ZEOLITE
CLINOPTILOLITE
APPLICATION FOR
WATER TREATMENT
AQUACULTURE & AQUARIUM

TOXINS IN AQUACULTURE

Aquaculture has two vital parameters: dissolved oxygen and ammonia. Compared to dissolved oxygen, ammonia concentration is more difficult to control. Fish's urine, faeces and accumulating wasted feed, all produce ammonia. Ammonia is easily dissolved in aqueous solution and converts into ammonium ion (NH_4^+). Dissolved ammonia concentration and toxicity increases by temperature and pH; decreases by dissolved oxygen concentration. Ammonia is toxic to aqueous life and reduces oxygen carriage capacity of hemoglobin. Furthermore, ammonia damages the gills and prevents fish to get oxygen.

Apart from ammonia, water sources are constantly polluted by heavy metals, such as copper, zinc and lead, by chemicals and chemotherapeutants used in the farming and by persistent organic pollutants. These toxins and heavy metals easily accumulate in different tissues of fish and increase the health risk of humans who consume them.

Natural zeolite - clinoptilolite is the perfect mineral to get rid of the toxins, heavy metals and ammonia from water sources. It improves the overall quality and health of the aqua system and provides the best conditions for the living in the system. Rota Mining now offers granule and pellet products for water treatment applications in aquaculture , aquariums and ponds.

Granule Zeolite

Pellet Zeolite

GRANULE ZEOLITE: 1 MINERAL, 3 DIFFERENT FILTRATIONS

Zeolite granules has the ability to remove toxins, heavy metals, ammonia and suspended particles from water in three different filtration processes:

Mechanical Filtration

Fish faeces and wasted feed are filtered mechanically. Despite the widely usage of sand and coal; zeolite, in appropriate sizes and amounts, is more effective than sand and coal. Sand filters are able to filter particles down to 20-40 microns. However, zeolite can filter particles down to 4 micron. Moreover, filters with zeolite reduce backwashing needs by half.

Chemical Filtration

In chemical filtration, ammonia is adsorbed by an ion exchanger media. Such filtration needs high efficiency in ammonia ion exchange capability, which Zeolite – Clinoptilolite possesses. After ammonium ions are adsorbed by zeolite, ammonium cannot be dissolved in water any more.

Biological Filtration

Biological filtration works with natural bacterial growth which mineralizes nitrogen components. Biological filtration includes aerobic (nitrification) and anaerobic (denitrification) steps. Nitrification is the most popular filtration method which converts ammonia to nitrite and then nitrite to nitrate by autotrophic bacteria. Wide space provided by zeolite is perfectly suitable for bacterial colonies. Zeolite employed systems process nitrification at optimum levels.

PELLET ZEOLITE: AN INNOVATION FOR FISH FARMING

According to the demands of fresh water fish and shrimp farmers in Southeast Asia, Rota Mining developed the pellet zeolite product from its high quality ore. Pellet zeolite is produced from 400 micron grade powder product. No additives is used during pelleting but only pure water. Lastly pellets are activated and hardened at a very high temperature which increases the cation exchange capacity of the product.

Pellet zeolite can easily be spread to the ponds by the farmers without dust. Pellet stays rigid until it falls to the bottom of the pond, and it doesn't blur the water. At the bottom of the pond it turns into powder form again and expands its surface area. Powder zeolite absorbs the toxins and ammonia and heavy metals with a greater efficiency.

STARKE AQUACARE TECHNOLOGIES

ZEOLITE
CLINOPTILOLITE

WATER TREATMENT

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CONTENT

Zeolite is a crystalline, hydrated aluminosilicate that has an infinite three dimensional structure. Zeolite contains extremely pure Clinop - tilolite (**92% by mass on average**), which is one of the most effective Heulandite type of zeolite. Its highly porous structure (with a porosity reaching 50%) provides an extremely large surface area on which chemical reactions and cation exchanges can take place at a very high degree. It can absorb incredible amounts of water/liquid into its pores. Clinoptilolite has a natural negative ion charge which furnishes it with a tremendously high cation exchange capacity (CEC). Thanks to CEC, it adsorbs and binds ammonium, toxins, mycotoxins and heavy metals like Ni, Pb, Hg and Cd, very efficiently and effectively.

CATION EXCHANGE CAPACITY

Cation exchange capacity (CEC) is a measure of the amount of cations (positively-charged ions) that a clay can catch. As mycotoxins, toxins, heavy metals and ammonium are all positively charged, they are all easily trapped by cation exchangers.

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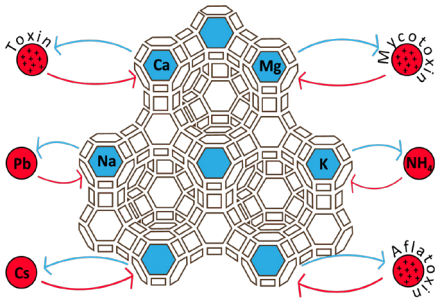

APPLICATION

Granule products are placed in a filtering column. Column size, flow rate, contact time, etc. should be arranged with the assistance of a technician, according to the quality parameters of the influent.

Pellet products are spread to the pond. Application rates depend on the volume of water and total weight of fish.

SUITABLE SIZES

- 0,7 - 1,6 mm
- 1,6 - 3 mm
- 3 - 5 mm
- 5 - 9 mm
- 9 - 16 mm
- 16 - 50 mm
- Pellet

ENVIRONMENT-FRIENDLY

100% natural and safe product; produced under the strict quality control system and surveillance of FamiQs.

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