

Alyza IQ PO₄ on wastewater treatment plants of different sizes

Since its launch, the new Alyza IQ PO₄ has been used in wastewater treatment plants of various sizes. For three of these plants we present comparisons between the measured values of the analyzer and laboratory tests carried out in parallel. All three cases show a very high level of agreement, thus proving the high measurement accuracy of the Alyza IQ PO₄.

Example 1: Wastewater treatment plant in Tyrol (Austria)

The first example is a plant in the Austrian province of Tyrol. The treatment plant has a size of about 170,000 population equivalents (PE). It is equipped with a mechanical, a biological and a chemical treatment station. In addition, the plant has an anammox basin and a sludge treatment system consisting of various thickeners and centrifuges.

The Alyza IQ PO₄ takes samples at the beginning of the low load biology tank and is being tested there for its suitability in this application.

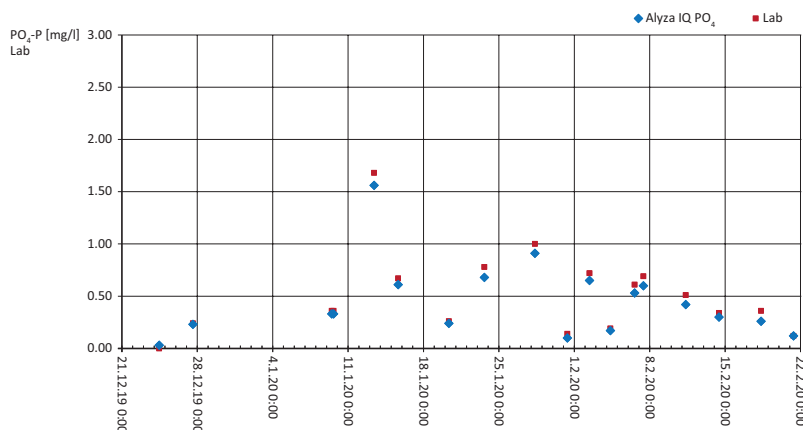


Figure 1: Measured values of the Alyza IQ PO₄ (blue) and corresponding laboratory values (red) in the period from the end of December 2019 until the end of February 2020.

Data evaluation: Figure 1 shows 17 comparative values between Alyza IQ PO₄ (blue) and laboratory (red) for a period from the end of December 2019 to the end of February 2020, with measured values varying between 0.03 mg/l PO₄-P and 1.7 mg/l PO₄-P. To further illustrate the high measurement accuracy of the analyzer, Figure 2 shows a linear regression for these data points.

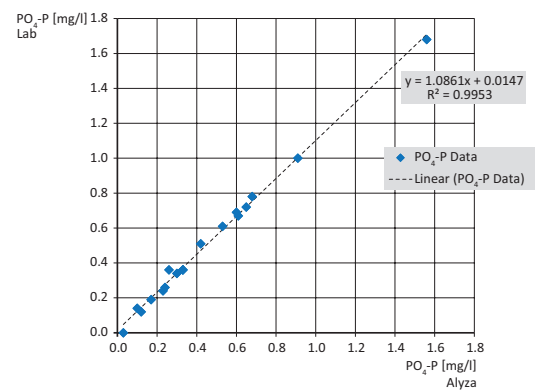


Figure 2: Linear regression of the value pairs with a coefficient of determination greater than 0.99.

The measured values of the analyzer thus correlate almost 100 percent with the laboratory values.

Example 2: Wastewater treatment plant in Upper Bavaria (Germany)

In this case, the plant is designed for 40.000 PE. The mechanical stage is followed by a biological one with two lines and finally the chemical purification. The sludge is stored in silos and processed by a mobile sludge treatment plant.

The two-channel unit is sampling before and after the precipitant dosage at the outlet of the biological treatment.

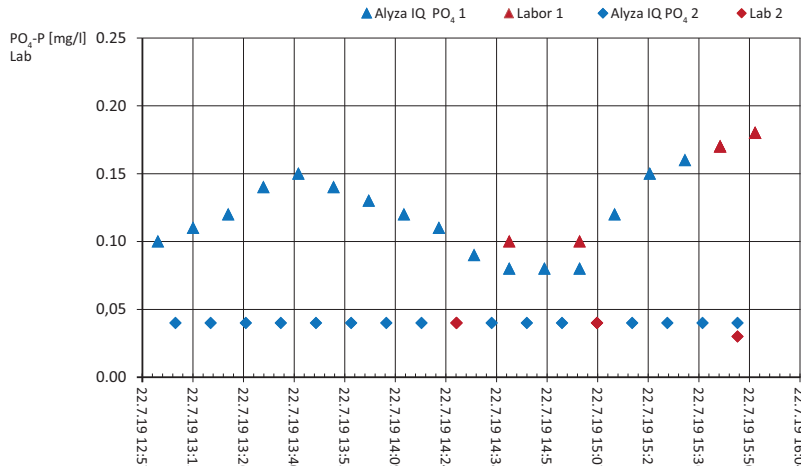


Figure 3: Measured values of Alyza IQ PO₄ (blue) and corresponding laboratory values (red) on 22.07.2019.

