PHOSPHINE TRAINING 101

An annual training guideline for understanding workplace hazards associated with RUP metal phosphides (phosphine)

This training guideline should be accompanied by the specific product Applicator's Manual and label.

It is the responsibility of the fumigated facility to provide training on the guidelines in this manual.

RESTRICTED USE PESTICIDE

This product is accompanied by an approved label, Applicator's Manual and guidance for preparation of a Fumigation Management Plan. Read and understand the entire label and the applicator's manual. All parts of the label and manual are equally important for safe and effective use of this product. Call the manufacturer if you have any questions or do not understand any part of this label and the applicator's manual.

Persons working with aluminum phosphide must be knowledgeable of the hazards of this chemical and trained in the use of respiratory equipment and detection devices.

Metal phosphides are used for the fumigation of stored grain, nuts, tobacco, flat storage structures and rodent burrows.

Metal phosphides react with ambient humidity (water) producing aluminum or magnesium hydroxide and phosphine (PH_3) gas.

Hazards of the Work Area:

- Keep away from water. Releases flammable gas.
- Fatal if inhaled or swallowed. Wear respiratory protection if required. Call poison control center if swallowed.
- Causes serious eye damage.
- Causes skin irritation.

Pest Management Practices:

- An operational pest management plan must be put in place in food processing facilities and/or other relevant sites where insects/rodents forage or seek refuge in order that the facility, its equipment and its exterior surroundings do not promote pest populations, and are amenable to control and treatment methods.

The plan should include the following:

- Practice to reduce or eliminate infestations in incoming food and ingredients through strict purchase specifications, audits of suppliers, and inspection of incoming material.
- Good sanitation practices involving thorough and regular cleaning, prevention of dust generation and accumulation, and removal of food sources and harbourages for pests.
- Building maintenance to eliminate holes and cracks in floors, walls, ceilings, roofs, doors and windows that allow access for pests.
- Regular inspections and monitoring to guide schedules and locations of treatments, and to monitor the effectiveness of the overall management strategy.
- Pest identification and understanding of each pest's lifecycle to select the most appropriate control methods.
- Other practices including physical and mechanical treatments, controlled atmospheres, and applications of registered pesticides. Each treatment should be used as one component of an overall pest management plan. All pesticides must be stored, handled, and used according to label instructions.

Physical & Chemical Properties:

- Form: Solid (while in metal phosphide form; then gas)
- Color: Dark charcoal gray (while in metal phosphide form; then colorless or cloudy gas)
- Odour: Garlic, carbide or decaying fish.

Toxicological Information:

- Acute Poison – classified as Very Toxic
- Primary routes of exposure – inhalation and ingestion. Phosphine gas, PH_3, is not absorbed dermally.

First-Aid Measures:

- Symptoms of overexposure are headache, dizziness, nausea, difficulty breathing, vomiting or diarrhoea.
  In ALL cases of overexposure, get medical attention immediately and move exposed person into fresh air.
  Perform CPR if necessary.

- Swallowing – call poison control center, give sips of water if able to swallow and do not induce vomiting.

- Eye – if contaminated by metal phosphide dust, remove contact lenses and rinse with water for 15-20 minutes.

- Skin – if contaminated by metal phosphide dust, remove clothing and rinse skin with water for 15-20 minutes.

Have the product container label or container with you when calling a poison control center or doctor. Contact 1-800-308-4856 for assistance with human or animal medical emergencies. You may also contact DEGESCH AMERICA, INC. 540-234-9281/1-800-330-2525 or GARDEX CHEMICALS LTD. 416-675-1638. For all other chemical emergencies, please contact CHEMTREC – 1-800-424-9300 OR Canadian Transport Emergency Centre (CANUTEC) 613-996-6666.

Prior to performing fumigation:

- Prepare Fumigation Management Plan (FMP). This is required to be written for **all** fumigations.
- Read and understand the complete product label which consists of the container label and Applicator's Manual.

Effective Fumigation:

- Adequate exposure period
  -Avoid minimums
  -Think days; not hours

- Adequate temperature
  -Commodity and ambient
  -Extended exposure period

- Ensure lethal concentrations
  -Monitor, monitor, monitor

Placarding of Fumigated Area:

- Posting of warning signs for the protection zone perimeter is required, UNLESS there is a physical barrier (e.g., fence) that prevents access into the protection zone.
- Signage must not be removed until the fumigated site has been aerated and the hydrogen phosphide level is at or below 0.1 ppm in the fumigated site and the protection zone.
- Only a licensed/certified applicator can authorise removal of warning signs.
- Review specific product applicator's manual – Placarding of Fumigated Areas – for complete instructions.

