

INCH-POUND
MIL-DTL-6749B
11 February 2008
SUPERSEDING
MIL-DTL-6749A
23 August 2002

DETAIL SPECIFICATION

RESISTOR, VARIABLE, WIREWOUND,
NONPRECISION, AIRCRAFT POWER

Inactive for new design after
31 January 1998.

This specification is approved for use by all Departments
and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the general requirements for linear and taper wirewound resistors of the nominal wattage and resistance ratings as specified herein.

1.2 Classification.

1.2.1 Part or Identifying Number (PIN). The PIN is in the following form and as specified in table I herein.

AN3155	-	25	-	10
Style		Power rating (see 3.4 and table I)		Resistance (see 3.5 and table I)

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in [sections 3](#) and [4](#) of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in [sections 3](#) and [4](#) of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 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 cited in the solicitation or contract ([see 6.2](#)).

DEPARTMENT OF DEFENSE SPECIFICATION

MS25166	-	Knob, Pointer, Illuminated
AN508	-	Screw, Round Head Machine

Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center, Columbus, ATTN: DSCC-VAT, Post Office Box 3990, Columbus, Ohio 43218-3990 or by email Resistor@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil/>.

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DEPARTMENT OF DEFENSE STANDARDS

- [MIL-STD-202](#) - Tests Methods for Electronic and Electrical Components Parts.
- [FED-STD-H28](#) - Screw-Thread Standard for Federal Service.

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094).

2.3 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 cited in the solicitation or contract ([see 6.2](#)).

AEROSPACE INDUSTRIES ASSOCIATION of AMERICA (AIAA)

- [NASM35333](#) - Washer, Lock, Flat-Internal Tooth
- [NASM35338](#) - Washer, Lock-Spring, Helical, Regular (Medium) Series

(Copies of this document are available from <http://www.aia-aerospace.org/> or from the Aerospace Industries Association of America, 1250 Eye St., N.W., Suite 1200, Washington, DC 20005-3924)

INTERNATIONAL ORGANIZATION for STANDARDS (ISO)

- [ISO 10012-1](#) - Equipment, Quality Assurance Requirements for Measuring - Part 1: Meteorological Confirmation System for Measuring Equipment.

(Copies of this document are available online at <http://www.iso.org/> or should be addressed to the American National Standards Institute, 11 West 42nd Street New York, NY 10036.)

NATIONAL CONFERENCE OF STANDARDS LABORATORIES (NCSL)

- [NCSL Z540-1](#) - Laboratories, Calibration, and Measuring and Test Equipment.

(Copies of this document are available from <http://www.ncsli.org/> or from the National Conference of Standards Laboratories (NCSL) International, 1800 30th Street, Suite 305, Boulder, CO 80301-1026.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), 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 Qualification. Resistors furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable Qualified Products List (QPL) at the time of award of contact ([see 4.4](#) and [6.3](#)).

3.2 Material. The material shall be as specified herein. However, when a definite material is not specified, a material shall be used which will enable the resistors to meet the performance requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product.

3.2.1 Pure tin. The use of pure tin, as an underplate or final finish, is prohibited both internally and externally. Tin content of resistor components and solder shall not exceed 97 percent, by mass. Tin shall be alloyed with a minimum of 3 percent lead, by mass ([see 6.4](#)).

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3.3 Interface and physical dimension requirements. Resistors shall meet the interface and physical dimensions as specified in [figure 1](#).

3.3.1 Resistor winding. The resistor winding shall be resistance wire, wound on a form which shall not char or break down as a result of the tests specified herein. The element shall be a continuous unbroken length of conductor without joints, bonds, or welds, except at the junction of resistor element and the winding terminals.

3.3.2 Protective housing or enclosure. The resistor shall be totally enclosed for protection against dust and mechanical or electrical damage.

3.3.2.1 Non-turn device. A non-turn device on the panel mounting surface of the resistor shall be located in the plane passing through the center line of the shaft and midpoint of the winding core. The device shall be on the same side of the shaft as the midpoint of the winding core and at a distance as specified ([see figure 1](#)).

