BS ISO 16304:2013

BSI Standards Publication

Ships and marine technology — Marine environment protection — Arrangement and management of port waste reception facilities

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of ISO 16304:2013.

The UK participation in its preparation was entrusted to Technical Committee SME/32/-/2, Ships and marine technology - Maritime environment protection.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Published by BSI Standards Limited 2013.

ISBN 978 0 580 75002 1

ICS 13.020.99

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2013.

Amendments issued since publication

Date	Text affected

BS ISO 16304:2013

INTERNATIONAL STANDARD

ISO 16304

First edition
2013-03-15

Ships and marine technology — Marine environment protection — Arrangement and management of port waste reception facilities

Navires et technologie maritime — Protection de l'environnement marin — Disposition et gestion des installations portuaires de collecte des déchets

Reference number
ISO 16304:2013(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 8, *Ships and marine technology*, Subcommittee SC 2, *Marine environment protection*.

Introduction

The development of adequate Port Reception Facilities (PRFs) for ship generated waste and cargo residues is a major element in the management of each of the shipboard waste streams covered by the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL) Annex 1 to VI, as amended, excluding Annex III (packaged dangerous goods). MARPOL requires that Party States ensure the provision of adequate reception facilities in ports to receive these wastes. Parties to MARPOL are encouraged to develop implementing legislation and should consider incorporating regional and intergovernmental legislation.[1)]However, due to operational, ownership, geographic, and legislative differences in ports, there is a large disparity in how operations are conducted. In order to overcome some of the major issues, IMO, through its Flag State Implementation (FSI) Subcommittee developed an action programme to tackle the inadequacy of port reception facilities.

This International Standard provides a method for addressing ship generated waste and cargo residues from when it is delivered from the ship to how it is managed ashore. The provision, operation and use of PRFs are inherently linked, so this International Standard addresses the design of the PRFs, and their operation and management. It is designed to be used by ports and terminals with existing PRFs which aim to refine their systems; it is also to be used by new ports and terminals that are developing PRFs.

To obtain the most efficient management of waste and to reduce the time and resource burden in segregating and handling waste in the ports, the concept of waste minimization has been integrated into this International Standard by incorporating the following basic principle:

- For waste generated aboard a vessel:

"Prevention before recycling before energy recovery before disposal"

- Once the waste is landed ashore:

"Avoidance before reduction before reuse before recycling before incineration with energy recovery before disposal"

Ship owners and operators, cargo owners, and port and terminal owners and operators, along with governments, are aware of the importance of well organized and managed waste collection, especially with respect to health and safety onboard ships and at ports and terminals. It has been acknowledged at the IMO that standard methodologies for waste management both onboard ships and ashore at PRFs would harmonize practices and ensure a smooth delivery of ship generated waste to shore-side facilities.[2)] The parties to the Basel Convention also support the development of this International Standard and have requested the Secretariat to continue its cooperation with ISO with the objective of including the Basel Convention requirements of waste minimization and environmentally sound management in this International Standard.

ISO has published ISO 21070, which provides a methodology for ships to segregate their garbage, Thus, port facilities worldwide may therefore expect a certain level of segregated ship generated waste. However, ISO 21070 cannot work alone and needs to be complemented by a parallel International Standard for reception of the waste. This International Standard assists in the planning for the provision of an appropriate PRF.

Many ports and terminals have invested much in achieving ISO 14001 Environmental Management Systems accreditation. This International Standard is also meant to complement ISO 14001 by adding a port component which extends the principles of ISO 14001 to ships' waste management in ports. It provides a specific methodology that any port, harbour, terminal or marina can apply to the planning, development and operation of its PRF. This International Standard can be incorporated easily into

1) An example of intergovernmental legislation is "Directive 2000/59/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues". Regional arrangements between countries or ports to jointly provide facilities have also been agreed.

2) This has been reflected in the FSI Action Programme, Work Item 3.2 "Equipment/Technology – Standardize garbage segregation requirements and containment identification.'

other plans for achieving ISO 14001 accreditation, as an extension that focuses on PRFs. Conversely, the processes put in place during the preparations for ISO 14001 accreditation will assist in meeting the development of a holistic Port Waste Management Plan (PWMP) under this International Standard.

INTERNATIONAL STANDARD ISO 16304:2013(E)

Ships and marine technology — Marine environment protection — Arrangement and management of port waste reception facilities

1 Scope

Parties to MARPOL are obligated as Port States to ensure that port reception facilities (PRFs) adequate to meet the needs of the ships using them without causing undue delay are provided at their ports and terminals. MARPOL does not seek to regulate the management of ship generated waste at ports and terminals beyond the reception facility requirement. However, ports and terminals must observe any national and regional regulations. While these regulations exceed the scope of MARPOL, the IMO recognizes the need to manage ship generated waste at ports and terminals as part of an environmentally sound management approach for avoiding, minimizing and eliminating pollution from ships.

This International Standard applies to the management of ship generated waste regulated by MARPOL that is discharged at ports and terminals. It also covers principles and issues that should be considered in the development of a port waste management plan (PWMP), its implementation and PRF operations. The operation of any PRF is governed by the principles and procedures included in the PWMP. The procedures to operate the PRF and the development of a PWMP are closely linked and therefore are integrated into this International Standard.

This International Standard addresses the principles and issues that should be considered in:

- The development of a port waste management strategy;
- The design and operation of PRFs;
- PWMP development, implementation and compliance; and
- PRF management and accountability.

