

Chapter 12

CARRIAGE AND STORAGE OF HAZARDOUS MATERIALS

This Chapter provides guidance on the carriage and storage of hazardous materials carried on board tankers as ship's stores, cargo samples or material stowed on deck.

ISGINTT does not attempt to give guidance on the many hazardous chemical cargoes that may be shipped from time to time.

General guidance on the properties of such materials may be obtained from (inter)national technical publications, which may also include recommendations on handling and storage. Material Safety Data Sheets (MSDS) on specific chemicals should be obtained from the shipper. Specific information may also be displayed on the packaging of the materials.

12.1 Liquefied Gases

In addition to the general precautions for handling packaged petroleum and other flammable liquids given in Section 12.5 below, the following safeguards should be observed when handling packaged liquefied gas cargoes:

- Pressurised receptacles should be suitably protected against physical damage from other cargo, stores or equipment.
- Pressurised receptacles should not be over-stowed with other heavy goods or other items.
- Pressurised receptacles should be stowed in such a position that the safety relief device is in contact with the vapour space within the receptacle.
- Valves should be protected against any form of physical damage with a suitable protection cap in place at all times when the cylinder is not in use.
- Cylinders stowed below deck should be in compartments or holds capable of being ventilated and away from accommodation and working areas and all sources of heat.
- Oxygen cylinders should be stowed separately from flammable gas cylinders.
- Temperatures should be kept down and hold temperatures should not be permitted to rise above 50°C. Hold temperatures should be checked constantly and, if they approach this level, the storage locations should be ventilated.

12.2 Tanker's Stores

12.2.1 General

Any chemical or hazardous material placed on board a tanker as stores should be accompanied by a Material Safety Data Sheet (MSDS). Where an MSDS is not provided for an item taken into tanker's stores, the item should be isolated and stored in accordance with guidance provided on its container or packaging. It should not be put into use until satisfactory user information is provided.

Containers and packages should be stowed closed and the storage location kept clean and tidy.

12.2.2 Paint

Paint, paint thinners and associated cleaners and hardeners should be stowed in storage locations according to applicable legislation.

12.2.3 Chemicals

All chemicals should be stowed in a designated and dedicated storage location. Care should be taken to ensure that incompatible chemicals are stowed separately. Information on handling, first aid and the fire-fighting medium for each chemical should be readily available from the product's MSDS.

12.2.4 Cleaning Liquids

It is preferable to use cleaning liquids that are non-toxic and non-flammable. If flammable liquids are used, they should have a high flashpoint. Highly volatile liquids, such as gasoline or naphtha, should never be used in engine and boiler rooms.

Flammable cleaning liquids should be kept in closed, unbreakable, correctly labelled containers and should be stored in a suitable compartment when not in use.

Cleaning liquids should only be used in places where ventilation is adequate, taking into consideration the volatility of the liquids being used. All such liquids should be stowed and used in compliance with the manufacturer's instructions.

Direct skin contact with, or the contamination of clothing by, cleaning liquids should be avoided.

12.2.5 Spare Gear Storage

Spare gear is not inherently hazardous. There have, however, been cases where large items of spare gear stowed on deck have broken free of their lashings with consequent damage to the vessel and risk of injury to personnel. When stowing spare gear, the following should be borne in mind:

- It should allow safe access to, and operation of, any safety equipment.
- It should not interfere with mooring or other operations.
- It should be properly lashed, taking into account expected weather on the voyage.

12.3 Cargo and Bunker Samples

Whenever samples are kept on board they should be stowed securely in lockers that have access external to the accommodation. Receptacles shall meet the applicable packing requirements and should be placed on board, at a specific point in the cargo area, such that under normal conditions of carriage they cannot break or be punctured and their contents cannot spill. Fragile receptacles shall be suitably protected.

The number of samples retained on board should be carefully managed and, when no longer required, they should be disposed of appropriately. The Company should have a policy that addresses the disposal of samples; the aim should be to minimise the period of retention after the relevant cargo has been discharged. Unless the Company advises to the contrary, it is suggested that samples are retained for a period of three months after the cargo has been discharged.

12.4 Other Materials

12.4.1 Sawdust, Oil Absorbent Granules and Pads

The use of sawdust for cleaning up small oil spills on board is discouraged. If sawdust is carried on board, care should be taken to ensure that, while unused, it is stowed in a dry condition and, if possible, in a cool location. Moist sawdust is susceptible to spontaneous combustion (see Section 4.9).

When sawdust has been used to clean up a minor oil spill, the contaminated sawdust should be stowed separately, in a sealed container and in a safe location, clear of the accommodation and hazardous areas.

Any oil-impregnated absorbent granules or pads should be stowed in dedicated containers on board, clear of the accommodation and hazardous areas.

Oil-impregnated sawdust and absorbent granules should be disposed of ashore as early as possible.

12.4.2 Garbage

The storage locations for garbage should be carefully selected to ensure that the garbage presents no potential hazard to adjacent spaces.

