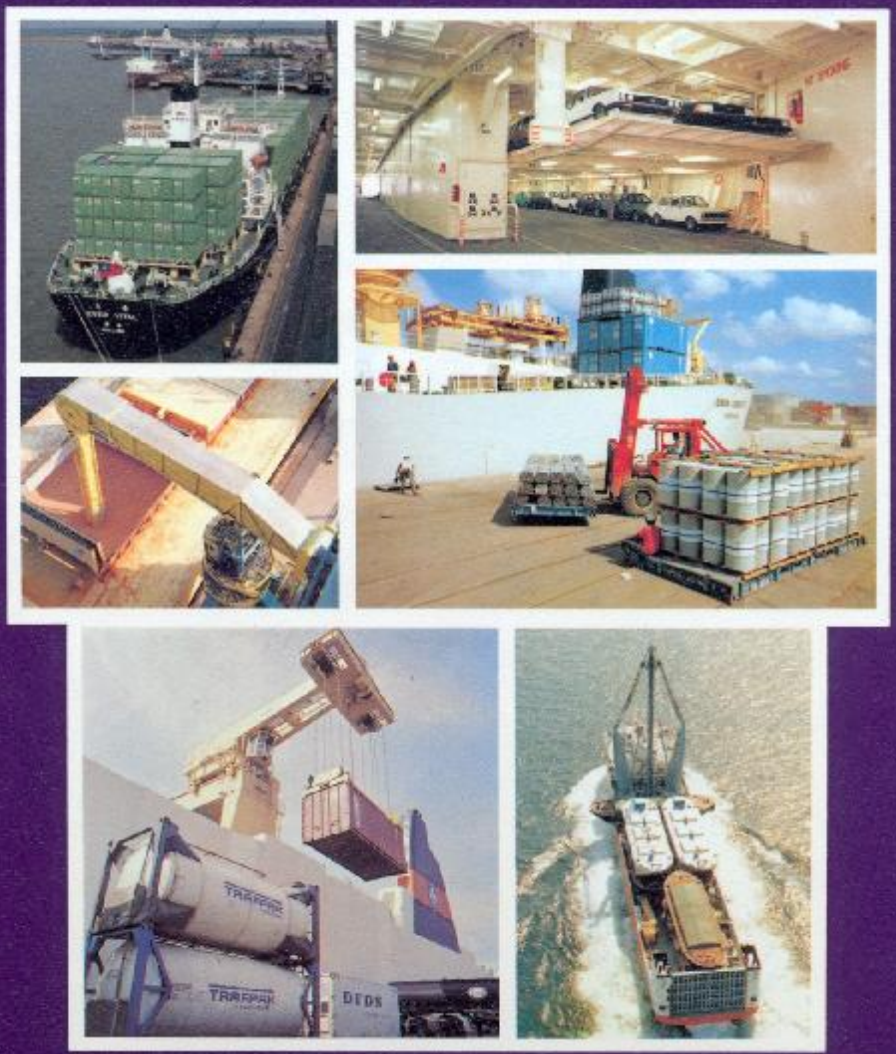
Thomas' Stowage

The properties and stowage of cargoes



FOURTH EDITION

Revised by Capt. K. S. RANKIN

Heavylift Ship laden with project cargo (*Photo: JumboShip*).

RoRo Container Ships (Photo: Linea Ignazio Messina, Genoa).

Woodpulp and Newsprint awaiting loading (Photo: Fourth Floors PLC).

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
FLAX SEED		1.39/1.50 1.59/1.67	Bulk Bags

The seed of the flax plant, more generally known as linseed, from which linseed oil is obtained, the seed residue being utilised for cattle feed, i.e. linseed cake.

FLAX SEED OIL

See Linseed Oil, also Vegetable Oils, also Part 2, Oils and Fats.

FLOUR  1.39/1.59 Bags

Flour is prepared by grinding (milling) cereal grains. The commonest variety is made from wheat, but other forms of cereal flour may be shipped under this generic name. Flour is usually produced in the country of consumption, but quantities are still shipped by sea.

A delicate cargo, very liable to damage by tainting if stowed near to or in the same compartment as odorous goods, also readily damaged by moisture, so that flour should always be stowed apart from odorous, wet goods, or such as are liable to heat and throw off moisture, and should never be stowed with or on newly sawn timbers.

Large claims have had to be met for flour damage as the result of having been stowed over maize and other cargoes liable to heat and throw off moisture: such stowage should be avoided at all costs.

Flour is particularly susceptible to damage by turpentine and spirit fumes, and should not be received into a vessel carrying such, unless stowage can be so arranged that the turpentine, etc., is separated from the flour by the engine and boiler room spaces.

If required by the trade, bagged flour should be suitably dunnaged and kept from contact with bulkheads, pillars, etc. The use of hooks for handling bagged flour should not be permitted.

In some trades shipments of full cargoes of bagged flour are loaded by being dump stowed sometimes called random stow. Open hatch vessels are suitable for this method of stowing. Bags are lifted aboard on nets or in tubs and rolled out into the hold to find their own position. Some cubic is of course lost but there are considerable savings in loading costs and the loading operation is much faster than placing individual bags. Paper is used to protect the cargo from ships' sides, bare metal, etc., where necessary. The stowage factor for this form of stow using an open hatch ship would be 1.73/1.87 M3/tonne.

FLOWERS (FRESH) 

Carried on, or under deck for short sea passages. Can be carried for lengthier periods under refrigeration. Carrying temperature +5 degrees C (41 degrees F).

FLOWERS (PLASTIC) 

From Hong Kong and Far East. May be infused with artificial scent. Examine before stowing with taintable foodstuffs. Stow away from heated areas, protect from standing in direct sunlight (ISO containers).

FLUORINE  2.37/2.93 Cases

Obtained from fluorspar and used in the manufacture of glass. Compressed Gas.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
FLUORITE OR FLUORSPAR		0.92/0.98 0.33 0.55/0.71	Baskets or Mats, Blocks Bulk

One of the most beautiful of minerals formed of cubical crystals of a variety of colours, being a compound of calcium and fluorine. It is used to a large extent in the manufacture of glass and hydrofluoric acid is obtained from it. Shipped from Far East, etc., usually in bags or in solid blocks. Ordinary dry stowage — guarding against damage to other goods through siftage of fluorite, dust or powder from packaging. Maybe harmful if inhaled.

FLY ASH  1.26 Bulk

Light finely divided powder. Residual ash from coal-fired power stations. Used in commercial products. Angle of repose 40 degrees. See Calcined Pyrites. See IMDG Code. (See IMO Code of Safe Practice for Solid Bulk Cargoes).

FODDER See Feedstuff

FOGGRASS SEED  4.74 Sacks

See Grass Seeds.

FOODSTUFFS  Cases. Cartons.

Do not stow with odorous or objectionable cargoes, particularly skins, bones, hides or animal bristles on account of Anthrax risk. Chinese foodstuffs are usually in frail packages, which are easily damaged. May be infested. See also Chinese Groceries.

FORMALDEHYDE  1.53/1.67
3.07/3.34 Liquid
Cases, Powder

A strong disinfectant, shipped both in the liquid and powder form.

In the powder form, ordinary dry stowage away from delicate foodstuffs.

Any leakage of the liquid releases strong pungent fumes by which men are apt to be overcome or be made sick, for which reason it should be stowed near the ventilators in spaces well removed from crew quarters, where good air circulation is assured. *ISO containers* — liquid should never be stowed in insulated or refrigerated containers. Doors should be opened with care prior to unpacking, and a few minutes allowed for any fumes to disperse before entering the container.

FORMIC ACID 

Pungent and corrosive. Stow away from foodstuffs. Check ISO container carefully after use for any damage to fabric or structure. See IMDG Code.

FOSSIL WAX 1.81/1.90 Drums

An inflammable substance of a wax-like nature (Cerasine) used in textile trades. See Part 2, Petroleum.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
FRESH WATER		See Appendix 4, Fluids Weights and Capacities	
FRANKINCENSE		1.67/1.81	Drums

A resinous juice obtained from certain trees which, when burnt, emits a strongly fragrant smell. A valuable cargo, should be carefully tallied and watched. Stow in a special cargo locker or strong room.

FROZEN MEAT		See Part 2, Refrigerated Cargoes Also under individual categories	
FRUIT, DRIED		1.95/2.09 1.42	Cases Cartons

Clean, dry stowage, away from any odorous cargoes such as sheepskins, hides, casings, etc., as the fruit is susceptible to taint.

Stow away from flour, as the flour will become tainted. Avoid extremes of temperature. Adequate ventilation at all times. Under warm conditions liable to develop grub.

FRUIT, GREEN 

Fresh fruit respirate. This process absorbs oxygen and emits carbon dioxide and other trace elements back into the atmosphere. This process produces heat which, if unchecked, will eventually cause the fruit to decompose and rot. It is therefore essential, if a long passage or shelf-life is contemplated, that the heating process is minimised or arrested. This is done normally through refrigeration. Shippers loading and carrying instructions should be strictly observed, with particular regard to temperature. If the fruit is not received precooled, it should be brought down to carrying temperature as soon as practical. Check pulp temperature prior to loading.

For relatively short voyages, through temperate latitudes, green fruits, if picked at the right time, carry, with natural ventilation, without undue loss. Apples from N. America, oranges, lemons, grapes and peaches from the Mediterranean and N. Atlantic Islands form the bulk of fruit carried under such conditions. Even tropical inter-island voyages are acceptable if transport time is of only a few days duration.

Thorough and uninterrupted ventilation is indispensable; inattention to or defective ventilation, even for a few hours, may spoil the entire cargo. See Part 2, Ventilation.

When a mechanical system of ventilation is not provided, it is both necessary and customary to form large vertical air shafts by means of boards and cases, extending from the hatchways and from the underside of ventilators to the bottom of compartments, where they connect with gutters or air passages, formed of cases, leading to the sides. These, in turn, connect with similar air passages leading fore and aft through the cargo — all being designed to ensure the best possible circulation of air through the mass of the cargo, by which means only can it be kept cool and the heated air and gases, which the fruit throws off discharged, this being necessary in order to retard the natural process of ripening.

In some trades it is customary to arrange side and fore and aft air passages at more than one level.

Further, to assist in the ventilation, the cases of fruit are loosely, and not compactly stowed — air spaces of 200 mm to 250 mm clear being left at and across the bulkheads, the stowage stopped 200 mm or 250 mm short of deck beams and laths laid athwart between the tiers. Owing to the difficulty of adequately ventilating deep lower holds, it is seldom that such are utilised for more than a limited quantity of green fruit.

Fruit compartments, bilges, etc., should be thoroughly cleaned and sweetened and 'tween deck scuppers cleared.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

Green fruit should not be stowed with or over any cargo that is odorous, moist or liable to heat, as it is liable to receive damage from such; while, on the other hand, edible and delicate goods such as tea, coffee, eggs, vermicelli, macaroni, dried fish, flour, etc., are readily damaged, if stowed with or near green fruit.

Mechanical means of ventilating fruit cargoes are now generally fitted, especially in large vessels carrying large consignments of apples, etc. This, usually, consists of extractor fans, fitted to each compartment, by which means the heated air and gases that ascend to the upper part of the compartment are withdrawn and expelled. Better results are obtained when controlled humidity air is forced by fans through specially constructed air trunks to and through the bottom tiers of cargo, thus circulating cool air through the mass of the stowage and not through or over the uppermost tiers.

The ventilating system for Refrigerated Fruit Cargoes is referred to in Part 2, Refrigeration, which see.

The hatch covers should be kept off whenever weather conditions permit. Sometimes booby hatches are fitted over hatch coamings so that the latches can remain uncovered and, at the same time, ensure that rain or spray does not wet the cargo.

Decomposed fruit throws off poisonous fumes and a number of fatal accidents have resulted owing to men having entered ill-ventilated compartments or recesses containing, or which recently had contained, decomposed fruit.

ISO containers — except in very limited circumstances involving hardy products and short voyage times closed box general purpose containers should never be used. If circumstances prevail where this type of container has to be used, then limited ventilation may be introduced by lashing the doors open, stowing the cargo with pallets or dunnage on the floors and lining the sides. CO_2 (given off by the fruit), being heavier than air, may then be induced to "pour" out of the doors. Special attention is, of course, needed to the securing of the cargo face in way of the open doors.

Open sided containers with tilts lifted (dropped if exposed to rain) are better. Reefer/insulated containers or containers with forced air ventilation facilities are best. Open top containers may also be used, but more attention will be required to covering up when exposed to rain, and dunnaging as suggested above for general purpose closed box containers.

N.B. It is doubtful if closed box containers with small ventilation grilles in each side can be properly effective with this type of cargo.

The stowage factors of green fruit vary considerably as for different ports and countries. As a result of difference in style and size of packages, method of packing, the degree of compactness of stowage, number and sizes of air shafts, etc.

FUEL OILS  See Part 2, Petroleum.

FUEL, PATENT  0.92/1.00

A mixture of small coal, tar and various other combustible materials made up into brick shape or brickets.

It is a very dusty and strong smelling cargo.

Stow away from foodstuffs and delicate goods and protect adjacent cargo from the dust which is always present where this commodity is stowed and handled. Trays, tubs or like means should be used for loading and discharging patent fuel. See IMDG Code.

FULLER'S EARTH  1.11 Bags

A clay-like substance used in the preparation of cosmetics and in the clothing trade, etc. Reject all torn or rotten bags. Dry stowage, remote from timber and goods, liable to be defaced or stained by the earth leaking from the bags.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
FURNITURE		1.1/2.2	Packages

Usually in fairly large packages. Stowage similar to case cars, etc. Containing personal property as they do, especial care is needed to ensure good outturn. Delay in delivery can cause considerable inconvenience.

ISO containers — vibration of container over roads may cause abrasion and chaffe. Use adequate packing materials and tight stowage to guard against this.

May require in container fumigation prior to shipping to certain ports. Check current destination government requirements.

FURS		2.79/4.18	Tin Lined Cases Boxes or Bales

A large variety of furs are shipped from Russia, Far East, Canada, etc., a number of which constitute very valuable cargo, the following being amongst the higher priced furs:—

Badger
Bear
Chinchilla
Ermine
Fox
Marten
Mink
Muskrat or Musquash
Mutria or Coypu Rat
Otter
Polecat
Racoon
Sable
Seal
Skunk
Squirrel
Weasel

and are shipped in tin-lined cases, boxes (sometimes containing a disinfectant powder) or are made up into well protected bales. Bales may be canvas wrapped 1 or 2 layers. Furs packed in pairs, fur side to fur side, then folded. Naptha crystals sprinkled between skins.

Fur slip destroys commercial value and bald patches most likely to occur along the fold. Preparation — scraping, drying, curing — influences safe carriage.

Fur packages should be carefully tallied, marks checked, any packages showing signs of having been tampered with rejected, and should be stowed in strong room or special cargo locker, which is free of rats and rat-proof.

Amongst the cheaper kinds of furs are the rabbit, hare, cat and the skins of certain types of dogs, which usually are made up into bales.

All furs should be stowed in a well ventilated compartment, which contains no moist or wet goods or any that are susceptible to damage by odours from the skins.

In many cases a Sanitary Certificate from country of origin suitably endorsed by the appropriate Consular Officer is necessary.

Pelts may be carried wet, chemically treated or pickled. Wet blue hides have little smell, but give off moisture. Unlikely to deteriorate in transit. See also Hides.

See Skins for the coarser grades.

High quality furs are also carried under refrigeration, to preserve their condition. Carrying temperature 2 degrees C to 5 degrees C (35–40 degrees F).

FUSTIAN

A coarse twilled cotton fabric, including moleskin, corduroy and velveteen.

FUSTIC	1.95/2.51	Bulk

The wood of the species of West Indian mulberry tree, which yields yellow, green, brown and olive dyes. Usually shipped in lengths of from 1.22 m to 1.52 m, mostly very crooked, as a result of which

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

its stowage factor varies very considerably, as shown, and for that reason it is not very suitable for dunnaging purposes, though at times it is used for such purpose with dry cargoes, but it is very useful for broken stowage.

GALANGAL  2.65 Well Packed Bales
4.18 Loose Packing

The aromatic roots of an Asiatic plant, which has a hot spicy taste not unlike ginger. Ordinary dry stowage.

GALBAN OR GALBANUM

A gum used for medicinal purposes also in the manufacture of varnish. See Gums.

GALENA  0.45 Bags
(Lead Ore) 0.36/0.39 Bulk
(Lead Sulphite) 1.95 Baskets

Ore shipped in bulk from Spain and elsewhere. When very soft, Galena can oxidise and give off toxic Sulphur Dioxide Gas. May liquefy if shipped wet. See Part 2, Ores. (See Code of Safe Practice for Solid Bulk Cargoes).

GALLNUT EXTRACT  1.11/1.25 Tin Lined Cases
1.20/1.34 Cases of Powder

Stow in a cool place.

GALLS OR GALLNUTS  2.17/2.23 Cases
2.23/2.37 Bags

A hard excrescence deposited by insects on the leaves and twigs of various plants growing in Far East, etc., from which gallic and tannic acids are obtained. Dry cargo, but one that is liable to heat, which property should be considered when arranging the stowage, which should be in a cool, well ventilated space.

GALVANISED IRON  0.67/0.78 Packages
0.84 Coils

Sheet iron coated with zinc deposit, the bulk of which is corrugated, though plain flat sheets are not uncommon. Is made up into unprotected packages held together by iron bands or clips or in crates, which, not infrequently, are of a construction that necessitates very careful handling to avoid their collapse and/or damage to the sheets. Claims in respect of this cargo are usually due to the buckling or rusting of sheets and re-cooperage. To guard against the former, the use of chain slings on packages that lack stout protection must be prohibited; stow on the flat wherever possible on a firm flat surface, with ends free.

If overstowing sheet iron, protect by overlaying with stout boards. To avoid rust claims, dunnage well (with boards), if stowing on ground floor; do not receive goods in wet condition, a condition frequently experienced when loading direct from railways trucks; stow in a position remote from moist goods as well as from sulphates, salt and other bagged chemicals; do not overstow with acid or wet goods and avoid chafing and scratching exposed sheets by dragging other cargo over them, as the protective zinc coating is thereby damaged and rust quickly forms.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

Galvanised goods should not be stowed in the same compartment as fertilisers. Fertilisers coming into contact with galvanised goods will cause corrosion of the protective zinc coating. If stowage of the two commodities has to be effected, adequate separations must be provided. See also Part 2, Steel.

ISO containers — the size of sheet — and resultant crate — may make the package awkward and uneconomical to load into a closed box container. Open-sided containers and flat racks often allow a greater number of crates to be carried, with side access suitable for fork-lift truck operations. Appropriate weather protection (tarpaulin or plastic sheets) must be provided for flat rack stowage. Particular care must be exercised in securing, particularly in the absence of side wall restraint. Lashing equipment must be set up tight in way of bearers or skids to avoid loosening when cargo flexes and vibrates. Non-stretch material (e.g. wire or metal strapping) should be used. Where appropriate and possible, timber shoring to be used, with wire nails to secure battens, etc., on the floor.

See also Part 2, Neobulk.

GAMBIER  2.65/2.79 Bales
3.07 Cases
3.34 Baskets

An astringent substance extracted from the leaves of certain East Indian shrubs, used for tanning and dyeing purposes.

It is one of the most objectionable cargoes of the Far East and should not be stowed over anything except coal, nor against any commodity except jetalong. The drainage from gambier (a thick viscous fluid) is great in hot weather, which, when cold weather is experienced, sets very hard, rendering it exceedingly difficult to detach the packages from deck, bulkheads, stringers, etc., and, unless a liberal supply of sawdust is introduced between tiers, the packages become almost a solid mass.

The greatest care should be exercised to keep gambier drainage from fouling bilge suction pipes, strum boxes, 'tween deck scuppers pipes, etc., as, if the fluid gets into such, it will necessitate the whole pipe line being disconnected and, in all probability, the removal of such, as that will be cheaper than clearing them.

If possible, stow in bridge, poop or shelter deck space; if in the latter, airtight bulkheads, the lower part of same to be made watertight, should be erected to protect other cargo from damage by the heated moisture and odours emitted by or drainage from gambier.

Stow on 50 mm or more of sawdust and cover each layer with sawdust to the depth of 25 mm or more, also at ships' side if sparring is not fitted.

Gambier generates humid heat, so that every care is necessary to protect delicate cargo in the vicinity from the effect of the fumes emitted. Ample ventilation of compartments containing gambier should be provided for this purpose, which should include the removal of hatch covers whenever conditions permit.

Dry or delicate cargo should not be stowed in the same compartment or in one that is connected by ventilators to that in which gambier is stowed.

If overstowing with other coarse and suitable cargo, the gambier should be boarded over and well matted to prevent the top cargo sinking into the gambier. Cutch, being of the same nature as gambier, is suitable for overstowing, if the need arises, but, if possible, overstowing should be avoided.

GAMBOGE  1.84/1.95 Cases

A gum resin obtained from trees growing wild on the coasts of Far East, Malabar, Sri Lanka, etc., from which a yellow water colour pigment is obtained. It is a strong poison with a bitter taste. Stow in a cool place away from foodstuffs. See IMDG Code.

GANGA

Used in lieu of tobacco and as a narcotic. A product of the hemp plant. Special stowage, very liable to pillage.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
GAPLEK		1.53/1.67 2.37 2.09/2.23 1.95	Bags Chips Roots Roots Bulk

See Tapioca.

GARLIC  2.65 Bags

The bulbous root of a plant, not unlike the onion; has a highly pungent taste and very strong smell. Perishable cargo, stow same as onions. May be carried under refrigeration. Suggested temperature 0 degrees C. Full air freshening to reduce build up of CO_2 and other gases. Observe shippers loading and carrying instructions.

ISO containers — not suitable for closed box containers, except for short journeys when doors are best left open to assist ventilation. May carry somewhat better in open-sided containers, tilts rolled up and dunnage (or pallets) on the floor to improve ventilation. Care must be exercised in the Terminal and on board to ensure adequate weather protection, e.g. tilts rolled down if exposed to rain.

See also Fruit — Green.

GARMENTS, HANGING var. Unpacked

In closed box ISO containers on specially constructed racks that have to be dismantled and returned complete to shippers. Garments may be polythene-wrapped and partially exhausted of air at time of stuffing into the container, to reduce moisture content and increase number of garments in the limited space. Very important that they are not unpacked for inspection purposes except by expert personnel, since there is little hope of replacing all the garments temporarily removed. May have desiccants in the container to absorb migrating moisture.

GARNET ORE  0.50/0.56 Bags

Also known as Garent, Rubble Ore, a dry dusty cargo. See Ores.

GASES  See Compressed Gases

GASOLINE  1.39/1.45 Cases, Drums, Bulk

A highly inflammable spirit with low flash point. See Part 2, Petroleum Cargoes. Shipped in 5 gallon cans, two in a case, also in drums of varying capacity and in bulk. See Case Oil for Stowage. See IMDG Code.

GAUGAO  Bags and Cartons

Starch used in the preparation of clothing materials. Keep dry.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
GELATINE		1.67/1.95 1.53/1.81	Cases Bags

An animal product obtained from the bones and resembles jelly. May also be shipped as powder or sheet. Susceptible to damage by moisture (causes powder to lump) and heat causes melting.

ISO containers — stow and store away from direct sunlight. Cool dry stowage, free from taint.

GEMS			See Precious Stones Also Part 2, Specials
GENEVA **(Hollands, Schiedam)**		1.62/1.73	Cases

A spirit distilled from grain and flavoured with juniper berries. Should be carefully watched to avoid broaching. Stow in special cargo locker or overstow immediately with other cargo. Also carried in tanks. See IMDG Code.

GENTIAN ROOT		3.34/3.48	Bales

A dried herb root with bitter taste, its tonic properties making it valuable for medicinal purposes. Ordinary dry stowage away from oily, moist or odorous goods.

GHATTI		An Indian gum. See Gums.
GHEE		1.39/1.53	Tins in Cases Tanks

An Indian clarified butter, mostly prepared from buffalo milk and largely used in the Far East. Often shipped in second-hand receptacles, treat as wet cargo liable to leakage and stow well clear of odorous goods.

