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ENVIRONMENT AND HERITAGE SERVICE
SEPA Scottish Environment Protection Agency
ENVIRONMENT AGENCY

Environmental Alliance – working together

Pollution Prevention Guidelines

storage & handling of drums & intermediate bulk containers: PPG 26

These notes are intended to assist all who deal with the storage and handling of drums and Intermediate Bulk Containers (IBCs). 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 mineral 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 expected to be introduced in Scotland during 2004 and may follow in Northern Ireland and Wales. Further advice may be obtained by contacting your local Agency office, details of which appear at the end of these guidelines. These notes have been produced by the Environment Agency for England and 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.

1. Introduction

The Agencies publish guidance on fixed oil storage tanks and for containers directly connected to a point of use (PPG2; Reference 2). However, other containers of oil, chemical or other potentially polluting materials that are handled or stored incorrectly can also lead to pollution, through accidental leakage or spillage. **In most cases, such incidents can be prevented if appropriate measures are taken at an early stage.**

A wide variety of potentially polluting liquids are 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 and 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 they pose, and dedicated stores should display appropriate warning signs at access points. The quantity 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, Control of Substances Hazardous to Health (COSHH) Regulations data, volumes, and location on site or within the store.

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.

2. Special requirements

In some circumstances, the risks associated with particular materials involve additional requirements. These include the following:

a. Hazardous substances

During the handling of drums and IBCs, particularly during dispensing, there is the potential for workers to be exposed to the contents. This may occur as a result of minor leaks or emissions, or from spillages. Under the COSHH Regulations 2002, 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. Reference 3 gives guidance on minimising the 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 2002 as liquids with 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. Reference 4 gives 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

Pesticides should be stored in accordance with the Food and Environment Protection Act 1985 (FEPA) and the Control of Pesticide Regulations 1986 (COPR) as amended. Statutory bunding requirements apply. Where more than 200 litres (200 kg) of pesticides approved for agricultural use are kept for sale or supply, their storage should be supervised by someone holding a certificate of competence. The pesticide store and management arrangements must be inspected annually, as a minimum, by an independent expert. Registration and certification by BASIS Registration Limited (Reference 6) ensures compliance. Further guidance on pesticide storage is available (References 7, 8 and 9)

d. Timber treatment chemicals

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

3. Delivery and handling

Vandalism, overfilling, failure of storage structures, fires and contaminated firewater, and incorrect or damaged drainage systems can all give rise to pollution. However, a large proportion of incidents involving drums and IBCs occur during the 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, sumps or drainage shut-off valves. Delivery and handling areas should be impermeable to the products handled and the provision of a roof or canopy will greatly simplify the management of surface water in these 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). Use drum carriers, drum taps, funnels and containers with lids (as appropriate) 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 use as soon as they are identified. Hazardous substances should be stored according to relevant legislation (see Section 2a). Unless recommended otherwise, primary containers should be stored inside or protected from the elements by another method. Steel drums stored outside in a vertical position are at risk of rusting and contamination from rainwater, while plastic containers can age and become brittle. We do not recommend the multiple storage of drums directly on top of one another because this greatly increases the risk of drums splitting under pressure or falling over.

5. Secondary containment systems

A secondary containment system is designed to catch leaks from the primary container or spillages when in use. **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 and operational needs, the quantities and nature of materials stored, and their location within the site.

a. Siting

Containers without secondary containment should not be kept within 10 metres of a watercourse or 50 metres of a borehole or well. As an additional precaution, it is recommended that no containers are stored within these areas. The proximity of storage areas to surface water drains, source protection zones protecting groundwater abstraction points or flood plains should also be considered in determining the level of secondary containment provided. The location of source protection zones and flood plains can be checked on the Agency websites or by contacting your local Agency office.

b. Capacity

The capacity of secondary containment facilities should 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 fire-fighting media likely to be used. **In general, for multiple container storage, 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. Drip trays may only be used for drum storage, not for IBCs, and must 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 100 mm height on the walls, known as freeboard, is therefore recommended.

c. Construction

Secondary containment can be provided by using prefabricated systems generally made from steel or plastic, or by in-situ construction using concrete or masonry, kerbs, ramps or sloped floors to provide containment. All containment system walls and floors should be impervious and resistant to attack from the materials stored. **There should be no drainage outlet.**

Concrete and masonry structures should not have a damp-proof course. Floor joints should be 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. A sloping floor together with a sump cast 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 forklift trucks used.

See Table 1 for details of the various storage options and prefabricated systems.

Table 1. Storage Options

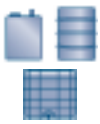
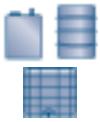
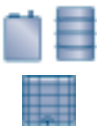
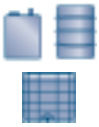
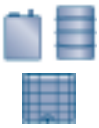
Storage Option	Description	Uses	Notes
Drip tray	Simple container placed under a single drum to contain minor leaks and spillages.		Ideal for single drums in storage or at their point of use.
Dispensing sump trolley	Proprietary system used for transporting and then dispensing a single drum.		Good where 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 while providing containment underneath.		Proprietary units can be added to cover the floor area required, either 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 (i.e. at 3 and 9 o'clock) and extra care will be needed to watch for leaks.

