

INCH-POUND

MIL-DTL-8971C
22 December 1998
 SUPERSEDING
 MIL-E-8971B
 21 OCTOBER 1991

DETAIL SPECIFICATION
 ELECTRODES, GRAPHITE, SPECTROSCOPIC GRADE

Inactive for new design after 1 January 1999

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

1. SCOPE

1.1 Scope. This specification covers graphite electrodes for use in spectrometric analysis of metallic elements in used oils and other fluids.

1.2 Classification and part number. The electrodes shall be of the following types and part numbers as specified in 3.4:

<u>Electrode type</u>	<u>Part number</u>
Type I, disc	M8971-1
Type II, rod	M8971-2

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 4 and 5 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

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: 88 LOG/LGMEP, Building 280 Door 4, 4170 Hebble Creek Road, Wright Patterson AFB OH 45433-5653 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

MIL-DTL-8971

Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2)

STANDARDS

FEDERAL

FED-STD-123 Marking for Shipment.

DEPARTMENT OF DEFENSE

MIL-STD-831 Test Reports, Preparation of.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available 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 which are DoD adopted are those listed in issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

American Society for Testing and Materials

ASTM E 504 Selection of Electrode Material Used in Optical Emission Spectroscopy Based on Physical Properties

ASTM C 559 Density in Air of Manufactured Carbon and Graphite Articles by Physical Measurements

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103-1187.)

American Society for Quality

ASQ Z 1.4 Sampling Procedures and Tables for Inspection by Attributes

(Application for copies should be addressed to American Society for Quality, 611 East Wisconsin Avenue, Milwaukee, Wisconsin 53202-3005.)

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

3. REQUIREMENTS

3.1 Qualification. The electrodes furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time of award of contract (see 4.1 and 6.3).

3.2 Material. The composition of electrodes furnished under this specification shall be high-purity graphite (Spectroscopic Grade), ASTM E 504.

MIL-DTL-8971C

The raw materials shall be as free as possible of the elements specified in 3.2.4. The finished product shall conform to the requirements specified herein and a material certification shall be forwarded by the contractor to the qualifying activity and the procuring agent.

MIL-DTL-8971C

3.2.1 Breaking Strength. When tested in accordance with 4.8.2.2, the density of the graphite material shall be 1.56 g/cc minimum to 1.65 g/cc maximum.

3.2.2 Density. When tested in accordance with 4.8.2.3, the density of the graphite material shall be 1.56 g/cc minimum to 1.65 g/cc maximum.

3.2.3 Resistivity. When tested in accordance with 4.8.2.1, the dc ohmic resistance shall be 220 to 450 microhm-inches (5.5 to 11.4 microhm-meters).

3.2.4 Purity (trace metal content). The purity of the electrodes (type I and type II) shall be determined in accordance with 4.8.2.3, and shall meet the requirements for each of the following elements: iron (Fe), silver (Ag), aluminum (Al), chromium (Cr), copper (Cu), magnesium (Mg), sodium (Na), nickel (Ni), lead (Pb), silicon (Si), tin (Sn), titanium (Ti), boron (B), molybdenum (Mo), and zinc (Zn). The purity of the electrodes shall be:

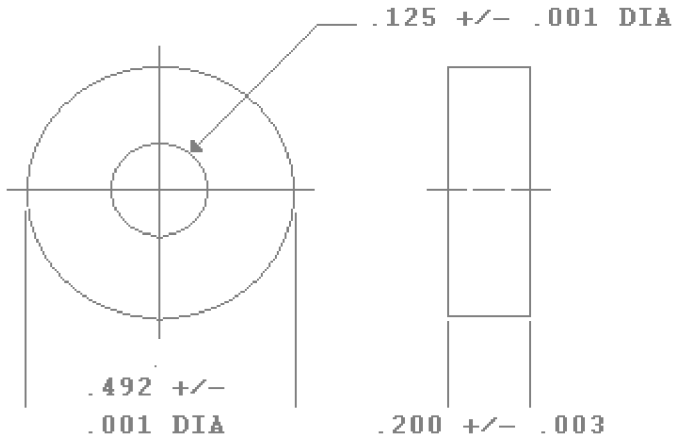
- a. 2 PPM (Parts Per Million) maximum allowable spot impurity for each required element.
- b. 6 ppm maximum allowable spot impurities for all elements. "Spot impurities" are defined such that if all the impurities (trace elements) of each electrode were concentrated in one spot, the analysis of that one spot shall not exceed 6 PPM for all required elements.

