

MIL-I-20037B  
 1 June 1984  
 SUPERSEDING  
 MIL-I-20037A  
 17 April 1956  
 (See 6:6)

## MILITARY SPECIFICATION

### INDICATORS, SIGHT, LIQUID LEVEL, DIRECT/INDIRECT READING, TUBULAR GLASS/PLASTIC

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

#### 1. SCOPE

1.1 Scope. This specification covers sight liquid level indicators of the direct and indirect reading type having tubular glass, clear polycarbonate or rigid polyvinyl chloride (PVC).

1.2 Classification. Sight glass indicators covered by this specification shall be designated in the following form (see 6.2.1):

<u>SGI</u>	<u>DIR</u>	<u>A</u>	<u>POLY</u>	<u>PA</u>
Equipment designator (see 1.2.1)	Indication (see 1.2.2)	Shut-off valve (see 1.2.3)	Sight glass material (see 1.2.4)	Application (see 1.2.5)

1.2.1 Equipment designator. The level indicator shall be designated as SGI - sight glass indicator.

1.2.2 Indication. The type of indication desired shall be specified as follows:

DIR - Direct indication, the tank fluid level shall be visible in the glass or tube.

IND - Indirect indication, the tank fluid level shall be contained in a sealed chamber and indicated by some other means such as a float or flag actuated by a magnet contained in a float in the fluid chamber.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362 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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1.2.3 Shut-off valves. The sight glass indicators shall be equipped with a manual or automatic shut-off valve of the ball-check type depending on the type of indication specified. Valve type shall be designated as:

- A - Automatic for direct indication.
- M - Manual for indirect indication.

1.2.4 Sight glass material. The tube material of direct reading sight glass indicators shall be designated as follows:

- G/T - Glass with teflon heat shrink tube
- POLY - Polycarbonate
- PVC - Rigid polyvinyl chloride

1.2.5 Application. The sight glass indicators may be used, but are not limited to, the following applications:

- LA - Lubricating oil and air interface
- PA - Potable water and air interface
- DA - Diesel oil and air interface
- JA - JP fuel and air interface
- DFT - Deaerating feed tanks
- FA - Feedwater and air interface
- AG - Aviation gasoline
- AFFF - Aqueous film forming fluid

## 2. APPLICABLE DOCUMENTS

### 2.1 Government documents.

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

### SPECIFICATIONS

#### FEDERAL

- |           |                                                                                                                                                                                            |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| L-P-393   | - Plastic Molding Material, Polycarbonate, Injection and Extrusion.                                                                                                                        |
| DD-G-511  | - Glass Tubing, Round (Gage Boiler).                                                                                                                                                       |
| QQ-C-465  | - Copper Aluminum Alloys (Aluminum Bronze) (Copper Alloy Numbers 606, 614, 630, 632M, and 642), Rod, Flat Products With Finished Edges (Flat Wire, Strip, and Bar), Shapes, and Forgings). |
| PPP-B-591 | - Boxes, Shipping Fiberboard, Wood-Cleated.                                                                                                                                                |
| PPP-B-601 | - Boxes, Wood, Cleated-Plywood.                                                                                                                                                            |
| PPP-B-621 | - Boxes, Wood, Nailed and Lock-Corner.                                                                                                                                                     |
| PPP-B-636 | - Boxes, Shipping, Fiberboard.                                                                                                                                                             |

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- MIL-P-116 - Preservation, Methods of.
- MIL-S-901 - Shock Tests, H.I. (High Impact); Shipboard Machinery, Equipment and Systems, Requirements for.
- MIL-L-10547 - Liners, Case, and Sheet, Overwrap; Water-Vaporproof or Waterproof, Flexible.
- MIL-I-23053 - Insulation Sleeving, Electrical, Heat Shrinkable, General Specification for.
- MIL-I-23053/11 - Insulation Sleeving, Electrical, Heat Shrinkable, Fluorinated Ethylene Propylene, Non-crosslinked.

## STANDARDS

## MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-167-1 - Mechanical Vibrations of Shipboard Equipment (Type I - Environmental and Type II - Internally Excited).
- MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts.
- MIL-STD-278 - Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping and Pressure Vessels in Ships of the United States Navy.
- MIL-STD-438 - Schedule of Piping, Valves, Fittings and Associated Piping Components for Submarine Service.
- MIL-STD-777 - Schedule of Piping, Valves, Fittings and Associated Piping Components for Naval Surface Ships.

