



## **Safety Guidelines for Storage of Pesticides**

### **INTRODUCTION**

As a general policy, the area where pesticides are stored and handled should be constructed and maintained in such a way that the risk of contamination to people and the environment is avoided. Regular inspection of these premises is required to ensure they are always in acceptable conditions.

In addition, all pesticides should be adequately packed and placed to prevent spillage and leakage. The precautions for handling of a chemical should be read carefully with respect to each active ingredient as stated on the label.

This guidance note is prepared as general guidelines for the storage of general pesticides. Information covered here however does not fully cover all safety aspects for highly flammable pesticides. All chemicals classified as dangerous goods under Dangerous Goods Ordinance or liquefied petroleum gas under Gas Safety Ordinance must be kept in appropriate stores in compliance with any conditions as required by the relevant government departments.

### **LOCATION**

Pesticide storage premises should be located away from schools, housing estates, hospitals, shopping areas, food manufacturing and storage premises, buildings used for housing livestock, fuel or combustible materials. Large-scale stores should be situated in industrial buildings.

The storage premises should be located where there is no known flood risk and should be sited to minimize any hazard to watercourses, ponds, impounding reservoirs, water gathering grounds, service reservoirs and underground water which could be polluted by spilled pesticides.

In addition, within the store, the followings should be followed:

- (a) suitable emergency exit is provided and marked.
- (b) there is adequate accessible storage space for the expected maximum contents.
- (c) construction including doors, ceiling, walls and floors should be, as far as possible made of non-flammable or fire-resistant materials (except as specified in (j) below); no rug or carpet should be used.
- (d) floors and walls are free from cracks, impermeable to pesticide to prevent leakage of pesticide or contaminated water.
- (e) there are entire wall partitions to separate store from office.

- (f) there is adequate natural or artificial lighting to permit safe handling of pesticides.
- (g) it is accessible to a washroom with running water.
- (h) the premises should be clean and tidy.
- (i) for Part II pesticide stores where a large amount of liquid concentrates may be stored, especially in drums, floor should be set below ground level, or an impervious door sill of suitable size should be provided to create a sump of sufficient capacity.
- (j) for pesticides classified under the control of Dangerous Goods Ordinance, prior consultation and approval from Fire Services Department on storage requirements are required.

## **SECURITY**

Pesticides must be kept away from and out of reach of children, animals and any unauthorized persons. The following are security aspects to be considered:

- (a) stores or buildings should be securely locked outside business hours when staff is not present.
- (b) stores or buildings should be designed to resist intruders and windows should be constructed to prevent intruders and resist rainstorm.
- (c) prior arrangements should be made with suppliers regarding the delivery of pesticides; pesticides must not be left unattended outside.

## **WARNING SIGNS**

Smoking, drinking or eating should be prohibited within the premises. Warning notices must be prominently displayed. The warning signs, “PESTICIDES STORED” and “除害劑儲存處”, and the notices, “NO SMOKING” and “不准吸煙” as well as “NO EATING AND DRINKING” and “不准飲食” must be clearly exhibited in places in the height that are easily visible within the premises. Pictogram in lieu of words is also acceptable. All the notices should be printed and waterproof. The background of the notice should be white in colour while the words should be in red or black with a minimum height of 160 mm.

Regarding pesticides classified under the control of Dangerous Goods Ordinance, a plate showing the category of the dangerous goods as prescribed by Fire Services Department is required to be provided.

## **VENTILATION**

The storage site should be well ventilated in order to control potential health, fire or explosive hazard. Where possible, natural ventilation should be provided by vents on the upper and lower walls and the roof. Vent on lower part of door is also acceptable. For good air circulation, it is recommended that a clear space of 1 metre be maintained between the topmost products and the roof as well as between the goods and the walls. The sizes of windows and door should be at least 10% of the floor area and always kept opened.

