



## Our Web Site Links

[Home](#)

[Catalogue](#)

[Guides](#)

[Links](#)

[Order Form](#)

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## [Harmonium](#) ... [How To Use](#). ... [What Is It and Why Use It](#).

The benefits of reaching a balance in aquaria and other closed systems are those of real enjoyment. Our aquatic companions repay this wisdom by living longer and eventually reproducing. The philosophy is simple if you want to maintain and even breed anything you must establish an optimum environment which must also be "stable" and in equilibrium.

The natural pink zeolite from AusQuatic will help you achieve this balance. That is why I called the media [Harmonium](#) because it helps bring harmony to the chemistry and biology of closed systems.

Like any media there are limits to what it can achieve, however, [Harmonium](#) is a naturally occurring pink zeolite with some very special properties. It is quite hard and can therefore be used in a fluidised bed filtration system. Being a zeolite it is a natural ion exchange resin, exchanging not only sodium (Na) but also calcium (Ca) and iron (Fe) for ammonium (ionized ammonia) and other harmful waste products and toxic heavy metals such as copper (Cu), zinc (Zn) and others. This is particularly beneficial when dealing with copper sensitive species such as crustaceans.

In fact the dilemma of maintaining crustaceans is one of the reasons I first started using **Harmonium**. The issue with crustaceans is they are quite sensitive to copper and other water parameters such as ammonium, nitrite and nitrate and pH. They are more sensitive to rapid changes in water chemistry than many fish and as such often display adverse and usually fatal reactions. This is particularly true just prior, during and just after a moult (Ecdysis). Many of us who keep crustaceans have noted that a population will often exhibit a "die off" where you can lose anywhere from 5% to 90% of a population. This is particularly true when first acclimating a new acquisition.

Keepers of crustaceans are also painfully aware that most, if not all foods contain copper, in fact it is inevitable and a trace requirement. The question often asked is how much copper is too much copper. Well a more balanced question is how much copper is available as a free ion, since this is the toxic form. The answer I have found; is to use **Harmonium**; not only does it bind any free ions of copper and exchange it for a biologically friendly ion such as sodium or calcium but it also allows the copper to find an equilibrium at a trace level.

**Harmonium** also binds ammonium and other waste products which are not only directly harmful but also effect pH values.

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## Philosophy

The idea of an equilibrium must be understood; it is this which makes **Harmonium** such a beneficial product. The recommendations for many other zeolites on the market are that they be removed and replaced often. I however, believe and recommend that our zeolites only be replaced every 1 to 3 months depending on load and when replacing our product it is not to be done completely but in a staggered fashion. That is when replacing the media replace about one third (1/3) to one half (1/2) at a time. This can be expedited by the use of more than one media bag.

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# How to Use Harmonium

## Directions:

1. Rinse the media to remove any fines (dust).
2. Add Harmonium at the rate of 20g per 35 litres (N.B. 1 tablespoon of Harmonium weighs ~ 25g and will treat 40 Litres; 1 teaspoon of Harmonium weighs ~ 6g and will treat 10 Litres).
3. Tie off the media bag and place either in your filter or directly in your aquaria.
  - **If placing the media bag in a canister filter we suggest locating it within the biological layer of your canister or directly under the fine mechanical filter layer in the canister.**
  - **If placing the media bag directly in the aquaria we suggest placing it out of sight but in a water current; i.e. near a return pipe of a canister filter or the outlet of an internal filter.**
4. To optimise results we recommend rinsing the media and bag every 2 weeks and replacing every 1 to 3 month depending on load.
5. When replacing our product, we recommend not to do a complete change but to replace the media in a staggered fashion. That is when replacing the media replace about one third (1/3) to one half (1/2) at a time. This can be expedited by the use of more than one media bag.

## Recommendations:

1. Harmonium as other zeolites can be recharged. However, owing to the special nature of Harmonium we recommend not to recharge it, since the commonly suggested method of recharging zeolites will result in a inferior cation exchange zeolite only able to exchange sodium.
2. Instead we recommend it is best utilised as a slow release fertiliser for your plants both terrestrial and aquatic.

# What Is Harmonium and Why Use It?

300 Million years in the making, ***Harmonium*** is a "Zeolite" which is a naturally occurring clay with the ability to exchange cations.

## Benefits of Using ***Harmonium***

1. **Detoxifies water by binding ammonium and toxic cations such as copper.**
2. **Reduces stress from "New Tank Syndrome" and Transportation.**
3. **Reduces ammonium spikes caused by accidental over feeding and stocking fluctuations.**
4. **Ideal for sensitive crustaceans particularly while moulting.**
5. **Our Media size is well suited for use in a variety of filtration systems from box filters; canister filters to fluidised beds.**

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## What is Zeolite ?

