

Frequently Asked Questions

Where can I get EM?

How do I know that the EM I'm buying is genuine EM?

Can I get a free sample of EM?

Whom do I contact for technical questions?

FAQ on EM

What is EM?

Is EM safe?

How is it that most of the microorganisms in EM are considered food-grade?

Who invented EM?

When was EM discovered?

What are the different uses of EM?

How is EM applied?

How can I tell the EM has expired?

Why does my EM-1 smell and/or look different?

Should I keep the EM in the refrigerator?

How long should I store my EM?

What is the difference between Extended EM and Activated EM?

How will I know the extended EM I just made is ready to use?

How long can I store my extended EM?

Can I make Extended EM from Extended EM?

What is Bokashi?

What is EM-5?

What is FPE?

FAQ on General Microorganisms

What is a microorganism?

What is the difference between bacteria and fungus?

Aren't all microorganisms bad?

What are lactic acid bacteria?

What are yeasts?

What are phototrophic bacteria?

How many microorganisms exist?

Where can I buy EM?

You can buy EM at:

Sanko Sangyo Co., Ltd. 272-1 Nakaima, Naha city, Okinawa 902-0074, Japan.

Tel 00-81-98-832-3555 Fax: 00-81-98-832-3556

Email: info.overseas@saion-em.co.jp

How do I know that the EM I'm buying is genuine EM?

As long as the product bears our Logo it should be genuine EM. There are competitors out there and some may be close to or similar to our products, but to be sure you are getting the right product. You can also contact our office for verification, especially if you purchase through a retailer you're not sure is carrying genuine EM.

Can I get a free sample of EM?

No. It is our policy not to give out free samples. (Even so, unfortunately, people who receive free EM, even those who asked for them, tend not to use them. They let it sit somewhere until they get to it. By the time those few who do actually decide it's time to use it, the EM has expired. The EM products have a shelf-life of 3~6 months. Using expired EM may not result in anything but bad word-of-mouth. See also "How can I tell the EM has expired " below.)

However, if you can convince us then we may provide you a sample of EM for your trial.

Whom do I contact for technical questions?

Please contact Sanko Sangyo Co., Ltd. 272-1 Nakima, Naha City, Okinawa-Japan.

Tel 00-81-98-832-3555

Fax:00-81-98-3556

Email: info.overseas@saion-em.co.jp

for technical support or consultation on EM Technology.

FAQ on EM***What is EM?***

EM is a liquid solution of effective microorganisms. "Effective" in that the microorganisms can change and improve the environment in which they are applied. EM is produced through a fermentation process and consists of water, molasses, lactic acid bacteria, yeast, and photosynthetic bacteria, enzymes and anti-oxidants. See also, What is EM?

Is EM safe?

EM consists of non-pathogenic and non-toxic microorganisms. The microorganisms specifically used are not genetically modified or engineered (non-GMO [non-genetically modified organism] or non-GM [non-genetically modified]). Most of the microorganisms in EM are considered food-grade. All microbes used for EM production are classified as Bio-safety Level 1. Items that are Bio-safety Level 1 (BSL-1) are known NOT to cause diseases in healthy human adults. The classification is based on assessment of the potential risk using U.S. Public Health Service guidelines and also as provided by the American Type Culture Collection (ATCC) scientific advisory committees. All lactic acid bacteria and yeasts used for EM-1 production are on U.S. Food and Drug Administration's (FDA) GRAS list (generally recognized as safe). Also, two of the EM products are OMRI Listed.

What is OMRI Listed?

OMRI is the Organic Materials Review Institute and when a product is "OMRI Listed", the product has been reviewed and determined to be allowed for use in organic production. Organic growers can then use these OMRI Listed products and still have their operation maintain their organic certification. EM-1 Microbial Inoculants is OMRI Listed.

How it is that most of the microorganisms in EM are considered food-grade?

Most of the species of microorganisms in EM are the same or similar to those found in foods. EM contains 3 basic groups of microorganisms: lactic acid bacteria (food examples: yogurt, cheese, buttermilk, sour cream, pickles, sauerkraut, sausage), yeast (various yeasts are used for baking [bread], beer making and wine making), and phototrophic bacteria known as photosynthetic bacteria

Who invented/developed EM?

