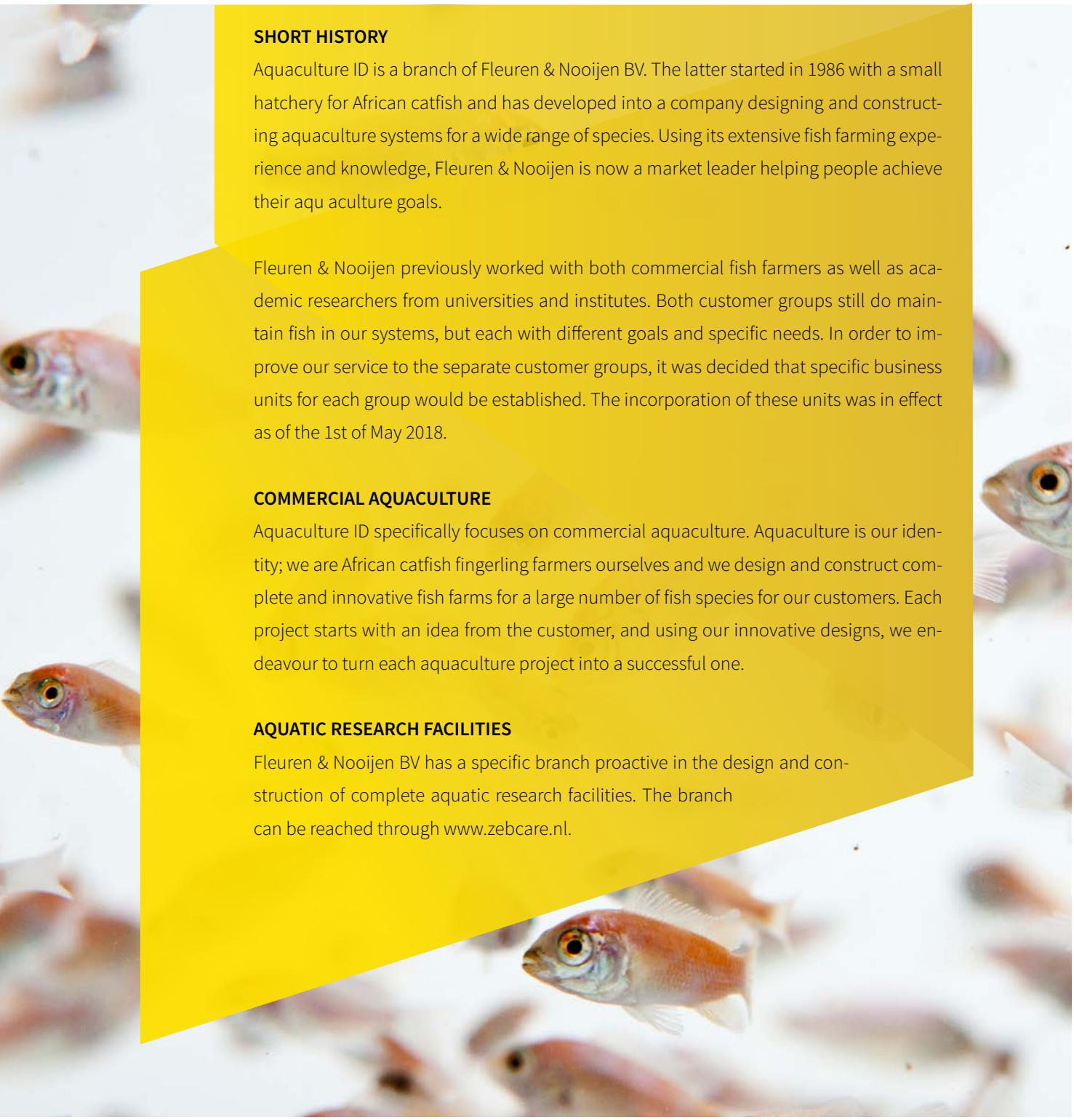
AQUACULTURE ID
a Fleuren & Nooijen branch

PLUG-AND-PLAY HATCHERY SYSTEMS

for the production of African catfish and Tilapia fingerlings

WWW.AQUACULTUREID.COM

INTRODUCTION TO AQUACULTURE ID



SHORT HISTORY

Aquaculture ID is a branch of Fleuren & Nooijen BV. The latter started in 1986 with a small hatchery for African catfish and has developed into a company designing and constructing aquaculture systems for a wide range of species. Using its extensive fish farming experience and knowledge, Fleuren & Nooijen is now a market leader helping people achieve their aqu aculture goals.

