, and from community activities. It does not include solid or dissolved material in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Clean Water Act, (33 U.S.C. 1342 et seq.), or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) (Source: Federal Acquisition Regulations, section 23.402).

6.4.4 Leaks. The following definitions for leaks apply (see 4.7.9.6):

- a. Weep - Any non-recurring evidence of fluid beyond the seal or joint.
- b. Weep - Any recurring evidence of fluid beyond the seal or joint that results in an accumulation of more than 0.05 cubic centimeters volume.
- c. Droplet - Any recurring evidence of fluid beyond the seal or joint that results in an accumulation of more than 0.05 cubic centimeters volume that does not fall.
- d. Drop - A drop is defined as a volume of 0.05 cubic centimeters.
- e. Drip - Any recurring evidence of fluid beyond the seal or joint where a droplet or more forms and falls.

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6.5 Subject Term (key word) listing.

Angular deviation
Astigmatism
Fungus
Gun fire shock
High temperature
Humidity
Light (photopic) transmission
Low temperature
Optical density
Photopic (light) transmission
Remlution
Recovered material
Recycled material
Salt fog
Shock, basis
Spherical power
Submergence
Unity periscope
Vibration
Weathering

6.6 Supression data. This specification supersedes MIL-P-0046329B(AT) dated 1 December 1988.

6.7 AMC policy on AQLs/LTPDs. This specification is certified to be in compliance with current Army Materiel Command (AMC) policy for the elimination of AQLs/LTPDs (Acceptable Quality Levels,/Lot Tolerance Percent Defectives) from military specifications.

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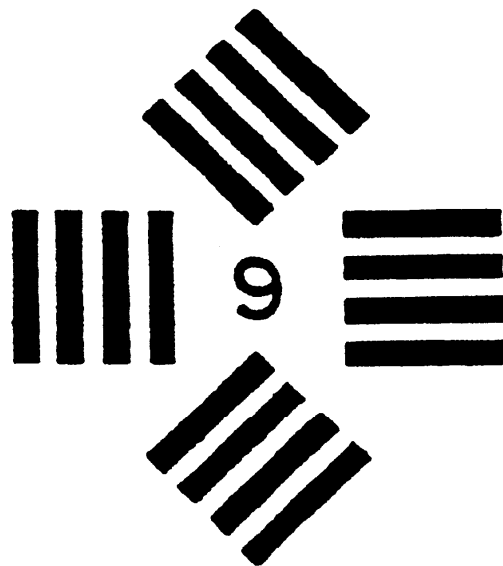
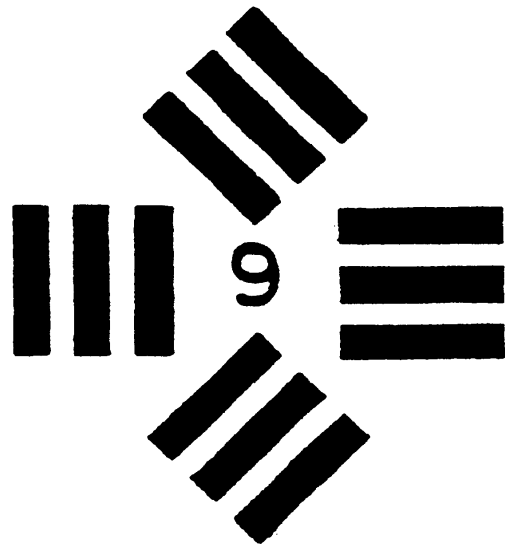
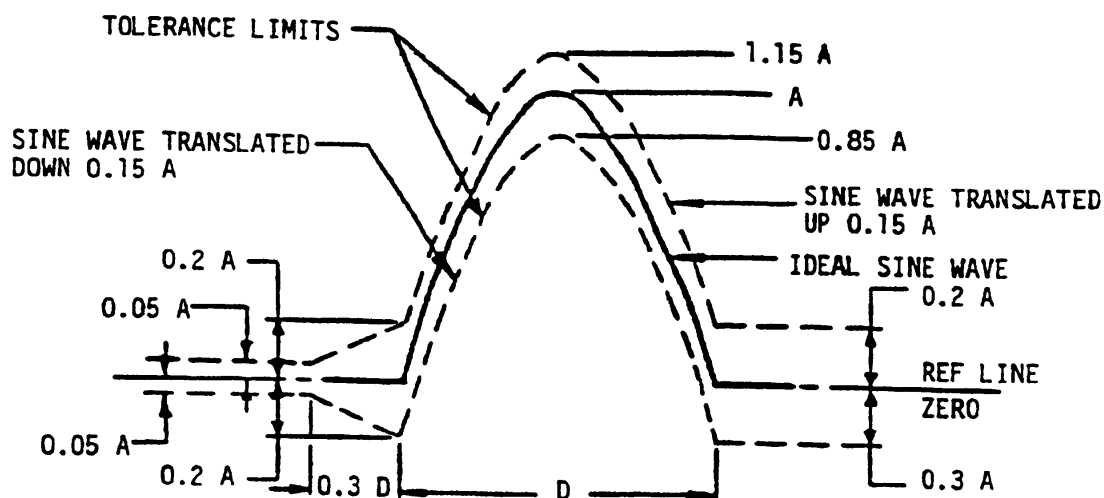


