

8000C Method criteria
2/13/2007

This document was prepared by the Arizona lab licensure program for guidance purposes only. The laboratory staff must read SW846 Method 8000C to determine all the requirements of the method before running compliance samples.

1. Calibration

- a. A minimum of five different concentrations (11.4.1.1), and six standards for quadratic regressions (11.5.3.1).
- b. Isotope dilution model is applicable (11.4.4) for SIM GC/MS procedures, as well as extracted internal standards (11.4.5).
- c. The allowance for the use of the grand mean RSD to evaluate calibration linearity has been withdrawn and all target compounds should have RSDs less than or equal to 20% (Sec.9.3.1/11.5.1.3).
- d. Allowance for the use of the grand mean difference of all the analytes has been withdrawn (11.7), the difference or % drift calculated for the calibration verification standard must be within $\pm 20\%$ for each analyte (11.7).
- e. If the closing standard was outside of the acceptance limit, and the analyte was not detected in any of the previous samples during the analytical shift, then the sample extracts do not need to be reanalyzed (11.7.6).*
- f. Whichever calibration model is selected, it is recommended that the model be subjected to an additional check of re-fitting of the calibration data back to the model (Section 11.5.5) and the absolute value of the percent difference between these two amounts for every calibration level should be less than or equal to 20% (9.3.3/11.5.5.1).
- g. An initial calibration should be considered a single event process and a reanalysis of a calibration standard should be performed immediately to ensure that the reanalysis is still part of the original initial calibration event, e.g. within the same tuning period for a GC/MS method (11.5.5.2).
- h. If a standard is reanalyzed or a new standard is analyzed, then ALL of the results from the original analysis of the standard in question must be discarded (11.5.5.2).
- i. The practice of running additional standards at other concentrations and then picking only those results that meet the calibration acceptance criteria is EXPRESSLY PROHIBITED (11.5.5.2).
- j. It may be appropriate to force the regression through zero for some calibrations (11.5.2.1).
- k. For both linear and non-linear curves based on least squares regression calibration models, the correlation coefficient (also referred to as "r"), and the coefficient of determination (also referred to as "r²" or COD) must be ≥ 0.99 (9.3.2/11.5.2.2/11.5.3.2),
- l. The lowest concentration establishes the method quantitation limit MQL (11.4.1.2).
- m. If RSD is $\leq 20\%$, linear model can be used (11.5.1).
- n. Calibration factor (CF) may be calculated using the concentration of the standard rather than the mass in the denominator (11.4.2). **
- o. Response factors for GC/MS methods may be calculated using the sums of the areas of two ions for each target analyte and each internal standard (11.4.3).

2. Initial Demonstration of Capability

- a. Multiple laboratory performance data included in some referenced methods may be used for guidance for acceptable precision and accuracy (9.4.6).
- b. Interim limits $100 \pm 30\%$ may be used (9.4.9).
- c. In-house limits are strongly recommended (9.4.8).

3. Quality Control

- a. MS/sample duplicate or MS/MSD pairs must be analyzed with each preparation batch of up to every 20 samples (9.5).
- b. LCS with each extracted batch (9.5) and interim limits of $100 \pm 30\%$ (9.5.4).
- c. Matrix spike recoveries of $100 \pm 30\%$ is used as a guide to generate in-house limits (9.5.4).
- d. For surrogate recoveries, generate in-house limits (9.6.1).
- e. Method blank < lowest limit of detection, 5% of regulatory limit, or 5% of sample result for same analyte, whichever is greater (9.2.6.5).

4. Reporting

- a. When the sample results are confirmed using two dissimilar columns or with two dissimilar detectors, if one result is significantly higher (e.g., >40%), and if no anomalies are noted, then report the lower result (11.10.4.2).
- b. Moisture corrected reporting;
The results for solid samples may be reported on the basis of the wet weight (as received) or the moisture corrected sample concentration, and is ALWAYS a project-specific decision. Generally, it is recommended that the calculated concentrations of volatile organics samples that are solvent extracted in a water-miscible solvent such as methanol be corrected for the solvent/water dilution effect for situations when the sample moisture content is greater than 10%. The potential under reporting of volatile concentrations is more pronounced as the percent moisture content increases (9.9/11.10.5). ***

* *The results must be qualified, according to Arizona Rules.*

** *It is also assumed that the response factor may be calculated inversely, but note that some referenced determinative methods may require minimum calibration factors/response factors that would need to be addressed appropriately. 8260C has specific minimum RF values for several compounds (around 0.1), and if the lab is calculating RF by dividing concentration by response (instead of response by concentration), and they didn't consider the min RF values, it could falsely appear that they met the requirement.*

*** *Note that this is a significant change for most Arizona Projects, the labs must confirm with their clients if they require the moisture corrected results reported as well.*