

STORAGE AND HANDLING OF DRUMS & INTERMEDIATE BULK CONTAINERS: PPG26

POLLUTION PREVENTION GUIDELINES

These notes are intended to assist all who deal with the storage and handling of drums and Intermediate Bulk Containers (IBCs). They have been produced by the Environment Agency for England & Wales, the Scottish Environment Protection Agency and the Environment and Heritage Service in Northern Ireland which are referred to here as the Agency or Agencies. The guidelines are basic requirements to protect the environment. Additional requirements may be imposed by legislation such as the Environmental Protection Act 1990 and the Environment Act 1995. In England, the storage of oils (except waste oils) in containers over 200 litres in capacity on industrial, commercial and institutional sites is subject to specific regulations (Reference 1). Where these regulations may apply, the text in this document has been highlighted. Similar regulations are due to be introduced in Scotland. Further advice may be obtained from your local Agency office, details of which appear at the end of these guidelines.

1. INTRODUCTION

The Agencies publish guidance on fixed oil storage tanks, which includes containers directly connected to a point of use (PPG2 – Reference 2). However, other containers of oil, chemical or other potentially polluting materials that have been handled or stored incorrectly also lead to pollution incidents, through accidental leakage or spillage. **In most cases, such incidents can be prevented if appropriate measures are taken at an early stage.** These notes provide guidance on options that will reduce the risk of pollution of land, surface waters, groundwaters, sewers and drains. They apply to containers of not more than 1,000 litres capacity that are not directly connected to a part of a process or other point of use, irrespective of the number of containers stored.

A wide variety of potentially polluting liquids is routinely distributed, stored or collected in containers ranging in capacity from a few litres up to drums of 205 litres (45 gallon) capacity and IBCs of 1,000 litres. These materials must be stored in accordance with the appropriate legislation, Health & Safety Executive (HSE) requirements and any other relevant guidelines, such as those issued by the Fire Service. Individual containers should be clearly labelled with the nature of their contents and any hazard it may pose, and dedicated stores should display the appropriate warning signs at access points. Quantities of materials stored should be kept to a working minimum. A detailed and up-to-date product inventory should be maintained, containing such information as product types, trade names, UN numbers, COSHH data, volumes, and location on site or within the store.

2. SPECIAL REQUIREMENTS

In some circumstances, the risks associated with particular materials involve additional requirements, particularly the following:

a. Hazardous substances

During the handling of drums and IBCs and particularly during dispensing, there is the potential for workers to be exposed to the contents. These may occur as a result of minor leaks or emissions, or from spillages. Under the Control of Substances

Hazardous to Health Regulations 1999 (COSHH), employers are required to carry out a suitable and sufficient assessment of the risks to their employees' health and the steps needed to reduce any identified risk. See Reference 3 for guidance on minimising health risks arising from the use of hazardous substances.

b. Flammable liquids

Flammable liquids are defined by the Chemicals (Hazardous Information and Packaging for Supply) Regulations 1994 as liquids that have a flash point of 55°C and below. The storage and use of flammable liquids (including highly flammable liquids and petroleum products) are subject to specific health and safety legislation. See Reference 4 for details of the relevant legislation and guidance on the safe storage of flammable liquids. Additional guidance on the safe use, handling and dispensing of flammable liquids is also available (Reference 5).

c. Pesticides

All pesticides must be stored in accordance with the Food and Environment Protection Act 1985 (FEPA) and Control of Pesticide Regulations (COPR). Where more than of 200 litres (200kg) of agricultural products are kept for sale or supply there is a need for certification or the direct supervision of a certificate holder. In particular, statutory bunding requirements apply. Registration and certification by BASIS Registration Ltd. (Reference 6) ensures compliance. Further guidance on pesticide storage is available (Reference 7, 8 and 9).

d. Timber treatment chemicals

Timber treatment compounds are also pesticides and are subject to the FEPA and COPR requirements. See Reference 10 for sector specific guidance.

3. DELIVERY AND HANDLING

Vandalism, failure of storage structures, fires and contaminated fire-water can all give rise to pollution. However, a large proportion of incidents involving drums and IBCs occur during delivery and subsequent handling of containers, for example forklift damage or spillages. To minimise these risks where practical, delivery, handling and transfer or decanting areas should be designated, marked as such and isolated from the surface water drainage system, possibly with the use of ramps (sleeping policemen), sumps or drainage shut-off valves. The provision of a roof or canopy will greatly simplify the management of surface water in delivery and handling areas. Forklift drivers should be suitably trained, and deliveries (loading and unloading) should be supervised properly. Any damaged containers or spillage should be reported immediately for appropriate action to be taken (see Section 7). As appropriate, use drum carriers, drum taps, funnels and containers with lids to minimise the risk of spillage during handling and transfer.

