



EMYG

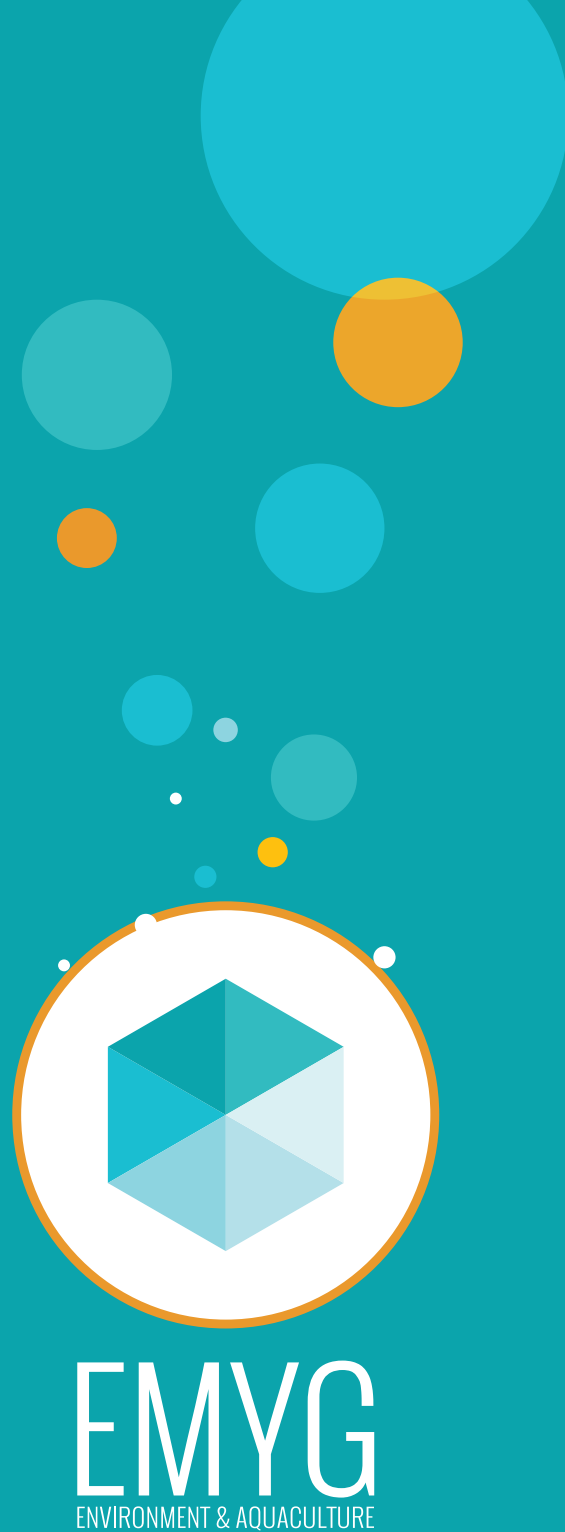
ENVIRONMENT & AQUACULTURE



DEPURATION & HOLDING FOR SHELLFISH & CRUSTACEANS

Physical storage conditions mimicking those of their natural environment





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AQUACULTURE
EMYG
PLAYS ITS PART
IN EVOLVING
A HIGHLY
STRATEGIC
SECTOR



EMYG
ENVIRONMENT & AQUACULTURE

INTRO

EXPERTISE IN WATER TREATMENT & PLAYING A PART IN A MAJOR, MULTI-FACETED AND GLOBAL CHALLENGE

"Aquaculture is seeing exponential growth and significant transformation in its practices. Product quality and preservation of the marine world are now its priorities. INNOPURE® has been developed in partnership with IFREMER, the French Research Institute for Exploitation of the Sea, first and foremost providing solutions to the requirements of European and international standards for the shellfish and crustacean market.

Thanks to strong commitment within the EMYG Environnement & Aquaculture Research & Development Department, today INNOPURE® applications are revolutionising this market: they are making it possible to hold live shellfish and crustaceans in their original water, from the fisherman/producer right through to the consumer's plate. They thus represent the individual links of a new chain: the "Living Seafood Chain®". The master link in this new chain is the solution for shipping by sea, "AQUAVIVA".