This International Standard has been designed to be used by ports of any size and capability. It does not give specifics on the size or location of PRFs in each port, but provides a list of principles to be considered and applied to any size or type of port or terminal (e.g. marina, fishing port, container terminal, oil terminal, roll on/roll off terminal, cruise terminal, ferry terminal, bulk or general cargo terminal, ship repair or recycling facility, and offshore terminal). This International Standard can also be used by those ports that have entered into regional arrangements for the provision of their PRF, or inland ports and marinas, providing that the definition of waste and its management in the national legislation of the facility are referenced accordingly. Many ports already have systems in place that work efficiently; therefore this International Standard can be used by ports with existing PRFs as well as new ports or existing ports developing new PRFs.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 21070:2011, *Ships and marine technology — Marine environment protection — Management and handling of shipboard garbage*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
adequacy
<PRFs> meeting the needs of ships normally calling at the port, without providing ships with a disincentive to use them, without causing undue delays, and contributing to the protection of the environment

[IMO Circular 671]

3.2
cargo residues
remnants of any cargo material on board which remain on the deck or in cargo holds or tanks following loading and unloading, including loading and unloading excess or spillage, whether in wet or dry conditions or entrained in wash water

Note 1 to entry: Does not include dust remaining on the deck after sweeping or dust on the external surfaces of the ship.

3.3
energy recovery
energy reclamation from waste before final disposal

3.4
port
place or geographical area consisting of infrastructure and equipment as to permit, principally, the reception of ships, including fishing vessels and recreational craft, for the loading or unloading of passengers, cargo, stores, equipment, fuel, fish from commercial or sport fishing, or for repairs or berthing or other related activities

3.5
port administration
public or private organization with the responsibility for the operation of the port

3.6
port authority
organization, either private or governmental, that manages the operations of a port, in whole or part

Note 1 to entry: Port authorities may have complete or limited jurisdiction within a geographic region.

3.7
port reception facility
PRF
any facility operating in a port, which is fixed, floating or mobile and capable of receiving ship generated waste or cargo residues in a way consistent with national, regional and local requirements

3.8
quarantine waste
any solid or liquid waste determined by national, regional or local legislation to require special handling, segregation, management and final disposal due to its potential to spread disease or plant and animal pests

3.9
recreational craft
boat or ship of any type, regardless of means of propulsion, that is intended for non-commercial sport or leisure purposes

3.10
ship
sea-going vessel of any type whatsoever operating in the marine environment, including hydrofoil boats, air cushion vehicles, submersibles, floating craft, and fixed or floating platforms

[MARPOL Annex V]

Note 1 to entry: Ships may call at inland ports.

3.11
ship generated waste and residue
all wastes and cargo residues which are generated during the normal operation of a ship and fall under the scope of Annexes I, II, IV, V and VI to MARPOL

Note 1 to entry: Hazardous Waste may also be generated in the event of breakage and subsequent spillage of Annex III packaged cargos.

3.12
terminal
specific and distinct cargo or passenger loading and unloading facility for ships

3.13
waste recovery
reuse, recycling, reclamation or treatment of waste for reuse

4 Waste management strategy elements

4.1 General

There are three main components of any waste management strategy: administrative and legal matters; technology; and infrastructure and support services.[3)]

4.2 Administrative and legal matters

Many nations have implemented legislation, policies and national waste management strategies that govern the management of waste at PRFs, including ship generated waste. Such legislation must be considered when developing a port waste management strategy as it will determine the level of compliance that must be maintained. Additional requirements such as the need for licensing and/or approvals, and waste tracking and documentation must also be considered.

The best possible environmental solution for waste recovery and disposal should be identified. Waste management targets adopted by the national administration for ports within its jurisdiction should be included in the development of waste management strategies. If there are no such targets, then the port should consider developing them.

4.3 Technology

Waste management technology that is current and suitable should be employed. The technology considered as part of the waste management strategy should reflect the most current state of waste management techniques. However, the focus is shifting toward recycling and reclamation of waste, versus disposal (see 6.5). Thus, the waste management strategy should recognize and promote alternative methods of waste management that harness the benefits of new and emerging technologies.

4.4 Infrastructure and support services

The waste management strategy must be developed in an effective way with an awareness of the infrastructure and support services not only throughout the port or terminal, but also beyond those physical limits. There must be in place suitable waste transport organizations, recycling facilities, treatment facilities, and if necessary, final disposal sites. These treatment and disposal facilities may or may not be located within the port. Waste management strategies should also incorporate proactive mechanisms to inform and educate those having an interest in using the PRFs.

3) International Maritime Organization, 1999

5 Design and operation of PRFs

5.1 General

The types and number of ships normally calling at the port and the nature of operations must be considered. PRFs for relevant wastes need to be available without causing undue delay to ships or imposing economic or other disincentives for their use, such as prohibiting waste offload at a specific pier during cargo handling for safety reasons. Reference to the PWMP will provide options for waste stream collection and handling, and this, combined with the calculated PRF capacity, provides a foundation for the PRF design. However, for those waste volumes that could be anticipated to fluctuate widely over different periods, the provision of PRFs should be adapted appropriately. The system designed to support and operate a PRF should take into account the following core components.

5.2 Port characteristics

5.2.1 Spatial and siting requirements

The location of PRFs should be "convenient" and not be a disincentive to use.[4)] The location must be suitable and sufficient to allow easy and safe use that does not impose an undue delay upon the ship. Siting considerations should include an awareness of the impact on other port operations as well as the public areas surrounding the port or terminal.

Larger ports and terminals may require higher capacities or more diverse capabilities. Construction of a new port or terminal may offer greater flexibility in design as opposed to making improvements to an existing PRF.

Regardless of the type of PRF that is chosen, the port or terminal geography and layout must be considered as part of the design phase. The best way to collect each waste stream throughout the port or at the terminal must be determined. In a compact port with large berths, garbage waste disposal bins on each quay or a direct transfer to the waste handler could be implemented. However, in certain other port configurations, it may be better to collect waste by barge. If the port is lock-bound, waste can be landed upon entry or exit at the lock.

A port or terminal with expansive space to increase operations in the future may see a rise in shipping waste volumes. This may drive a need to consider providing excess capability during PRF planning activities so as not to limit future port or terminal expansion activities.

5.2.2 Types of cargo handled within the port or by the terminal

Multiple MARPOL waste reception facilities may be required. Ports or terminals that receive ships with diverse cargoes that could produce cargo residues, such as oil and noxious liquid substances, would create unique waste handling challenges.

