



Designation: D117 – 10

Standard Guide for Sampling, Test Methods, and Specifications for Electrical Insulating Oils of Petroleum Origin¹

This standard is issued under the fixed designation D117; the number immediately following the designation indicates the year of original adoption or, in the case of revisions, the year of last revision. A number in parentheses indicates the year of last approval. A superscript symbol (¹) indicates an editorial change since the last revision or approval.

1. Scope

1.1 This guide describes methods of testing and specifications for electrical insulating oils of petroleum origin intended for use in electrical cables, transformers, oil circuit breakers, and other electrical apparatus where the oils are used as insulating, or heat transfer media, or both.

1.2 The purpose of this guide is to outline the applicability of the available test methods. Where more than one is available for measuring a given property, their relative advantages are described, along with an indication of laboratory convenience, precision, (95 % confidence limits), and applicability to specific types of electrical insulating oils.

1.3 This guide is classified into the following categories: Sampling Practices, Physical Tests, Electrical Tests, Chemical Tests, and Specifications. Within each test category, the test methods are listed alphabetically by property measured. A list of standards follows:

Category	Section	ASTM Method
Sampling:	3	D493, D2759, D3365
Physical Tests:		
Acidic Point	4	D611
Coefficient of Thermal Expansion	5	D1903
Color	6	D4500
Examination: Visual Infrared	7	D4524, D2144
Flash and Fire Point	8	D92
Interfacial Tension	9	D474, D3366
Pour Point: Petroleum Products	10	D47
Particle Count in Mineral Insulating Oil	11	D4790
Refractive Index	12	D1258, D1907
Relative Density (Specific Gravity)	13	D287, D1217, D1298, D1481

Category	Section	ASTM Method
Specific Heat	14	D2768
Thermal Conductivity	15	D2717
Turbidity	16	D6184
Viscosity	17	D56, D445, D2161
Electrical Tests:		
Dielectric Breakdown Voltage	18	D607, D1846, D3300
Dissipation Factor and Relative Permittivity (Dielectric Constant)	19	D924
Gassing Characteristics Under Thermal Stress	20	D1150
Gassing Tendency	21	D2306
Moisture	22	D1169
Stability Under Electrical Discharge	23	D6180
Chemical Tests:		
Acidity: Approximate	24	D1534
Carbon Type Composition	25	D2140
Compatibility with Construction Material	26	D3455
Copper Content	27	D3630
Elements by Inductively Coupled Plasma (ICP-AES)	28	D1751
Fluoric Compounds in Electrical Insulating Liquids	29	D5847
Gas Analysis	30	D3612
Gas Content	31	D631, D1827, D2940
Inorganic Chlorides and Sulfates	32	D678
Neutralization (Acid and Base) Numbers	33	D664, D974
Oxidation Inhibitor Content	34	D2666, D4766
Oxidation Stability	35	D1934, D2112, D2440
Polychlorinated Biphenyl Content	36	D4058
Relative Content of Dissolved Dewey	37	D6880
Sediment and Soluble Sludge	38	D1688
Sulfur, Corrosive	39	D1275
Water Content	40	D1523
Specifications:		
Mineral Insulating Oil for Electrical Apparatus	41	D2487
High Firepoint Electrical Insulating Oils	42	D6222

1.4 The values stated in SI units are to be regarded as standard. The values stated in parentheses are provided for information only.

¹ This guide is under the jurisdiction of ASTM Committee D27 on Electrical Insulating Liquids and Classed is the direct responsibility of Subcommittee D27.01 on Mineral.

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Astm D117 10 Standard Guide For Sampling Test Methods

Guillaume Favre



Astm D117 10 Standard Guide For Sampling Test Methods:

Electrical Power Equipment Maintenance and Testing Paul Gill,2016-12-19 The second edition of a bestseller this definitive text covers all aspects of testing and maintenance of the equipment found in electrical power systems serving industrial commercial utility substations and generating plants It addresses practical aspects of routing testing and maintenance and presents both the methodologies and engineering basics needed to carry out these tasks It is an essential reference for engineers and technicians responsible for the operation maintenance and testing of power system equipment Comprehensive coverage includes dielectric theory dissolved gas analysis cable fault locating ground resistance measurements and power factor dissipation factor DC breaker and relay testing methods *Index of Specifications and Standards* ,2005 **Department Of Defense Index of Specifications and Standards Alphabetical Listing Part I July 2005** , *Annual Book of ASTM Standards* ASTM International,American Society for Testing and Materials,2004 **IEEE Guide for Diagnostic Field Testing of Electric Power Apparatus--** Institute of Electrical and Electronics Engineers,1995 Diagnostic tests and measurements that are performed in the field on oil immersed power transformers and regulators are described Whenever possible shunt reactors are treated in a similar manner to transformers Tests are presented systematically in categories depending on the subsystem of the unit being examined A diagnostic chart is included as an aid to identify the various sybsystems Additional information is provided regarding specialized test and measureing techniques

Department Of Defense Index of Specifications and Standards Federal Supply Class Listing (FSC) Part III July 2005 , **Annual Book of ASTM Standards** American Society for Testing and Materials,1990 **Standardization News** American Society for Testing and Materials,2002 *ASA Standard* American Standards Association,1955 *Industrial Standardization* ,1959 *The Magazine of Standards* ,1958 *Magazine of Standards* ,1963 [Index and Directory of U.S. Industry Standards](#) ,1987 **Book of ASTM Standards Including Tentatives** American Society for Testing and Materials,1962 **Book of ASTM Standards** American Society for Testing and Materials,1969 [1949 Book of ASTM Standards Including Tentatives \(a Triennial Publication\)](#). American Society for Testing and Materials,1949

Miscellaneous ASTM Standards for Petroleum Products ASTM Committee D-2 on Petroleum Products and Lubricants,1968 [Book of A.S.T.M. Standards, with Related Material](#) American Society for Testing and Materials,1968 *Industrial Standardization and Commercial Standards Monthly* ,1942 **Catalog of American National Standards** American Standards Association,1963

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