Fleuren & Nooijen previously worked with both commercial fish farmers as well as academic researchers from universities and institutes. Both customer groups still do maintain fish in our systems, but each with different goals and specific needs. In order to improve our service to the separate customer groups, it was decided that specific business units for each group would be established. The incorporation of these units was in effect as of the 1st of May 2018.

COMMERCIAL AQUACULTURE

Aquaculture ID specifically focuses on commercial aquaculture. Aquaculture is our identity; we are African catfish fingerling farmers ourselves and we design and construct complete and innovative fish farms for a large number of fish species for our customers. Each project starts with an idea from the customer, and using our innovative designs, we endeavour to turn each aquaculture project into a successful one.

AQUATIC RESEARCH FACILITIES

Fleuren & Nooijen BV has a specific branch proactive in the design and construction of complete aquatic research facilities. The branch can be reached through www.zebcare.nl.

OUR PHILOSOPHY

HATCHERY REQUIREMENTS

We believe four requirements are essential for a successful hatchery:

1. RAS Technology. A Recirculating Aquaculture System is ideal for controlling the water parameters. With such equipment, your young fish are given optimal living conditions ensuring the best chance of healthy fingerlings.
2. Good genetics. Using broodstock from a well-performing genetic strain improves the growth and health performance of your fish. Please contact us for prices and availability of our Dutch strain African catfish broodstock and/or Dutch strain African catfish fingerlings.
3. High-quality fish feed. To get a head start in life, the broodstock and young fish in every hatchery should be fed with high quality fish feed. Quality fish feed is not only important for your fish but it is also vital for the operation of your RAS systems as low quality fish feed spoils the filters of such RAS systems.
4. Proper management and staff. A successful hatchery cannot work properly without good management and the well-trained staff.

Plug-and-Play hatchery systems

Through years of experience, we've come to appreciate that there is a shortage of high-quality aquaculture products in many places in the world. We also understand that installation costs for small to medium-sized hatcheries (< 1 million) can be high. With a mind to mitigate these challenges, we have developed "Plug-and-Play" hatchery systems. The innovative hatchery systems have been specifically designed for the breeding of African catfish and tilapia. Also, these systems feature RAS technology, are affordable, easy to install and efficient to transport.

Specifically designed for African catfish and tilapia

Plug-and-Play hatchery systems are designed according to the different life stages of African catfish. Each life stage having certain requirements, these needs are the basis of the diverse systems' designs.

Highest quality

The various RAS hatchery systems available to date have been developed using our 30+ year experience in hatcheries. Simple to operate, easy to clean, disinfect and maintain, and constructed from sustainable materials such as polypropylene, PVC and stainless steel, these systems are very effective in producing healthy fingerlings!

