

MIL-K-25049C
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~~SUPERSEDING~~
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MILITARY SPECIFICATION

KNOBS, CONTROL, ELECTRONIC EQUIPMENT, GENERAL SPECIFICATION FOR

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

1. SCOPE

1.1 Scope. This specification covers aircraft control knobs, with and without skirts used with electric, communications and allied equipment (see 6.1).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks 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

FEDERAL

P-C-444	- Cleaning Compound, Solvent Soluble, Grease Emulsifying
C-F-206	- Felt Sheet: Cloth, Felt, Wool, Pressed
"T-T-266	- Thinner, Dope and Lacquer (Cellulose-Nitrate)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Engineering Specifications and Standards Department (Code 93), Naval Air Engineering Center, Lakehurst, NJ 08733, 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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- MIL-L-6081 - Lubricating Oil, Jet Engine
- MIL-P-7788 - Panels, Information, Integrally Illuminated
- MIL-E-17555 - Electronic and Electrical Equipment, Accessories, and Repair Parts: Packaging and Packing of
- MIL-M-18012 - Markings for Aircrew Station Displays, Design and Configuration of
- MIL-F-18240 - Fastener, Externally Threaded, 250°F, Self-locking, Element for
- MIL-H-83282 - Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Aircraft, NATO Code Number H-537

(See supplement 1 for list of associated specification sheets and MS standards.)

STANDARDS

FEDERAL

- FED-STD-595 - Colors
- FED-STD-H28/2 - Screw-Thread Standards for Federal Services, Section 2, Unified Threaded Form and Thread Series for Bolts, Screws, Nuts, Tapped Holes and General Applications
- FED-STD-H28/20 - Screw-Thread Standards for Federal Services, Section 20, Inspection Methods for Acceptability of UN, UNR, UNJ, M and MJ Threads

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- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
- MIL-STD-130 - Identification Marking of U.S. Military Property
- MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts
- MIL-STD-810 - Environmental Test Methods
- MS33742 - Shafts, Control Knob
- MS33743 - Holes, Control Knob Shaft
- MS51021 - Setscrew-Hexagon Socket, Cup Point, Corrosion-Resisting Steel, Passivated, UNC-3A, Plain and Self-locking
- MS51963 - Setscrew - Hexagon Socket, Cup Point, Alloy Steel, Cadmium Plated, UNC-3A, Plain and Self-locking

(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.)

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2.2 Other publications. The following documents form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DODISS and the supplement thereto, if applicable.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM G23 - Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials

ASTM D822 Operating Light and Water Exposure Apparatus (Carbon-Arc Type) For Testing Paint, Varnish, Lacquer and Related Products, Practice For

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

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references other than specification sheets cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Specification sheets and military standards. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet or MS sheet. In the event of any conflict between requirements of this specification and the specification sheet or MS sheet, the latter shall govern. If specific requirements specified herein are not required for any knob, it shall be so indicated on the specification sheet or MS sheet.

3.2 Qualification. Knobs furnished under this specification shall be products which are qualified for listing on the applicable qualified products list at the time set for opening of bids (see 4.5 and 6.3).

3.3 Material. The material for each part of the knobs shall be as specified (see 3.1). However, when a definite material is not specified, a material shall be used which will enable the knobs to meet the requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guarantee of the acceptance of the finished product.

3.4 Design and construction. The control knobs shall be of the design, construction and physical dimensions specified (see 3.1).

3.4.1 Weight. When specified (see 3.1), knobs shall meet weight requirements.

3.4.2 Concentricity and perpendicularity. The periphery of the knob shall be concentric to the rotation axis within 0.025 inch full indicator movement (FIM). The back plane of the knob shall be perpendicular to the rotational axis of the knob within 1/2 degree.

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3.4.3 Threads. All threads shall be right hand and in accordance with FED-STD-H28/2. Acceptability of screw threads shall be in accordance with FED-STD-H28/20, system (22).

