

# The EcoSphere<sup>®</sup> Handbook



PLEASE READ FOR PROPER CARE

## UNPACKING YOUR ECOSPHERE®

When you unpack your EcoSphere® you may notice that the water is initially a little cloudy. This will clear up after a few hours. Slowly let the EcoSphere® warm up to room temperature. Don't panic if it is cold to the touch and the shrimp are still or sluggish. When the temperature is cooler the shrimp's metabolism slows and they may appear still and lifeless. Normally the shrimp will be swimming around within 24 hours. Sometimes the lightweight gravel at the bottom of the EcoSphere® will float to the surface. It will eventually sink back down.

## NOTICE THE AMOUNT OF GREEN ALGAE IN YOUR ECOSPHERE®

This initial quantity is the inoculant required to produce sufficient oxygen for the shrimp. Do not allow the algae to grow much more than this or the chemical balance will change. Light controls the growth of the algae. If the algae begins to grow reduce the amount of light by shading the EcoSphere® or putting it in a darker area. If the shrimp consume the algae, it will grow back when you place it in an area with slightly higher light. It will take about two months for the algae to noticeably regrow. It is not threatening to the system to lose visible algae.

IF THE ALGAE IS GROWING AT A RAPID RATE, THE ECOSPHERE® IS IN AN AREA WHERE THE LIGHT IS TOO BRIGHT. THIS WILL RAISE THE PH LEVEL AND CAUSE THE SHRIMP TO PERISH.

## GUIDELINES FOR ECOSPHERE® CARE

**Do** provide light for the EcoSphere® for at least six to eight hours per day. The light intensity should be suitable for reading and from one of the following sources: ceiling mounted fluorescent lamps or low indirect window light.

**Do** keep your EcoSphere® at temperatures between 60° and 80° F. Temperatures above 80° can put excess stress on the EcoSphere®. Temperatures below 60° slow down the metabolism of the shrimp.

**Do not** leave the EcoSphere® in direct sunlight. It is a tiny greenhouse and direct sunlight will overheat it, regardless of the room's temperature. It will also cause the algae to grow rapidly.

**Do not** handle the EcoSphere® excessively. The EcoSphere® will pick up the heat from your hands.

**Do not** let the EcoSphere® go for more than 60 hours without light. If the EcoSphere® has received light for several days, it will be “charged” with oxygen.

**Do not** shake it, drop it, or otherwise treat it roughly.

**Do not** place the EcoSphere® on televisions, stereo equipment, fireplace mantels, near heating radiators, computer equipment, vents, or in lighted cabinets. It can also pick up heat from exterior walls which are exposed to the sun. Also, be aware of the light source, because it may give off too much heat.

**Do not** place the EcoSphere® in front of a window because heat and cold can transfer through the glass.

Complete care instructions can be found on our website: [www.eco-sphere.com/care.html](http://www.eco-sphere.com/care.html)

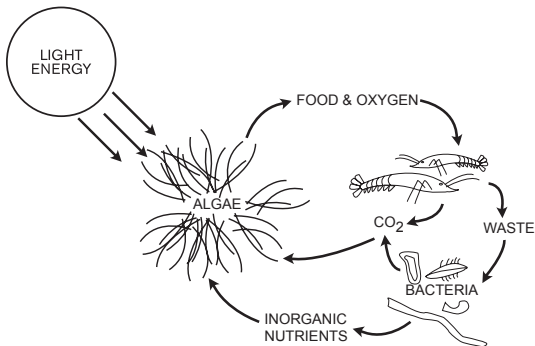
## WHAT IS IN THE ECOSPHERE® ?

The shrimp, algae, gorgonia, decorative shells and lightweight gravel are all part of the working ecosystem. These shrimp were chosen because they do not show aggression towards each other. The gorgonia, lightweight gravel and glass offer surface area to the ecosystem. All of these surfaces are places where micro-organisms and algae can attach themselves. The gorgonia is a non-living material and is hand cut for each individual EcoSphere®.

## HOW DOES THE ECOSPHERE® WORK?

The EcoSphere® works on energy. The EcoSphere® is a small biological battery, storing light energy converted biochemically. Food and oxygen cannot be produced for the shrimp if the system is starved for light. Light, together with carbon dioxide in the water, enables the algae to produce oxygen. The shrimp breathe oxygen in the water and nibble on the algae and bacteria.

Bacteria break down the shrimp's waste into nutrients which the algae again utilize. The shrimp and bacteria also give off carbon dioxide that the algae use to produce oxygen. The following diagram shows the nutrient cycle:



## HOW WERE ECOSPHERES® DISCOVERED?

Two scientists, the late Dr. Joe Hanson and the late Dr. Clair Folsome, originally discovered these shrimp could live for many years inside a closed ecosystem. NASA became interested in these systems for two reasons. First, this tiny model of the Earth could add information to NASA's "Mission To Planet Earth" program aimed at studying Earth's biosphere. Second, it could help NASA's research on human life support systems directed towards the construction of space stations for exploring our solar system.

## WHAT DOES THE ECOSPHERE® REPRESENT?

The EcoSphere® represents our planet on a small scale, and the shrimp represent the human race. We can learn, through the EcoSphere®, the importance of maintaining the delicate balance with our environment.

## DO THE ANIMALS AND PLANTS REPRODUCE?

There have been cases of reproduction by the shrimp, but it's rare. The algae and the bacteria in the EcoSphere® do reproduce continuously. As the years go by, gradual changes may occur in the algae's population. These changes will include the green algae turning into blue-green algae.