5.2.3 PRF service providers

Companies that are licensed or otherwise certified or approved to provide waste handling services should be identified and verified by the port administration or port authority. Effective port waste management goes beyond the act of receiving waste from ships. Good downstream waste management supports the intent and purpose of having PRFs.

5.2.4 External factors

Extreme weather conditions or extreme tidal cycles may make it difficult to access PRF services or hinder the operation of traditional waste handling equipment.

---

4) International Maritime Organization, 1999

5.3 Types

5.3.1 General

The type of PRF can vary between ports and terminals and is determined after assessing the different options.

5.3.2 Floating

The use of barges may have distinct advantages, as they are relatively mobile, typically have sufficient capacity to service multiple ships, and can receive most wastes. Their shallow draught allows for access in most port and terminal areas. However, sea state limitations may prevent floating reception facilities from operating at all times. Additionally, there is an added element of risk when transferring waste to a floating PRF, especially those containing oily or noxious liquid mixtures, or in ports and terminals where ship traffic is heavy and continuous in volume.

5.3.3 Mobile

Vehicle-borne PRFs offer speed and flexibility, particularly with respect to smaller ports, terminals or marinas. However, the capacity of vehicles such as tank trucks and traditional over-the-road garbage collection trucks may be a limiting factor when servicing large ships. This may mean a smaller number of ships can be serviced before the vehicle is full. This can cause delays and increase congestion in the already very busy ports and terminals. Furthermore, certain areas may be off limits to third party waste collection organizations due to either safety and/or security concerns, or both.

5.3.3.1 Other considerations

Temporary placement of containers or collection bins that are dropped off via truck and picked up at a later date, after the container/bin is full, may be an option.

5.3.4 Fixed

The use of fixed PRFs might be the preferred route for locations where terminals operate their PRFs independently. Centralized PRF arrangements (e.g. at or near frequently used locks) may be considered, however, it should be recognized that such arrangements could increase the burden on ships due to scheduling requirements. In cases where specialized PRFs are needed, such as those for oily or noxious liquid mixtures, having distinct and separate PRFs at each terminal might be the best option. This arrangement will ensure that the ships having business with those terminals are provided with the appropriate type of reception facility services.

5.4 Waste characteristics

5.4.1 General

All types of ship generated waste that will be received and handled at the port or terminal must be determined. Failure to consider certain waste streams may limit the future potential of the port or terminal. Wastes may be delivered by ships in many different forms, from single compound waste streams such as oil, sewage or segregated waste, to mixed waste streams such as garbage. Ship generated wastes are discussed in 6.7.

NOTE See Table A.1 for a listing of waste streams and treatment options.

5.4.2 Other considerations

a) Not all waste streams will necessarily be produced by every ship or be discharged in every port. Additionally, in some circumstances ships may need or wish to discharge waste, such as food waste and non-harmful cargo residues that could be discharges into the sea under the provisions

of MARPOL but due to operations, company policy, or other considerations, the master of the ship chooses to discharge these wastes ashore. Therefore, the PRF should consider these additional waste streams.

b) Ports may also have to take into account any local, national or regional legislation and guidance that requires vessels to deliver all of their waste, or part of their waste prior to departure.

c) Special national legislative considerations may have to be taken into account when receiving ships on international voyages as opposed to domestic voyages (such as food waste or quarantine waste).

d) Where applicable, in cases where ship generated wastes and cargo residues are considered "hazardous wastes" or "other wastes" under the Basel Convention, the requirement for environmentally sound management should be taken into account.

5.5 Design capacity

5.5.1 General

The design of a PRF should be based on the number and types of ships calling on the port. The basic PRF capacity needed in the port or terminal, per waste stream or per ship type, can be calculated based on the expected or most probable level of traffic in the port.

5.5.2 Existing ports

For existing ports and terminals the level/quantities of waste received in previous years can be used to determine PRF capacity. Additionally, if there is any anticipated change in traffic, legislation or waste management technology, then the initial figures may have to be modified.

5.5.3 New ports or terminals

When designing a new port or terminal or redesigning an existing port to handle new business, or larger or different types of ships, a calculation of waste reception facility capacity must be made using estimates of the expected vessel traffic. Calculations should take into consideration the number and frequency of port calls for each type of vessel and the expected wastes that are generated aboard those vessels based on the type and size of vessel and cargo(es) handed (volumes or tonnes), the crew size, the number of passengers (if any), the average length of the voyages for inbound ships, and whether the port is a loading or unloading port or a combination.

If no data are available for a new port, the information could be obtained from other ports with similar traffic.

NOTE Annex A of ISO 21070:2011 provides information on calculation of the expected amounts of (Annex V) wastes.

5.6 Waste handling capabilities

5.6.1 Adequacy

A fundamental consideration is to determine the waste handling capabilities needed in order to be considered adequate (see 3.1.).

5.6.2 Accessibility and suitability

Suitable PRF equipment for all waste streams must be easily accessible by the ship. PRF equipment that is difficult to use and poorly arranged may create a disincentive for ships to properly dispose of their waste while at the port or terminal.

5.6.3 Waste handling equipment

There is a variety of equipment that can be used to collect, store and in some cases, treat the different waste streams collected at ports and terminals. The equipment selected must be suitable for the type and quantity of waste.

Inadequate space at the berth to support waste handling equipment and its use must be avoided as it may compromise the safety of the PRF and ship personnel, create the risk for discharges into the environment and possibly create a disincentive for proper waste disposal.

5.6.4 Storage

Consideration must also be given to the period of time the port or terminal could store the ship generated waste on-site. Lengthy storage of waste should be avoided, as it can create stress on the supporting infrastructure and impact the waste handling services for future ships. It may also affect the health and safety of workers and the environment if stored waste quantities exceed storage capacities. PRFs that do not plan to arrange for routine waste removal services must ensure that waste storage receptacles of sufficient capacity and quantity are provided. Conversely, PRFs that are serviced frequently may not need to have large capacity waste storage receptacles.