3.4.4 Insert. A metallic cylindrical insert shall form the shaft hole of plastic knobs. The insert shall be molded into the knob body and shall be provided with thread holes for setscrews as specified (see 3.1). A minimum of three threads shall be provided for setscrew engagement. The shaft hole shall be in accordance with MS33743. The screw holes within the plastic knob body shall be counterbored to the major diameter of the thread. Knobs with round shaft holes are not permitted for aircraft applications.

3.4.5 Setscrew. Unless otherwise specified (see 3.1), locking type, cup point setscrews shall be provided within all knobs. The setscrews shall conform to MS51021 for corrosion-resisting steel (CRES), and MS51963 for alloy steel. Self-locking insert shall be in accordance with MIL-F-18240.

3.4.5.1 Screw length. The length of the screws shall be such that when tightened firmly against the shaft, it shall provide a minimum of three thread engagement and its head shall be a minimum of .015 of an inch below the surface of the knob.

3.4.6 Indicia. (See 6.4.4) Unless otherwise specified (see 3.1), letters, numbers and reference markings on control knobs shall be in accordance with MIL-H-18012.

3.4.7 Color. The colors of the knobs shall be as specified (see 3.1) and shall match the applicable color chip of FED-STD-595 when tested in accordance with 4.7.2.

3.5 Performance.

3.5.1 Light transmission. (See 6.4.3) Illuminated knobs shall be tested in accordance with 4.7.3. Brightness ratio of reference markings on the knob shall be as specified (see 3.1). There shall be no light leakage around the setscrews.

3.5.2 Daylight contrast. Daylight contrast of knob indicia marking to the adjacent background shall be as specified (see 3.1) when tested in accordance with 4.7.4.

3.5.3 Coating adhesion. Coated knobs, when tested (see 4.7.5) shall show no more than 25 percent loss of coating on each square.

3.5.4 Structural integrity.

3.5.4.1 Self-locking screws. Self-locking screws shall conform to MIL-F-18240 when tested in accordance with 4.7.6.1.

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3.5.4.2 Screw threads. Setscrew and insert threads shall not strip and the hexagon recess in the screw shall not deform when tested in accordance with 4.7.6.2.

3.5.4.3 Component parts. The insert in the plastic knob shall not move and the knob shall not crack or loosen on the shaft. Component dial, plate, pointer, cap, etc. (see 3.1) shall show no evidence of separation, cracking or movement when knobs are tested in accordance with 4.7.6.3.

3.5.4.4 Temperature shock. Plastic knobs with inserts shall be temperature conditioned without failures (see 3.5.4.3 and 4.7.6.3.1).

3.5.4.5 Pull. Knobs with component parts shall be subjected to pull test without failures (see 3.5.4.3 and 4.7.6.3.2).

3.5.4.6 Shock. All knobs shall withstand 15g's shock test (see 3.5.4.3 and 4.7.6.3.3).

3.5.4.7 Vibration. All knobs shall withstand 5 to 500 cycles per second vibration (see 3.5.4.3 and 4.7.6.3.4).

3.5.5 Environmental resistance. (See 6.4) All knobs shall withstand environmental tests specified in 4.7.6.4 without failures. There shall be no corrosion, cracking, crazing, spalling, chipping, softening, blistering, and peeling; no transfer of pigment from adjacent details.

3.5.5.1 Humidity. All knobs shall be subjected to relative humidity up to 100 percent without failures (see 3.5.5 and 4.7.6.4.1).

3.5.5.2 Salt fog. All knobs shall be tested for salty atmosphere exposure without failures (see 3.5.5 and 4.7.6.4.2).

3.5.5.3 Accelerated weathering. When knobs are tested as specified in 4.7.6.4.3 the color and their luster shall be within the limits specified in MIL-STD-595.

