

The Excitation-Emission-Matrix (EEM) data are collected with a Fluorolog-3[®] (FL-3) Research Spectrofluorometer. This instrument Includes:

- a 450 W ozone free Xenon source and power supply,
- a double Czerny-Turner excitation monochromator with a 1200 g/mm grating blazed at 330 nm,
- a double Czerny-Turner emission monochromator with a 1200 g/mm gratings blazed at 500 nm,
- a multi-alkali Photomultiplier Tube (PMT) emission detector (R928P) with photon counting electronics and an output range from 190 nm to 860 nm,
- computer controlled, continuously adjustable entrance and exit slits,
- a T-format sampling module with reflective optics and photodiode reference detector,
- a secondary single monochromator with 600 g/mm grating blazed at 1000 nm,
- an extended infrared capability with liquid nitrogen cooled InGaAs solid state detector with an output range from 1 μm to 1.5 μm at 77K (-196 °C), and
- a fiber optic sample chamber platform with a 2 m, bifurcated, randomized, fiber optic bundle.

The FL-3 spectrofluorometer is autocalibrating, upon initialization, based on a stored calibration file. However, as recommended, the accuracy of this file is checked on a regular schedule.

Unencumbered and non destructive fluorescence measurement of samples that do not fit standard accessories, loose granular materials, powders, or even liquids requires horizontal placement. This configuration is accomplished through the use of the fiber optic sample chamber platform, the bifurcated, fiber optic cable, and a special, extra large, light excluding chamber. This apparatus was used for the measurement of the Avian Technologies products provided. It was originally developed for the repetitive measurement of live plants undergoing long term stress treatments.