

WORLD-CLASS FISHMEAL AND FISH OIL PLANTS

Maximising value from marine raw materials



Turning marine raw materials into maximum value

Fishmeal and fish oil production requires efficient processing, controlled conditions, and reliable operation across varying raw material quality. Fjell Technology Group delivers complete processing solutions designed to optimize each stage of the process.



- 1 Maximised Yield and Profit**
 Rapid Return of Investment (ROI). Optimised process design and best available technology ensure production of high-quality fishmeal (>70 % protein) and premium oil.
- 2 Energy-efficient Operation**
 Integrated heat recovery and a patented energy-optimized process design can reduce overall energy demand. Energy consumption can be < 200 kWh per tonne of raw material.
- 3 Automated and Consistent Product Quality**
 Controlled processing conditions ensure stable and predictable product quality. Fully automated system with minimal supervision required.
- 4 Robust and Reliable Performance**
 Designed for continuous industrial and reliable operation with high uptime.
- 5 Tailored Process Solutions**
 Each plant is engineered based on raw material characteristics, capacity needs and site-specific requirements.

We deliver complete, tailor-made solutions for both onboard and land-based fishmeal and fish oil production.

Land-based Processing Solutions

- Scalable solutions for large capacities.
- Optimized energy and heat recovery.
- Fully automated and stable operation.

Why

choose Fjell Technology Group?

Fjell Technology Group combines long experience with advanced process engineering to deliver reliable and efficient fishmeal and fish oil production plants.

• We Offer Operational Performance

- High-quality fishmeal (> 70 % protein) and premium oil produced.
- Reduced energy consumption through optimized design.
- Stable operation and high uptime.
- Based on decades of operational experience.
- High-quality materials & Long equipment lifetime.
- Predictable and low maintenance costs. (Average 1-2% of CAPEX per year).

• We Deliver Engineering Expertise

- More than 45 years of experience.
- Proven processing technology in demanding industrial environments.
- Advanced drying solutions.
- Turnkey delivery and complete EPC* capability.
- Scalability - covering the full range, from onboard trawlers to large onshore plants.
- International project experience.
- Supported by Trusted, local partners for after-sale service and maintenance.

*EPC Engineering, Procurement, Construction

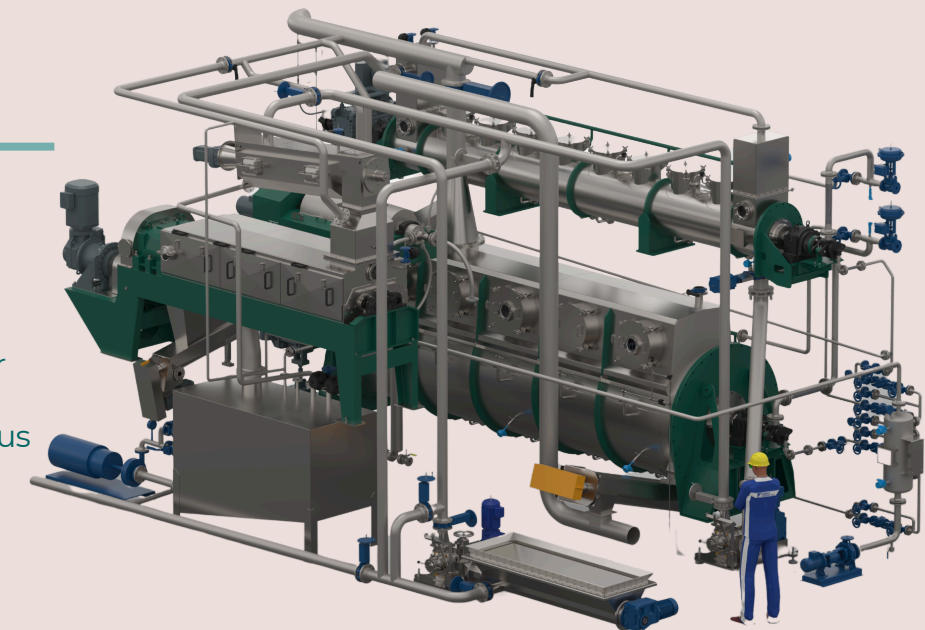


Premium quality milled fishmeal and fish oil from one of Fjell's reference plants

Customized to a maritime environment

Onboard processing

- Compact and space-efficient design.
- Robust operation under variable conditions.
- Optimized for continuous production at sea.