3.2.5 Repeatability and accuracy. Type I and Type II candidate electrodes shall be statistically compared to the reference electrodes using Table III and IV and standard statistical analysis to ensure that the candidate electrodes meet or exceed the required analytical requirements.

MIL-DTL-8971C

3.3 Dimensions. Dimensions of the electrodes shall conform to the following:

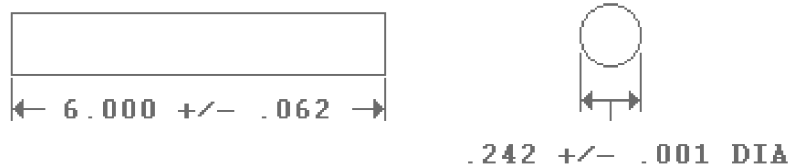
- a. Type I, Disc, part number M8971/1-2



INCHES	MM
.0005	.013
.001	.03
.003	.08
.005	.13
.062	1.57
.125	3.18
.200	5.08
.242	6.51
.375	9.52
.492	12.50
6.000	152.40

ECCENTRICITY: Eccentricity between the hole and the outside cylindrical surface of the disc shall not exceed .0005 TIR.

- b. Type II, Rod, part number M8971/2-2



STRAIGHTNESS: The bow (from cord to arc) when measured on a surface plate shall not exceed .005 when L = 6.000 inches.

ROUNDNESS: Rods shall be capable of passing freely through a .244 inch diameter hole.

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only and are based upon 1.00 inches = 25.4 mm.

3.5 Design and construction. The electrodes, type I and type II, shall be designed and constructed such that they shall exhibit no evidence of fracturing or spalling as a result of the reshaping, grinding, machining, or processing. Purification shall be performed following all machining operations.

MIL-DTL-8971C

3.6 Workmanship. The electrodes shall be uniform in quality and free from all defects (pits, chips, flat spots, cracks) which may affect their serviceability, machining, and appearance.

4. VERIFICATION

4.1 Contractor responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor shall be responsible for the performance of the following inspection requirements (examinations and tests) as specified herein: Design, construction, workmanship, and dimensions; Resistivity; Breaking strength; Density; Purity. 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. Repeatability and Accuracy examinations and tests shall be performed at a laboratory approved by the qualifying activity (see 6.5). The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 4. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

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

- a. Qualification inspection (4.4).
- b. Quality conformance inspection (4.6).

4.3 Sampling lots. For purposes of sampling, a lot is defined as an indefinite quantity of electrodes (type I and type II) subjected to the manufacturer's purification process at any one time. Sample size will be determined as specified in 4.6.1.4.

4.4 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.

4.4.1 Qualification inspection samples. All rods required for the qualification inspection shall be six inches long.

4.4.1.1 Discs. The disc sample for qualification shall consist of 125 discs and 40 disc rods which have been fabricated from material from the same mix and processed as a single batch and lot.

4.4.1.2 Rods. The rod electrode sample shall consist of 125 rods.

4.4.2 Inspection routine. The qualification samples shall be subjected to

MIL-DTL-8971C

the inspections shown in TABLE I.

4.4.2.1 Failures. One or more failures shall be cause for refusal to grant qualification approval.

TABLE I. Qualification inspection.