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

## DRAWINGS

## NAVAL SEA SYSTEMS COMMAND (NAVSEA)

- NAVSEA 803-5184222 - Gage Glass Ball Valve.
- NAVSHIP S8700-1385802 - Level Indicator Shield.
- NAVSEA 803-5001003 - 1/4 thru 2-1/2 Ball Valve Straight and Threeway Line 700 psi.

(Copies of specifications, standards and drawings required by contractors 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 NATIONAL STANDARDS INSTITUTE, INC. (ANSI)  
B16.5 - Pipe Flanges and Flanged Fittings. (DoD adopted)

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

ASTM

- A 312 - Seamless and Welded Austenitic Stainless Steel Pipe.  
(DoD adopted)
- B 61 - Steam or Valve Bronze Castings. (DoD adopted)
- B 62 - Composition Bronze or Ounce Metal Castings.  
(DoD adopted)
- D 1784 - Rigid Poly (Vinyl Chloride) (PVC) Compounds and  
Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.  
(DoD adopted)
- D 3951 - Commercial Packaging, Practice for. (DoD adopted)

(Application for copies should be addressed to ASTM, 1916 Race Street, Philadelphia, PA 19103.)

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT  
National Motor Freight Classification

(Application for copies should be addressed to the National Motor Freight Traffic Association, Inc., ATA TRAFFIC Dept., 1616 "P" Street, NW, Washington, DC 20036.)

UNIFORM CLASSIFICATION COMMITTEE AGENT  
Uniform Freight Classification Ratings, Rules and Regulations

(Application for copies should be addressed to the Uniform Classification Committee Agent, Tariff Publication Officer, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

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

3. REQUIREMENTS

3.1 First article. When specified, a sample shall be subjected to first article inspection (see 4.3 and 6.3).

3.2 Performance.

3.2.1 Direct indicator accuracy. Accuracy of direct indicator shall be within plus or minus 1/2 inch.

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3.2.2 Indirect indicator accuracy. Accuracy of the indirect indicator (flags and so forth) shall be within plus or minus 1 inch. In addition, when indirect indicators are capable of providing a remote indication, the remote indication shall be accurate to within plus or minus 3 percent of full scale.

3.3 Materials. Piping material used in the construction of sight glass indicators shall be in accordance with MIL-STD-777 or MIL-STD-438 (submarines) for the intended service of the indicator. Material for indirect indicators using a magnetic operating principle shall be corrosion resistant steel in accordance with type 304 of ASTM A 312.

3.3.1 Castings. The composition of castings shall be in accordance with ASTM B 61 or B 62.

3.3.2 Forgings. The composition of forgings shall be in accordance with alloy 632M of QQ-C-465.

3.3.3 Welding. Welding and nondestructive testing shall be in accordance with MIL-STD-278. In no case shall such processes as peening or plugging be used on castings or forgings for reclaiming any parts.

3.3.4 Glass. The glass used shall be 5/8-inch outside diameter (o.d.) in accordance with DD-G-511 with the exception that the tube shall have a minimum wall thickness of 3/32 inch with a transparent fluorinated ethylene propylene plastic tube in accordance with MIL-I-23053 and MIL-I-23053/11 heat shrunk over the glass tube. Glass tubes shall be used for temperatures above 150 degrees Fahrenheit (°F) but not to exceed 270°F or where the fluid is not compatible with polycarbonate or rigid PVC.

3.3.4.1 Length. Maximum length of glass tubes shall be as specified in Drawing 803-5184222.

3.3.5 Plastics. Plastics used in the sight glass indicator shall be polycarbonate in accordance with L-P-393 or rigid PVC in accordance with ASTM D 1784.

3.3.5.1 Temperature. Direct reading indicators using plastic tubes shall not be used in applications above 150°F. Glass tubes shall be used for temperatures above 150°F but not to exceed 270°F. Indirect reading indicators using plastic flags in the indicator may be used up to 300 and 450°F when aluminum flags are used.

3.3.6 Working pressure.

3.3.6.1 Direct indicators. Maximum working pressure for direct indicators shall be as specified on Drawing 803-5184222.

3.3.6.2 Indirect indicators. Maximum working pressure for indirect indicators shall be 300 pounds per square inch (lb/in<sup>2</sup>) at 300°F.