3.3.3 Operating shaft. The operating shaft shall be provided with a flat side located directly opposite of the contactor.

3.3.4 Contact arm. Uniform contact pressure on the resistor element shall be maintained by positive pressure and shall permit smooth electrical and mechanical control of the resistor over the entire range. The contact shall have continuous electrical contact with its terminal throughout the entire mechanical travel.

3.3.5 Electrical connectors. Two terminals, tapped for and equipped with screws and washers are as specified herein ([see figure 1](#)). Terminals and current carrying parts shall be of corrosion resistant material.

3.3.6 Mounting hardware. Resistors shall be furnished with corrosion resistant mounting hardware as specified herein ([see figure 1](#)).

3.3.6.1 Knob. The knob shall conform to [MS25166](#) or equivalent as specified herein ([see figure 1](#)).

3.3.7 Rotation. Unless otherwise specified the arrangement of the resistor assembly shall be such that when the operator faces the resistor mounted on the panel, a clockwise rotation of the knob shall decrease the resistance.

3.3.7.1 Angular rotation. The resistor shall be designed to provide an angular rotation of 260 degrees to 310 degrees (including the "OFF" position).

3.3.7.2 Off-position. Unless otherwise specified, the resistor shall be provided with an "OFF" position. The construction of the "OFF" position shall be such that the operator will know without question when the contact is turned from the winding. This construction shall be approved by the Qualifying Activity.

3.3.7.3 On position. Unless otherwise specified, when the resistor is turned on (from the "OFF" position), the brush contact shall be in the position to provide maximum resistance.

3.4 Power rating. The power rating in watts for each PIN shall be as specified herein ([see 1.2.1](#) and [table I](#)).

3.5 DC resistance The resistance shall be as specified herein ([see 1.2.1](#) and [table I](#)).

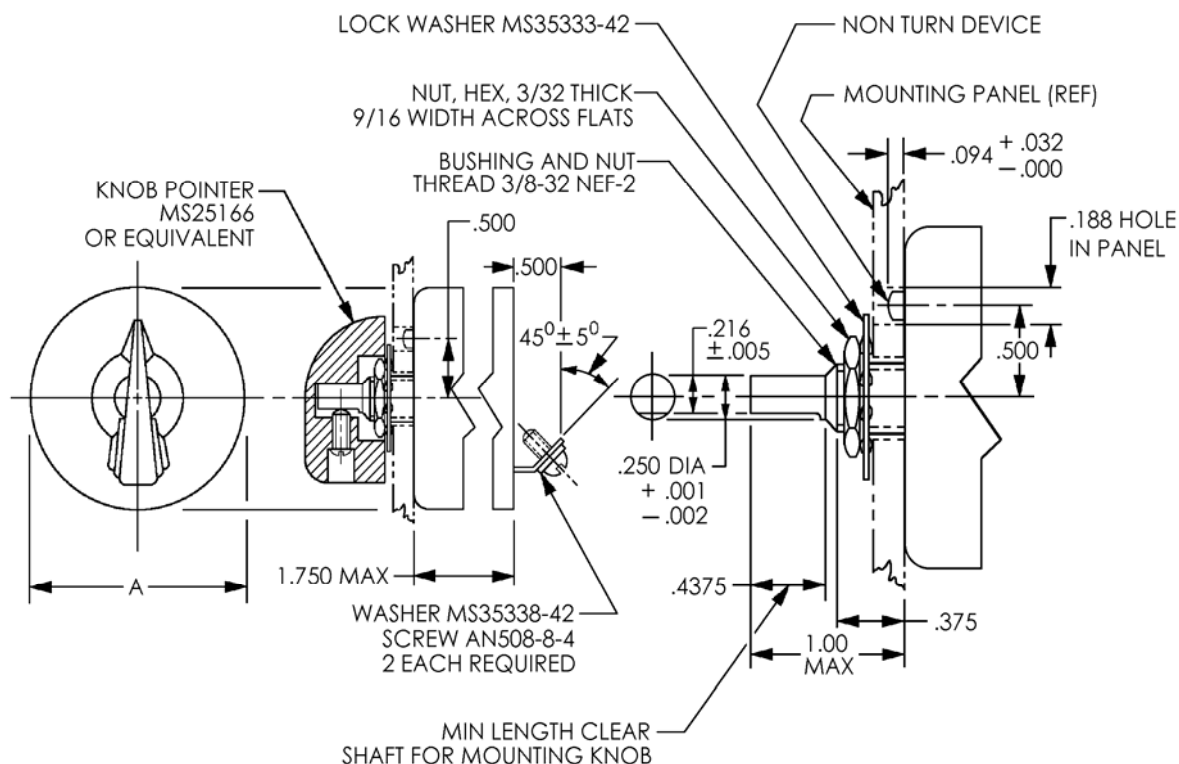
3.5.1 Minimum resistance. When measured as specified in [4.7.2.1](#), the minimum resistance shall not exceed 0.2 ohm.

