



Using gases to create optimum conditions for fish farming

Overfishing of our oceans and seas is a serious ecological problem. To keep up with global demand, fish for human consumption has to be raised commercially. Pure oxygen helps keep fish healthier and raise stocks.

Overfishing – a threat to natural fish stocks

The food industry has seen sales of fresh fish products soar in recent years, reflecting the steady increase in annual fish consumption. According to the German Fish Information Centre (FIZ), German citizens consumed an average 16 kilograms of fish per capita in 2008 – a new all-time high. However, rising fish consumption is not just a national trend but a global phenomenon.

All of which has had devastating consequences for the world's natural fish population. Around 80 percent of fish stocks are now endangered as a result of overfishing. Fish farming has therefore become increasingly important in recent years, filling the gap between global supply and demand.

And it is here that the injection of pure oxygen plays a crucial role as the gas is vital for ensuring healthy fish growth. Consistent oxygen levels enable fish to digest their food more efficiently. In contrast, excessive fluctuations in oxygen content lead to slower growth levels and higher disease rates. So when it comes to creating ideal fish farming conditions, sophisticated technology is a must.

End-to-end systems for low-impact fish farming

Linde's technical solutions for oxygen injection are carefully developed and can be deployed for salt-, fresh- and brackwater breeds. At our test and development centre in Ålesund on the coast of Norway, we gained valuable insights into the behaviour of gases in water, supplementing our experiences thus far through close collaboration with Europe's leading fish farms.

We then used these findings to develop end-to-end systems for the continually growing aquaculture market. From the gas itself through oxygen injection technology to software for optimizing breeding conditions, these highly specialized solutions guarantee optimum levels of gas in the water, thus ensuring a controlled, healthy environment for fish and successful yields.

Optimum oxygen levels, however, cannot entirely eliminate the threat of disease for fish stocks. Linde has therefore developed a further process to counter this risk. It involves treating water with ozone before it is pumped into the breeding pools. This process kills germs and spores in the water without the need for antibiotics or similar substances. It is also safe for the environment as the greenhouse gas ozone automatically changes to oxygen once it has been released.

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