3.3.7 Recovered materials. Unless otherwise specified herein, all equipment, material and articles incorporated in the products covered by this specification shall be new and shall be fabricated using materials produced from recovered materials to the maximum extent practicable without jeopardizing the

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intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specifically specified.

3.4 Construction. The indicators shall be constructed so as to allow replacement of the glass tube or indicating element, and also allow cleaning from either end without loosening any packing or sealing material while the pressure vessel is under pressure.

3.4.1 Sizes. Unless otherwise specified (see 6.2.1), the connections of direct indicators shall be of the size specified for the diameter of the tube in accordance with table I.

TABLE I. Connection sizes.

Tube diameter	Connection size (flanged)
5/8-inch o.d.	3/4 inch
3/4-inch o.d.	3/4 inch

3.4.2 Valves. Direct indicators shall be supplied with automatic ball-check shut-off valves as an integral part of the indicator.

3.4.2.1 Nonautomatic shutoff. The nonautomatic shut-off valve shall be in accordance with Drawing 803-5001003.

3.4.2.2 Automatic shutoff. Direct indicators shall have an automatic shutoff valve of the solid ball-check type in accordance with Drawing 803-5184222. The check valve shall be constructed so as to allow leakage of 5-25 cubic centimeters (cm<sup>3</sup>) per minute at 50 lb/in<sup>2</sup> when the check valve is in the closed position.

3.4.2.3 Handwheel. When required for remote operation, the shutoff valves shall be furnished with a handwheel having an o.d. not less than 3-1/2 inches and with holes drilled in the rim located for adapting to chain operation. When specified (see 6.2.1), chain shall be provided.

3.4.2.4 Glands. Glands for direct reading gage glasses shall receive grommets 5/16-inch thick to minimize torsional stress on the glass when the gland is tightened.

### 3.5. Protection.

3.5.1 Class a. The glass tube of direct indicators shall be protected from damage by not less than four 1/4-inch solid brass rods of sufficient length to allow for a maximum 36 inch tube length. A shield shall be provided in accordance with Drawing S8700-1385802 for combustible fluids.

3.5.2 Class b. Where all plastic sight tubes are used protective rods or shields are not required. They shall not be required for indirect indicators.

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3.6 Connections. Sight glass indicators shall have flat-face flanged connections. Flanges shall be 3/4 inch in accordance with the dimensions of ANSI B16.5 classes. The flange rating shall be compatible with the maximum pressure and temperature conditions expected and shall be based upon the ratio of the allowable stress at temperature of the material used to that for the material specified in ANSI B16.5.

3.6.1 Drain valve connections. The indicators shall have a drain valve to which a drain line of at least 3/8 inch may be connected.

3.7 Reliability. The sight glass indicator shall operate reliably in a Naval shipboard environment for a service life of at least 40,000 hours. The sight glass indicator shall be mechanically reliable for operating at least 2000 hours mean-time-between-failures at a 90 percent confidence level. A failure is any malfunction that requires unscheduled corrective maintenance of more than 1 hour or which requires replacement of the equipment.

3.7.1 The sight glass indicator shall be tested as specified in 4.6.5.

3.8 Salt spray. This sight glass indicator shall be salt spray tested as specified in 4.6.4.

3.9 Inclination. The sight glass indicator shall be inclination tested as specified in 4.6.3.

3.10 Hydrostatic effects. Each indirect sight glass indicator shall be hydrostatically tested in accordance with 4.6.2.1. Each direct sight glass indicator shall be hydrostatically tested in accordance with 4.6.2.3.

3.11 Shock. The indicator shall withstand the grade A, class I shock test for indirect indicators and grade B for direct indicators in accordance with MIL-S-901 as specified in 4.6.6.

3.12 Vibration. The indicator shall withstand the type I vibration test in accordance with MIL-STD-167-1 as specified in 4.6.7. As a result of the test, there shall be no signs of visible damage or loose parts. The unit shall be tested for operation by varying the fluid level between 20-80 percent of indication range.

3.13 Interchangeability. Parts, components and attachments shall be interchangeable with parts and components of the same types and classes produced by the same contractor.

#### 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.

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4.1.1 Inspection system. The contractor shall provide and maintain an inspection system in accordance with the data ordering documents included in the contract or order (see 6.2.2).

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

- (a) First article inspection (see 4.3).
- (b) Quality conformance inspection (see 4.4).