5.7 Participation in segregation, recycling or disposal programs

5.7.1 General

The provision for waste segregation may lead to increased participation in recycling programs. In order for this to be successful, segregated waste should remain segregated until the final treatment. Many PRFs can be conveniently arranged to accommodate recycling and other waste management services. Additionally, ships that implement ISO 21070 will have waste segregation procedures that will make operations at the PRF and downstream waste management easier.

5.7.2 Recycling capabilities

Recycling is a process where materials, which are otherwise destined for final disposal, are collected, processed or reprocessed, and then reused. These materials all have useful chemical or physical properties after having served their original purpose.

5.7.3 Final disposal

Final disposal of wastes should be viewed as a last option to be exercised only after alternatives have been exploited, including energy recovery from wastes, and deemed unattainable. Several options for final disposal exist, and the benefits and drawbacks should be considered and documented in the port or terminal's waste management strategy.

6 Port waste management plan (PWMP)

Ports and terminals must, at a minimum provide PRFs for MARPOL wastes (see 3.11). As such, the PWMP takes into account the national waste management strategy and defines how and by whom waste is collected at a port and/or terminal. This is necessary as waste streams received from ships calling on ports and terminals must be dealt with in an environmentally and economically sound manner. Developing and following a reasonable waste management strategy will ensure that all parties involved in the generation, reception and transfer of waste abide by practices and standards that not only serve to protect the health and quality of the environment and public, but also ensure compliance with local, national and international laws and treaties.

6.1 Key elements in the development of a PWMP

There are five major elements to consider in the provision of PWMP. They are:

- The development,
- Its publication,
- Its implementation,
- Enforcement of delivery of ship-generated waste and cargo residues by competent authorities, and
- Monitoring of the plan to ensure that all parties, including ships and facility providers are adhering to the plan, the plan is and remains fit for use and the reception facilities are adequate.

The development of a PWMP is the planning stage for the eventual provision of a PRF and is the most crucial and time consuming part of the process. First, the port should consider what waste reception services they should provide and exactly how they can provide them. The PWMP needs to be developed to manage the different waste streams generated onboard a ship in an efficient and environmentally sound manner without causing undue delay to ships or cause disincentives to shipping. A PWMP can be developed in-house, or by a consultant, but nevertheless it has to be transparent, auditable, include provisions for consultation with the stakeholders and fulfil all legal requirements within the national legislation of the port. It should identify the major principles of waste minimization, management and disposal, while ensuring the health, safety and security concerns of the port or terminal user. The PWMP should also result in the development of a formal plan that must be consulted upon, approved (if necessary) and used as the day to day manual for the management and operation of the PRF.

The PWMP should include relevant information on the following key areas outlining pertinent procedures and management measures, as appropriate:

- An analysis of the relevant legislation, the international, regional, national and local waste management structure that the PWMP fits into, including the official responsibilities of the port owners/operators and other relevant parties under national waste laws and the different governmental administrations involved in controlling the management of ship generated waste;
- Geographical and administrative scope of the PWMP;
- Official responsibilities within the management and operation of the PRF within the port;
- An assessment of the need for PRFs (see 5.1);
- A description of the cost recovery system;
- Procedures for how to report and take action on alleged inadequacies of PRFs;[5)]
- Explanation of reporting and notification procedures for ship generated waste;[6)]
- A description of the method for recording the amounts of wastes received;
- Procedures for ongoing consultations with organisations representing the port or terminal users; waste contractors, and other stakeholders, including a description of how the essential information will be made available to the public (e.g. shipping agents and other relevant stakeholders);
- Review, refinement (corrective and preventive) actions and/or auditing; and
- Enforcement measures.

5) International Maritime Organization, 2007

6) International Maritime Organization, 2007

Each plan will take into account the specific nature of the port or terminal and its users. This is then outlined in a formal plan which is implemented after consultation with the users of the port.[7)]

6.2 Legislation and regulatory considerations

6.2.1 Applicable laws and regulations

Before any PWMP or PRF can be developed or established, there needs to be an analysis of the international, regional, national and local legislation that controls waste and waste generated on ships, and that analysis should be included in the PWMP. National legislation will, at a minimum, reflect the international requirements of MARPPOL. However, this legislation is also likely to set out the responsibilities, legal processes, waste management options and procedures that the port will have to comply with. Issues to specifically note include, but are not limited to:

- Responsibility for developing a PWMP;
- The procedure for approval of the PWMP;
- The procedures to keep the plan up-to-date and valid;
- The duty of care responsibilities for the port with respect to waste management, waste transfer and waste handling;
- Recovery and disposal regulations for different waste types;
- Licensing and other requirements for the transfer, storage and the disposal of the waste; and
- Requirements for the payment of fees, if applicable.

Strict compliance with local and national legislation is critical when considering the design of PRFs to ensure that they are both adequate and legally sufficient. The design of PRFs must be based in part on the principle that ships using PRFs will not be subject to disincentives to properly dispose of their wastes. The following areas should also be examined:

- The existence of a waste management strategy for the port or terminal;
- Special rules regarding health, safety, security and the environment; and
- The port or terminal's experience with waste management.

Parties to MARPOL have a responsibility to ensure the provision of port reception facilities at their ports and terminals, depending on the nature of their operation.[8)] Prospective wastes, as defined in the Annexes to MARPOL include:

— Oily wastes

— Noxious liquid substances in bulk

— Sewage

— Garbage

— Residues from exhaust gas cleaning systems and ozone depleting substances

7) International Maritime Organization, 2009

8) Refer to the MARPOL Annexes for regulations pertaining to each waste type.

6.3 Port structure and administration

The first issue to consider is the scope of the PWMP and what it will cover. Ports or terminals may join together in one plan to provide more efficient waste management services. The scope of the plan depends on the following factors:

- The official responsibilities placed on the ports or terminals;
- The type and size of the port;
- The geographical spread of these facilities and the geographical layout of the port;
- Types of facilities within the port;
- If, in terms of cost to shipping and economies of scale, whether or not these port facilities should have their own PWMP; and
- Relationships and interfaces with, and agreements between, adjacent and nearby ports and port facilities.