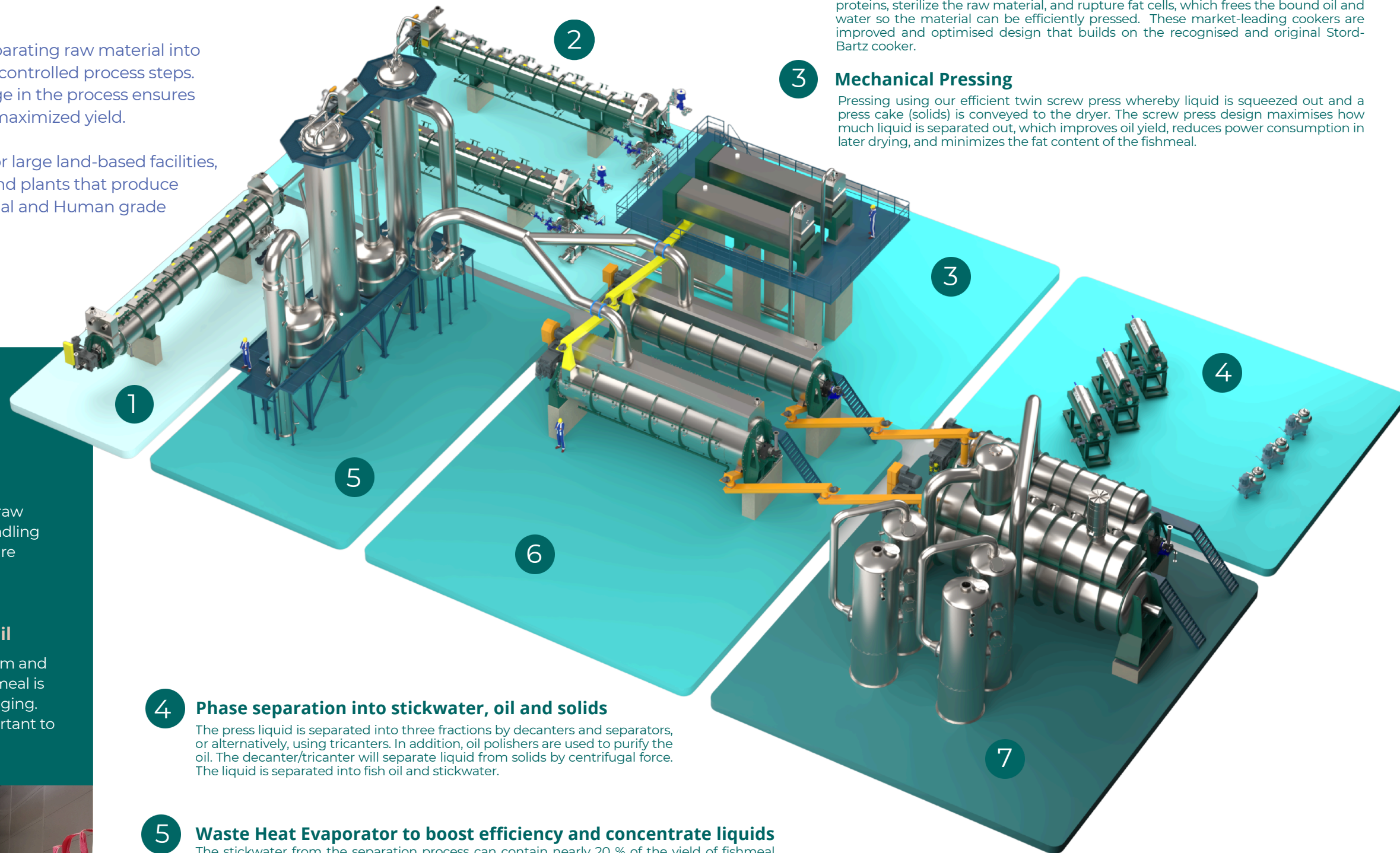


Production Step-by-Step

From raw materials to high value products

Fishmeal and fish oil production is based on separating raw material into solid, oil and water fractions through a series of controlled process steps. Careful control and optimal design of every stage in the process ensures energy efficiency, optimal product quality and maximized yield.