ISO containers — may be carried in closed box containers. Probable payload 17.5 tonnes for 20 ft. Closed box containers.

GILSONITE		See Pitch
GIN		See Geneva.
GINGELLY **(Sesame)**		1.62/1.67	Bags

The seeds of an annual, cultivated in large quantities in East Mediterranean countries, India, China, Japan, etc., from which is obtained "Gingili" oil. See Seeds for Stowage.

GINGER **(Preserved)**		1.95/2.09 1.58/1.81	Cases Casks

The ginger root preserved in a syrup. Wet cargo, very liable to leakage; the cases require careful handling and should be watched to avoid pilferage. See Chinese Groceries.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
GINGER ROOT (DRIED)		2.23/2.65	Bags

The dried stem-like root of a reed-like plant grown in the East and West Indies, valued for its hot and spicy properties. Shipped in bags and comes in handy for filling broken stowage amongst clean cargoes. Stow away from tea and other goods liable to taint.

GINGER ROOT (GREEN)		2.23	Crates

Succulent aromatic root from sub-tropical countries. Used in oriental cooking. May be damaged by drying and shrivelling (too much ventilation), mildew and rot (too high humidity). Roots from Singapore and Hong Kong have the reputation of being unsuitable for long storage.

Pre-shipment condition is important. Roots should be dry on the outside with little or no earth adhering. There should be no evidence of mildew, green shoots, or excessive drying (shrivelling).

May be best suited to carriage under refrigeration. Suggested carrying temperature +10 degrees C (50 degrees F).

ISO containers — open-sided containers with tilts raised to allow maximum ventilation, with due regard to the prevention of moisture (rain, etc.) entering the container.

GINSENG		3.07/3.34	Baskets

A dried plant root grown in the Far East, which is very popular amongst the Chinese as a restorative medicine. Ordinary dry stowage, away from moist, oily or odorous goods. Care against pilferage at time of loading.

GLASS		1.11/1.39 1.39 1.39/1.53	Crates Plate Common Good Grade

In the plate or sheet form this is a very fragile cargo requiring great care in handling and stowing to avoid breakage. Certain sheet glass may "cloud", if it becomes damp. Plate and window glass is packed in strong crates or cases which should be devoid of battens on the outside edges to enable them to rest on deck, etc., for their length.

They should be stowed on firm ground, on the 'tween deck preferably, with extra large and heavy packages in square of hatch for ease of handling. On no account should glass be stowed on top of any cargo which is liable to settle such as coke, bagged stuff, etc. The Courts have held that the stowage of glass on sand which was not properly levelled and boarded over was "Improper Stowage".

Dunnaging should not be resorted to, as it is preferable for the package to be supported along its entire length.

Crates and cases of glass should always be stowed On Edge and in all cases plate glass should be stowed Athwart. The general run of window glass will stow satisfactorily fore and aft if desired.

It is essential that the crates, etc., be well chocked off and all broken stowage filled with suitable material in order to reduce to a minimum any movement in a seaway.

Slings of glass should be made up in such a manner that the deeper packages are central and the smaller on the outside, grading upwards towards the centre, thus avoiding the rope slings straining the crates, etc., at their upper edges with disastrous results to their contents.

The use of trays for handling glass has many and decided advantages.

Crates of glass bottles stow at 2.23/2.79 M3/tonne. Crates of glassware vary in stowage over a very wide range.

Glass beads should be stowed in metal drums. There is a case on record of glass beads shipped in hessian bags; some bags were torn, as a result of which some of the contents spilled on to a flour stowage, resulting in some of the flour shipment being condemned.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
GLAXO		2.23/2.65	Cartons. Bags.

A milk by-product shipped in large quantities from Australia and New Zealand. See Milk Powder.

GLUCOSE		1.17/1.25 1.28/1.34 1.11	Cases Barrels Drums

A sugar, obtained from the juice of grapes and other fruits, also by the action of sulphuric acid upon starch which is largely used in brewing. Do not stow with cargoes that are susceptible to wet damage.

GLUE (Animal)		4.18/5.57 3.34 3.07/3.34 1.81/2.09 3.34/3.62	Bales Drums Casks Liquid In Cases Bags

A viscid substance obtained by boiling the hides and hoofs of animals. Glue pieces are liable to spontaneous combustion. Stow in poop or bridge space or in square of hatch. Shipped both in the liquid and dry condition. See IMDG Code.

GLUE REFUSE		1.25/1.29	Casks

An animal manure composed of hide trimmings, etc., after the gelatine has been extracted. On account of its offensive odour, suitable for on deck stowage remote from crews quarters. See IMDG Code.

GLUTEN		2.23	Bags

Product of flour. Treat as Flour.

GLYCERINE		1.11/1.39 1.25/1.53 0.81/0.84	Cases Drums Bulk

A colourless viscid sweet tasting fluid soluble in water and in alcohol, obtained from animal fats, oils, etc. Packed in a variety of ways. Wet stowage. Drums from the Far East stow as high as 2.23 M3/tonne (80 cu. ft/ton). Weighs approximately 1250 kg per M3 at 37.8 degrees C (78 lbs per cu. ft at 100 degrees F) and is shipped in the form of a solution of 90 per cent glycerine and 10 per cent water. Salt content varies between 0.5% and 7% or more.

While the caustic alkali content of crude glycerine will dissolve any ferric oxide (rust) present on the steel of the tank, it has no harmful effect on the steel itself.

This commodity does not solidify, but being very heavy may require slight heating (which, it is said, causes it no harm) to facilitate pumping during cold weather. Pumping temperatures 35–40 degrees C. (95–105 degrees F).

While this cargo is not in any sense dangerous, it has very penetrating qualities, which makes it very difficult to avoid leakage even when tanks are known and certified to be oil tight. In order to protect plate joints, points of rivets, etc., from corrosion, it is the practice to protect them with a coating of paraffin wax. Wax does not contaminate glycerine.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

Shipment is in steel drums or in bulk when B/L should be claused "Not responsible for leakage, all glycerine remaining in tank to be delivered whereupon vessel's responsibility shall cease". See Tank Cleaning, etc., under Vegetable Oils. See also Coconut Oil Products.

GOATHAIR  See Mohair

GOAT MEAT  2.09/2.23 Cartons

Goat meat is shipped in carcase, cartons and, occasionally, bags. The meat is extremely lean and, as much of this is shipped to West Indian and Mediterranean ports where it is discharged during hot weather, it should be stowed in the most accessible place and discharged as quickly as possible.
Suggested carrying temperature −12/ − 9 degrees C. See Part 2, Techniques, Refrigeration.

GOATS See Part 2, Techniques, Livestock.

GOATSKINS  See Skins

GOLD, BULLION OR COIN See Bullion. See also Part 2, Specials.

GOLD SLAG 0.42 Bags

A heavy metal dross. Dry cargo.

GOORA NUT  See Kola Nut

GRAM  1.53/1.67 Bags

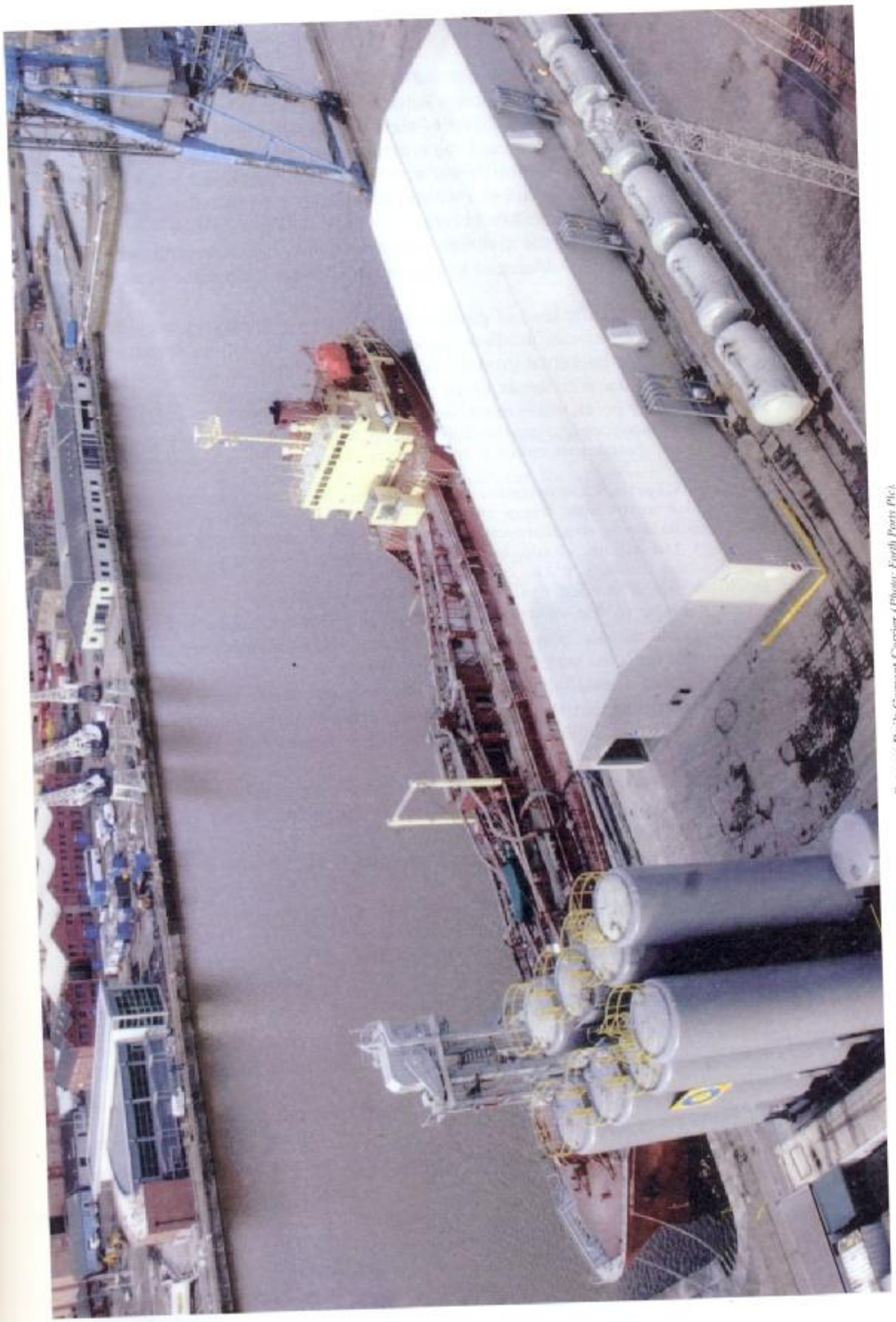
An Indian pulse or bean, known also as Chick Pea, used as an article of food in India and in considerable demand as a cattle food. It contains a high percentage of oxalic acid and is very liable to sweat, though not giving to fermenting. Cool stowage away from moist goods and those liable to damage from sweat. Dunnage well.

GRAIN Bags, Bulk

Grain is the collective name for the edible seeds of various plants. Many of them are also called cereals, e.g. wheat, barley, although products like maize and rice are also considered under this heading. Most grain, especially wheat and maize (corn), is carried in bulk. Bagged cargoes are still carried, particularly of rice.

However it is carried, the moisture content of the grain must be below a certain value, to ensure that damage will not occur during transportation. There are generally accepted levels of moisture, above which the grain is likely to deteriorate, and below which it is considered to be safer to carry. Examples of these critical values are 14% for wheat and 13% for maize.

Nearing Completion of Automated Grain Discharge *(Photo: Forth Ports Plc).*



Purpose Built Cement Carrier (Photo: Forth Ports Plc).

Commodity *Characteristics* *M3 per Tonne* *Packaging*

There are advantages in shipping grain at a moisture content well below the critical limit. The moisture content of a shipment of grain is an average value determined usually on a composite sample. Since it is an average, there will inevitably be parts of the shipment that have moisture values higher than the average, and some of these could exceed the critical value. In such areas within a stow, there is a danger of local growth of microorganisms. Their activities create heat and further moisture, and this can lead to the movement of water vapour within the stow. At points where warm moist air impinges on cooler grain, water may condense and create a further region of damage.

There is also a relationship between the moisture content of grain and the amount of moisture in the surrounding air. The relationship is influenced by the ambient temperature, since as air gets warmer so it can hold more moisture.

The relationship is governed by the laws of physics, and is quite complex. In general terms, warm moist air impinging on cooler grain, can produce liquid water by condensation, thereby wetting the grain and creating conditions for microbial growth. Whether or not this can happen depends on the dew point of the air. This is the temperature at which the air becomes saturated with water vapour, so that if it is cooled below the dew point, water must condense from it.

The dew point is measured by comparing the difference in the reading of a wet bulb and dry bulb thermometer, or by using an instrument called a hygrometer. The dew point can then be read from values in published tables.

Most self trimming bulk carriers are designed so that the hatch coamings become a feeder which, in turn, minimises the space in the hold wings and ends largely between the top of the stow and the underlying deckhead. Ventilation is therefore ineffective. Ventilation may remove warm air from the surface of a heating cargo, but will not eliminate the source of internal heating as most systems are not designed to force air through the bulk of the cargo. It is therefore felt that the efficiacy of ventilating a bulk cargo is minimal and if carried out, should be with reference to the dew points. Further unavoidable but small damage to the cargo may occur when the warm grain is loaded to a ship destined for discharge in a cold climate. Shipside sweat will occur and condensation from the underside of deckheads may drip down onto the surface of the cargo. Where there is surface damage this should be carefully removed, preferably manually, in order to effectively separate the good from bad.

Care should be taken to ensure that the heat applied to double-bottom fueltanks is not excessive. Many claims arise where the grain adjacent to the tanktops are toasted from this source. Soyabean meal is particularly susceptible to this problem.

It is virtually impossible to detect visually the presence of excessive moisture content in the cargo. However, if it is being loaded from a country known for this problem, it may be prudent to take random samples and seal them in jars or bottles for future analysis.

There are many parts of the world where discharge of grain is almost always routinely followed by a claim for shortage. Normally this is based upon weights obtained from a weighbridge and truck discharge or, alternatively, from an elevator where the ship has patently no control over the discharged tonnage measurements. In this case it may be prudent for the shipowner to arrange for a sealing of the hatches upon completion of loading and to invite the receiver to be present at the unsealing prior to commencement of discharge. Upon completion of unloading, empty hold certificates should be issued by an independent surveyor. These measures may assist an owner in defending a claim for shortage.

Grain	*M3/tonne bags*	*M3/tonne bulk*
Barley	1.67/1.81	1.45/1.67
Buckwheat	1.67/1.81	1.39/1.53
Maize	1.39/1.67	1.34/1.48
Oats, clipped	1.95/2.09	1.78/1.89
Oats, unclipped	2.34/2.40	2.01/2.17
Rye	1.48/1.53	1.34/1.45
Wheat	1.34/1.48	1.25/1.39

See Part 2, Grain Cargoes in Bulk.

ISO containers — bagged grain is suitable for closed box containers. Preferably not to stow bags with their length parallel to the long axis of the container, or settling bags may deflect the container

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

sides. Bulk grain may be loaded into dry bulk containers direct by overhead hoppers. Trimming is usually required to achieve the payload — or a quick "drive round the block" to settle the grain. Care should be taken at time of loading to ensure that the roof hatch seals are not obstructed by loose grain. Also that the hatches are well tightened down onto the seals to prevent any ingress of water. (In some makes of containers the drain holes from the hatch wells may also need to be checked clear to prevent a build-up of rain water). Closed box containers may usually be used in conjunction with a temporary bulkhead in way of the doors and throwing or blowing equipment to load the grain. See Part 2, Containers. In either case (i.e. bulk container or ordinary container), labels, locks and seals should be used to prevent doors being opened by accident.

GRANITE SLABS

0.45/0.50	Large Dressed
0.50/0.56	
0.64/0.70	Macadam (broken)
0.81/0.84	Chippings

Ground stowage for large dressed slabs or blocks. Macadam (broken) sets if stacked. Chippings may be liable to shift.

ISO containers — bulk granite chips are not suitable for container stowage on account of their abrasive qualities.

GRANULATED SLAG 0.90 Bulk

Residue of blast furnaces in granulated form. Detrimental if loaded too hot. Angle of repose 40 degrees.

GRAPEFRUIT  See Citrus

GRAPES  3.29/4.18 Cases, Cartons

Shipped in cartons, trays or cases. Stow preferably in 'tween decks. Floor dunnage should be suitable battens laid in line with the air flow, with a covering of 150 × 25 mm boards to ensure full support of the packages. Damage noted on out-turn may be of pre-shipment origin and not readily detected at the time of loading. Table grapes do not ripen after cutting and should be chilled as soon as practical after they are cut.

If damage is noted on discharge, a competent surveyor should be instructed to investigate. Samples should be taken in order to analyse the degree of infection or deterioration. If palletised on 2 way entry pallets, ensure stowage is such as to promote cold air passage through and around each pallet. Normally refrigerated. Observe shippers' carrying instructions.

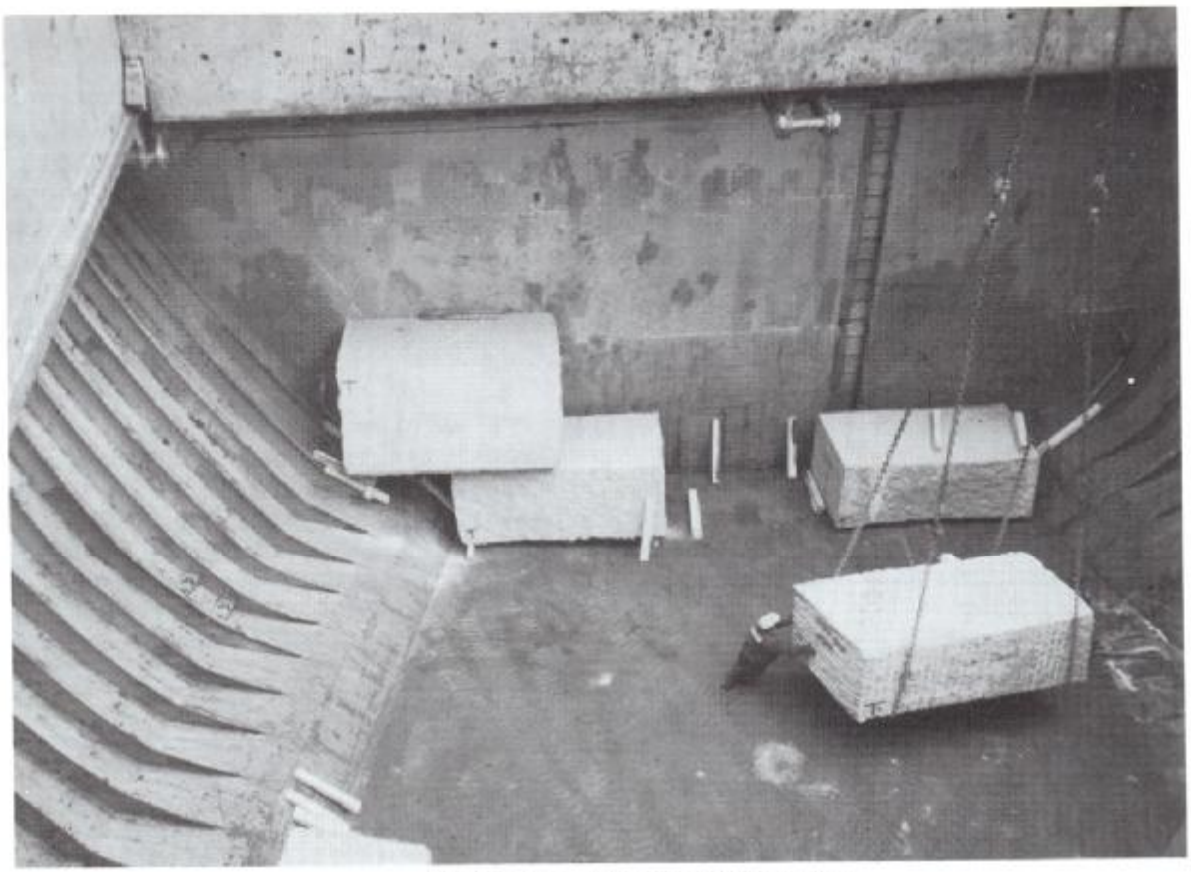
See Fruits, Green, also Part 2, Techniques, Refrigeration. Carrying temperature −1 to 0 degrees C.

GRAPHITE
Plumbago 

1.34/1.39	Paper Lined Kegs
1.25/1.34	Cases
1.11/1.25	Double Bags

An iron black or steel grey mineral — known also as plumbago or black lead — shipped in considerable quantities from Siberia, Canada, India, etc., in kegs and cases.

Unless the containers are well made and lined with stout paper a great deal of siftage of contents occurs, so that all precautions should be observed to protect other cargo in vicinity of graphite from damage by the powder. Dry stowage.



Granite blocks — adequate dunnaging essential.

Granite blocks. Completion of loading.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
GRASS CLOTH		2.79/3.07	Cases

Clean dry cargo.

GRASS RAFFIA		3.34/3.62	Pressed Bales

A fibre root. Ordinary dry stowage.

GRASS SEEDS  1.39/4.18

Many varieties, all more or less valuable, are shipped. Generally they are shipped in bags. Sometimes double bags are used to prevent loss of contents, as the seeds are, mostly, very fine and small and easily pass through ordinary sacking in course of handling.

The higher priced of these seeds are, not infrequently, packed in boxes.

Must be stowed in a cool dry place where no moisture is apt to reach them. The commoner and coarser class of seeds are referred to under Grain, which see. In some cases may be carried under temperature controlled conditions. Suggested carriage temperature +10 degrees C.

Different varieties have different stowage factors:—

Name	*M3/tonne*	*Package*
Browntop	3.09	Bags
Clover	2.20	Bags
Cocksfoot	3.73	Bags
Cowgrass	2.09	Bags
Dogstail	2.68	Bags
Fescue	4.18	Bags
Rape	2.42	Bags
Ryegrass	3.09	Bags
Yarrow	2.50	Bags

GREASES  1.53/1.81 Drums

All greases are solidified oil and liable to melt if subjected to heat. Stow in a cool place well removed from engine and boilers. Treat as Wet Cargo liable to leakage. See IMDG Code.

GREEN FRUIT 

See Fruit, Green.

GREY AMBER See Ambergris

GROUNDNUTS		1.67/1.81	Bags
PEANUTS		3.34/4.18	Shelled
ARACHIDES		2.79/2.93	Unshelled
MONKEY NUTS		1.53/1.67	Bulk
KERNEL		1.67/1.81	Bags
		2.51	Bulk

An edible earth nut which when new contains a large amount of moisture, shipped from Southern U.S., Argentina and China, and valued for its oil yield which averages 45 per cent of its weight. Also used for human consumption.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

Groundnuts are normally in single hessian bags and may be sound in appearance at both loading and discharge port. However, claims for mould damage on out-turn may reach epidemic proportions. Some of the mould forms toxins during their growth, and these may cause the nuts to become inedible. Some fungal toxins, notably those called aflatoxins, can be fatal to humans if eaten.

This mould growth may be influenced by one or all of the following:—

1. The cargo shipped onboard the ship may be the crop from the previous season.
2. The temperature of the groundnuts allied to the moisture content.
3. The quality of the groundnuts: foreign matter, broken kernels, etc.
4. Embryonic mould growth at the time of shipment.

Preloading history, quality of content and moisture content, may have to be accepted at face value and it is appreciated that it is virtually impossible for the master to question the veracity of the certificates.

Holds and decks prior to shipment of cargo must be clean and dry. Discontinue loading during rain. Ventilation channels should be left in the stow and the bags protected from direct contact with metallic surfaces by dunnaging.

The Master and ship's staff should pay particular attention to the condition of the cargo prior to loading. As many bags as possible should be inspected and those showing any signs of mould growth or excessive moisture should be rejected. Meticulous attention should be paid to ventilation and an accurate record kept. It is important that the temperature of the groundnuts is measured during loading. If the ambient air temperature is 2 to 3 degrees Celsius below the temperature of the cargo at the time of loading, then ventilation should commence.

