mpact™ CSF

COLD STORAGE OZONE FUMIGATION SYSTEM

Produce Treated

- **Table Grapes**
- **Citrus Fruit**
  Oranges, Lemons
- **Stone Fruit**
  Peaches
- **Fruits & Vegetables**
  Cucumbers, Honeydew, Onions, Peppers, Pickles, Potatoes, Squash, Kiwis, Tomatoes, Watermelon, Zucchini

Cold Storage, Ozone Fumigation System

Gaseous ozone has been shown to effectively combat mold and bacteria in a cold storage environment and directly on produce in cold storage. The main benefit of using gaseous ozone is that mold and bacteria can be controlled both in the air and on surfaces. Additionally, gaseous ozone oxidizes and destroys ethylene gas that is released when fruits and vegetables begin to ripen by the following reaction:

$$H_2C{=}CH_2 + O_3 \rightarrow CO_2 + H_2O$$

Thus, the use of gaseous ozone can reduce ripening while in storage.

Ozone Gaseous Treatment Benefits

- Air-borne and surface-borne microbial control
- Ethylene removal
- Ozone generated, monitored and applied automatically on-site
- Treats & sanitizes incoming cold air at point of introduction and maintains ozone residual for mold control
- Product “Insurance” – help maintain product quality in cases of increased hold times (5-10 day increased storage life)
- Odor Control – “fresh and clean” smell with ozone

AMFIL has researched, tested, and collected data on the effects of ozone on a range of fruits and vegetables in cold storage. “Continuous ozone exposure at 0.3 ppm inhibited aerial mycelial growth and sporulation on ‘Elegant Lady’ peaches wound inoculated with Monilinia fructicola, Botrytis cinerea, Mucor piriformis, or Penicillium expansum and stored for 4 weeks at 5° C and 90% humidity. Gray mold nesting among ‘Thompson Seedless’ table grapes was completely inhibited under 0.3 ppm ozone when the fruit was stored for 7 weeks at 5° C.”

“The number of colony forming units (cfu) of fungi, yeasts and bacteria naturally present on the berry [grape] surface was considerably reduced by a 20 minute exposure to ozone. Ozone treatments significantly reduced the extent of berry decay caused by fungi following cold storage and increased shelf-life.”

“Ozonizing the air in a cold storage room can reduce the level of ethylene in the air. Ozone generators may be of most use in places where ethylene-producing and ethylene-sensitive fruits and vegetables may be stored in the same room.”

AMFIL Technologies Inc.™

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mPact™ CSF

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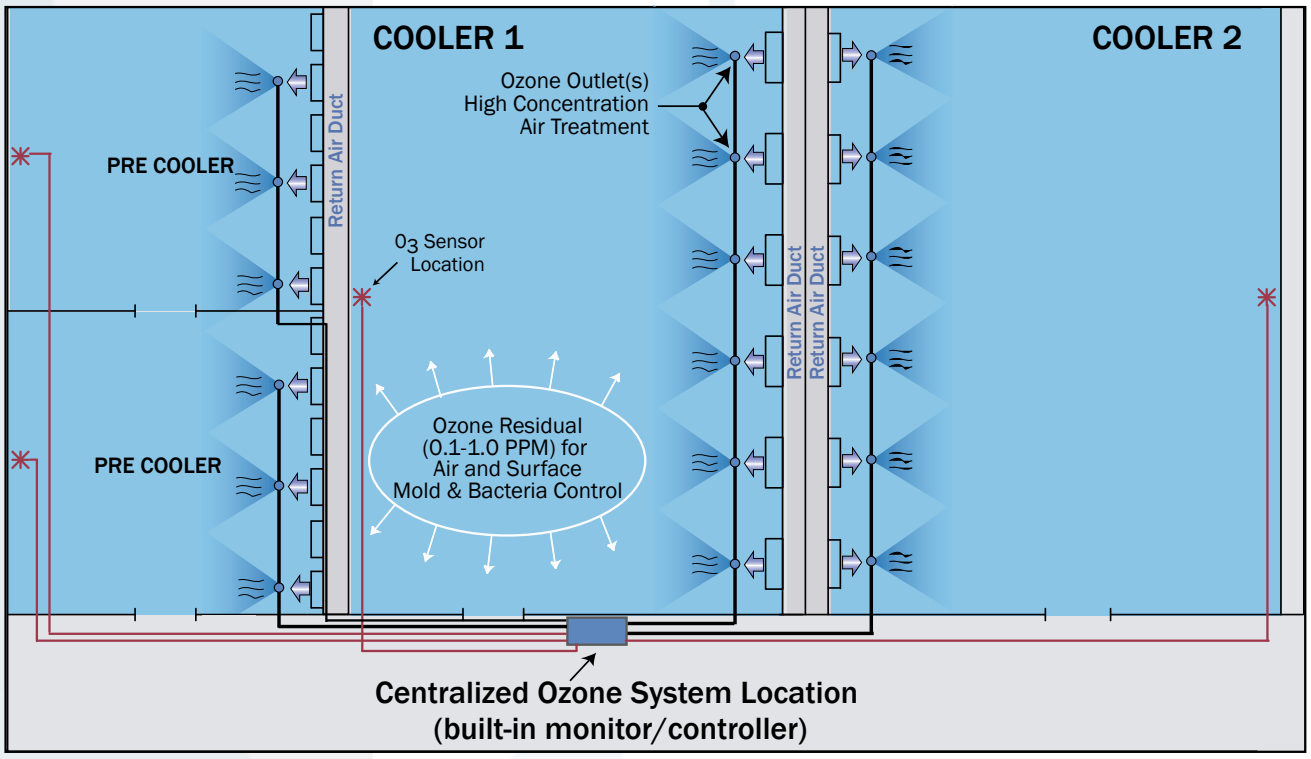
mPact-CSF - Testing and Validation

mPact-CSF installed ozone systems have been tested and validated in a variety of fruit/vegetable packing and cold storage facilities demonstrating improved storage and product shelf life. The adoption of ozone within cold storage facilities provides improved product life and reduced SO_2 use. A few customer samples may be found below:

	Produce Treated	Rooms Installed	mPact™ Results
Baloian	Mixed Vegetables	8	Did not experience bell pepper decay as from previous year. Hard surface testing indicated 99.9% microbial reduction over pre-ozone.
Sunfed	Produce Treated	Rooms Installed	mPact™ Results
	Mixed Vegetables	8	Five to seven day increased storage life.
HMC Group	Produce Treated	Rooms Installed	mPact™ Results
	Table Grapes	10	Air sampling plates indicated significant reduction of airborne microbes.

Centralized mPact-CSF System



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