FIGURE 1. Line sets

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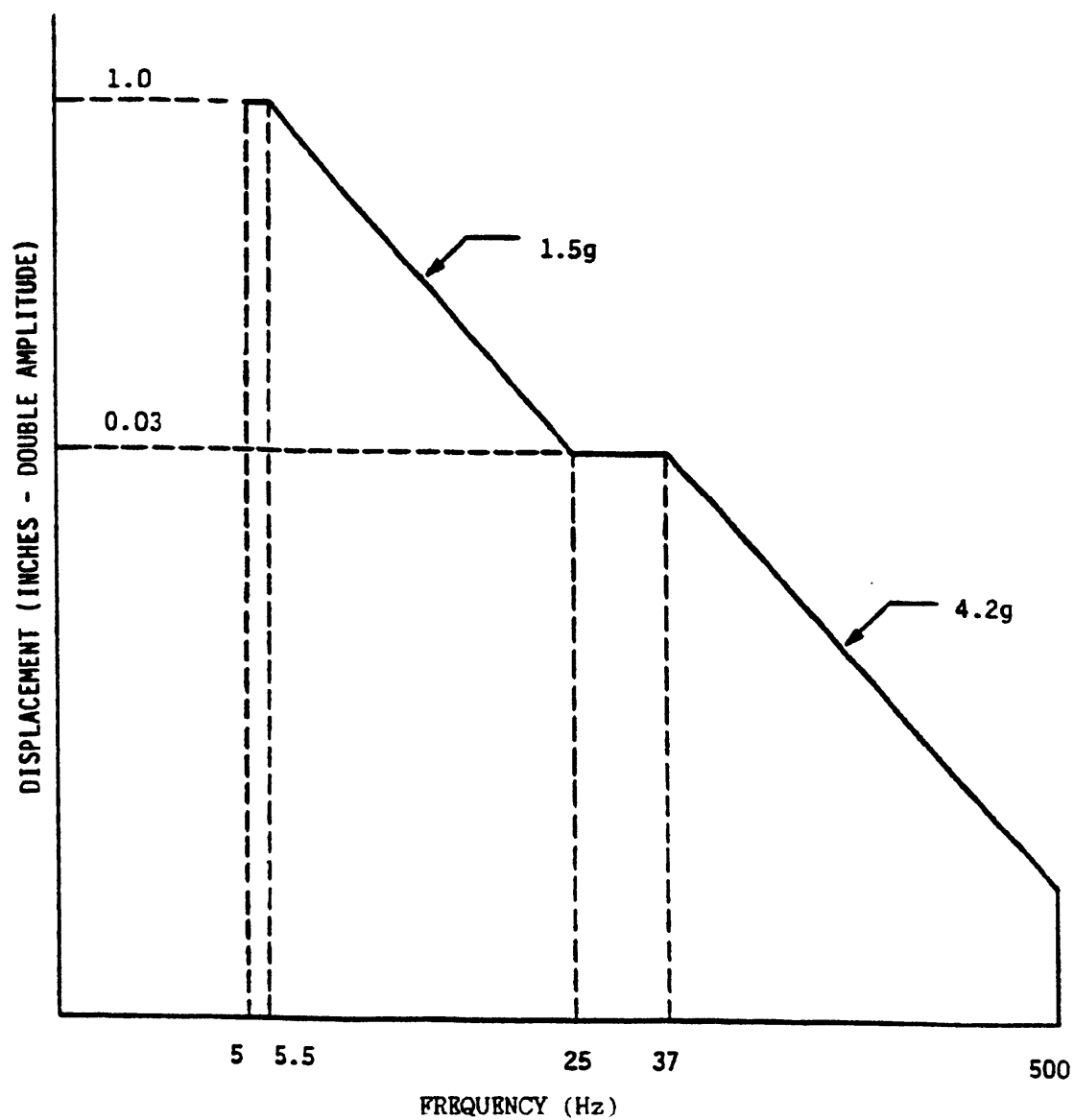