EM was not invented; it is not an engineered product. The potential of the naturally existing microbes and their coexistence abilities were "discovered" and developed by Dr. Teruo Higa who was professor of horticulture at the University of the Ryukyus in Okinawa, Japan.

When was EM discovered?

EM was discovered over a period of time starting in the 1960's with the first EM product appearing in 1982. Basically, the research towards discovering EM was started

in the 1960's by Prof. Dr. Teruo Higa who was looking for an alternative to agricultural chemicals. He discovered that naturally existing microorganisms can be a powerful tool, and through trial and error, found out that the key was the combination of certain naturally existing, beneficial, aerobic and anaerobic, nontoxic and nonpathogenic microorganisms. Sanko is the mother company of EM Products. Sanko developed its microbial products "Bio Life, Bio Sand, Bio Star, etc.", in collaboration with Dr.Higa, when these products were already in market and then later were renamed as "EM- so and so" in early 80's. Sanko is producing EM products since 1982.

What are the different uses of EM?

EM product has various uses:

Agriculture uses (regular crops, vegetables, fruits, green house, hydroponics, etc.)

Municipal Waste Treatment (solid waste, garbage, etc.) Sewage Waste Treatment (wastewater, wastewater treatment plants, sewer systems, septic systems applications, on-site systems, holding tanks, recreational vehicles, boats, and portable restrooms, lagoons, pond systems, etc.)

Industrial Waste Treatment (toxic waste from leather tanneries, textile mills, oil refineries, etc.)

Industrial Effluent Treatment (toxic effluent from leather tanneries, textile mills, oil refineries, etc.)

Emission Control (dioxins from incinerators, emissions from automobiles, etc.)

Construction (buildings, houses, swimming pools, etc.)

Corrosion (marine oil pipes, concretes, saline/sodic soils, brackish water, etc.)

How is EM applied?

Depending on use, EM can be applied directly or diluted in water (without chlorine) or Activated/extended and then either applied directly or again diluted in water.

How can I tell the EM has expired?

The EM product labels have an expiration date stamped on it. Beyond the expiration date, application of the product may not be effective or may be less effective.

Why does my EM-1 smell and/or look different?

1. Variations in batches will occur due to fermentation, ingredients, temperature, etc. We do our best to keep it stable by climate controlling our production facility, and having a temperature controlled fermentation. However, the microbes are live and go

through natural cycles of fermentation that is beyond our control.

2. Shipping also affects the EM-1. Sediments on the bottom of the container get stirred up and can cause a small secondary fermentation to occur, resulting in other variation of color, smell, and gas production. Temperatures during shipping will also affect the EM-1. Remember, EM-1 is a living product.

3. In most cases, even with the above variations, the EM-1 should still be useful. If extreme conditions occur, consult with Sanko Sangyo co., Ltd.

Should I keep the EM in the refrigerator?

No. The EM products contain live microorganisms and should therefore not be put in the refrigerator. The low temperature may affect the microbial balance. You should store the EM products at room temperature (20 Celsius to 25 Celsius) out of direct sunlight and away from dust. Keep container closed and airtight, and use by the expiration date. You can always refer to the product label for storage instructions.

How long should I store my EM?

The shelf-life of EM is about 3~6 months. However, as you use it, the level falls in the container and more air is exposed to the product which will cause it to deteriorate quicker. To avoid this, transfer the unused portion into another smaller clean container that is airtight. This will keep that portion longer. But, still try to use it up by the expiration date.

How will I know when the Extended EM I just made is ready to use?

Extended EM can be ready to use anywhere from 5 to 10 days, cooler temperatures could slow the process and therefore take longer, and may take as long as up to 15~20 days. Typical indications that the Extended EM is ready are as follows:

- Gassing has stopped or is negligent*
- Odor is a sweet-sour smell*
- pH is below 3.7*

These indications are only a guideline and do not guarantee an accurate predictor.

In making activated/extended EM, there are various activation rates {ratios of EMs (EM-1,2,3) to molasses and to water}. We encourage the user to stick at least with the recommended extension rate of 1:1:10 and not venture into more diluted rates until after, at least, one year of successful activation experience. Various conditions affect the choice made as to which activation rate is to be used. The greatest factor is time. A more diluted activated/extended EM has a considerably decreased storage time (from

20 days long down to 5-7 days only, after they are ready to use). Consult with our experts in regards to different activation rates and discuss whether or not they are right for you.