Table 1. Storage Options con'td

Storage Option	Description	Uses	Notes
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 (e.g. 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 take into account aspects of containment, security and safety measures including:

- 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;
- impermeability and resistance to attack from materials stored;
- nature of the product, e.g. toxicity;
- fixed fire-fighting systems;
- security;
- signage;
- ventilation at high and low level (above secondary containment);
- manual handling;
- the need to segregate products;
- all relevant legislation;
- site environmental sensitivity.

Services such as electricity supply should be carried over the secondary containment system rather than penetrating it. Mains water supply (except water-based fixed fire-fighting systems and safety shower/eye wash stations) should not enter the containment 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 any containment system, provision should be made to prevent a high level leak running down between the cladding and the containment wall. Containers should not be stored at such a height or proximity that they might fall outside the containment system.

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 in accordance with legislation (for example by a registered waste carrier). Any structural or other defects should be repaired promptly using the appropriate technique to ensure the containment system retains its integrity.

7. Dealing with spillages

Spill kits containing materials such as leak-sealing putty, over-drums, drain seals, oil or chemical absorbents and personal protective equipment (PPE) should be on site. These should be located both within or near the storage area and remote from it (in case during an event it is not possible to reach the equipment near the storage containers). All staff should be trained in the use of this equipment. 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 seal leaking drums temporarily. 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, for example 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 spillage to the Agencies on the Emergency Hotline, 0800 80 70 60.

8. Waste management

Carry out a waste minimisation review and consider methods to reduce the volume of waste you produce. Contact Envirowise on the Environment and Energy Helpline (0800 585794) for free advice and publications.

Containers must always be clearly labelled with their contents. All waste and waste containers should be stored in designated areas, which are isolated completely from surface water drains or direct discharge to the environment. The area should be able to contain spillages. Empty containers should not be allowed to accumulate, but should be collected by the supplier (where possible), 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. For further information on the storage and disposal of waste oils see reference 12 (PPG8). 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. Guidance note for the Control of Pollution (Oil Storage) (England) Regulations 2001. Department for Environment, Food and Rural Affairs (DEFRA). www.defra.gov.uk/environment/water/quality/oilstore/index.htm
2. Pollution Prevention Guidance Note (PPG) 2: Above ground oil storage tanks
3. HSG193 COSHH Essentials: Easy steps to control chemicals. ISBN 0-7176-2737-3
4. HSG51 Storage of flammable liquids in containers. ISBN 0-7176-1471-9
5. HSG140 Safe use and handling of flammable liquids. ISBN 0-7176-0967-7
6. BASIS (Registration) Limited, 34 St John Street, Ashbourne, Derbyshire, DE6 1GH. 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 (This document is available in Welsh as Guidance Note AIS16W).

9. Code of practice for the safe use of pesticides on farms and holdings (Green Code). PB3528. Defra Publications, Admail 6000, London, SW1A 2XX. Tel: 08459 556 000

10. Timber Treatment Installations 2003 - Code of practice for safe design and operation.; Environment Agency/British Wood Preserving and Damp Proofing Association, Tel: 01332 225 100; www.bwpda.co.uk

11. PPG21: Incident response planning

12. PPG8: Storage and disposal of used oils

References 3–5 and 8 may be obtained from: HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA. Tel: 01787 881165.

10. Other relevant publications

Cost-effective management of lubricating and hydraulic oils GG227 Envirowise, Tel: 0800 585794; www.envirowise.gov.uk.

PPG11: Preventing pollution at industrial sites

PPG18: Managing firewater run-off and major spillages

Pollution Prevention Pays booklet

These notes are for guidance only and following the good practice described does not remove the reader's obligation to ensure relevant legislation is complied with at all times and that their activities do not result in the release of polluting matter to the environment. Pollution of the environment is a criminal offence and compliance with one or more Guidance Note(s) is not a defence to such offences. It is recommended that references to other sources of guidance are checked to ensure they are still current.

ENVIRONMENT AGENCY
GENERAL ENQUIRY LINE
0845 9 333 111

ENVIRONMENT AGENCY
EMERGENCY HOTLINE
0800 80 70 60

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

Pollution Prevention Guidance notes (PPGs) are available to download from the Agencies' websites, see details below.

Environment Agency
www.environment-agency.gov.uk

HEAD OFFICE
Rio House
Waterside Drive
Aztec West
Almondsbury
Bristol BS32 4UD
Tel: 01454 624 400
Fax: 01454 624 409

Scottish Environment Protection Agency
www.sepa.org.uk

CORPORATE OFFICE
Erskine Court
The Castle Business Park
Stirling FK9 4TR
Tel: 01786 457 700
Fax: 01786 461 425

Environment and Heritage Service
www.ehsni.gov.uk

HEAD OFFICE
Calvert House
23 Castle Place
Belfast BT1 1FY
Tel: 028 9025 4868
Fax: 028 9025 4777

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