3.5.2 Maximum resistance. When resistors are tested as specified in [4.7.2.2](#), the maximum resistance in ohms shall not exceed +15 percent, -5 percent of the rated resistance.

3.5.3 Resistance value deviations. All maximum deviations as specified in this section are to be considered absolute limits with the exception of the contact resistance adjustments.

3.6 Dielectric withstanding voltage. When resistors are tested as specified in [4.7.3](#), there shall be no evidence of insulation breakdown.

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Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
0.001	0.03	0.005	0.13	0.094	2.39	0.216	5.49	0.500	12.70	1.750	44.45	0.4375	11.12
0.002	0.05	0.032	0.81	0.188	4.78	0.250	6.35	1.000	25.40	0.375	9.52		

NOTES:

1. Dimensions are in inches
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are ± 0.005 for decimals and $\pm 3/64$ for fractions.
4. For dimension "A" see table I.
5. MS35333 and MS35338 have been cancelled and replaced by NASM35333 and NASM35338, respectfully. The existing PIN's have been retained in the NASM document.

FIGURE 1. Style AN3155 resistors.3.7 Torque.

3.7.1 Starting. When resistors are tested as specified in 4.7.4.1, the torque required to affect rotation shall not exceed 2.5 pound-inches.

3.7.2 Stop. When resistors are tested as specified in 4.7.4.2, there shall be no evidence of mechanical damage.

3.8 Shock (specified pulse). When resistors are tested as specified in 4.7.5, there shall be no electrical discontinuity or evidence of mechanical damage.

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3.9 Vibration. When resistors are tested as specified in 4.7.6, there shall be no electrical discontinuity or evidence of mechanical damage.

TABLE I. Resistor characteristics.

PIN (see 1.2.1)	Amperes		Dim "A" Max	Wt Lb Max	Number of sample units	Design operating load of taper wound resistors
	Min ohms	Max ohms				
AN3155-25-10	1.95	0.30	1-7/8	0.40	10	3 Volt, 0.195 Amp; Instrument lamps operating at 3 Volts
AN3155-25-11 <u>1/</u>	1.25	1.25				
AN3155-25-15	1.30	1.30				
AN3155-25-25	1.00	1.00				
AN3155-25-50	0.71	0.71				
AN3155-25-75	0.58	0.58				
AN3155-25-100	0.85	0.16			3	2 CP, 12-16 Volt; Lamps operating at 14.25 Volts.
AN3155-25-200	0.35	0.35				
AN3155-50-5	5.50	1.82	2-3/4	0.60	1	100 CP, 12-16 Volt; Lamps operating at 14.25 Volts.
AN3155-50-8 <u>2/</u>	2.50	2.50				
AN3155-50-10	2.50	1.60			1	100 CP, 28 Volt; Lamps operating at 28.5 Volts.
AN3155-50-25	2.70	0.70			1	21/21 CP, 12-16 Volt; Lamp with two filaments operating at 14.25 Volts.
AN3155-50-30 <u>2/</u>	1.70	0.90			1	24 Volt series motor that requires 1.70 Amps MAX
AN3155-50-50	1.00	1.00				
AN3155-50-75	0.82	0.82				
AN3155-50-100	1.35	0.25			1	21/21 CP, 28 Volt; Lamp with two filaments operating at 28.5 Volts.
AN3155-50-150	0.69	0.17			1	21/21 CP, 28 Volt; Lamp with one filament operating.
AN3155-50-200	1.35	0.15			1	21/21 CP, 28 Volt; Lamp with two filaments operating at 28.5 Volts.