4.3 First article inspection. First article inspection shall consist of two samples of each type indicator subjected to the examinations and tests in accordance with table II.

TABLE II. First article and quality conformance inspections.

Inspection	Requirement paragraph	First article examination or test paragraph	Quality conformance inspection
Visual and dimensional Accuracy	3.2, 3.3, 3.4, 3.5 3.2.1, 3.2.2	4.5 4.6.1	4.5 ----
Hydrostatic testing	3.10	4.6.2	4.6.2
Inclination	3.9	4.6.3	----
Salt spray	3.8	4.6.4	----
Reliability	3.7, 3.7.1	4.6.5	----
Shock	3.11	4.6.6	----
Vibration	3.12	4.6.7	----

4.4 Quality conformance inspection. Sight glass indicators which are produced on the same facilities, using identical materials, manufacturing and assembly procedures shall be subjected to the quality conformance tests specified in table II.

4.4.1 Inspection lot. Sight glass indicators of the same type, class and size offered for delivery at one time shall be considered a lot for purposes of inspections and tests.

4.4.2 Sampling for quality conformance inspection. A random sample of indicators shall be selected from each lot in accordance with MIL-STD-105, inspection level II, acceptable quality level (AQL) 1.5 percent defective, and subjected to the examination in accordance with 4.5 and tested in accordance with 4.6.2.

4.5 Visual and dimensional examination. Sight glass indicators shall be examined in accordance with the requirements of this specification with respect to material, finish, construction, assembly, dimensions and weight.

#### 4.6 Tests.

4.6.1 Accuracy. Indicator accuracy shall be determined by mounting the indicator assembly to a test tank with a capacity at least 10 percent greater than the total indication at the indicator. The tank shall be filled to the



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zero point of the indicator and in 10 percent increments until the maximum level of the indicator is reached. Measurements of the actual fluid level of the tank shall be compared to level shown on the indicator. Indicator accuracy shall be in accordance with 3.2.1 and 3.2.2.

4.6.2 Hydrostatic tests. Sight glass indicators shall be subjected to hydrostatic testing as specified in 4.6.2.1 through 4.6.2.4.

4.6.2.1 Indirect indicators. Indirect indicators shall be tested at ambient conditions as a complete assembly for strength and porosity. With the shutoff valves in the open position, a pressure of 450 lb/in<sup>2</sup> shall be applied for 20 minutes. Any weeping, porosity or deformation shall be cause for rejection. Upon completion of the test, the pressure shall be reduced to 300 lb/in<sup>2</sup> and the valve shall be checked for closing readily against the maximum working pressure of the indicator. The valve shall operate with a maximum force of 30 pounds.

4.6.2.2 Nonautomatic shutoff valve. After operating the valve for 10 cycles (open-close), hydrostatically test for seat tightness. With the valve in the closed position, apply 300 lb/in<sup>2</sup> to the inlet. Pressure shall be maintained for 15 minutes. No leakage shall be allowed.

4.6.2.3 Direct indicators. Direct indicators shall be tested at ambient conditions as a complete assembly for strength and porosity. With the shutoff valves in the open position, a pressure of 450 lb/in<sup>2</sup> shall be applied for 20 minutes. Any weeping or porosity shall be cause for rejection. Indicators having plastic sight tubes shall have no permanent deformation of the tube upon release of the test pressure. Upon completion of the test, the pressure shall be reduced to 300 lb/in<sup>2</sup> and the valve shall be checked for closing readily. The valve shall operate with a maximum force of 30 pounds.

4.6.2.4 Automatic shutoff valves. Direct reading sight glass indicator shutoff valves shall be tested in accordance with Drawing 803-5184222.

4.6.3 Inclination test. Indirect indicators shall be tested inclined at 45 degrees forward, backward, left and right. The fluid level shall be varied between 20 to 80 percent indication to verify satisfactory operation.

4.6.4 Salt spray. The complete indicator assembly and shutoff valves shall be subjected to a salt spray test in accordance with method 101 of MIL-STD-202 using a 5 percent solution. Duration of the test shall be 96 hours. No appreciable corrosion or other damage shall be evident after the salt spray test.

