



Standard Practices for Sampling Electrical Insulating Liquids¹

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

1. Scope

1.1 These practices cover sampling of new electrical insulating liquids including oils, askarels, silicones, and synthetic liquids as well as such liquids in service or subsequent to service in cables, transformers, circuit breakers, and other electrical apparatus. These practices apply to liquids having a viscosity of less than $6.476 \times 10^{-4} \text{ m}^2/\text{s}$ (540 cSt) at 40°C (100°F).

1.2 The values stated in SI units are regarded as the standard where applicable. Inch pound units are used where there is no SI equivalent.

1.3 Sampling procedures using syringe-type devices, tin plated steel cans with flexible sides and stainless steel cylinders are described in Test Methods D 3613. This method describes preferred techniques to use when sampling for dissolved gas analysis and water content in insulating fluid.

1.4 The procedures appear in the following order:

Procedure	Section/Paragraph
Dip-Type Device (drum thief)	6.2, 13, and A1.1
Pressure-Type Device	6.3, 14, and A1.2
Tank Car-Type Device	6.4, 15, and A1.3
Manifold-Type Device	6.5, 21, and A1.4
Electric Equipment Sampling Outlet or Valve	6.6 and 18

1.5 These practices involve close contact with the electrical insulating liquids being sampled as well as liquids and other materials used to clean the sampling tools and devices. Proper use of personal protective equipment (PPE) is suggested.

1.6 Handle askarels as outlined in IEEE 799-1992 to avoid environmental contamination. For methods of testing askarels see Methods D 901.

1.7 Properly contain, package and dispose of any liquid or material resulting from the use of these practices in a manner that is in accordance with local, state and federal regulations.

1.8 *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.* Specific precau-

tionary statements are given in 1.5, 1.7, 14.2, Section 17, 19.2, and 21.2.3.

2. Referenced Documents

2.1 ASTM Standards:

D901 Methods of Testing Askarels²

D 1933 Specification for Nitrogen Gas as an Electrical Insulating Material²

D 3613 Test Methods of Sampling Electrical Insulating Oils for Gas Analysis and Determination of Water Content²

D 4057 Practice for Manual Sampling of Petroleum and Petroleum Products³

2.2 IEEE Standards:

799-1992 Guide for Handling and Disposal of Transformer Grade Insulating Fluids Containing PCBs⁴

3. Terminology

3.1 Definition:

3.1.1 *sampling*—the obtaining of that amount of a material which is adequate for making the required tests and which is representative of that portion of the material from which it is taken.

3.1.1.1 *Discussion*—In most cases the detection of contaminants that are not ordinarily dispersed uniformly through the liquid being sampled, such as water or solid particles, necessitates taking samples at specific locations where the contaminants are likely to be found. For a liquid having a relative density (specific gravity) less than one, water and some other impurities are most likely to be found on the bottom, whereas in the case of a liquid having a specific gravity greater than one, some of these impurities are most likely to be found on the surface.

4. Summary of Practice

4.1 Representative samples of electrical insulating liquids are taken for test specimens so that the quality pertinent to their use may be determined. The quality in different portions of a given container, or the average quality of the whole bulk may be ascertained if desired.

¹ This test method is under the jurisdiction of ASTM Committee D-27 on Electrical Insulating Liquids and Gases and is the direct responsibility of Subcommittee D27.07 on Physical Tests.

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² Annual Book of ASTM Standards, Vol 10.03.

³ Annual Book of ASTM Standards, Vol 05.02.

⁴ Available from the IEEE, 345 E. 47th St., NY, NY 10017-2394.