1/ Rotation clockwise increases resistance. No "OFF" position. Ninety steps minimum.

2/ Rotation clockwise increases resistance. Minimum resistance obtained when the resistor is turned on from the "OFF" position.

3.10 Salt atmosphere (corrosion). When resistors are tested as specified in 4.7.7 resistors shall show no corrosion and shall remain mechanically operative.

3.11 Life. When resistors are tested as specified in 4.7.8, there shall be no evidence of mechanical failure and the change in maximum resistance shall not exceed five percent.

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3.12 Low temperature exposure. When resistors are tested as specified in 4.7.9, there shall be no electrical discontinuity or evidence of mechanical damage.

3.13 High temperature exposure. When resistors are tested as specified in 4.7.10, there shall be no electrical discontinuity or evidence of mechanical damage.

3.14 Terminal strength. When resistors are tested as specified in 4.7.11, there shall be no electrical discontinuity or evidence of mechanical damage.

3.15 Marking. Resistors shall be marked on the back or periphery with the following minimum information

- a. PIN (see 1.2.1)
- b. Resistance value
- c. Amps Max (applicable to linear wound resistors)
- d. Amps Max at minimum resistance (applicable to taper wound resistors)
- e. Amps Max at maximum resistance (applicable to taper wound resistors)
- f. Power rating
- g. Manufacturer's name, Commercial and Government Entity (CAGE) code, or trademark

3.16 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.17 Workmanship. Resistors shall be processed in such a manner as to be uniform in quality and shall be free from other defects that will affect life, serviceability, or appearance.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.4).
- b. Conformance inspection (see 4.6).

4.2 Test equipment and inspection facilities. The supplier shall establish and maintain a calibration system in accordance with NCSL Z540-1, ISO 10012-1, or equivalent system as approved by the qualifying activity.

4.3 Inspection conditions and precautions.

4.3.1 Conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the **GENERAL REQUIREMENTS** of MIL-STD-202.

4.3.2 Precautions. Adequate precautions shall be taken during tests to prevent condensation of moisture on resistors, except during the moisture resistance tests.

4.4 Qualification. Qualification inspection shall be performed at a laboratory acceptable to the Government on sample units produced with equipment and procedures normally used in production (see 6.3).

4.4.1 Sample size. Three sample units shall be subjected for qualification inspection.

4.4.2 Inspection routine. Three sample units shall be subjected to the qualification inspection specified in table II.

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Table II. Qualification inspection.

Inspection	Requirements Paragraph	Method paragraph	Number of samples	Number of defectives
Visual and mechanical examination	3.2 to 3.3.7.3 incl., 3.15, and 3.17	4.7.1	3	0
Minimum resistance	3.5.1	4.7.2.1		
Maximum resistance	3.5.2	4.7.2.2		
Dielectric withstanding voltage	3.6	4.7.3		
Torque	3.7	4.7.4		
Shock	3.8	4.7.5		
Vibration	3.9	4.7.6		
Salt atmosphere	3.10	4.7.7		
Life	3.11	4.7.8		
Low Temperature exposure	3.12	4.7.9		
High temperature exposure	3.13	4.7.10		
Terminal strength	3.14	4.7.11		

4.4.3 Defects. Resistors that have been rejected may be replaced or repaired to correct the defects and resubmitted for all the specified tests. Before resubmitting, full particulars concerning previous rejection and the action taken to correct the original defects shall be furnished to the qualifying activity. Units rejected after retest shall not be resubmitted without the specific approval of the Procuring Agency.

