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WET Labs

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ECO Chlorophyll Fluorometer Characterization Sheet

Date: 01/20/06   Customer: University of Washington - School of Oceanography

Job #: 410001   S/N#: BB2FVMG-164

> Chlorophyll concentration expressed in µg/l can be derived using the equation:
>
> ## CHL (µg/l) = Scale Factor * (Output - Dark Counts)

Dark Counts	44 counts
Chl. Equivalent Concentration (CEC)	1020 counts
Scale Factor (SF)	0.0172 µg/l/count
Maximum Output	4121 counts
Resolution	2.0 counts
Ambient temperature during characterization	21.5 °C

Dark Counts: Signal output of the meter in clean water with black tape over detector.

CEC Signal output of the fluorometer when using a fluorescent proxy that has been determined to be approximately equivalent to 16.8 µg/l of a *Thalassiosira weissflogii* phytoplankton culture.

SF: Used to derive chlorophyll concentration from the signal output of the fluorometer. The scale factor is determined using the following equation: SF = 16.8 ÷ (CEC - dark counts). For example: 16.8 ÷ (2865 - 43.5) = 0.00595.

Maximum Output: Maximum signal output the fluorometer is capable of.

Resolution: Standard deviation of 1 minute of collected data.

The relationship between fluorescence and chlorophyll-a concentrations in-situ is highly variable. The scale factor listed on this document was determined using a mono-culture of phytoplankton (Thalassiosira weissflogii). The population was assumed to be reasonably healthy and the concentration was determined by using the absorption method. To accurately determine chlorophyll concentration using a fluorometer, you must perform secondary measurements on the populations of interest. This is typically done using extraction-based measurement techniques on discrete samples. For additional information on determining chlorophyll concentration see "Standard Methods for the Examination of Water and Wastewater" part 10200 H, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation.

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Scattering Meter Calibration Sheet

12/12/05   Customer: University of Washington - School of Oceanography
Wavelength: 470   S/N#: BB2FVMG-164   Job #: 410001   Tech: RW

Use the following equation to obtain "scaled" output values:

$$\beta(\theta c)\ m^{-1}\ sr^{-1} = \text{Scale Factor x (Output - Dark Counts)}$$

- **Scale Factor for 470 nm** = 1.19E-05 (counts)
- **Output** = meter reading (counts)
- **Dark Counts** = 42 (counts)

  Instrument Resolution = 2.3 (counts)   2.34E+00 $(m^{-1} sr^{-1})$

Definitions:

- **Scale Factor**: Calibration scale factor, $\beta(\theta c)$/counts. Refer to User's Guide for derivation.
- **Output**: Measured signal output of the scattering meter.
- **Dark Counts**: Signal obtained by covering detector with black tape and submersing sensor in water.

Instrument Resolution: Standard deviation of 1 minute of collected data.

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Scattering Meter Calibration Sheet

12/12/05   Customer: University of Washington - School of Oceanography
Wavelength: 700   S/N#: BB2FVMG-164   Job #: 410001   Tech: RW

Use the following equation to obtain "scaled" output values:

$$\beta(\theta c)\ m^{-1}\ sr^{-1} = \text{Scale Factor} \times (\text{Output} - \text{Dark Counts})$$

- **Scale Factor for 700 nm**   =   2.86E-06 (counts)
- **Output**   =   meter reading (counts)
- **Dark Counts**   =   45 (counts)

Instrument Resolution   =   1.5 (counts)   1.53E+00 $(m^{-1}\ sr^{-1})$

Definitions:

- **Scale Factor**: Calibration scale factor, $\beta(\theta c)$/counts. Refer to User's Guide for derivation.

- **Output**: Measured signal output of the scattering meter.

- **Dark Counts**: Signal obtained by covering detector with black tape and submersing sensor in water.

Instrument Resolution: Standard deviation of 1 minute of collected data.