In view of the potential severity of claims arising from the carriage of this cargo, it may well be that the prudent shipowner may wish to appoint a surveyor to monitor, sample and report upon the out-turn of the cargo. See Part 2, Techniques, Bag Cargo, also Nuts.

GROUNDNUT CAKE  1.40/2.10 Bulk

See Seed Cake. See IMDG Code. (See IMO Code of Safe Practice for Bulk Cargoes).

GROUNDNUT (PEANUT) OIL

Groundnut oil which, when produced from good-quality groundnuts, is a light-coloured oil, is produced for export mainly in West Africa, although production of the oil in India is on a far larger scale. Indian production is, however, mainly for domestic consumption. The oil contains a significant proportion of saturated material which will cause the oil to partially crystallise when exposed to low temperatures. The oil as shipped should have a low free fatty acid content, contract limits normally being no higher than 1.5%. It should be stored at ambient temperature when shipped, but recommended loading and discharge temperatures are 20–25 degrees C.

The oil has a density at 25 degrees C of approximately 910 kg/m^3. In the refined state it is used as an edible oil and can also be used as a fat if processed further (hardening) after refining. The high cost of the oil limits its use in Europe and North America.

See Part 2, Oils and Fats. See Appendix Table No. 7.

GUANO  1.11 Bulk
1.17/1.23 Bag

Is the more or less fossilised dung of seabirds, mainly collected from islands off the West Coast of S. America and the Pacific Ocean.

It is a valuable manure containing a high percentage of lime phosphate and ammonia and is quite unsuitable for carriage in a vessel carrying foodstuffs and other delicate goods.

Must be kept apart from nitrate of soda, which is also shipped from S. American ports, and carefully protected from contact with salt water, but rain water does not adversely affect it.

Charterers supply bagging, etc., when required.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
GUINEA CORN		1.50/1.39	Bags

See Durra.

GUM
Gum Resin

1.39/1.81 Bags

Gum is the generic term applied to a large variety of substances composed of the viscous exudation of numerous trees and plants — mostly tropical.

The true gum is soluble in cold water, while the other varieties, which contain resin and essential oil (the gum resin kind), are not so, but are soluble in spirits. Some of the latter kind will, however, absorb moisture more or less freely and form into an adhesive paste.

Gums are used for a variety of purposes, by food, pharmaceutical, and industrial companies, to glaze and stiffen the fabric, for making mucilage, varnish, etc., as well as for medicinal purposes, some of the true gums being classed valuable cargo.

All are inflammable and may be damaged if heated, so that dry, cool stowage, well dunnaged in a well ventilated space is necessary. They should also be stowed apart from oils and greases, and the finer kinds from strong smelling goods.

Arabic	Dragon's Blood	Locust Bean Gum
Assafoetida	Euphorbium	Mastic
Bdellium	Fossil Gums	Mouri
Benjamin or Benzoine	Frankincense or Bdellium	Myrrh
Caboge or Gamboge	Galban or Galbanum	Olibanumor Bdellium
Camphor	Ghatti	Persian
Cerasin or Cherry	Herol	Senegal
Chicle	Karage	Thus
Churrah	Kalera	Tragacanth
Copal	Kauri	Wattle
Dammar	Lac	Yacca

Gums are variously packed for shipment, sacks, chests, cases, etc., being used. They form a dry, clean cargo. Stow in a cool place.

ISO containers — may be carried in closed box containers. Keep away from heat and direct sunlight when stowed on board or in the stack ashore. See IMDG Code.

GUM OLIBANUM
BDELLIUM

1.90 Cases
1.84 Bales

Obtained from trees in the Far East. Stow in a cool place. See Gums.

GUNGA, GUNJA
GANJA

Cases

A narcotic drug obtained from the hemp plant. In a certain form it is mixed with tobacco leaf and smoked. Some countries prohibit or restrict the importation of this drug. See Hashish.

GUNNIES

1.38/1.81 Bales

A coarse jute cloth woven with single threads, while hessian is of double threads, shipped in large quantities from Calcutta, etc. Clean cargo, but care, especially during the S.W. Monsoon, must be exercised to see that damp or wet bales are not shipped and particularly if receiving from lighters. When bales are wetted, the lightermen, given the time, are able to dry the outside folds and escape detection that way, leaving the ship to fight claims for rotted bales. Stow apart from oils, greases, moist and sweat producing cargo and do not permit the use of hooks for handling.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
GUNPOWDER		See Part 2, Dangerous Goods	
GUR		See Jaggery	
GUTTA PERCHA **GUTTA**		2.37 2.23	Bags Cases

Is the dried resin of a very large tree grown in Malay Archipelago and is used largely for insulating electric cables, etc.

Has no objectionable properties.

Stow as for Rubber, which see.

GYPSUM		1.20/1.28 1.06	Bags Bulk

A soft mineral, a common form of which is alabaster, another form is known as monstone or selenite, which is transparent. On being dried it crumbles into powder and is then called plaster of paris.

Do not store near goods liable to be damaged by moisture or dust. Liable to cake if wetted.

HAEMATIN			Cases

Logwood crystals used for dyeing purposes.

HAIR, ANIMAL		1.53/1.95 3.34/3.90	Pressed Bales Unpressed

Animal hair is usually shipped in bales, compressed to various densities, or in bags and, in some instances, a Sanitary Certificate from country of origin endorsed by the appropriate Consular officer has to be produced at destination.

HAIR, HUMAN		1.67/2.23 1.53/1.95	Cases Bales

This is a valuable cargo. Cases should be carefully examined before receiving for any indications of tampering. The weighing of each case is advisable as a check against pilferage. Some cases contain a disinfectant powder and in some instances a Sanitary Certificate as for animal hair has to be produced. Dry cargo stow in special cargo locker or in holds, provided it can be overstowed quickly with other cargo for the same destination, but not in contact with other cargoes.

HANGING GARMENTS		See Garments, Hanging	
HARDBOARD		1.67	As for Plywood
HARES See Rabbits.			Crates

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

HASHEESH
HASHISH
BANQUE

A narcotic drug obtained from hemp, the importation of which is only permitted to most countries under very strict regulations. See also Opium.

HAY  3.34/4.46 Bales

Loose, wet or damp hay should not be received on board under any circumstances; all broken bales should be rejected. It is pressed into bales of varying densities.

If stowing large quantity, air shafts should be introduced to ensure air circulating through the stowage, where no mechanical ventilation is available, as proper ventilation is essential to avoid heating and spontaneous combustion.

Every protection against an outbreak of fire should be taken. See Feedstuff. See IMDG Code.

HEAVY INDIVISIBLE LOADS See Part 2, Techniques

HEAVY SPAR  Bags

Chemical powder. Odourless but dirty.

HEAVY WEIGHTS/LIFTS See Part 2, Techniques.

HECOGINON Drums

A liquid extract of sisal. A valuable commodity which should be given lock up stowage.

HEMP
(Abaca) 

2.56/2.93	Bales Pressed
1.39/1.67	High Density
6.13/6.97	Unpressed
2.51/2.79	N.Z. Bales dumped

The fibre of a variety of plants grown in Russia, the East, etc. It is longer, coarser and stronger than flax, to which it is allied, and is used in the manufacture of cordage, paper, sailcloth, etc.

It is a dry, clean cargo, devoid of any objectionable properties, but must be kept clear of greases, oils, etc., as it is liable to spontaneous combustion if it has been in contact with such.

Manila bales run 8 to the ton of 2240 lbs, stow at about 0.37 cu. m per bale. A certain class of China hemp is pressed to a very high density, stowing at about 1.39 cu. m per tonne. See IMDG Code.

ISO containers — traditional, loosely compacted 125 kg (275.6 lbs) bales can stow 60 to the 20 ft container. New high density bales (125 kg) can stow 80 to the container. However, the Trade deals in 25 bale units, so 75 bales per TEU has become a normal load.

HEMP SEED

1.95	Bags
1.62	Bulk

The seed of the hemp plant. See Seeds.

Heavylift Ship Jaderen with project cargo (*Photo: Jumboship*).

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
HENEQUEN SISAL HEMP		2.51/3.26	Bales

The fibre of the agave or maguey growing in Mexico and other central American countries, also in the Bahamas, Philippines, etc. Otherwise known as sisal hemp, used in the manufacture of cordage, for which it is well adapted, as this fibre resists the action of salt water better than other fibres.

HERBS  5.30/5.57 Cases. Bags.

The dried leaf, stalk or seeds of certain plants used for culinary purposes and in preparing medicines. Shipped in relatively small quantities packed in cases or well-made bags. Most kinds are scented and may taint other cargoes. Stow in a dry cool place.

HERRING See Fish

HESSIANS  1.39/1.81 Bales

A cloth woven from jute, shipped from Scotland and India, etc., in large quantities, generally referred to as gunnies, which see, or burlap amongst nautical men.

Shipped in rolls or made up into bags or sacks which are hard pressed into bales, varying in size and contents for different destinations.

Is a clean dry cargo — ordinary stowage. See Gunnies. The use of hooks for handling should be strictly forbidden. Must not be contaminated with vegetable oils.

HIDES 

Hides are shipped in the dry and wet conditions.

They should be very carefully tallied and Sanitary Certificates, endorsed by the appropriate Consul or other Authority, should be obtained almost in all cases.

Dry Hides — see Skins. Should not be stowed near wet hides.

Wet Hides — (Salted or pickled). Various methods are adopted in shipping wet hides, i.e.

In casks, stowing at about 1.67 M3/tonne.
In barrels, stowing at about 1.53 M3/tonne.
In bales or bundles — with the hairy side out — 1.39/1.67 M3/tonne wet.
In bags, wet, 1.81/1.95 M3/tonne.
In bags, dry, 2.09/2.23 M3/tonne.
In the loose condition about 1.95 M3/tonne wet, 2.79/4.18 M3/tonne dry.
Unitised — compressed, polythene wrapped and strapped to disposable pallets.

When packed in casks or barrels, treat as wet cargo, which throws off a very strong smell, and stow away from dry, fine and other goods liable to damage from moisture or tainting.

Wet hides put in bundles or bales or when shipped loose are very fruitful of claims and, unless the greatest care is observed in preparing holds for their reception also in stowing and in ventilating them, the vessel is liable to be held responsible for damage which, likely, is attributable to conditions existing prior to shipment.

Much of the damage noted after discharge is due to the hides being old and/or improperly cured or to the hides having lain for a long period in leaky lighters or on earth or damp floors of badly

Commodity *Characteristics* *M3 per Tonne* *Packaging*

ventilated warehouses. It is a most difficult matter, however, for this incipient form of damage to be directed by tally men or ships' officers at the time of shipment and, as clean receipts are usually demanded, the only defence which can be set up against a claim for damage arising from the above or like conditions is that of having properly prepared holds and that the hides have been stowed and ventilated in the best possible manner.

Whether wet hides are shipped in bales, bags, bundles or loose, it is essential to ensure sound delivery, so that they do not come into contact with iron, steel or any other metal or with oak timber.

Dunnage should be carefully examined and any pieces of oak rejected.

Reject all hides with the hair off, any that are damaged and any hides showing signs of Red Heat. This is a form of heating on the flesh side of the hides and can lead to advanced stages of damage on discharge.

The use of hooks in handling and stowing hides should be strictly forbidden.

When preparing holds, see that the bilges and strum boxes are properly cleaned so that the drainings — which will be very considerable — can be taken care of.

Bales, Bags or Bundles of Wet Hides can be stowed in 'tween or shelter deck spaces, but should be well removed and separated from any fine or dry cargo that is liable to be damaged by moisture or by the very strong and offensive odours thrown off.

Adequate floor dunnage should be laid under the hides and care should be taken to ensure that there is a clear passage for the seepage of brine to the scuppers. In order to ensure adequate ventilation to avoid overheating, it is recommended that flat dunnage be placed some 300–400 mm apart every six tiers high. The entire stow should be interspersed by channels for the full depth of the stow. These channels should be approximately 150 mm wide and should run in both fore and aft and athwartship directions, so dividing the cargo up into series of approximately 6 sacks of hides. The dunnage used must be clear of nails.

Wire bands should not be used to secure hides on pallets; there have been cases of rust damage through this practice.

Loose Wet Hides — Steer hides average about 27.2 kg each; about 36 hides to the tonne, cow hides average about 21.8/22.7 kg each; about 44 hides to the tonne; stowing about 1.25/1.34 M3/tonne.

Generally only received into lower holds or deep tanks — the latter for preference if the lids can be left off for ventilation.

The deck or tank top, stringers, box beams, gussets, bulkhead brackets, etc., must be well dunnaged and the whole, as well as the sides, bulkheads, tunnel, stanchions and ladders covered with mats, paper, etc.

Some trades demand the lining of sides and ends of deep tanks or holds intended for the carriage of loose salted hides with boards, secured edge to edge and butt to butt — not spaced like spar ceiling.

When stowing loose, each hide is to be laid perfectly flat, hairy side up. On no account are hides to be doubled, bent or folded to any extent, otherwise they will rot in way of the bend.

The stowage of wet hides should cease not less than 1220 mm below overhead deck and thus ensure plenty of room in which the men can work in spreading the hides out. A layer of salt 150 mm thick should be laid over the uppermost tier.

The pickle may be mixed with either fresh or salt water and is usually prepared in large receptacles conveniently placed on deck, the contents being led into the tank or hold by means of a flexible hose.

Notwithstanding the hides being wet, it is important that they be carefully protected from rain or salt water.

Ventilation — on account of the heat, moisture and strong odours thrown off, it is most important, in order to avoid deterioration of this and damage to other cargo, that hatch covers be taken off whenever conditions permit.

After Discharging, the compartment in which salted hides have been carried should be thoroughly washed out with fresh water, using plenty of force, so as to remove all traces of brine and salt crystals from behind frames, etc. This is necessary both in order to prevent corrosion of the steel work and to ensure the proper drying of the compartment to render it fit to receive and carry the next cargo. It is common to treat wet hides with Napthalene. This chemical has a very persistent odour and great care should be taken to ensure holds are odour free after cleaning.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

ISO containers — palletised units of wet salted hides can be carried successfully in closed box general purpose containers. Such containers must be lined (floors and well up the walls) with a single piece of impervious material (e.g. plastic) to protect the container from corrosive brine and facilitate cleaning. On the floor a layer of sawdust (50 mm, 2") deep, covered by sheets of hardboard or similar to allow mechanical handling equipment to enter. The containers, once loaded, should not be left standing in full sunlight and should be stowed on the ship away from sources of heat such as direct sunlight. Under certain circumstances temperature controlled carriage may be required (10 degrees C, 50 degrees F). Reefer containers so used should be lined with protective material in such a way that the circulating air can move unimpeded.

HIGH ACID  See Coconut Oil Products.

HOMINY CHOP  1.40/2.10 Bulk

See Seed Cake. See IMDG Code. (See IMO Code of Safe Practice for Solid Bulk Cargoes).

Is roughly crushed maize — an offal, the best part of the maize having been taken out for human food. Exported from S. Africa in large quantities as a cattle food, in two separate grades, viz. — yellow hominy chop, to which a very small percentage of ground maize cob is added, and white hominy chop which contains a higher percentage of cob. The higher the percentage of cob, the larger becomes the stowage factor. Stow and care for exactly as for maize which see.

HONEY 

1.25/1.34	Barrel
1.45/1.50	Cases
0.99/1.11	Drums
	Tanks

Wet cargo, very liable to leakage. May crystallize as a result of impurities, which may affect handling (tanks) or processing — blending.

Stow clear of dry goods, the bottom tier to be well bedded.

ISO containers — tank containers must be clean, dry and odour-free. May require heating at time of discharge to improve the flow properties. Any heating should be applied gradually.

HOPS  5.02/6.97 Bales and Bags

A dried leaf exported from U.S.A., Australia, Holland, etc. Pungent odour, can take harm from cross taint. Moisture content may be up to 9½%. Stow in a dry cool place, well removed from moist cargoes. May require temperature controlled carriage; recommended temperature 1 degree C +1 degree.

ISO containers — when not requiring refrigeration may be suitable for closed box containers. Payload at approximately 10.5 tonnes may be achieved for a 20 ft container.

HORNS 

2.79	Loose
4.18/5.02	Bags
2.51/2.79	Bags

HORN SHAVINGS AND HOOF TIPS

Horns are usually shipped in bulk, horn shavings and hoof tips in bags.

Hoof tips, if allowed to get wet in stowage, will crack and split when drying.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

It is customary in all trades to use them as dunnage (see Hides, also Dunnage) and for filling broken stowage. When horns are used for that purpose between frames, back of spar ceiling, they should be arranged points up so that they will not catch and retain moisture.

As these are apt to give off strong smells, guard against tainting edible and other delicate goods.

In ports of India and Far East, horns are preferred to native wood as dunnage, as there is a danger of the destructive white ants being introduced into the vessel with the latter.

If different parcels are shipped, it is necessary that they are kept entirely apart to avoid mixing and claims on delivery.

If shipped loose, the B/L should never specify quantity, but should have "quantity unknown" clearly shown thereon. See IMDG Code.

HORSE HAIR  1.95/2.79 Bales

Dry stowage, well dunnaged. See Hair, Animal re Sanitary Certificate.

HORSES AND MULES

The transport of horses by sea is governed by Official Regulations prescribed by the Government of the exporting country, whose inspectors are held accountable for their observance. See also Part 2, Techniques.

HORSE MEAT (Chilled)  See Chilled Beef

HUMAN HAIR  See Hair

ICE BLOCKS  1.11 Blocks Boxes

Relatively heavy stowage. Clean handling.
Suggested carrying temperature −18/ − 12 degrees C.

ICE CREAM  Cartons

Carton stowage. Can be carried at higher temperature at shippers request. At no stage should this commodity be allowed to thaw. Suggested carrying temperature −18/ − 15 degrees C.

ILLIPE NUTS  1.67/1.81 Bags

An oil bearing nut. From Malaysia, India, Sumatra. Size of harvest varies enormously from year to year. For manufacture of edible fats, known as chocolate fats. Gathering process may involve the nuts being submerged for several weeks to reduce infestation and to burst shells of nuts by germination. Liable to heat — see IMDG Code. If moisture content greater than 7.5% may require on deck stowage only.

For stowage see Nuts.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
ILMENITE SAND		0.36	Bulk

Ilmenite is a very heavy sand, almost black in colour, to be found on the Coast of India, Malaya, Australia, etc. Holds must be to an exceptional state of cleanliness in order to pass shippers inspection for carriage of certain grades of this mineral.

On the coast of India this sand is carried from the interior mountains to the sea by the rivers and, later, by the action of the S.W. Monsoon, is thrown up on the beach.

The sand is sun dried, sifted and run on belts under strong magnets after which it appears jet black and resembles gunpowder in appearance. By further treatment two valuable minerals — Monazite and Zircon — are extracted.

From Ilmenite also is extracted Titanium Dioxide from which a white pigment is obtained. See Appendix 5.

INDIGO, POWDER **INDIGO, PASTE**		1.73 2.09/2.23	Cases Casks

A deep blue dye prepared from the leaves and stalks of the Indigo plant which grows in Indonesia, Philippines, India, Egypt, W. Indies, etc. Shipped both in powder and paste form, the former is usually packed in strong cases lined with suitable material to prevent siftage, and the latter in kegs.

It is a valuable commodity; packages should be carefully examined for any evidence of tampering and unsound packages promptly rejected. Stow in a special cargo locker.

INFUSORIAL EARTH **(KIESELGUHR)**		1.39/2.51	Bags

Used in building material, ceramics, sugar refining and the soap-making industry, etc. Cool, dry stowage. Stow away from foodstuffs to avoid contamination.

INDOROUS FELT		See Felt, indorous

INTERMEDIATE BULK CONTAINERS	See Part 2, Techniques

I.P.A. (ISO — Propanol, ISO Propanol Alcohol)

See Part 2, Chemical Cargoes.

IPECACUANHA ROOT **(Ipecac Root)**		Bags or Bales

The root of a plant grown in and exported from Central America, Brazil, etc.

Dry, cool stowage, remote from commodities likely to heat and sweat and from odorous and oily goods.

IRON, GALVANISED **(Pipes)**	0.56	Bundles Envelopes

See Part 2, Iron and Steel Products.
See Galvanised Iron sheet.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
IRON ORE CONCENTRATE		See Hematite and Ores. Also Part 2, Techniques, Bulk Cargoes.	

May liquify, check physical properties prior to loading. See Appendix 5. (See IMO Code of Safe Practice for Bulk Cargoes).

IRON OXIDE (Spent)		0.45	Bulk

See Iron Sponge (Spent).

IRON, PIG		0.28/0.33	Bulk

See Steel.

IRON PYRITE		See Pyrites	Bulk

May liquify, check properties before loading. (See IMO Code of Safe Practice for Solid Bulk Cargoes). See Appendix 5.

IRON, SCRAP		See Scrap Iron	

IRON SPONGE (Spent)		0.45	Bulk

Derivative of coal gas purification. Liable to spontaneous combustion. Avoid contamination. May evolve toxic gases. Shipper certificate required. These cargoes are sometimes misinterpreted as D.R.I. not so, but may be used in further processes to produce D.R.I. The cargo is extremely dusty and the dust, if it becomes wet and allowed to lie will attack and penetrate paintwork.
(See IMO Code of Safe Practice for Bulk Cargoes).

IRONSTONE		0.39	Bulk

Angle of repose 36 degrees. See also Part 2, Ores.

ISINGLASS		2.51/2.56 2.68/2.79	Casks Bales

A white gelatinous substance prepared from the sounds or air bladders of certain fresh water fish, used for culinary purposes and clarifying wines.
Dry stowage, special cargo locker.

ISOPHORENE			Drums

Chemical used in printing industry. Obnoxious. Combustible. See IMDG Code.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
ISTLE (Ixtle)		2.51/2.79	Bales

A fibre exported from Mexico — pressed into bales of various densities. See also Fibre and IMDG Code.

IVORY		0.84/0.98 1.53/1.67	Loose or Bundles Cases

Legislation may prohibit the carriage of this cargo.

A very valuable commodity which includes elephant tusks, wolves, narwhal and hippopotamus teeth, etc. Generally shipped in the loose condition. Some countries now ban all imports of ivory.

Should be carefully tallied and scrutinised for damage and should be gently handled to avoid chipping and marking, must be kept clear of oils and greases. Stow in a special cargo locker. See Part 2, Specials.

IVORY NUTS		1.67/1.81	Bags

See Corozo Nuts.

IVORY SCRAP		1.81/1.95	Barrels

Dry cargo.

JAGGERY		1.25/1.39	Bags

An exceedingly moist sugar obtained from a certain variety of palm tree grown in India. It quickly melts in hot weather and tends to become one viscous mass from which a thick syrup drains. The loss of weight sometimes amounts to 10 per cent or more after a voyage through the tropics.

If overstowing with other cargo, the jaggery should be well boarded over and heavily covered so as to preclude all possibility of top cargo getting into contact or mixing with jaggery.

Goods which are susceptible to damage from moisture should not be stowed in the same vicinity, neither should bag seed be stowed over same, if that can be avoided, owing to the danger of seed mixing with the jaggery. B/L should be adequately claused to protect vessel for any loss of weight.

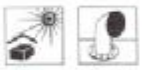
JAMS		1.11/1.39	Cartons

Stow as for canned goods. May be shipped in glass jars, in which case top weight must be limited.

JAPAN WAX		See Vegetable Wax	

JARRAH WOOD		0.84/1.06	

The most valuable timber found in Australia, sometimes called Australian mahogany, is extensively used for furniture and boat making and the coarser grade for railway sleepers and for paving. The unseasoned timber has a high moisture content. See Part 2, Techniques, Neobulk.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
JARRY BEANS		2.65/2.79	Bags

Stow in well-ventilated position, remote from odorous or heat-giving goods. See Beans.

JAVA COTTON		See Kapoc	

JELATONG		1.95/2.09	Cases

Is a form of wet rubber exported in considerable quantities from Malay Archipelago.

An objectionable cargo from which a great quantity of water drains. Sometimes packed in frail cases, which generally appear quite sound when shipped but which, from the action of their contents, become rotten before discharge and require a great deal of recoopering. B/L should be claused to the effect that cooperage charges be to account of consignees.