Inspection	Rod	Disc		Requirement paragraph	Method paragraph
		Rod	Finished		
Design, construction, workmanship, and dimensions	40	--	40	3.4 to 3.6	4.8.1.1
Resistivity	40	40	--	3.2.3	4.8.2.1
Breaking Strength	20	20	--	3.2.1	4.8.2.2
Purity	20		20	3.2.4	4.8.2.3
Repeatability and accuracy	75		75	3.2.5	4.8.2.4

4.4.3 Retention of qualification. To retain qualification, the contractor shall forward a report at 18 month intervals. The qualifying activity shall establish the initial reporting date. The report shall consist of:

- a. A summary of the results of the test performed for inspection of product for delivery (group A), indicating as a minimum the number of lots that have passed and the number that have failed, including the number and type of part failures. The results of tests of all reworked lots shall be identified and accounted for.
- b. By submitting a DD Form 1718 (Certification of Qualified Products) signed by a responsible company official.

4.4.4 Requalification. Requalification will be required in the event any change is made in source of manufacture, purity, or composition of the graphite base stock.

4.5 Test reports. The qualification and retention of qualification test reports shall be prepared in accordance with MIL-STD-831. One copy of the report with 70 sample rods and 270 sample discs, which were not subjected to the destructive tests, shall be forwarded to the Joint Oil Analysis Program Technical Support Center (JOAP-TSC), 296 Farrar Road, NAS Pensacola, FL 32508. Two copies of the test reports shall be forwarded to the preparing activity (see 6.3).

4.6 Quality conformance inspection.

4.6.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A inspection.

4.6.1.2 Inspection lot. A lot shall be defined as that quantity of rod or disc electrode material that is subjected to the manufacturer's purification process at any one time.

4.6.1.3 Group A inspection. Group A inspection shall consist of the inspections specified in TABLE II. The sample selected for groups I and II

MIL-DTL-8971C

(see 4.6.1.4) shall be divided, as near as possible, into two equal subsamples, one subsample shall be subjected to the test specified for group I and the second subsample shall be subjected to the test specified for group II. The sample selected from group III (see 4.6.1.4.b.) shall be subjected to the tests specified for group III.

4.6.1.4 Sampling plan. Two samplings from each purification lot shall be selected for group A inspection as follows:

- a. Groups I and II - Statistical sampling and inspection shall be in accordance with ASQ Z 1.4 for general inspection level I. The acceptable quality level (AQL) shall be as specified for group I and II of TABLE II.
- b. Group III - A random sample of 75 electrodes. Acceptance criteria shall be as specified in 3.2.5.

TABLE II. Group A inspection.

Inspection	Requirement Paragraph	Method Paragraph	AQL (percent defective) max acceptable	
			Major	Minor
Group I Dimensions Design, construction, and workmanship	3.4 3.5, 3.6	4.8.1.1 4.8.1.1	0.65	4.0
Group II Purity <u>1/</u>	3.2.4	4.8.2.4	0.65	4.0
Group III Repeatability and accuracy	3.2.5	4.8.2.5	75 sample units. For acceptance criteria see 3.2.5.	

1/ Purity testing to be performed on finished product (type I and type II electrodes).

4.6.2 Rejected lots. If an inspection lot is rejected for a feature that may be corrected or screened the manufacturer may rework it to correct the defects or screen out the defective units and resubmit the lot for reinspection. Such lots shall be separate from new lots and shall be clearly identified as reinspected lots.

4.6.3 Disposition of sample units. Sample units which have been subjected to group A inspection shall not be delivered on contract or order.

4.7 Test conditions.

4.7.1 Atmospheric. Unless otherwise specified, all tests shall be performed at a room temperature of 20° to 30° Celsius, 30 to 80 percent relative humidity, and a barometric pressure of 24 to 31 inches of mercury. The test area shall be free from drafts.

