Designation: D 128 – 98 (Reapproved 2003)$^{\epsilon 1}$

An American National Standard

Standard Test Methods for Analysis of Lubricating Grease[1]

This standard is issued under the fixed designation D 128; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

ϵ[1] NOTE—Warning notes were editorially moved into the standard text in July 2003.

1. Scope

1.1 These test methods for analysis cover greases of the conventional type, which consist essentially of petroleum oil and soap. The constituents that can be determined are soap, unsaponifiable matter (petroleum oil, and so forth), water, free alkalinity, free fatty acid, fat, glycerin, and insolubles.

NOTE 1—Any of the test methods described herein are best used by an experienced grease analyst who may also be able to make appropriate adaptations of the techniques as occasion requires.

1.2 A supplementary test method is provided in Appendix X1. This test method is intended primarily for application to greases containing thickeners that are essentially insoluble in *n*-hexane, and to greases that cannot be analyzed by conventional methods because of the presence of such constituents as nonpetroleum fluids or nonsoap-type thickeners, or both. In some cases, these constituents can react with strong acid or alkaline solutions.

1.3 These test methods appear in the following order:

	Sections
Ash Determination	7-11
Insolubles, Soap, Fat, Petroleum Oil, and Unsaponifiable Matter	12-20
Free Alkali and Free Acid	21-23
Water	24
Glycerin (Quantitative)	25-29

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.*

1.5 The values stated in SI units are to be regarded as the standard.

2. Referenced Documents

2.1 *ASTM Standards:*

D 95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation[2]

D 156 Test Method for Saybolt Color of Petroleum Products (Saybolt Chromometer Method)[2]

D 217 Test Methods for Cone Penetration of Lubricating Grease[2]

D 445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)[2]

D 473 Test Method for Sediment in Crude Oils and Fuel Oils by the Extraction Method[2]

D 1078 Test Method for Distillation Range of Volatile Organic Liquids[3]

D 1193 Specification for Reagent Water[4]

D 1353 Test Method for Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer, and Related Products[3]

3. Terminology

3.1 *Definitions:*

3.1.1 *asphalt*, *n*—a dark brown-to-black cementitious material in which the predominating constituents are bitumens.

3.1.1.1 *Discussion*—Asphalt can be a natural product or a material obtained from petroleum processing.

3.1.2 *candle pitch*, *n*—a dark brown-to-black, tarry or solid, by-product residue from soap and candle stock manufacture, refining of vegetable oils, refining of wool grease, or refining of refuse animal fats.

3.1.3 *cup grease*, *n*—any lubricating grease having physical properties, such as consistency and texture, suitable for its use in spring-loaded or screw-type lubricating cups.

3.1.3.1 *Discussion*—Cup greases are predominantly NLGI No. 3 or 4 calcium greases, but grease types other than calcium are also used.

3.1.4 *degras (wool fat, wool grease, wool wax)*, *n*—a fat-like material comprised primarily of sterols, other higher alcohols, and fatty acids, obtained from the solvent extraction of sheep's wool.

[1] These test methods are under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and are the direct responsibility of Subcommittee D02.G0 on Lubricating Grease.

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[2] *Annual Book of ASTM Standards*, Vol 05.01.

[3] *Annual Book of ASTM Standards*, Vol 06.04.

[4] *Annual Book of ASTM Standards*, Vol 11.01.

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