4.6.5 Reliability. Reliability of the assembled indicator shall be demonstrated by the following tests:

4.6.5.1 Cycling. The assembled indicator and shutoff valves shall be cycled a minimum of 25000 cycles at the rate of 3 to 6 cycles per minute. The fluid level shall be varied between 20 to 80 percent of the total indication level. Test temperature and pressure shall be in accordance with Drawing 803-5184222, notes 17B, C and D. During the cycling period, the following tests shall be conducted:

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- (a) After every 1000 cycles the indicator shall be blown-down by shutting the lower indicator shutoff valve and rapidly opening the indicator drain valve. Shut the drain valve and reopen the indicator lower shutoff valve.
- (b) Thermal shock. After every 3000 cycles the indicator shall be allowed to cool to ambient temperature ( $75 \pm 2^\circ\text{F}$ ) and drained. The indicator shall be rapidly filled with hot water (200 to  $212^\circ\text{F}$  for glass tubes,  $150^\circ\text{F}$  for rigid PVC tubes) to the maximum indication level. After 2 minutes the indicator shall be drained and rapidly refilled with cold water ( $50^\circ\text{F}$ ). Any evidence of spalling, cracking, breaking of the sight glass or any abnormal wear or material deformation (during or at the end of the tests) shall constitute a failure.

4.6.5.2 Hydrostatic. Upon completion of the 25,000 cycles the indicator and valves shall be subjected to the hydrostatic test as specified in 4.6.2 through 4.6.2.4.

4.6.6 Shock. Indicators shall be shock tested in accordance with MIL-S-901, class I, grade A for indirect indicators and grade B for direct indicators. The indicators shall be tested as a complete assembly mounted on a type 4-A mounting fixture. The shock test shall be performed in the following sequence:

- (a) Valves open, indicator at 50 percent fluid level and pressurized to normal working pressure. A total of nine blows shall be applied, three blows shall be applied parallel to each of the three principal axes.
- (b) Valves shut, normal working pressure applied to valve inlet. Indicator dry and drain plug removed. A total of nine blows shall be applied, three blows shall be applied parallel to each of the three principal axes. Upon completion of the shock tests, the indicator shall be refilled and the fluid level varied between 20-80 percent to ensure satisfactory operation. The shutoff valves shall be hydrostatically tested to  $450 \text{ lb/in}^2$  in the open position to check for body and valve stem leakage and the closed position to check for seat leakage. The indicators and valves shall be disassembled and visually examined for any damage.

4.6.7 Vibration. Indicator shall be tested as a complete assembly in accordance with MIL-STD-167-1, type I. The indicator shall be filled to the 50 percent indication level and pressurized to normal working pressure.

4.7 Inspection of packaging. Sample packages and packs, and the inspection of the preservation-packaging, packing and marking for shipment and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

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## 5. PACKAGING

(The preparation for delivery requirements specified herein apply only for direct Government acquisition. For the extent of applicability of the preparation for delivery requirements of referenced documents listed in section 2, see 6.5.)

5.1 Cleaning, preservation and packaging.

5.1.1 Level A. The indicators shall be cleaned by process C-1 and packaged by method III in accordance with MIL-P-116. Unit and intermediate containers shall be in accordance with PPP-B-636. The gross weights shall not exceed the weight limitations specified in the applicable container specification. Closure and sealing of containers shall conform to the applicable container specification and appendix thereto.

5.1.2 Level C. Cleaning, preservation and packaging shall be in accordance with the requirements of ASTM D 3951.

5.2 Packing.

5.2.1 Level A. The indicators shall be packed in snug-fitting wood cleated fiberboard, wood cleated plywood, nailed wood or fiberboard boxes in accordance with PPP-B-591 (overseas type), PPP-B-621 or PPP-B-636 respectively. Containers shall be lined with a waterproof case liner in accordance with MIL-L-10547, grades A or B and sealed in accordance with the appendix thereto. Shipping containers shall be closed and strapped in accordance with the appendix of the applicable container specification. The gross weight of wood boxes shall not exceed 200 pounds and fiberboard boxes shall be 70 pounds or less. Case liners shall not be required when the equipment is packaged in fiberboard boxes in accordance with PPP-B-636 and appendix thereto.

5.2.2 Level B. The indicators shall be packed in snug-fitting wood cleated fiberboard, cleated plywood, nailed wood, corrugated or solid fiberboard boxes in accordance with PPP-B-591, PPP-B-601 (domestic type), PPP-B-621, or PPP-B-636, respectively. Fiberboard containers shall be in accordance with special requirements of the applicable container specification and appendix thereto. The gross weight of wood boxes shall be 200 pounds or less, and fiberboard boxes shall be 90 pounds or less.