"Zeolite" is the name given to a Group of safe, naturally occurring, environmentally friendly minerals that are aluminosilicates with similar composition and characteristics. There are over 40 different minerals in the Group and only 4 of them have the absorption characteristics that render them of commercial value. These 4 useful minerals are clinoptilolite, mordenite, chabazite and phillipsite. With clinoptilolite and mordenite, being by far the most effective. ***Harmonium*** has the best of both Worlds with a mixture of both clinoptilolite and mordenite. Natural Zeolites have an open box work crystal structure, which is occupied by cations and water molecules. These ions and water molecules can move within the large cavities allowing ionic exchange and reversible rehydration plus they have a very high micro-porosity. The porous structure of zeolites can accommodate a wide variety of cations, such as Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup> and others. These positive ions are rather loosely held and can readily be exchanged for others in a contact solution. Their action is physical absorption and ion exchange rather than a chemical reaction allowing the exchange process to proceed virtually to completion. These special features of zeolites mean that they are invaluable in solving many environmental problems.

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## How Are Zeolites Formed ?

Natural zeolites form where volcanic rocks and ash layers react with alkaline groundwater. Zeolites also crystallise in post-depositional environments over periods ranging from thousands to millions of years in shallow marine basins. Most commercial deposits are formed from a layer of volcanic dust (ash). The conditions required are very complex and precise and hence commercial deposits of natural zeolite are rare.

### One must have:

1. **A relatively thick layer of volcanic ash.**
2. **That volcanic ash must be of the correct composition. Essentially it must be composed of amorphous silica glass (called obsidian).**
3. **That ash must fall into, or be washed into water.**
4. **That water must be static and neither fresh nor salt (i.e. brackish).**
5. **The water must be brackish with the correct salts.**
6. **This environment must be stable for a long time (at least ½ million years).**
7. **The ratio and concentration of the various salts determines which particular zeolite minerals are formed.**

What happens is that the amorphous glass slowly re-crystallises and in doing so takes up the salts from the surrounding water. This causes the formation of aluminosilicate minerals with the characteristic crystal forms of the particular zeolites.

**Harmonium** is of Carboniferous Age, some 300 million years old and is one of the oldest commercial zeolite deposits in the World. Unlike most overseas zeolites it is hard, very stable and contains no soluble salts.

**Harmonium** has a distinctive pink-brown colouration unlike most other zeolites which have a white-cream, gray or even green colouration. It is not a blend of "inferior" zeolites but contains 100% Pink Zeolite from a single ancient deposit.

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# Aquarium keeping

Zeolites can be used to adsorb ammonium and other nitrogenous compounds. However, due to the high affinity of *some* zeolites for calcium, they may be less effective in hard water and may even deplete calcium. *Where* and *how* the zeolite deposit was formed is an important consideration for aquarium use. Most natural zeolites from the Northern hemisphere, were formed when molten lava came in contact with sea water, thereby 'loading' the zeolite with Na (sodium) as the sacrificial ions. These sodium ions will speciate with other ions in solution, meaning that the take-up of ammonium, will result in the release of the sodium.

Zeolite deposits formed under the influence of fresh water are less common. One deposit in southern Idaho near Bear River is a fresh water variety ( Na < 0.05%) In Southern hemisphere zeolites, however, such as [Harmonium](#) found in Australia, which were formed with fresh water; calcium uptake was done during their formation. This means [Harmonium](#) is well suited for marine and fresh water aquaria use.

Zeolite filtration in marine aquaria has been gaining in popularity over the last few years, to keep nutrient concentrations low for the benefit of corals adapted to nutrient-depleted waters.

[Harmonium](#) is so effective at binding and removing ammonium from the water column that some care should be exercised when using our product in **established marine aquaria**, which often have elevated nutrient levels. Corals which have become accustomed to higher levels of ammonium and other nitrogenous wastes (nutrients) may have an adverse reaction to the sudden reduction of these waste products, initially. We recommend, the aquarist slowly build up to the required amount of [Harmonium](#) for their system, rather than adding the full amount immediately. **The concept of balance must be understood and maintained; anything which rapidly changes any water parameter is potentially hazardous to your aquatic companions, be it our product or a water change.**

Although [Harmonium](#) will also remove other positive ions of similar charge and size to those of ammonium, such as calcium, copper and silver, it doesn't strip them completely. Instead it purely reaches an equilibrium with the water. The zeolite already possesses calcium from its formation and may well add a little to the water if it is deficient. When using zeolite for the first time simply test your water after a day and see how it is affected, you may need to add a little calcium to compensate but usually you won't need to do anything

*[Harmonium](#) is a natural product and while every effort is made for consistency in production, it is possible that variations can occur.*