

Volume 3 - 2015

NEWSLETTER



- 1** Pescatech Update
- 2** Bakkafrøst
(new salmon factory)
- 3** Nutrimar
(new fish meal/oil facility)
- 4** Barry Group
(external project department)
- 5** Lerøy / NorgesGruppen
(seafood centers)
- 6** Lerøy Midt and Aurora
(software etc.)
- 7** Cermaq
(project management)
- 8** Grieg Finnmark
(optimization & greenfield studies)
- 9** Alsaker Fjorbruk
(greenfield studies)
- 10** Press release
(patent release)





It has been a while, but definitely worth the wait as this newsletter has many good stories telling about the Pescatech consolidation within the fish & seafood industry.

We have grown in size and more importantly in knowledge. The role as the new child in the classroom, who must challenge the establishment to prove himself has grown into a trademark or expectancy. It has been an educating journey, where the profound understanding of our clients has made us realize and adapt to a new market situation. Today, WE are more than US within Pescatech and include all our good friends and clients.

Over the past seasons we have been challenged with many exciting projects; sushi factories, software projects, fish meal and other bi product handling. We have participated in pre-studies and green field projects, master plans and technical due diligence analysis, designed projects and acted as project managers.

Some of our more hidden treasures have also surfaced lately, where especially concept development have been brought to life again. On behalf of and in cooperation with clients Pescatech has spearheaded design and development of more labor saving concepts. The limited or none commercial approach, where the aim is to challenge rather than protect has resulted in a fast development of conceptual ideas. These have afterwards been made public available to the greater benefit of the industry rather than seeking a patent protection.

Besides the many new experiences within our normal core product areas we have also had the pleasure of assisting our customers customers...Market leading supermarket chains have asked us to assist them in their evaluation and understanding of the process environment, where especially bridging and carrying their expectations forward to the processors have been the task.

Pescatech has today widened our horizon enormously vs our initial thoughts. Thinking we would have to start from scratch to the quite sizeable projects we ended up with made us diversify towards another situation / reality.

The birth of an equalizing design team has naturally not exactly been trouble free, but influential friends and clients have shown their support and made us firm believers of the laid course.

We try to expand our activities within the interests of our clients by becoming stronger in all aspects of their business. Today, we cover most support systems in addition to our core expertise within fish & seafood processing. We know of multiple species and product handling, but we shall never become too smart to learn new things with the sole objective: To make our clients better in what they do!



Best Regards

Chris Bjerregaard
Managing Director



In the Atlantic sea north of UK and in route between Denmark and Iceland you will find a cherished member of the Danish realm – The Faroe Islands.

This region with its long history has often been in the headlines for its position on fisheries and whaling, but when you travel through and work with the people on the Faroes you will discover a proud, modest and cozy atmosphere wherever you go.

The oldest writings in the Faroes are the scripts called "Sheep Letter" (Seyðabrævið), which are dated back to 24th of June 1298 which is an ancient nordic regulation for the area of the Faroes islands. In addition to describing the historic society it also



provides rules on many property aspects and other old legislation down to the very charitable distribution of whale meat as one of the oldest traditions of the islands.

Taking the scenic route from Thorshavn to Glyvrrar you will pass many small cities and travel through mountains and springs with sheep by the bundle on the side of the roads. The library of Glyvrrar displays a woolen knitted hat worn by Jens Martin Knudsen, who became an international celebrity in the 1980's by wearing a knitted hat during

international soccer matches. More important though is the presence of one of the largest and most quality oriented salmon producers in the world – Bakkafrost.

Bakkafrost is also one of the world's most vertically integrated salmon farming companies. It controls all aspects of production - from feed to finished value added products, which ensures unrivaled traceability and consistent high quality. The group of companies under the Bakkafrost process umbrella have now set sails towards new exciting and record breaking endeavors.

The consolidation of its 6-7 processing facilities into a giant and extremely modern processing plant will strengthen the company enormously and place Bakkafrost as the undisputed no 1 when it comes to processing and value adding of farmed atlantic salmon. The plant will use all the most modern production methods with a simultaneous aim to provide top quality salmon products.



Pescatech is a proud member of the design team behind this new super factory. The journey has been with many interesting experiences in the project design and purchase phase explains Chris Bjerregaard of Pescatech. It is always challenging when you work with record breaking projects and everyone is eager to influence and be part of the process. There is no doubt that this particular factory will be the one other companies will seek to beat and visit to get inspired.