How long can I store my Extended EM?

A rule of thumb is 30 days. This is for Extended EM activated at 1:1:10 (EMs:Molasses:Water). However, its peak efficacy occurs at about 15-20 days. Try to make activated/extended EM as you need it to prevent wasting of product. If you have some left over, you can always throw it into a compost pile, or pour it down the drain. When you make Extended EM, the microbes become highly active with a peak in population growth at about 15 days. After about the 15th day, the number of effective microorganisms or active microorganisms begins to decrease. Among the 3 groups of microbes, each group decrease in count, one group earlier than the other. Beyond 30 days, maybe only 1 or 2 of the groups are left in significant counts, and therefore the balance among the 3 groups is no longer there (the balance that makes EM effective). Best time to use would then be between 10 to 20 days after it is ready (see "How will I know when the Extended EM I just made is ready to use" above).

Can I make Extended EM from Extended EM?

No. First of all, once EM is activated/extended, it is really no longer the same as the stock EM product basically because outside sources/materials (water and molasses) have been added to the solution. These outside sources not only add unknown contaminants, but also start the road to the eventual demise of much of the microorganisms and therefore break the balance among the 3 main groups of microorganisms. For this reason, Activated/Extended EM should also be used within a much shorter period of time (30 days).

See also "How long can I store Extended EM?" below.

It is possible to get some results using old Extended EM, but it may be due to the conditions in which it was stored or is applied, that is, where the microbes that are remaining just happens to be enough to do something. Otherwise, the full effect of EM is no longer there and activating it again (extending it) may not give you anything at all close to a first generation "Activated/Extended EM."

What is Bokashi?

The general term "Bokashi" is Japanese for fermented organic material. Japanese farmers have used bokashi for a long time now, and with the advent of EM came EM

Bokashi, that is, organic materials fermented with EM. The standard ingredient of EM Bokashi for farm use is rice bran treated with a solution of EM-1, molasses and water.

What is EM-5?

EM-5 is sometimes called "Stochu" (Japanese term) and is used to directly apply to plants (not while it's flowering though) to deter (make unpalatable to) pests. EM-5 is usually made with water, molasses, spirits (40% alcohol, such as vodka or tequila), spices (garlic, hot pepper, etc.) and fermented with EM-1.

What is EM-FPE?

EM-FPE, EM fermented plant extract, also known as "green grass liquid fertilizer," relies on the use of fresh cut grass and weeds (without wilted plants and before seeds are formed, i.e., pre-flowering) fermented with EM-1, EM Bokashi, molasses, fresh water, and sea water.

FAQ on General Microorganisms

What is a microorganism? (A detailed chapter on organism)

An organism of microscopic size. Microorganisms also include organisms of sizes that are undetectable through a microscope, that is, of submicroscopic size. Microorganisms are a basic component of life. They exist everywhere: in the ground, in the water, in the air, on surfaces, on our body, in our body, in our intestines, and so forth. They are the cause of decomposition, putrefaction, foul order, or the cause of fermentation, bio-remediation, natural preservation (pickling), sweet-sour smell; they are the cause of disease or maintains health; they are a part of digestion; they give us colds; yet they give us beer, cheese, bread, yogurt (the old fashion kind); they give us pickles, sauerkraut, soy sauce, kimchee (Korean pickled cabbage); and they give us the ability to cycle life sustain ably at the human level -- treat waste and turn them into useful resources.

What's the difference between bacteria and fungus?

Bacteria (singular, bacterium) are one-celled microorganisms that do not have a membrane around its nucleus or its organ-like structures, and does not have its DNA organized into chromosomes.

Fungi (singular, fungus) are single cell (unicellular) or multi-cellular that has a membrane around its nucleus. Fungi include yeasts, molds, and mushrooms. (also, powdery masses of spores)

Aren't all microorganisms harmful?