Alongside rail and road shipping, it is revolutionising the practices of actors in this sector. Reduced reliance on intermediaries, independence from market prices, a high-quality offer to consumers... all made possible by "the Live Chain®" and INNOPURE®. Purification, oxygenation and circulation are assured, guaranteeing the quality of these products at every stage of the distribution channel for shellfish and crustaceans".

THE CLOSED-LOOP CIRCUIT: THE ENVIRONMENTAL RESPONSE FOR SUSTAINABLE AQUACULTURE

"The use of closed-loop circuits makes it possible for the various players within the sector to limit their consumption of water and energy, to guarantee total traceability and to facilitate the management of batches and stocks. It is also a major alternative solution to the problems that arise from sharing the coastline with other human activities.»



Giancarlo FAGIANO
EMYG Environment & Aquaculture
CEO



EMYG is an engineering company specialized in closed-circuit water treatment, dedicated to the aquaculture sector.

KEY FIGURES



OUR SITES

REGISTERED OFFICE
EMYG SAS
Carnoux-en-Provence
FRANCE

R&D CENTRE
EMYG ATLANTIQUE
La Rochelle
FRANCE

SUBSIDIARY
EMYG Canada Inc.
Montreal
QUEBEC

SATISFIED CUSTOMERS

FRANCE: Les Établissements Gillardeau, Mericq, Lamaison, les Établissements Marionneau, l'Oléronaise, Boniface, Verneuil, Rolland Lambert, Parc St Kerber, Parc de l'Impératrice, Fonteneau, Viviers d'Audierne, La Moule Morrisseau, Toute la Marée, Manche Marée, Les Huitres David Hervé

NORTH AMERICA: La Maison Beausoleil, American Mussel, Taylor Shellfish, Seattle Shellfish, Mook Seafarm

EUROPE: Krijn Verwijs, Rooney Fish, Harty Oyster, Piet Verwijs, Bell, Lenger Seafood, Qualimer, Wittrup Seafood

MAGHREB: Azura, Délices de la Mer, Muskaten



DESIGN OFFICE & AFTER-SALE

In order to support you, EMYG has created a Technical Department within its organisation. Our engineering skills enable us to design all types of project, from the simplest to the most complex, transforming your idea into a successful partnership.



OUR EXPERTISE

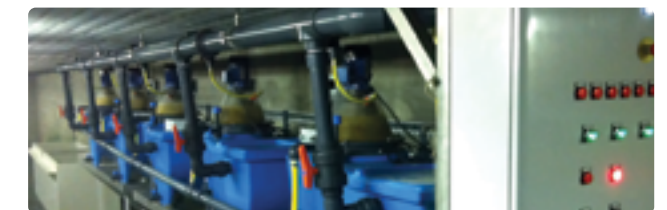
- > Manufacture of electrical cabinets
- > Manufacture and design of cooling systems
- > Design of hydraulic systems
- > After-Sale Service: Network of EMYG-approved Team/Partner

OUR METHOD

- > **An in-depth study**
Carried out at your site, we perform an analysis of your water treatment needs: sizing of the treatment part (depuration), the water system, the electrical system and the cooling unit...
- > **A clear and accessible process**
The overall project is presented to you in the form of an AUTOCAD drawing or 3D plan (SOLIDWORKS), completed by a detailed technical description.
- > **End-to-end support**
The mission of our team is to advise and support you from the very inception of your idea and to remain on hand after completion

OUR STRENGTHS

Adapting to existing structures



Coordinating our installations with new building plans



Offering turnkey solutions



THE LIVING SEAFOOD CHAIN®

EMYG ENVIRONMENT & AQUACULTURE IS REVOLUTIONISING PRACTICES IN THE SHELFISH AND CRUSTACEAN MARKET

AFTER THE COLD CHAIN: THE LIVING SEAFOOD CHAIN®

Translated into adapted solutions, INNOPURE® technology provides a means of maintaining the very best holding conditions for shellfish and crustaceans, from the producer/fisherman right through to the consumer's plate. The products remain live at each stage of the distribution channel: they can be kept in their original water, in which the characteristics of their natural environment are recreated.