Our experience spans from processing plants for large land-based facilities, smaller, compact onboard factories (trawlers) and plants that produce premium quality fishmeal and oil for both Animal and Human grade applications.



- 1 Pre-cooking**
Energy-efficient and gentle pre-cooking by means of heat recovery and hot water using our own Pre-cooker design .
- 2 Cooking releases oil and prepares material for separation**
Cooking in Fjell's steam-heated single or double-stage screw cookers coagulate proteins, sterilize the raw material, and rupture fat cells, which frees the bound oil and water so the material can be efficiently pressed. These market-leading cookers are improved and optimised design that builds on the recognised and original Stord-Bartz cooker.
- 3 Mechanical Pressing**
Pressing using our efficient twin screw press whereby liquid is squeezed out and a press cake (solids) is conveyed to the dryer. The screw press design maximises how much liquid is separated out, which improves oil yield, reduces power consumption in later drying, and minimizes the fat content of the fishmeal.

Quality in every stage

- from Raw material to Storage

Raw material

The efficiency and quality of fishmeal and fish oil production are directly linked to the quality of the raw material. Maintaining freshness and controlled handling and feeding of the raw material is essential to ensure stable operation and product quality.

Storage of high-quality fishmeal and fish oil

After drying the fishmeal is milled and cooled. Warm and bony fishmeal is conveyed to a mill where the fishmeal is milled into a homogenous powder ready for packaging. Careful control of these final stages is equally important to preserve product quality and stability.