"Bakkafrost decided to use Pescatech as an integrated part of our project group upon recommendations and interviews. We feel they fulfil our expectations as a member of the Bakkafrost project team and also provide us with valuable know-how and experience, so our management is getting the necessary assistance and sparring in the important project process." explains Regin Jacobsen, CEO of Bakkafrost.





In the shadows of mighty Salmar the old Nutrimar is presently transforming into a new modern fish meal and oil producer with higher production capacities and with the most advanced handling and processing methods.

Established in 2007, Nutrimar is a Norwegian biomarine company that produces high quality oil, protein concentrate and meal from salmon. The facilities are located on the beautiful island of Frøya, the westernmost municipality in Sør-Trøndelag county, Norway.

Nutrimar's plant is directly coupled to InnovaMar, the biggest and most efficient salmon processing plant in the world. Through innovative production technology and logistics the plant is able to set a high standard of quality throughout the product range. This unique connection ensures that the raw material is consistently of the highest possible quality. The aim is to utilize the bi products from the salmon farming industry

to ensure the optimal use of a natural resource.

Nutrimar's new advanced and modern production plant is built to achieve highest quality targets. The plant has approvals from Norwegian

authorities for HACCP codex alimentarius practices, and they are working under GMP quality regime with an approval from Trustfeed.

Pescatech was selected to oversee the transformation as project manager and member of a strong internal team in this project. Though not being prepared as specialists in this field - Pescatech still managed to land this contract due to the work methods and straight forward approach with a deep understanding of the equipment industries.

We naturally are learning many valuable aspects of supporting systems to the primary factories these days explains Chris

Bjerregaard. This and other similar project management tasks is helping Pescatech to spread our services to other related activities within the same customer base. Not necessary as processing specialists, but a solid project member and coordinator.

Kristbjørn Bjarnason, General Manager of Nutrimar explains: ***"We decided to use Pescatech, since they have significant experience from the salmon industry and have worked with us on previous smaller projects. Experience and reputation had a lot to say in our decision. In this project we were in need of project management and control rather than specialist knowledge of fish meal and oil production. I'm very satisfied with this cooperation and so far this has proven itself to be the right choice for us. The people from Pescatech are very service minded and solution oriented, which is exactly what you need in hectic and complicated project like this one."***

The glory of nature

Newfoundland is one of the best places to see and appreciate nature in all its glory. Dramatic coastlines, sweeping barrens, thick boreal forests, ancient rock formations, teeming seabird colonies, tiny alpine blossoms, and rich marine life are all part of the diverse natural heritage.

Many people believe that the island of Newfoundland will be the best guess for 'Vinland', one of the three areas Leif Eriksson (den Lykkelige) according to the sagas, discovered and named in North America about year 1000.

On this amazing island you also find Barry Group Inc. Barry Group has been involved in fish harvesting and processing since the 1830's. In 1854 they established the current business in Corner Brook, Newfoundland.

During the 1960's, the advent of modern technology presented promising business

opportunities and, as a result, the Barry Group placed greater focus on quality, customer service, and marketing, while significantly expanding the customer base and production with more diverse species and packs.

The responsible expansion of the Barry Group was contrived in the final decade of the last century with strategic access to more processing plants, and expanded quotas. This expansion allowed the company to begin diversifying domestically and internationally. Today, a large and skillful workforce throughout Atlantic Canada processes thousands of tons of fish from an expanding list of species for the demanding and competitive international market. To this date Pescatech has had the pleasure to work with this interesting company in two projects.

The first one was a salmon factory, where Pescatech in close cooperation with the Barry guys designed the factory with focus

on optimizing the buildings and securing all hygienic requirements were met. After internal approval of layout and budget Pescatech took the project through a fast track tender phase including negotiations until contracting phase.

The second project was a processing line for packing herrings into barrels. Pescatech and Barry group designed the layout together and also here made fast track tender materials, as Barry Group wanted competitive situation with more supplier options. Barry Group knows very well what they want and is capable of designing their own solutions, where Pescatech often is used as an external project department for both smaller and larger tasks. This use of our resources is exactly the role Pescatech was designed for, explains Chris Bjerregaard of Pescatech, we would like to become an international, skilled and flexible project task force.





The lighthouse of fresh fish and seafood

Norway's largest and most innovative facilities for fresh fish and seafood is the recently opened "Sjømathuset" located at Kalbakken in Oslo. For the first time pre-packed fish, bulk, and sushi have been gathered in one place - the most modern and complete facilities for fresh distributed seafood in Europe.