3.5.5.4 Fungus. All knobs shall be exposed to tropical conditions without failures (see 3.5.5 and 4.7.6.4.4).

3.5.5.5 Solvent. All knobs shall withstand chemical solvent test without failures (see 3.5.5 and 4.7.6.4.5).

3.6 Flammability. When knobs are tested as specified in 4.7.7 they shall not support visible flame or combustion for more than 30 seconds after removal of the flame.

3.7 Marking. (See 6.4) Unless otherwise specified, the knobs shall be marked for identification in accordance with MIL-STD-130 on knob surfaces not visible under normal operating conditions. When the space on the knob or light transmission does not permit for complete marking, the manufacturer's symbol or trademark shall be on the knob insert or the bottom of shaft hole and other information on the unit package.

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3.8 Workmanship. Workmanship shall be uniform in quality. Knob surfaces shall not contain any foreign matter, corrosion, scale, seams, cracks, sharp edges or corners, scratches or any other defects which may affect serviceability.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, 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 assure supplies and services conform to prescribed requirements.

4.1.1 Test equipment and inspection facilities. The manufacturer shall insure that test and inspection facilities of sufficient accuracy, quality and quantity are established and maintained to permit performance of required inspections.

4.2 Classification of inspections. The inspections specified herein are classified as follows:

- a. Qualification inspection (see 4.5).
- b. Quality conformance inspection (see 4.6).

4.3 Materials certification. Materials certification shall consist of verifying data that materials and processes in fabrication of knobs, furnished by qualified manufacturers are the same as materials and processes in previously qualified knobs.

4.4 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMENTS" of MIL-STD-810.

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

4.5.1 Sample. The test sample shall consist of 21 knobs of the same design. The sample units shall be taken at random from a lot manufactured with equipment and procedures normally used in production. The sample units shall be subjected to and pass the requirements of group A inspection (see 4.6.1.2). Qualification shall not be granted if group A inspection requirements are not met.

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4.5.1.1 Extent of qualification. Unless otherwise specified in paragraph 3.1, qualification shall be restricted to the part number submitted. In the event of multiple designs (see 3.1) representative part numbers specified (see 3.1) shall be submitted for qualification inspection. All sizes, colors, shapes and brightness ratio values shall be represented in the sample submitted.

4.5.2 Inspection routine. Sample units shall be subjected to the qualification inspection specified in table I in the order shown.

4.5.3 Failures. Failures in excess of those allowed in table I shall be cause for refusal to grant qualification. A failure is any non-conformance of a characteristic to specified requirements.

TABLE I. Qualification inspection.

Examination or test	Requirement paragraph	Test method paragraph	No. of units	Failures allowed
Group A inspection	3.4, 3.7, 3.8	4.7.1	21	-
Color	3.4.7	4.7.2	3	0
Light transmission	3.5.1	4.7.3		
Daylight contrast	3.5.2	4.7.4		
Coating adhesion	3.5.3	4.7.5		
Self-locking screw	3.5.4.1	4.7.6.1		
Setscrew-insert	3.5.4.2	4.7.6.2		
Component parts	3.5.4.3	4.7.6.3		
Flammability	3.6	4.7.7		
Temperature shock	3.5.4.4	4.7.6.3.1	3	0
Pull	3.5.4.5	4.7.6.3.2		
Humidity	3.5.5.1	4.7.6.4.1	3	0
Salt-fog	3.5.5.2	4.7.6.4.2	3	0
Accelerated weathering	3.5.5.3	4.7.6.4.3	3	0
Vibration	3.5.4.7	4.7.6.3.4	3	0
Solvent	3.5.5.5	4.7.6.4.5		
Shock	3.5.4.6	4.7.6.3.3	3	0
Fungus	3.5.5.4	4.7.6.4.4		

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4.5.4 Retention of qualification. To retain qualification, the contractor shall forward a report at 36-month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. The report shall consist of:

- a. A summary of the results of the tests performed for inspection of product for delivery (groups A and B), indicating as a minimum the number of lots that have passed, the number that have failed, and the group which they failed. The results of tests of all re-worked lots shall be identified and accounted for.
- b. A summary of the results of tests performed for periodic inspection (group C), including the number and mode of failures. The summary shall include results of all periodic inspection tests performed and completed during the 36-month period. If the summary of the test results indicates nonconformance to specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list.