CUTTING-EDGE

Solutions that are tailored for sea, rail and road transportation, and for the mass retail and small retail trade sector (*holding and direct sales*), have enabled the emergence of the live chain.

TRANSPORTING LIVE PRODUCTS IN ALL FOUR CORNERS OF THE WORLD

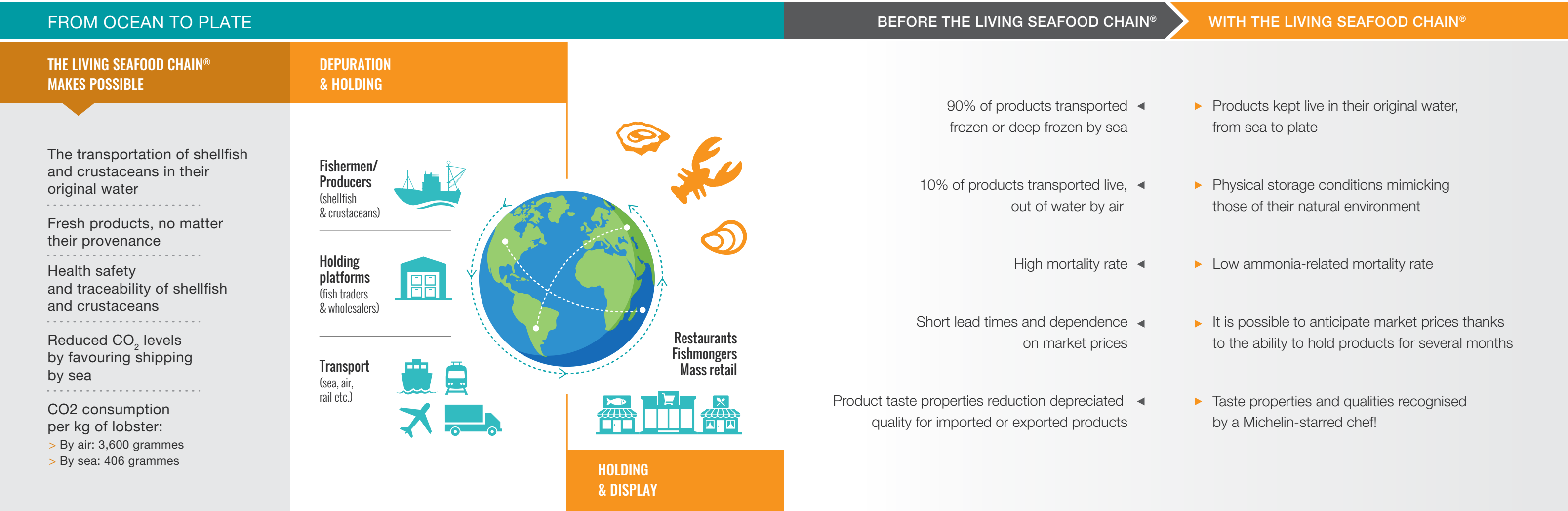
Up to now, shellfish and crustaceans have been imported and exported frozen or deep frozen - 90% by sea and 10% by air (live, out of water). As the result of five years of Research and Development, the INNOPURE® technology can now be adapted for deployment in a container. Loaded onto a boat, wagon or lorry, this container is capable of transporting shellfish and crustaceans live in their original water. Sub-micron water treatment within a closed-loop circuit offers unrivalled holding quality and food safety during long-distance journeys.

THE LOBSTER, THE FIRST SPECIES TO BE SHIPPED UNDER IDEAL AND INNOVATIVE CONDITIONS

A seafood product with high added value, the lobster is the first species we have been able to transport live. Water is maintained at the ideal temperature for this species, regardless of outside weather conditions: the container has been tested down to - 30°C and up to + 40°C.

FRESH PRODUCTS FROM ALL OVER THE WORLD

Thanks to this solution, the import and export of lobsters is possible regardless of the fishing ground or location of the consumer. Shipped in an environment as close to its natural surroundings as it is possible to achieve, the lobster no longer suffers the stress of out-of-water shipping. Upon arrival, the mortality rate is low and the taste quality of the product intact.