If available, stow in deep tank taking care that the moist and heated air ascending from the tank (or other compartment) has direct access on deck and does not find its way into compartments above.

Do not stow with any delicate goods including rubber, which becomes mouldy if stowed near jelatong; it stows all right with gambier, which see.

JERKED BEEF		1.62/1.73	See Carne Seca

JEWELLERY

For valuable jewellery see Precious Stones. See also Part 2, Techniques, "Specials".

JEWELLERY, CHEAP OR IMITATION

Considerable quantities of these are shipped from time to time and should be closely watched as they are very liable to pilferage, when claims are considerable.

Packages should be carefully inspected on receipt and doubtful packages rejected.

Stow in special cargo locker or strong room. If on delivery a clean cargo receipt is not forthcoming, the contents should be counted and package weighed in the presence of the consignee and, if necessary, of Customs officer — and results noted on receipt. See Part 2, Techniques, "Specials".

JOWAREE DARI **JOWAR**		1.48/1.56	Bags

An Indian grain. See Seeds.

JUNIPER BERRIES		2.23/2.39	Bags

Small berry smelling strongly of turpentine which renders it most unsuitable for stowage with or near tea, flour, arrowroot, tapioca and like edible goods.

JUSI CLOTH

Native cloth of the Philippines.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
JUTE		1.81/1.87 1.62/1.67	Bales per Tonne of 5 Bales

Is the fibre of an annual Indian plant used in the manufacture of Hessian (which see) gunnies, carpets, cordage, etc., also, when mixed with silk, of low grade satins.

Jute grows in water and the fibre is stripped by maceration in water. As a result of this form of preparation, also of exposure after packing to heavy monsoon rains and, in some instances, to deliberate wetting to ensure heavier weight, this cargo contains a considerable amount of moisture.

The moisture tends to rot the fibre — the heart of the bale more particularly in the former case — and when in stowage it evaporates and condenses on sides, bulkheads and overhead, thus producing sweat damage which often is quite impossible to avoid. The loss of weight by evaporation with certain jute cargoes is very considerable.

Bales which are noted to be wet or damp should be rejected. The dunnaging and matting for jute cargoes should be very thorough and such as to prevent the bales coming into contact with ships' sides, frames, beams, decks, bulkheads, stringers, pillars, brackets, etc., on which moisture will collect; contact with condensed moisture will cause the fibre to rot.

Jute should not be stowed in the same hold as seeds or goods, which are liable to heat and sweat, or with those which are likely to be damaged by moisture; contact with oils and greases should also be guarded against.

Every precaution against fire from sparks, smoking, etc., should be taken while jute is on board.

Jute, whilst not liable to spontaneous combustion unless impregnated with oil, is readily combustible. See IMDG Code.

JUTE BUTTS		1.62/1.67	Bales

Stow as for Jute.

JUTE CADDIES		4.46/4.65 2.37/2.51	Bales Pressed Bales

Jute Caddies are waste pieces of jute collected in and around jute mills, which, when baled, are shipped from India and Pakistan. One of their eventual uses is the making of felt.

These pieces of waste jute contain vegetable and/or mineral oils to a varying degree. In consequence some caddies are liable to spontaneous combustion and should be given stowage accordingly.

They are believed to have been the cause of many fires both on board ship and ashore and should never be shipped without both a shipper's declaration Certificate of Cleanliness and also a Surveyor's Certificate.

It was usual for Surveyors in Calcutta to base their reports on the "Regulations of the Board of Underwriters of New York" insofar as they relate to the carriage of Cotton (a commodity with the same properties). These rules also apply in the case of Caddies shipped in American vessels and are quoted as under:—

"Cotton waste, mill sweepings, and similar materials free of oil can be stowed under deck, provided it is properly baled and covered with bagging.

Any of these commodities containing not more than 5 per cent by weight of animal, vegetable or mineral oils, if properly baled, may be stowed in any deck or hold providing ordinary cotton is not stowed in the same deck or hold.

These commodities may also be stowed in the forward end of a bridge deck or the after part of a shelter deck separated from ordinary cotton.

Cotton waste, mill and oily sweepings containing more than 5 per cent of mineral oil only requires on deck stowage.

Cotton waste, mill and oily sweepings containing more than 5 per cent of vegetable or animal oil is prohibited".

See IMDG Code.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
JUTE CUTTINGS		1.53/1.59	Bales

Stow as for Jute.

KAINITE		1.06/1.11 0.98/1.03	Bag Bulk

A mineral — hydrated compound of the chlorides and sulphates of magnesium and potassium — found in Germany and used as a fertiliser.

Shipped in large quantities from the Weser ports, etc., both in bulk and (in the finer form) in bags.

Dry stowage is essential, as, if Kainite gets wet or damp, it sets in a hard solid mass.

Kainite C/P makes it obligatory upon the ship to provide mats and boards for separations.

Holds should be thoroughly cleaned and dried on the discharge of Kainite to prevent dampness and corrosion.

KAOLIN		See China Clay	

KAPOC **KAPOK**		3.34/4.74 1.67/1.81	Pressed Bales Bales

A vegetable down — a silk-like fibre covering the seeds of a species of silk cotton tree grown in the East Indies, used for making life jackets and upholstery work. Ordinary dry stowage. Like all vegetable fibres there is a danger of combustion if wet or oil stained. See IMDG Code.

KAPOC SEED		Bags, Bulk.

Bags should be adequately dunnaged. Good ventilation. This is a very fine cargo; take all precautions to avoid same penetrating into bilge suctions, etc.

KAPOC SEED OIL		1.09	Bulk

Specific Gravity at 15.6 degrees C = .9154. Stowage factor 1.09 M3/tonne. Solidifies (partly) at about 12.8 degrees C.

An edible oil not unlike cottonseed oil in appearance, exported from Indonesia and other Malaysian ports. This oil is probably the most delicate of the vegetable oils which move in sufficient volume as to permit of bulk shipments. It is readily contaminated even by slight leakage of other vegetable oils from an adjoining tank, from which it follows that the tank must be scrupulously cleaned, properly tested and its suitability for the reception of the oil properly certified by a competent authority before loading commences. See Vegetable Oils in Bulk.

It is peculiarly susceptible to damage by scorching and consequent discolouration through overheating, the temperature to which it may be raised without being some 28 to 30 degrees C lower than that to which some other vegetable oils are heated to facilitate discharge by pumping.

That fact is of great importance when other oil is carried in an adjoining tank (not separated by a cofferdam). For instance, if Palm Oil which requires to be heated to a temperature of 52-55 degrees C for pumping is carried in a tank adjoining that which contains Kapok Seed Oil (whose discharging temperature is probably not to exceed 24 degrees C or 30 degrees C). It is obvious that the Palm Oil must not be heated above the prescribed discharging temperature of Kapok Seed Oil until the latter is discharged.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

That, in turn, is likely to affect despatch as, especially during the winter months, it will take a considerable time to raise the temperature of the Palm Oil 25 to 28 degrees C after the Kapoc Seed Oil tank is empty.

Some shippers recommend that the temperature of this oil should not be permitted to get below 15.5 degrees C during the voyage gradually raising it, as the discharging port is approached, to just short of the prescribed discharging temperature.

When shippers prescribe the discharging temperature, it should be done so in writing, but, if such is left to the discretion of Consignees, time may be saved by the local Agents at discharging port obtaining the necessary particulars in writing and communicating same to the Master of the ship, the ship arriving in port with the temperature just a little below the prescribed temperature.

Further to avoid any risk of local scorching and discolouration, the heating of this oil (as indeed all vegetable oils) should be gradual and not forced.

Samples of oil taken at commencement of and during progress of discharge may come in very useful should a claim have to be considered.

See Part 2, Oils and Fats.

KAURI GUM  1.95 Bags
1.67/1.81 Cases

The semi-fossilised resin of the kauri pine (Dammara), the largest of New Zealand trees, used for varnish making. The resin is usually obtained by digging near standing trees or in ground previously occupied by the kauri pine. Dry cargo. See Gums.

KAVU PUTCH 

See Eucalyptus Oil, also Essential Oils.

KEROSENE   1.39/1.45 Cases
1.73/1.78 Drums
1.76/1.78 Barrels

An inflammable illuminant oil. See Case Oil Petroleum. Shipped in 5 gallon cans, 2 in a case, weighing 36.74/37.19 kg more rarely in barrels and in drums, also in bulk. See IMDG Code.

KIESELGUHR (Infusorial Earth)  1.39/1.48 Bags

See Infusorial Earth.

KIWI FRUIT  Cartons
Wooden Trays
Palletised

Usually carried by dedicated ships or containers. Very sensitive to minute quantities of ethylene gas, so must be in a gas tight, self contained, compartment if other fresh produce is being carried on the same ship.

Written carriage instructions will always be given, but for general guidance the following may be helpful.

Holds should be pre-cooled to +0.5°C. Fruit should be pre-cooled to at least +2.0°C prior to loading, and should not be accepted if it is higher than this value.

The ideal carriage temperature is −0.5°C.

Commodity *Characteristics* *M3 per Tonne* *Packaging*

Continuous high speed ventilation is essential throughout the voyage. This should be at a minimum rate equivalent to a complete empty hold volume air replacement every 5 hours. The efficiency of ventilation can be assessed by measuring the carbon dioxide level in the holds at regular intervals. This should not exceed 0.2%.

The ethylene level must not exceed 0.03 parts per million. If these levels are exceeded, then fresh air ventilation must be increased until the value returns to below this level.

KOGASIN Bulk

An oil made from coal and used in the soap industry. Non-corrosive with a flash point of 92 degrees C. No heating required. See Vegetable Oils.

KOLA NUTS  1.85/1.95 Bags

The fruit of an African tree possessing great stimulating properties. Liable to heat, otherwise has no objectionable properties. Dry stowage in a cool, well-ventilated space. See Nuts.

KOLAI 1.56/1.62 Bags

An Indian edible grain. See Grain for stowage.

KRAFT LINERBOARD  1.53/1.67 Reels

Used for the manufacture of cartons. Usually about 1200 mm in diameter, but heights vary considerably. Stow as for paper rolls. See also Part 2, Techniques, Neobulk.

KYANITE  0.50/0.61 Bulk
0.84/0.98 Bags

Kyanite ore must be kept dry as it solidifies if wet.
See Part 2, Ores.

LAC
STICK LAC
SHELLAC, ETC. 

Stick Lac	1.95/2.09	Bags
Lac Dye	2.09/2.23	Cases
Shellac	2.23/2.37	Lined Cases
Grain Lac	2.15/2.31	Cases
Garnet Lac	2.15/2.23	Bags

A resinous exudation found on the bark of the Indian fig and the Banyan fig trees where punctured by the lac insect, which is shipped under various names according to the processes through which it has been put.

Stick Lac is the crude substance in which is embedded the insects and their eggs, small portions of twigs, etc., which, when boiled, becomes known as Seed Lac.

Lac Dye is precipitated from Stick Lac during boiling.

Shellac is that into which Seed Lac is resolved by melting, refining and pressing into thin flakes, and is used in the manufacture of sealing wax and special varnishes, etc.

Grain Lac and Button Lac are different grades of Shellac differing from one another in the proportions of wax and resin content.

Stow cases on edge, not on flat, to prevent massing of flakes.

Garnet Lac is obtained by treating Seed Lac with alcohol.

All the foregoing Lac products require cool dry stowage, well removed from boilers.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

LAC DYE

A dye obtained from Lac, which see.

LACTOSE
(Sugar Milk)

Bags, Drums

Sugar used in the preparation of food and medicine. Will deteriorate if damp.

LAMB, MUTTON
HOGGET OR TEGS

3.04/3.12
Hard Frozen

Carcases

Lamb and mutton is shipped in bulk in the hard frozen condition, the carcases being wrapped in white gauzy material.

Gross weight and measurement vary considerably at each port and according to the time of year. It is, therefore, necessary to obtain particulars of current stowage factors of all classes of meat from the local agent or stevedore.

For the purposes of classing, Lamb is meat derived from sheep of either sex under 12 months of age at date of slaughter. Most lamb carcases exported from New Zealand would be from animals aged between four and six months. Hogget is meat derived from sheep. Either maiden ewes or wethers, sheep with no more than two permanent incisor teeth; the weight of these dressed carcases is not permitted to exceed 56 lbs. Wether mutton is a class of meat derived from sheep which are either wethers or maiden ewes. Ewe mutton is meat derived from female sheep which have lambed.

Carcases should be carefully examined for softness and any found in that condition rejected; also for any sign of mould, paying special attention to throats and necks. Mouldy packages should be rejected.

Dunnage battens, horizontal and vertical.

With mixed cargo, lamb and mutton should be stowed in 'tween deck spaces, reserving the holds for the heavier goods. Mutton and lamb stow well with beef and butter, but lamb should not be overstowed with any other goods, neither should mutton except with lamb, to avoid crushing and mis-shaping the carcases, which is easily done.

Stow carcases fore and aft, heads and tails, lower tier back to battens, then belly to belly and so on.

At ends of sides, care should be exercised to avoid shanks, protruding into and interlaying brine pipes, which, if permitted, will bring strain to bear on the pipes, as weight is superimposed and the natural settling of cargo occurs, neither should carcases be allowed to contact with pipes or insulation.

Mutton and lamb shanks in the hard frozen condition are very brittle and easily broken so that they require careful handling to avoid damage.

Stow to reaching height from each end towards the square of hatchway, after which the carcases in way of hatchway should be covered with a clean canvas screen and a platform laid over same on which to land incoming cargo, repeating as necessary. Walking boards should be provided and used to prevent damage, disfigurement and soiling by men walking on the carcases.

In order to achieve rapid discharge it is essential to obtain a loading which gives the stevedore at discharge port the best "run of parcels" together with producing as much information as possible relating to stowage dispositions. The necessity of planned stowage and detailed preparation of meat plans is essential.

ISO containers — carcase lamb. Gives poor payload approximately 7–10 tonnes.

See Part 2, Refrigerated Cargoes.

LAMB
MUTTON CHILLED

4.18
1.81

Carcases
Cartons

When packed in cartons, the lamb and mutton should be laid on their flat, usually under the hanging quarters of chilled beef. Clean close spaced 150 × 25 mm boards should be used as floor dunnage. If the cartons are block stacked, the stowage should be broken every two tiers high with 150 × 25 mm dunnage.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

When shipped in carcase form, the shanks are secured to a bar which in turn is secured to the chain or hanging hook. Care must be taken to ensure that the meat is stowed as closely as possible to avoid chafage.

See Chilled Beef.
See Part 2, Refrigeration.

LAMPASOS — Bags

Coconut husks used for scrubbing floors. Usually inter-island carriage only.

LAMP BLACK — 3.21/3.34 — Kegs
(Carbon Black) — 3.07/3.21 — Bags
Carbon non-activated — 3.01/3.12 — Paper Cartons
Charcoal non-activated

A sooty substance liable to spontaneous combustion, packed in barrels and in bags. From hydrocarbon sources, for fillers and reinforcing agents in rubber and plastic products. Very dirty. May sift. Stow near hatchway and protect other cargo from damage by sifting of the lamp black, particularly greasy or oily materials. See IMDG Code.

LANOLINE — Drums

Often in second-hand drums. May leak. Gives off odour. Stow away from foodstuffs and fine goods.

LARD — 1.53/1.61 — Cases
2.01/2.69 — Pails
1.73/1.81 — Tierces

The melted fat of the hog, etc. Liable to melt if subjected to heat.

Stow apart from scented goods, such as turpentine, and away from delicate edible goods, this commodity being of a delicate nature itself and liable to taint other delicate goods.

LARD OIL — 1.67/1.78 — Barrels/Drums

An animal oil, primarily, though certain oils of vegetable origin (notably rape seed oil) are referred to under this name.

Can also be carried under refrigeration. Carrying temperature 4.5 degrees C. If lower temperatures are required these should be confirmed in writing.

Wet stowage, see Barrels.

LATEX — See Rubber Latex

LATHS — See Timber

LEAD CHROMATE — See Chrome Ore

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
LEAD CONCENTRATES		0.33/0.39	Bulk

May liquify. Check physical properties before loading. See Ores. Also Part 2, Bulk Cargoes.

LEAD DROSS 

Is classed as Dangerous Goods, which see.

LEAD NITRATE  Bulk

Avoid dust inhalation. Toxic. Aggravated and intense fire if mixed with combustible materials. See IMO Code of Safe Practice for Solid Bulk Cargoes.

LEAD ORE  0.24/0.65 Bulk

May liquify. Check physical properties before loading. See Galena. See Part 2 Ores. See IMO Code of Safe Practice for Solid Bulk Cargoes.

LEAD, PIG	0.22/0.31	Pigs
	0.28/0.33	Ingots
	0.20	Slabs

Pig lead should be well distributed over tank top or deck and should not be tiered in a high block. See Refrigerated Cargo.

When lead is shipped in one-ton or two-ton ingots or strapped, it is usually the practice to load and discharge the lead with the aid of fork lifts. If shipped in vessels prior to loading refrigerated cargoes and in this case care should be taken to ensure that there is no damage, through excess weight, to the insulated tank tops. If necessary, plates should be laid under the track of the fork lifts to obviate damage. 'Tween deck stowage is not advised for heavy ingots. Soft lead blocks and strapped bundles may average 1 tonne weight.

ISO containers — it is most important that high density cargo of this nature is well distributed over the strongest part of the floor, i.e. adjacent to the walls and ends. Particular attention must be paid to securing against the slightest movement — it is not possible for ships' staff to see inside a closed box container as it is loaded on board.

See Steel and Iron.

LEAD, BLACK  See Graphite

LEAD PIPING Crated Coils

Avoid crushing by overstowing with heavy goods.

LEAD SHEET	0.56/0.61	Cases
	0.45/0.56	Rolls

Stow on the flat. Protected by straw roping or burlap.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
LEAD, WHITE		0.67/0.70	Kegs/Drums

In paste.

LEATHER		1.95/2.79	Bales
		5.57	Rolls
		1.67/2.23	Cases

Many kinds of leathers are shipped either in rolls, bales, protected or otherwise, and in cases.

Some are valuable and should be stowed in a special cargo room. Stow in a dry place, well removed from greasy or oily goods, from acids and from goods liable to transmit taint.

LEMONS 

See Fruit, Green, also Citrus.

LEMON GRASS OIL  Drums

May corrode the drums. Very strong smell. Obnoxious. See Essential Oils.

LENTILS	 	1.25	Bulk
		1.38/1.53	Bags

The seed of a leguminous plant grown in Ecuador, Chile, North America and the Mediterranean countries. May be infested. Dry stowage, well ventilated.

LICORICE		2.62/2.73	Bales (Alexandria)
	Liquid Extract	1.67/1.81	Barrels
	Paste Extract	1.25/1.39	Cases

The dried root of a perennial plant grown in Spain, Sicily, Italy, Asia Minor, etc., from which a sweet juice of medicinal value is obtained.

Bales from Alexandria = 0.34 M3 = 160 kos; from Beirut = 0.34 M3 = 125 kos. Dry stowage required.

Liquid Extract and Paste Extract both require wet stowage.

LIGNITE 

Brown coal, mined in Germany, Canada, New Zealand. See Coal.

LIGNUM VITAE 0.70/0.84

The hardest and heaviest wood grown.

See Part 2, Techniques, Neobulk.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
LILY BULBS		1.39/1.53	Cases/Cartons

Lily bulbs are exported from Japan and certain European countries in considerable quantities during the winter months, packed in well-made boxes containing friable clay mould, sand, earth or rice husks, which must be thoroughly dry and devoid of moisture, otherwise germination and rotting is inevitable.

So much depends on the condition of the goods at time of shipment that identical stowage often fails to give the same results. Frequently the out-turn proves quite satisfactory; at others a considerable percentage turns out in a more or less deteriorated condition, such being due to one or other or the combination of the following: inherent vice, the presence of moisture in the packing material, defective ventilation, heat, sweat or moisture from goods stowed in the same compartment.

Being perishable goods, they are usually carried at shippers' risk and B/L should be claused accordingly. Nevertheless the greatest care must be exercised in selecting a suitable place for their stowage, as well as in the actual stowing, to enable the vessel to benefit to the full by such clause.

Dunnage well, stow in a dry, cool, well-ventilated space below the waterline, preferably No. 1 lower Hold, uppermost tiers, which is the place preferred by experienced shippers. Usually the cases are fitted with two thin battens on each side, which form air passages and facilitate circulation of air through the mass of the stowage; where that is not the case, interlay each tier with thin battens or laths. Avoid deep stowage or overstowing with bags or like "dense" cargo and stow entirely apart from all goods liable to give off heat and moisture.

Wet or damp packages should be rejected.

Meticulous attention to shippers instructions should be observed. Many claims are formulated where receiver claims bulbs have matured in transit. There is no damage but their shelf-life has been reduced and there is an alleged commercial loss in consequence.

Bulbs are also carried under refrigeration. European bulbs usually at a temperature of 1–4 degrees C, Japanese bulbs 4.5 degrees C and sometimes higher at shippers' request. Cool stowage with full air freshening.

Other carriage temperatures which may be acceptable:

Tulip 10 degrees C (50 degrees F)
Lily 0 degrees C (32 degrees F).

LIME
CALCIUM OXIDE
UNHYDRATED LIME
WHITE ROCK

Quick lime, which is normally packaged in metal damp-proof drums, is prepared by heating limestone; is a very dangerous cargo, as it readily combines with water evolving great heat, which produces gases. Corrosive. May affect eyes and mucous membranes. Masks and goggles should be worn. See IMDG Code.

LIME (Unslaked)

Bulk

Must be loaded in dry conditions. If mixed with water produces hydrated lime which in turn creates intense heat and possible ignition if in contact with combustible materials.

(See IMO Code of Safe Practice for Solid Bulk Cargoes).

LIME, HYDRATED OR
CALCIUM HYDRATE

1.11/1.17
1.23/1.34

Bags
Casks

Slaked lime, this being the usual form in which lime is shipped — sometimes in bulk, mostly in drums or bags. Stow slaked lime in a dry compartment removed from moist goods.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
LIME, BORATE OF		1.39/1.50	Bags

Shipped from W.C.S. America. Dry stowage.

LIME, CITRATE OF		2.23/2.37	Bags

Cool, dry stowage. Liable to attack tin plate and like products.

LIME, CHLORIDE OF			See Bleaching Powder See Calcium Hypochlorite

LIMES 

A citrus fruit, resembling a lemon but smaller, from which lime juice is obtained. Shipped in the green condition. See Citrus Fruit.

LIME JUICES	1.45/1.62 2.09	Cases Drums

In bottles, should be stowed in spirit room or special cargo locker, handled carefully and watched for broaching.

LIMESTONE	0.67/0.84	Bulk

A sedimentary rock containing calcium, carbonate. Angle of repose 34–55 degrees.

LIMEWASH

Mix one part by weight of slaked lime (hydrated calcium hydroxide) with three parts of fresh water.

LINATEX

Is prepared from Rubber latex and resembles crepe rubber. See Rubber.

LINEN, FLAX	2.65/2.93	Bales
LINEN, TOW	2.65/2.93	Bales

See Bale Goods.

LINOLEUM		1.67/2.23 1.39	Rolls

Floor coverings usually made of cork refuse mixed with linseed or similar oils.

In cold weather is apt to crack; should not be overstowed except with the lightest of dry goods.

Shipped in rolls covered with stout paper or gunny and ends protected with soft material; occasionally it is crated. Stow rolls on end, protect from marking during slinging. Stowage requirements may be given on packaging. See IMDG Code.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
LINSEED		1.59/1.70	Bags

Linseed or flax seed, the seed of the flax plant, from which linseed oil is obtained. (See Flax). It yields from 37 to 40 per cent of oil. It is one of the worst kind of seeds for shifting, its angle of repose being less than that of any class of seed shipped in bulk.

It is very liable to heat and should be well ventilated. See Grain and Seeds.

LINSEED CAKE		1.39/1.53	Bag
(See Seed Cake)		1.34	Bulk

Made from the refuse of linseed after the oil has been extracted and is used for feeding cattle. Packed in bags or made up into packages covered with gunny or otherwise shipped in bulk.

