Water Matrix Evaluation Reference Guide for ABRAXIS® Algal Toxin Test Strip Kits

Although water is often considered a single sample matrix, there are many important differences among water samples from different sources that must be recognized and taken into consideration in order to ensure optimal test performance and accuracy in test results. An example of this can be seen with freshwater and brackish/seawater samples. The salts found in brackish and seawater samples can cause matrix interference with some test types that does not occur when analyzing freshwater samples. It is therefore important to evaluate each individual sample prior to testing, to ensure that samples are being prepared and analyzed according to the appropriate procedure and using the correct test type in order to avoid matrix interferences and to ensure the accuracy of results.

Treated Drinking Water Samples (Finished Drinking Water)
Treated drinking water samples are freshwater samples and do not contain algal cells (any algal cells present in the source water are removed during the water treatment process). Treated water samples contain chlorine, which must be quenched immediately at the time of sample collection, as chlorine will degrade toxins, producing inaccurate, biased low sample results. Although many different reagents can effectively quench chlorine, the type of reagent that should be used will vary depending on the type of toxin being tested for and on the test kit being used. The use of an incompatible quenching reagent may affect the stability of the toxin or cause matrix interference during testing, so please refer to the specific instructions on sample quenching that are included in each of the different strip test user's guides (see the *Warnings and Precautions* and the *Sample Collection and Handling* sections).

Low to Moderate Biomass Freshwater Samples
Low to moderate biomass freshwater samples are surface water samples that contain low to moderate amounts of visible algae. When allowed to sit, visible algae may accumulate at the top of the sample (Fig. 1 below). Low to moderate biomass water samples should be shaken thoroughly to homogenize the sample prior to aliquoting for testing, in order to ensure that a truly representative sample aliquot is being tested (Fig. 2 below).

An example of the appearance of a low biomass freshwater sample is shown below:

Fig. 1 Sample with algal cells visible, accumulating at the top of the vial

Fig. 2 Sample after shaking to homogenize before testing

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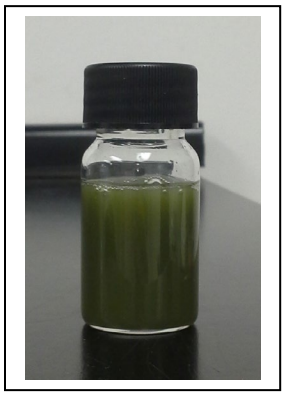
High Biomass Freshwater Samples

High biomass freshwater samples are surface water samples that contain exceptionally large amounts of visible algae, producing an opaque sample appearance. This type of sample may also be unusually thick or viscous. Due to the high density of algal cells, high biomass water samples may produce matrix interferences in strip testing. Matrix interference may be caused by the viscosity of the sample, which may slow or prevent the sample from wicking up the test strip, therefore slowing or preventing the development of test and/or control lines, or from interference from pigments and other cellular contents, which can also prevent full line intensity development. Water samples, which contain very high amounts of biomass, should be diluted 1:10 in distilled or deionized water prior to testing to remove matrix interference that could produce inaccurate results. To dilute samples, add 9 mL of distilled or deionized water to a clean glass vial. Thoroughly shake the high biomass sample to homogenize the sample, and then transfer 1 mL into the vial containing the 9 mL of distilled or deionized water. Shake the diluted sample thoroughly, then proceed with the procedure shown in the test kit user's guide (for example, if analyzing for Anatoxin-a, transfer 3 mL of the diluted sample to the preservation vial; if analyzing for Cylindrospermopsin, transfer 1 mL of the diluted sample to the lysis vial). Results for 1:10 diluted samples must be multiplied by a factor of 10 to obtain final sample results. An example of this using the Microcystins Strip Kit for Recreational Water with a test strip appearance that shows only a control line and no visible test line, corresponding to the ≥10 ppb appearance as shown on the user's guide, would have the final result of ≥100 ppb of Microcystins present in the original sample (≥10 ppb test strip result x dilution factor of 10 = ≥100 ppb final sample result).

An example of the appearance of a high biomass freshwater sample is shown below:



Brackish or Seawater Samples

Seawater samples have salinities in the range of 27-38 parts per thousand (‰). Brackish waters (also commonly referred to as estuary samples) are classified as those samples with salinities of >1 to <27‰. The ABRAXIS® test strip kits were developed for use with freshwater samples, such as freshwater lakes and reservoirs, which are classified, as have salinities of ≤0.1‰, and with finished drinking waters, which have salinities of ≤1‰. The salts found in brackish and seawater samples can cause matrix interference that can produce inaccurate sample results. Please see the user's guides for each strip test type for specific information on brackish and/or seawater compatibility or contact Gold Standard Diagnostics Technical Services for additional information and options for the analysis of brackish or seawater samples.

For ordering or technical assistance contact:

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