Plug-and-Play for easy installation

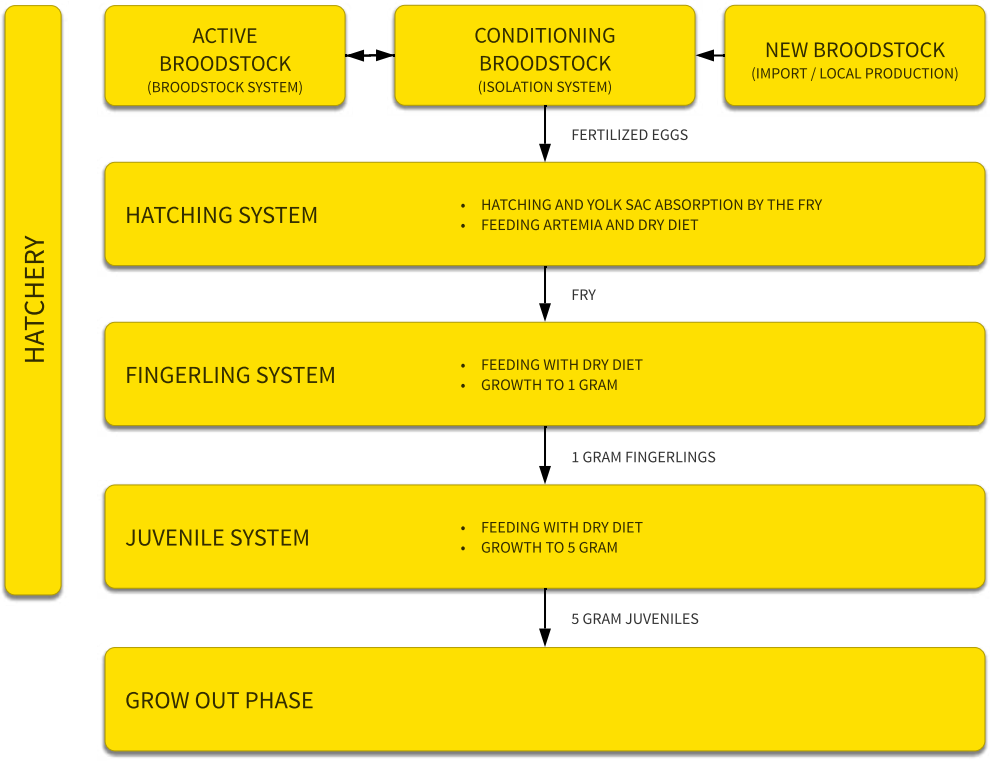
All the Plug-and-Play hatchery systems use RAS technology and are prefabricated and tested at our well-equipped workshop in The Netherlands. After transport of the equipment to your hatchery site, the only things you need to do are (1) place the system level using the adjustable feet, (2) attach it to a local water source, and (3) plug it in!

Efficient transport

Also, we offer efficient transport options; a hatchery with an annual output of half a million fingerlings will fit into one 40ft high cube container. This compactness allows us to keep transport costs low.

AFRICAN CATFISH
PRODUCTION SCHEME

Plug-and-Play hatchery systems are designed according to the different life stages of African catfish. Each life stage having certain requirements, these needs are the basis of the diverse systems' designs.



AFRICAN CATFISH
BROODSTOCK SYSTEM

The African catfish broodstock system Plug-and-Play allows full control of your African catfish broodstock and contributes to the good health of your fish. The combination of perfect husbandry and high quality broodstock fish feed, gives the best chances of having African catfish broodstock being in excellent condition. If desired, Aquaculture ID can also supply broodstock fish (Dutch strain African catfish) worldwide.

SPECIFICATIONS:

- 2x Polypropylene fish tanks with two outlets; one for return to sedimentation tank and one for draining the tank completely
- 2x Cover (out of SS304) to prevent the fish from jumping out of the tank
- Sedimentation filter tank (mechanical filtration) allows for removing all the solid particles from the system water flow.
- Moving bed filter tanks (biological filtration), converts the ammonia produced by the fish into nitrate. Each tank consists of a moving bed filter tank, filled with PP particles and aeration equipment to aerate the filter tank.
- Pump tank in which pump, freshwater supply and overflow pipe are installed.
- Frame (out of SS304) with adjustable stands for easy system installation.
- 1x Messner pump (70 W – 240 V) (made in Germany)
- 1x 40-watt VGE UV-C unit with SS304 housing (made in The Netherlands)
- 1x Air pump (160 W – 240 V) to aerate the moving bed filter tank
- Connection for freshwater supply (1x floating valve (automatic filling), 1x ball valve (manual filling))
- PVC piping and fittings to connect the different system elements.

- Fish tank volume: 720 L
- Number of fish tanks: 2
- Recommended density: 90 kg/m3
- Average fish size: 4 kg
- Dimensions: 4.0 x 1.0 x 1.1 m (LxWxH)

AFRICAN CATFISH
ISOLATION SYSTEM

In the African catfish isolation system Plug-and-Play, space available for up to three African catfish broodstock. These broodstock will be selected from the African catfish broodstock system and kept isolated prior to breeding. After breeding, the broodstock fish should be placed back in the isolation system to recuperate.

