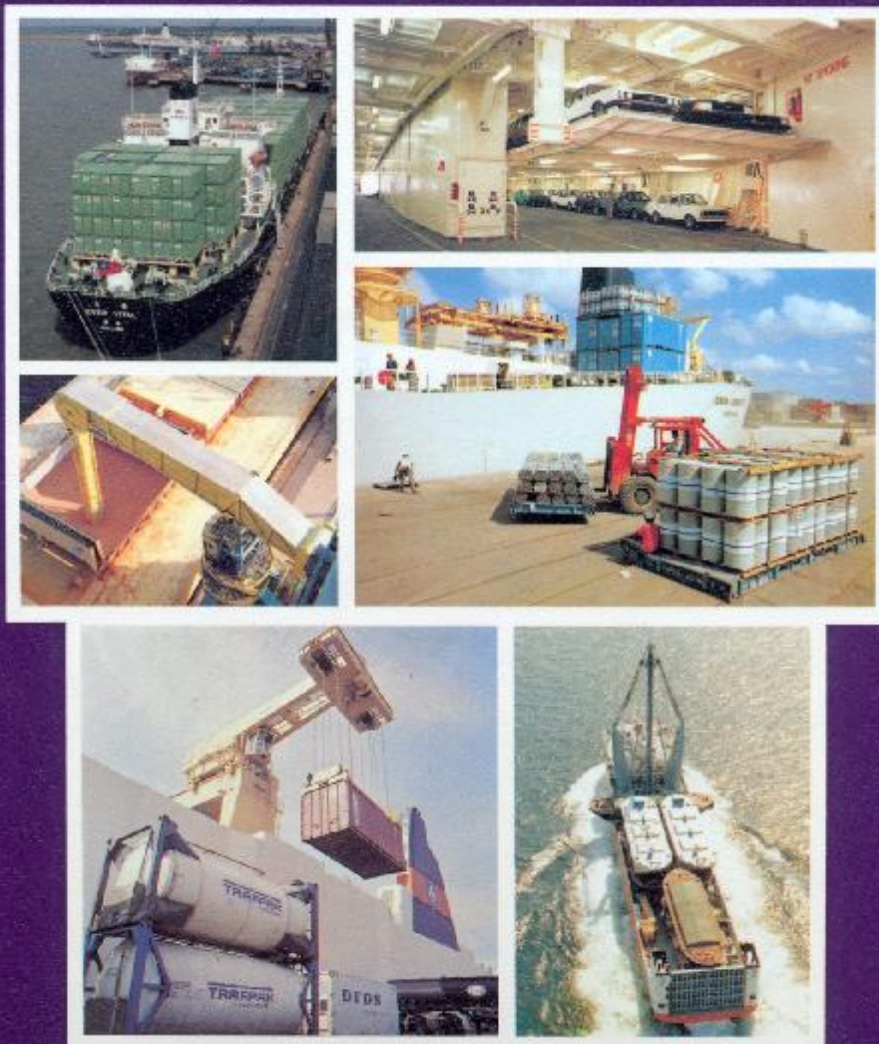


Thomas' Stowage

The properties and stowage of cargoes



FOURTH EDITION
Revised by Capt. K. S. RANKIN

PART 3

ALPHABETICAL SECTION

The commodities in this section have been arranged in alphabetical order. Where alternative names exist cross referencing to those names has been made.

The illustrations given against each commodity indicate the major problems that may be encountered when stowing or storing that commodity. Greater detail is given in the paragraph below each commodity.

Those using this book should independently check the commodity with regard to local legislation, international regulations and requirements, and any requirements there may be in the country of destination and those countries which may be transitted. This is particularly important in the case of Dangerous goods.