4. PRIMARY CONTAINER

The primary storage container should be of sufficient strength and integrity to ensure that in normal circumstances it is unlikely to burst or leak. Damaged or unsuitable containers should be repaired or removed from circulation as soon as they are identified. Unless subject to the requirements of Section 2.a, it is recommended that primary containers are stored inside or otherwise protected from the elements, where possible. Steel drums stored outside in a vertical position are at risk of contamination from rainwater and rusting, while plastic containers can age and become brittle.

5. SECONDARY CONTAINMENT SYSTEMS

A secondary containment system is designed to catch leaks from the primary container. A suitable secondary containment system should be provided, as this will significantly reduce the risk of a spill resulting in pollution. It will also allow the controlled recovery or treatment of any spilled material, and may prevent the spread of burning liquids. Containment methods include a bund (which can be around, or incorporated into, a storage facility), a drip tray, kerbs and any other system that will prevent a spilled product escaping. The system chosen will depend on factors such as site sensitivity, existing on-site facilities, the quantities and nature of materials stored, and their location within the site.

a. Siting

As an additional precaution, do not store containers within 10 metres of watercourses and 50 metres of boreholes and wells, where possible. Unbunded containers should not be kept within this zone.

b. Capacity

In deciding on the capacity of secondary containment facilities, take account of the maximum volume of product that could be stored at any one time. If a fixed fire-fighting system is in place, additional provision will be required for the quantity of firefighting media likely to be used. In general, containment facilities should have sufficient capacity to contain at least 25% of the total volume of the containers being stored, or 110% of the largest container, whichever is the greater. Where a drip tray is used, it should be capable of containing 25% of the volume of the container. Where containers are stored inside a building, it is recommended (and may be required by law in the case of agrochemicals, such as pesticides) that containment facilities should be proportionate to the risk. The risk may be substantial, for example in the case of agricultural stores and the capacity should be between 110% and 185% of the maximum storage capacity. With large external stores, 25% containment capacity may result in low containment walls, which are quickly overwhelmed by rainfall or fire-fighting agents. An additional 100mm freeboard is therefore recommended.

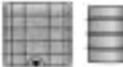
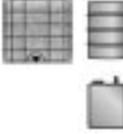
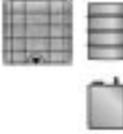
c. Construction

Secondary containment can be provided by prefabricated systems made from steel or plastic, or by in-situ systems, generally in concrete. All bund walls and floors should be impervious, and resistant to attack from the materials stored.

In-situ systems can use walls, kerbs, ramps and sloped floors to provide containment. There should be no damp proof course or drainage outlet. A sloping floor together with a sump in the base slab will ease the recovery of spilled product and any accumulated rainwater. Ensure that gradients are within the safe working limits recommended by the manufacturer for any fork-lift trucks used. It is recommended that floor joints are avoided, but where they are required for constructional purposes, great care must be taken to ensure that the joint-sealing results in a complete and lasting liquid-proof seal. Sealants must be able to withstand attack from any material likely to be stored.

For details of the various storage options and prefabricated systems, see Table 1.

Table 1. Storage Options

Storage Option	Description	Uses	Notes
Drip tray	Simple container placed under a single drum to contain minor leaks and spillages.		Ideal for single drums in storage or at their point of use.
Dispensing sump trolley	Proprietary system used for transporting and then dispensing a single drum.		Good where products need to be stored next to their point of use. Fully bunded when in horizontal position.
Sump pallets	Pallets to hold two or four drums with a sump to contain spills.		Containers are kept off the ground and containment is provided.
Decking	Decking units allow containers to stand off the ground on a grid whilst providing containment underneath.		Proprietary units can be added to cover the floor area required, in the area of use or in a dedicated store.
Drum racking	Racks specifically for the storage of drums, normally in pairs or rows of four.		May have integral bunding or otherwise can be used in dedicated stores. Drums are normally stored off the ground and in their horizontal position on the rack. In this position, drums should be orientated so that both bungs are covered with product (ie at 3 and 9 o'clock), and extra care will be needed to watch for leaks.
Conventional racking systems	The racking found in most warehouses, with the addition of chocks to keep drums in place.		For use in dedicated stores where secondary containment is provided. Drums should be orientated as above.
Dedicated internal store	Purpose-built, prefabricated or adapted (eg freight container) store.		Ideal where substantial storage capacity is required. Containment can be provided by means of stepped or ramped access, kerbing, bund walls, sloping floors or use of a proprietary system.
Dedicated external store	Purpose-built external storage area incorporating containment design features.		Useful for storing large quantities of materials, particularly where ventilation is an issue. Containment provided as above. In addition, containers should be protected from the elements by roofing (which will also prevent rainwater accumulating) and be stored off the ground. Consider the need for fencing for security and to prevent containers being ejected in the case of fire.

d. Design considerations

The design features of any chosen storage option, be it a prefabricated system, purpose built or adapted system such as a converted freight container, should consider the following containment, security and safety measures:

- means of containment and system integrity
- separation from ignition sources, process areas, occupied buildings and site boundaries
- fire resistance, including the effects of fire on the containment system
- fixed fire fighting systems
- security
- signage
- ventilation at high and low level (above bund)
- manual handling
- the need to segregate products

Services such as electricity supply should be carried over the bund rather than penetrating it. Mains water supply (except water-based fixed fire-fighting systems and safety shower/eye wash stations) should not enter the bunded area of the store and there should be no drainage discharge.

