

PROPYLENE OXIDE

A Versatile Fumigant

- **Tom Griffith, PRESIDENT**
ABERCO, Inc.

PROPYLENE OXIDE

P - A - V - E - S

The Road of Fumigation Technology

- **P**RACTICAL
- **A**AVAILABLE
- **V**ERSATILE
- **E**FFECTIVE
- **S**AFE

PROPYLENE OXIDE

(USEPA APPROVED LABEL)

- To aid in the control of microbiological spoilage and as a insecticidal fumigant for the control of stored products' insects.
 - To reduce bacterial and mold contamination in processed spices, cocoa, cocoa beans, inshell and processed nutmeats (except peanuts).
 - (the label includes dried onion, garlic & chili powder)
 - Dried Basil has a PCH tolerance of 6000ppm
- For non food use as a insecticidal fumigant for
- Cosmetic articles and ingredients, gums, ores,
 - Packaging, including pallets, pigments, pharmaceutical materials,

- PPO has been re-registered as of 8/29/07.
- There were no adverse comments filed by any environmental groups.
- EPA reregistered all existing uses of PPO including spices, cocoa beans, inshell and processed nutmeats. Figs, Prunes and Raisins were added.
- EPA has eliminated the 4-hour treatment limit and extended it to 12 hours for spices.
- Inhalation Exposure is now 2ppm as an 8-hr TWA.

Propylene Oxide Converts To GRAS Propylene Glycol in Human Stomach

Ground Breaking Tests Show . . .

Half life of Propylene Oxide (PPO) in human stomach juice is 114 seconds.

- All PPO converted to GRAS propylene glycol.
- As part of the recent reregistration process, the EPA has accepted this data and adjusted the PPO risk assessment accordingly.
- No toxic by-products were formed.

- We produced radio-labeled propylene oxide.
- Using simulated stomach juice at pH 1.0, PPO half life was 63 seconds.
- Using human stomach juice at pH 1.5, PPO half life was 114 seconds.
- No propylene chlorohydrin, a suspected by-product, was found.
- Propylene oxide has a major methyl bromide replacement advantage because it is already registered as a insecticidal fumigant for use on certain foods.

Regulatory Status, Export Markets

AUSTRALIA

The Australian Pesticide and Veterinary Medicines Authority (APVMA) issued an ADI for PPO of 0.006 mg/kg bw/d.

- The ADI translates to > 50 ppm residues of PPO.

JAPAN

A provisional MRL for PPO on spices, cocoa, cocoa beans and inshell nuts and nutmeats of 300ppm had been issued. Final determination expected in 5 years.

CANADA

- Petition to issue a food additive clearance for PPO has been filed with the Food Safety Directorate of Health Canada.
- Canadian Counsel Retained
- An MRL of 300ppm is anticipated in early June 2009. for almonds. Spices to follow.

EU APPROACH

- PPO is listed on the Codex Food Standards in the Processing Aid Category.
- Possible Regulatory Boxes:
 - Biocidal Products Directive
 - Plant Protection Products Directive
 - Food Additive
 - Preservative
 - Food Processing Aid

FOOD PROCESSING AID DEFINITION

Directive 89/107/EEC concerning food additives authorized for use in foodstuffs intended for human consumption defines “Processing aid” as any substance:

- (1) Not consumed as a food ingredient by itself; and
- (2) Intentionally used in the processing of raw materials, foods or their ingredients, to fulfill a certain technological purpose during treatment or processing; and
- (3) Which may result in the unintentional but technically unavoidable presence of residues of the substance or its derivatives in the final product; and
- (4) Provided that these residues do not present any health risk; and
- (5) Do not have any technological effect on the finished product.

Microbiological Activity

TESTS SHOW LOW DOSE OF
PROPYLENE OXIDE KILLS >99.9% OF
SALMONELLA AND E. COLI 157
IN NUTS, COCOA, SPICES.

Tests run by DFA of California confirmed that propylene oxide was highly effective against these two pathogens.

THE ALMOND BOARD OF CALIFORNIA

- **SPONSORED PROPYLENE OXIDE EFFICACY STUDY.** The study was performed by Dr. Linda Harris of the University of California, in conjunction with Blue Diamond Growers and Industrial Sterilization of NV.
- **RESULTS DEMONSTRATED A 5-LOG REDUCTION OF SALMONELLA WITH A LOW DOSE OF 0.5 OZ/CUFT. OF VACUUM CHAMBER SPACE, WHEN ALL OTHER NORMAL OPERATING CONDIDTIONS ARE MET.**

PRICING

- 1 - 4 drums \$3.33/lb
- 5 - 9 drums \$3.31/lb
- 10 - 19 drums \$3.29/lb
- 20 - 60 drums \$3.27/lb
- FOB NJ Terms Net 30

PACKAGING

- 55 Gal. 16 gage, heavy duty, non returnable
- steel drum.
- Shipped as a flammable liquid, not as a poison



TECHNICAL DATA

- A PENDING RELOCATION OF OUR
- OFFICE HAS NECESSITATED THE NEED TO TEMPORARILY ARCHIVE OUR DATA.
- HOWEVER, I WILL HAVE ACCESS
- WHEN I RETURN TO MD IN MID MAY.

Propox_{tm} 892

8% Propylene Oxide - 92% Carbon Dioxide

- Can be used at Normal Atmospheric Pressure (NAP)
- Exposure may be extended to 48 hours
- Low dose evaporates quickly, usually non-detectable in 2 days
- Mix is more effective than either component alone
(Dr. A. Isikber, MBAO 2001)
- Recently submitted final EPA label revision, reflecting the PPO RED. We are developing a fumigation plan.

POST HARVEST

EFFECTIVE - ALL LIFE STAGES

- Indian meal moth
- Warehouse beetle
- Red flour beetle
- Confused flour beetle
- Coddling moth
- Cigarette beetle
- Sawtooth grain beetle
- Mediterranean flour moth
- Lesser grain borer
- Dried fruit beetle
- Also effective on *A.flavus* & *A.paraciticus*
- What about Aflatoxin?

PROPERTIES FAVORABLE FOR PREPLANT

- Liquid, Boiling Point 95 °F, Water Soluble
- Shipped in heavy duty 55 (US) gallon drums as flammable liquid - not as a poison
- Not corrosive
- Pleasant ether-like odor
- Does not deplete the ozone layer
- Converts to propylene glycol with
 - . 1/2 life of 22 days in water (ground)
 - . 1/2 life of 60 seconds in human stomach
- Available now

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