

EM•1[®] microbial products can be grown one time for economical purposes. This "growing" or "brewing" process is called **Activation** (it used to be called "extension"). It does not mean the microbes in EM•1[®] are not active, they are. It is just a term EMRO developed years ago. Activation involves taking one part EM•1[®], 1 part molasses, and 20 parts water. Numbers can be rounded up or down a bit according to the size of the container and are not crucial to the outcome of the final product.

Equipment

As with beer and wine, the colder the temperature, the longer the fermentation takes to complete. And, the process is done without air. Any local home brewing supplier will have the materials you will need to have a successful Activation. These items include airlocks, carboys, tubing, etc. For an example of what an airlock looks like and costs, [click here](#). Airlocks and other brewing equipment can be found online through many home brewing suppliers or at a local home brew supply. If you want to keep it really simple, you may use a clean soda bottle with a screw on top. These bottles are very good because they can take a tremendous amount of pressure and can be found virtually anywhere.

- Use a clean airtight plastic bottle or container or large tank with screw-on lid.
- Use a container about the volume of the recipe being made. Avoid containers that have large air space as the excess air tends to interfere with fermentation and do not use containers with loose lids such as 5-gallon pails.
- Be prepared to either make an airlock or manually release the pressure on a daily basis.**
 - Use only fresh, clean water. Tap water is fine (yes, even if chlorinated).
- Use blackstrap molasses. Avoid using beet molasses or corn syrup as they tend to spoil easily.

Ingredients

Ingredient	1 Quart	1 Gallon	5 Gallons	55 Gallons	275 Gallons	1200 Gallons
EM•1[®]	1.5 oz	3/4 Cup	32oz	2.5 gallons	12 Gallons	55 Gallons
Molasses	1.5 oz	3/4 Cup	32oz	2.5 Gallons	12 Gallons	55 Gallons
Water (110°F)	29 oz	116oz	4.5 Gallons	50 Gallons	251 Gallons	1090 Gallons

Directions

- Mix ingredients in the container. Check the initial pH with a pH meter or pH paper.
 - Put on an airtight lid (preferably a screw on lid),
 - Attach airlock and
 - Ferment at room temperature for 3-5 days.
- Some time between days 3 and 5, remove the lid and check the pH of the liquid using a pH meter or pH paper. If the pH is 3.8 or below, allow the fermentation to complete for an additional 5-7 days.
- Toward the end of the fermentation, check the smell of the product. It should have some alcohol smell, some white flakes on it and look and smell similar to the original EM•1[®]. If all these are true, it is ready to use.

Checking pH

The initial fermentation process takes roughly 3-5 days. During this time sugars are being digested by the microbes. As they do this, they produce various acids that cause the pH to drop. pH is the measurement of Alkalinity (bases) and Acidity (acids). You can easily measure this using some pH paper. The pH paper we sell has a perfect range for testing this. It goes from 3.0-5.5. (Electronic pH meters are sold through scientific companies, however, they require maintenance and calibration and can vary in readings between meters. If you choose to use an electronic meter, maintain it well and use the same meter every time.) The pH paper we sell is very accurate and consistent. There is a color chart on the side of the package that you use to gauge the pH. You generally do not start checking the pH until about 3-5 days after you mix and start the fermentation. However, if you would like to know the starting point and the finishing point, you can check the mixture before fermentation.

When the pH of the solution drops to 3.8 or below **and** has rested at this pH for 5-7 days, the Activated EM•1[®] is ready to use. The target pH is 3.5.

You will have about 45-60 days to use it at this point.

**During the fermentation process pressure builds up in the containers as the microbes digest the sugars. To avoid rupturing the container, "burp" it and reseal. Burping may have to be done one or more times per day. You may also use airlocks or blow off tubes similar to what is done in brewing wine or beer.

STORAGE

Activated EM•1[®] should be kept in an air-tight container to keep it anaerobic and used within 45-60 days after the pH drops below 3.8.

Store Activated EM•1[®] at room temperature, 68°F to 86°F (20°C-30°C). Refrigeration is not necessary.

NOTES

Speed of fermentation: Usually larger batches ferment faster than smaller ones. Sometimes the pH drop will only take 24 hours. Usually we plan for the pH drop (below 3.8) to take about 3 days.

Temperatures and seasonal changes in fermentation times: EM•1[®] likes warm conditions. Keep the material in a relatively warm area while it is fermenting. (for example, a cellar is too cool for it to ferment quickly.) In the winter, when the temperature is low, place the fermenting mixture somewhere to keep it warm. There is no need to incubate or heat the product as this actually tends to prevent the pH from dropping.

Type of Molasses: Organic molasses tends to have some type of pH buffer in it, which sometimes prevents the fermentation process. You can add in an equal amount of vinegar (apple cider, wine, etc.) to the molasses to help break the pH buffer.

Air causes the Activated EM•1[®] to spoil. This includes extra air space in the bottle. Be sure to leave as little airspace in the bottle as possible when fermenting.

Try not to make too more product than you can use within a month or two to avoid wasting product.

If Activated EM•1[®] has a foul smell, or the pH rises above 4.0, the solution is likely contaminated with something and should be discarded. This material is fine to pour into a long-term compost pile or down a household drain.