

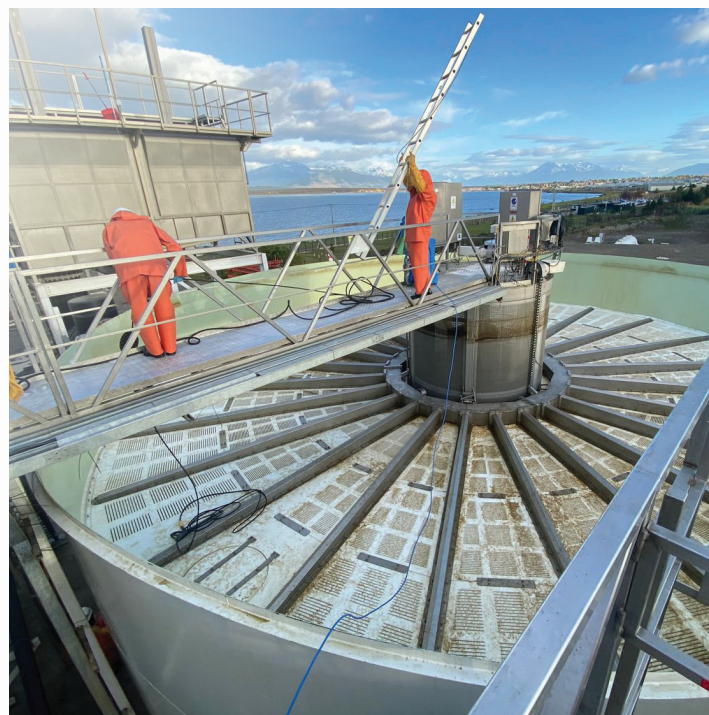


MAXIMIZING EFFICIENCY AT A SALMON PROCESSING PLANT: 63% Oxygen Savings, Higher Load Density, and Better Fish Welfare

Customer: Australis Mar S.A.

Location:	Type of application:	Unit Type:	Dates:	Results:
Dumestre Plant, Puerto Natales, Chile	Holding Tanks 1000 m ³	Two Trinity L1	October 2024	<ul style="list-style-type: none"> • 63% Reduction in Oxygen Use • ROI Based on O2 Savings: < 6 months • Improved fish welfare and quality • Increased Load Density to 120 kg/m³

The Dumestre salmon processing plant is a state-of-the-art facility and one of only two in Chile with on-land holding tanks. As the country's first large-scale smart processing plant, it has an annual processing capacity of 72,000 tons. The facility has four 1,000 m³ holding tanks for the reception of live fish.



Maximizing Production with Existing Resources

Australis Mar S.A. faced a critical challenge common in the aquaculture industry: how to increase holding capacity within existing facilities while maintaining optimal fish welfare and reducing oxygenation costs. With the Dumestre Plant being one of the most advanced salmon processing plants in the world, the company needed a more adaptive and efficient oxygenation system to respond to the dynamic conditions typical of high-performance aquaculture

operations. Variations in water temperature, fish size, biomass density, and stress levels made it increasingly difficult to meet production targets while safeguarding fish health and product quality. The company aimed to replace its conventional Venturi oxygenation system with a more effective, responsive solution—one that could deliver superior oxygen transfer efficiency, greater stability, and enhanced fish welfare. The company turned to Moleaer's advanced nanobubble technology as a path to increased operational efficiency, reduced costs, and improved outcomes across the board.

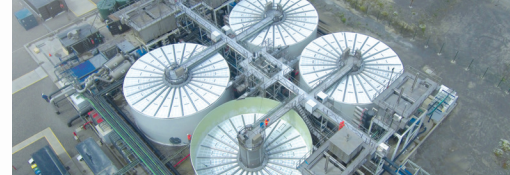
Integrating and Testing Moleaer Nanobubbles for Oxygenation System

Historically, the maximum sustainable biomass density achieved was around 90 kg/m³ which required over 500 SLPM oxygen injected via two Venturis.

Two Trinity L1 nanobubble generators were seamlessly integrated in one of the plant's 1,000 m³ holding tanks, replacing the two previous Venturi systems. Moleaer technology used the same pumps and piping, making it a seamless transition while meeting the required oxygenation levels. The goal was to increase dissolved oxygen to support greater load density, while improving oxygen and reducing energy costs.



Trinity Nanobubble Generators



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Unprecedented Efficiency and Healthier Fish

Over 24-to-48-hour testing periods, Moleaer nanobubbles demonstrated significant performance improvements. Oxygen consumption was reduced by 63% while achieving optimal dissolved oxygen (DO) levels. Additionally, the technology supported a critical improvement in achievable stocking densities of 120 kg/m³ (120 tons per tank), an improvement over the control tank using the traditional Venturi system.

Beyond oxygen savings, the benefits were notable in the water quality and fish welfare. CO₂ levels in the tank remained stable and according to José Luis Requeros, Manager at the Dumestre Plant:

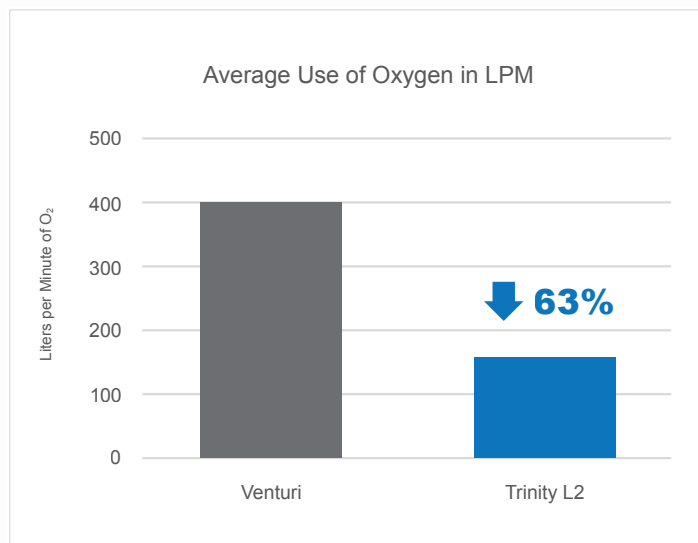
“The CO₂ inside the tank remains much more stable compared to the conventional system, and the fish appeared more relaxed.”

The fish also displayed firmer scales and less flaking, a direct result of improved water conditions and enhanced aeration. These observations indicated healthier fish, crucial for both the welfare of the fish and the quality of the final product.

A Solution for Sustainable Growth

By integrating Moleaer nanobubble technology, Australis Mar S.A. successfully increased their operational efficiency while improving fish welfare. The technology enabled a higher load density, reduced oxygen costs, and led to healthier fish – all while maintaining a sustainable operation. Moleaer’s unique ability to improve oxygen transfer and water quality, while preventing biofilm and organic buildup, adds long-term value by enhancing filtration and reducing the risk of disease.

Moleaer nanobubble technology enabled Australis to increase the load at their existing plant, more cost-effectively and sustainably, while improving fish health and welfare.



Average Oxygen Use Venturi vs. Moleaer



Read more about how nanobubbles help in aquaculture:
www.moleaer.com/industries/aquaculture

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