

OXYGEN IN FISH FARMING

iStock.com/Vaara


 O₂

CASE STUDY

FORELLENHOF SIGL IN AUSTRIA: SELF-GENERATED OXYGEN AS A FACTOR FOR SUCCESS IN FISH FARMING

Forellenhof Sigl has been active in controlled fish farming since 1975. However, the rising temperatures in summer are making it increasingly difficult to keep fish in natural ponds due to the reduced oxygen uptake of the water. Only through the introduction of pure oxygen is it possible to ensure the desired stocking density and sufficient feed uptake by the fish as well as prevent diseases. An INMATEC oxygen generator generates such oxygen in an environmentally friendly manner on-site and provides exactly the right amount of oxygen at all times.

Sigl fish farm is located in St. Veit an der Gölsen near Vienna, Austria. Up to roughly seven tons of rainbow trout and char are farmed every year in several breeding tanks and holding tanks, a hatchery and eight natural ponds. The requisite water is obtained from the passing Wobach river and several wells. In this regard, aquafarming has become more difficult within pond farming in recent years. For instance, the average temperatures in the stagnant open-air waters are rising steadily. These days, the temperature of the Sigl fish ponds in summer can be up to roughly 20 degrees Celsius. This is an enormous problem for controlled

fish farming and keeping. Rising water temperatures mean decreasing oxygen saturation. This is a measurement for the amount of oxygen dissolved in the water and should ideally be between 7 and 10 mg/l (100% saturation). Insufficient oxygen saturation of the water leads to lower stocking density, lower fish growth and declining production numbers in fish farms. It also promotes the development of diseases in the fish. Conventional methods for pond ventilation bring ambient air into the ponds via various devices such as injector, propeller and paddle-wheel aerators or blowers. As the oxygen content of the air is only 21%, such a per-

centage is not sufficient to ensure adequate oxygen saturation at high water temperatures. In addition, the requisite energy expenditure increases enormously from a water temperature of 15 degrees Celsius.

As a solution to this problem, Forellenhof Sigl took the decision to use an INMATEC oxygen generator to ventilate all of the tanks and ponds. To this end, the IMT PO 2150 presses air from the environment into two adsorption vessels in alternation. These vessels are filled with a zeolite molecular sieve and switch successively from filter mode to regeneration mode. The nitrogen



and carbon dioxide molecules contained in the air are adsorbed in the strainer in one vessel, while the strainer regenerates in the second vessel under compressed air relief. The oxygen obtained in this way has a purity of 90% and is guided into a product vessel where it is then available for ventilation of the fish farm. The oxygen generator, housed in a steel container, supplies up to 5.4 Nm³ of oxygen per hour and produces it as needed. Together with numerous sensors in the water for measuring oxygen saturation, the rearing tanks are supplied via ceramic vents and the ponds are supplied via special O₂ input devices. All in all, the exact

amount of oxygen required is automatically guided into the respective tanks via a 90-metre pipe system. This ensures that oxygen saturation, which depends on the temperature as well as atmospheric pressure, can always be kept at a constant level.

„Needs-based enrichment with pure oxygen makes our work in fish farming much easier. After each feeding, the oxygen uptake of the fish increases rapidly, as they consume more oxygen due to increased metabolic processes. In summer, we would not be able to meet the increased oxygen needs at all using conventional ventilation methods. The

INMATEC oxygen generator also compensates for temperature fluctuations - which regularly lead to oxygen fluctuations in the tanks - without any problems and ensures optimum oxygen saturation. The pure oxygen dissolved in the water offers us many advantages. This improves feed uptake and we go through less feed. In addition, we don't need to use antibiotics as a means of preventing diseases. Our fish are healthy and are showing signs of very good growth. All in all, we are able to say that the oxygen we produce ourselves is a factor in the success of our fish farming”, says Dieter Sigl of Forellenhof Sigl.



Image 1: The IMT PO 2150 oxygen generator used enables continuous measurement and monitoring of all operating values and supplies oxygen with a purity of up to 95%. The L touch control panel lets you comfortably read the logged data for all relevant operating values.



THE PONDS AT FORELLENHOF SIGL ARE VENTILATED WITH OXYGEN THAT IS PRODUCED ON THE FARM. THIS ENSURES A HIGH LEVEL OF OXYGEN SATURATION AND OPTIMUM CONDITIONS FOR FARMING TROUT AND CHAR.

Image 2: Pond farming is the most widespread form of aquaculture in Europe. Pond farming Forellenhof Sigl in St. Veit an der Gölzen near Vienna, Austria.