If adequate natural air circulation cannot be provided, ventilation system such as exhaust hood or extraction fan may be installed to maintain a well-ventilated environment. The exhaust hood should be independent and should not allow exhaust air to re-circulate without appropriate treatment. Generally speaking, two industrial type extraction fans (one in and one out) are more effective. For storage premises not exceeding 90 square meters in area, one extraction fan of industrial type in diameter of 25 cm is recommended in stores keeping general Part I pesticides where two of 30 cm are suggested in those keeping agricultural (Part II) pesticides. If necessary, adequate wall fan, ceiling fan, table fan or standing fan should be available for internal ventilation.

For pesticides that do not generate fumes under normal storage conditions, such as mosquito mat, rat or roach bait or pesticidal dehumidifier, air conditioning system may be installed to maintain a dry, cool and ventilated environment.

The provision of ventilation for storage of pesticides classified under the control of Dangerous Goods Ordinance should be in accordance with the requirements specified by Fire Services Department.

### **FIRE PROTECTION FACILITIES**

Fire protection facilities under good conditions are very important. Proper maintenance of fire service installations within the store is essential for the sake of fire safety.

Automatic fire extinguisher system is required in storage premises. For those pesticides, which may become dangerous when come into contact with water, gas type fire extinguishing system may be required. Fire alarm and fire hose inside the store or in the corridor are necessary, especially for large-scale store.

At least two foam or dry powder type fire extinguishers with a typical capacity of 6 kg are available in store in area of first 50 square meters where an extra one is required for an additional area of 100 square meters. They should be fixed and placed on shelf or hung on wall in readily accessible and conspicuous positions.

At least two buckets of sand should also be available. The buckets should be red in colour, made of metal and with cover and handle. In addition, fire blanket may also be equipped.

Regarding pesticides classified as dangerous goods under the Dangerous Goods Ordinance, specific fire service installations requirements will be required by Fire Services Department depending on the category of dangerous goods involved.

### **STACKING**

Pesticide containers should be stacked according to their dimensions and design, the materials of which they are made, and their contents, so that there is no danger of stack falling or collapsing. The heavier one must be placed at the bottom of stacking.

Where well-packed stock is placed on ground, pallets should be used so as to prevent unawareness of leakage of liquid pesticides and thereby reduce the risk of cross contamination or corrosion. Containers should be stacked only to a height, which is within safe working reach of either the authorized personnel or the mechanical system used, and which will not cause damage to containers lower down the stack. An inspection aisle between blocks of stock is necessary.

Care should be taken not to block the emergency exits.

### **SEPARATION FROM OTHER COMMODITIES**

Pesticides must be kept separately from other commodities to avoid any contamination or confusion with other materials. In general, pesticides should be separated from other commodities as follows:

- (a) for Part II pesticide stores, food or medicines for internal use should on no account be kept in a pesticide store; for Part I pesticide stores, pesticides should be stored away and separated from any foodstuff;
- (b) for the stores keeping Part II pesticides for own uses, herbicide should be placed separately from other pesticides; the notices stating pesticides in different kinds should be clearly posted on pesticide shelf or in pesticide cupboard e.g. insecticide, herbicide, plant growth regulator, etc.;
- (c) other commodities such as animal feeding stuffs and veterinary medicines, seeds, fertilizers, etc. are unsuitable to be stored with pesticides and should be kept separately to avoid contamination;
- (d) all pesticides should be physically segregated from readily combustible materials and distant from fire source to minimize fire risk and the production of harmful fumes should fire occur;
- (e) pesticides which are classified as a particular category of dangerous goods should not be stored with other category of dangerous goods;
- (f) the incompatibility of the pesticides with other substances as detailed in the material or product safety data sheet of each pesticide should also be observed;
- (g) pesticides should be labelled with the word “**POISON**” and the characters “**毒藥**” (some with “**CAUTION**” and “**小心**” only), the trade name and, if any, the common names; and
- (h) storage area, especially in large-scale store, should be clearly defined by markings with a width of 5 cm on the floor.