4.5 Retention of qualification. Every 12 months, the manufacturer shall verify the retention of qualification to the qualifying activity. In addition, the manufacturer shall immediately notify the qualifying activity whenever the group B inspection results indicate failures of the qualified product to meet the requirements of this specification. Verification shall be based on meeting the following requirements:

- a. The manufacturer has not modified the design of the item.
- b. The specification requirements for the item have not been amended so far as to affect the character of the item.
- c. Lot rejection for group A inspection does not exceed the group A sampling plan.
- d. The requirements for group B inspection are met.

When group B requirements were not met and the manufacturer has taken corrective action satisfactory to the Government, group B inspection retesting shall be instituted.

4.6 Conformance inspection.

4.6.1 Inspection of product for delivery. Inspection of packaging shall consist of groups A and B inspections.

4.6.1.1 Inspection lot. An inspection lot, as far as practicable, shall consist of all resistors produced under essentially the same conditions, and offered for inspection at one time.

4.6.1.2 Group A inspection. Group A inspection shall consist of the examination and tests specified in [table III](#) and shall be made on the same set of sample units.

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Table III. Group A inspection.

Inspection	Requirements paragraph	Method paragraph	Sampling plan
Visual and mechanical examination	3.2 to 3.3.7.3 incl., 3.15, and 3.17	4.7.1	4.6.1.2.1
Minimum resistance	3.5.1	4.7.2.1	
Maximum resistance	3.5.2	4.7.2.2	

4.6.1.2.1 Sampling plan. A sample of parts from each inspection lot shall be randomly selected in accordance with table IV. If one or more defects are found, the lot shall be screened and defectives removed. After screening and removal of defectives a new sample of parts shall be randomly selected in accordance with table IV. If one or more defects are in the second sample, the lot shall be rejected and shall not be supplied to this specification.

TABLE IV. Group A sampling plan.

Lot size	Sample size
1 to 13	100 percent
14 to 150	13
151 to 280	20
281 to 500	29
501 to 1,200	34
1,201 to 3,200	42
3,201 to 10,000	50
10,001 to 350,00	60
35,001 to 150,000	74
150,001 to 500,000	90
500,001 and over	102

4.6.1.3 Group B inspection. Group B inspection shall consist of the tests specified in table V, in the order shown, and the sample shall be selected from inspection lots that have passed group A inspection.

TABLE V Group B inspection. 1/

Inspection 2/	Requirements paragraph	Method paragraph	Sampling plan
Dielectric withstanding voltage	3.6	4.7.3	4.6.1.3.1
Torque	3.7	4.7.4	
Shock	3.8	4.7.5	
Vibration	3.9	4.7.6	
Salt atmosphere	3.10	4.7.7	
Life	3.11	4.7.8	
Low temperature exposure	3.12	4.7.9	
High temperature exposure	3.13	4.7.10	
Terminal strength	3.14	4.7.11	

1/ If the manufacturer can demonstrate that this test has been performed 5 consecutive times with zero failures, the frequency of this test, with approval of the qualifying activity, can be performed on an annual basis. If the design, material, construction or processing of the part is changed, or if there are any quality problems or failure, the qualifying activity may require resumption of the original test.

2/ Failure of a resistor in one or more tests shall be charged as a single defective.

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4.6.1.3.1 Sampling plan. A sample of parts shall be randomly selected in accordance with table VI. If one or more defects are found, the lot shall be screened and defectives replaced or repaired. After screening and replace or repair of defectives, a new sample of parts shall be randomly selected in accordance with table VI. If one or more defects are found in the second sample, the lot shall not be supplied to this specification.

Table VI. Group B sampling plan.

Lot size		Sample size
1	to 25	3
26	to 50	5
51	to 90	6
91	to 150	7
151	to 280	10
281	to 500	11
501	to 1,200	15
1,201	to 3,200	18

4.6.1.4 Certification. The acquiring activity, at its discretion, may accept a certificate of compliance with group B requirements from a qualified manufacturer in lieu of performing group B tests (see 6.2.d).