FRAGILE



USE NO HOOKS



KEEP DRY



KEEP AWAY FROM HEAT



MAY REQUIRE TEMPERATURE CONTROL



LINE CONTAINER OR ADJACENT DECK



POSSIBLE TAINT PROBLEM



POSSIBLE FIRE RISK



POSSIBLE POISON



POSSIBLE CORROSIVE



POSSIBLE INFESTATION PROBLEM



MAY SIFT OR GIVE OFF DUST



MAY GIVE OFF MOISTURE



MAY BE DANGEROUS GOODS



MAY REQUIRE VENTILATING

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
ABACA	 	See Hemp	
ABALONE	 	2.23/2.37 2.51	Bags Cases
Shellfish. The shell is used for inlay work and the body used for foodstuffs. Dry stowage. May also be carried hard frozen. See Fish, shellfish.			
ACETATE OF LIME		2.23/2.51	Drums. Bags
Wet Stowage.			
ACETATE TOW	 		Bales
Synthetic fibre used for manufacture of tipped cigarettes. Must be kept clean and taint free.			
ACETONE		2.23/2.5	Drums. Casks.
Colourless liquid valuable as a solvent of organic compounds. Wet storage. Hazardous. See IMDG Code.			
ACHIOTE		See Annatto	
ACID ARABIC	 	1.11/1.25	Kegs. Drums
A crude gum of an acid nature; the natural exudation of a species of Acacia tree. Cool dry stowage.			
ACIDOIL		See Coconut oil products	
ACIDS		See Part 2, Dangerous Goods	
AEROPLANES Light Aircraft			Cases
Packed in cases. They are shipped in the partially dismantled condition and owing to the light construction and size of the cases require very careful handling to avoid damage.			
Sling by both ends, placing the slings in positions which, ordinarily, are marked on the cases and adjusting their lengths so that the case is level and not tilted when slung, using spreaders to avoid crushing the upper edges of the case.			
Stow on a solid and perfectly level flat making provisions where necessary for reeving slings underneath the case for discharging without lifting or tilting the case. Secure the chock off well with suitable packages.			
Aircraft may also be carried in knockdown form within containers. Particular care should be taken in securing the parts without stressing the fuselage and wings.			
See also Motor Cars.			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
AGAR-AGAR		1.95/2.09	Bales

A gelatinous substance obtained from certain tropical seaweed. Dry stowage.

AGRICULTURAL MACHINERY		1.39/2.23	Crates/Cases
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Crates may be insufficiently robust — avoid heavy overstuff. Beware leaking oil.

AJWAN SEED Ajowan	 	2.15/2.23	Bags
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An oil bearing aromatic seed from which stearoptine or thymol is obtained also an essential oil. Dry cool stowage remote from tea and edible goods.

ALABASTER	 	1.10/1.28 1.06	Bags Bulk
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Exported from Spain, Italy, etc. See Gypsum.

ALBUMEN (MOIST)	 	1.28	Tins in Cases
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Wet cargo. Usually shipped in small quantities from Far East. Packed in tins. Sometimes shipped as frozen cargo requiring a temperature of -15 degrees C or lower. See Egg Albumen, also Part 2, Refrigerated Cargoes.

ALBUMEN (DRIED)		1.53/1.62	Tins in Cases
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Packed in tin lined cases sometimes carried in refrigerating chambers when a temperature of -15 degrees C is considered to give best results. See Part 2, Refrigerated Cargoes.

ALBURNAM		1.53/1.67	Bags
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The hardened heart of wood of the ebony, mahogany, etc., trees; used in the tanning processes.

ALCOHOL	 	2.09/2.12 1.95/2.23	Barrels Drums
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Spirit of wine is obtained by the fermentation of substances containing saccharine or sugar. Pure or absolute alcohol has a specific gravity of 0.80 and boils at 78.8 degrees C — flash point 4.4/18.7 degrees C. Wood alcohol flash point 8.7 degrees C. See Dangerous Goods. See IMDG Code.

ALE	  	See Beer
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ALFALFA

A fodder grass. Gives off green dust. Affected by moisture and strong odours. See Hay.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
ALGARROBA		See Carob	

ALKANET		1.34/1.39	Cases
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A valuable root from which is obtained a deep red dye. Cool stowage.

ALKYL BENZINE		1.39	Drums
		1.11/1.17	Bulk
			Bulk Bags

Non-corrosive, non-hazardous liquid used in the making of detergents.