MIL-DTL-8971C

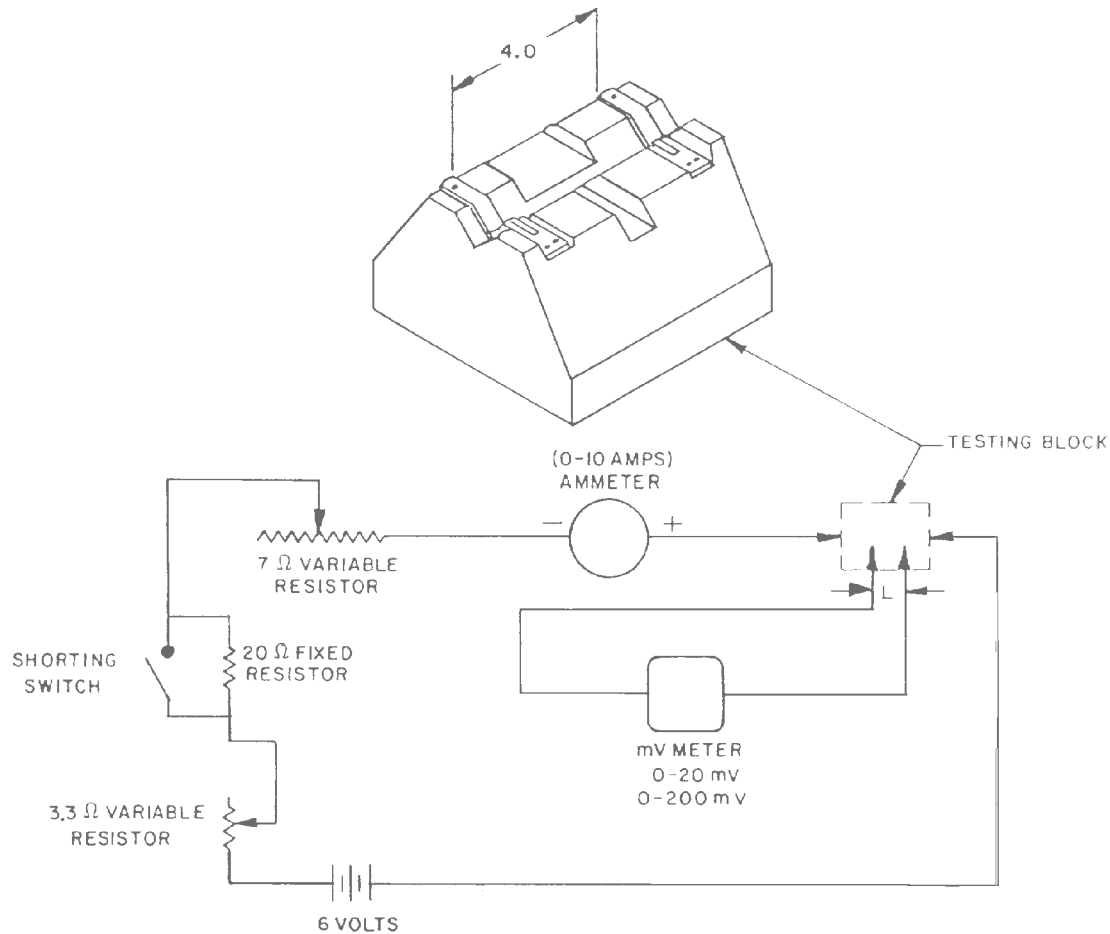
4.8 Methods of inspection.

4.8.1 Examinations.

4.8.1.1 Examination of product. Electrodes shall be carefully examined to determine compliance with this specification and with respect to materials, design and construction, workmanship, and dimensions.

4.8.1.2 Electrode discs. Unless otherwise specified, testing shall be performed on the disc rods prior to fabrication of the discs.

