



Standard Practice for Sampling Small Gas Volume in a Transformer¹

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1. Scope

1.1 This practice covers the sampling of gas from a transformer gas space or from a gas-collector relay where the volume of gas available is small and will not permit the use of Practice D 2759.

1.2 This practice covers sampling, using a gas-tight syringe as the sampling apparatus and container.

1.3 If the apparatus to be sampled is found to be under a negative pressure, the apparatus pressure should be raised by the addition of nitrogen gas until a positive pressure is obtained.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D 2759 Practice for Sampling Gas from a Transformer Under Positive Pressure

3. Significance and Use

3.1 Gases may be formed in oil-filled electrical equipment as a result of faults. The type of fault and its severity may often be inferred from the composition of the gases.

3.2 Gas samples are taken from transformer gas spaces or from gas-collector relays in order that the composition of the gas sample may be determined.

3.3 In nitrogen-blanketed transformers, the gases generated by a fault will partition between the gaseous and liquid phases. On transformers with gas-collector relays, gas in the form of bubbles may collect in a gas-collector relay and provide a means to obtain a gas sample for analysis.

3.4 Do not draw samples from an energized instrument transformer.

4. Apparatus

4.1 *Syringe*, gastight, 5-mL, with luer loc termination.

4.2 *Stopcock*, three-way, plastic.

4.3 *Length of PTFE Tubing*, 1/8 in. inside diameter.

5. Procedure

5.1 Connect the plastic stopcock to the plastic tubing. Connect the other end of tubing to a suitable valved entrance to the transformer gas space or gas-collector relay.

5.2 Open the valve and stopcock so gas space gas can flush air from valve, tubing, and stopcock. (The stopcock handle points to the closed port, leaving the other two ports in open communication.)

5.3 Connect syringe to the stopcock.

5.4 Turn the stopcock handle to allow gas from the gas space to enter the syringe, taking care that gas pressure does not eject the plunger completely.

5.5 Turn the stopcock so gas can be expelled from the syringe through the exhaust port of stopcock by pushing plunger home.

5.6 Open the stopcock to connect gas space to syringe and fill syringe. Close the stopcock by turning handle toward the syringe.

5.7 Close the valve on the gas space.

5.8 Remove the plastic tubing from the valve and stopcock, leaving the stopcock on the syringe.

5.9 Label the sample, package carefully, and transport to laboratory for analysis.

6. Keywords

6.1 gas; sampling gas; transformer

¹ This practice is under the jurisdiction of ASTM Committee D27 on Electrical Insulating Liquids and Gases and is the direct responsibility of Subcommittee D27.07 on Physical Test.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.