Absolute cleanliness of the tanks is essential prior to loading. After discharge, tanks can easily be cleaned by washing down with fresh water.

ALSPICE		3.34/3.62	Bags
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See Pimento, also known as Jamaica pepper.

ALMACIGA	
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Incense made from the latex of the Almacigo tree. May taint.

ALMONDS		1.95/2.09	Cases
		2.03/2.09	Bags
		3.34	Hogsheads

Mostly shipped from Spain, for unshelled add 20 per cent more space. Dry fine cargo, clean stowage. Bags shipped from India have a stowage factor as high as 2.5/2.65 M3 per tonne.

ALOES		1.11	Cases
		1.31/1.39	Mats

A vegetable product. Shipped chiefly from Socotra, Aden, West Coast of India, Barbados, etc. Are exceedingly bitter to the taste — to be stowed apart from dry delicate goods.

ALPISTE		As for Canary Seed. See also Seeds.
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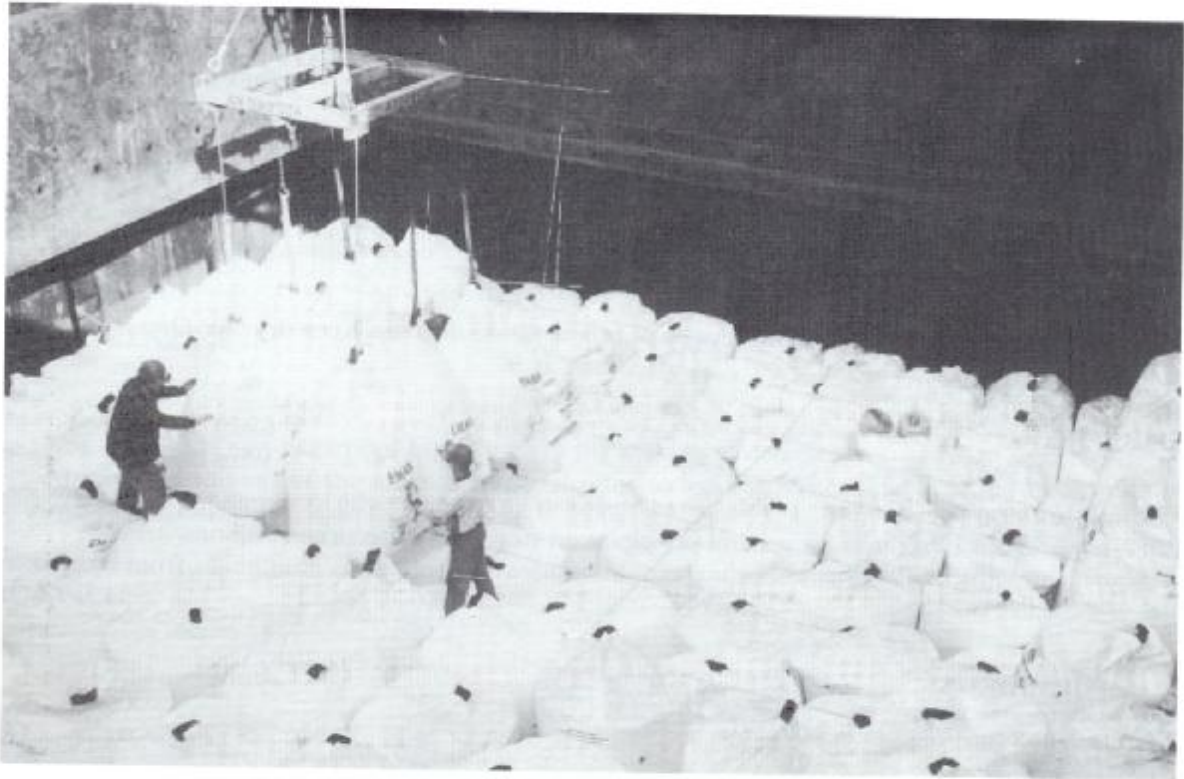
ALUM	 	1.48	Cases
		1.62	Casks
		1.95	Baskets

A mineral salt. It is colourless and has an acid taste. Dry stowage, well dunnaged, clear of metallic and textile goods which it attacks, also of goods which are susceptible to damage by moisture as this commodity produces a condition of dampness. B/L should protect ship from claims for rotted bags.