OUR EXPERTISE: WATER TREATMENT

3 KEY FUNCTIONS

EMYG's mission relies on unique expertise in the field of water circulation in closed-loop circuits, which makes achieving the live chain possible by providing solutions that are tailored to the individual players making up this chain. To accomplish this, we offer optimal holding conditions.

This calls for three key criteria to be met

EMYG has developed INNOPURE® technology with the goal of optimising these three functionalities. It constitutes the core of our range of treatment units. Furthermore, EMYG has also developed a range of motorised circulation and oxygenation device. In order to maximise the efficiency of the INNOPURE® treatment, these device can be installed to complement the treatment units. The motors can also be used to improve the quality of a water mass by performing one or two of the above-mentioned key functionalities.



OXYGENATION

This functionality is provided by the hydro-injection of atmospheric air. The dissolution of air in the water optimises oxygenation thanks to the fineness of the micro-bubbles formed.



FILTRATION

INNOPURE® technology also exploits the process of micro-bubble formation under pressure in order to perform a filtration function: the cloud of micro-bubbles traps, concentrates and removes these particles in the form of a foam, through a supplementary integrated mechanical process.



CURRENT PATTERN

In order to treat the entire mass of water, the current pattern has to be sufficiently powerful. This condition is met through the flow of water taken in and then expelled by the INNOPURE® treatment units. Water is re-integrated into the closed-loop circuit by discharge or gravity return depending on the treatment unit. Where so required by the configuration of the ponds, our solution will be adapted by strengthening the current pattern through the installation of relay water circulators (see oxygenation and circulation tools p.12 & 13).



SHELLFISH AND CRUSTACEANS: HOLDING CONDITIONS THAT MIMICK THEIR NATURAL ENVIRONMENT

This technology replicates the characteristics of the marine environment, bringing it as close to reality as it is possible to achieve: current pattern, temperature, oxygenation, filtration. The water is rendered clear, clean and sterile. Involving no chemical process, this environment-mimicking reconstitution gives the shellfish and crustaceans the illusion of being in their natural surroundings. They can adopt their natural behaviours: absorbing what they need from the water (oxygen) and "decontaminating" themselves under optimum conditions.

INNOPURE® TECHNOLOGY

AT THE CENTRE OF THE DEVELOPMENT OF EMYG ENVIRONMENT & AQUACULTURE

A PATENTED TECHNOLOGY

By means of a mechanical process and using atmospheric air, INNOPURE® is capable of fulfilling all three functions that are crucial to water treatment: oxygenation, filtration and optimised circulation. Micro-bubbles produced under pressure form a cloud that filters the smallest polluting sub-micron particles such as bacteria.

WATER AND ENERGY SAVING

The efficiency of this technology means that water can be maintained in a closed-loop circuit for long periods. Drawing just 2.1 kWatts per hour in operation, it meets the paramount need to reduce energy costs.

