



# The EcoSphere Handbook

**IMPORTANT INFORMATION - PLEASE READ CAREFULLY  
AND RETAIN FOR CORRECT CARE AND HANDLING**

## **Unpacking Your EcoSphere**

When you unpack your EcoSphere be careful to keep it upright and avoid shaking it. If it is cold to the touch and the shrimp are still or sluggish, don't panic - when the temperature is cooler the shrimp's metabolism slows and they may appear to be lifeless. Allow the EcoSphere to warm up to room temperature - normally the shrimp will be swimming around within 24 hours. You may also notice the water is initially a little cloudy - again there is no need to be concerned, this will clear after a few hours.

## **Take Note Of The Amount Of Green Algae**

Look carefully at the green algae in the system - this is the quantity required to produce sufficient oxygen for the shrimp. Do not allow the algae to grow more than this or the chemical balance of the water will change and this will be harmful to the shrimp. You can control the growth of the algae by controlling the amount of light the EcoSystem receives - if the algae grow more than it should then place the EcoSphere in a slightly darker position, or shade it in some way. If the shrimp consume all the algae then place the EcoSphere in a lighter area and it will grow back. Do not worry if this takes time, it is not threatening to the system to lose all visible algae.

## **Caring For Your EcoSphere**

Keeping your EcoSphere healthy depends on understanding the simple principle behind the system - the health of the animals and the balance of the system depends upon the water chemistry. If the algae grow more than is required, then this will change the water chemistry (the pH of the water will rise) and the shrimp will perish. Although your EcoSphere will eventually 'wind down' due to a lack of nutrients, the following simple care guidelines will ensure you are able to enjoy your system for as long as possible.

### **The do's are easy to follow**

- Monitor the green algae and adjust the position of your EcoSphere accordingly to regulate the growth - less light to reduce growth, more light to stimulate growth.
- Provide light for your EcoSphere for at least 6 hours and ideally 12 hours each day. As a rough guide, the light intensity should be suitable for reading from either a ceiling-mounted fluorescent lamp or indirect window light.
- Maintain the temperature between 60F (15C) AND 85F (30C). Lower temperatures slow the metabolism of the shrimp, higher temperatures place excess stress on the system.

### **And the don'ts are common sense**

- Avoid placing your EcoSphere in direct sunlight as this will cause overheating regardless of the ambient room temperature. Overheating causes the algae to grow rapidly and this will unbalance your

system.

- Ensure your EcoSphere does not go for more than 48 hours without light. And if you do need to keep your system in the dark for some reason, such as moving home, make sure you 'charge' it in advance by providing plenty of light beforehand.
- Avoid unnecessary handling of your EcoSphere (in particular shaking) as this disrupts the contents, especially the live shrimp, and the system takes time to settle again.
- Keep your EcoSphere away from sources of heat or cold. Heat sources include electrical equipment, such as computers or stereo equipment, as well as radiators and lighted cabinets. Cold points include windows, which may transfer lower temperature to the system.

Providing you follow these simple guidelines your EcoSphere will thrive and provide years of enjoyment.

## **FREQUENTLY ASKED QUESTIONS**

Below you will find answers to frequently asked questions, and you can always email us with any queries.

### **What is an EcoSphere?**

An EcoSphere is a working ecological system and its biological cycle represents a simple version of Earth's own ecosystem. While beautiful to look at, it demonstrates the delicate balance of a closed system like the Earth and contains some of the same essential elements that are found on our planet. The Earth is represented by the gravel at the bottom, (with) water filling approximately two-thirds of the system and air filling the balance of the space. Fire is represented by (the) light. And finally to complete the system, life – the shrimp, the algae and the bacteria.

### **Who developed EcoSpheres?**

Originally discovered by two scientists, the late Dr Joe Hanson and the late Dr Clair Folsome, the EcoSphere is the result of technology developed at NASA's research laboratories. NASA scientists were researching self-contained communities for space explorers to live in during long-term space flights. And out of this work came the EcoSphere – an ecosystem of animal and plant life in perfect balance with nature.

The EcoSphere is a NASA -Jet Propulsion Laboratory Technology Transfer Program.

