

KALDNES

INCORPORATING **KALDNES** MOVING BED™ PROCESS

Kaldnes Moving Bed™ process, which has been scientifically tried and tested in fish farming and waste water treatment for over 10 years, is now available for fish keepers and is exclusively distributed worldwide by Evolution Aqua.

Design:

Developed by Professor Halvard Odergard at Trondheim University of Science & Technology, Norway, the Kaldnes Moving Bed™ bio film process has been designed specifically to create the most effective environment for the nitrification process to take place.

The media is engineered in a wheel shape and is slightly positively buoyant. This allows a small amount of water flow to circulate the media throughout the vessel. This flow is created by pumping air through a perforated plastic circular tube (which is provided), at the base of the Nexus.



How it Works:

Maturing the Kaldnes bio-media is important because a delicate ecosystem is naturally developing for the bacteria involved in the nitrification process. Fish are required to generate the waste which bacteria survive on. The bacteria colonise the new media without the need for additional chemicals. When established, your Kaldnes should be brown in colour. See Image below.

Nitrification Process:

Oxygen and food (fish waste) give the beneficial bacteria the means to grow, whilst the Kaldnes media provides maximum active surface area for the bacteria to colonise more than other types of static media. It is this process which removes harmful ammonia and nitrite from the water.

As the Kaldnes media chaotically circulates within the Nexus, it causes old dead bacteria on the outside to be removed, making space for new younger heavier feeding bacteria to colonise. Within the wheel is a protected surface, which enables colonies of bacteria to naturally follow

their life cycle, maturing and dying, in turn fuelling the latter stages of the nitrification process. It also assists in the breakdown of any small particles passing through from the mechanical stage. Therefore, the Kaldnes media provides a correct mix of both young and mature beneficial colonies, providing a more consistent filter performance whilst improving water quality, encouraging healthier fish and aiding in the reduction of green water and blanket weed.

Maturing Process:

The maturing process needs monitoring closely to ensure that levels of pH, ammonia and nitrite are within acceptable parameters for your fish. Usually, after a period of between 6-20 weeks the beneficial bacteria will have colonised the media to a satisfactory level to deal with the waste produced by your fish. This period may extend depending on local water conditions, temperature and stocking density.

Self Cleaning:

Due to chaotic movement of the Kaldnes KI media, the process is self-cleaning and requires no maintenance. This allows the filter to reach optimum effectiveness without the disturbance of periodic maintenance, avoiding unnecessary loss of bacteria within the filter. This prevents high levels of ammonia and nitrite within the water.

Levels of Kaldnes KI within the Nexus:

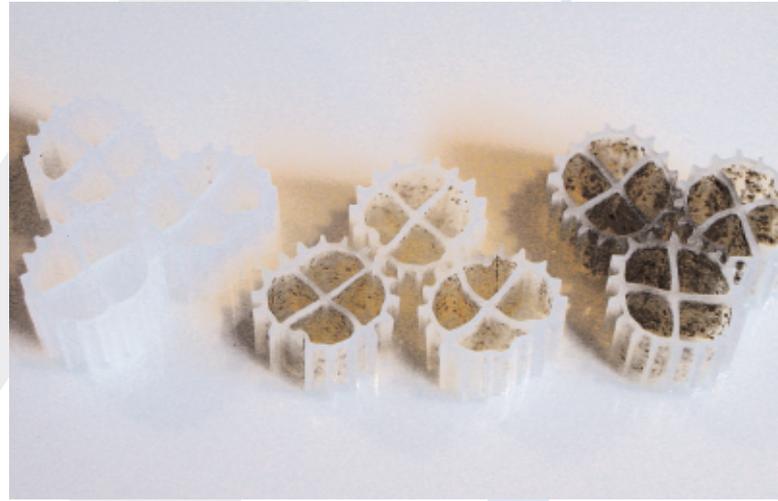
Kaldnes KI has been proven in fish farming with feed rates up to



0.75kgs of 40% protein food per 50 litres of media per day. Evolution Aqua is rating it at a maximum of 0.25kgs of food per 50 litres used, in order to ensure the best possible water parameters are achieved. If a higher feed rate is required, extra media can easily be added.

Koi are typically fed at between 1% - 2% of body weight per day. Therefore, for every 5 grams of food fed, 1 litre of K1 media is required. At Evolution Aqua, our filter designs are based on the higher rate of 2% per day.

Below is a table you can use as a guide if you do not wish to weigh your fish. It illustrates an approximate relationship between average length and average weight of Koi. (NB: All Koi develop different body shapes according to breed, feed rate, pond design and water current).



KALDNES MAIN BENEFITS

- Kaldnes Moving Bed™ process creates an oxygen rich environment for your fish.
- Even distribution of water throughout media (avoids the dead areas within the filter normally associated with static type media filtration).
- Old bacteria is constantly renewed promoting new young heavy feeding bacteria.
- Many times more surface area than other types of filter media.
- Totally maintenance free and self cleaning.
- Oxygen rich environment gives improved oxygen transfer in moving bed technology.

Average Length of Fish	Average Weight of Fish
10CM	13g
15CM	46g
20CM	110g
25CM	210g
30CM	370g
40CM	890g
50CM	1,750g
60CM	3,050g

- Simply add more Kaldnes K1 media to increase the biological filter performance.
- 50 litres of K1 media will handle up to 0.25kg of food per day.

To assist you in calculating the amount of K1 media required or maximum stocking densities, please refer to the table below:-

Amount of K1 Media in the Nexus	Maximum Daily Feed Rate for the Nexus	Maximum fish stocking weight depending on percentage of body weight fed daily		
		1% body weight	1.5% body weight	2% body weight
50 litres	250g of food	25kg of fish	18.75kg of fish	12.5kg of fish
100 litres	500g of food	50kg of fish	37.5kg of fish	25kg of fish
150 litres	750g of food	75kg of fish	56.25kg of fish	37.5kg of fish
200 litres	1000g of food (1kg)	100kg of fish	75kg of fish	50kg of fish