The port owner/management must analyse the makeup of the port or terminal and decide on the most appropriate way to handle ship generated waste. A port may decide that certain terminals must have their own PWMP, include all terminals in one PWMP or have a hybrid system. This may depend on the relevant national legislation which may identify the responsible party for creating and running a PWMP and depending on this, the PWMP developed may have many options as outlined in Table 1.

Table 1 — Examples of different options in PWMP planning

Port	Potential PWMP structure	Comments
One port	One PWMP	The PWMP covers all PRF in all port facilities throughout the port.
One port with discrete terminals/ port facilities contracted to other companies (container, bulk, oil, cruise, etc.) or forming port facilities for one type of ship (fishing vessel berths or marinas)	One PWMP	The PWMP brings together independently developed and run plans for each terminal/port facility in one volume.
One port with discrete terminals/ port facilities contracted to other companies (container, bulk, oil, cruise, etc.) or forming port facilities for one type of ship (fishing vessel berths or marinas)	Many PWMPs	Each discrete terminal or port facility has an independently developed and run PWMP. Efficiency of size and economies of scale depend on the size of the port facility and the traffic visiting it.
One port with one or two discrete terminals contracted to other companies (container, bulk, oil, etc.)	One PWMP	The PWMP brings together any independently run plans for each terminal as a discrete section in the PWMP, and also provides an overarching PWMP for the other port facilities in the port.
One port with one or two discrete terminals contracted to other companies (container, bulk, oil, etc.)	Many PWMPs	Each discrete terminal has an independently developed and run PWMP, with the other port facilities in the port covered by a separate overarching PWMP.
Two or more ports/port facilities	One PWMP	One PWMP is produced to cover two ports or port facilities that are inherently linked by trade or geographic proximity to provide efficiency of size and economies of scale.
	Two or more PWMPs	PRF are shared between ports, however, two or more PWMPs are developed, one for each port or port facility, to outline where ship-generated waste can be discharged at each port. In such cases, ports or port facilities should be inherently linked by trade or geographic proximity and one must have limited capabilities to provide a PRF (e.g. for environmental, security or space considerations)
	One PWMP	Development of one PWMP to cover a distinct geographic region, which outlines the provision of relevant PRF in every port (e.g. ports/port facilities under the control of one municipality or authority)

6.4 Official responsibilities

Once the scope of the PWMP has been identified, it is crucial to determine and identify who is responsible for each element of the plan, not only for the development phase but also for the operational phase. Therefore, the PWMP should outline and document the detailed responsibilities of the following parties:

- The Port Authority, including:
  - — the Harbour Master,
  - — the port's designated PRF manager, and

  - all staff involved in the management of the PRF, including staff involved in collecting fees, the reporting procedure from ships and liaison with waste contractors;
- Any individual terminals in the port and their staff responsible for PRF administration and operation;
- PWMP consultants;
- Operating contractors (if applicable);
- Ship crews, including:
  - the ship's master
  - the ship's designated waste management officer, and
  - other appropriate staff onboard ship;
- Ship agents
- Waste facility providers;
- Waste transfer providers;
- Waste recovery and disposal providers;
- The Authority that approves PWMP, if applicable; and
- Other appropriate government or non-governmental entities that may include but are not limited to officials involved in Port State Control (PSC), Maritime Administrations, Coast Guards, and Marine Environmental Protection officials.

6.5 Waste management

The PWMP must also consider what waste streams are likely to be encountered in the port. Ship generated waste may be delivered by ships in many different forms, from single substance waste streams, such as oil, sewage or segregated garbage, to mixed waste streams such as domestic garbage. Waste management is a key principle that should be applied to the development of the PWMP in order to promote and realize the environmentally sound treatment of waste on land.

The developers of the PWMP should liaise with local waste disposal companies to source and implement methods to collect waste so it can be reused, recycled, reclaimed or otherwise treated. There is a variety of equipment that can be used to treat the different waste streams in ports and terminals, or treatment can be done off-site. This equipment can include the use of gravity separation, physical, chemical or biological separation or treatment, or other alternatives. The selection of equipment must be suitable to the type and quantity of waste. An example of waste streams generated from ships can be found in Table A.1.

For each of these waste streams, methods for collection, recovery and disposal in an environmentally sound manner need to be identified and developed with local waste authorities and local licensed waste contractors and companies. An analysis of the options for collecting these wastes should be developed based on the local market for waste disposal.

Ports and terminal operators should also consider promoting at-source waste minimization onboard ships and consider rewarding vessels that adopt good waste management or environmental practices (e.g. minimizing packaging during loading or the application of ISO 21070) with reduced fees. Methods that the port or terminal has adopted or considered should be documented in the PWMP.

6.6 Cost recovery system — Financial considerations

6.6.1 General

From the information on waste collected in 5.2.2, the detailed design of the PRF, the cost of providing the PRF and the cost of waste disposal (including reuse, recycling, reclamation and treatment), a fee per ship can be developed. The business model used therefore may depend on local and regional legislation or political guidance, and ports should liaise with their competent authority to obtain guidance on this matter. The fee can also be varied with type or size of ship, and include costs of developing the PWMP and the administration cost for managing the system or collecting the fee (also called system costs). However, the fee should be based on the following principles:

- The waste generator pays for the provision and use of the PRF;
- The "not for profit" principle with respect to the service the ports provides (i.e. costs for the disposal and the provision of PRF should not be inflated by the port for profit);
- The fee should be fair, non-discriminatory and reflects the costs of the facilities and services provided;
- The fee should not provide an incentive to discharge waste into the sea; and
- It should be transparent so that generators of the waste are aware of and understand all of the components and methods for calculating the fees.

6.6.2 Underlying considerations for cost and fee systems for using PRFs

When the waste is discharged in a port, crew members only see the PRF. After the waste is collected, it can be brought to a processing unit and subsequently treated, including further segregation. In general the following activities must be defined:

- Collection
- Transport
- Segregation
- (Final) treatment (i.e. reuse, recycling, reclamation/energy recovery, final disposal)

For all of these activities, one or more public or private companies can be utilized. In some cases the terminal operator can be part of this chain (e.g. collecting containers on quay). It is important that all those involved in the waste management chain are aware of the principles of environmentally sound management and that the assessment of the costs reflect this.