Stow clear of strong smelling goods such as turpentine, onions, fruit, etc., and, as this commodity is given to heating, it must be stowed in a well-ventilated space clear of articles which are liable to be affected by the heat so generated. See IMDG Code. (See IMO Code of Safe Practice for Solid Bulk Cargoes).

LINSEED OIL		1.81/1.95	Drums
		1.07	Bulk

Linseed oil is obtained from flaxseed or linseed and although it is rich in some fatty acids that are important in the human diet the oil is always used for industrial purposes. The oil as produced by crushing and extraction has a dark amber colour and has a characteristic odour. The composition of the oil makes it suitable for applications in the paint and varnish industries, but the oil is also used in a number of other industrial applications. The ability of the oil to oxidise rapidly is a potential disadvantage for handlers of the oil, as oxidisation leads to the formation of a strong film which, if allowed to harden, is difficult to remove from surfaces. It is therefore generally advisable to clean tanks that have carried linseed oil as soon as possible after discharge of the oil.

The major producer and exporter of linseed oil is Argentina, but the oil is also produced on a significant scale in the European Union and in the U.S.A.

The density of linseed oil is 930 kg/m^3 at 15 degrees C. Crude linseed oil contains considerable quantities of mucilaginous material, which may precipitate on stowage.

See Part 2 Oils and Fats. See Appendix Table No. 7.

LIQUEURS		1.81/2.09	Bottled in Cases

Alcoholic liquors, flavoured, perfumed or sweetened in various ways. Stow in spirit or special cargo locker, careful watching being necessary to avoid pilferage.

LIQUORICE		See Licorice.

LIVESTOCK	See Part 2, Livestock

LOCUST BEANS		2.34/2.50	Bulk

Shipped in considerable quantities from Syria, Cyprus, Spain, etc. The flour obtained from these is made up into various classes of foodstuff for both human and animal consumption. Requires good ventilation. See Beans.

Locust Bean Oil, in bulk stows at 1.95 M3/tonne.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
LOCUST MEAL		2.37	Bags

The flour of the bean of same name. Dry stowage. Keep apart from odorous or moist goods.

LOGS

See Timber. The average stowage factor of logs, varying in lengths and denuded of the bark, is 150 cu. ft per 1000 board feet and for logs of uniform length, denuded of the bark, is in the region of 135 cu. ft per 1000 board feet.

From W. Africa Abura stows at 75, Wara and Obeche about 130. Majority of W. Africa species av. 100 including Utele, Guaria, Agba, Iroko, Mahogany, Sápale, Okume, Afra.

In N.Z. — Japan log trade, Haakon Dahl scale gives estimated super feet by squaring one quarter centre girth and multiplying by length.

See Part 2, Techniques.

LOGWOOD		2.37/2.65	Bundles

Wood of a deep red colour, grown in Central America and W. Indies, used as a dye.

LOGSWOOD EXTRACT			Drums

Dye from Central America. Liable to leak and stain. Cover container floor before loading.

LONGCLOTH			

A cotton fibre used for shirting; differs from calico inasmuch as the warp and woof are alike. See Part 2, Bale Goods.

LUBRICATING OIL		1.25/1.34	Cases
		1.48/1.62	Drums

A lubricant obtained from petroleum. See Part 2 Petroleum.

Drums should not be stowed on their bilges as fillers or flatters in holds; neither is it prudent to stow two heights of drums on end over drums stowed on their bilges in 'tween decks, as the superimposed weight is too heavy for the bottom tiers. See IMDG Code.

LUCERNE		2.93/3.07	Bags

A forage crop. See Hay. (Alfalfa).

LUPIN SEED		1.81	Sacks

See Grass Seeds.

LUMBER		See Timber. Also Part 2, Techniques, Neobulk.	

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
MACARONI		1.20	Cases

A paste prepared from the glutinous granular flour of hard wheat, pressed through a perforated vessel into long tubes and then dried.

Stow as fine delicate cargo, well removed from garlic, onions, lemons or other green fruit, and from all cargo liable to damage edible goods either by tainting or by moisture thrown of.

MACASSAR OIL — See Vegetable Fat

MACE  2.37/2.65 Cases; 1.95/2.09 Bags

A spice. The outside covering of the nutmeg, shipped from Singapore and adjacent islands. Treat and stow as a fine dry cargo liable to be damaged if stowed near moist or greasy goods.

MACE, OIL OF — Or Nutmeg Oil. See Vegetable Fats.

MADDER
MADDER ROOT  1.81/2.23 Bales

The dried root of a plant which grows in India, Turkey, Greece, etc., from which a red dye called garance or garancine is extracted.

Must be stowed in a dry place to avoid deterioration. It has a great affinity for water and attracts moisture.

MAGNESIA — Bottles in Cases

A white powder used medicinally and in certain manufacturing processes.

MAGNESITE, DEADBURNED  0.70 Bulk

Used in the manufacture of refractory bricks. Very dusty but not odorous. Damaged if wetted. Liable to shift if wet; according to quantity, shifting boards may be necessary.

MAGNESIUM NITRATE  Bulk

Mixed with combustible material, will ignite easily and burn fiercely. (See IMO Code of Safe Practice for Solid Bulk Cargoes).

MAGNETITE 0.42/0.47 Bulk

An iron ore, containing about 52 per cent of metal, shipped principally from Scandinavia, Russia and Eastern U.S.A. See Part 2, Ores. See Appendix 5.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
MAGUEY			

Local name (Philippines) for Hemp — which see.

MAHOGANY	0.75/0.84	Sq. Logs
ACAJON	1.11/1.25	Boards

The wood of one of the loftiest and largest of tropical trees, shipped from Cuba, Haiti, Jamaica, Honduras, West Africa, etc.

Avoid stowing near anything that will stain the timber. Chain slings, if used for lifting heavy sawn logs, should be well protected. Avoid rough handling of boards to prevent splitting. See Timber, also Jarrah Wood.

See Part 2, Techniques, Neobulk.

MAHWA BUTTER  See Vegetable Fats

MAIL	  	2.79/4.18 3.34	Parcels

It is of the utmost importance that the receiving, stowing and redelivery of this cargo should be under the constant supervision of a responsible officer with independent ship tallyman.

The mail room should be well ventilated and rat proof. The mail rooms should be fitted with two locks with different keys.

Failing the lockers being equipped with gratings, it is necessary that the mailbags be well dunnaged.

Tally and check in the mail room before stowing, particular attention being paid to check for broken seals.

Delivery should never be made by the ships' officers except by order of the Master. Any dispute should be settled before delivery.

The keys of the mail room should be kept in the safe in the Master's and Chief Officer's or Purser's Rooms and should never be allowed in the hands of anyone except Senior Officers. Cases have occurred where duplicate keys were made through impressions of the keys proper taken while out of the custody of the responsible officer.

All Way Bills should be carefully checked on receipt of the mail and should be forwarded to the appropriate Authorities, on delivery of the mail.

Where it is necessary to carry mails in open stow, reliable watchmen must be in constant attention.

ISO containers — Mail should only be carried in closed box containers. Doors must be sealed and/or locked on completion of stuffing. Ships' staff must inspect these seals when loaded on board and prior to discharge.

MAIZE	 	1.25/1.41	Bulk
See Hominy		1.39/1.53	Bags

Indian corn, known as corn in America, is grown and exported in large quantities from Argentina, S. Africa, etc., as well as from the U.S.A., where it constitutes the greatest single crop.

Maize is the largest of the cereals and, besides its value as food for man and animal, is much in demand for the glucose and starch which it yields. It also yields 5 to 10 per cent of oil.

The grain is very liable to heat and sweat, resulting in sourness, and is a cargo prolific in damage claims.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

In a great number of cases where maize fails to carry in good condition, the explanation is to be sought for in the pre-shipment history.

It not infrequently happens that maize is stacked in the open — either at the railside upcountry or on the barrancas off loading berths. Should it, at that time, be inefficiently dunnaged or inadequately protected from rain, deterioration will already have set in before shipment.

The greatest care should be exercised in protecting the ship against claims for damage or deterioration from causes beyond the control of those concerned in its sea transport. The only safe way of doing that is by suitably qualifying bills of lading. The furthest a Master should go in the matter of a clean bill of lading is to accept the words "Shipped in apparent good condition" or "weight, quality, quantity, and condition unknown".

Stow away from boilers and any similar source of heat. Keep well apart from any cargo such as flour, bran, oats, canned, dry and delicate goods, also wool, which are liable to be damaged by moisture — none of which should be stowed in compartments above maize.

Provided maize is suitably dried prior to shipment, it should carry well.

ISO containers — not normally suitable for carriage in closed box containers through marked changes in ambient temperatures due to the inherent tendency to sweat. Open-sided containers may be utilised for voyages of limited length, with tilts rolled up (when external conditions permit) to allow ventilation. Proprietary containers with double skins designed to protect the cargo from condensation damage have been used successfully on occasion.

See Part 2, Grain.

MAIZE CAKE  1.40/2.10 Bulk

See Hominy Chop. See Seed Cake.

(See IMO Code of Safe Practice for Solid Bulk Cargoes).

MALT 2.51/2.65 Bags
1.81/1.95 Tanks
Bulk

Barley or other grain immersed in water until it germinates, afterwards dried in an oven or kiln — a preliminary treatment of the grain to that of brewing and distilling.

Sometimes shipped in airtight tanks, at others in bags or bulk.

Stow away from dry, delicate and perishable goods.

ISO containers — suitable for dry bulk containers or as bulk (or bags) in general containers. Payload for 20 ft closed box container may be 16.5–17.5 tonnes. Dry bulk containers usually achieve less due to trimming.

MANDARINES See Citrus

MANDIOCA Barrels. Bags.

Brazilian arrowroot. Keep dry and away from taint. See Arrowroot.

MANGANESE FERRO 0.42/0.47 Bags

An alloy of Manganese and iron.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
MANGANESE ORE		0.47/0.50 0.61/0.70	Bulk Bags

The ore from which is obtained a metal not unlike and largely employed as an alloy of iron in the manufacture of steel. Two kinds of this ore exist, i.e. the black oxide and the red oxide — the former kind is also used for colouring pottery and glass.

When Chrome Ore and Manganese Ore are carried, they should be stowed in such a manner as to preclude any possibility of the smallest quantity of Chrome getting mixed with the Manganese. Admixture of even a small proportion of Chrome with Manganese renders the latter useless for important purposes in connection with the steel trade. Frequently very damp and gives off a lot of moisture during passage. Separate well from other cargoes. Dirty. May liquify. Check physical properties before shipping. See Part 2, Ores.

MANGROVE BARK		2.09/2.23 1.67/2.51	Bags Bales

The bark of the mangrove tree. See Barks. Bales of 80 to 100 kg from E. Africa and Madagascar.

MANGROVE EXTRACT		See Cutch	

MANI

Local name (Philippines) for Peanuts. See Groundnuts.

MANIOC OR MANDIOCA MEAL		2.51/2.65 1.67/1.81	Cases. Bags. Bulk/Pellets

An edible meal obtained from the manioca plant, from the roots of which are obtained tapioca and cassava.

Dry stowage away from odorous and moist goods.

Sometimes likely to be moist on shipment and can be liable to spontaneous combustion. Good ventilation is essential.

Shipments are frequently infested with the kaprha beetle, charterers usually being called upon to pay for the necessary fumigation after discharge.

See IMDG Code.

MANJEET		1.81/2.23	Bales

A plant from which a red dye is obtained. Dry stowage.

MANNITOL			Bottles, Drums

A sugar product used for medicines, etc. Do not stow with poisons or goods liable to give off moisture or taint.

MANOLA		2.15/2.23	Bags

Dry stowage, removed from odorous and moist goods.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
MANURES (Fertilisers)		1.11/1.67 0.90/1.40	Bags Bulk

See Fertilisers.

MARBLE	0.42/0.47	Blocks
	0.50/0.56	Slabs
	0.56/0.61	Crates
	0.89/1.00	Marble Dust in Barrels
	0.70/0.72	Marble Clippings in Bags

Is a crystallised form of limestone which takes a high polish, valued for ornamental work in buildings, etc.

Being very heavy and usually shipped in large blocks, should be stowed on the ground floor. Care should be taken to see that marble slabs are compactly stowed and avoid overstowing with heavy goods.

Slabs of moderate size should be stowed on edge like glass, also slabs in crates.

Chain slings should not be used for slinging marble unless for heavy blocks, in which case they should be well protected with leather, etc., to avoid damaging the blocks.

Do not overstow marble with greasy oil or acid bearing cargo, as the marble will absorb any leakage from such and claims will quickly follow.

MARJORAM  5.57/6.69 Bales

An aromatic plant valued for its tonic and seasoning properties, also used as a stimulant. Dry stowage well clear of odours.

MASTIC

A gum resin obtained from the lentisk tree — a native of the Levant — by making incisions in the branches and stem. See Gums for Stowage, etc.

MATCHES  2.79/3.62 Cases

Packed in strongly made wooden case or cartons especially approved. See IMDG Code.

Stow in a dry place readily accessible.

MATE 

Dried leaves, used as tea. See Tea.

MATHIC SEED METHEY  2.51/2.79 Bags

A very light aromatic seed, the stowage factor of which varies considerably. Valued for its medicinal properties. Usually shipped in small quantities. Dry stowage away from foodstuffs.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
MATS		4.66/5.57	Rolls
MATTING		3.90/5.57	Bales
		2.79	Press Packed
		3.62/4.18	Tea Mats
		5.02/5.57	Ordinary Cargo Mats

Mats are woven from various fibrous material such as bamboo, grasses, leaves, seeds, sedge, straw, etc.

Some matting, like Japanese and certain Chinese matting, is valuable and should be given great care in stowing to avoid crushing the rolls, straining, etc.

The better class matting is made up into rolls and covered — they should never be overstowed with other cargo.

Hooks should not be used when handling mats.

The coarser matting like cargo mats, etc., are made up into bales or bundles.

MEALS, SEED  Variable Bags

Seed meals. Residue after oil extraction from coconut, cottonseed, groundnut, linseed, maize, niger seed, palm kernal, rape seed, ricebran, soya bean, sunflower. Liable to heat. Moisture and oil content important. See IMDG Code. See Seed Cake. (See IMO Code of Safe Practice for Solid Bulk Cargoes).

MEAT MEAL  2.23/2.37 Bags

Usually packed in bags or multiple paper bags. Sometimes dusty and can be very odorous, stow well away from cargoes liable to taint. Keep dry and well ventilated. Certain grades with high oil content are liable to spontaneous combustion. See IMDG Code.

MEAT, PRESERVED 1.78 Cartons

Stow as for cartoned goods.

MEAT, SUNDRIES 

1.81/2.23	Cases
2.37/2.65	Bags
1.81/2.23	Cartons

Offal includes oxtail, hearts, casings or intestine, livers, kidneys, etc., and are packed either in bags, cases or in cartons. Casings are often in kegs and offal is sometimes shipped in pails. They are all carried in the hard frozen condition. Carrying temperature −12/ − 9 degrees C. Stowage of cased offal, etc., is the same as other hard frozen goods in cases. Cartons may be stowed on the flat or edges.

Stow in 50 × 50 mm dunnage floored with 150 × 25 mm to ensure adequate support to packages. Cases are stowed on their flat; cartons hitherto stowed on the flat are now being stowed on their edge. In deep stowages it is advisable to break the stow at least at half height with suitable dunnage. Vessels equipped only with brine grid system should break the stow at least every four tiers high with 50 × 50 mm dunnage.

In the case of boneless meat in bags, adequate dunnage should be used to avoid the interlocking of the cargo, thus impeding the airflow. 50 × 50 mm battens should be laid in line with the airflow at least every four tiers high.

Bagged offal and meat should carefully be examined for mould, packages showing blood stains should be suspect, opened for inspection, and all mouldy packages rejected as well as any which are soft. This class of cargo is not suitable for over stowage by any other. Dirty, wet or cut cartons should be rejected.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

Stow in 'tween decks if possible, as it does not carry well in deep stowage. Ordinary 50 × 50 mm floor dunnage is not sufficient with this and other class of bagged goods, which are likely to sag down to the deck and so impede circulation. One or other of the two following methods is adopted when stowing bagged offal to eliminate that risk:

1. Floor off with quarters of beef or cased offal, dunnaged as necessary; follow with a tier of quarters at the sides and bulkheads extending right up, such goods to be separated from the offal with suitable dunnage.
2. Lay flat dunnage boards fore and aft over the floor battens, spaced so as to allow air circulation, but not far enough apart to permit bags to sag on the deck.

See Part 2, Techniques, Refrigerated Cargoes.

MELONS  2.79/3.34 Crates Cartons

Observe the general conditions for the carriage of fresh produce and refrigerated cargo. Different varieties of melon show differing sensitivity to lower temperatures and suitable carriage instructions should be provided by the shippers. For general guidance, note the following:—

Honeydew melon	10°C	not tolerant of lower temperatures
Cantaloupe	3°C	tolerant to 2°C for short periods
Watermelon	10°C	tolerant to 4.5°C for short periods.

Cantaloupe melons are more sensitive to ethylene than other varieties, and require good ventilation.

MENHADEN Bulk

Herring oil shipped in bulk, very odorous. Carried at 24–29 degrees C. Pumped out at 35–40 degrees C. Temperature must not be allowed to exceed 40 degrees C. See IMDG Code.

MERCURY  Cylinders Flasks

A very heavy fluid metal (s.g. 13–59) shipped in cylinders or flasks.
Stow in a cool place, chock off well and do not overstow with heavy packages.
Very valuable, care against pillage.

METAL BORINGS AND CUTTINGS  0.70/0.84 Drums

See also Scrap Iron.

Metal borings and cuttings are frequently coated with oil. They will heat due to oxidisation. They should not be stowed in the same compartment, as that which contains any commodity which is known to heat in stowage, or in a compartment abutting or abreast of the engineroom, etc.

Self heating or inadequate ventilation may result in oxygen depletion. Spaces must not be entered without breathing apparatus, until the overall condition of the atmosphere has been sampled, and determined to be safe.

Not infrequently this material contains woollen or cotton rags, paper, sawdust and other combustible materials which promote combustion.

Fires in this cargo must be dealt with by flooding the relevant holds.

The National Cargo Bureau Inc., New York, recommended that, before this commodity is accepted for shipment, it be carefully inspected by one of their inspectors to ascertain if materials of a

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

combustible nature are mixed with the borings; to take the temperature of the metal prior to loading, and if it is found to be 43 degrees C or above that, the loading be not proceeded with until the temperature shows positive signs of decreasing. See IMDG Code.

See IMO Code of Safe Practice for Solid Bulk Cargoes (Ferrous Metal).

METAL POLISHES (Liquid) 

Flammable liquids. See IMDG Code.

METAL SULPHIDE CONCENTRATES  0.31/0.56 Bulk

Sulphide concentrates of iron, lead, nickel, copper, zinc. Some may oxidise and self heat and produce toxic fumes. May cause corrosion.

Details should be furnished by shipper, prior to loading of any hazards or precautions to be taken during loading, carriage and discharges.

(See IMO Code of Safe Practice for Solid Bulk Cargoes).

METHANOL (Methyl Alcohol)  See Part 2, Chemical Cargoes.

METHYLATED SPIRITS  2.0/2.06 Barrels
1.95/2.01 Drums

Is a mixture of 9 parts alcohol and 1 part of wood spirit. Inflammable Substance. See IMDG Code.

METHYL TERTIARY- BUTYL ETHER (MTBE) See Part 2, Chemical Cargoes.

MICA TALC  1.11 Cases
1.25/1.53 Bags

A mineral glittering, easily split into thin plates.

White mica, also known as Muscovite or Siberian glass, is the form most generally in use as a substitute for glass. Shipped from India, Far East, etc. Dry cargo.

MIDDLINGS SEMETIN 1.95/2.23 Bags
POLLARDS 1.48/1.56 Bulk, Pellets

A by-product of flour milling used for cattle food, dog biscuits, etc. Shipped in bags of about 40 kg. This requires to be well ventilated to prevent heating and deterioration especially by caking internally as distinct from external caking due to sweat and moisture. Dry stowage.

MILK, CONDENSED See Condensed Milk.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
MILK, DRY OR POWDERED		1.67/1.81 1.95/2.51 1.67/2.27 2.83/3.96	Cartons Cases Bags Pallets

Much of this cargo, Evaporated, Skim, Whole Milk, Buttermilk, etc., is shipped from ports where vessels normally load refrigerated cargoes in addition. Avoid wherever possible stowage over or adjacent to a frozen compartment. If this is not possible, at least 125 mm of dunnage should be laid on the deck and/or the adjacent bulkhead. It is the considered opinion of many shipping lines in the trade, that in order to avoid condensation damage, ventilation should be restricted throughout the passage.

Liable to taint damage. Liable to attract weevils, stow away from Barley, Flour and other cargoes likely to be weevil infested.

Milk powder from New Zealand usually shipped in 25 kg multiwall bags.

ISO containers — typical payload of 20 ft container:

bags 15.5 tonnes; consumer pack tins 14.0 tonnes (New Zealand)
bags 16.3 tonnes; consumer pack tins 11.0 tonnes (Australia)

MILK, FRESH 

In cans or bottles, carries best at a temperature of +1.5 degrees C. Homogenised may be hard frozen.

MILK, MALTED  2.51/2.65 Bottles in Cases

Fine cargo, very liable to pilferage. Must be stowed in cool place, well removed from moist goods.

MILLBOARDS  0.84/1.11 Crates

Asbestos, etc., Sheets, packed in crates which should be stowed on edge on a solid platform. See also Asbestos.

MILLET 1.37 Bulk; 1.39/1.67 Bags

A species of small seed used as a substitute for rice, for poultry feeding, etc., of which there is a large variety.

MILORGANITE  1.53 Bulk

Heat-dried activated sludge. Very fine granular product. Angle of repose 40 to 45 degrees.

MINERAL OILS See Part 2, Petroleum

MIQUI

Chinese noodles made from Wheat.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
MIRABOLANS		1.95/2.01	Pockets
		1.95/2.06	Bags

The berry-like fruit of a tree allied to the maple, valuable for tanning and dyeing processes.

MIRABOLANS EXTRACT		1.25/1.39	Bags
		0.98/1.03	Cases

Ordinary dry stowage.

Extract and crushed Mirabolans should be given dirty stowage. Wet stowage, well dunnaged and matted. The commodity runs and melts in hot weather.

MOHAIR		6.97	Bags
		2.79/4.18	Bales

The hair of the Angora goat used for weaving certain kinds of cloth. Shipped in bags, also in bales of varying densities. Precautions against Anthrax.

Cashmere — may need inspection and disinfection. Adequate packaging essential, e.g. bales covered in double woven polypropylene. If packaging remains intact, there is no danger of Anthrax. If cashmere is visible through the covering, the adjacent cargo may need disinfection.

Goathair — tops and yarns (slivers and other rovings) most dangerous regarding risk of anthrax.

Cashmere yarns, bleached and dyed, mohair yarns, may need a certificate of approval from certain countries.

See Wool.

MOLASSES		1.39/1.67	Casks/Drums
		0.69	Bulk

Molasses is a thick syrup derived as a by product of the production of sugar, from both cane and beet. As produced, it has a specific gravity of about 1.45 corresponding to a stowage factor of about 0.69 M3 per Tonne.

Molasses is normally carried in bulk. It may be in a dedicated vessel, but may also be in one or more tanks of a parcel tanker.

Molasses is stable as produced, but if diluted with water begins to ferment rapidly. Tanks and pipelines used for molasses must be free of water prior to loading, or diluted pockets of molasses may occur and be the focus for subsequent damage.

Molasses varies widely in combustion depending on where, when and from what it is produced. As a result, it exhibits a range of anomalous viscosity that may cause pumping problems. It is usual to load and carry molasses at elevated temperatures (between 32 and 40°C) to facilitate its pumping. The temperature should not exceed 40°C, as above this point there can be a destruction of sugar, with a consequent deterioration in the value of the molasses for animal feed.