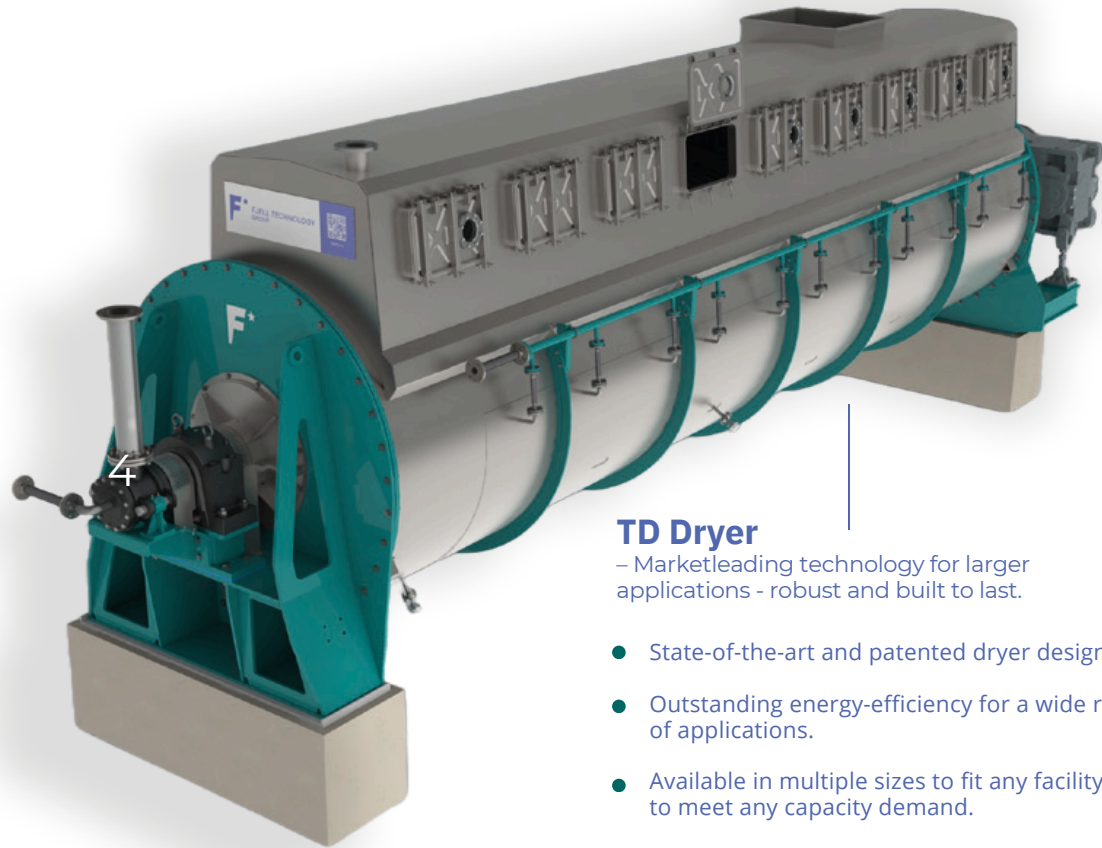
- 4 Phase separation into stickwater, oil and solids**
The press liquid is separated into three fractions by decanters and separators, or alternatively, using tricanter. In addition, oil polishers are used to purify the oil. The decanter/tricanter will separate liquid from solids by centrifugal force. The liquid is separated into fish oil and stickwater.
- 5 Waste Heat Evaporator to boost efficiency and concentrate liquids**
The stickwater from the separation process can contain nearly 20 % of the yield of fishmeal and up to 25 % of the total proteins. Evaporators are used to recover proteins, minerals and vitamins in the stickwater. A Waste Heat Evaporator is an energy efficient method whereby liquid is separated into condensate and concentrate. The concentrate is transferred to the dryer and adds important, nutritious, soluble proteins to the fishmeal. Heat recovered can be utilised in the pre-cooker. Fjell can also supply other types of evaporator technologies.
- 6 (Pre-) Drying to produce high-quality fishmeal**
Drying of press cake, decanter solids, and concentrate in our patented and unique Fjell Turbo Disc dryer, for superior durability, and performance. Gentle rotation and evaporation result in dry, stable and protein rich fishmeal with approx. 10 % residual water. Explore our TD Dryer on page 6.
- 7 Final drying stage (Vacuum) and Scrubbers**
Fjell can deliver single stage state-of-the-art dryer or a patented two-stage drying, both options produce high-quality fishmeal. Fjell has patented an advanced and energy-efficient two stage drying process that can become an integral part of the fishmeal plant. The first partial drying step (6) operates at atmospheric pressure, while the fishmeal is further dried under vacuum conditions in the final drying stage.

Energy integration between the stages improves overall efficiency substantially. Vapor generated in the first stage is utilised as heat source in the second stage. Vapour from the dryer is treated in scrubber(s) to reduce emissions and odour before release to environment.