The cost for these activities should be paid by the delivering vessel. Depending on local and regional legislation or guidance, ports should liaise with their competent authority to obtain guidance on this matter. Elements of the above activities can be provided by public or private companies, other authorities, or terminal operators. As a result of this guidance, ports may develop a fee system. The actual fee system may vary from port to port. Examples of types of fee systems include:

- *Indirect fee system* (also called *No special fee system*) — the cost will be entirely financed by the collection of fees from the ships.
- *Direct fee system* — the costs will be paid directly to the PRF.
- *Combinations of indirect and direct fee system* — the costs are partly financed by the collected fees.
- *Rebate system* — vessels pay an upfront fee which can be partially refunded if the vessel uses a PRF.

NOTE There are a lot of variations among fee systems.

The fee will be used to cover the costs of the PRF in a port or terminal. When vessels deliver waste streams that are not included in the fee system, there will be an additional direct fee.

The fee may also vary with the type or size (e.g. GT) of the ship, or its main engine capacity.

6.6.3 Information for port users (ship masters, ship owners, ship agents and port/terminal operators)

Ports should provide information on the development of fees and indirect costs for the provision of the PRF in the PWMP on the port's website and provide literature for distribution to ships and their agents. This could include a comprehensive list of the types of wastes and the cost of disposing of each type of waste in the port or terminal, including costs for excessive amounts of waste and off-hours service. For indirect fees, the structure should be explained in the PWMP or any other relevant document (e.g. Port Entry Guide or General Conditions/tariffs from a port) and include:

- The cost of any indirect fee;
- How any indirect fee has been calculated;
- What (which services) the fee covers;
- What rights (e.g. indirect costs, reimbursement, discount) a ship paying the fee has; and
- What is excluded.

This information should be included as a separate annex to the PWMP, so it can be updated quickly without the need to revise the whole document.

6.6.4 Cost advantages of reuse, recovery and recycling

Reusing, recovering and recycling waste can reduce final disposal costs, generate income if the waste still has value and can improve the image and environmental credentials of the port. A variety of options can be considered, including refurbishment or repair, recycling by reconditioning, dismantling for parts, using waste as a product or raw material, composting or energy recovery from the waste. An analysis of the options for collecting these wastes should be developed based on the local market for waste management and documented in the PWMP.

This may be difficult as certain waste processing facilities may not be available locally, or in the country where the waste is delivered. Therefore, the PWMP developers should liaise with local waste handlers to identify new opportunities and stimulate possible waste recovery industries.

6.7 Data collection and monitoring

6.7.1 Notification

The PWMP should also include detailed information on:

- Advance notification forms to the port of the expected waste the ship needs to discharge;[9)]
- Waste delivery notes or receipts — between the ship and the port, the ship and the waste contractor or the port and the waste contractor as appropriate;[10)]
- How this information is verified; and
- Monitoring and enforcement procedures.

6.7.2 Data management

Develop processes for collecting information on waste types and quantities that are actually received and on how a conduct a comparison between the value received and what was expected through the

9) The Advance Notice Form (ANF) developed by IMO should be used (MEPC.1/Circ. 671, Appendix 2)

10) The Waste Delivery Receipt Form (WDR) developed by IMO should be used (MEPC.1/Circ.671, Appendix 3)

advanced notification submissions. Establish criteria for retention of data for statistical or study purposes and/or for accurate reporting purposes, if required.

Ports should develop a data management system that is "fit for use" and includes procedures that can handle:

- Waste notification by ships
- Recording waste levels delivered in port
- The production and storage of waste transfer notes
- The provision of receipts to the ship
- Evaluation and calculation of annual waste levels by ship type and waste stream
- The provision of statistical data, if necessary
- Consultation with port users
- Invoicing and fees management

6.8 Pre- and ongoing consultation

Throughout the process of designing a PRF, as well as other processes related to the operation and management of PRFs, port and terminal operators need to consult with their users to determine customer needs with respect to the provision of the PRF. This will help in determining the appropriate levels of service for each waste stream, actual and potential, and identify ways to improve service and reduce disruptions. Consultation with governing bodies is required to ensure compliance with local and national legislation is achieved and maintained. Evidence of regular and extensive consultation is necessary.

Procedures should include a description of how information will be made available to the public. All the information pertinent to the management of the PRF should be made available to the ships visiting the port and their ship's agents in an easily understood format. There are many ways this can be done including a dedicated internet site or specific brochures or notices to shipping (see 6.6.3).

6.9 Dissemination of information related to the PRF

Each port or terminal must consider the most effective way of disseminating information, as well as how irregular or new users of the port or terminal will be informed of the provisions of the PWMP. Making information publically available will assist shipping companies with voyage planning and in-transit waste management decisions.

Information to be made available to users of PRFs at the port or terminal includes:

- Brief reference to the fundamental importance of proper delivery of prescribed wastes
- The location of port reception facilities applicable to each berth, with a diagram or map
- A list of prescribed wastes normally dealt with
- A list of contact points, the operators and the services offered
- A description of procedures for delivery
- A description of the charges or fee schedule (6.6.3)
- Procedures for reporting alleged inadequacies of port reception facilities

NOTE Complaint procedures should focus on resolutions originating at the local level before elevation of the complaint is considered.[11)]

11) International Maritime Organization, 2007

6.10 Additional documentation

The following documents may be prepared by the port and included in the PWMP:

- A health and safety risk assessment for the storage, movement, collection and scheduled removal of waste in the port
- Consideration of environmental impacts of the PRF activities, consistent with local and national legislation
- An emergency response system for spills of waste, especially hazardous waste and oily waste
- Provision of facilities outside of normal working hours, especially those that are supplied on a ship by ship basis
- The administrative system needed for the management of the PRF – such documentation may include but not limited to:
  - The entity that will provide administrative or operational oversight of the PRF whether in-house or through a contractor;
  - Detailed responsibilities for the day to day PRF management;
  - Flow charts, action lists for each member of staff or contractor involved in managing the PRF;
  - Procedures for training personnel, ensuring that all relevant port staff are trained, informed, and have the necessary competencies on all procedures concerning waste reception facilities;
  - Records of education, training, qualifications, etc. of workers;
  - Procedures for tendering, awarding and monitoring contracts with local waste handlers, recovery companies and disposal companies;
  - Procedures for the audit and pre-contract assessment of licensed waste contractors to ensure that licensed waste handling, recovery and disposal facilities are used. Special consideration should be given to how the waste is disposed of and ports should ensure waste is being disposed of appropriately to national, regional and local requirements;
  - The development of contracts that are based on the average port waste stream calculated in 5.5 ensuring that there are clauses to ensure the contractors can vary their service to account for PRF provisioning during peak and off-peak periods and non-normal working hours. Ports should also include an emergency clause to provide contingencies for large amounts of waste that may arise;
  - For systems using the direct interaction between ships and contractors, a list of port and nationally approved contractors should be developed by the port, included in the PWMP and circulated to all ship agents operating in the port; and
  - An assessment of how the PWMP relates to the company's ISO 9001 and/or 14001 accreditation, if appropriate.

NOTE Ships tend to report on volume, while disposal may be based on weight. An example of conversion factors between volume and weight can be found in Annex B.

7 Publication and implementation

When developing the PWMP, the port should undertake extensive consultation with its stakeholders. Any consultation should include the operational information that the port intends to circulate to port users.

Once consultation has identified and overcome any practical problems, the PWMP should then be submitted to the competent authority for approval. Once approved, the PWMP should be published along with any information that the port intends to provide to port users.

7.1 Implementation

The PWMP should then be implemented. This can be outsourced or kept in-house, but either way, during the implementation phase the following issues should be regularly raised and assessed:

1) Do the facilities meet the requirements of the plan?

2) Are performance standards being met?

3) What is being done to address any identified shortcomings?

The port should also set up a system where individual problems encountered by ships with respect to the inadequacies of the PRF can be reported and overcome, and where under and over capacity in the PWMP can be rectified in the short-term.

7.2 PWMP review

The plan must be kept up to date, especially with respect to services provided and point of contact information. The measures could involve procedures to update significant details without delay, regular reviews and review after significant changes in the operation of the port or in its PRF system. There should be processes in place to:

a) Conduct a review and update of the PWMP based on data collected relevant to waste types, quantities, and frequency of use;

b) Capture and implement best management practices and lessons learned resulting from reports of alleged inadequacies; and

c) Implement corrective actions based on a finding of inadequacy.

NOTE Local or national governing bodies may require a PWMP be submitted for review and approval on a schedule deemed appropriate for their purposes.

7.3 Periodic auditing

The Port should also develop a periodic auditing system for review at regular intervals in line with national legislation or guidance, which should include an assessment of adequacy of the designed facilities based on the ongoing collection of data related to their use or the amount of waste landed. Audits may be conducted internally, by national authorities, or by third-party auditors. This should also include an audit of operations based on the plan from the perspective of the:

— User;

— Port or terminal;

— Waste contractor;

— Waste disposal company; and

— Other stakeholders

The results should then be used to refine any PRF and the fee charged for their use. This process should include ongoing consultation with port users and waste contractors.

7.3.1 Conducting the audit

The methodologies contained within ISO 14001 may be used as the basis for conducting the port-related aspects of the audit.

Annex A
(normative)

Examples of waste streams originating from ships

Table A.1 — Listing of waste streams and treatment options

Waste type	Recommended segregation (where possible)	Recommended PRF (where possible)	Final recommended waste management option (where possible)
Paper and paper products	Should be segregated from the general waste stream	Specific and separate waterproof PRF	Recovery by recycling
Glass	Should be segregated from the general waste stream	Specific and separate PRF	Recovery by recycling
Metals	Should be segregated from the general waste stream	Specific and separate PRF	Recovery by recycling
Plastics	Should be separated from the general waste stream into their different types	Specific and separate PRF	Recovery by recycling
Dirty rags	Should be segregated from the general waste stream	Specific and separate PRF	Treated with the waste stream of its most hazardous component e.g. oil, food residues, etc.
Mixed domestic waste	Should be segregated from the general waste stream	Specific and separate PRF	Treated with the waste stream of its most hazardous component
Food waste	Should be segregated or kept separate from the general waste stream	Specific and separate PRF	Recovery by composting (see quarantine waste)
Quarantine waste	Should be kept separate from the general waste stream	Specific, secure and leak proof PRF	Due to public health requirements in specific countries, food waste, galley waste, or other organic waste may have to be treated as hazardous. The PWMP developer should contact the relevant authorities to determine if this is the case.
Dunnage	Should be kept separate from the general waste stream	Specific and separate PRF unless treated as quarantine waste	Recovery by recycling, reuse or used as energy source

Table A.1 *(continued)*

Waste type	Recommended segregation (where possible)	Recommended PRF (where possible)	Final recommended waste management option (where possible)
Hazardous waste including but not limited to: medical wastes (may be national requirements); Noxious liquids; Batteries; Aerosol/gas cans; Paint; Time expired pyrotechnics; Fluorescent and other light bulbs; Incinerator ashes from burning plastics	All hazardous waste should be kept separate or segregated from the general waste stream	Specific, separate, bunded, labelled and secure PRF. It is important to ensure that the appropriate colour coding is used to avoid mixing wastes which may react together	Recovery by recycling, reuse, or treatment as appropriate, or disposed of accordingly through incineration or at appropriate landfill sites
Sewage NOTE Hazardous waste may also be generated in the event of breakage and subsequent spillage of Annex III packaged cargos.	Should be kept separate from the general waste stream. Should only be expected when a ship cannot apply MARPOL Annex IV rules or has a problem with their MSD unit(s)	The waste should be safely transported to an appropriate sewage treatment facility. If it proposed that the sewage is to be put directly into the local sewage treatment system in the port, then prior agreement with the appropriate authorities is needed.	Tertiary treatment at an appropriate sewage treatment facility
Grey water	Should be kept separate from the general waste stream. Very rarely landed in a port.	The waste should be safely transported to an appropriate sewage treatment facility. If it proposed that the sewage is to be put directly into the local sewage treatment system in the port, then prior agreement with the appropriate authorities is needed.	Tertiary treatment at an appropriate sewage treatment facility
Fish, animal or livestock wastes	Should be kept separate from the general waste stream. Should only be landed when a ship cannot apply MARPOL Annex V rules.	Specific, separate, secure and leak proof PRF. See quarantine wastes	Disposed of properly under national regulations. If there are no national regulations, then these wastes should be disposed of in such a way that the waste cannot contaminate drinking water, pass on diseases to livestock or enter the food chain.``
Fishing nets and other equipment	Should be segregated according to the material they are made of. Predominantly needed in fishing ports.	Specific and separate PRF	Recovery by recycling

