



Extend-A-Life Ethylene Removal Systems

All About Ethylene and the Solution for Removal

What is Ethylene Gas?

Ethylene gas (C_2H_4) is a natural ripening hormone produced by fruits and vegetables and flowers. Ethylene gases that are contained or trapped in storage areas cause fruits to prematurely ripen and decay and vegetables & flowers to fade and wilt. It also causes bitterness in vegetables.

What are the sources?

Plants are not the only producers of ethylene. There are also synthetic sources. Some common examples are automotive emissions, plastics, improperly vented greenhouse heaters, cigarette smoke and fluorescent lights. Pure automotive exhaust contains approximately 400 ppm of ethylene. Just a very small amount of gas (One part per million, 1 ppm), when added to produce or floral storage areas can result in premature aging. A single propane-powered forklift will cause serious damage to highly sensitive fruits and vegetables.

Why is Ethylene exposure a problem?

When plants are exposed to ethylene gases they react by producing more themselves. This process is called “autocatalytic” ethylene production.

Concentrations of ethylene ranging from a few parts per billion (ppb) to a few parts per million (ppm) can cause destruction to such as:

- Premature Ripening and Decay (fruits and vegetables)
- Russet Spotting (leafy vegetables and eggplant)
- Loss of Color (cucumbers, broccoli, peppers, squash, brussel sprouts)
- Odor (garlic and onions)
- Wilting (vegetables and flowers)
- Scald and Loss of Crunch (apples) and rind breakdown (citrus)
- Bitterness (vegetables)
- Early Sprouting (root vegetables)

Are Some Fruits and Vegetables and Flowers More Sensitive than Others?

Yes. How fast fruits and vegetables are affected by ethylene gases depends on which category they fall into. Some are Ethylene Producers and some are Ethylene Absorbers. For example: Cucumbers and celery turn yellow in the presence of ethylene while lettuce and bananas will turn brown.

Examples of Ethylene Producers Examples of Ethylene Sensitive

Apples Bananas (unripe)
Cantaloupes Broccoli
Kiwi fruit (ripe) Carrots
Peaches Peppers

Is Controlling the Temperature and Humidity enough?

No. While refrigeration and humidity control are important to slow down the ripening process, they can't stop the damage caused by ethylene gases. Only including measures to control ethylene gas levels will preserve the freshness and reduce spoilage.

How big a problem is ethylene production?

Losses due directly to ethylene production run into the billions of US dollars annually.

Not only is the proper storage of produce an economic issue, but it is an issue of social responsibility.

In an article entitled "Shrink Rapped, the amount of fresh fruits & vegetables food waste-known as shrink was discussed."The Food Marketing Institute stated that the 'perishable" food sales totaled \$196 billion in 2006. "That means food worth nearly \$20 billion was dumped by retailers. In a report published on May 14th, the United Nations estimated that retailers and consumers in America throw away food worth \$48 billion each year and called upon governments everywhere to halve food wastage by 2025." (***"Shrink Rapped" The Economist, May 17, 2008***)

"Sysco Corp., the largest U.S. foodservice company by sales, said fruit, vegetable and dairy products have been the main drivers of inflation in the sector, rather than "center of the plate" meat products."....Sysco... said it would focus on cost control for another 12 to 18 months to counter the impact of rising input costs on sales (***"Sysco Cites Fruit for Inflation Bite" Philadelphia Inquirer, August 12, 2008***)

How do Ethylene Filters work?

Ethylene Extend –A-Life Filters work naturally to neutralize gases by absorbing the gases that build up in confined spaces. The filters soak up the odorless gas like a sponge.

What is the Active Ingredient?

Potassium Permanganate (KMnO₄). AgraCo offers the highest level of removal capacity with 8% of active ingredient.

Can the filters help with food safety?

Yes. The filters also absorb fungi spores, bacteria and bad odors. When adopting a food safety program an ounce of prevention really is worth a pound of cure. The cost of a food born illness claim can be quite expensive. To include Extend-A-Life™ Ethylene filters in your food safety program, use 1 filter per 250 cubic feet of refrigerated air space. The filters are compatible with all Organic Produce since no chemical residue is left on the food.

What are the some of the benefits to using Extend-A-Life Filters?

- Green Technology versus Chemical Process to Extend “Fresh Time”
- Reduce the Amount of Spoilage/ Shrink
- Extend Shelf Life
- Maintain the highest level of Food Quality
- Fresher = Higher Nutrients & Vitamin Content
- Reduce the Risk of Food Born Illness Claims
- No messy Bags or Measuring of Pellets / Pellets are Encased in Metal
- Landfill Disposable- Environmentally Safe
- Does Not require large Capital Costs unlike use of Ozone as Preservation Method
- Customer Satisfaction with Appearance, Taste and overall Freshness
- Improve Profit Margins / Save \$ Money

Controlling the destructive properties of ethylene gases post harvest will extend the life cycle of fruits, vegetables, and flowers during transport and storage.

Contact AgraCo today to order the Solution-Extend-A-Life™ absorbing Ethylene Filters.

AgraCo Technologies International LLC

220 South 2nd Street

Dillsburg, PA 17019

1-800-337-4169

717-502-0350

Fax 717-502-0353

<http://www.agraco.com>