A = Peak value = 30 ± 3 g for 4.7.9.5.1
 See table V for 4.7.9.5.2
 D = Nominal duration = 11 ms. For 4.7.9.5.1
 see table V for 4.7.9.5.2

NOTE: The oscillogram shall include a time about $3D$ long with a pulse located approximately in the center. The acceleration amplitude of the ideal half sine pulse is A and its duration is D . The measured acceleration pulse shall be contained between the broken line boundaries and the measured velocity change (which may be obtained by integration of the acceleration pulse) shall be within the limits of $V_i \pm 0.1 V_i$ where V_i is the velocity-change associated with the ideal pulse which equals $2AD/\omega$. The integration to determine velocity change shall extend from $0.4D$ before the pulse to $0.1D$ after the pulse.

FIGURE 2. Half sine shock pulse configuration and its tolerance limits.

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NOTE: All curves shall be extended to 2 Hz when test item resonances below 5 Hz are expected.

FIGURE 3. Vibration test curve.

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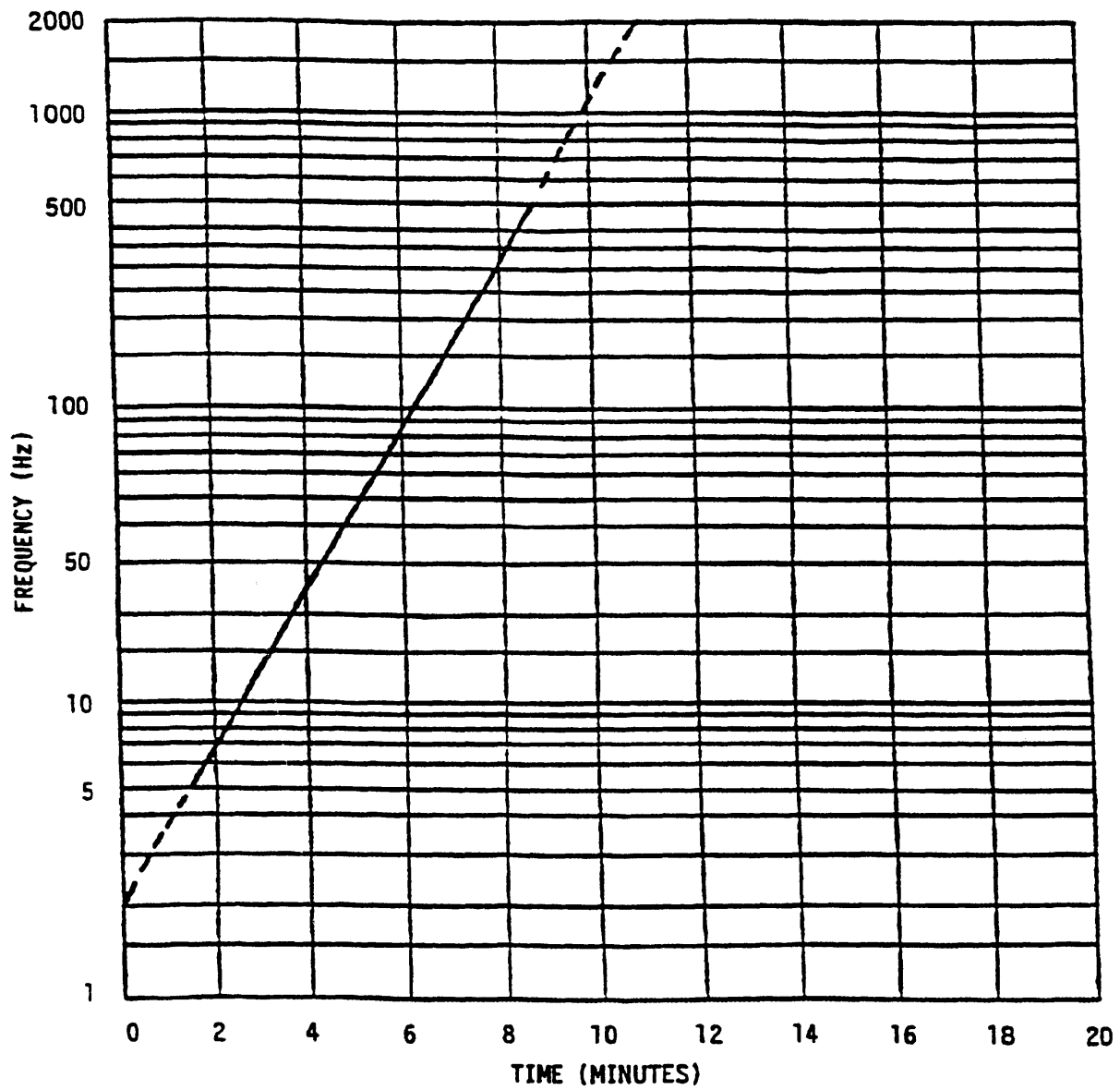


