§ 1065.267 Gas chromatograph with a flame ionization detector.

(a) Application. You may use a gas chromatograph with a flame ionization detector (GC–FID) to measure CH₄ concentrations of diluted exhaust for batch sampling. While you may also use a nonmethane cutter to measure CH₄, as described in §1065.265, use a reference procedure based on a gas chromatograph for comparison with any proposed alternate measurement procedure under §1065.10.

(b) Component requirements. We recommend that you use a GC–FID that meets the specifications in Table 1 of §1065.205 and that the measurement be done according to SAE J1151 (incorporated by reference in §1065.1010). The GC–FID must meet the linearity verification in §1065.307.


§ 1065.269 Photoacoustic analyzer for ethanol and methanol.

(a) Application. You may use a photoacoustic analyzer to measure ethanol and/or methanol concentrations in diluted exhaust for batch sampling.

(b) Component requirements. We recommend that you use a photoacoustic analyzer that meets the specifications in Table 1 of §1065.205. Note that your photoacoustic system must meet the verification in §1065.369 and it must also meet the linearity verification in §1065.307. Use an optical wheel configuration that gives analytical priority to measurement of the least stable components in the sample. Select a sample integration time of at least 5 seconds. Take into account sample chamber and sample line volumes when determining flush times for your instrument.

[79 FR 23761, Apr. 28, 2014]

NOₓ and N₂O measurements

§ 1065.270 Chemiluminescent detector.

(a) Application. You may use a chemiluminescent detector (CLD) to measure NOₓ concentration in raw or diluted exhaust for batch or continuous sampling. We generally accept a CLD for NOₓ measurement, even though it measures only NO and NO₂, when coupled with an NO₂-to-NO converter, since conventional engines and aftertreatment systems do not emit significant amounts of NOₓ species other than NO and NO₂. Measure other NOₓ species if required by the standard-setting part. While you may also use other instruments to measure NOₓ, as described in §1065.272, use a reference procedure based on a chemiluminescent detector for comparison with any proposed alternate measurement procedure under §1065.10.

(b) Component requirements. We recommend that you use a CLD that meets the specifications in Table 1 of §1065.205. Note that your CLD-based system must meet the quench verification in §1065.370 and it must also meet the linearity verification in §1065.307. You may use a heated or unheated CLD, and you may use a CLD that operates at atmospheric pressure or under a vacuum.

(c) NO₂-to-NO converter. Place upstream of the CLD an internal or external NO₂-to-NO converter that meets the verification in §1065.378. Configure the converter with a bypass line if it is needed to facilitate this verification.

(d) Humidity effects. You must maintain all CLD temperatures to prevent aqueous condensation. If you remove humidity from a sample upstream of a CLD, use one of the following configurations:

(1) Connect a CLD downstream of any dryer or chiller that is downstream of an NO₂-to-NO converter that meets the verification in §1065.378.

(2) Connect a CLD downstream of any dryer or thermal chiller that meets the verification in §1065.376.

(e) Response time. You may use a heated CLD to improve CLD response time.


§ 1065.272 Nondispersive ultraviolet analyzer.

(a) Application. You may use a nondispersive ultraviolet (NDUV) analyzer to measure NOₓ concentration in raw or diluted exhaust for batch or continuous sampling. We generally accept an NDUV for NOₓ measurement, even though it measures only NO and NO₂, since conventional engines and