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For any inquiries about our services, products, or references, or if you'd like to discover the potential for collaboration, please feel free to reach out to us.

NORTH AquaCulture

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North AquaCulture Deliverables

North AquaCulture offers comprehensive consulting and support services to clients and investors engaged in new or ongoing land-based aquaculture projects. We proudly serve as a client representative throughout the lifecycle of each project.

We specialize in the **design, prefabrication, installation, and biological maintenance** of your facility. Our team provide guidance during all project phases, from concept and design to installation and commissioning.

Our **site management services** which include pipe installation and assembly of mechanical equipment, are executed by some of the industry's most experienced installation teams.

We also provide **prefabrication and delivery of custom-made products** for various systems. Our products are tailored to meet performance requirements and customer needs.

North AquaCulture Team

North AquaCulture was founded in 2021 and has 40 employees

The company was established by a team with over 10 years of experience in designing and construction of land-based fish farms. The team has participated in several of the largest RAS projects in Norway over the past 10 years, covering different phases such as hatcheries, smolt, post-smolt and grow-out facilities.

Our team consists of project engineers, biologists, project managers, technical designers, site managers, installers, and other professionals with extensive expertise in land-based aquaculture technology and several years of experience in their respective fields. Their backgrounds enable us to customize our deliveries and solutions to your specific needs, ensuring performance requirements and project goals are achieved through close collaboration during the design, construction and operational phase of each project.

Ongoing and completed projects:

- 3600-ton grow-out RAS facility (Skagen Salmon, North Denmark)
- Biofilter Module for existing post-smolt facility (Lerøy, West Norway)
- Incubation facility (Scotland) and Hatchery facility (North Norway)
- Energy Central (Mid Norway) and RAS Test Facility (North Denmark)



Incubation and Hatchery

What is Incubation/Hatchery? In this phase, salmon embryos are nurtured until they hatch into alevins, prior to the smolt phase. The aim is to maximize hatching rates and develop robust, high-quality juveniles.

RAS for Incubation/Hatchery. RAS facilities in this phase use filtration and disinfection technologies to provide optimal water conditions. This stage requires low-light conditions and unlike later stages, doesn't require feeding due to nutrients supplied by the alevins attached yolk sac.



- **Early-Stage Development**

Hatchery and incubation systems allow for careful genetic selection, fostering the production of high-quality fish with desirable traits.



- **Biosecurity and Monitoring**

Eggs and alevins, being vulnerable to diseases and parasites, benefit from controlled environments and strict monitoring practices, reducing operational risk and enhancing overall health.



Temperature Regulation System

Core Components

Incubation Units. These provide optimal conditions for egg incubation and alevin rearing, ensuring safe fish transportation and waste removal for optimal growth.

Intake Water System. The MFX 2x3 Dual Version membrane filter combined with pre-filtering and UV treatment ensures high-quality intake water by removing fine particles and micro-organisms.

Partnership and Collaboration. Our strategic collaborations with leading suppliers enhance the success of your hatchery and incubation.

Temperature Control. Maintaining accurate temperature levels is crucial during this phase. It directly impacts hatching rates and the overall health of the developing embryos.



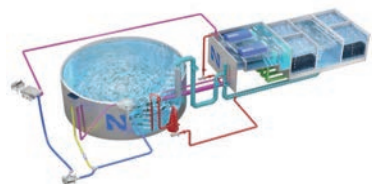
Smolt and Post-Smolt

What is Smolt/Post-smolt? This phase signifies the crucial stage of salmon development during smoltification and post-smoltification, where salmon acclimate to seawater conditions before transfer to Grow-Out facilities or sea-based net pens.

RAS for Smolt/Post-Smolt. RAS facilities in this phase use advanced filtration systems and carefully control conditions to promote smoltification. The system supports gradual adaptation to saltwater and accommodates increased feeding rates during this transition.

Optimizing Production. Precise feeding regimes, growth tracking, and overall operational efficiency is achieved by using automated management systems to optimize production.

Feeding Systems. In collaboration with our partners, we offer feeding systems delivering balanced nutrition promptly and sufficiently, fostering this rapid growth phase.

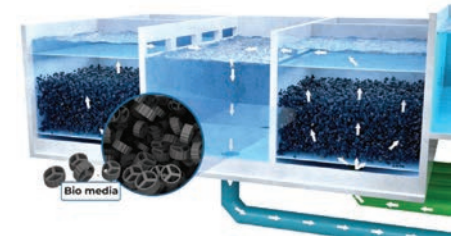


Post-Smolt RAS Facility (North AquaCulture)

Core Components

Biofiltration in Smolt Phase.

