



## **New or Change to Product Label Evaluation Report for Category C, Subcategory C.3.1 and C.3.11, Application rate decrease and New pests**

**Application Number:** 2007-4402  
**Application:** C.3.1 and C.3.11, New changes to the product label - Application rate decrease and New pests  
**Product:** ECO<sub>2</sub>FUME Gas Fumigant  
**Registration Number:** 27684  
**Active ingredients (a.i.):** 2% Phosphine  
**PMRA Document Number :** 1564391

### **Background**

ECO<sub>2</sub>FUME Fumigant Gas (Reg. No. 27684, 2% phosphine gas) has been registered since June 3, 2004. ECO<sub>2</sub>FUME Fumigant Gas is registered to control a variety of insect pests (i.e., moths, weevils, beetles, flies, mites) and rodents in raw agricultural commodities, processed foods, animal feed and feed ingredients and non-food commodities at an application rate 200-500 ppm. Refer to the product label for specific details of uses, application rates and methods, precautions, restrictions, and personal protective equipment requirements.

### **Purpose of Application**

The purpose of this application was to amend the registration of ECO<sub>2</sub>FUME Fumigant Gas to include a new method of application using the combination of 4-10% CO<sub>2</sub>, 30 to 40°C temperatures and lower rates of phosphine gas (50 to 150 ppm); increase the concentration from 200 - 500 to 200 - 1000 ppm for all registered uses; the addition of new pests (i.e., wood infesting beetles and nematodes); and new instructions for the fumigation of wood and wood products and control of rodents. The new instruction for the control of pests in wood and wood recommends using a higher concentration of phosphine to counteract the solubility of phosphine in water because of the moisture content of wood. The new instruction for rodent control states that rodents can be controlled within 1 to 4 hours after achieving distribution of phosphine throughout the structure.

## **Chemistry Assessment**

A chemistry assessment was not required since there was no change to product chemistry.

## **Health Assessments**

A toxicology assessment was not required since there was no change to the formulation.

An exposure assessment was not required since exposure to phosphine would be similar to other phosphide products.

An food residue assessment was not required since exposure to phosphine would be similar to other phosphide products.

## **Environmental Assessment**

An environmental assessment was not required since the environmental exposure to phosphine would be similar to other phosphide products.

## **Value Assessment**

In support of new phosphine gas, CO<sub>2</sub> and heat method of application , one efficacy study conducted in 2005 and 2006 was submitted. These data demonstrated that the combination of phosphine gas, CO<sub>2</sub> and heat provided 98.6-100% control of red flour beetle adults and larva in mills, which was equivalent to the commercial standard. Therefore, the addition of the new phosphine gas, CO<sub>2</sub> and heat method of application is supported.

The increase in application rate and addition of wood boring beetles and nematodes were supported based on the similarity in phosphine concentration and use pattern as other registered phosphide fumigants.

Information reviewed indicates that the moisture content in commodities such as treated wood and wood products may result in a decrease in the concentration of fumigants such as phosphine. Although phosphine is considered to be relatively insoluble in water, there is some potential for decreased phosphine concentration due to moisture content of the wood or wood product. The recommendation of applying a higher concentration to counteract the effect of phosphine's solubility due to the moisture content in the wood or wood product is supported.

In support of the label claim for the controlling rodents within 1 to 4 hours, a laboratory trial was submitted which exposed rats to several concentrations of phosphine gas. Rat mortality was 80-100% after 4 hours of exposure to 64 and 105 ppm phosphine. Since the registered concentration to control rodents is 200-1000 ppm phosphine, it is expected that mortality in rodents will likely be killed with a 1 to 4 hour period of exposure to phosphine. Therefore, the label claim of controlling rodents with "1 to 4 hours after achieving distribution of phosphine throughout the fumigated structure" is supported.

## Conclusion

The following amendments to the Eco2Fume Fumigant Gas label are supported:

1. A new method of application using the combination of 4-10% CO<sub>2</sub>, 30 to 40°C temperatures and lower rates of phosphine gas (50 to 150 ppm)
2. An increase the concentration from 200 to 500 to 200-1000 ppm for all registered uses
3. The addition of new pests (i.e., wood infesting beetles and nematodes);
4. New instructions for the fumigation of wood and wood products and control of rodents

## References

### Applicant Supplied Data

1432214. 2007, Appendix 1 AAFC Efficacy Assessment Report, DACO: 10.2

1505294. 2007, ECO<sub>2</sub>FUME SUB 2007-4402 Request for Clarification Response, DACO: 0.8

1505295. 1986, Phosphine Acute Inhalation Toxicity Test, 49-528, DACO: 4.6.3

1505296. Low Concentration Phosphine Fumigation Method (Canadian Patent 2136270), DACO: 0.8

1505297. Corrosive Effects of Phosphine, Carbon Dioxide, Heat and Humidity on Electronic Equipment: Phase II, DACO: 3.5.14

1505298. Compressed Gas Association, Inc., Handbook of Compressed Gases - Page 576 Physical Constants (Phosphine), DACO: 3.7

1505299. Low Concentration Phosphine Fumigation Method (US Patent 5403597), DACO: 0.8

1505300. Application for a Canadian Patent. DACO 0.8

1541244. US EPA, 2007, Structural Fumigation Using a Combined Treatment of Phosphine, Heat, and Carbon Dioxide. <http://www.epa.gov/ozone/mbr/casestudies/volume1/mueller.html>, DACO: 0.8.23

1541243. AAFC Research Centre, Manual of fumigation for insect control. FAO PLANT PRODUCTION AND PROTECTION PAPER 54. <http://www.fao.org/docrep/x5042e/x5042E0m.htm>, DACO: 10.7.2

ISSN: 1911-8082

Catalogue number: xxxxxxxxxxx (xxxxxxxx)

© **Her Majesty the Queen in Right of Canada, represented by the Minister of Public Works and Government Services Canada 2006**

All rights reserved. No part of this information (publication or product) may be reproduced or transmitted in any form or by any means, electronic, mechanical photocopying, recording or otherwise, or stored in a retrieval system, without prior written permission of the Minister of Public Works and Government Services Canada, Ottawa, Ontario K1A 0S5.