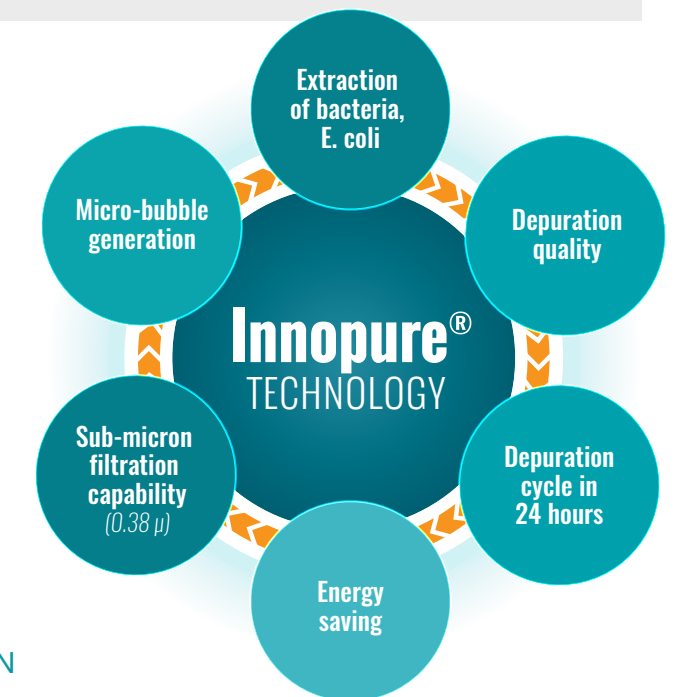
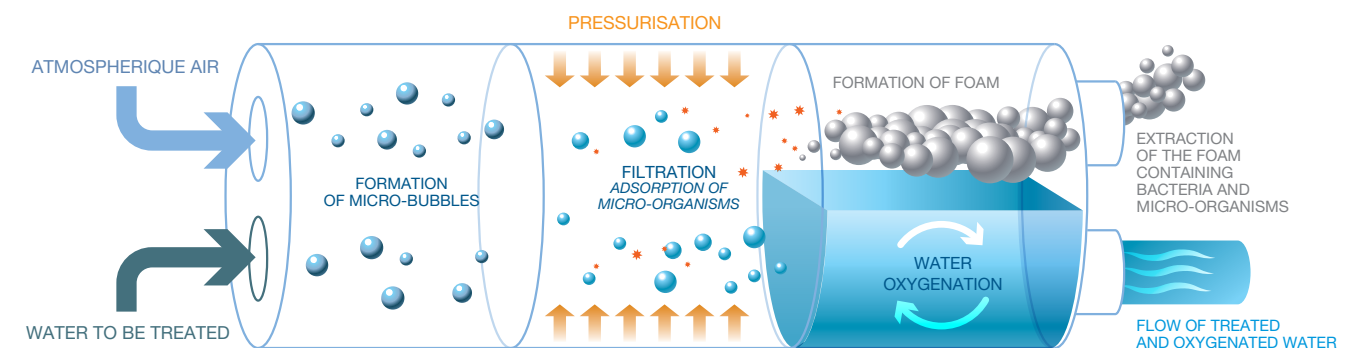


DIAGRAM SHOWING WATER DEPURATION WITH INNOPURE® TECHNOLOGY



IN ORDER TO TAILOR OUR
SOLUTIONS TO YOUR NEEDS
WE OFFER THREE TYPES
OF TREATMENT UNITS
IN OUR INNOPURE®
PRODUCT RANGE



SKIM



- 1 Intake of atmospheric air
- 2 Liquid foam collection chamber
- 3 Water and air hydro-injector
- 4 Discharge of depurated water
- 5 Oxygenation
- 6 Formation of the solid foam
- 7 Pollutant extraction pump
- 8 Formation of the liquid foam
- 9 Centrifugal motor

THROUGHPUT	▶ 100 m³/h
TONNES OF PRODUCTS HELD ON A 24-HOUR CYCLE (CRUSTACEANS)	▶ 4 t
TONNES OF PRODUCTS DEPURATED ON A 24-HOUR CYCLE (SHELLFISH)	▶ 7 t
ELECTRICITY CONSUMPTION	▶ 2.1 kw
POSITIONING	▶ Submersible in a flotation system or remote from the pond (outside holding)
CURRENT PATTERN	▶ Hydraulic flow expelled by discharge

PROTOS



THROUGHPUT	▶ 15 m³/h
TONNES OF PRODUCTS HELD ON A 24-HOUR CYCLE (CRUSTACEANS)	▶ 2 t
TONNES OF PRODUCTS DEPURATED ON A 24-HOUR CYCLE (SHELLFISH)	▶ 4 t
ELECTRICITY CONSUMPTION	▶ 1.35 kw
POSITIONING	▶ Outside
CURRENT PATTERN	▶ Hydraulic flow expelled by gravity return

ECOMIX



THROUGHPUT	▶ 5 m³/h
TONNES OF PRODUCTS HELD ON A 24-HOUR CYCLE (CRUSTACEANS)	▶ 500 Kg
TONNES OF PRODUCTS DEPURATED ON A 24-HOUR CYCLE (SHELLFISH)	▶ 1.5 t
ELECTRICITY CONSUMPTION	▶ Depending on the supply pump
POSITIONING	▶ Outside the pond
CURRENT PATTERN	▶ Hydraulic flow expelled by gravity return