ALUMINA, calcined	 	1.17	Bulk
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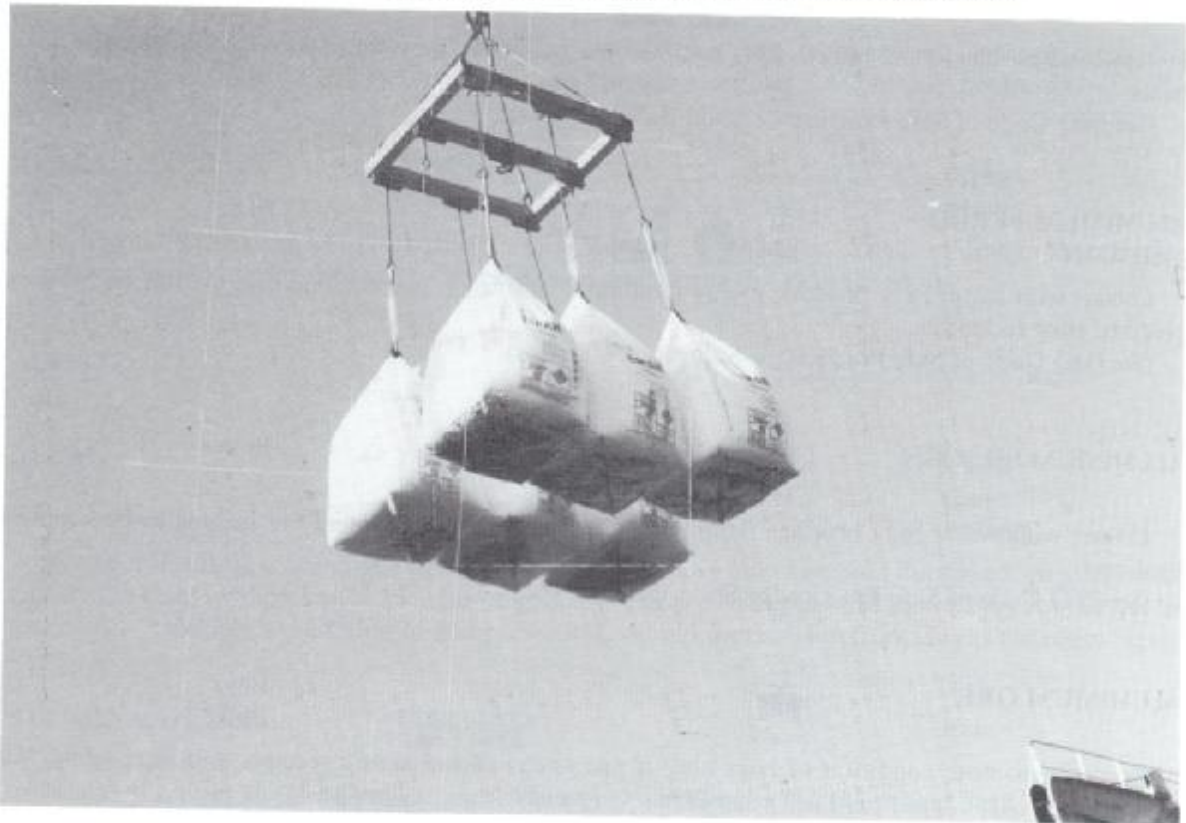
Angle of repose 30–34 degrees. Light to dark grey, small particles, lumps and dust.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
ALUMINA SILICA	 	0.70 0.78/0.84	Bulk Crystals Bulk Pellets
Angle of repose 35 degrees. White to off-white. Very low moisture content.			
ALUMINA Trihydrate	 	0.90	Bulk
An aluminium bearing earth or clay. Angle of repose 40–43 degrees. Keep dry. See Ores.			
ALUMINIUM		0.80	Slabs/Ingots Wire Bars
Usually in strapped bundles. Liable to corrosion if in contact with concrete-for any time. See Part 2, Iron and Steel Products for general principles on stowage and securing/lashings. Separation cloths or Polythene sheeting should be used to protect the aluminium from bagged or bulk commodities.			
ALUMINIUM DROSS By-product waste from the aluminium smelting process	   		Bulk
Contact with water may produce flammable and toxic gases. Load in dry conditions. (See IMO Code of Safe Practice for Solid Bulk Cargoes).			
ALUMINIUM NITRATE	  		
Non combustible but if mixed with combustible materials may burn fiercely and give off toxic fumes. (See IMO Code of Safe Practice for Solid Bulk Cargoes).			
ALUMINIUM FERRO SILICON	   		Bulk
Contact with water may produce highly flammable and toxic gases. Condition Certificate must be produced prior to loading. (See IMO Code of Safe Practice for Solid Bulk Cargoes).			
ALUMINIUM SILICON	   		Bulk
Contact with water may produce flammable and toxic gases. Shipment certificates to be supplied by shipper. (See IMO Code of Safe Practice for Solid Bulk Cargoes).			
ALUMINIUM ORE		1.11 0.84/0.92	Bags Bulk
Be careful to note condition of bags and, if necessary, clause mate's receipts and Bs/Lading. See Bauxite.			