5.2.3 Level C. The indicators shall be packed in accordance with ASTM D 3951.

5.3 Marking.

5.3.1 Level A. In addition to any special marking required by the contract or order, unit packages, intermediate, and exterior shipping containers shall be marked in accordance with MIL-STD-129.

5.3.2 Commercial. Commercial or industrial marking shall be in accordance with ASTM D 3951.

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## 6. NOTES

6.1 Intended use.

6.1.1 Indirect. Indirect indicators are for water and fuel service at working pressures of 300 lb/in<sup>2</sup> and below, temperatures of 300°F and below, and for hi-shock applications.

6.1.2 Direct. Direct indicators for hi-shock applications shall use plastic sight tubes where the fluid is compatible and temperatures do not exceed 150°F. Glass tubes shall only be used for low shock applications and where the fluid is not compatible with plastic tubes.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- (a) Title, number and date of this specification.
- (b) Type and class indicator required (see 1.2).
- (c) Size of connection if specified (see 3.4.1).
- (d) Handwheel with chain when required (see 3.4.2.3).
- (e) Indication length (see 3.3.4.1).
- (f) Operating temperature °F minimum and maximum (see 3.3.5.1).
- (g) Operating pressure (lb/in<sup>2</sup>); normal and maximum (see 3.3.6).
- (h) Operating media (see 1.2.5).
- (i) Viscosity and specific gravity of fluid for indirect indicators only (see 1.2.5).

6.2.2 Data requirements. When this specification is used in an acquisition which incorporates a DD Form 1423, Contract Data Requirements List (CDRL), the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL incorporated into the contract. When the provisions of FAR 52.227-7031 are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification is cited in the following paragraph.

<u>Paragraph no.</u>	<u>Data requirement title</u>	<u>Applicable DID no.</u>	<u>Option</u>
4.1.1	Inspection system program plan	DI-R-4803	--

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DoD 5000.19L., Vol. II, AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

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6.2.2.1 The data requirements of 6.2.2 and any task in sections 3, 4 or 5 of this specification required to be performed to meet a data requirement may be waived by the contracting/acquisition activity upon certification by the offeror that identical data were submitted by the offeror and accepted by the Government under a previous contract for identical item acquired to this specification. This does not apply to specific data which may be required for each contract regardless of whether an identical item has been supplied previously (for example, test reports).

6.3. First article inspection. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection as 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. Provisioning. Provisioning Technical Documentation (PTD), spare parts and repair parts should be furnished as specified in the contract.

6.4.1 When ordering spare parts or repair parts for the equipment covered by this specification, the contract should state that such spare parts and repair parts should meet the same requirements and quality assurance provisions as the parts used in the manufacture of the equipment. Packaging for such parts should also be specified.

6.5. Sub-contracted material and parts. The preparation for delivery requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

6.6. 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 - ME  
Navy - SH  
Air Force - 99

Preparing activity:  
Navy - SH  
(Project 6680-0188)

Reviewer activity:  
Air Force - 82

**INSTRUCTIONS:** In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (*DO NOT STAPLE*), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

**NOTE:** This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

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NAVAL SEA SYSTEMS COMMAND (SEA 5523)  
DEPARTMENT OF THE NAVY  
WASHINGTON, DC 20362



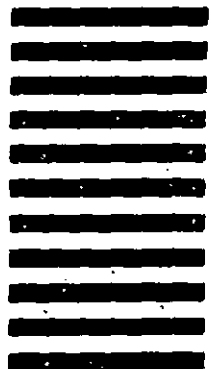
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COMMANDER  
NAVAL SEA SYSTEMS COMMAND (SEA 5523)  
DEPARTMENT OF THE NAVY  
WASHINGTON, DC 20362



## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-I-20037B		2. DOCUMENT TITLE TUBULAR GLASS/PLASTIC INDICATORS, SIGHT, LIQUID LEVEL, DIRECT/INDIRECT READING,	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one)	
b. ADDRESS (Street, City, State, ZIP Code)		<input type="checkbox"/> VENDOR	
		<input type="checkbox"/> USER	
		<input type="checkbox"/> MANUFACTURER	
		<input type="checkbox"/> OTHER (Specify): _____	
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)	