

Question 8.11

Topic: Concurrent Runs for Moisture, CO₂, and O₂ with Flow

Question: Are separate Method 3 (CO₂/O₂) and Method 4 (moisture) runs required for each Method 2 (flue gas velocity) run when performing a flow RATA?

Answer: No, provided that the only reason for measuring moisture or CO₂/O₂ is to determine the stack gas molecular weight. In this case, it is sufficient to collect one sample from Method 3 and Method 4 for every clock hour of a flow RATA or every three successive velocity traverse runs. Alternatively, moisture measurements used solely for the determination of molecular weight may be performed before and after a series of flow RATA runs at a particular load or operating level, provided that the time interval between the two moisture measurements does not exceed three hours. If this option is selected, the results of the before and after moisture measurements are to be averaged, and this average moisture value is to be applied to the data for all runs of the flow RATA.

Since stack gas velocity varies with the square root of one over the stack gas molecular weight (see Equation 2-7 in Method 2), relatively large variations in O₂, CO₂, and moisture will have a fairly small impact on the calculation of gas velocity. Therefore, if gas composition and moisture data are only used for calculating stack gas molecular weight, collecting Method 3 and Method 4 samples with each Method 2 run is not necessary.

For gas monitor RATAs, however, moisture results are sometimes needed to convert CEM and reference method data to the same basis. In such instances, a one percent change in flue gas moisture content causes a one percent change in the CEM or reference method results. Since changes in stack gas moisture content can create a significant impact on corrected results and the outcome of performance tests, Method 4 samples must be collected with each set of reference method samples when the Method 4 results are used to correct CEM and reference method results to the same moisture basis. Note that if two gas RATA runs are able to be completed within the same hour (60 minute period), the results of a single Method 4 run, taken during the 60 minute period, may be applied to both RATA runs.

References: 40 CFR Part 60, Appendix A (RMs 2, 3, and 4)

History: First published in November 1993, Update #2; revised in October 1999 Revised Manual; revised in October 2003 Revised Manual