Particular consideration should be given to the storage of garbage that is designated as 'special waste', such as batteries, sensors and fluorescent tubes, to ensure that only compatible materials are stowed together.

12.5 Packaged Cargoes

12.5.1 Petroleum and Other Flammable Liquids

Packaged petroleum cargoes are usually shipped in steel drums of approximately 200 litres capacity. Products transported in this manner include gasoline, kerosene, gas oils and lubricating oil.

In addition to the general safety precautions for handling bulk petroleum, the following procedures should be observed when handling packaged petroleum products.

12.5.1.1 Loading and Discharging

Packaged petroleum and other flammable liquids should not be handled during the loading of volatile products in bulk, except with the express permission of both the Responsible Person and the Terminal Representative. When handling steel drums, the loading of bulk cargo should be suspended owing to the increased risk of spark generation.

12.5.1.2 Precautions During Handling

A Responsible Person should supervise the handling of packaged petroleum and other flammable liquids. The following precautions should be taken:

- Stevedores must comply with smoking restrictions and other safety regulations.
- When permanent hatch protection is not fitted, temporary protection should be provided to avoid the risk of sparks being caused by hoists striking the hatch coamings, hatch sides or hold ladders.
- All hoists should be of a size suitable for passing through hatches with ample clearance.
- Fibre rope slings, cargo nets, or drum hooks on wire rope or chain slings, should be used for handling loose drums.
- Goods should preferably be palletted and secured. Pallets should be lifted with pallet lifting gear with safety nets. If goods are not presented on pallets, cargo trays or fibre rope slings may be used. The use of cargo nets for packaged goods is generally to be discouraged as they are liable to cause damage to the packaging.
- Loose gas cylinders should be handled with cargo nets of a sufficiently small mesh to prevent them falling through the net. Cylinders should never be handled by the valve or protection cap. Cylinders should never be lifted on board using lifting magnets, chains, slings or strops. A cylinder trolley or other appropriate device should be used when moving cylinders, even for short distances.
- Each package should be inspected for leakage or damage before being stowed, and any found defective to an extent likely to impair safety should be rejected.
- Packages should be placed on dunnage on the deck or in the hold.
- Packages should not be dragged across the deck or hold and should not be allowed to slide or roll free.
- Cans and drums should be stowed with caps and end plugs uppermost.
- When securing the cargo, each tier should be separated by dunnage. The height to which cargo can be safely stowed should be related to the nature, size and strength of the packages. Advice should be obtained from the terminal or shipper, as appropriate.
- Sufficient suitable dunnage should be used to prevent possible damage during the voyage.
- The cargo should be properly secured to prevent any movement during the voyage.
- During darkness, adequate approved lighting should be provided over the side and in the hold.

- Empty receptacles, unless gas free, should be treated as filled receptacles.
- No materials susceptible to spontaneous combustion should be used as dunnage or stowed in the same compartment as the packages. Attention is drawn to the combustible nature of certain protective packaging, such as straw, wood shavings, bituminised paper, felts and polyurethane.
- On completion of loading or discharge and prior to closing hatches, the hold should be inspected to check that everything is in order.

12.5.2 N/A

12.5.3 Entry into Holds

Before entry into any hold which contains, or which has contained, packaged petroleum and/or other flammable liquids, all the precautions for entry into enclosed spaces should be taken (see Chapter 10).

Holds should be ventilated during all cargo handling operations. If handling operations are interrupted and hatches are closed, the atmosphere should be re-tested before resuming work.

12.5.4 Portable Electrical Equipment

The use of portable electrical equipment, other than approved air driven lamps, should be prohibited in holds or spaces containing packaged petroleum or other flammable liquids, or on deck or in spaces over or adjacent to such holds or spaces, unless the tanker complies with the conditions for the use of such equipment on tankers (see Section 4.3).

12.5.5 Smothering Type Fire Extinguishing Systems

When packaged petroleum or other flammable liquids are being handled, the control valves of any smothering system in the holds should be closed and precautions taken to prevent unauthorised or accidental opening of these valves. On completion of loading or discharge operations, and after hatches have been secured, any previously isolated fixed smothering system should be returned to operational readiness.

12.5.6 Fire-Fighting Precautions

In addition to the precautions outlined in Section 24.8, at least two dry chemical fire extinguishers, together with fire hoses equipped with spray nozzles, should be ready for use while cargo handling is taking place.

12.5.7 Forecastle Spaces

Packaged petroleum or other flammable liquids should not be carried in the forecastle spaces or any other space unless such spaces have been specifically designed and classified for the purpose.

12.5.8 Material Stowed on Deck

When drums or other receptacles are carried on deck, they should be given protection against the elements, and normally be stowed only one tier high.

All material should be stowed well clear of all deck fittings, including tank and valve controls, fire hydrants, safety equipment, steam pipes, deck lines, tank washing openings, tank vents, hatches, doorways, emergency exits and ladders. They should be provided with adequate dunnage and be properly secured to strong points on the tanker's structure.

12.5.9 N/A