SPECIFICATIONS:

- 2x Polypropylene fish tanks
- Connection for freshwater supply
- Frame (out of SS304) with adjustable stands for easy system installation.
- PVC piping and fittings to connect the different system elements.

- Effective fish tank volume: 150 L
- Number of fish tanks: 3
- Recommended density: 1 fish/tank
- Dimensions: 1.0 x 0.7 x 0.9 m (LxWxH)

AFRICAN CATFISH
HATCHING SYSTEM

In the African catfish hatching system, the fertilised eggs, obtained from the selected broodstock, will be placed and hatched. Each floating egg tray, one in each tank, should be stocked with 100 grams of fertilised eggs. This will result in a total stocking density of 400 eggs per cycle. The fertilised eggs are then evenly spread over the sieves of the floating egg trays and hatch in around 24 hours (when water temperature is around 29 degrees Celsius). The larvae will fall through the mesh of the egg trays while the non-hatched eggs will stay behind. Treating the eggs with chemicals is NOT needed, refraining to do so will result in healthier fry.

SPECIFICATIONS:

- 4x polypropylene fish tanks with 1 outlet in the bottom. Complete with two types of outflow sieves (large and small)
- Sedimentation filter tank (mechanical filtration) allows for removing all the solid particles from the system water flow.
- Pump tank in which pump, freshwater supply and overflow pipe are installed.
- Frame (out of SS304) with adjustable stands for easy system installation.
- Connection for freshwater supply (1x floating valve (automatic filling), 1x ball valve (manual filling))
- 1x Messner pump (70 W – 240 V) (made in Germany)
- 1x 40-watt VGE UV-C unit with SS304 housing (made in The Netherlands)
- 1x Air pump (50 W – 240 V) including supply line and air diffusers
- 4x floating egg trays
- PVC piping and fittings to connect the different system elements.

- Fish tank volume: 120 L
- Number of fish tanks: 4
- Stocking density: 400 grams of eggs
- Final fish size: 0.1 gram
- Estimated cycles per year: 15
- Annual system production: One system per 500,000 fingerlings production
- Dimensions: 2.3 x 1.0 x 1.3 m (LxWxH)

AFRICAN CATFISH
FINGERLING SYSTEM

After the fish are transferred from African catfish hatching system Plug-and-Play into the African catfish fingerling system Plug-and-Play, the fry need about 3 weeks to grow to 1-gram fingerlings. The fingerling system consists of two fish tanks which are very easy to maintain (disinfect and clean) between each batch of fry.

SPECIFICATIONS:

- 2x Polypropylene fish tanks with two outlets; one for return to sedimentation tank and one for draining the tank completely
- Sedimentation filter tank (mechanical filtration) allows for removing all the solid particles from the system water flow.
- Moving bed filter tanks (biological filtration) which convert the ammonia produced by the fish into nitrate. Each tank consists of a moving bed filter tank, filled with PP particles and aeration equipment to aerate the filter tank.
- Pump tank in which pump, freshwater supply and overflow pipe are installed.
- Frame (out of SS304) with adjustable stands for easy installation of system.
- 1x Messner pump (70 W – 240 V) (made in Germany)
- 1x 40-watt VGE UV-C unit with SS304 housing (made in The Netherlands)
- 1x Air pump (160 W – 240 V) to aerate the moving bed filter tank
- Connection for freshwater supply (1x floating valve (automatic filling), 1x ball valve (manual filling))
- PVC piping and fittings to connect the different system elements.

- Fish tank volume: 630 L
- Number of fish tanks: 2
- Recommended final density: 10 kg/m3
- Final fish size: 1 gram
- Estimated cycles per year: 15
- Production per cycle: 12,600 fishes
- Annual production: 189,000 fishes
- Dimensions: 3.8 x 1.2 x 1.1 m (LxWxH)

AFRICAN CATFISH
JUVENILE SYSTEM

After the fish are transferred from African catfish fingerling system Plug-and-Play to the African catfish juvenile system Plug-and-Play, the fingerlings need about 4 weeks to grow to 5-gram juveniles. The juvenile system consists of two fish tanks which are very easy to maintain (disinfect and clean) between each batch of fry. These larger African catfish juveniles are much stronger than the smaller African catfish fingerlings, giving them a head start in the pre on-growing section of your African catfish grow out farm.