Ammonium Nitrate in stow.

Ammonium Nitrate on cradle. These bags must be rejected due to presence of dirt on underside.



<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
ALUMINIUM SCRAP, FOIL		1.39	Bags, Bales
Foil, in cases on skids. For cigarette packing. Highly susceptible to taking taint.			
ALUMINIUM TURNINGS			Drums, etc.
Hazardous cargo when not carried in hermetically sealed tins. See IMDG Code.			
ALUNITE See Ores.		0.70/0.75	Bulk
AMBER GREY AMBER		1.00/1.06	Cases
A yellow semi-transparent fossil resin, mostly obtained in the Baltic area. Used in the jewellery and pipe making trades. Stow in special cargo locker and watch for signs of pilferage when receiving cargo.			
AMBERGRIS	 		Lined Cases
A solid, inflammable, fragrant substance found on the coasts of, or floating on the sea around India, Africa, Brazil, etc., sometimes referred to as "Grey Amber". Used in perfume manufacture and is a very valuable article. Stow in strong room; shipped only in small quantities.			
AMBLYGONITE		0.71/0.84 0.78/0.84	Bulk Bags
Ore, dusty, but not odorous (similar to Lepidolite).			
AMBOYNA WOOD		1.45	Bulk
A valuable wood. Unless B/L clausd otherwise, it can be used for dunnaging fine dry cargo or filling broken stowage amongst same.			
AMMONIUM NITRATE	  	1.00	Bulk
Fertiliser. IMO Class 5-1. Check chemical composition. Avoid any possible contact with oil. Risk of explosion. If heated may give off toxic gases. Carefully check specification/shippers description as may also be non hazardous. (See IMO Code of Safe Practice for Solid Bulk Cargoes).			
AMMONIUM SULPHATE	 	1.00	Bulk
Liable to cake. Corrosive to steel if sweating develops.			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
AMMUNITION		See Part 2, Dangerous goods. See IMDG Code.	
ANATTA A dye product shipped in liquid or powder form.		2.42/2.65	Barrels
ANGOSTA BARK	  	See Barks	
ANILINE DYES Oil		1.81/1.95 1.50	Casks Drums
A by-product of coal-tar which emits fumes of a very dangerous character. Generally shipped either as oil in drums, or crystals in casks. The oil fumes are very penetrating and taint goods stowed with or near this cargo; furthermore, the oil leaves damaging stains on whatever it contacts with. Ships have been put to very great expense in freeing holds of the taint of Aniline Oil, entire compartments having had to be scrubbed with soap and water. Stow in poop, or forecastle, away from foodstuffs and crew's quarters, and well removed from Bleaching Powder (which see) as the mixture of their gases is dangerous. See IMDG Code.			
ANILINE SALT	  	1.62/1.73	Casks, Drums
A poisonous liquid which must be packed in strong and sound containers — it gives off vapour. Any spillage stains. Stow remote from foodstuffs and delicate goods. See IMDG Code.			
ANIMAL MEAL	  	1.45/1.53	Bags
A dirty odorous cargo, stow well away from fine goods. Adequate ventilation. See IMDG Code. (See Seed Cakes).			
ANIMAL OILS		See Part 2, Oils and Fats. See Vegetable and Animal Oil Constants. Appendix 7.	
ANIMALS		See Part 2, Livestock.	
ANINE African Copal		A yellow transparent Rosin. See Copal.	
ANISEED	 	3.34	Bags
A very light star-shaped seed which gives off a pungent odour. Dunnage used should not be used for subsequent taint-sensitive cargoes. Compartment or ISO container may need special cleaning or ozonating after use.			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
ANISEED OIL		1.39	Tins in Cases