MIL-DTL-8971C

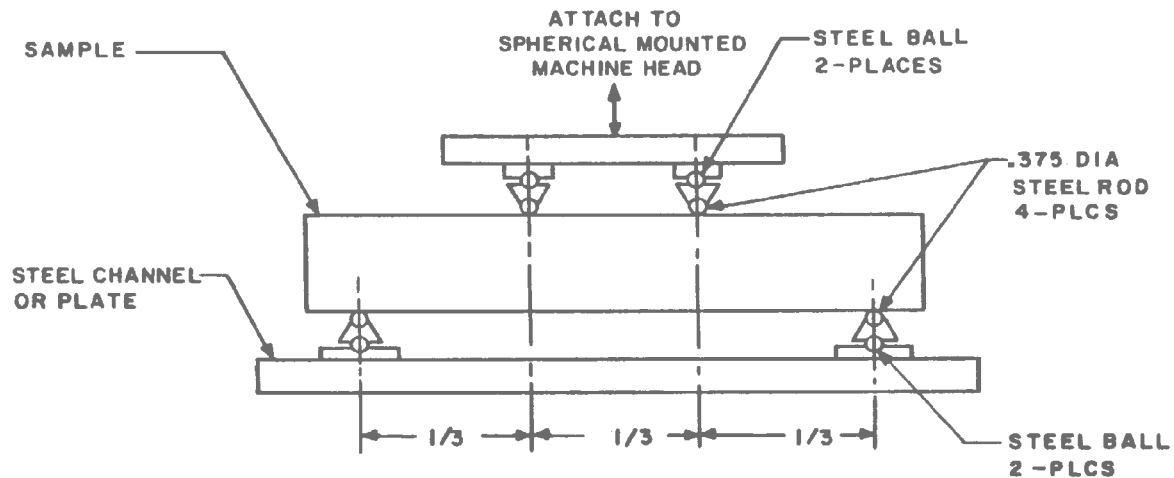
4.8.2 Tests.

MEASUREMENTS: Gage length may be measured by any scale that will give an accuracy of ± 0.5 percent of the length measured. Cross-sectional measurements shall be made with a micrometer and sufficient measurements shall be made to determine the mean cross-sectional area to within 0.5 percent.

PROCEDURE: Place the sample in the "V" contacts of the test block and press down firmly to insure good contact. Adjust amperage by means of the rheostats so that the voltage drop indicated by the millivolt meter will be in the middle 80 percent of its scale. Record amperes and volts.

FIGURE 1. Resistivity test procedure and test setup.

MIL-DTL-8971C



PROCEDURE: Measure diameter with micrometers. Make sufficient measurements to determine average diameter to within 0.5 percent.

LOAD SPAN: Make sure that bottom span is centered in testing machine. Center the sample on lower span bearing blocks. Align upper span so that bearing edges are at points 1/3 of the bottom span. See FIGURE 1.

NOTE: Proper alignment is facilitated by locating proper contact points with a steel scale and marking the points on the sample with crayon (do not scribe).

APPLICATION OF LOAD: Select a range on the testing machine so that the sample will break above the lower 10 percent of the range and not above 98 percent of the range. For example, on the 0-1200 lb. range the sample should break at a load above 240 lbs. and less than 1175 lbs. The load should be applied at a rate so that the break will occur within one to two minutes. Adjust load pointer to zero and set "maximum load pointer" so that it almost touches load pointer. Apply pressure until a slight load is indicated by pointer. Apply load until sample fractures and record the value indicated by the maximum load pointer.

NOTE: If the fracture occurs outside the middle third of the span length by more than 5 percent of the span length the test shall be discarded.

FIGURE 2. Breaking test procedure and test setup.

MIL-DTL-8971C

4.8.2.1 Resistivity. When tested in accordance with the procedure described on FIGURE 1, the resistance shall be as specified in 3.2.3. The specified resistance shall be calculated using the following formula:

$$R = \frac{E \times A}{I \times L}$$

Where: R = Specific resistance expressed in inches or ohm-inches
 E = Voltage reading in volts
 I = Current in amperes
 A = Cross-sectional area in square inches
 L = Length of electrode between voltmeter contacts in inches

4.8.2.2 Breaking strength. When tested in accordance with the procedure described on FIGURE 2, the breaking strength shall be as specified in 3.2.1. Breaking strength shall be calculated using the following formula:

$$\text{Breaking strength (p.s.i.)} = \frac{1.697 PL}{D^3}$$

Where: P = Maximum load indicated by testing machine in pounds
 L = Length of bottom span in inches
 D = Average diameter of sample in inches

4.8.2.3 Density. The density shall be as specified in 3.2.2 when determined in accordance with method ASTM C 559 using the following formula:

$$\text{Density} = \frac{\text{Weight}}{\text{Volume}}$$

Where: Density is expressed in g/cc
 Weight is expressed in grams
 Volume is expressed in cubic centimeters

4.8.2.4 Purity. Elemental impurity is to be determined by the manufacturer and shall not exceed the limits specified in 3.2.4. The manufacturer shall determine the test methodology and shall provide verification of purity.