Lerøy and NorgesGruppen have been working together since 2006 and the target from the two parties is clear: to increase the consumption of seafood in the Norwegian population.

With Sjømathuset seafood in highest quality will be available in grocery stores all over Norway. Everything from cod loins and salmon portions to lobster and crab claws lying pre-packed in refrigerated displays. Never before so much good seafood have been available for the Norwegian customers.

In a European context Sjømathuset is a lighthouse when it comes to cooperation between seafood producer and retail. Hygiene zones and optimized production flow are significant features in a project like Sjømathuset, and Pescatech is very proud of being a part of this unique project, hired primarily to take care of design and logistics within the sushi and fish departments.

To expand our area of expertise with such special tasks like the ones the Lerøy group has given us and to become an external project sparring partner for NorgesGruppen has really widened our horizon. The profound understanding of the mechanism between processors



Henning Beltestad, CEO of Lerøy Seafood Group.
Elisabeth Aspaker, Norwegian Minister for Fisheries.
Tommy Korneliussen, President and CEO in NorgesGruppen

professional and motivated staff will meet you from the beginning to the end. Tradition and knowledge go hand in hand where flexibility and short delivery times are significant on a market requiring small series and tailor made products. Full control in the process of environmentally certified products with complete traceability is a matter of course.



and supermarkets are impossible to put a value on, but it definitely has brought Pescatech to the next levels explains Chris Bjerregaard of Pescatech.



The Swedish smokehouse

On the idyllic west coast of Sweden you find Lerøy Smögen Seafood, the leading producer and supplier of a wide range of fish and seafood. High development rate, steady growth, financial strength and capacity for expansion motivate people to stay for many years, some for more than 50 - so



Sushi of highest quality are created as well as catch, salmon, fresh fish in all shapes, smoked or marinated, fresh or frozen seafood, pickled herrings – Lerøy has a wide range for the restaurants, catering, retail and stores and the target is always to be in front finding new, innovative seafood products - often in cooperation with some of Sweden's most renowned chefs.

Lerøy opened the newly expanded factory to meet the increasing requirements from the discerning customers. Pescatech had the distinct pleasure to assist with this expansion in close cooperation with the Swedish Lerøy team and to be a part of the project team to ensure the project was implemented on time.



ck

Lerøy Midt and Aurora

Lerøy Seafood Group can trace its operations back to 1899, when the fisherman-farmer Ole Mikkjel Lerøy started selling live fish on the Bergen fish market. This was fish he either had caught himself or had bought from other fishermen. The fish was hauled to market in a corf behind Ole Mikkjel Lerøy's rowing boat, a journey that could take between 6 and 12 hours, depending on prevailing winds and currents.

Over time, Ole Mikkjel Lerøy's operations gradually came to include retail sales in Bergen, the sale of live shellfish and a budding export business. Since then the company has been a pioneering enterprise in the fishing industry. The main focus has always been on developing markets for seafood products, and the company has frequently led the way into new markets or been the first to commercialize new species. This pioneering spirit is still very much alive in the Group.

Today Lerøy Seafood Group is the leading exporter of seafood from Norway and the

world's second largest producer of Atlantic Salmon. The vision is "Lerøy in every kitchen", and each day they supply the equivalent of three million meals of seafood to more than 70 markets worldwide.

Pescatech has a long almost family alike relationship with Lerøy and also got involved, when Lerøy Seafood Group decided to look for a series of plant level MES (Manufacturing Execution Systems) modules. These modules should be installed and collect data from existing and new processing equipment, Microsoft Windows PC's and hand held wireless devices across an entire plant. The project should include all Lerøy factories, however, Lerøy Midt and Hestvika were chosen as pilot-projects.

Pescatech had the pleasure of working with the Lerøy team on the mapping of existing hardware end software, and specifications and requirements for the new system. Based on that tender materials were made and Pescatech was in lead assistant in the negotiations and contracting with the chosen suppliers.



A tale of transformation

Established in 1995, the history of Cermaq is a tale of transformation - from a grain trading company to a global leader of salmon farming. Today Cermaq Group AS is a fully owned subsidiary of Mitsubishi Corporation. It is their vision to be an internationally leading company within sustainable aquaculture, and this calls for responsibility: Cermaq is committed to support global initiatives aiming at improving environmental, social and economic conditions worldwide.