No. Generally speaking, and very simplistically speaking, most of the microorganisms are "neutral" or does not affect us directly either way. The minority of the microorganisms can be separated into "harmful" and "beneficial" microorganisms. Most people are familiar with the "harmful" microorganisms, basically due to advertising and the media: salmonella, E. coli, and "bacteria" that are the causes of colds, infections, and other illnesses. The beneficial microorganisms affect us all the time: in the soil to help grow food, in the foods that go in our body, especially those that are produced through fermentation (cheese, pickles, etc.), in our body to help digestion, and so on and so forth.

What are lactic acid bacteria?

Lactic acid bacteria are bacteria that produce lactic acid. Lactic acid bacteria is used in the food industry for fermentation and to lower the carbohydrate content of foods, the pH level in the food, and change the texture of the food. Foods fermented with lactic acid bacteria include cheese, yogurt, buttermilk, sour cream, pickles, saurkraut, and sausage.*

** Lactic acid, the substance produced by the bacteria, is a syrupy liquid. Lactic acid is also found in sour milk, molasses, fruits and wines.*

Reference: waksmanfoundation.org/labs/mb1/lactic.html

What are yeasts?

Yeasts are unicellular fungi (see also "what are the difference between bacteria and fungus" above). There are various yeasts that you may know about: baker's yeast to "yeast infection". Yeast can convert sugars from grains (such as, barley, rice) and grape juice into alcohol through fermentation. Therefore, it is used to produce alcoholic beverages, including beer and wine. Yeast also produces CO₂ gas and is used in baking, such as bread and pastries. The microbe that causes a yeast infection is yeast like fungus (and is not the same kind used in EM). This microbe is normally found on humans and is not generally harmful, but can cause problems when the body is weak with some other illness or condition.

Reference: Stanford.edu/Saccharomyces/VL-what_are_yeast.html

What are phototrophic bacteria?

Phototrophic bacteria are also known as photosynthetic bacteria. Phototrophic bacteria consists of two groups, the purple and the green bacteria. Unlike the process of

photosynthesis that is associated with blue-green algae and plants, phototrophic bacteria do not perform plant photosynthesis, do not contain chlorophyll-a, and do not produce oxygen. Their photosynthetic operation can instead produce hydrogen (depending on conditions) and carbon dioxide. Their growth also depends on sunlight. Several studies show phototrophic bacteria to be detoxifiers and/or consume waste matter. Phototrophic bacteria applications are being researched in various fields, including hydrogen-fuel production. The purple bacterium that's also known as 'purple sulfur bacteria' is mostly known in the waste treatment industry. Although phototrophic bacteria may represent a small minority of all bacteria, they exist in virtually every environment on earth. The phototrophic bacteria in EM are the purple bacteria variety.

Reference:

http://www.fns.wau.nl/prock/Reaserch/Rene/Intro_Photobacteria.htm

http://define.ansme.com/words/p/phototrophic_bacteria.html

http://www.disknet.com/Indiana_biolab/b410.html

How many microorganisms exist?

No one can be sure, especially with so many that are known to be undetectable with even the most powerful of microscopes. It has been suggested that we are only aware of less than 10% of the microorganisms that may exist on our planet. They exist everywhere from the extreme cold of the arctic to the very hot temperatures of volcanic vents. The more humidity the greater their population may be, but even in dry climates, if there are lots of airborne particles, they may reside on/within them. Your hands may have gathered millions of microorganisms by the end of the day. And even if you wash your hands thoroughly, you may still have hundreds left on your hands. You may be able to kill off practically all of the microorganisms from your hands with alcohol, but as soon as you touch something or even if you don't, over time, airborne particles will eventually get to your hands as well as their microscopic inhabitants.

We may want to do without the “harmful” microorganisms, but we definitely cannot live, and life in general would not exist, without microorganisms. We have no choice but to learn how to live with them and apply the beneficial microorganisms. Nature took millions of years to perfect some of these microscopic creatures. We can harness them and develop the means towards sustainability. We should be able to recycle just about everything and minimize our waste and pollution, perhaps to zero emissions, with effective microorganisms.

DISCLAIMER: *The above is presented here only as information. Sanko Sangyo Co., Ltd. intends to provide the latest and most accurate information available. Any errors or inaccuracies or out-of-date information are not intended and Sanko Sangyo Co., Ltd. is not liable for the sources referenced by the Sanko Sangyo Co., Ltd. website.*