Application of Fumigant:

- Never fumigate alone from inside the structure.
- At least two persons, (a licensed/certified applicator and trained person), or two persons trained in accordance with the Applicator's Manual working under the direct supervision of the licensed/certified applicator must be present during fumigation of structures when entry into the structure for application of the fumigant is required.
- (Review specific product applicator's manual - Directions for Use - for complete instructions.)

Aeration & Re-Entry:

- If a fumigation site is to be entered after fumigation, it must be aerated until the level of hydrogen phosphide gas is at or below 0.1 ppm in the fumigated site and the protection zone.
- (Review specific product applicator's manual – Aeration and Re-Entry – for complete instructions.)

Firefighting Measures:

- Metal phosphide fires may be extinguished with CO_2, sand or dry chemical extinguisher – DO NOT USE WATER!!
- Phosphine is flammable, spontaneous ignition may occur if reaction environment exceeds the LEL of 1.8% v/v or 18,000 ppm.
- NEVER confine partially spent material.
- Full turnout gear and SCBA required in firefighting operations.

Clean-Up Procedures:

- Respiratory personal protective equipment (PPE) may be required during cleanup of spilled products.
- Freshly spilled material may be placed into original packaging or other appropriate gas-tight container.
- Damaged packaging may be repaired with aluminum tape.
- Spills undergoing the off-gassing process may be cleaned up and wet or dry deactivated per label instructions.
- **DO NOT CONFINE** partially spent metal phosphide products!!

Handling and Storage:

- Store in a locked, dry and cool place in tightly closed containers.
- Keep away from ignition sources and heat.
- Post as pesticide storage area.
- Do not store within dwellings.

Detect and Monitor:

- Monitoring must be conducted to determine accurate phosphine concentrations.

Personal Protection Equipment:

- Proper respiratory equipment must be worn when the concentration exceeds 0.1 ppm or is unknown.
- Smell is **not** an indicator of concentration.
- A full-face canister gas mask is required for levels above 0.1 ppm and below 5 ppm.
- A SCBA is required for concentrations 5 ppm or above; or when concentration is unknown.
- Wear dry cotton gloves if contact with tablets, pellets or dust is likely.
- Aerate contaminated gloves and clothing in a well-ventilated area prior to laundering.

Disposal:

- Must not be disposed with household trash.
- Unreacted material is classified as hazardous waste.
- Spent material is **NOT** classified as hazardous waste, but it may require special care.
- May be classified as non-hazardous special waste.
- Check with landfill for local regulations prior to disposal.
- Triple rinse contaminated containers and puncture. They may be disposed or offered for recycling.
- Be sure to follow provincial regulations.

Stability and Reactivity:

- Chemical stability: product is stable unless exposed to elements allowing hydrolysis leading to the release of toxic PH_3 gas.
- May react with certain metals: copper, brass, and precious metals; providing a catalyst for corrosion especially at higher temperatures and relative humidity.
- Electric motors, smoke detectors, sprinkler heads, alarm components, other electronics, and electrical systems may be damaged.

Notification Requirements:

- Immediately report theft of any phosphine fumigants to the local police department and the manufacturer.
- Registrant of label must be informed by telephone of any adverse incident to human health or the environment involving these products.

Ecological Information:

- Solid material is very toxic to fish and aquatic organisms.
- Do not allow product to reach groundwater, sewage systems or water bodies.

Transport Information (US Department of Transportation):

- Transport hazard classes
  -4.3
  6.1 (RQ= 45.4 kg)

- Packaging and labeling
  -Packing group 1
  -4.3
  -6.1
  -Marine pollutant

Regulatory Information:

- Non-carcinogenic substance
- May be fatal if inhaled
- PPE may be required
- Keep away from heat and water
- Do not extinguish fire with water
- Do not confine unreacted material

If you have **ANY** questions or concerns about the use of these chemicals, let your supervisor know immediately.

Nothing herein shall be deemed as warranty, expressed or implied. It is the responsibility of the user to determine applicability of this information and the suitability of the product for any particular use.