One of the major challenges the world is facing is an increasing global population where a growing part of the population replace rice, maize and cereals with food richer in protein as meat and fish. Fish is efficient converter of feed, and farmed salmon has better feed efficiency than pig, sheep and cattle, and the ecological footprint is little (low CO2 equivalent).

Cermaq's part of the value chain starts with smolt production and covers primary processing and into secondary processing. The company structure is based on a lean head office and operating companies in Chile, Canada and Norway.

Two of the slaughtering facilities are located in Hammerfest and Alsvåg in the northern part of Norway. Through the years Pescatech has been helping Cermaq with miscellaneous projects like Opti-Advice, Masterlayouts and supply analysis. Via these Pescatech received a perfect overview and knowledge of the local conditions and options. So when Cermaq decided to modernize these facilities it became quite naturally to ask Pescatech to assist in the project phase.

Based on various supplier proposals Pescatech was brought onboard to assist in the final evaluations and contract phase in order to increase mutual awareness and system supply responsibility between buyer and seller. After negotiations and a successful ProDesigner phase Cermaq decided to let Pescatech continue with the

natural follow up package: ProManager. This phase included project management during the important installation phase, to ensure the project was ready on time and the performance was just like expected.

Pescatech also with Cermaq maintains a position as an external project resource, which can be called in on short notice to help with smaller or larger tasks. This is easily handled from a distance as well as on site with our frequent and various assistance tasks.



Open, respectful and ambitious

Grieg Seafood ASA is one of the world's leading fish farming companies, specializing in atlantic salmon, with an annual production capacity of more than 90.000 tons gutted weight. Today the Group is present in Norway, British Columbia (Canada) and in Shetland (UK), employing approximately 700 people. Grieg Seafood ASA was listed at the Oslo Stock Exchange (OSEBX) in June 2007, and their headquarters are located in Bergen, Norway.

The business development of Grieg Seafood focuses on profitable growth, sustainable use of resources and being the preferred supplier to selected customers.

Grieg's operations are based on hands-on experience and innovative, technological solutions. They believe experience and competence are the foundation for safe, clean and efficient farming of high quality salmon. The Grieg Seafood organization emphasizes reliability and a continuous year-around supply of quality salmon. This is possible due to the high competence of their employees and a genuine dedication to sustainable production and fish health.

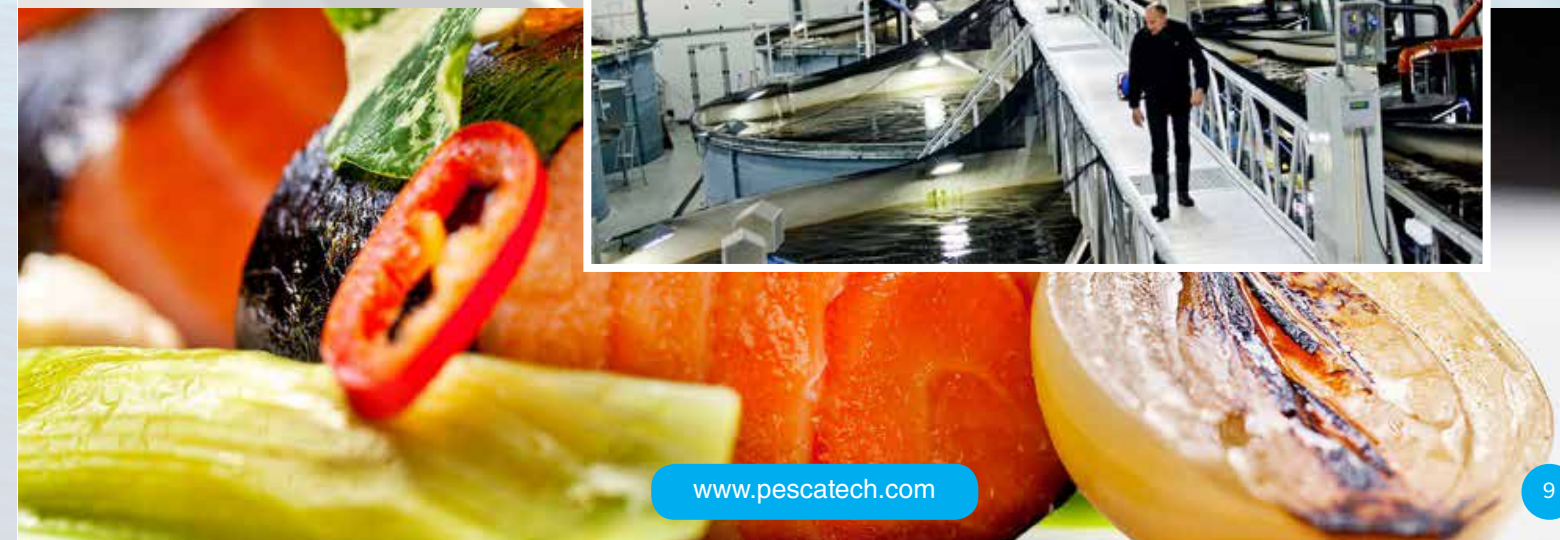
Grieg's ambition is to always supply fresh and healthy products with optimal nutritional values. This requires full traceability and attention to quality and food safety in products and raw materials. Grieg apply strict quality control, focusing on sustainability, fish welfare and environmental concerns. The production standards and quality management programs allow them to provide the predictability the customers demand by verifying the quality of fish from egg to market. Grieg controls the complete value chain; from stripping brood eggs, growing smolts at freshwater hatcheries to grow out sites at sea and harvesting.