SPECIFICATIONS:

- 2x Polypropylene fish tanks with two outlets; one for return to sedimentation tank and one for draining the tank completely
- Sedimentation filter tank (mechanical filtration) allows for removing all the solid particles from the system water flow.
- Moving bed filter tanks (biological filtration), which converts the ammonia produced by the fish into nitrate. Each tank consists of a moving bed filter tank, filled with PP particles and aeration equipment to aerate the filter tank.
- Pump tank in which pump, freshwater supply and overflow pipe are installed.
- Frame (out of SS304) with adjustable stands for easy installation of system.
- 1x Messner pump (70 W – 240 V) (made in Germany)
- 1x 40-watt VGE UV-C unit with SS304 housing (made in The Netherlands)
- 1x Air pump (160 W – 240 V) to aerate the moving bed filter tank
- Connection for freshwater supply (1x floating valve (automatic filling), 1x ball valve (manual filling))
- PVC piping and fittings to connect the different system elements.

- Fish tank volume: 630 L
- Number of fish tanks: 2
- Recommended final density: 40 kg/m3
- Final fish size: 5 gram
- Estimated cycles per year: 12
- Production per cycle: 10,000 fishes
- Annual production: 120,000 fishes
- Dimensions: 3.9 x 1.2 x 1.1 m (LxWxH)

ARTEMIA

HATCHING SYSTEM SMALL

Artemia or brine shrimp are used as a first feed for African catfish fry. The benefit of this fish feed is that it can be hatched on-site using cysts. These cysts have a very long shelf life (when stored vacuum and in the refrigerator many years) without losing hatching capacity. With our artemia hatching systems, you will be able to produce large quantities of artemia for your fry.

SPECIFICATIONS:

- 2x Polyethylene funnels (113 litres) with bottom outlet including ball valve
- Frame (out of SS304) with adjustable stands for easy installation of system.
- 1 TL-pendant 2x 36 Watt (240 V)
- Connection for freshwater supply
- Air pump (47 W - 240 V) including supply line and air diffuser
- Gutter with a central outlet
- Artemia harvest sieve
- PVC plate at the back of the stand with aeration line

- Tank volume: 113 L
- Number of tanks: 2
- Max production per cycle: 540 gr of artemia cysts
- Dimensions: 1.3 x 0.6 x 1.8 m (LxWxH)

ARTEMIA

HATCHING SYSTEM LARGE

Artemia or brine shrimp are used as first feed for African catfish fry. The benefit of this fish feed is that it can be hatched on-site using cysts. These cysts have a very long shelf life (when stored vacuum and in the refrigerator many years) without losing hatching capacity. With our artemia hatching systems, you will be able to produce large quantities of artemia for your fry.

SPECIFICATIONS:

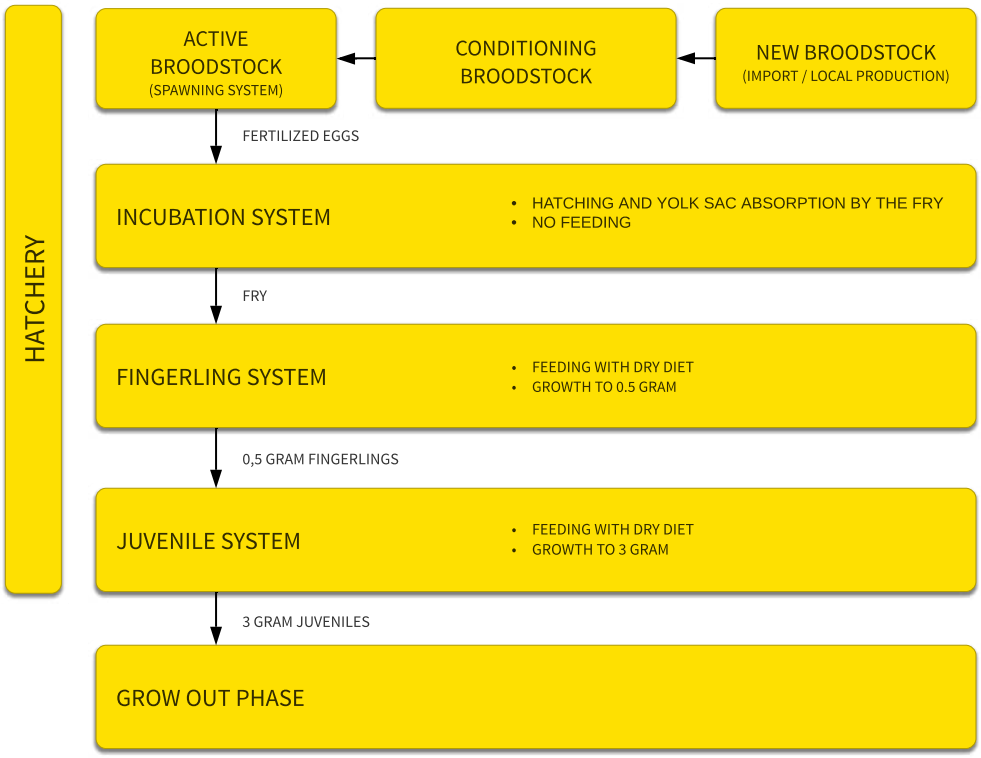
- 4x Polyethylene funnels (113 litres) with bottom outlet including ball valve
- Frame (out of SS304) with adjustable stands for easy system installation.
- 2x TL-pendant 2x 36 Watt (240 V)
- Connection for freshwater supply
- Air pump (72 W - 240 V) including supply line and air diffuser
- Gutter with a central outlet
- Artemia harvest sieve
- PVC plate at the back of the stand with aeration line

- Tank volume: 113 L
- Number of tanks: 4
- Max production per cycle: 1080 gr of artemia cysts
- Dimensions: 2.6 x 0.6 x 1.8 m (LxWxH)

TILAPIA

PRODUCTION SCHEME

The Plug-and-Play hatchery systems are designed according to the different life stages of the tilapia. Each life stage having certain requirements. These requirements are the basis of the system's design.



TILAPIA

INCUBATION SYSTEM 3-JARS

For tilapia hatcheries who handle smaller amounts of tilapia eggs we have developed the tilapia egg incubator with 3 jars. Tilapia eggs will be transferred to one of the three Mc Donald hatching jars of the tilapia incubation system Plug-and-Play. Each hatching jar has a volume of 8 litres at a density of maximum of 20,000 eggs per jar, resulting in a total density of 60,000 eggs per cycle. After a period of 3 to 5 days, the eggs will hatch. After hatching, the yolk sac fry will flow out of the jar into a white reception tank. After complete yolk sac absorption, the fry should be transferred to the tilapia fingerling systems.

SPECIFICATIONS:

- 3x Mc Donald hatching jars, approximately 8 litres each
- 3x Tilapia fry reception tanks
- Sedimentation filter tank (mechanical filtration) allows for removing all the solid particles from the system water flow.
- Pump tank in which pump, freshwater supply and overflow pipe are installed.
- Frame (out of SS304) with adjustable stands for easy installation of the system.
- Connection for freshwater supply (1x floating valve (automatic filling), 1x ball valve (manual filling))
- 1x Messner pump (48 W – 240 V) (made in Germany)
- 1x 40-watt VGE UV-C unit with SS304 housing (made in The Netherlands)
- PVC piping and fittings to connect the different system elements.

- Fish tank volume: 10 L
- Number of fish tanks: 3
- Final fish size: 0.1 gram
- Estimated cycles per year: 25
- Annual system production: One system per 250,000 fingerlings production
- Dimensions: 1.1 x 0.6 x 1.2 m (LxWxH)

TILAPIA

INCUBATION SYSTEM 6-JARS

Tilapia eggs will be transferred to one of the six Mc Donald hatching jars of the tilapia incubation system Plug-and-Play. Each hatching jar has a volume of 8 litres at a density of max. 20,000 eggs per jar, resulting in a total density of 120,000 eggs per cycle. After a period of 3 to 5 days the eggs will hatch. After hatching the yolk sac fry will flow out of the jar into a white reception tank. After complete yolk sac absorption, the fry should be transferred to the tilapia fingerling systems.