Key Technologies that drive performance

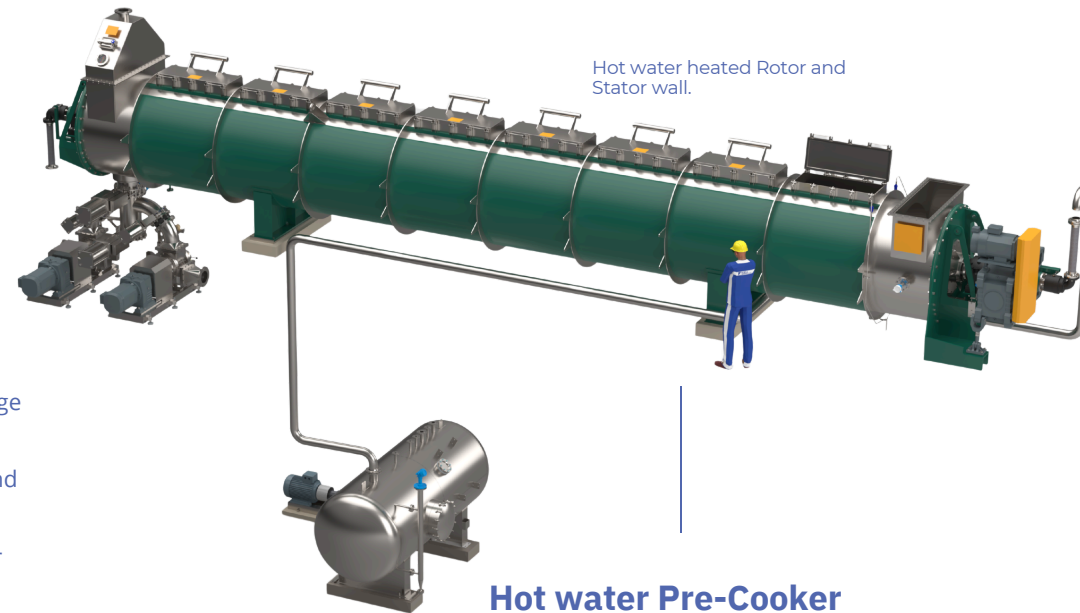
Our solutions are built on proven process technologies designed to ensure efficient operation, stable performance and long service life. For >45 years, we have delivered the most advanced and energy-efficient process equipment, machines that are built to last.



TD Dryer

– Marketleading technology for larger applications - robust and built to last.

- State-of-the-art and patented dryer design.
- Outstanding energy-efficiency for a wide range of applications.
- Available in multiple sizes to fit any facility and to meet any capacity demand.
- Smooth disc surface maximizes heat transfer and eliminates risk of steam leakages from stay bolt welds.
- Easy integration and low maintenance.



Hot water heated Rotor and Stator wall.

Hot water Pre-Cooker

– World-class performance with Optimised design based on original Stord-Bartz cooker.

- Pre-cooking by means of heat recovery.
- Reduces energy consumption of the plant.
- Improves environmental footprint of the plant.
- Available in single or double-stage versions, and in sizes to fit any capacity need.



Screw Cooker

– World-class performance with Optimised design based on original Stord-Bartz cooker.

- Available in single or double-stage versions, and in sizes to fit any capacity need.
- Stainless steel options for maximum hygiene and durability.
- Larger heating surface provides optimum heat transfer and process control.
- Gentle slow cooking improves subsequent separation, and improves oil yields and stickwater quality.
- Robust design with long life reliability and longer intervals between cleanings.

Closing the loop in Fish Processing

- Value Recovery Upstream
- Clean water Downstream

The SKIRA Wastewater Treatment Plant is our customized and proven end-to-end solution for aquaculture effluent, including wastewater from fish processing.



High-recovery and energy-efficient fishmeal and fish oil production must be combined with responsible handling of wastewater and residual streams. Fjell Technology Group delivers integrated solutions that support both production performance and environmental compliance.

SKIRA

WASTEWATER TREATMENT

SKIRA WWTP (Wastewater Treatment Plant) is our complete and cost-efficient wastewater treatment solution that can meet any emission requirement.

The SKIRA process plant features a custom-engineered design and fully automated system adapted to regulatory requirements.

SKIRA WWTP delivers

- Clean reject water that can be released to sea.
- 90%+ removal of suspended solids.
- Removal of Tot-N, Tot-P, TOC, BOD, and COD as per need.
- Full emission control guaranteed.



Explore

Our Customer Stories



Showcasing how we have supported our customers in onboard and landbased plant design.

Fjell Technology Group is a Norwegian Engineering company specialized in advanced process solutions for aquaculture, fish processing and sludge treatment.

With more than 40 years of experience, we design and deliver complete systems for efficient production, resource recovery and environmental compliance.

Technology for value circle

We navigate the value circle of our customers - delivering energy-efficient and impactful technology that create value from rest raw material.



Email
Sales enquiries
Other enquiries

post@fjelltg.com
+47 4690 8056
+47 9962 0772

Main office
Thormøhlensgate 49A
Marineholmen
5006 Bergen - Norway
Fjelltg.com

Follow us