Grieg Seafood has developed standards that exceed government requirements, and have established best management practices and continuous programs to reduce their impact on the environment and its inhabitants.

Pescatech has known Grieg Seafood for several years and this relationship has resulted in various projects, starting with an Opti-Advice at the Simanes facilities in the rough nature of Finnmark, Norway.

Opti-Advice is an excellent door opener, as Pescatech reviews the processing lines, and optimizations and suggestions for improvements are described, drawn and calculated. It is then up to the customer whether he wants to continue or not. If he does he can choose the most profitable findings to improve according to payback calculations. Pescatech can, of course, help implement these improvements as well via Pro-Manager, which is project management during the installation phase.

Another project Pescatech has worked on with Grieg is a pre-study project for a new large factory including box factory and oil-/meal factory. These facilities have been designed in ProEducator, too, for better visualization and presentation as most people need 3d pictures instead of top views to really understand the essence.





Over the past seasons we have had the pleasure of working with the joyful personnel from Alsaker Fjordbruk.

Taking the scenic route through curved roads and rainforest alike landscapes towards Onarheim you first must ensure yourself you're tuned in on the correct Onarheim. Suddenly the administrative building of Alsaker Fjordbruk appears from the mist and forest and the sight gives you the first impression of a cozy and leaned back approach of doing serious business.

Alsaker Fjordbruk is one of the leading Salmon farming companies in Norway. Vertically integrated from hatchery to harvest the goal is to do what they do best! They focus on the production of salmon;



From the hatching of eggs, the production of smolt and via sea farming to their own slaughter and packing facilities, where their focus is on top quality.

The company is more than self-sufficient in smolt production having a capacity of nearly 30 million. The surplus smolt is sold to leading companies in Norway and abroad. The company owns 22 licenses for farming Salmon in the sea and the annual production is approximately 30 thousand metric tons.

Viking Fjord, the packing facility in the town of Sunde in Kvinnherad, has recently



completed a major renovation, resulting in an optimization, built on the most modern technology available on the market today. The activities have their origins in Onarheim on the island of Tysnes in the county of Hordaland. The salmon swim here where the fresh glacial water from the Folgefonna glacier meets one of Norway's richest ecological systems – The Hardanger fjord.

"Pescatech has been involved in internal analysis as well as designing future processing facilities with astonishing new potentials in process capacities and exciting developments within handling methods. The casual working environment of Alsaker Fjordbruk is unique, where it is allowed to enjoy and be serious simultaneously." explains Chris Bjerregaard.

Pescatech was chosen based on knowledge of the industry and easy going approach, which is a suitable match to the Alsaker way of thinking and working. A certain amount of craziness combined with ingenuity is bringing new developments and thoughts into the project design phase, which also is a key element in the good chemistry between the companies.

Press release

Patent pending solution

FOR FREE

A new design and patent pending innovative solution from Pescatech for fully automatic orientation of fish. Designed on behalf of Alsaker Fjordbruk and the salmon industry. The first sketches were made in early 2013 and the present solution evolved, since early 2014.