FORCE 7 OXYGENATOR



- OXYGENATION**
The injection of air causes a water-air exchange and thus the oxygenation of the surface in question. The FORCE 7 generates extremely fine micro-bubbles, which optimises the dissolution of oxygen. This motor has been carefully designed to allow direct connection to an ozone or pure oxygen generator. Energy-efficient. It is ideal for oxygenation during the holding phase.
- CURRENT PATTERN**
It enables the displacement of the entire mass of water in the pond and therefore the continuous intake and dispersal of dissolved water and temperature.
- DEGASSING**
The injection of air, and therefore of oxygen, causes the gases dissolved in the water (*nitrogen, ammonia etc.*) to be transferred to the air. This degassing process reduces the formation of gas pockets which are harmful to production, and rebalances the atmosphere/water interface of the pond.
- DESTRATIFICATION**
The current pattern restricts the formation of different thermal strata, having a general influence on the metabolism of the aquaculture products. A water volume that is uniform in terms of temperature and oxygen is created, which is beneficial for the holding of all aquaculture products.

- TECHNICAL DESCRIPTION**
- > Submersible and lightweight motor
 - > Option of floating deployment and angled orientation of the motor unit
 - > Corrosion-protected motor in marine-grade bronze and stainless steel shaft
 - > Submersion depth: down to 2m
 - > Supplied with 20 m of cable

SPLASH/SPRINT AERATOR

- OXYGENATION**
The forcing of water into the air (water jet) causes a water-air exchange and an immediate increase in the concentration of oxygen in the water, with reduced energy consumption. Various models have been developed to cover different water volumes.
- CURRENT PATTERN**
The SPLASH provides excellent vertical and horizontal circulation without creating any bottom erosion whatsoever. It also promotes destratification.
- DEGASSING**
Perfectly suitable for degassing water and facilitating ammonia extraction.
- COOLING**
The 1.5 hp motor assembly produces a water jet 2 m in height. This creates a thermal exchange and calorie loss in the water. The temperature thus drops by 3 or 4°C, and can eliminate the need for investment in a refrigeration installation.

- TECHNICAL DESCRIPTION**
- > Easy-to-install and lightweight submersible motor
 - > Corrosion-protected motor in marine-grade bronze
 - > Deep water lift conveyor as an option
 - > Supplied with 20 m of cable



- OPTION**
- LIGHT PACK**
A choice of different colours to light your spaces.
- -
 -
 -
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 -
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BRIO CIRCULATOR

- FILTRATION AID**
The BRIO circulator is a virtually permanent complementary device to a SKIM or PROTOS installation. In fact, it is a real relay both in terms of mixing the water and facilitating the extraction of pollutants (*displacement of sediments or suspended matter*). It thus prevents the creation of any dead zones.
- CURRENT PATTERN**
The BRIO displaces the mass of water in the pond and provides:
 - Effective distribution of the dissolved oxygen supplied by the treatment units
 - Effective distribution of temperature throughout the pond
 - A throughput of 130m³/h (17)Where the configuration calls for more current pattern options, the RIO range has been designed with this in mind.
- DESTRATIFICATION**
The current pattern restricts the formation of different thermal strata, having a general influence on the metabolism of the aquaculture products. A water volume that is uniform in terms of temperature and oxygen is created, which is beneficial for all aquaculture products.

- TECHNICAL DESCRIPTION**
- > Submersible and lightweight motor (*easily moved from pond to pond*)
 - > Option of floating and angled deployment of the motor unit (*possibility of directing the water flow*)
 - > Corrosion-protected motor in marine-grade bronze
 - > Supplied with 20 m of cable



RIO/COMBO CIRCULATOR

- FILTRATION AID**
It is essential to have uniform circulation if filtration of the total mass of water is to be achieved. The complement between the filtration system and the current pattern provides an optimal treatment solution. The RIO is ideal for substantial volumes of water.
- CURRENT PATTERN**
It displaces the mass of water in the pond and constantly disperses both the dissolved oxygen and the temperature (*where thermal regulation is present*). It is a true filtration booster.
- DESTRATIFICATION**
The current pattern restricts the formation of different thermal strata, having a general influence on the metabolism of the aquaculture products. A water volume that is uniform in terms of temperature and oxygen is created, which is beneficial for the stocking of all aquaculture products. The creation of dead zones (*which favour the development of bacteria*) is prevented.

