



Designation: D 3305 – 94 (Reapproved 1999)^{ε1}

Standard Practice for Sampling Small Gas Volume in a Transformer¹

This standard is issued under the fixed designation D 3305; 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 approval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

^{ε1} NOTE—Editorial changes were made in March 1999.

1. Scope

1.1 This practice is used for sampling 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:

D 2759 Practice for Sampling Gas from a Transformer Under Positive Pressure²

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.

¹ This practice 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.

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