Failure to submit the report within 30 days after the end of each 36-month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the contractor shall immediately notify the qualifying activity at any time during the 36-month period that the inspection data indicates failure of the qualified product to meet the requirements of this specification.

In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during two consecutive reporting periods there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit his qualified products to testing in accordance with the qualification inspection requirements and to state the reason for no production.

4.6 Quality conformance inspection.

4.6.1 Inspection of product for delivery. Unless otherwise specified (see 3.1), inspection of knobs for delivery shall consist of groups A, B and C inspections.

4.6.1.1 Inspection lot. An inspection lot shall be as defined in MIL-STD-105 and shall consist of knobs of the same part number produced under essentially the same conditions and offered for inspection during a period of 1 month.

4.6.1.2 Group A inspection. Group A inspections shall be performed on all knobs of the sample set in the order shown in table II.

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4.6.1.3 Sampling plan. The sample units selected must be the same part numbers as those selected for qualification inspection as listed on the military standard sheet. Statistical sampling and inspection shall be in accordance with MIL-STD-105 for normal inspection. The acceptable quality levels (AQL) shall be 1.0 and 4.0 percent defective for major and minor defects, respectively.

4.6.1.4 Classification of defects. Defects for group A inspection shall be classified as specified in table II.

TABLE II. Classification of defects.

Category	Defect	Inspection method
Major		
101	Material failing to meet specified requirement (see 3.3)	Visual
102	Color failing to meet specified requirement (see 3.4.7)	Visual
103	Shaft hole not within specified dimensions (see 3.1)	SIE ^{1/}
104	Indicia not as specified (see 3.4.6)	Visual
Minor		
201	Envelope dimensions not as specified (see 3.1)	SIE ^{1/}
202	Marking missing, illegible or not permanent (see 3.7)	Visual
203	Workmanship not as specified (see 3.8)	Visual
204	Packaging failing to meet specified requirement (see 5.1)	Visual

^{1/} Standard inspection equipment.

4.6.1.5 Rejected lots. If an inspection lot is rejected, the supplier may withdraw the lot, rework it to correct the defects, or screen out the defective units, as applicable and reinspect. Such lots shall be separate from new lots and shall be clearly identified as reinspected lots. Rejected lots shall be inspected, using tightened inspection.

4.6.1.6 Group B inspection. Group B inspection shall consist of the tests specified in table III, in the order shown. Sample knobs which have passed group A inspection shall be subjected to group B inspection.

4.6.1.7 Sampling. Sampling shall be in accordance with MIL-STD-105. The AQL shall be 6.5 percent defective, and the inspection level shall be S-4.

4.6.1.8 Disposition of sample units. Sample knobs which have been subjected to the group B inspection may be delivered on the contract or order provided that the inspection lot is accepted and that the knob has not been damaged as a result of conducting the test (must meet 4.6.1.2 Group A inspection).

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TABLE III. Group B inspection.

Examination or test	Requirement paragraph	Test method paragraph
Light transmission	3.5.1	4.7.3
Daylight contrast	3.5.2	4.7.4
Weight	3.4.1	4.6.1
Pull	3.5.4.5	4.7.6.3.2

4.6.2 Periodic inspection.

4.6.2.1 Group C inspection. Group C inspection shall consist of the tests specified in table IV in the order shown. Group C inspection shall be made on knobs selected from lots which have passed group A inspection.

4.6.2.2 Sampling. Knobs shall be selected from the first production lot or from current production at least once per year. The specified number of knobs (see 3.1 and 4.5.1) for each test shall be submitted for group C inspection as specified in table IV.

