

## **POSTHARVEST PHOSPHINE FUMIGATION OF NUTS USING THE HORN DILUPHOS SYSTEM (HDS)**

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### **Abstract**

The HORN DILUPHOS SYSTEM (HDS) allows the blending of pure phosphine with air, to obtain a continuous flow of an phosphine air mixture at concentration of 10,000 ppm or less at a rate of 19 or 47 grams/minute of phosphine, depending on the model of dispensing equipment used.

The Horn Diluphos System is an automatic system that informs the operator on an LCD screen the steps to follow. The equipment is designed to apply the product VAPORPH<sub>3</sub>OS, manufactured by Cytec, which is pure cylinderized phosphine.

Additionally the fumigation can be monitored using the Fosfoquim Phosphine monitor, which is an equipment that allows a continuous automated monitoring of fumigation sampling four points and storing 1000 data per zone.

The H-System for fumigation of silo bins without using recirculation is a fumigation method where a phosphine-air mixture is injected into the silo bin at the bottom, at a concentration close to the final required. This phosphine-air mixture replaces the air between the product, distributing the gas evenly in only a couple of hours.

This method has been used for some years when fumigating grain silos with the Horn Diluphos System, but now it is used also for the post harvest fumigation of nuts.

The advantages of this method are that:

- a) Applied from outside the facility
- b) Reduced fumigation time and no gas generation time required
- c) Easy distribution
- d) Gas generation does not depend on temperature nor moisture.
- e) Lower dosage
- f) Easy aeration and Fumigation does not leave residues of any hazardous waste
- g) Not necessary for deactivation of residual dust from AIP tablets
- h) Only pure phosphine free of ammonia is applied. (Important to avoid change in color in nuts)

But not only silo bins can be fumigated with pure phosphine using the Horn Diluphos System; Also stacks and fumigation chambers with nuts have been fumigated successfully with the same advantages that previously described.