The solids content of molasses is expressed as degrees Brix (this is a reading taken using a specially calibrated hydrometer). Often refractometric solids are used instead of Brix. Molasses is usually at about 82% Brix. Molasses that is exceptionally difficult to pump may be diluted to about 75% Brix, but should not be accepted for loading at solids levels below this value.

Molasses is subject to foaming. This may be due to gases formed during fermentation, or to air entrained during pumping or to the spontaneous destructive degradation of the molasses. If this occurs, it is best to take expert advice since the treatment for the three possible causes is different.

Molasses is very odorous and highly coloured, and can easily contaminate other liquid products if pipelines and tanks are inadequately cleaned.

MOLYBDENUM ORE		0.56	Bags

See Ores.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
MONAZITE		1.39	Bags Bulk

A sand obtained from Australia containing thorea from which thorium nitrate is obtained. For certain grades, holds must be exceptionally clean.

MONGOS

Vegetable Seeds, small globular. From Philippines. See Seeds.

MONKEY NUTS
ARACHIDES 

See Ground Nuts, also Nuts.

MONOAMMONIUM PHOSPHATE  1.21 Bulk

Can be highly corrosive in presence of moisture. Ammonium phosphates with pH greater than 4.5 are essentially non-corrosive. Continuous carriage may have detrimental structural effects over a long period of time. Angle of repose 35 degrees.

MONO ETHYLENE GLYCOL See Part 2, Chemical Cargoes.

MOONSTONE

Or Selenite is a transparent form of gypsum, which see.

MOROCCO LEATHER 

5.57 Approx.	Rolls
2.79 Approx.	Bales
3.07 Approx.	Cases

Goat or sheep skins tanned with sumach and dyed. A valuable commodity. Shipped in bales, rolls and cases.

Special stowage in a dry place free from rats and well removed from oils, grease, greasy articles and acids. Avoid the use of cargo hooks.

MOSS  8.36/16.72 Bales

Various kinds of mosses are shipped. Used for surgical dressings (sphaghnum), gardens, etc. Dry stowage.

MOTHER OF PEARL 1.25/1.31 Cases

Iridescent sheets obtained in Australian waters, Arabian Sea, etc. (by diving); used in ornamental work.

Specially selected shells are of considerable value and should be cared for accordingly. Clean cargo. Special stowage to avoid broaching.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
MOTOR CARS			
MOTOR VEHICLES		4.18/8.36	Unpacked
C.K.D.		2.79/3.07	Crates
M/CYCLES		3.34	Crates

These are shipped in cases or crates and in the unboxed condition.

In cases or crates, the cars may be shipped intact with certain parts dismantled to enable better use to be made of the stowage space. Cars Knocked Down, abbreviated to C.K.D., or Part Knocked Down — P.K.D.

Stow cases and crates on perfectly level and solid surfaces, never on their sides. Chock off and fill broken stowage with strongly built cases (not bales, which will be liable to chafe or light goods liable to crush).

If overstowing with these packages, the lower block of cargo must be closely overlaid with stout boards so as to provide a level and stable platform, each tier of cases or crates to be similarly overlaid in order that the superimposed weight is distributed as evenly as possible and so to avoid distortion and straining of the packages. If overstowing with other cargo, select light goods for that purpose.

Crates of C.K.D. are often stored in the pen prior to shipment, so that while the contents may themselves be protected by the packaging, coatings of grease, etc., the timber may have a very high moisture content especially if unseasoned or green timber is used in their construction. Ice or snow maybe adhering to the crates and, in some instances, pools of water may be lying on the waterproof covers. In these circumstances other cargo stowed in the same compartment or container may be affected by this source of moisture. When carried from temperate to hot weather, the protective oil coatings on some of the contents may liquify and leak out of the crates, to the possible detriment of cargo in the same compartment or container.

C.K.D. in *ISO containers* will achieve poor space utilisation unless the crates and packaging have been designed specifically to fit inside an ISO container. General Purpose containers and Insulated containers have different internal dimensions and the module developed for one will not necessarily successfully fit the other. Consideration must be given at time of stuffing for the problems of removing C.K.D. from the container at destination. A tight-fitting module that has to be pushed to the rear of the container with mechanical handling equipment, may be impossible to extract without damaging the crate. Where bearers exist, they should be in line with the direction of approach of any mechanical handling equipment and assistance can be given by leaving snotters or slings suitably positioned to help drag the cargo out. The concern over moisture migration from crates with high moisture content is even more important in ISO containers, which will develop their own micro-climate in varying ambient conditions. Crates should be absolutely dry at time of stuffing with a moisture content of less than 14 per cent.

Unpacked vehicles are normally left at the quayside, prior to loading, in a drivable condition with the windows closed, the doors and boot lids locked and all electrical systems switched off. Aerials should be in the collapsed position.

Vehicles should only be left with their keys inside the car, if they are in a fenced area with adequate security.

Hand brakes should be fully on.

In the case of sports cars and convertibles, they may require the protection of a shed during their term on the quayside.

Identification markings must not be made on the hoods or windows.

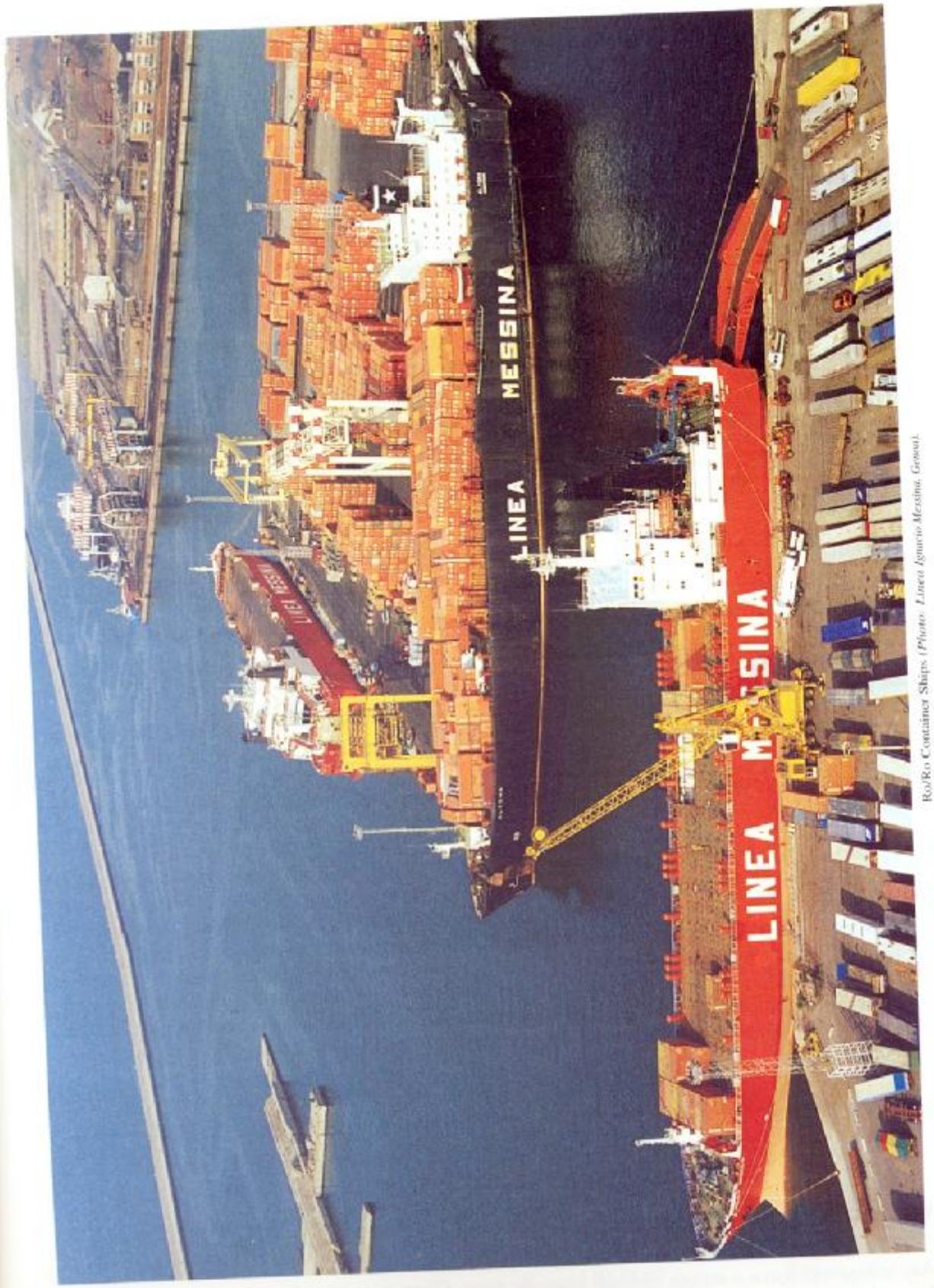
Vehicles should never be moved by means of the starter motor.

Engines should never be started by using reverse or low gear or when moving vehicles down the ramps or pushing or towing them with other vehicles.

Vehicles should not be moved under their own power unless adequate ventilation is provided to dispel the fumes.

Where slings are used, spreader bars should be of sufficient length to prevent any contact of the lifting gear with the vehicle itself. When lifting nets are used, it must be ensured that the body work is not touched by any part of the net.

Steel work should he padded where necessary to prevent risk of damage to painted surfaces.



Ro/Ro Container Ships (Photo: Linea Ignacio Messina, Genoa).

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

Drag ropes should be fitted where necessary to the platforms, front and/or rear of vehicles, to improve control and manoeuvring.

Scissor gear should never be used.

Vehicles must not be shipped as deck cargo without the shippers' knowledge and/or consent.

Engines should be switched off, together with all electrical systems. Hand brakes should be applied firmly. Vehicles stowed athwartships should be left in gear or in the parked mode for automatic vehicles. N.B. these latter requirements should not normally be carried out for vehicles parked fore and aft.

Check that the bonnet, boot lid or tail gate and windows are properly closed and that the keys are not left in the boot lid or door locks.

IMDG Code requirements should be followed regarding the disconnection of batteries, the taping of battery terminals and the requirements for petrol in the tank.

Vehicles should not normally be stowed closer than 230 mm (9") to each other or any stanchion, ladder, bulkhead, etc. Some manufacturers require a greater clearance between each vehicle and the nearest obstruction. If a row of vehicles are being stowed one alongside each other, then the clearance for the end car (to allow the driver an exit) should be not less than 400 mm (16"). N.B. Australian labour require 450 mm clear between vehicles.

It is the Master's responsibility to ensure that all vehicles are correctly secured in the stow.

Each vehicle should be secured by at least 4 lashings, more if stowed athwartships. Approved lashing points may be provided by the shipper, however, normally the requirement is to secure by a point that will not be affected by the suspension; e.g. towing brackets; leaf springs (near shackle); axle beam; special brackets. However, heavy vehicles may require one or more lashing to be taken from the chassis.

Normally lashed vehicles should not be left in gear, except when the vehicle is parked athwartship.

Lashings should be taken down and away from the vehicle, so as not to foul any part of the body work, while providing both downward and horizontal restraint. On no account should vehicles be secured to each other.

In the process of stowing and securing vehicles, labour should not be permitted to climb over the vehicles, crawl across them or stand upon them.

Personnel employed to drive and secure vehicles should hold valid driver's licences. They must be issued with clean overalls which should not have metal buckles nor fastenings which could damage upholstery or paintwork.

Special attention should be taken when removing lashing equipment, so as not to damage the vehicles.

No attempt should be made to move or lift a vehicle while any lashings are still in place.

Unpacked vehicles in *ISO containers* — it may not always be possible to drive vehicles into a closed box container, since the restricted internal width of the container may prevent the vehicle doors being opened. Securing is best achieved using both lashings and timber shoring. Lashings should be taken to the appropriate lashing points in the container floor and timber shoring nailed alongside the wheels, in front of the front wheels and behind the rear wheels. Timber across the front and rear should be chamfered to reduce wear and rub in the tyres. Other cargo should not normally be stowed in the same container, though, if space permits, suitable bagged stuff may be stuffed to form a level support onto which the vehicle may be rolled. Access to the lashing points must still be possible with this type of stow.

MOTOR SPIRIT		See Gasoline and Case Oil	
MOULDING POWDER		1.53	Bags

Any spillage will leave a strong residual phenolic taint. Great care must be taken to guard against spillage and clean up any residue.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
MOWA, MOWRAH		1.76/1.84	Bags

The seeds of the mowrah plant. See Grain.

MOWA CAKE **MOWRAH CAKE**		1.64/1.67	Bags

An oil cake which is very liable to heat and to spontaneous combustion, on which account it should be given 'tween deck stowage remote from source of heat and inflammable cargo, well ventilated and not overstowed with other cargo. See IMDG Code.

See Oil Cake.

MUD COAL		See Slurry
MUDSLURRY		See Slurry
MULES		See Part 2, Livestock
MURIATE OF POTASH **(Potassium Chloride)**		0.81/1.12 Bulk

White crystals, in granulated and powder form. Used for production of chemical fertiliser. Angle of repose 30 to 47 degrees. See Fertilisers.

MUSK		Packed in Tin Lined Cases

A highly scented substance obtained from near the navel and other parts of the musk deer found in Central Asia, Indonesia, Ceylon, etc. The name is also given to plants with a similar scent.

A valuable commodity, especially the Tibet and Tonquin musk.

Must be stowed well clear of tea, edible and other goods liable to be damaged by the strong odour always present where musk is. Treat as Essential Oils, which see.

MUSK FUR **MUSQUASH**		2.79/4.18	Bales and Cases

The fur of the musk rat or musquash, a beaver-like animal but much smaller. See Furs.

MUSTARD SEED		1.81/1.95 1.56/1.62	Bags New Crop Bags Old Crop

An oil bearing seed, which yields about 25 per cent of oil. See Grain.

MUSTARD SEED OIL	1.37/1.42 1.48/1.53	Tins in Cases Drums

See Vegetable Oils.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
MUTTON		3.40 Mixed 3.15	Carcases Mutton/Lamb

See Lamb.

MYRABOLANS — See Mirabolans

MYRRH  — In Cases, Sometimes Tin Lined

A transparent, bitter gum resin which exudes from a small tree found in Nubia and Arabia. Valuable. See Gums.

NAILS		0.84 0.75 0.84/0.98	Cases Bags Kegs

Ordinary dry stowage. Bags are best stowed in a block to avoid chafe.

NAPHTHA 

See Part 2, Petroleum Cargoes.

NEATSFOOT OIL	1.95/2.09	Drums Bulk

Shipped from Argentina, U.S.A., etc.

Avoid stowing over Tallow, Stearine, etc., often shipped at the same time. See Vegetable and Animal Oil constants, Appendix 7.

NEWSPRINT  — See Paper. Also Part 2, Neobulk.

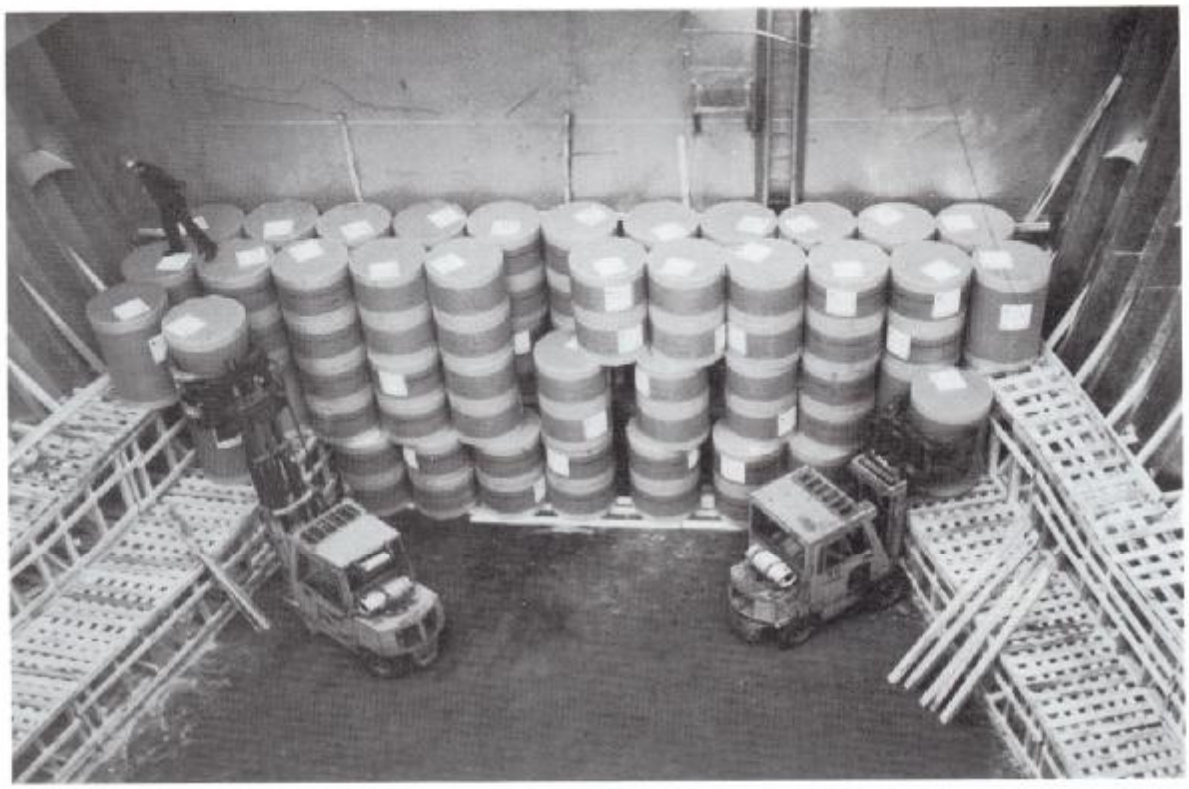
NICKEL BRIQUETTES — Pallet Loads

Dust given off is slightly toxic. *ISO container* — 18 tonnes payload 20 ft container.

NICKEL ORE	0.67/0.70 0.56 0.28/0.36	Barrels Bags Ingots

A mineral mostly obtained in Canada, France, Germany and Australia; alloyed with copper it forms nickel plate; with copper and zinc it forms German silver. Special armour steel (nickel steel) is made by adding about 4 per cent nickel to the steel. Nickel ore is normally shipped in bulk as a concentrate.

It may shift if the moisture content is above the acceptable "transportable moisture content". (See IMO Code of Safe Transport for Solid Bulk Cargoes).



Newsprint loaded at forward end of hold. Note extensive bridging down the wings.

Adequate dunnaging is essential. Note left-hand role with supplementary timber. Centre roll may be discharged damaged.

Woodpulp and Newsprint awaiting loading (Photo: Forth Ports Plc).

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
NIGER SEED		1.76/1.78	Bags

An Indian oil bearing seed. The seeds are black and shiny and yield about 40 to 45 per cent of oil.

NIGER SEED CAKE		1.50/1.56	Bags

An oil cake, the residue of niger seed after the oil is extracted. See Oil Cake. (See Seed Cake).

NIGER SEED OIL		1.67/1.78	Barrels/Drums

This pale yellow oil — not unlike rape seed oil in appearance — is obtained from the niger seed (which see), has a sweet taste but very little smell.

See Vegetable Oil Constants, also Barrels, Stowage of. Refer FOSFA International Procedures and Acceptable Previous Cargoes.

NITRATE OF SODA **(See Fertilisers)**		0.84/0.86 0.98/1.00	Bulk Bags

A natural deposit of sodium nitrate found encrusting the soil in certain regions of Chile and Peru — used as a fertiliser and in the chemical industry but usually prepared synthetically.

In the case of fire, all nitrates augment the rapidity and violence of the conflagration, so that this cargo should be stowed well removed from goods liable to spontaneous combustion.

Any fire in a compartment involving nitrate can best be extinguished by flooding with water. Selected hatch covers should be opened to prevent an explosion due to pressure.

Clean nitrate of soda is an anhydrous salt, which, in its granular form, is almost completely dust-free and it is normally shipped in the dry granular form.

It is shipped from Tocapilla, Chile, normally in bulk (usually as full cargoes) by means of a fast mechanical loader. Some small amounts are, however, still shipped in jute or polythene-lined jute bags.

Moisture content of nitrate by analysis immediately prior to loading in Chile is usually 0.1 to 0.3%, after arrival at destination does not normally vary from this figure, although if discharged in particularly humid conditions, the hygroscopic nature of the material can result in a slight increase of moisture content of about 0.05%.

Masters of vessels carrying nitrate are recommended to keep all hatches and ventilators closed during the voyage to avoid any possibility of moisture pick up which would be prejudicial to the normal free running characteristic of this commodity.

It is shipped in a dry granulated form.

See IMDG Code.

NITRATES **(See Fertilisers)**		1.11	Bags, Bulk

In the case of fire all nitrates augment the rapidity and violence of the conflagration, and so should be stowed well apart from all cargoes liable to spontaneous combustion, and free from contact with sulphur, charcoal or acids. For various classes of nitrates, see IMDG Code.

(See IMO Code of Safe Practice for Solid Bulk Cargoes).

NITRE		See Nitrate of Soda

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

NITRE, SWEET SPIRITS OF 

Its carriage is governed by the same Regulations as Petroleum Spirits. Stow in a cool place.

NITRIC ACID 

A corrosive liquid. Dangerous Goods. On deck stowage, clear of acids and inflammable materials.

See IMDG Code.

NITRO CHALK  See Fertilisers

NITROLINE See Cyanide

NITRO PHOSKA  See Fertilisers

NUTMEGS  1.67/1.81 Large Cases; 1.81/1.95 Small Cases

The aromatic kernal of the fruit of an East Indian tree, valued for its spicy properties. An oil (nutmeg butter) is also obtained from same.

NUTMEG OIL 

Or Oil of Mace. See Vegetable Fats.

NUTS Bags or Bulk

Many kinds of nuts valued for their edible or oil-bearing properties are dealt with herein. Nuts are very liable to heat and deteriorate. To guard against this they should be stowed in a cool, dry and well-ventilated space away from engine room and boilers, well dunnaged and not overstowed. They should also be kept apart from dry and delicate goods. Nuts which have been wetted by rain, etc., should not be shipped until they are thoroughly dry, and the bleeding of bags should on no account be permitted. See Part 2, Techniques, Bag Cargo, also Grain.

NUX VOMICA  1.67/1.81 Bags

The nut-like seeds of a tree growing on the Coromandel Coast, etc., from which strychinine is prepared — valuable for medicinal purposes, etc. Stow well away from tea. See Nuts for stowage, etc.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
NYLON POLYMER (Terylene Polymer) (See Plastic Resins)		2.23/2.79	Paper Sacks Bags IBCs

Extruded into minute filaments. Granules made from "chopped strand". Clean and odour-free. Must not be contaminated by any other cargo — addition of foreign matter also spoils the flow characteristics. Different types of polymer must be kept well separated from each other.

May sift and contaminate adjacent bagged foodstuffs (e.g. Rice) if not adequately separated, hence rebagged sweepings can only be disposed of by salvage sale.

ISO containers — suitable for Close Box containers and insulated containers. May be carried in bulk; containers must be lined and/or properly cleaned. Payload varies from 15.5 tonnes (Insulated containers) to 17.8 tonnes in General Purpose containers. IBCs in containers may only achieve 14 tonnes.

OAK		1.11/1.17 1.20/1.31 1.39/1.53	Sawn (English) Sawn Staves

The stowage factor of oak, like that of all timber, varies considerably.

Avoid stowing green oak with steel or galvanised iron products as such gives off acetic acid gas which causes steel, iron, etc., to rust.

See Timber.

OAKUM		2.51/2.79 1.95/2.09	Ordinary Bales Pressed Bales

Tarred hemp in the "unlaid" condition sometimes obtained by unravelling and teasing old rope.

Oakum should be treated as wet cargo and stowed accordingly as the tar content is liable to run in warm weather. Though very light cargo, it should never be used for beam fillings or for overstowing fine cargo. See IMDG Code.

OATMEAL		1.81/1.95	Bags

Dry stowage. Treat as for Flour.

OATS		1.81/2.06 1.67/1.94	Bags Bulk

The hardiest of all cereals, will grow in practically all countries from the Arctic Circle to the Tropics.