External walls next to any racked storage should be strong enough to withstand the force of the rack, or its contents, falling against them. In clad buildings, where racking extends above the bunding, provision should be made to prevent a high level leak running down between the cladding and the bund wall. Containers should not be stored at such a height or proximity (1m) to the bund wall that they might fall outside.

6. MAINTENANCE

Containment facilities should be inspected regularly, and checked at least weekly, to ensure that rainwater does not build up and that the bund or drip tray is clean and clear of product and debris. Keep a log of inspections and cleaning. Any accumulated rainwater should be pumped or bailed out only under controlled circumstances and, if contaminated, should be disposed of by a registered waste carrier. Any defects in the bund wall or lining should be repaired promptly, using the appropriate technique to ensure the bund retains its integrity.

7. DEALING WITH SPILLAGES

Spill kits containing materials such as leak-sealing putty, overdrums, drain seals, oil or chemical absorbents and personal protective equipment (PPE) should be located both within or near the storage area and also remote from it. Consider providing a 'quarantine area' where leaking containers can be placed safely. It is advisable to have a leak-sealing kit available at delivery and handling areas or other high-risk locations, to temporarily seal leaking drums. It is also recommended that vehicles transporting drums and IBCs carry a spill kit. Do not flush away spilt material or use dispersants. Contain any spillage for proper off-site disposal by a registered waste carrier and, in high-risk areas, consider the use of cut-off or isolation valves in the drainage system. A detailed site drainage plan should be kept available to assist in the event of a spillage or fire. A site incident response plan (PPG21- Reference 11) should be drawn up to deal with leaking containers and spillages, and all staff should be trained in its application, in the use of related equipment and in the relevant health and safety issues. Report any significant spillage to the Agency on the Emergency Hotline, 0800 80 70 60.

8. WASTE MANAGEMENT

Containers must always be clearly labelled with their contents. Empty containers should not be allowed to accumulate, but should be returned to the supplier, where possible. Containers used for waste materials should be stored in the same way as new materials and should not be allowed to accumulate. They should either be dealt with using suitable on-site facilities or removed as soon as possible by a registered waste carrier to a licensed waste management facility. Local Agency offices hold lists of companies that specialise in the disposal of waste chemicals, oils or empty containers. It must be remembered that everyone has a 'Duty of Care' under the Environmental Protection Act to ensure that all waste is transported and disposed of safely and legally and that it does not escape the control of the waste producer.

9. REFERENCES

1. Control of Pollution (Oil Storage Facilities) Regulations 2001
2. PPG2: Above-ground oil storage tanks
3. HSG193 – COSHH Essentials, ISBN 0-7176-2421-8
4. HSG51 - The storage of flammable liquids in containers, ISBN 0-7176-1471-9
5. HSG140 – The safe use and handling of flammable liquids, ISBN 0-7176-0967-7
6. For details of BASIS Registration, contact BASIS (Registrations) Limited, 2000, Tel: 01335 343945
7. PPG9: Prevention of pollution by pesticides
8. Guidance on storing pesticides for farmers and other professional users (HSE Guidance note AIS16)
9. Code of practice for the safe use of pesticides on farms and holdings (Green Code). PB3528: MAFF Publications. Tel: 0645 556000
10. Code of Practice for the Safe Design and Operation of Timber Treatment Plant; Environment Agency/British Wood Preserving and Damp Proofing Association, 1998. Tel: 020 8519 2588
11. PPG21: Incident response planning
References 3-5 and 8 may be obtained from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 6FS. Telephone: 01787 881165

10. OTHER RELEVANT PUBLICATIONS

Cost-effective management of lubricating and hydraulic oils Envirowise Guide GG227
Envirowise, Telephone: 0800 585794

PPG8: Safe storage and disposal of used oil

PPG18: Managing firewater run-off and major spillages

The Pollution Prevention Guidance notes (PPGs) are available from the Agencies

All the Agencies' pollution prevention guidance notes are available on the web sites listed below.

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The 24-hour emergency hotline number for reporting all environmental incidents relating to air, land and water in England, Wales, Scotland and Northern Ireland.

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