4.6.2.3 Failures. If one or more knobs fail to pass group C inspection, the entire sample shall be considered to have failed.

4.6.2.4 Noncompliance. If a sample fails to pass group C inspection, the manufacturer shall notify the qualifying activity and the cognizant inspection activity of such failure and take corrective action on the materials or processes, or both, as warranted, and on all units of product which can be corrected and which are manufactured using essentially the same materials and processes, and which are considered subject to the same failure. Acceptance and shipment of the product shall be discontinued until corrective action acceptable to the qualifying activity has been taken. After the corrective action has been taken, group C inspection shall be repeated on additional sample units (all tests and examinations, or the test which the original sample failed, at the option of the qualifying activity). Groups A and B inspections may be reinstated; however, final acceptance and shipment shall be withheld until the group C inspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure shall be furnished to the cognizant inspection activity and the qualifying activity.

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TABLE IV. Group C inspection.

Examination or test	Requirement paragraph	Test method paragraph	No. of units
Structural integrity	3.5.4	4.7.6	3
Self-locking screw	3.5.4.1	4.7.6.1	
Screw thread	3.5.4.2	4.7.6.2	
Component parts	3.5.4.3	4.7.6.3	
Shock	3.5.4.6	4.7.6.3.3	
Coating adhesion	3.5.3	4.7.5	
Vibration	3.5.4.7	4.7.6.3.4	3
Solvent	3.5.5.5	4.7.6.4.5	

4.6.2.5 Disposition of sample units. Knobs which have been subjected to group C inspection shall not be delivered on the contract or order.

4.6.3 Inspection of packaging. The sampling and inspection of the preservation, packing, and container marking shall be in accordance with the requirements of MIL-F-17555.

4.7 Methods of inspection.

4.7.1 Visual and dimensional examination. The knob shall be carefully examined to determine conformance to the requirements of this specification and applicable Military Standards, that are not covered by tests, such as material, weight, detailed dimensions, workmanship, and markings.

4.7.2 Color. The color of the knob shall conform in cool fluorescent light to the color chip specified in FFD-STD-505.

4.7.3 Light transmission. When specified (see 3.1), light transmission shall be tested as specified below.

4.7.3.1 Apparatus. The apparatus shall consist of a brightness meter capable of focusing upon a point of illuminated indicia of the knob which is to be measured. The knob shall be mounted in contact with a light source which presents an evenly diffused circular light area of known brightness. The shaft hole of the knob under test shall be plugged with an opaque material and the knob shall be placed concentrically over the circle of light so as to overlap it by 0.06 inch on all sides.

4.7.3.2 Procedure. Brightness measurements shall be taken at five uniformly spaced points along the entire length of the index line except the portion over the metallic insert and the shaft diameter. The measurements shall be within 1:3 ratio. An average of all measurements shall fall within the brightness ratio specified (see 3.1).

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4.7.4 Daylight contrast. When specified (see 3.1), daylight contrast shall be measured in accordance with MIL-P-7783, except "PANEL UNDER TEST" in figure 3 shall be replaced by "KNOB UNDER TEST". The marking on the knob shall be perpendicular to the line of sight of the photometer.

$$\text{Contrast } C = (B_2 - B_1)/B_1$$

where B_1 is the average brightness of the background immediately surrounding the marking and B_2 is the average brightness of the marking. Brightness measurements shall be taken at five uniformly spaced points of observation along entire indicia, and sufficient observations employed to obtain a valid record. White markings on illuminated knobs may be reduced to 50 percent minimum reflectance.

