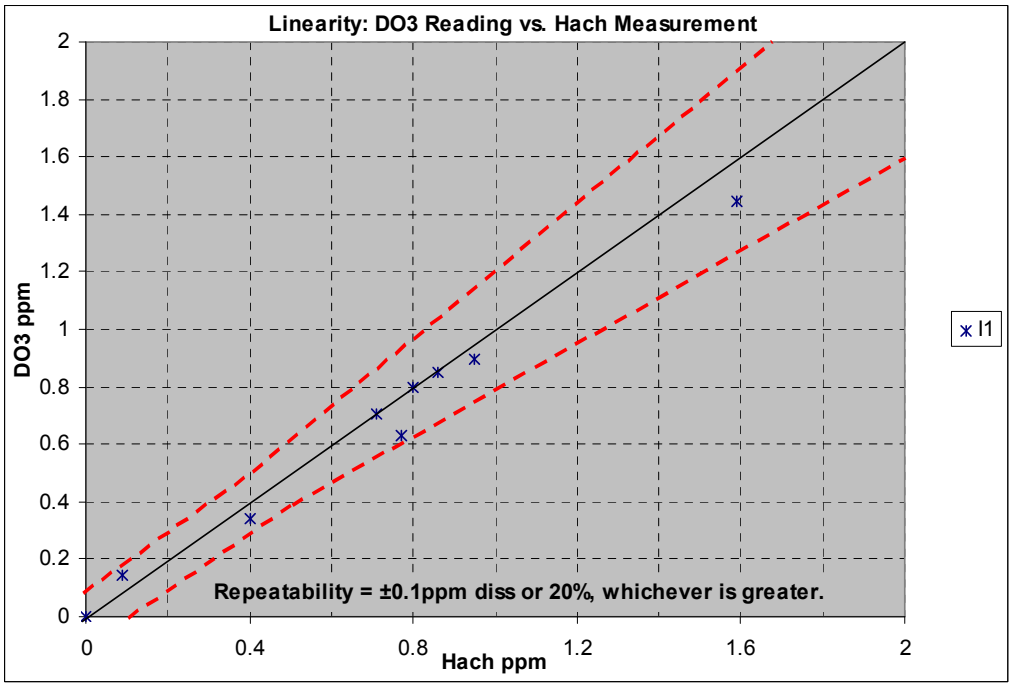
APPLICATION NOTE DO3-01:
Making Repeatable Measurements of Ozone in Water with DO3

The following data indicates the repeatability of the DO3 for measuring ozone in water under typical conditions. Test conditions were 65-75^{0}F, 35-65% RH. Municipal tap water, passed through a residential-grade sediment and chlorine-removal filter, was used as the feed water for the ozonator.

Repeatability: Based on a total of 18 measurements using 2 different instruments, the standard deviation was 11.2%. For a single instrument, 9 measurements, 1 STD = 7%. Concentrations measured ranged from 0.4 mg/L (ppm) to 1.5 mg/L. [3 St Dev = 21-33%].

Linearity: Measurements over the range 0.4 to 1.5 ppm were compared to the *Hach* indigo dye colorimetric method. Results are shown in the graph below:



There are several factors which will affect the accuracy of the DO3 ozone in water measurement:

i) Ozone is an extremely reactive compound, which is why it is such an effective cleaner/disinfenctant. This extreme reactivity, though, means that it is not very stable in air or water. Once produced. The ozone molecule has a typical lifetime of 15 minutes in clean air, and even shorter in water. The ozone will react with any compounds such as residual chlorine or VOCs in the water, rapidly removing it from the water once the ozone source is removed. *The quality of the feed water will not only affect the amount of ozone needed to create the desired dissolved ozone level, but also how rapidly the ozone is depleted from the grab sample collected for measurement with the DO3. If results are extremely variable, it may be due to varying chlorine, VOCs or other dissolved compounds which add to the "ozone demand" of the water.*

ii) Most ozonators inject the ozone into the water as extremely fine bubbles. While much of the ozone dissolves in a well-designed ozonator, there will be varying amounts of undissolved, or "entrained" ozone in bubbles in the water. This ozone may not contact the contaminants in the water, and also will quickly dissipate into the air once the water flows from the tap. It will be detected by the DO3, however, giving potentially high readings. *It is recommended that you let sample sit undisturbed in beaker for 30-60 seconds before pouring into 500 mL bottle, to allow entrained ozone to dissipate.*

iii) The temperature also affects the stability of ozone in the water. For best results, maintain the water temperature constant, between 65 and 75^0 F.

For this reason, the simple, convenient grab sample measurement made possible with the DO3 must be done carefully. The closer your conditions are to those at factory calibration, and the more carefully you time the measurement steps, the more repeatable your results will be.

Please Note: *While we certify that the DO3 was calibrated and verified to be within the tolerances given above when it left the factory, this does not guarantee the accuracy under the customer's environment. If you require more accurate results, we recommend you calibrate the DO3 with actual samples from your ozonated water system. [**Contact Eco Sensors Technical Support for guidance**.]*