SPECIFICATIONS:

- 6x Mc Donald hatching jars, approximately 8 litres each
- 6x Tilapia fry reception tanks
- Sedimentation filter tank (mechanical filtration) allows for removing all the solid particles from the system water flow.
- Pump tank in which pump, freshwater supply and overflow pipe are installed.
- Frame (out of SS304) with adjustable stands for easy system installation.
- Connection for freshwater supply (1x floating valve (automatic filling), 1x ball valve (manual filling))
- 1x Messner pump (48 W – 240 V) (made in Germany)
- 1x 40-watt VGE UV-C unit with SS304 housing (made in The Netherlands)
- PVC piping and fittings to connect the different system elements.

- Fish tank volume: 10 L
- Number of fish tanks: 6
- Final fish size: 0.1 gram
- Estimated cycles per year: 25
- Annual system production: One system per 500,000 fingerlings production
- Dimensions: 1.9 x 0.6 x 1.2 m (LxWxH)

TILAPIA

FINGERLING SYSTEM

After the fish are transferred from the incubation system to the tilapia fingerling system Plug-and-Play, the fry need about 3 weeks to grow to 0.5-gram fingerlings. The fingerling system consists of two fish tanks which are very easy to maintain and disinfected or clean between each batch of fry. Please note that the fingerling systems of tilapia and catfish are similar in setup with the only difference that the tilapia systems have an aeration module to provide the water with enough dissolved oxygen.

SPECIFICATIONS:

- 2x Polypropylene fish tanks with two outlets; one for return to sedimentation tank and one for draining the tank completely
- Sedimentation filter tank (mechanical filtration) allows for removing all the solid particles from the system water flow.
- Moving bed filter tanks (biological filtration) which convert the ammonia produced by the fish into nitrate. Each tank consists of a moving bed filter tank, filled with PP particles and aeration equipment to aerate the filter tank.
- Pump tank in which pump, freshwater supply and overflow pipe are installed.
- Frame (out of SS304) with adjustable stands for easy system installation.
- 1x Messner pump (70 W – 240 V) (made in Germany)
- 1x 40-watt VGE UV-C unit with SS304 housing (made in The Netherlands)
- 1x Air pump (160 W – 240 V) to aerate the moving bed filter tank
- 1x Aeration module, consisting out of Air pump (160 W – 240 V) including supply line and air diffusers in fish tanks
- Connection for freshwater supply (1x floating valve (automatic filling), 1x ball valve (manual filling))
- PVC piping and fittings to connect the different system elements.

- Fish tank volume: 630 L
- Number of fish tanks: 2
- Recommended final density: 6 kg/m3
- Final fish size: 0,5 gram
- Estimated cycles per year: 15
- Production per cycle: 15,000 fishes
- Annual production: 225,000 fishes
- Dimensions: 3.8 x 1.2 x 1.1 m (LxWxH)

TILAPIA
JUVENILE SYSTEM

After the fish are transferred from tilapia fingerling system Plug-and-Play to the tilapia juvenile system Plug-and-Play, the fingerlings need about 3 weeks to grow to 3-gram juveniles. The juvenile system consists of two fish tanks which are very easy to maintain (disinfect and clean) between each batch of fry. These larger tilapia juveniles are much stronger than the smaller tilapia fingerlings, giving them a head start in the pre on-growing section of your tilapia grow out farm. Please note that the juvenile systems of tilapia and catfish are similar in setup with the only difference that the tilapia systems have an aeration module to provide the water with enough dissolved oxygen.