4.8.2.5 Repeatability and accuracy. The repeatability and accuracy shall be calculated using the formulas provided in TABLE III and IV. The JOAP-TSC shall test the candidate electrodes using established test procedures and the applicable reference curves.

MIL-DTL-8971C

TABLE III Repeatability Criteria

The following criteria shall be used to determine if sets of 10 analyses of JOAP Standards pass or fail Repeatability Criteria.

Y	Fe Al Cr Cu Mg Ni Si	Ag Na Mo	Pb	Sn	B Ba Cd Mn Ti	Zn	V
0	0.50	0.50	0.90	1.00	0.50	0.50	0.80
5	0.56	0.64	0.95	1.04	0.58	0.78	0.84
10	0.71	0.94	1.08	1.17	0.78	1.30	0.94
30	1.58	2.45	2.01	2.06	1.87	3.63	1.70
50	2.55	4.03	3.13	3.16	3.04	6.02	2.62
100	5.03	8.02	6.07	6.08	6.02	12.00	5.06
	Fe Ag Mo	Al Cr Ni Si V	Cu Mg	Na	B Ba Cd Mn Pb Sn Ti	Zn	
300	24.00	15.00	27.00	48.00	18.00	36.00	
500	40.00	25.00	45.00	80.00	30.00	60.00	
700	56.00	35.00	63.00	112.00	42.00	84.00	
900	72.00	45.00	81.00	144.00	54.00	108.00	

To apply these criteria, the following calculations shall be made:

$$\text{Repeatability Index (RI)} = \sqrt{\frac{N(\sum X_i^2) - (\sum X_i)^2}{N(N-1)}}$$

N is the number of analyses (normally 10). $(\sum X_i^2)$ is the sum of the 10 squared standard values. $(\sum X_i)^2$ is the square of the sum of the 10 standard values. If calculated RI value is less than or equal to the table value, the set of analyses are considered to have passed the repeatability criteria.

MIL-DTL-8971C

TABLE IV Accuracy Criteria

The following criteria shall be used to determine if sets of 10 analyses of JOAP Standards pass or fail Accuracy Criteria.							
Y	Fe Ag Mo	Al Cr Ni Si	Cu Mg	Na	Pb Sn	B Ba Cd Mn Ti V	Zn
0	0.91	0.88	0.92	1.01	1.60	0.89	0.96
5	1.50	1.20	1.61	2.59	1.98	1.30	1.99
10	2.21	1.59	2.44	4.36	2.43	1.78	3.19
30	5.23	3.33	5.91	11.60	4.47	3.93	8.15
50	8.29	5.12	9.43	18.9	6.64	6.14	13.1
100	16.00	9.65	18.20	37.10	12.20	11.70	25.60
300	46.70	27.80	53.50	110.00	34.30	33.90	75.60
500	77.50	46.00	88.80	183.00	56.60	56.10	126.00
700	108.00	64.20	124.00	255.00	78.80	78.30	176.00
900	139.00	82.40	159.00	328.00	101.00	101.00	226.00
To apply these criteria, the following calculations shall be made:							
<i>Accuracy Index (AI) = $Y - \bar{X}$ or $\bar{X} - Y$, whichever yeilds a positive value.</i>							
Y is the standard value in parts per million (PPM) and X is the mean of ten analyses. If the calculated AI value is less than or equal to the table value, the set of analyses are considered to have passed the accuracy criteria.							

4.8.2.4.1 Test method. The following is the procedure to use for spectrometric qualification of Type I and Type II electrodes.

- a. A JOAP approved emission rotrode spectrometer shall be used for this spectrometric testing.
- b. JOAP approved Primary Reference Calibration Standards at 0, 10, 30, 50, 100, 300, 500, 700, and 900 PPM shall be used to set up an approved reference electrode curve. These standards contain 19 elements: Fe, Ag, Al, Cr, Cu, Mg, Na, Ni, Pb, Si, Sn, Ti, B, Ba, Cd, Mn, Mo, V, and Zn (see 6.4).
- c. The reference curve must be set up using previously approved reference electrodes tested and approved by the JOAP-TSC. The JOAP-TSC is tasked to ensure that reference electrodes meet the requirements of TABLE III and IV. Reference electrodes and references curves shall be established for each qualified manufacturer of electrodes.
- d. At least 50 candidate rod electrodes or 500 candidate disc electrodes shall be submitted for routine testing, as applicable. The manufacturer shall provide at least 50 reference rod electrodes and 500 reference discs to facilitate testing (see 4.8.2.4.1.c).

