

## NDSA Calibration Standard

Turner Designs offers a deep UV optical sensor used to detect Refined Oils and/or Fuels in water. This sensor uses an LED light source to emit deep UV wavelengths that are absorbed by a specific Refined Oil or Fuel causing that compound to fluoresce. The fluorescence response is detected between 325 and 375 nm wavelengths and is proportional to the concentration of the Refined Oil or Fuel in water.

Typically, Refined Oils or Fuels don't exist in natural waters as isolate compounds. Rather, we see a mix of various compounds, all with varying fluorescence intensities. This makes it difficult to measure a specific Refined Oil or Fuel in a natural water sample or to distinguish among the various compounds, which all add to the bulk fluorescence measured, and challenging when deciding on the appropriate standard to use for the purpose of calibrating the sensor.

Most standards used to calibrate this sensor are toxic, extremely flammable and difficult to handle, and have strict regulations for disposal. To alleviate the risk and cost associated with handling hazardous materials for the purpose of standardizing deep UV fluorometers, Turner Designs recommends using NDSA [1,5-naphthalene disulfonic acid disodium salt, dihydrate (CAS# 76758-30-0)] as a calibration standard.

NDSA is a fluorescent compound that emits wavelengths between 300 and 400 nm when irradiated with deep UV (< 300 nm) light. It is safe to handle, easy to dilute, neither toxic nor flammable, not reactive with other compounds, and non-hazardous. NDSA is an ideal lab standard that can be used to standardize fluorometers configured for detection of Refined Oils or Fuels in water. Also, users who want to compare deep UV sensors either from the same or different manufacturers may be able to use NDSA so that values are reported as a standard unit of measure.

Below is a calibration curve generated from reading serial dilutions of NDSA using a Turner Designs Refined Fuels sensor. Typical linear range for a Refined Fuel's sensor is 0-5000 ppb NDSA, with a saturation point at 20,000 ppb NDSA.

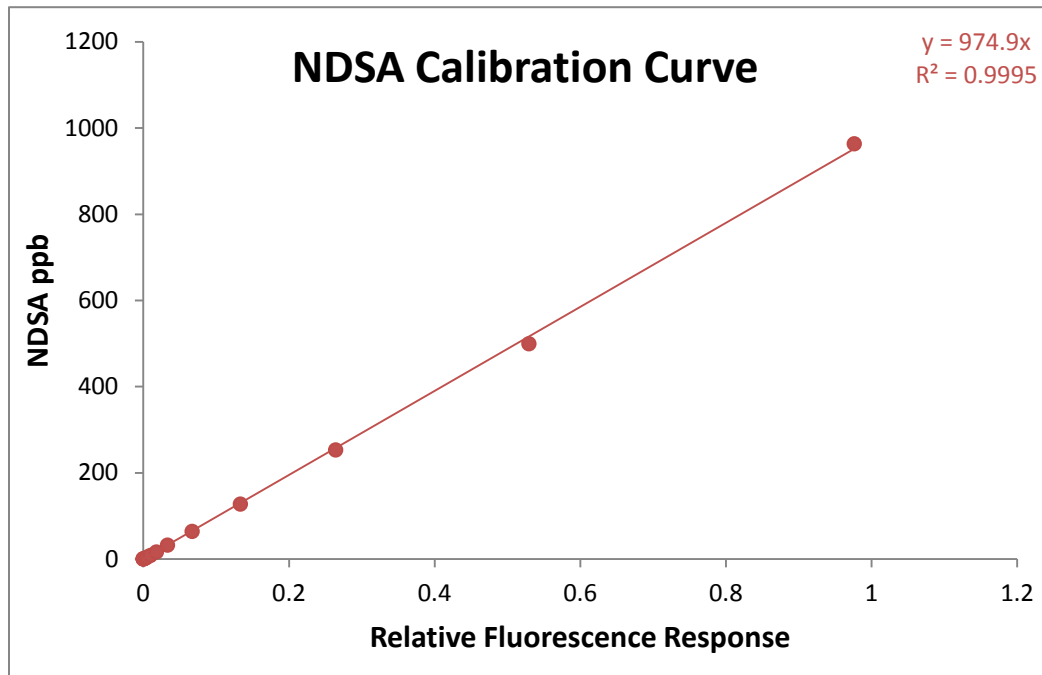


Figure 1: The figure to the right is an example of a calibration curve created from Cyclops Refined Fuel responses to serial dilutions of NDSA from 0-1000 ppb; Full Linear range is 0-5000 ppb.