### **STORE RECORDS**

Storekeepers are required to keep a record of all pesticide movements within the store. Accurate record-keeping and stock control ensure that the contents of a store can be readily identified in an accident and/or when asked for by the regulatory authorities or emergency services. Records should include details of:

- (a) all movements of stock in and out of the store, including pesticides received, stored, destroyed, or sold. Supporting documents such as import/export licences or receipts should be kept.
- (b) trade name and common name, registration number and quantity of each pesticide stored.

### **STOCK CHECKING**

Regular check on pesticides stock including shelf life of pesticides, conditions of packing and labels should be made thoroughly. This ensures the manager be aware of any leakage or spillage of pesticides at an early stage, so as to mitigate the hazards arisen. Stock turnover must be organized to ensure that the contents of a container are used as quickly as possible once the container has been opened.

### **DISPOSAL OF OUTDATED AND UNWANTED PESTICIDES**

Disposal of expired, leaked or unwanted pesticides is subject to the requirements under the Waste Disposal Ordinance. Prior approval from Environmental Protection Department and arrangement with licensed waste collector are required.

### **OPERATIONAL SAFETY**

All personnel involved in the handling of pesticides should be fully informed of the potential hazard of the chemical. Storeowners should make the material or product safety data sheet of each pesticide stored available for their staff. The working instructions and procedures should be prepared and documented. In large-scale stores, instruction for safe handling of equipment is also required. Regular training in handling chemicals, use of fire extinguishers and occupational safety and health should be provided to all the staff.

The transport emergency card attaching with pesticides during transportation is necessary.

### **PROVISION FOR EMERGENCY**

The following items should be readily available for use in emergency:

- (a) each emergency exit should be clearly marked with a sign, “EXIT” and “出口”, located above the door.
- (b) signs for the way of escape, especially in large-scale store is encouraged.
- (c) first aid box with sufficient items should be placed in conspicuous position outside the storage area. However, it should be within ready access by staff. Personnel, especially supervisory persons, should be trained in appropriate first aid and rescue procedures.
- (d) protective gear such as overalls, apron, rubber gloves, safety boots, goggles, mouth mask with canisters and industrial cleansers for human should be available for emergency.

- (e) tools such as empty open head drums, large heavy-duty plastic bags, broom, shovel, rubber wiper and adequate absorbent material should be available for handling leakage or spillage.

Storekeepers are required to report any large spillage or leakage of pesticide in warehouses to the appropriate authorities immediately. In occurrence of spillage, follow the label recommendation for the protective clothing to be worn when handling the concentrated pesticides. In the absence of specific instructions for handling the spillage of the product, the following procedure may be followed:

- (a) contain and cover the spillage with double its volume of inert absorbent e.g. sand, sawdust or soil;
- (b) after the spill has been absorbed, sweep or shovel this up thoroughly;
- (c) put all contaminated debris in a sealed and marked container or large heavy duty plastic bag and place this in a secure area to await safe disposal;
- (d) water used to clean containers, or any contaminated liquids should under no circumstances be allowed to enter drains or watercourses;
- (e) disposal of contaminated liquids and debris should be carried out only after consultation with the Environmental Protection Department (EPD).

After removal of spillage and debris, thoroughly clean the contaminated area and all equipment used. A spill area may be decontaminated in one of the following ways:

- (a) Sprinkle area with hydrated lime, “氫氧化鈣” (1 handful / 0.1 square meter), and dampen it slightly; rope off the area overnight. Absorb the scrubbing liquid in clay or similar material. Repeat the process if necessary. Dispose of the contaminated material in accordance with EPD regulations.
- (b) Cover the contaminated surface with undiluted household bleach and scrub it with brushes for at least half an hour. Avoid breathing vapours by wearing the appropriate protective clothing e.g. facemask. Take up the scrubbing liquid with absorbent clay or similar material and allow the treated area to dry. Repeat the process if necessary. Dispose of the contaminated material in accordance with EPD regulations.