Biofiltration plays a vital role at this stage, efficiently removing ammonia and nitrite, ensuring optimal water conditions for smolt development. We offer fixed-bed, moving-bed biofilter, or a hybrid model.



Biofilter System

Degassing Systems. Degassing is an important aspect of the smolt phase, removing harmful gases from the water to ensure optimal water quality for the healthy development of smolt.



NAC RAS type 1

Lighting Systems. Light is used to control the smoltification process, mimicking natural light patterns to prepare smolts for the grow-out phase.

Salinity Control. Effective salinity control is used with systems gradually increasing salt concentration to help smolts adapt smoothly to future saltwater conditions.



Grow-Out and Purge

What is Grow-Out Salmon? Grow-out production focuses on nurturing and growing smolt salmon until they reach market size. The aim is to ensure a healthy transition to full maturity, leading to the 'purge' stage before harvest, where the fish are starved to clear their digestive system.

RAS for Grow-Out and Purge

In this phase, RAS facilities implement advanced filtration, aeration, and control systems to support the healthy growth and well-being of the maturing salmon, ensuring optimal conditions also during the purge stage.

Waste Management

With the increase in feed and biomass, effective waste management becomes even more critical. Our waste management systems, including sludge treatment systems, are designed to proficiently eliminate both solid and dissolved waste. This ensures a clean, safe environment for the growing salmon and enables further waste management beyond the system itself.



Grow-Out (Skagen Salmon)



Grow-Out (Skagen Salmon)

Core Components

Oxygenation Systems

Ensuring sufficient oxygen levels in the water is critical during the Grow-Out phase. Our oxygenation systems are designed to maintain optimal conditions for high-density stocks of salmon, also during the purge stage.



Oxygen Cones & In-Line Oxygenation



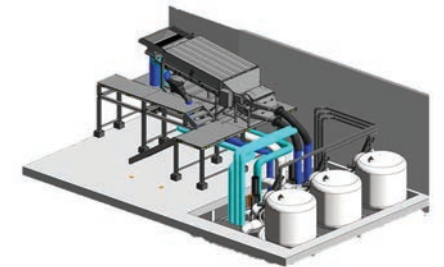
Proteinskimmer /w Ozone Injection

Protein Skimmers and Ozone

In the Grow-Out phase, protein skimmers and ozone systems work in tandem to maintain optimal water conditions. Protein skimmers remove organic waste materials while ozone systems efficiently disinfect the water, ensuring a conducive environment for salmon growth and health through the Grow-Out phase.

Transportation and Grading

Efficient fish transport and grading systems are crucial during the Grow-Out phase. Our systems ensure safe and stress-free transportation of the salmon, while effective grading facilitates optimal fish distribution and management, all the way up to and during the purge stage.

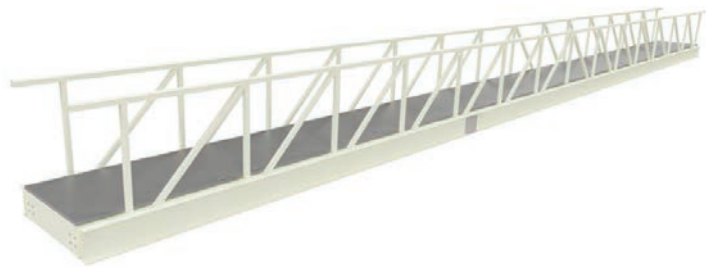


Transportation and Grading System



Products

We offer design and construction of customized walkways and platforms for various applications in your aquaculture facility. Our team handles all structural and strength calculations.



- **GRP Walkway tailored for your aquaculture system**

Whether you require a 14.5-meter or an 18.31-meter solution, our walkways are designed for inspection and oversight in various areas of your facility. Engineered with durability and safety in mind, these walkways provide reliable access for observing tank systems.



- **Mid-Walkway Support**

The steel Mid-Walkway Support offers a robust and dependable structural support specifically for the central sections of walkways, catwalks, and platforms within an aquaculture system.



- **End-Walkway Support**

The steel End-Walkway Support is designed to provide strong and reliable structural support at the end of walkways, catwalks, and platforms throughout an aquaculture system.



- **PE Fix BED Ø3300**

The add-on fixed-bed and degasser module is a space-saving solution, tailored for integration into new or existing land-based aquaculture facilities. This scalable unit can handle 50-300 kg of feed daily for each filter and is adaptable to various aquaculture systems, including FTS-R and RAS.



- **Grading Plug**

The grading plug is a device used within the tank system to manage and control the transportation of fish through the center outlet. Its function is to serve as a barrier or gate that can be selectively opened or closed.