4.7.5 Coating adhesion. The knob shall be immersed in distilled water for a period of 16 hours and wiped dry. On suitable areas of knob, within a minute after immersion, scribe (to the base material) three (3) parallel lines and three perpendicular lines forming a grid of four (4) .10 inch squares. A 1/2-inch strip of masking tape, taken from a fresh sample of Minnesota Mining and Manufacturing Company, Code No. 250 masking tape, or equal, shall be applied across the grid, adhesive side down. The tape shall be firmly pressed down with the thumb. The tape shall be removed in one abrupt motion immediately after application.

4.7.6 Structural integrity.

4.7.6.1 Self-locking setscrews. Self-locking setscrews shall be tested in accordance with MIL-P-18240 except the screws shall be tested in the screw hole of the knob, with screw point being flush with inner surface of shaft hole.

4.7.6.2 Screw-threads. A suitable CRFS shaft conforming to MS33742 shall be mounted into the applicable knob by tightening screws as follows: CRFS screws to a torque of 4 inch-pounds for size .112-40 and 16 inch-pounds for .164-32 screws; alloy steel screws to 5 and 20 inch-pounds for the respective sizes.

4.7.6.3 Insert. With the knob-shaft assembly (see 4.7.6.2) held firmly in a suitable jig, apply clockwise torsional load of 15 or 30 inch-pounds about .125 inch or .250 inch shaft axis, respectively, for a duration of one minute. Repeat the test in the counterclockwise direction for one minute.

4.7.6.3.1 Temperature shock. The knob shaft assembly (see 4.7.6.2) shall be subjected to the temperature shock tests, Method 503.1, Procedure I, of MIL-STD-810, except that the low temperature shall be -65°C (-85°F) and the high temperature shall be 85°C (185°F). The insert test listed above in 4.7.6.3 shall be performed at both high and low temperatures during the test and at room temperature after the test.

4.7.6.3.2 Pull. Component parts of knobs (see 3.5.4.3) shall be subjected to a pull of 20 pounds for knob overall diameters up to .75 inch; 30 pounds for diameters .75 to 1.5 inch and 50 pounds above 1.5 inch diameter in direction parallel to the shaft hole and supported uniformly.

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4.7.6.3.3 Shock. The knob mounted on a shaft conforming to MS33742 shall be subjected to the shock test, Method 516.2, Procedure I of MIL-STD-810, except 15G acceleration shall be applied parallel to the knob shaft axis directed toward the top and toward the bottom of the knob (total 6 shocks).

4.7.6.3.4 Vibration. The knob shall be mounted on a shaft conforming to MS33742 and subjected to the vibration tests, Method 514.2, Procedure I, Part 2 Curve B and AR of MIL-STD-810.

4.7.6.4 Environmental resistance. The knob-shaft assemblies (see 4.7.6.2) shall be subjected to environmental resistance tests.

4.7.6.4.1 Humidity. Humidity test shall be in accordance with Method 507.1, Procedure I of MIL-STD-810 (10 cycles).

4.7.6.4.2 Salt-fog. Salt-fog test shall be in accordance with Method 509.1, Procedure I of MIL-STD-810.

4.7.6.4.3 Accelerated weathering. The apparatus shall consist of an accelerated weathering chamber as described in ASTM G23 Method 1, Type A.

4.7.6.4.3.1 Procedure. The knob shall be exposed to the radiation from the carbon-arc for a period of 150 hours in accordance with ASTM D822. After exposure, the knob shall be visually compared to a similar unexposed knob. If discoloration of the indicia has occurred, contrast measurements shall be made to determine that the knob meets the specified contrast requirements. Failure to meet minimum contrast requirements shall be cause for rejection.

4.7.6.4.4 Fungus. Fungus resistance tests shall be in accordance with Method 508.1, Procedure I of MIL-STD-810.

4.7.6.4.5 Solvents and fluids. The following materials shall be used:

- (a) Lacquer Thinner, TT-T-266.
- (b) Engine Oil (Grade 1010), MIL-L-6081.
- (c) Grease Cleaning Compound, P-C-444.
- (d) Hydraulic Fluid, MIL-H-83282.
- (e) Felt Pad, C-F-206, Classification 12R1 or 12R2.

