INCH - POUND

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SUPERSEDING
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PERFORMANCE SPECIFICATION
PENETROMETERS, SOIL: DIAL INDICATING AND SPRING INDICATING

This specification is approved for use by all Departments and Agencies of the Department of Defense. The original issue of this Performance Specification replaced MIL-P-3627.

1. SCOPE

1.1 Scope. This specification covers penetrometers used to determine the penetration resistance and degree of compaction of soils.

1.2 Classification. Penetrometers are of the following types, as specified (see 6.2):

Type I - Dial indicating.

Type II- Spring indicating.

2. APPLICABLE DOCUMENTS

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

2.2 Order of precedence. In the event of a conflict between the text of this document and the

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

3. REQUIREMENTS

3.1 First article. When specified (see 6.2) a sample shall be subjected to first article inspection in accordance with 4.2.

3.2 Materials. The contractor shall select the materials, but the materials shall be capable of meeting all the operational and environmental requirements specified herein. Recovered materials shall be used to the maximum extent possible. Used, rebuilt, or remanufactured components, pieces and parts shall not be incorporated in the penetrometer.

3.2.1 Deterioration prevention and control. The penetrometer shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide protection against the various forms of corrosion and deterioration to which the material is susceptible.

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

3.3 Environmental considerations. The penetrometer shall be constructed in such a way that its operation is unaffected by moisture and shall operate within the temperature range of 32^0 to 125^0 F.

3.4 Maintainability. The penetrometer shall be supplied with all required parts, tools, and documentation to allow operation and maintenance in the field, without special training.

3.5 Transportability. The penetrometer with all required parts, tools, and documentation shall be provided in a suitable case and transportable in the field by a single person.

3.6 Durability The penetrometer shall withstand the rigors and stresses of unrestricted use under conditions specified herein, without repair, for not less than one year. Zeroing of the instrument, routine mounting block adjustment, or the replacement of damaged cones will not be considered repair. For type I instruments, permanent deformation of the proving ring resulting from the testing of any soil, that can not be corrected by re-calibration, shall not be acceptable.

3.7 Performance characteristics. The penetrometer shall contain an indicator capable of legibly displaying readings from 0 to 150 pounds per square inch (PSI) and shall return to 0 PSI between readings. Graduations shall be in no greater than 10 PSI increments. The indicator shall maintain an accuracy of ± 2.5 PSI up to 50 PSI and ± 3.5 PSI beyond the 50 PSI range. The penetrometer shall be capable of one-man operation.

3.8 Dimensions. The penetrometer shall be no greater than 28 inches in length, with the main portion of the device within an envelope of four inches in diameter. The penetrometer shall weigh no more than 20 LBS.

4. VERIFICATION

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

a. First article inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.2 First article inspection. When a first article inspection is required, it shall be performed on one complete penetrometer assembly. This inspection shall include the examination of 4.4 and the testing of 4.5.

4.3 Conformance inspection. Conformance inspection shall include the examination of 4.4 and the testing of 4.5.

4.4 Examination. Each penetrometer shall be examined for compliance with the requirements specified in 3.2 through 3.8. Any redesign or modification to comply with specified requirements, or any redesign or modification necessary following failure to meet the specified requirements, shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all examinations of performance and dimensional requirements. Non-compliance with any specified requirement, or the presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.5 Testing. Force in 10 PSI increments up to 150 PSI shall be applied to the top of the penetrometer. Force may be applied by any of the load machines commonly used in laboratory work or by using dead weights with the penetrometer resting securely on an unyielding impenetrable surface. After each increment, a visual check of the indicator shall be made and recorded. The indicator shall display an accuracy of ± 2.5 PSI up to 50 PSI and ± 3.5 PSI beyond the 50 PSI range and shall return to 0 PSI with the force removed. Failure to display the aforementioned accuracy or failure of the indicator to return to 0 PSI, shall constitute failure of this test.

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 materiel 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 which may be helpful, but is not mandatory.)

6.1 Intended use. The penetrometer is intended to measure soil penetration resistance.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification.
b. Type of penetrometer required (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).
d. When a first article inspection is required (see 3.1).
e. Packaging requirements (see 5.1).

6.3 First article inspection. When a first article inspection is required, the item should be a preproduction model. The first article should consist of one or more units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, tests, and approval of the first article test results and disposition of the first article.

6.4 Data requirements. The contracting officer should include requirements for such data as technical publications, instructional materials, illustrated parts lists, and contractor's maintenance and operation manuals to be furnished with each penetrometer.

6.5 Drawings. Drawings 13200E9820 and 13211E8520 are examples of two types of penetrometers. These are to be used for information purposes only.

6.6 Recovered materials. For the purpose of this requirement, recovered materials are those that have been collected from solid waste and reprocessed to become a source of raw materials, as distinguished from virgin raw materials.

6.7 Part Identification Number (PIN). The following part identification numbering procedure is for government purposes and does not constitute a requirement for the contractor.

This example describes a part numbering system for specification MIL-PRF-3627:

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1 - Dial indicating (Type I)
2 - Spring indicating (Type II)

6.8 Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this

document based on the entire content irrespective of the marginal notations and the relationship to the previous issue.

6.9 Subject term (key word) listing.

Penetration resistance

The preparing activity for this document is: The U.S. Army Topographic Engineering Center, Attn: CEERD-TS, 7701 Telegraph Road, Alexandria, VA 22315-3864.

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