4.6.2 Noncompliance. If a sample fails to pass group B inspection, the supplier shall take corrective action on the materials or processes, or both, as warranted, and on all units of product which can be corrected and which were manufactured under essentially the same conditions, with essentially the same materials, processes, etc., and which are considered subject to the same failure. Acceptance of the product shall be discontinued until corrective action, acceptable to the Government, has been taken. After the corrective action has been taken, group B inspection shall be repeated on additional sample units (all inspection, or the inspection which the original sample failed, at the option of the Government). Group A inspections may be reinstated; however, final acceptance shall be withheld until group B reinspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure and corrective action taken shall be furnished to cognizant inspection activity and the qualifying activity.

4.7 Methods of examination and test.

4.7.1 Visual and mechanical examination. Resistors shall be examined to verify that the materials, interface and physical dimensions, marking, and workmanship are in accordance with the applicable requirements (see 3.2 to 3.3.7.3 inclusive, 3.15, and 3.17).

4.7.2 DC resistance (see 3.5).

4.7.2.1 Minimum resistance (see 3.5.1). The resistance shall be measured with the contact in the minimum resistance position by any method satisfactory to the inspector that causes negligible heating of the resistor winding. The resistance shall not exceed 0.2 ohm. This test determines the resistance of the lug, contact arm, and center lead assembly.

4.7.2.2 Maximum resistance (see 3.5.2). The resistance shall be measured with the contact in the maximum resistance position by any method satisfactory to the inspector that causes negligible heating of the resistor winding. The resistance shall not vary more than +15 percent, -5 percent of the rated resistance.

4.7.3 Dielectric withstanding voltage (see 3.6).

4.7.3.1 At atmospheric pressure. An approximate sine-wave test potential of 1000 volts rms from an ac supply at commercial line frequency shall be applied between the terminals and then between each terminal with resistor in the off position and the mounting bushing or shaft, as applicable, for one minute. There shall be no breakdown of insulation.

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4.7.3.2 At reduced pressure. A sine-wave test potential of 550 volts rms from an ac supply at commercial line frequency shall be applied as specified for atmospheric pressure except that the pressure shall be 3.4 inches of mercury. There shall be no breakdown of insulation.

4.7.4 Torque (see 3.7).

4.7.4.1 Starting. The torque required to rotate the contact on the resistance winding shall be determined throughout the entire range by any method satisfactory to the Government, except at the full "OFF" position.

4.7.4.2 Stopping. The contact arm shall be rotated to both extremes and a torque of not less than 30 pound-inches shall be applied to the control shaft.

4.7.5 Shock (specified pulse) (see 3.8). Resistors shall be tested as specified in [method 213](#) of MIL-STD-202. The following details and exceptions shall apply:

- a. Deceleration velocity: 25 gravity units .
- b. Examination after test: There shall be no evidence of mechanical or electrical failure or movement of the contact arm.

4.7.6 Vibration (see 3.9). Resistors shall be tested as specified in [method 201](#) of MIL-STD-202. The following details and exceptions shall apply:

- a. Frequency range: 600 to 1300 Hz.
- b. Period of test: 5 hours.
- c. Position of contact arm: The contact arm shall be set at approximately 50 percent rotation position at start of test.
- d. Examination after test: There shall be no evidence of mechanical or electrical failure and vibration has not caused the contact arm to change position.

4.7.7 Salt atmosphere (corrosion) (see 3.10). Resistors shall be tested as specified in [method 101](#) of MIL-STD-202. The following details and exceptions shall apply:

- a. Length of test: Test condition A.
- b. Examination after test: Parts shall be washed, air-dried, and examined for corrosion.
- c. Measurements after test: The maximum resistance and torque test shall again be conducted. The maximum resistance shall not have changed by more than 5 percent. The torque required to operate the resistor shall not exceed 2-1/2 pound-inches.