### **What is inside an EcoSphere?**

Each system comprises a clear 'soup' of filtered seawater containing gravel and gorgonia (the non-living branch like material) together with some shrimp, algae and bacteria. Each is a key component of the ecosystem. The gravel, gorgonia and glass all provide surface areas to which the micro-organisms can attach themselves.

### **How does it work?**

The EcoSphere works by gathering energy from the light and converting it biochemically. Light, together with the carbon dioxide in the water, enables the algae to produce oxygen by photosynthesis. The shrimp breathe the oxygen in the water and graze on the algae and the bacteria. The waste from the shrimp is broken down by the bacteria into nutrients, which in turn feed the algae. The shrimp and the bacteria also give off carbon dioxide and the cycle is renewed when the algae use this once again to produce oxygen.

EcoSpheres need warmth as well as light to function correctly. Keeping the temperature fairly constant assists the long-term viability of the system.

### **Do the Animals and Plants Reproduce?**

The shrimp have reproduced in some systems, but this is rare. The algae and the bacteria reproduce continuously. Over time gradual changes may occur – the oldest systems end up with the blue-green algae (the green algae having become exhausted) but this can still produce sufficient oxygen to sustain the shrimp. In this way the system goes through transitions, starting out quite clear, then changing to a slightly cloudy cast and eventually becoming clear again.

### **How Long Will The System Live?**

The average life of the small EcoSpheres is two to three years. The larger systems tend to last longer because they contain more shrimp. It is not possible to be precise about this because much depends on the differing light and temperature conditions each system experiences. The actual age of the shrimp is also unknown. Some EcoSpheres have lasted ten years or more.

### **What Do The Animals Eat?**

The shrimp eat the algae and the bacteria. If you watch closely you will see them feeding. If the green algae is no longer visible, don't worry, there will still be plenty of other algae and bacteria for them to graze on.

The pale translucent shrimp-like images sometimes seen lying on the bottom are exoskeletons, which are shed by the shrimp (shrimp are crustaceans which means their skeletons are on the outside rather than the inside and they soon grow a new one, which expands and hardens). Nothing goes to waste in an EcoSphere – these are eaten by the shrimp and the bacteria.

### **What If One Or More Of The Shrimp Die?**

The age of each shrimp is unknown and like all living organisms they have a limited lifespan. It is therefore not unusual for a shrimp to die. But if several shrimp die within a short period of time this probably indicates that the EcoSphere is receiving too much light (resulting in a change in the water chemistry) or it has been too hot or too cold.

### **Why Do I Sometimes See Condensation On The Inside?**

If it is warmer inside the system than it is outside, water will condense on the cooler glass wall of the EcoSphere. As the system is like a small greenhouse this can occur quite often.

### **Can I Clean The Inside Of The Glass?**

Yes, it is possible to clean the glass if too much algae builds up, but this should only be necessary in exceptional circumstances provided you have cared for your EcoSphere correctly. Clean the glass using the magnet supplied with the handbook. The outside magnet attracts the magnet in the gravel and by gently moving it along the glass it will clean off the algae. (Make sure you use the flat side facing the glass). You do not need this any more, we do use a different magnet now which is the same on both sides.

### **Warranty & Replacement Policy**

Providing you take care of your EcoSphere and follow the advice in this Handbook, you should not encounter any difficulties. In the unlikely event of a complete system failure (when all the shrimp expire) we will provide a replacement free of charge. This applies for six months from the date of delivery for small and medium sized EcoSpheres and for twelve months for the large and extra large spheres.

Replacement will be made once the failed system has been returned to us for examination. Return the system to the address below together with your name, address, telephone number, copy of your receipt and, if you have one, your Email address. We will then contact you to discuss replacement. If

you are unsure about this process please contact us using the contact details below.

This replacement policy will not apply when it is apparent that an EcoSphere has been misused or mistreated, including cracking or breakage of the glass.

**ADDITIONAL INFORMATION: Ecosferas Europa - [www.ecosferas.com](http://www.ecosferas.com) - E-mail:ecosferas@ecosferas.com**