Data evaluation: Figure 3 shows the concentrations of both sample streams of the Alyza IQ PO₄ of July 22, 2019, which are lower than those of the other two systems (always below 0.2 mg/l PO₄-P). The upper measurement series (blue triangles) shows the concentrations before the precipitation stage, the lower measurement series (blue diamonds) corresponds to the samples taken after the precipitation stage. In addition, the corresponding laboratory values are shown in the same symbolism (red).

Example 3: Wastewater treatment plant in the Allgäu region (Germany)

The third example also shows a wastewater treatment plant in southern Germany with a size of 15,000 PE. In addition to a mechanical, biological and chemical treatment, a thickener for sludge treatment is also operated.

The sampling location and reason for operation of the single-channel unit are as well the monitoring of the biological stage and the control of precipitant dosage.

Data evaluation: The data were collected between November 2019 and February 2020 and range from 0.3 mg/l PO₄-P to just below 1 mg/l PO₄-P.

Conclusion:

The results show that the Alyza IQ PO₄ is suitable for measuring PO₄ on wastewater treatment plants of various sizes. In addition to the high data quality shown in this report, the Alyza also convinces with its low reagent consumption, easy handling and integrated diagnostic functions.

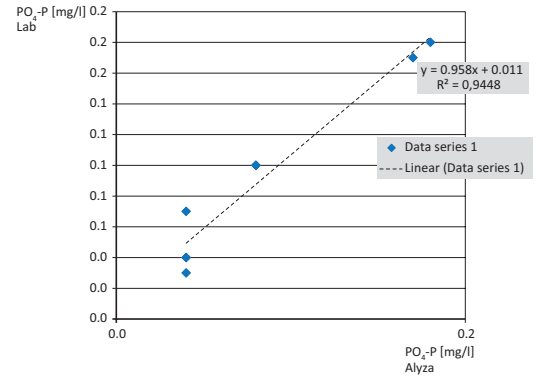


Figure 4: Linear regression of the pairs of measured values from Figure 3 with a coefficient of determination greater than 0.94. Figure

The regression line in Figure 4 shows a very high coefficient of determination with $R^2 > 0.94$. Although the value is smaller than in the other two plants, this is an outstanding result considering the low concentrations.

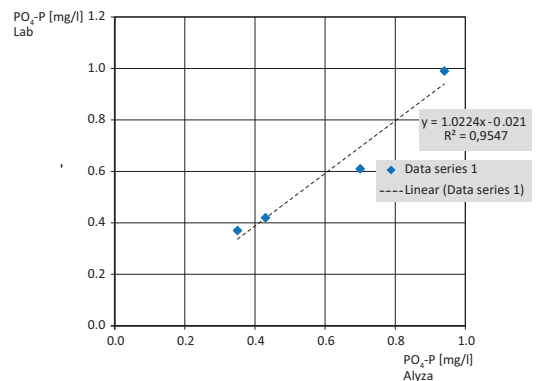


Figure 5: Linear regression of the pairs of measured values with a coefficient of determination greater than 0.95.

Figure 5 shows the regression line with a coefficient of determination $R^2 > 0.95$. The measured values of the Alyza IQ PO₄ therefore correlate with the laboratory measured values very well.

Practical tips for laboratory tests:

- Sample at the outlet of the Alyza IQ overflow vessel
- If possible, take the laboratory sample at the same time as the Alyza IQ measurement (observe the measuring interval)
- Analyze the sample in the laboratory as soon as possible, immediately after taking it (sample does not have to be filtered again)
- Perform at least a double, better a triple determination of the PO₄-P value (to identify and eliminate outliers)
- Calculate arithmetic mean of the laboratory values
- Use WTW test sets P6/25 and P7/25 (blue method) or 14546 and 14842 (yellow method)

Common mistakes:

- Sampling at a location other than the overflow vessel
- Determination of the laboratory value from a non-equivalent sample (e.g. two-hour composite sample)
- Limited or imprecise laboratory analysis



A202001

Do you have further questions?
Please contact our
Customer Care Center:

Xylem Analytics Germany Sales
GmbH & Co. KG, WTW
Am Achalaich 11
82362 Weilheim, Germany
Phone +49 881 1830
Fax +49 881 183-420
Info.WTW@xylem.com