

Step Change in Deepwater Oxygen Measurements with Improved Sensing Foil



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Oxygen is a prime parameter to measure in aquatic systems. Life and chemical balances depend on oxygen content. It is coupled with climate [change](#), and [eutrophication](#) and changes in oxygen have a direct impact on fish stocks and aquaculture.

When Aanderaa [introduced oxygen optodes](#) for aquatic investigations in 2002, the technical possibilities to measure O₂ were significantly improved with better long-term stability and reliability reflected in more than 200 [scientific papers](#).

After more than 10 years of experience on thousands of shallow water optodes ([4531](#), [5730](#), [4835](#)) we now introduce the FDO701 sensing foils as an improved alternative also for deepwater measurements, using [4330](#) and [4831](#) optodes. This technology was developed in Xylem, targeting the rough conditions encountered in water treatment plants.

Compared to the [PSt3](#) foils, that have so far been used on most [deep water optodes](#), the FDO701 foils are more rugged, a factor of 2-3 more stable and less affected by pressure, figure 1 and 2). Further, they show no dry-out/wetting effects and can detect trace amounts (nM) of oxygen in low-oxygen environments.

Aanderaa Optodes are fitted with pre-burned foils and automatically calibrated in 40-points (8 O₂-concentrations at 5 temperatures, figure 3). For referencing, three fully Winkler calibrated optodes are used to ensure the sensors fulfill the highest standards for accuracy.



Figure 1: Pressure testing system. A. SeaGuard logger. B. Sensors in test water. C. Stirrer for incubator water mixing.

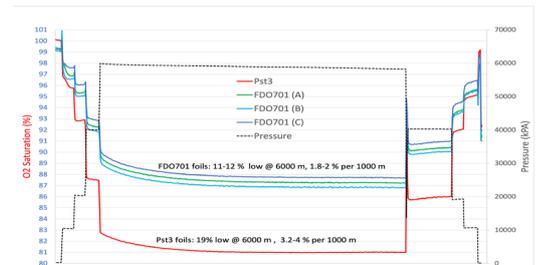


Figure 2: Short-term pressure effects on Pst3 and FDO701 foils.

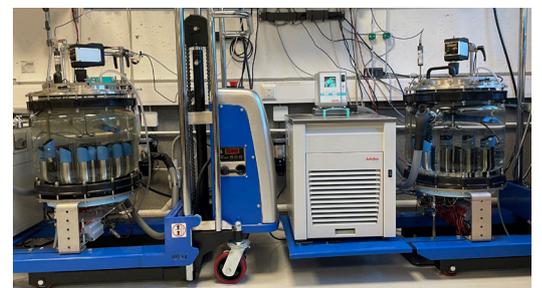


Figure 3: Oxygen multipoint calibration systems at Aanderaa