See 3D animation: <https://vimeo.com/103209440>

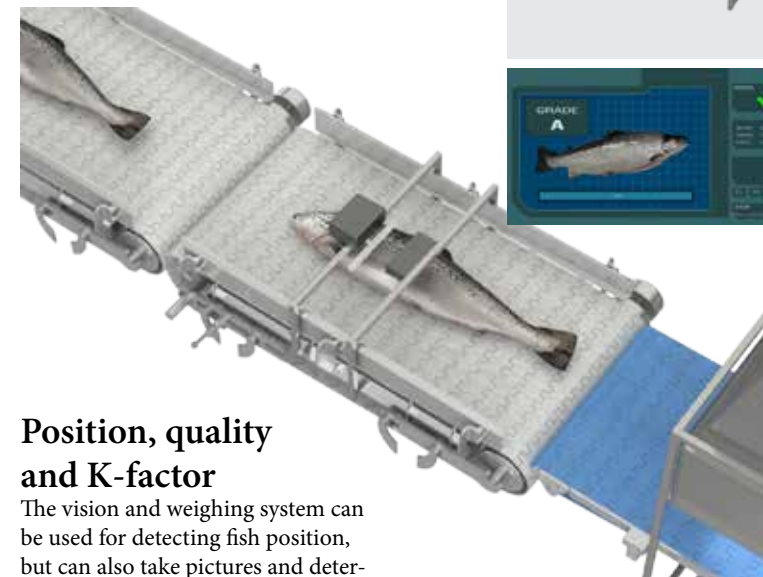
Solving the puzzle

The area between cooling tanks and gutting machines is still per today labor intensive and all attempts to automate in an industrial speed scale have failed, whether it was simple chute design or advanced robot solutions.



Fully automatic fish orientation

The method takes aim at solving the puzzle by a series of actions with the use of already existing technology with new functionalities. The idea was to create a system, which in a simple and affordable way can be scaled to match the highest production capacities.



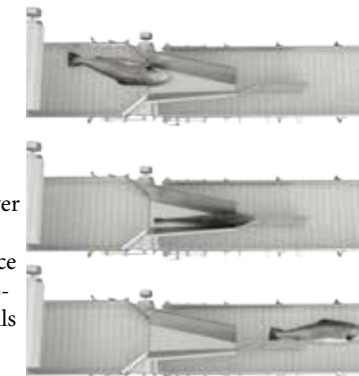
Position, quality and K-factor

The vision and weighing system can be used for detecting fish position, but can also take pictures and determine outside quality in addition to measuring and combining these dimensions with the weight (K-factor). Vision systems can also be placed prior to and after gutting machines in centralized spots if you want to ensure tracking of the fish and have

more product documentation. This all becomes sensible future oriented solutions if it is possible to orientate the fish automatically and thereby provide realistic savings.

Belly or back

The simple mechanic detection or by means of camera determines whether the fish shall be turned by the reverse or forward chute to the lower level conveyor. A simple belly/back chute can place the fish in the correct position, where possible fails afterwards are detected by another camera and returned.



Availability of a patent pending solution

We want to make the solution available and interested equipment suppliers can purchase the license to produce at a symbolic price. The vision is to motivate them and others to create solutions to the exclusive benefit of the industry.



Motivation

We want to challenge multiple equipment suppliers to take this development to the next level without being obstructed by patents or strategies. True competitive development must come from inspiration rather than protection and therefore we introduce this patent pending solution for the greater benefit of the industry without any kind of exclusivity.

OPTI-ADVICE

Opti-Advice is a corner stone in the Pescatech service programme, where we analyze existing fish productions (large or small) and focus on identifying quick wins and easy adjustments.

PRO-CONSULT

Pro-Consult is the natural follow up package, where Pescatech becomes a temporary employee or advisor and external sparring partner for a longer period.

PRO-DESIGNER

Pro-Designer is setting new standards within the industry by offering high quality visualization ranging from normal ACAD standard drawings all the way up to live animated factories.

PRO-MANAGER

Pro-Manager is the consequent follow up on a good design job, where production, implementation and proper training is necessary in order to make the new project a success.

PRO-ANIMATOR

Pro-Animator is a new product offered to the fish & seafood industries, where Pescatech distances itself by becoming the first to promote a higher design level by offering 3D animations.

PRO-EDUCATOR

Pro-Educator™ is a customized visualization and educational Software, which will give you an astonishing new overview of your factory. It will be able to present various important information to multiple user levels.

CONCEPT+

Concept+ could also be named line design as it aims at creating a superior and innovative solution solving a specific challenge.

TURNKEY+

Turnkey+ is a level of industry expertise present within Pescatech which makes the company capable of taking on larger processing challenges than any other consulting company.



Phone: +45 72 100 620
Fax: +45 72 100 640
E-Mail: mail@pescatech.com
Visit: www.pescatech.com



Foreningen af
Rådgivende Ingeniører
FRI