## HOW LONG WILL THEY LIVE?

The average life of an EcoSphere® is 2 to 3 years. The life expectancy of the shrimp used in the EcoSphere can exceed five years. The oldest EcoSpheres® are over 15 years old and are still going strong.

## CLEANING YOUR ECOSPHERE®

Do not be alarmed if film or spots form on the inside of the glass. These spots are another form of algae called diatoms and are of nutritional value to the shrimp. We have furnished two magnets to help clean the inside of the glass. Bringing the outer magnet up to the glass will attract the inner magnet. With the two magnets together gently move the magnets along the glass until a section of the glass appears clean. Then repeat this action for the rest of the glass area.

## WHAT TO LOOK FOR?

The algae is constantly growing, dying and being eaten by the shrimp. As time goes on, it is likely that there will be noticeable, gradual changes in the composition of the algae. Some of the older EcoSpheres® in our laboratory have lost all of their visible green algae. These systems continue to live for years because they contain heavy populations of single-celled algae that cover

the surfaces of the branch, lightweight gravel and glass. In a new EcoSphere® a white fungus may appear floating on the surface and is a harmless seasonal growth. The health of the organisms inside the EcoSphere® depends on water chemistry, which is a function of the algae growth. If the algae grows more than required, it will raise the pH of the water and kill the shrimp.

## WHAT DO THE SHRIMP EAT?

The shrimp eat the algae and bacteria. Even if the green algae is no longer visible, there is still plenty of other algae and bacteria for the shrimp to eat. Shrimp are crustaceans so their skeleton is on the outside. The pale shrimp-like objects sometimes seen lying on the bottom of the EcoSphere® are exoskeletons. After the old exoskeleton is shed a new one expands and hardens. The shrimp also eat the shed exoskeletons.

## WHAT IF ONE OR MORE OF THE SHRIMP DIE?

The age of the shrimp is unknown and it is not unusual for a shrimp to die. When a shrimp dies it will decompose and become nutrients for the system. Nothing goes to waste in the EcoSphere®. If the shrimp are dying over a short period of time, it usually indicates the EcoSphere® is in an environment that is not beneficial to the system. Common causes for shrimp death

are temperatures that are outside of the desired range and too much light.

## WHY DO I SOMETIMES SEE CONDENSATION?

Condensation will take place inside the EcoSphere® if it is warmer inside the system than outside. Since the EcoSphere® is a tiny greenhouse this occurs quite often.

## ECOSPHERE® REPLACEMENT POLICY

If all the shrimp should die within the Replacement Policy period, which begins at the time of purchase, Ecosphere Associates will replace the unit. The Small Sphere, Small Pod and Small Waterdrop have a 6 month Replacement Policy. Larger EcoSpheres® have a 12 month Replacement Policy. The Replacement Policy requires the customer to pay all shipping charges. Shipping charges are non refundable.

Replacement will be made only upon receipt of the failed system. The EcoSphere® must be packed so it will not break in transit, otherwise it cannot be replaced. The following items must accompany your return:

- Name, address, daytime phone number, email address

- Serial Number (found on bottom of EcoSphere®)
- Shipping charge as stated on the website

## RECHARGE AND UPGRADE POLICY

When the EcoSphere® Replacement Policy has expired and all of the shrimp have died, the system can be recharged or upgraded. For pricing and details please visit our website: [www.eco-sphere.com](http://www.eco-sphere.com) or call 1-800-729-9870.

## TERMS

Replacement policy valid only on EcoSpheres® shipped to U.S. addresses. Replacement policy is void if the EcoSphere® has been reshipped. No replacement policies extended on replacement or recharge units. Replacement, recharge or upgrade charges may be higher if shipped outside of the contiguous 48 states. Please keep this handbook and all original paperwork. Claims for damage must be made within 2 days of receipt. Repair or replacement of parts will be made at the discretion of Ecosphere Associates. No returns or refunds after 15 days of receipt. Shipping charges are not refundable. Refunds require an RA number, which can be obtained by contacting our office. Twenty five percent restocking fee on refunds.

For questions or comments:

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*Ecosphere Associates hereby attest and warrants that the New EcoSphere® is a balanced, closed ecosystem capable of sustaining life therein. Whereas, this policy is issued in consideration of the purchase of the EcoSphere®. Whereas the owner of the EcoSphere® agrees to properly provide and care for the EcoSphere® in accordance with the enclosed instructions. Also the owner will dutifully respect occupants of the system as living beings, and whereas since the age of the shrimp cannot be determined, sustaining life shall be determined as at least one (1) living shrimp. Ecosphere Associates hereby agrees to replace this EcoSphere® anytime within the replacement policy period should fewer than one (1) shrimp remain alive. No other warranty, implied or otherwise, shall exist on the EcoSphere®. No warranty exists in which the glass is cracked or broken, or in which the temperature or light limits have been exceeded.*

Our primary goal is education. We feel fortunate that we can expose so many people to an ecosystem that is decorative, entertaining, and which provides a window on a sea world to those who are unable to explore it on their own. The system demonstrates, in a most simple way, interdependence of animal and plant life and Earth's most precious element: water. The EcoSphere® has been called a science project, the world's lowest maintenance pet and a closed aquarium. It is in fact the result of space age technology initiated by NASA.

We are a family owned and operated business. Our employees respect science, art and revel in imparting this unique product to the world. We are proud that our product is on exhibit world wide. Our customer and client base transcends age, race, and geographic location.

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