9–10% moisture content a normal figure at time of loading.

Like all grain, but more so than most, it is liable to heat and turn sour. Many heavy claims have resulted from the stowage of oats in compartments above that in which maize was stowed, damage by heating and sweat resulting therefrom, and the Courts have held that such is "Improper Stowage".

ISO containers — suitable for 20 ft bulk containers, achieves maximum weight payload. If loaded as bulk in closed box containers may give high side wall deflections. For this reason some plywood panelled containers may not be suitable for such cargo — too high a side wall deflection may cause the container to foul the cell guides or other containers.

See Grain.

OBNOXIOUS CARGOES — See Part 2, Techniques

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
OCHRE		1.39/1.67	Drums and Barrels
PUREE		2.23	Bags
			Polythene Lined Paper Bags

A clay-like substance strongly impregnated with oxide of iron, chiefly red and yellow. Is used as a pigment in colour making. Liable to stain other cargoes.

ISO containers — provided bags are sound the container does not require lining against contamination. Payload for 20 ft closed box containers may be 17.5 tonnes.

OFFAL — See MEAT, SUNDRIES 

OILS AND FATS 

The oils of commerce may conveniently be divided into the following principal classes:—

Essential oils, which normally move in small quantities. Many of these are in the nature of valuable cargo. Nearly all have a very strong odour hence leakage can taint other sensitive cargoes.
Animal and Fish oils. These are carried in plastic containers or drums and some varieties in bulk.
Vegetable Oils. These are carried in barrels or drums and some varieties in bulk.
Refer FOSFA Procedures and Previous Cargoes.
Mineral Oils. See Petroleum and Petroleum Products. Part 2.

A large number of oils and fats are referred to herein under their specific names. See also Vegetable Fats, Vegetable Oils, Vegetable and Animal Oil Constants, Essential Oils. See IMDG Code. See Part 2, Oils and Fats.

OILSEEDS (Also See Seed Cake)		1.53/1.95	Bags. Varies considerably. Bulk, as Meal or Pellets.

These are the seeds of plants that have a high content of oil or fat that may be extracted commercially to produce edible products. Typical examples are soya beans and cottonseeds. This category also includes some specialist seeds like cocoa that have other uses.

They may be shipped in bulk or in bags. As with grains, the key to their safe shipment is the moisture content. The moisture present in oilseeds is contained in the non-oil bearing part of the seed, so values determined in the laboratory may appear to give a false picture. For example, if an oilseed contains 20% oil and has a moisture content of 13% the actual moisture in the non-oil part of the seed is $13 \times \frac{100}{80}$, i.e. 16.25%.

As with grains, the moisture content of oilseeds dictates their stability during shipment. Exactly the same physical processes govern the moisture relationships between the oilseed and the surrounding air. There is an added complication that, depending on the composition of the oil present in the seed, there may be a potential for spontaneous heat damage, which in extreme cases can lead to actual combustion.

There are several stages to such damage. The first stage is the growth of microorganisms which liberate heat and further moisture. This can cause an increase in the temperature of parts of the cargo. Temperatures achieved by microbial growth can be as high as 70°C. Above this point, microbial growth ceases, and further rises in temperature depend on chemical reactions occurring in the cargo.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

When oilseeds undergo spontaneous heating, a chemical reaction begins. Typically, this happens at temperatures above 55°C, and Masters can take this value as being critical. If cargo temperature is being monitored and is increasing steadily, then once it reaches 55°C expert help should be requested, as there is a high potential for spontaneous heat damage to occur.

The chemical reaction is oxidative, and liberates large quantities of heat. The heat is liberated faster than it can be removed by cooling (either natural or by ventilation). The heat causes damage and this may be seen as a darkening of the cargo, sometimes there is actual charring. Chemical changes occur in the composition of the seeds so that their quality drops. In extreme cases, there may be actual combustion that may take the form of either smouldering or ignition, to create a fire.

For this reason, many oilseeds and oilseed derived products are classified as dangerous, under IMDG Codes. Relevant standards for moisture and for safe carriage, have been promulgated, and Masters should consult the appropriate parts of the Code.

Not all oilseeds behave this way. For example, cocoa beans do not heat spontaneously, although they can undergo microbial heating. Whether or not an oilseed has the potential for spontaneous heating depends on the composition of the oil it contains. Those with more saturated oils, e.g. cocoa, are less likely to heat spontaneously than those with high levels of unsaturated oils, e.g. soya.

(See IMO Code of Safe Practice for Bulk Cargoes).

OIL CLOTH  1.39 Rolls

Certain kinds are classed as Dangerous Goods — see IMDG Code. See also Linoleum and Congoleum.

OITICICA OIL  0.92 Drums

Oil obtained from the oiticica nut, used in paint making. Shipped from Brazil, usually in drums. Wet stowage. See IMDG Code.

OLEO STEARINE  1.81/1.95 Bags
2.23 Casks

An extract from lard. Cool stowage away from odorous cargoes.
See also Tallow and Stearine.

OLIBANUM A gum — see Gums

OLIVES  1.90/1.95 Kegs. Drums.

A fruit from which is obtained olive oil, the pulp yielding from 40 to 55 per cent and the kernels from 13 to 15 per cent, the latter being of inferior grade.

In the pickled form, olives are valued as a delicacy. Wet stowage.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
OLIVE OIL		1.67/1.73	Drums Bulk

See Part 2, Oils and Fats.

An edible oil obtained from the pulp and kernel of the olive (which see) shipped in considerable quantities from various Mediterranean, Spanish and Portuguese ports, etc., the coarser qualities being used for soap making, etc.

Colour varies according to quality, the best grades being of a yellowish tint, whilst the coarser quality is of a brownish colour and sometimes has a greenish tinge. See Vegetable and Animal Oil Constants, Appendix 7.

ONIONS		2.23/2.29 2.6/3.8	Cases and Crates Bags, 40 = 1000 kilos

Onions may be carried either at ambient temperature or under refrigeration. If refrigerated, then a temperature of zero to 1°C is ideal.

Over recent years, onions have been shipped successfully from New Zealand in ventilated containers without temperature control. So long as the onions are kept dry, this method works well.

If the onions have been refrigerated, it is necessary to permit the temperatures to rise slowly for some days, prior to arrival at a port with high ambient temperatures. This will prevent sudden condensation of moisture from warm humid air impinging on cold onions. If this happens, then rotting will ensue rapidly.

It is usual for shippers to give specific carriage instructions to avoid this problem. As a guideline, the carriage temperature should be increased at a rate of about 1°C every 24 hours for about a week, prior to arrival.

Onions give off large quantities of moisture during shipment. Good ventilation is essential to remove this from holds to prevent rotting.

OPIUM		Small Cakes in Cases

The inspissated juice of the white or sleepy poppy — variously prepared for use. This highly narcotic drug is poisonous and is in great demand by the illegal drug market.

It is a highly valuable commodity and should be stowed in the strong room and carefully guarded against pilferage. Packages should be carefully examined before shipment and any showing signs of having been tampered with rejected.

The importation of opium and like narcotic drugs is only permitted to most countries under very strict regulations.

Opium smuggling by crews is to be most carefully guarded against. Many world syndicates have found this illicit traffic very remunerative and resort to all sorts of devices to attain their ends. Without the connivance of someone on board the ship, their operations are hampered.

OPOSSUM SKINS		6.25	Bales

See Furs.

ORANGES		2.37/2.51 1.67/1.81	Cases Cartons

Are exported in large quantities from Spain, Portugal, Italy, Brazil, Azores, W. Indies, Florida, California, Israel, S. Africa, etc.

Jaffa oranges average 26/29 kg per case. Avoid stowing edible goods near or into the same compartment as Oranges. The odour which oranges leave behind after discharge has frequently been

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

responsible for heavy claims for taint damage to such commodities as meat, eggs, flour, butter, etc., subsequently carried in the same compartments. Clean stowage. Usually stowed refrigerated.

Orange juice is also shipped hard frozen in plastic drums. Careful stowage and securing required. On passage these drums may chafe and leak. Check rim seals prior to shipment. Stow to avoid possible contamination or taint due to leakage.

See Citrus. See Fruits, Green, also Refrigerated Cargoes, also Tainting Damage.

ORANGE OIL  1.39 / 1.95 — Barrels / Cases

Shipped from E. Africa, etc. Pungent smell, stow well away from goods liable to taint. Good ventilation.

ORCHELLA  2.51 / 2.79 — Bales

A lichen obtained from rocks on the coasts of S. Africa, S. America, Madagascar, etc., from which the blue dye known as archel or orchil is obtained. Must be stowed in a dry place and away from moisture or wet goods.

ORES  Bags / Bulk

Must be kept separated from other cargoes particularly foods and fine goods — to avoid damage from sifting, moisture or contamination. Different types of ores should be kept separate from one another to avoid cross contamination.

By their very nature ores are heavy, and care must be taken to ensure appropriate distribution of weight — particularly in *ISO containers* and 'tween decks.

An increase in moisture content increases the chance of bulk ore shifting. See also Part 2, Techniques.

(See IMO Code of Safe Practice for Bulk Cargoes).

ORRIS ROOT  Bags or Bales

The dried, highly scented root of various kinds of the Iris plant, valued for its medicinal properties and in the perfumery trade, which is exported from some Mediterranean ports.

Dry stowage, remote from edible goods, and from oily materials.

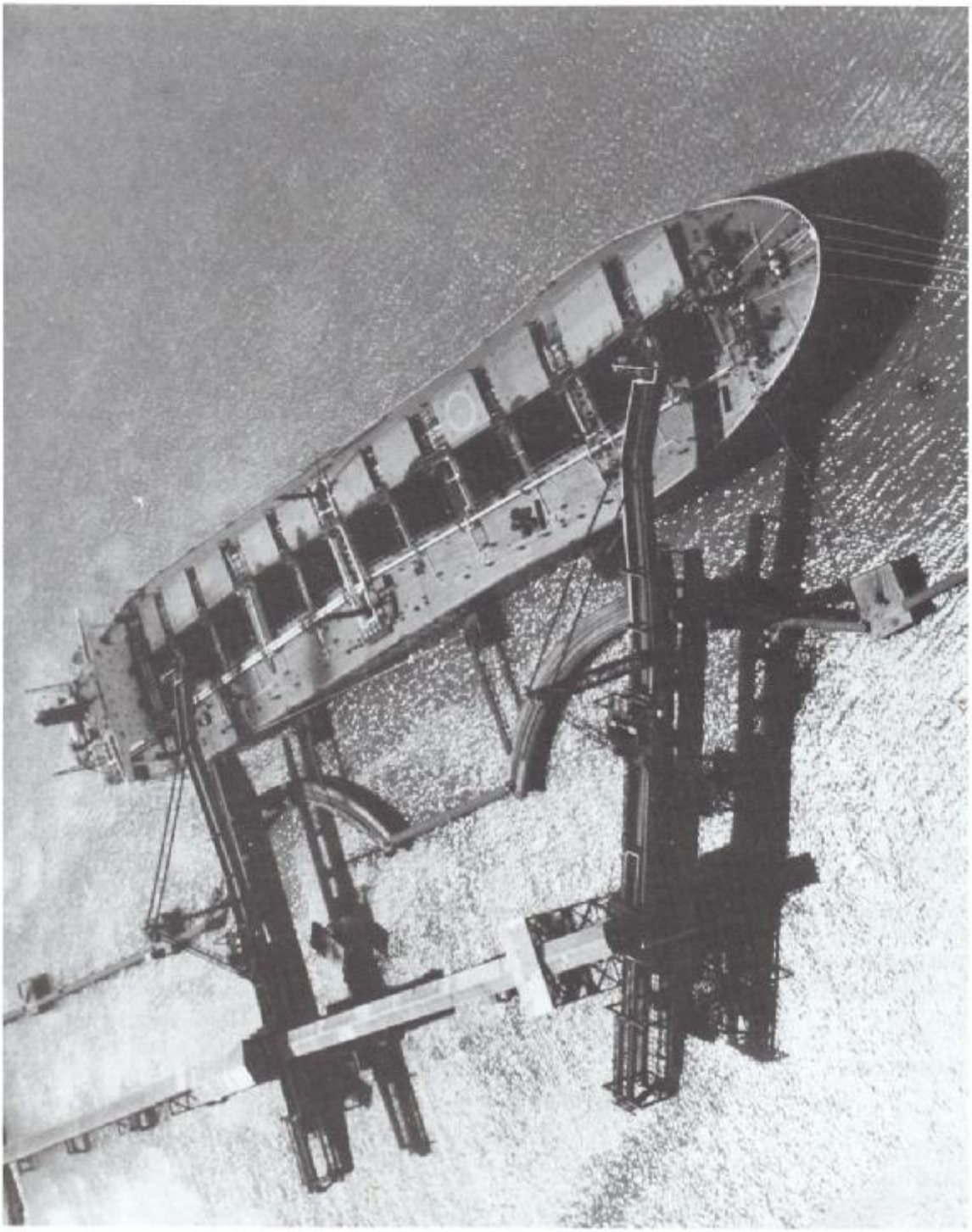
OTTO OF ROSES  See Attar of Roses

OX GALL  Drums

Odorous. Do not stow with foodstuffs or goods susceptible to damage by taint.

PADDY  1.81 / 1.95 — Bags

Is the name applied to rice before the husks are removed. See Rice.



Ore/Oil carrier alongside ore terminal. (*Photo: Bulk Systems International*)

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
PAINT		0.50/0.56	Drums

Ordinary wet stowage suitable to its weightiness. Oil based paints are inflammable and may be classed as Dangerous Goods. Water paints and some zinc silicate paints do not have dangerous properties but are damaged if frozen. There is a toxic danger from some solvents. See Dangerous Goods. See IMDG Code.

PALAY 	See Rice	
PALM KERNELS 	1.39/1.67 1.67/1.95	Bulk Bags

Are obtainable from the fruit of a certain palm tree grown in large numbers in W. Africa, etc.

The kernels yield an oil (about 45–50 per cent) which is much in demand for the manufacture of cattle food, soaps, etc. Like nuts, they are liable to heat and sweat; for stowage see Nuts.

PALM ACID OIL 

Palm acid oil is the by-product of the alkali refining of palm oil. In view of the fact that physical refining has largely displaced alkali refining in South-East Asia very little palm acid oil is now shipped. Its free fatty acid content is considerably lower than that specified for palm fatty acid distillate, the requirement being that it should contain at least 50% of free fatty acids. Palm acid oil is likely to be very dark in colour, and may contain traces of mineral acid.

Palm acid oil is likely to be used in the production of low-grade soap.

PALM FATTY ACID DISTILLATE (PFAD) 

Palm fatty acid distillate is the by-product of the physical refining process used in South-East Asia to refine palm oil. It normally has a free fatty acid content of at least 70% and, due to its high content of palmitic acid, is relatively high-melting. It therefore needs to be maintained at a temperature above ambient when being shipped, but the high free fatty acid content makes it important to avoid overheating. The recommended temperatures for storage and shipping are 42–50 degrees C, and 67–72 degrees C during loading and discharge. The density of Palm Fatty Acid Distillate is approximately 840 kg/m^3 at 80 degrees C. It is normally bright orange in appearance, but if it has been mixed with palm acid oil the colour is likely to be dark.

Palm fatty acid distillate is used as a raw material for the production of fatty acids or in the production of soap.

PALM KERNEL OIL 

Palm kernel oil is the oil obtained by crushing and extracting the kernels found in the palm fruitlet. It is therefore produced in those countries specialising in palm oil production. In contrast to palm oil, it is a relatively light-coloured fat which only melts completely when its temperature is raised to above 35 degrees C. The density of palm kernel oil is 890 kg/m^3 at 60 degrees C. Palm kernel oil is exported principally from Malaysia, the destinations being Europe, North America and Japan.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

It is possible that small quantities of palm kernel oil fractions, e.g. palm kernel oleine and palm kernel stearine, will also be exported. These fractions are normally produced as refined oils. Palm kernel oleine is partly liquid at ambient temperature, whereas palm kernel stearine is a hard fat requiring elevated storage temperatures (32–38 degrees C) to maintain it in a pumpable condition. The free fatty acid content of the refined oils is normally below 0.1%.

Palm kernel oil and its fractions are used widely in the production of edible fats but are finding increasing application in the oleochemicals industry for the production of fatty acids, fatty alcohols and their derivatives.

PALM OIL		1.62/1.67	Drums
		1.05	Bulk

Palm oil is obtained from the fruitlets found in large bunches on the oil palm, grown extensively in Malaysia, Indonesia and other countries having a tropical climate. In order to avoid rapid deterioration of the oil after recovery from the fruit the complete bunch must be sterilised as soon as possible after harvesting. Crude palm oil is normally sold against a specification of "not more than 5% free fatty acid". It is a dark-red oil which will contain a considerable amount of solid (crystallised fat) at ambient temperature in regions of temperate climate, but the oil remains sufficiently liquid for pumping purposes at the temperatures prevailing in the regions where the oil is produced. The recommended temperature range for storage and bulk shipments of the oil is 32–40 degrees C, and for loading and discharge is 50–55 degrees C. Palm oil is exported on a large scale as the crude oil to various Asian countries but Malaysian palm oil is generally refined and processed for export to Europe as refined, bleached and deodorised (RBD) palm oleine and RBD palm stearine. RBD Palm stearine is a hard fat which should be maintained at a temperature of at least 40 degrees C, but not more than 45 degrees C, if handling problems are to be avoided.

At 50 degrees C the specific gravity of palm oil is approximately 890 kg/m^3.

Palm oil is used extensively as an edible oil (after refining) but can also be used for the production of fatty acids and other oleochemicals.

See Part 2, Oils and Fats. See Appendix Table No. 7.

PANOCHA			Bags

Philippine local produce. Solidified sugar syrup dehydrated into hemispherical shape in coconut shells. In bags. Susceptible to high temperature damage.

PAPER	 	1.2/2.65	Reels
		1.3/1.8	Bales
	Kraft	1.67	Rolls
	Newsprint	1.81	Rolls
		1.39	Half Cases

Ordinary paper in rolls, stows, on average at about 2.51 M3/tonne. With a good selection of rolls and a suitable ship 2.37 M3/tonne will suffice, while with contrary conditions it may run to 2.65 M3/tonne.

Paper is made from vegetable matter reduced to pulp, such as wood, esparto grass, flax refuse, straw, jute, also rags. Spruce, Balsam, Hemlock, cottonwood and other timber are used in great and increasing quantities for paper making, especially in Scandinavia, Newfoundland, Eastern Canada, United States and British Colombia.

Very vulnerable to mechanical damage, also to damage by wetting. Distorted, torn or cut reels of paper may lose part or all of their value to the consignees.

Paper is usually shipped in rolls the ends of which are, in some cases protected by circular discs of wood; in other cases the rolls are simply wrapped with thick paper with extra layers over the ends.

Commodity *Characteristics* *M3 per Tonne* *Packaging*

Rolls of paper vary from 600 mm to 2,030 mm in length, i.e. width of paper while the diameters vary considerably, averaging in a mixed shipment about 900 mm.

Typical dimensions and weights might be:—

Diameter	*Height*	*Weight*
1535	835	
1125	1625	Up to 1200 kg each
1420	1220	
1050	1200	810 kg
800	1240	
960	960	
1010	960	769 kg
1010	900	756 kg
1010	650	716 kg

Rolls of paper should be stowed solid and well chocked off to avoid movement when vessel is at sea.

It is essential that the ground tier be stowed on a firm level floor, otherwise the bottom rolls will get badly distorted and claims for damage due to improper stowage will likely ensue. When mixed cargoes are carried, the floor can be levelled off up to turn of bilge by other suitable cargo — clean, dry lumber being particularly useful for this purpose. Clean, dry bagwork is very suitable.

In end holds, the greatest care should be exercised to ensure that the platform on which the ground tier of rolls is stowed is both level and firm. When a full cargo of paper is carried, the most satisfactory way of doing that is by building a platform consisting of a series of steps — width to suit the diameter of the larger rolls — the platform resting on substantial bearers.

All stanchions, ladders, etc., should be well covered with protective material to avoid chaffage of rolls; and dunnaging should be thorough throughout.

Soft rope slings should be used for slinging paper rolls — alternatively rubber tubing is fitted over the rope sling to avoid tearing the paper. Loading or discharging of paper rolls by swinging derricks should not be resorted to owing to the difficulty of keeping rolls from banging against hatch coamings, ship's side, etc., which tends to destroy their shape, to avoid which is most essential. Large shipments of reels are commonly handled by fork lift trucks equipped with clamps.

The dragging of rolls from wings or ends of compartments to square of the hatch should be prohibited.

The use of cargo hooks, crow or pinch bars should never be permitted when handling paper.

The amount of broken stowage with a cargo of paper is very considerable, the smaller rolls may, with reasonable care, safely be utilised for "fillings" in the wings, etc. However much paper moves in full shipments. See Part 2, Techniques, Neobulk.

Reels of paper are not suitable modules for *ISO containers*, giving a very poor payload and causing handling problems at time of stuffing and stripping. Further, they may suffer moisture migration and sweat in a closed box container. Typical payload of a 20 ft container might be 16.8 M3, net weight 14.5 tonnes.

Chinese paper — is made from bamboo bark of fine quality, brownish in colour and used principally for lithographic work. Shipped in strong cases from China. Special stowage in a dry place.

Japanese paper — is made from the bark of a certain mulberry tree and used principally for lithographic work. Shipped in cases. Special stowage in a dry place.

Recycled paper may be compressed into high density bales. These bales may themselves be grouped into units, usually about 12 bales to the unit. Stowage factor approximately 3.9 M3/tonne. Guard against risk of fire. See IMDG Code.

Rice paper in cases, stows at 2.23/2.37 M3/tonne. Prepared from the pith of a tree grown in Formosa.

Coated paper — one side gummed. Very susceptible to moisture damage. See also Neobulk Cargoes.

Carbon Paper — see IMDG Code.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*

Paper board on reels average 4 to 7 M3/tonne, and when packed in bales 1.5/2.3 M3/tonne.

Paper is frequently shipped from countries which have very cold winter climates. Large claims have resulted from such cargo being ventilated. The temperature of the reels should be checked at the time of loading and ventilation regime should be based on such temperature measurements.

PAPER OR WOOD PULP		1.25/1.39	Loose Bales
		1.25/1.39	Unitised Bales
		1.45/1.56	Wet Pulp

Made from various kinds of timber and shipped in large quantities from Scandinavia, Canada, U.S.A., etc. Various processes are used in the manufacture of pulp according to the class of timber used; the principal processes being the sulphate and soda, ground wood or mechanical, and the sulphite processes.

Wood pulp is shipped in compressed bales both as "Dry", and occasionally as "Wet" pulp.

Wet pulp should not be stowed over any cargo liable to damage from drainage, not in the same compartment as dry or other goods, such as flour, seeds, canned goods (which see), etc., liable to be damaged by moisture.

Dry pulp should for the same reason be stowed apart from such goods.

Wood pulp is very liable to damage from any fibrous material. During handling it must be kept clear of any contact from ropes, etc., and should be loaded and discharged with wire or chain slings. Unless especially designed, the wire binding is not suitable as a lifting point. Holds should be clear of any matter that could become embedded in the bales.

Similarly especial care must be taken when cleaning up after a grain shipment. Large claims have had to be met in the past through contamination of wood pulp by grain.

In considering the stowage of this cargo, suitable stowage must be found away from any cargo containing or covered by fibrous materials, such as hessian on bales of wool, Sisal, Burlap, etc.

Bales of pulp may, in some ports, be strapped together into units. A typical configuration might be units made up of 12 bales each, with 12 units (weighing approximately 20 tonnes) forming a single lift.

PARAFFIN WAX		1.39/1.53	Bags
		1.95/2.09	Barrels
		1.95/2.01	Cases
			Bulk

A white transparent substance obtained by distillation from petroleum, shale oil, coal, etc., and used for the production of petroleum jelly, candles and paper waxes.