FIGURE 4. Logarithmic sweep.

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MIL-P-62420(AT)
AMENDMENT 1
11 SEP 1992

MILITARY SPECIFICATION

PERISCOPE, TANK

This amendment forms a part of MIL-P-62420(AT), dated 8 June 1990, and approved is for use by the U.S. Army Tank automotive Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

PAGE 2

2.1.1 Delete: MIL-F-62543 (S) - Filter, Laser Protection."

PAGE 5

3.4.1.4 Delete and substitute:

"3.4.1.4 Photopic transmission. The photopic transmission of laser protected periscopes, excluding M1 Commander's periscopes, shall be equal to or greater than 36%. The photopic transmission of M1 periscopes shall be equal to or greater than the value specified below. The photopic transmission shall be measured at 0 ± 2 degrees incidence (see 4.7.6.4)."

Periscope	Nomenclature	Photopic Transmission
12357840	Commanders Side	29%
12357841	Commanders Front	24%
12357846	Driver's Side	33%
12357848	Driver's Front	33%

3.4.1.5 Delete and substitute:

"3.4.1.5 Optical density. The optical density requirements for specific wavelength ranges shall be as specified in MIL-F-6242. The optical density shall be measured at 0 ± 2 degrees incidence (see 4.7.6.5)."

3.4.1.6 Delete +/- 30 minutes" and substitute +/- degree".

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AMENDMENT 1

PAGE 6

3.5.1.1 Add to last sentence: and shall meet the requirement of 3.5.1.3.

3.5.1.2 Add to last sentence: and shall meet the requirement of 3.5.1.3.

3.5.1.3 Delete and substitute:

3.5.1.3 Mirror and window lamination. The unit shall show no evidence of bond failure. The appearance of bubbles, blisters, or other indications of cement separation shall be considered evidence of bond failure (4.7.9.1.3)."

PAGE 8

3.7.1 line 9, Delete ".10" and substitute ".010".

PAGE 11

TABLE II: Add low temperature test (3.5.1.1, 4.7.9.1.1) and high temperature test (3.5.1.2, 4.7.9.1.2) to control test (4.6).

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4.7.6.4 Delete: NOTE: S(W) may be omitted if one uses an equal energy per wavelength source."

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4.7.9.5.2 Delete: "Peak amplitude shall be 100 g for 11 ms duration."

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4.7.9.8, line 7, Delete "3.5.1.3 amd 3.4.1.6 and substitute "3.4.1.5 and 3.5.1.30".

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6.2 Delete: "e. for optical density requirement specify per MIL-F-62543 or MIL-F-62422 (see 3.4.1.5)."

Custodian:
Army - AT

Preparing Activity:
Army - AT
(project 1240-AB40)