Table A.1 *(continued)*

Waste type	Recommended segregation (where possible)	Recommended PRF (where possible)	Final recommended waste management option (where possible)
Cargo residues	Kept separate from the general waste stream. Should be landed according to the rules in MARPOL Annex I, II and V.	Specific PRF provided during loading and/or unloading	Cargo residues should be minimised during the loading and unloading of ships and the PWMP developer should, in conjunction with the port or terminal and the ship's master, develop procedures to minimize such waste. The recovery or disposal of these wastes would depend on the category of waste they belong to.
Cargo washings	Kept separate from the general waste stream. Should be landed according to the rules in MARPOL Annex I, II and V.	Specific PRF provided during unloading	Cargo washings should be minimised during the loading and unloading of ships and the PWMP developer should, in conjunction with the port or terminal and the ship's master, develop procedures to minimize such waste. The recovery or disposal of these wastes would depend on the category of waste they belong to.
Waste oil	Kept separate from the general waste stream. Should be landed according to the rules in MARPOL Annex I.	Specific and separate PRF	Recovery by recycling or reuse or disposal (incineration)
Oily mixtures including fuel residues and contaminated bunker oil	Kept separate from the general waste stream. Should be landed according to the rules in MARPOL Annex I.	Specific and separate PRF	Recovery by recycling or reuse
Oily mixtures containing chemicals	Kept separate from the general waste stream. Should be landed according to the rules in MARPOL Annex I. The ship's master should be asked to document what chemicals are in this waste.	Specific and separate PRF	Recovery by recycling or reuse or treatment
Waste from air pollution emissions reduction equipment	Kept separate from the general waste stream. Should be landed according to MARPOL Annex VI. The PRF operator should liaise with the ship's master to ascertain the nature of the waste stream.	Specific and separate PRF	Recovery by recycling, reuse or treatment or appropriate disposal
Waste from the removal or replacement of equipment onboard ship	Kept separate from the general waste stream	Specific and separate PRF	Recovery by recycling, reuse or reclamation

Table A.1 *(continued)*

Waste type	Recommended segregation (where possible)	Recommended PRF (where possible)	Final recommended waste management option (where possible)
CFC's and refrigerant gases	Kept separate from the general waste stream	Specialised PRF needed on a case by case basis. Waste should not be stored in port. Specialised handlers of this material will be required to ensure none of the gas leaks during recovery and transport and to ensure the gas is disposed of properly	Recovery by recycling, reuse or reclamation
Incinerator ashes	Kept separate from the general waste stream	Specific and separate PRF	Recovery by recycling, reuse or treatment
Occasional wastes: Ballast tank sediments; Hull biofouling; Antifouling paint residues; Sludges from ship waste water treatment plants.	Kept separate from the general waste stream	Specific and separate PRF	Should be treated as hazardous wastes (see above)

Annex B
(normative)

Waste conversion factors

Unit of measurement	Nature of waste	Factor to convert units to weight in tonnes
Cubic metres in skip	Office waste	0,10
	Laboratory waste	0,10
	Metals (mixed)	0,22
	Plastics (mixed)	0,22
	Oils (sludges and oil/water mixes)	0,51
	Paints	0,35
	Tyres	0,54
	Paper and cardboard	0,21
	Sub-soils	1,28
	Concrete and mortar	1,11
	Plasterboard	0,31
	Construction/demolition waste	0,55
	Wood	0,21
	Electronic equipment	0,21
	Cable and wire	0,10
	Rubber	0,32
	Glass	0,35
	Waste food (animal or mixed)	0,16
	Vegetable food	0,15
	Animals (whole or part)	0,86
	Animal fats, oils, waxes, etc.	0,39
	Screenings	0,50
	Grit/screenings	0,50
	Grit	0,65
	Water treatment sludge 30 % moisture	1,10
1 000 gallons	Water treatment sludge 30 % moisture	4,50
1 000 litres	Water treatment sludge 30 % moisture	1,0
Note 1 Data supplied by the Environment Agency, Anglian Water and Biffa from http://www.doeni.gov.uk/niea/waste_report_guidelines_pp.pdf		

Bibliography

[1] International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL) Annex I to VI, as amended

[2] International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended

[3] International Maritime Organization (IMO), http://www.imo.org/OurWork/Environment/PollutionPrevention/PortReceptionFacilities/Documents/469-Rev-1.pdf, July 2007

[4] International Maritime Organization (IMO), Comprehensive Manual on Port Reception Facilities, 1999

[5] International Maritime Organization (IMO), Guidelines for Ensuring the Adequacy of Port Reception Facilities, 2000

[6] International Maritime Organization (IMO), IMO MEPC.1/Circ.671 – Guide to good practice for port reception facility providers and users http://www.imo.org/ourwork/environment/pollutionprevention/portreceptionfacilities/documents/671.pdf

[7] ISO 21070:2011, *Ships and marine technology — Marine environment protection — Management and handling of shipboard garbage*

ICS 13.020.99
Price based on 23 pages

This page deliberately left blank

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.

...making excellence a habit.™