SPECIFICATIONS:

- 2x Polypropylene fish tanks with two outlets; one for return to sedimentation tank and one for draining the tank completely
- Sedimentation filter tank (mechanical filtration) allows for removing all the solid particles from the system water flow.
- Moving bed filter tanks (biological filtration), which convert the ammonia produced by the fish into nitrate. Each tank consists of a moving bed filter tank, filled with PP particles and aeration equipment to aerate the filter tank.
- Pump tank in which pump, freshwater supply and overflow pipe are installed.
- Frame (out of SS304) with adjustable stands for easy installation of system.
- 1x Messner pump (70 W – 240 V) (made in Germany)
- 1x 40-watt VGE UV-C unit with SS304 housing (made in The Netherlands)
- 1x Air pump (160 W – 240 V) to aerate the moving bed filter tank
- 1x Aeration module, consisting out of Air pump (160 W – 240 V) including supply line and air diffusers in fish tanks
- Connection for freshwater supply (1x floating valve (automatic filling), 1x ball valve (manual filling))
- PVC piping and fittings to connect the different system elements.

- Fish tank volume: 630 L
- Number of fish tanks: 2
- Recommended final density: 15 kg/m3
- Final fish size: 3 gram
- Estimated cycles per year: 15
- Production per cycle: 6,300 fishes
- Annual production: 94,500 fishes
- Dimensions: 3.9 x 1.2 x 1.1 m (LxWxH)

COMPLETE PACKAGES

HATCHERY EXAMPLES

African catfish hatchery with an annual output of 480,000 juveniles (5 gram):

- 1x African catfish Broodstock system
- 1x African catfish Isolation system
- 1x African catfish Hatching system
- 4x African catfish Fingerling system
- 4x African catfish Juvenile System
- 1x Artemia hatching system small

Transport: one 40ft HC container
Estimated water consumption: 4 m3/day
Estimated energy consumption: 3,75 kWh
Surface area needed: approx. 250 m2

African catfish hatchery with an annual output of 1,000,000 juveniles (5 gram):

- 2x African catfish Broodstock system
- 1x African catfish Isolation system
- 2x African catfish Hatching system
- 9x African catfish Fingerling system
- 9x African catfish Juvenile System
- 1x Artemia hatching system large

Transport: two 40ft HC container
Estimated water consumption: 8 m3/day
Estimated energy consumption: 8,25 kWh
Surface area needed: approx. 500 m2

Tilapia hatchery with an annual output of 500,000 juveniles (3 gram):

- 4x Spawning tank set
- 1x Tilapia incubation system 6-jars
- 3x Tilapia Fingerling system
- 6x Tilapia Juvenile System

Transport: one 40ft HC container
Estimated water consumption: 5 m3/day
Estimated energy consumption: 5,25 kWh
Surface area needed: approx. 500 m2

CUSTOM SOLUTIONS

TURN-KEY HATCHERIES

TURN-KEY HATCHERY SOLUTIONS FOR MANY FISH SPECIES.

Large hatcheries (production > 1 million fingerlings per year) and other fish species may require custom solutions. We have extensive experience in the design and construction of unique hatchery solutions for African catfish, Tilapia and other fish species, precisely fitting to the needs of the customer.

Aquaculture ID is highly capable of designing and constructing unique hatchery concepts for a wide range of fish species. The concepts and experience of the customer combined with the 30+ year experience of Aquaculture ID ensure designs which are suitable and practical.

Aquaculture ID provides optimal solutions for large scale hatcheries. Fully operational systems can be designed, constructed and installed on location by our skilled mechanics. Combined with technical and fish farming training on site and service and maintenance after completion. If so desired, Aquaculture ID can also provide complete biosecurity plans for hatcheries.

FULLY EQUIPPED

EQUIPMENT & SPARE PARTS

Your success is dependent on having a complete system. We always strive to offer this. All hatchery project proposals include the necessary hatchery equipment, cleaning and hygiene equipment, laboratory equipment, spawning equipment, and spare parts. Below some examples of available equipment are given. Please contact us directly for all available equipment and prices.

Hatchery equipment

- Fish graders
- Scoop nets
- Weighing scales

Cleaning and hygiene equipment

- Pipe brushes
- Disinfection equipment

Laboratory equipment

- Microscopes
- Water test kits
- Dissection kits

Spawning equipment

- Artemia
- Ovaprim
- Microchips for chipping of broodstock fish

AQUACULTURE ID

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