

Product Specifications

Air Repair™ Ethylene Absorbers

Your Key of Protection

GUIDELINES FOR CALCULATING THE AMOUNT OF PROTECTION TO BE USED

Group I
Factor .00001

Group II
Factor .00002

Group III
Factor .00003

Fruit	Vegetables	Fruit	Fruit	
Berries	Artichoke	Breadfruit	Apple	Mangosteen
Cherry	Asparagus	Guava	Apricot	Nectarine
Grapefruit	Beans	Jackfruit	Avocado	Passion Fruit
Grapes	Beets	Kiwifruit	Banana	Peach
Lemon	Broccoli	Lychee	Cantaloupe	Pears (all)
Limes (all)	Brussel Sprouts	Plantain	Cherimoya	Persimmon
Oranges	Cabbage (all)	Quince	Crenshaw	Plum
Pineapple	Carrots	Tamarillo	Persian	Sapota
Pomegranate	Cauliflower	Tomatoes (green)	Honeydew	Tomatoes (pink)
Mandarines	Celeriac		Mango	
Tangerines	Celery			
	Chard			

FORMULA

Calculating Factor X Days to be Protected X Weight of Merchandise = Size #

EXAMPLE

A 40 FT. CONTAINERIZED SHIPMENT IS LEAVING New York for a Caribbean Island. Estimated time of arrival to that island is five days.

The total weight of the merchandise is 36,000 lbs.

Half the items being shipped are found in Group I.

The remainder of the merchandise are items found in Group III.

We then calculate as follows:

$$.0001 \times 18,000 \times 5 = .9$$

(C.F.) (wt.) (days)

$$.00003 \times 18,000 \times 5 = 2.7$$

$$.9 + 2.7 = 3.6 \text{ USE ONE SIZE \#3}$$

and ONE SIZE \#1

(3 AND 1 = 4)



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Air Repair[™] Ethylene Absorbers

Application Guidelines

Mini-Packets: Place in each box of produce or flowers prior to shipment or storage. Best if placed into the box directly on the packing line. This way Air Repair[™] will protect the product from the time it is packaged, throughout distribution and storage, until it reaches the retail level.



The **5 gram** mini-bag is recommended for floral applications. Staple or tape the bag to the top edge, closure flap, or cover of each box. If using tape be sure that you only use a strip small enough to attach the bag without covering too much of it, so air can still circulate through the material and the absorber beads.

One **8 gram** mini-bag is recommended for produce applications, for a 10 to 15lb box traveling on short trips (20 days or less) with minimal cold storage. For longer trips, two 8 gram mini-bags are recommended in a 15 to 20 lb box. Instead of stapling or taping, the mini-packet can also be placed directly on top of the produce, as long as there isn't a lot of moisture present. If so, then stapling or taping will make sure that the mini-packet is hanging, thus less likely to get wet.



Mini-Tube (5"): Used for small walk-in coolers or refrigerated display cases in floral retail stores. Clip onto the fan guard, or fasten with a twist tie or wire, or free-standing on a shelf.

Tube (20"): Used in refrigerated containers where space is tight or in manifold systems for forced air return. Can also be used in small walk-in coolers, fasten to a fan guard, or hanging, suspended in the air flow (preferably the return side).

Mini-Blanket (10" x 10"): Same application as the tubes, except hangs in the air flow, again, preferably on the return side of the fans.



Blankets: Most popular size is the #6 blanket (20" x 25"), there is also a #5 (20" x 20") blanket. Use inside ocean containers, large coolers or in warehouses. In an ocean container two 20" x 25" blankets are usually sufficient, hang from the ceiling.



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BASIC ETHYLENE MANAGEMENT IN PRODUCE & FLORAL HANDLING

Exposure of horticultural products to ethylene gas during storage, distribution and at the retail level, can cause increased shrinkage and a decline in quality and shelf life. Following is some information to aid in ethylene management for floral and produce handling.

MINIMIZE OR ELIMINATE SOURCES

It is important to identify some basic sources of ethylene which could be present in your handling environment. The first phase of good ethylene management, after identification, is elimination, reduction or isolation of different sources of ethylene. These include:

Exhaust Fumes - Combustion engines powered by fossil fuel give off significant amounts of ethylene in their exhaust, up to 300 ppm. Forklifts, trucks and airplanes in the distribution chain, even heavy traffic or busy parking lots can be significant sources of ethylene. If elimination of engine exhaust is impossible, then ample ventilation must be provided. Fuel-fired heaters on trucks can leak exhaust ethylene into floral cargo areas during transport if heat exchangers are cracked.

Microorganisms - Rotting flowers, foliage, fruits and vegetables are perfect media for fungus and bacteria to grow and thrive. These microorganisms are capable of producing large amounts of ethylene. This problem is minimized by practicing proper sanitation on a routine basis, in cooler, work areas, and also floral buckets. Discard trimmed leaves, stem cuttings or any decaying plant matter as soon as possible.

Produce - As fruit baskets are becoming more popular in the floral industry, it is important to be aware of the greater risk of ethylene damage to floral while stored or shipped with high ethylene producing fruit. These include: apples, peaches, pears, bananas, and kiwifruit. While oranges and other citrus are low producers, they are susceptible to fungal growth. Even if a fruit basket is shrink wrapped, ethylene can pass through the pores of the poly films used. Fruit should ideally be isolated from floral products.

Tobacco Smoke - When many smokers are in an enclosed area, studies have shown that there can be a significant build up of ethylene gas over several hours. Do not smoke around horticultural products, or be certain that there is plenty of ventilation.

ELIMINATING ETHYLENE

Even with the above measures there will still be ethylene present, and even small amounts can cause significant and irreversible damage. Direct removal is done with ethylene scrubbers. When strategically placed in the air stream, as air passes through them, our Air Repair™ blankets or tubes act as filters. Ethylene gas present in the air is oxidized by the potassium permanganate beads in the filters, so clean air is being recirculated. Air Repair™ filters need to be replaced on a regular basis, depending on levels of ethylene present.



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