- TECHNICAL DESCRIPTION**
- > Submersible motor
 - > Option of floating deployment and angled injection (*possibility of directing the flow*)
 - > Corrosion-protected motor in marine-grade bronze

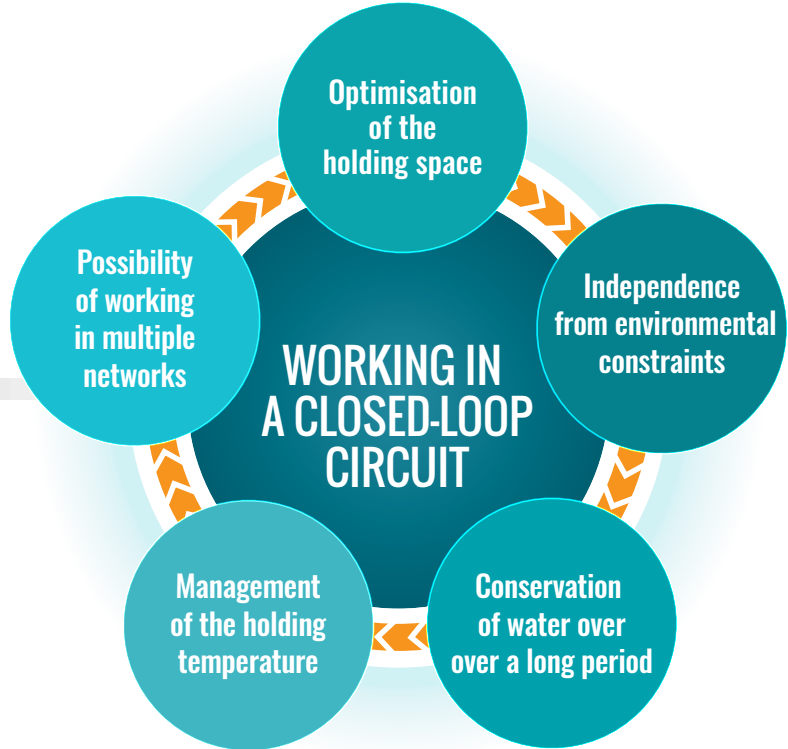


CIRCULATION/OXYGENATION IN COMBINATION: THE COMBO

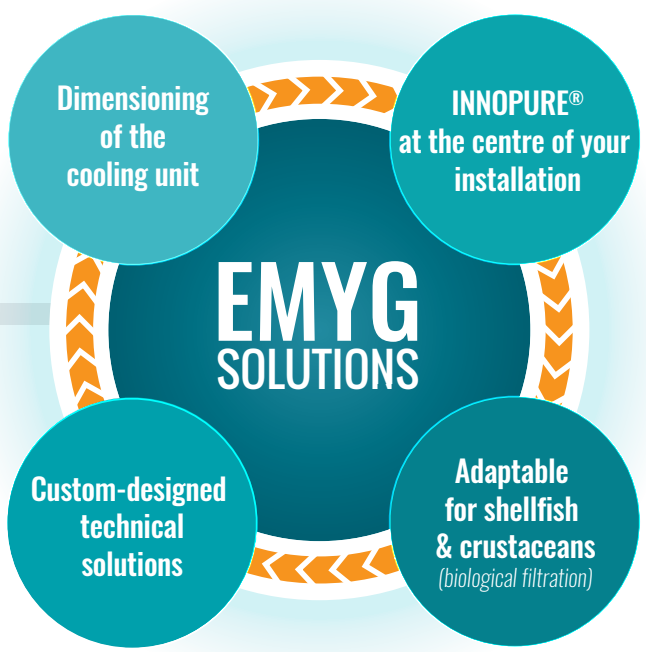
The circulation delivered by the RIO can be combined with water oxygenators in order to achieve wider dispersion, so as to add oxygenation to the existing circulation. Such combinations are used for large ponds.