Paraffin Wax is derived from the heavy end of the crude oil distillation process. Slack Wax (a dirty form of Paraffin Wax which still contains gasoil) is shipped to refineries, where it is processed to produce refined Paraffin Wax. The carriage of Paraffin Wax is generally undertaken by chemical tankers and carried in liquid form. Careful attention should be paid to shippers' instructions regarding carrying temperatures, as various grades of refined Paraffin Wax have a melting point between 50 degrees C and 71 degrees C. The discharging temperature is normally about 76 degrees C.

FOSFA describes Paraffin Wax as a Fatty Alcohol along with Latex, Tallow, etc.

The earlier practice of carrying Paraffin Wax in dry cargo ships' deep tanks and dedicated oil tanks and allowing the product to solidify has now ceased. Frequent problems were encountered during the re-heating process, including uneven temperature distribution producing lumpiness and overheating resulting in the product being off-specification in colour.

See IMDG Code. See Part 2, Petroleum Cargoes.

PATCHOULI PATCH		4.46	Bales
		11.15	Loose

The dried branches of a tree grown in India and the E. Indies from which a very pungent perfume is obtained. Stow clear of foodstuffs.

See Essential Oils.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
PATCHUK		See Putchok	
PEACAKE		1.39/1.45	Bale Bulk
See Seed Cake. Shipped from F. East.			
PEACHES		3.78 See Part 2, Refrigerated Cargoes.	Cartons
PEANUTS		See Ground Nuts	
PEAPULP		1.81/1.95	Bag
Moist goods; shipped from F. East.			
PEARLS		See Specials	
PEARS		2.26/2.29 2.05/2.96	Cases Cartons

Pears are packed in boxes or cartons each fruit being wrapped in paper.

Essentially, the same carriage conditions as apples. Note that pears are very susceptible to small changes in temperature, and ripen readily as a result. During ripening, they soften appreciably, and then are subject to severe bruising and mechanical damage. Good packaging will minimise, but not prevent this.

Shipments of pears should be examined carefully before shipment, to ensure they are not already ripening and are not bruised.

Good ventilation is essential, and carbon dioxide levels must be kept below 2%.

PEAS	 	1.45/1.75 1.28/1.39	Bags Bulk
	Quick Frozen	2.03	Cartons

Peas of various kinds are shipped in bags, but on occasions in bulk. May be liable to infestation.

Grain Regulations, which see, apply to their carriage. See remarks, on Beans, which generally apply, especially to peas in bulk. Also see Vegetables.

Quick frozen. Carriage temperature −15/ − 18 degrees C.

See Part 2, Refrigerated Cargoes.

PEBBLES (sea) 0.59 Bulk

Round pebbles, roll very easily. Should be overstowed with a layer of sacks. Angle of repose 30 degrees.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
PELLETS (concentrates)		0.47	Bulk

Angle of repose 44 to 47 degrees.
See Part 2, Ores.

PELTS  See Furs, Hides, Skins. For Pickled Pelts see Wet Hides.

PEPPER  2.06/2.51 Bags

The principal kinds of pepper, all valued for their spicy properties, are:—

Black pepper, the dried fruit of a small E. Indian tree.
White pepper, the same fruit with the outer covering removed.
Cayenne Pepper, Chillies, which see.

Other varieties are long pepper, shipped from India, bell pepper, bird pepper, etc.

Black and white pepper are shipped from the principal ports of the Far East, notably Singapore and Penang. The two kinds should be stowed well apart, preferably in separate compartments.

Pepper is very liable to heat and sweat (though white pepper produces less sweat) and for that reason it should not be stowed with fine and delicate goods such as tea, tapioca, etc., and it should, also, be stowed apart from moist and other goods liable to heat such as copra, jelatong, gambier, and from cubebs, onions, etc.

It should be well dunnaged and thoroughly protected from contact with beams, beam knees and other iron — avoid stowing too many heights — also, if possible, arrange to overstow suitable cargo with pepper so as to lessen the weight on lower tiers of pepper. If rattan is carried, they should be stowed in conjunction with pepper, i.e. rattan on the floor, up the sides and across bulkheads, three or four tiers of pepper, then a tier of rattan and finish with pepper. This gives ideal conditions for the proper carriage of the latter. See Dunnage.

Ventilation should be given constant attention.

ISO container — 2.22 M3/tonne approximately may be achieved. Open-sided containers, with tilts rolled up during transport and when weather protected. Dunnage (50 × 50 mm, 2" × 2") laid across the floor, and similarly half-way up the stow if a full container load. Pallets may be used instead of dunnage. Either must be suitably dry and clean. For short voyages may carry in closed box containers, with the doors hooked back while on board. The stowage position on board must allow adequate ventilation to flow around (and through) the containers, while maintaining protection from rain and spray. N.B. a refrigerated container with fans operating and without temperature control may also be suitable.

This is a valuable cargo and should receive suitable stowage and careful supervision during loading and discharge.

PEPPERMINT 

A pungent aromatic liquid, extracted by distillation from the mint plant. See Essential Oils.

PERFUMERY 

The raw materials from which perfumery is prepared are referred to under Essential Oils, which see.
The finished article is very valuable and is generally put up in sealed bottles packed in cases.
Special stowage in strong room.
See Part 2, Techniques, "Specials".

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
PERLITE ROCK		0.98/1.06	Bulk

Light grey, odourless, clay-like and dusty. Angle of repose 45 degrees.

PERSIAN GUM 

A gum exported from Middle East. See Gums.

PERSONAL EFFECTS AND ANTIQUES  2.83 Crates

Valuable. May be fragile. Advice should be sought before carrying out in container fumigation, as Methyl Bromide may linger in articles containing horsehair and other types of stuffing material. Great care should be taken when stuffing a container. Stow should be tight and well secured without damaging the goods. See also Furniture.

PERUVIAN BARK  See Cinchona

PETROLEUM COKE  1.25/1.68 Bulk

Petroleum Coke is the carbon residue produced from petroleum refining processes, and is the major source of synthetically produced carbon. Most Petroleum Coke is produced by the delayed coking process, although the specific properties of the resultant product are dependent on both the nature of the Feedstock and the operating (process) variables such as pressure, time, and coker heater outlet temperature during manufacture.

The major quality factors are sulphur content, volatiles, ash and thermal expansion. High quality, or "needle-cokes", have low thermal expansion, low ash content, high density and good crystal structure, and are used primarily in the manufacture of large graphite products such as electrodes. The lower quality "sponge cokes" are used primarily as fuel, and in the manufacture of anodes for the aluminium industry.

Petroleum Coke, when initially produced, still contains a significant proportion of volatile components, and is known as "Green Coke". That volatile content can be reduced to below 1% by a process called "calcining" (essentially, a heating process under non oxidising conditions): the two types of Petroleum Coke are also distinguished by the self-explanatory terms "uncalcined" and "calcined".

Petroleum Coke is frequently loaded when warm, although the requirements of the IMDG Bulk Code are (inter alia) that the temperature should not exceed 107°. There have been instances where excessively hot product has resulted in combustion.

To reduce dust contamination of the environment, the product is often loaded by conveyor via a water spray, and is therefore likely to be moist at the ship's side.

(Delayed coking is a semi-continuous process, in which the feedstock to the process is heated to a high temperature at high velocity, and then transferred to a large drum, which allows for the long residence time required for the cracking reactions to proceed to completion, thereby depositing the coke in the drum. It is this process which gives its name to the product.)

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
PETROL, PETROLEUM		See Part 2, Petroleum Bulk	

Petroleum, under the Systems and Technique section, should be studied in conjunction with the International Convention for Safety of Life at Sea (SOLAS Convention), the IMDG Code, the International Safety Guide for Oil Tankers and Terminals (ISGOTT) also the International Convention for the Prevention of Pollution from Ships, the MARPOL Convention and its Protocol together with the Clean Seas Guide for Oil Tankers.

PETROLEUM PRODUCTS			Cases Drums Deeptanks

See Part 2, Petroleum — See sub-heading "Carriage of Petroleum Products in General Cargo Vessels" (Drums/Cases etc.) also "Carriage in Deeptanks".

PETROLEUM JELLY		See Vaseline See Paraffin Wax	
PHORMIUM		2.51/2.79	Bales

Also known as New Zealand hemp, is a strong leaf fibre. See Hemp.

PHOSPHATE defluorinated		1.12	Bulk

Granular, similar to fine sand. Angle of repose 30 to 35 degrees.

PHOSPHATE ROCK		0.79/1.20	Bulk

A mineral fertiliser which absorbs moisture very readily and so should not be exposed to rain or moisture.

Very dusty cargo.

PHOSPHORIC ACID **(Orthophosphoric Acid)**		See Chemical Cargoes, Part 2.	
PHOTOGRAPHIC MATERIALS			Cartons Fibre Board Drums

Do not stow developed and sensitive paper in the same ISO container or near one another. Susceptible to temperature damage — protect from direct sunlight.

Some materials may be Dangerous Goods. See IMDG Code.

PIANOS		5.57	Cases

Stow right way up or as marked on cases. 'Tween deck stowage or top stowage Lower Hold. Away from hot bulkheads or moisture inherent cargo.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
PIASSABA		2.79/3.07	Bales

A stiff course fibre in considerable demand for brush making — grown in Brazil and other tropical S. American countries, also in Africa. Care should be taken with tallies as there may be problems with short shipment. May be damaged by moisture. Keep dry.

PICKETS — See Timber

PIGS — See Pork

PIG IRON		0.30	Bulk

High-carbon iron. Angle of repose 36 degrees.

PIMENTO		3.34/3.62	Bags

Also called Jamaica pepper and allspice, the unripe berries of a West Indian tree. Dry stowage, but away from delicate goods.

PINEAPPLES		1.53/1.73	Tins in Cases
FRESH/TINNED		1.95/2.09	In Crate/Carton

See canned goods. Should be carefully watched to avoid broaching.

Carried under refrigeration, but sensitive to damage. Not to be carried below 8.5°C unless specified by the shippers. Require ventilation but generally not very sensitive to small levels of ethylene.

Subject to damage because of inadequate packaging.

PINEY TALLOW		See Vegetable Fats See Part 2, Oils and Fats.

PIPES		1.67	Bundles
Iron and Steel Tubing			

See Part 2, Iron and Steel Products.

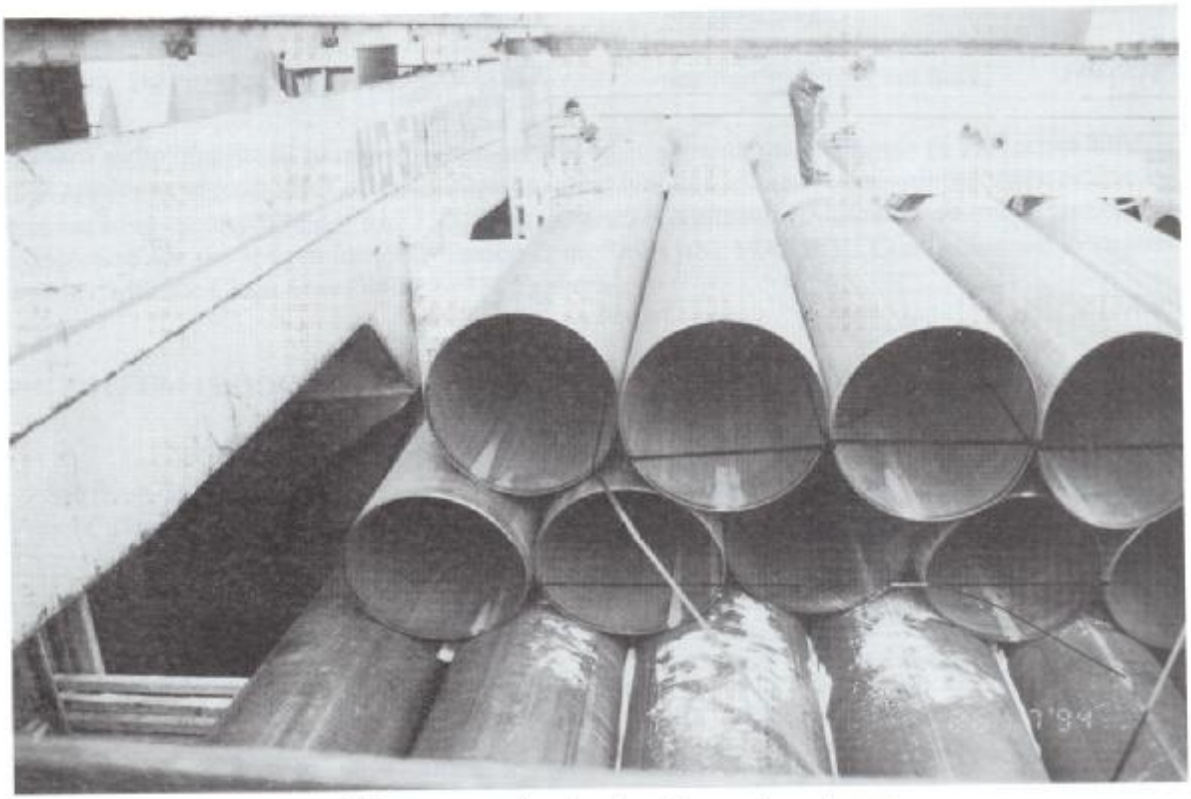
PISTACHIO NUTS		1.95/2.12	Cases
		1.67/1.81	Drums

The fruit of the pistachio tree has a very delicate flavour and is greenish in colour. See Nuts.

PITCH	 	1.25/1.39	Drum
		0.84/0.98	Bulk

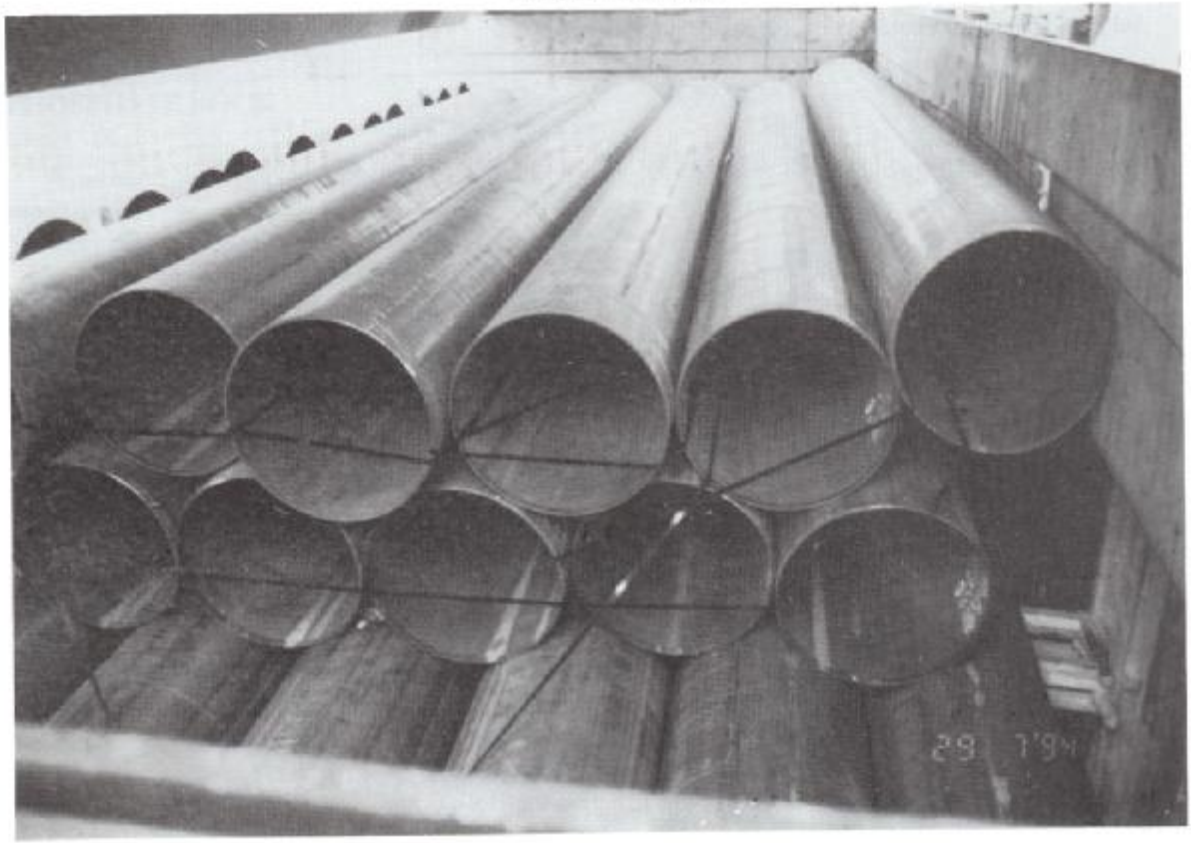
Is a tar or bitumen product — partakes of the same characteristics as Asphalt, which see.

It melts with heat — stow clear of fine and dry goods and away from boilers, etc. Pencil Prill or Prill Coal Tar when shipped in bulk care should be taken to minimise dust. Cargo should be softlanded etc. Turpentine residue can cause intense irritation to skin and eyes. Protective clothing should be worn. See IMDG Code. (See IMO Code of Safe Practice for Bulk Cargoes).



Untreated steel pipes in stow.

Note shipside/coaming tomming
and hoop iron lashings.



Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
PITPROPS		6.41/7.25	Bundles

Pitprops are short, straight lengths of timber, mostly fir, denuded of the bark, and are exported in large quantities from Scandinavia and Russia to many coal mining countries.

The stowage factor varies according to lengths and moisture content. The unit of measurement in the Pitprops trade to the U.K. is the English (cubic or pile) "Fathom", i.e. 6 ft × 6 ft × 6 ft = 216 cu. ft. freight being payable on that basis.

The Props vary from 75 mm to 300 mm in diameter, and are usually shipped in standard lengths, viz. 3.5 ft, 4 ft, 4.5 ft, 5 ft, etc., up to 11 ft. Crooked or split Props should be rejected.

A fathom of pitprops varies considerably in weight, viz. from 2.3 tonnes or less to, on occasions, as high as 4 tonnes, such depending partly on the class of timber but more particularly on the moisture content of same. When receiving from wharves or railway trucks, the timber, being relatively dry, approximates the lesser weight per fathom, but, when the props are brought alongside in leaky barges which, not infrequently, are partially waterlogged, or are drafted alongside, the weight per fathom is consequently high. In general, however, it may be stated that, with the modern type of ship, the limit of the deck load she will carry is determined by consideration of stability rather than by that of deadweight.

See Part 2, Techniques — Timber.

PLANTAINS		3.62	Bunches

A banana-like fruit shipped from the W. Indies. See Bananas.

PLASTER		0.98	Bags

Keep dry. Dusty.

PLASTER OF PARIS		See Gypsum	

PLASTIC RESINS		Various	Bags Drums Containers Bulk

These may be in the form of liquids. They may be dissolved in solvents, their carriage usually being covered in the IMDG Code as Class 3 flammable liquids. They may also be in the form of chemical intermediates — typical examples being isocyanates which are covered in the IMDG Code under their specific names.

Apart from hazards referred to in the IMDG Code, partially polymerised materials frequently continue to polymerise when exposed to the atmosphere to produce solid sticky materials which are often difficult to remove from ship's structures. Hence any leaking products should be absorbed on sand or sawdust as soon as possible after a leak is detected. However all members of a crew carrying out this work should take necessary precautions such as wearing respirators and protective clothing, as indicated by the specific IMDG Code entry.

Needless to say no leaking containers should be accepted at the time of loading.

Plastics resins may also be solids in the form of powders or beads. Plastics materials shipped in this form are polyethylene (polythene), polypropylene, polyvinyl chloride, nylon, polyester (terylene), polyacrylates, polycarbonate etc. These substances are normally packaged in paper or plastics sacks.

They must be kept free from any contamination and hence particular care should be taken during loading and discharge to prevent broaching of packages. Stows should be secured to minimise risk of

Commodity *Characteristics* *M3 per Tonne* *Packaging*

damaging packages. Any material which may leak from packages should be collected and rebagged making every effort to avoid contamination. Plastics resins of the same chemical type are produced in a number of grades e.g. there are separate grades of polyethylene for the manufacture of films, plastics bottles, rigid mouldings etc. Care must be taken to keep each grade of resin in a separate stow. Material rebagged must be properly labelled.

Some resins, particularly nylons, are moisture sensitive.

PLUMBAGO  See Graphite. See IMDG Code.

PLUMS  2.34/2.41 Cartons

May require change of temperature settings during transit. See Part 2, Techniques, Refrigeration.

PLYWOOD  2.09/2.23 Crates Best
1.95/2.12 Bundles

Plywood consists of three or more layers of thin wood laid crosswise and joined together by glue or cement under pressure.

Must be treated as fine cargo which is very liable to deteriorate if allowed to get damp. Stow apart from moist goods, including sawn lumber, or those which give off moisture when heated such as seeds, nuts, maize, etc. Protect from dust of all kinds and other staining mediums. Wet or stained bundles should be rejected or mates receipts/bills of lading claused accordingly. Stow away from logs or sawn timber. Secure well without damaging edges as cargo slides easily. Corners and edges are vulnerable and susceptible to damage.

Sheets usually measure 8 × 4 ft or 6 × 3 ft. When banded together into bundles or units, waste timber is used to protect the edges, thus making the package size slightly in excess of 8 × 4 ft or 6 × 3 ft.

ISO containers — the 8 × 4 ft sized sheet is not suitable for ISO closed box containers — the size makes it awkward to handle and impossible to achieve a worthwhile payload. Open sided containers and flatracks may be used, but very careful attention must be paid to secure the packs in such a way that they cannot move in a sideways direction. 8 × 4 ft packs will almost certainly make the container "overwidth" and it must be ascertained that such containers can be stowed on cellular vessels without fouling the cell guides or adjacent containers. Weather protection for the plywood must be provided — especially for flat rack stowage, a thin plastic sheet is insufficient against driving rain. If the container is stowed on deck it must not be on the outboard slots.

PODOPHYLLUM ERNODI  2.51/2.79 Bags

A root possessing medicinal properties from which is also obtained the dye, Quercetin. Dry stowage.

POLLARDS  See Middlings

POLYTHENE GRANULES 

See Plastics Resins.

Commodity	*Characteristics*	*M3 per Tonne*	*Packaging*
POONAC		See Brunack, also Oil Cake.	
POPPY SEED		1.95/2.01	Bags

The very small seed of the poppy plant, its oil yield being about 45 to 50 per cent. Two kinds of this seed are shipped, i.e. the white and the blue, the latter being bluish white in colour. Shipped in bags which, owing to the smallness of the seed, should be made of close woven material to avoid loss of contents. The bleeding of bags should not be permitted, and care should be taken to avoid mixture with other seeds. See Bag Cargo.

POPPY SEED CAKE		1.53/1.62	

See Seed Cake. IMDG Code. (See IMO Code of Safe Practice for Solid Bulk Cargoes).

PORK		1.67/1.73	Tierces
(Hard Frozen)		2.51/2.65	Sides

Pickled, salt; wet cargo. Stow well apart from dry and odorous goods like turpentine, etc., and in a cool place.

Pig carcases, or frozen pork, are shipped in bulk in the hard frozen condition, the carcases being wrapped in gauzy cotton material. Inspection, stowage, etc., as for Lamb, which see.

POTABLE SPIRITS			

See IMDG Code.

POTASH		0.98/1.06	Bags
Muriate of Potash		0.94/1.04	Bulk
Potassium chloride		1.10	Bags (Preslung)
Dead Sea Potash			

This is obtained from the water of the Dead Sea and elsewhere, and is exported in fairly large quantity from the Middle East.

It should be shipped thoroughly dried (water content averaging 0.25 per cent), it is not hygroscopic, does not give off any fumes when heated or under pressure. Under ordinary conditions, is not liable to taint edible goods.

It does not affect bare steel or iron to any greater extent than does common salt.

May be shipped in bulk as Standard, Fine, Flotation, Granular. Stowage factors for each may vary:

Standard and Fine 0.94 M3/t; Flotation 1.04 M3/t; Granular 0.95 M3/t.

See Fertilisers.

POTASH, CARBONITE			
(Pearl and Pot)			

An alkali obtained from vegetable matter by burning, from which is obtained caustic potash, and largely used in soap making.

Dry stowage remote from oils and greases.