4.7.6.4.5.1 Procedure. A felt pad 1/4 inch thick shall be saturated with the fluid. The felt pad shall then be placed on the face of the knob and held down by a uniformly distributed force of 1.5 pounds for one minute. At the termination of this time, the felt pad shall be removed and a clean, lint free, dry cloth shall be used to wipe the face of the knob and examined (see 3.5.5.5).

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4.7.7 Flammability. This test shall be performed on one knob of each form and color. The knob shall be tested as specified in Method 111 of MIL-STD-202. The knob shall be mounted on a horizontal shaft located on the center of a 1 foot square, vertically mounted panel, with the back surface of the knob not less than 1/8 inch nor more than 1/4 inch from the surface of the panel. The axis of the flame shall be in the plane of the axis of the shaft and at an angle of 45 degrees below the axis of the shaft. The flame shall be applied to the lowest portion of the knob at the junction of the knob body with the cap or top surface of the knob. Pointer and bar knobs shall be positioned with the pointer pointing upward (see 3.6).

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-F-17555 (see 3.7 and 6.2).

6. NOTES

6.1 Intended use. The knobs covered by this specification are intended for manual operation of controls on military electronic communications and allied equipment.

6.2 Ordering data. (see 6.3.1) Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Title, number, and date of the applicable specification sheet or MS sheet and the part number (see 3.1)
- c. Special testing if required.
- d. Level (degree) of protection in accordance with MIL-E-17555 (see 5.1)

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids, qualified for inclusion in the applicable Qualified Products List (QPL 25049) 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 purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Air Systems Command (AIR 5112); Washington, D.C. 20361, and information pertaining to qualification of products may be obtained from that activity.

6.3.1 If no qualified source exists, for a specific knob, first article testing is normally conducted. First article testing consists of all provisions specified for qualification inspection (see 4.5).

6.4 Definitions. The following definitions are applicable to this specification:

6.4.1 Crazing. Minute cracks on the surface of the knob.

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6.4.2 Dial plate or skirt. Flat dial, round or configured as an indicator attached to the bottom of knob body, containing calibration mark or numbers and also used to conceal the panel locking-nut.

6.4.3 Brightness ratio (illumination ratio). Ratio of light transmitted from a test knob (output) to the amount of light entering that knob (input).

6.4.4 Indicia. Any calibration or control references on the body of the knob; includes arrows, lines, dots, numbers and letters.

6.4.5 Marking. Identification marking for manufacturer's name or code letter and military standard part number.

6.4.6 Photometer. In this specification, an instrument for measuring luminance or brightness which are used synonymously.

6.4.7 Spalling. Splits or splinters on the plastic surface of the knob.

6.5 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Custodians:

Army - ER
Navy - AS
Air Force - 11

Preparing activity:
Navy - AS

Review activities:

Army - AR, AV, MI
Navy - AS, OS, SH
Air Force - 82, 99
DLA - IS

(Project 5355-0173)

Agent:

DLA - IS

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL*(See Instructions - Reverse Side)*1 DOCUMENT NUMBER
MIL-K-25049C2 DOCUMENT TITLE KNOBS, CONTROL, ELECTRONIC EQUIPMENT,
GENERAL SPECIFICATION FOR

3a. NAME OF SUBMITTING ORGANIZATION

4 TYPE OF ORGANIZATION (Mark one)

 VENDOR USER MANUFACTURER OTHER (Specify) _____

b ADDRESS (Street, City, State, ZIP Code)

5 PROBLEM AREAS

a. Paragraph Number and Wording

b. Recommended Wording

c. Reason/Rationale for Recommendation

6 REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) - Optional

b. WORK TELEPHONE NUMBER (Include Area Code) - Optional

c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional

8. DATE OF SUBMISSION (YYMMDD)