4.7.8 Life (see 3.11). The resistor shall be inserted in a 28.5 volts constant voltage circuit providing maximum rated current at minimum resistance of the resistor. The resistor shall then be subjected to 10,000 cycles of operation, at the rate of approximately 20 cycles per minute. A cycle shall consist of rotating the resistor from the "OFF" position to the full "ON" position and back to the "OFF" position. A suitable ammeter shall be connected in series with the resistor to determine if proper contact is being made. At the completion of the operating cycles the resistor shall be gradually rotated throughout its entire range and the effect on the ammeter needle noted. The resistor shall again be subjected to the maximum resistance test. The change in maximum resistance shall not exceed 5 percent. There shall be no mechanical failure of any kind. At the completion of the test there shall be no abrupt fluctuation of the ammeter needle when the resistor is rotated gradually from full "OFF" to "ON" except at the full "OFF" position.

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4.7.9 Low temperature exposure (see 3.12). The resistor shall be subjected to a temperature of -65°C (-85°F) for 48 hours. It shall then be carefully examined for damage. There shall be no evidence of electrical or mechanical damage. At the option of the inspector, any or all of the tests shall be conducted after this test.

4.7.10 High temperature exposure (see 3.13). Resistors shall be exposed to an ambient temperature of 150°C $\pm 3^{\circ}\text{C}$ for a period of 1000 hours ± 12 hours. At least 2 hours after the end of the exposure period, the resistors shall be examined for evidence of mechanical damage, and the maximum resistance shall be measured as specified in 4.7.2.2 at room temperature.

4.7.11 Terminal strength (see 3.14). A tensile load of 25 pounds shall be applied to each terminal, normal to the mounting plane of the resistor for one minute. The resistor shall then be operated several times and shall be checked for short circuiting while the terminals are loaded. Ability to operate mechanically and electrically after this test shall be considered a suitable indication of conformance with this requirement.

5. PACKAGING.

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Service or Defense Agency, or within the military services system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. The resistors covered by this specification are military unique due to the fact that these devices must be able to operate satisfactorily in military systems under the following demanding conditions: 20 G's of high frequency vibration, 25 G's of shock (specified pulse), thermal shock (with no more than 1 percent deviation in initial resistance), and a low temperature coefficient of resistance. In addition, these military requirements are verified under a qualification system. Commercial components are not designed to withstand these military environmental conditions.

6.2 Ordering data. Acquisition documents must specify the following:

- a. Title, number, and date of this specification, and the complete PIN (see 1.2).
- b. If not otherwise specified (see 2.1), the versions of the individual documents referenced will be those in effect on the date of release of the solicitation.
- c. Packaging instructions (see 5.1).
- d. Whether the manufacturer performs group B tests or provides certificate of compliance with group B requirements.

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in the [Qualified Products List](#) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Supply Center, Columbus, ATTN: DSCC-VQP, P.O. Box 3990, Columbus, Ohio 43218-3990

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6.4 Tin whisker growth. The use of alloys with tin content greater than 97 percent, by mass, may exhibit tin whisker growth problems after manufacture. Tin whiskers may occur anytime from a day to years after manufacture and can develop under typical operating conditions, on products that use such materials. Conformal coatings applied over top of a whisker-prone surface will not prevent the formation of tin whiskers. Alloys of 3 percent lead, by mass, have shown to inhibit the growth of tin whiskers. For additional information on this matter, refer to [ASTM-B545](#) (Standard Specification for Electrodeposited Coatings of Tin).

6.5 Subject term (key word) listing.

Terminal Post
Knob
Non turn device

6.6 PIN. This specification requires a PIN that describes technology and appropriate references to associated documents ([see 1.2.1](#)).

6.7 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmentally Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals is available on their website at <http://www.epa.gov/epaoswer/hazwaste/minimize/chemlist.htm>. Further information is available at the following EPA site: <http://www.epa.gov/epaoswer/hazwaste/minimize/>. Included in the EPA list of 31 priority chemicals are cadmium, lead, and mercury. Use of the materials on the list should be minimized or eliminated unless needed to meet the requirements specified herein ([see Section 3](#)).

6.8 Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes 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 last previous issue.

Custodians:
Army - CR
Navy - AS
Air Force - 11
DLA - CC

Preparing activity:
DLA - CC

(Project 5905-2008-030)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://assist.daps.dla.mil>.