OUR HOLDING SOLUTIONS

GOAL,
TO OFFER YOU
THE MOST APPROPRIATE
SOLUTION IN THE LIGHT
OF YOUR
CONSTRAINTS



TO PROVIDE
YOU WITH A
CLOSED-LOOP CIRCUIT,
EMYG IS ABLE TO OFFER
THE FOLLOWING
SOLUTIONS:



TURNKEY INSTALLATION



These two solutions offer unrivalled flexibility for your stock holding management. Independent of any external structures, their deployment is fast, agile and modular, for up to 7.5 tonnes of shellfish.

The CONKYBOX can be supplemented by the "CONKYFLY" water storage tank. Stand-alone and isothermal, these two turnkey solutions offer a perfect answer: no need for a construction permit and a real solution for limited spaces.



INSTALLATIONS
IN PONDS:
HORIZONTAL HOLDING



- > Functional solutions adapted to your organisation and the way you operate
- > Solutions that can be tailored to your needs
(existing ponds, quantity to be held)



WET STORAGE INSTALLATIONS: VERTICAL HOLDING



- > Optimisation of your space
- > Solutions tailored to the configuration of your buildings
- > Facilitates batch management and product traceability
- > Maintains the product in a optimal environment
- > Depuration and/or holding area



REARING POND INSTALLATIONS



SYSTEM GROUND LINE

Combined with an INNOPURE® treatment unit

- > Easy to install
- > Option of integrating a biological filter for shellfish and crustaceans
- > Modular installation

STANDARD



CUSTOM-DESIGNED



LANGOSTA LINE

Combined with an INNOPURE® treatment unit

- > Possibility of integrating a biological filter for shellfish and crustaceans
- > Space optimisation thanks to a reduced footprint
- > Arrangement of offset tanks to facilitate handling and the distribution of products according to grade

STANDARD



CUSTOM-DESIGNED



DIRECT SALE UNITS



MEDUSA LINE

- > Equipped with an ECOMIX treatment unit
- > Standard range or custom-designed
- > Standalone or connected to another holding unit upstream
- > Crustacean holding capacity: 50 kg according to grade
- > Shellfish holding capacity: Up to 100 kg
- > Maintains the product in a wet environment

STANDARD



CUSTOM-DESIGNED



HOMARIUM LINE

- > Equipped with an oxygenation and biological filter system
- > Standard range or custom-designed
- > Collaboration possible with an interior architect or decorator to guarantee a solution that is aesthetic as well as functional

STANDARD

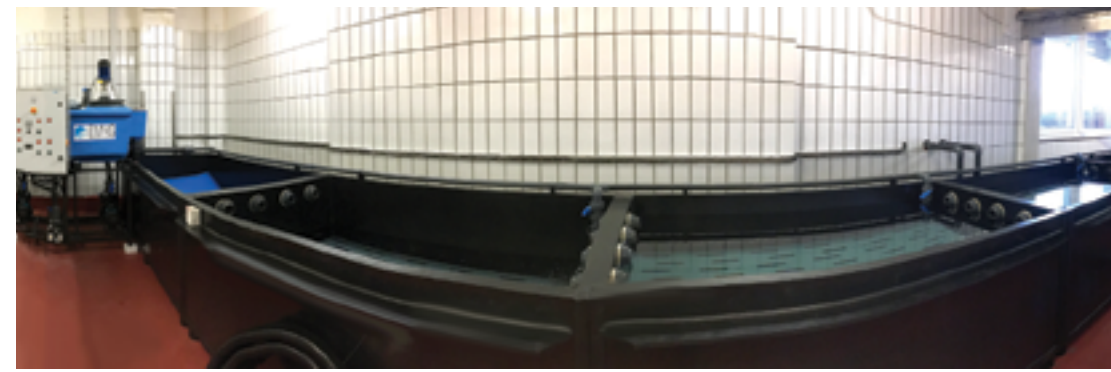


CUSTOM-DESIGNED



Fonteneau

(France)



Bell

(Switzerland)







EMYG

ENVIRONMENT & AQUACULTURE

DEPURATION & HOLDING FOR SHELLFISH & CRUSTACEANS

Physical keeping conditions mimicking those of their natural environment



www.emygaqua.com