MIL-DTL-8971C

Disk test - Manufacturers shall provide 500 test discs, 500 reference discs, and 50 reference rods.

Rod test - Manufacturers shall provide 50 test rods, 50 reference rods, and 500 reference discs.

- e. The JOAP-TSC shall test the candidate electrodes using established test procedures and the applicable reference curves.
- f. Elemental impurity shall be verified by the JOAP-TSC through the use of a JOAP approved atomic emission rotrode spectrometer. The results of the testing shall not exceed the limits specified in 3.2.4.
- g. Tests shall be performed for the 15 JOAP elements within their dynamic range for the following concentrations:

<u>Elements</u>	<u>Dynamic Range</u>	<u>Required Standard Tests (PPM)</u>
Ag, Mo	300 PPM	5, 30, 100, 300
Al, Cr, Ni, Si, Sn, Ti	500 PPM	5, 30, 100, 300, 500
Fe, Cu, Mg, Na, Pb, B, Zn	998 PPM	5, 30, 100, 300, 500, 900

Type I and Type II test electrodes will be considered acceptable if:

- (1.) The purity of the test electrodes is within the prescribed limits of 3.2.4
- (2.) The test electrodes exhibit no failures of accuracy and repeatability as outlined in Table III and IV.
- (3.) If accuracy or repeatability failures occur, but established statistical comparisons of reference and test indicate that there are no significant differences between the reference and test electrodes.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. 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 electrodes, rod type II and disc type I, are intended to be utilized as pairs and are further intended for use in a spectrometer specifically designed to analyze oils and fluids.

6.2 Acquisition requirements. Acquisition documents should specify the

MIL-DTL-8971C

following:

- a. Title, number, and date of specification.
- b. Military part number (see 1.2).
- c. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1 and 2.2.2).

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 Qualified Products List QPL No. 8971 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 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: 88 Logistics and Operations Group, Electronic Support Division (88 LOG/LGMEP), Building 280 Door 4, 4170 Hebble Creek Road, Wright Patterson AFB, OH 45433-5653 and information pertaining to qualification of products may be obtained from that activity.

6.4 Requirements for reference calibration oil standards. Reference calibration oil standards can be purchased at cost for use in establishing initial qualification, retention of qualification, and quality conformance verification. The request must be forwarded in writing to: Joint Oil Analysis Program Technical Support Center (JOAP-TSC), 296 Farrar Road, Pensacola FL 32508. The JOAP-TSC must be provided a minimum thirty day notice in order to ensure that adequate supplies of the oil standards are available.

6.5 Laboratory approved by qualification activity. The current approved laboratory for Accuracy and Repeatability examinations and tests is the Joint Oil Analysis Program Technical Support Center (JOAP-TSC). Testing will be performed at cost to the submitter. Pricing information may be obtained by writing to the address in paragraph 6.4, or by fax to (850) 452-2348.

6.6 Supersession data. This specification supersedes MIL-E-8971B dated 23 Oct 1991.

6.7 Part or Identifying Number (PIN). The PIN to be used for electrodes acquired to this specification are created as follows:

<u>M</u>	<u>8971</u>	<u>X</u>
Prefix for military specification	Specification number	Type (see 1.2)

6.8 Subject term (key word) listing.

Electrode disc
Electrode rod
Optical emission spectroscopy
Spectroscopic

6.9 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

MIL-DTL-8971C

Custodians:

Navy - AS
Air Force - 85

Preparing activity:
Air Force 85

(Project: 5977-1003)

Review Activities:

Army - ER, AR, AT, MI, ME
Air Force - 99
DLA - GS