Obtained by distillation from the fruit of the "Pimpinella Anisum" — shipped from India, Malta, Spain in small lots. Treat as Essential Oils, which see.

ANNATO	  	1.67/1.78	Cases
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A reddish yellow pulpy vegetable substance obtained from the seeds of a tree; largely used for colouring chocolate, butter and in the dyeing process. Strong odour; keep away from foodstuffs and goods liable to taint. Cool dry stowage.

ANTHRACITE	A non-bituminous coal — see Coal.		
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ANTIMONY COMPOUNDS	 
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All are poisonous. Stow clear of foodstuffs. Particular care must be paid to ensuring satisfactory separation from other cargoes. All cargo spaces must be thoroughly cleaned after carriage of antimony. See IMDG Code.

ANTIMONY ORE		0.78/0.89	Drums
		0.56/0.70	Bags
		0.61/0.75	Cases
		0.50	Bulk
		0.84	Bulk (Africa)

May be liable to sifting. Be careful to note condition of bags and, if necessary, clause mate's receipts and Bs/Lading. See also Ores.

APPLES	 	2.37/2.65	Cases, Cartons.
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Thorough ventilation is an absolute necessity. Not suitable for stowage in deep lower holds on account of the difficulty of getting adequate ventilation and of the "topweight" on lower tiers. See also Fruit, Green.

Apples are carried under temperature control conditions in:—

Cartons, South Africa 2.51/2.79 M3/tonne
 Cartons, U.S.A. 2.94 M3/tonne
 Cartons, British Columbia 3.21 M3/tonne
 Cartons, Australia and N.Z. 2.10/3.07 M3/tonne
 Boxes, Australia and N.Z. 2.65/2.78 M3/tonne.

Apples should be carried in accordance with the general rules for fresh produce (see appropriate section). Normally carried under temperature control. General temperature instructions are to carry between zero and 2°C. Apples freeze at -1.5°C and may suffer chill damage if held at zero or below for long periods.

Apples should normally be pre-cooled prior to loading. On occasions, this may not happen and such apples, i.e. still with orchard heat, should not be stowed with pre-cooled fruit.

Apples must be properly ventilated. They are very sensitive to ethylene, which they produce in large

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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amounts during ripening. Carriage instructions often nominate a maximum value for carbon dioxide as a monitor for ethylene levels.

Some varieties may suffer from carbon dioxide damage if levels are allowed to rise too high.

It is better to have specific carriage instructions for the variety being carried, and if in doubt expert advice should be taken.

Apples readily taint other cargo and should not be stowed in the same hold as meat or dairy produce.

Stowage of cartons must be in accordance with the general principles of permitting the optimum airflow through the cargo. If the apples have been pre-cooled, then the cartons can be block stowed either on pallets or on the perforated hold floor with a gap of at least 5.0 cm air space. A gap of at least 7.5 cm should be left between the topmost part of the stow and the deckhead.

With fruit that has not been pre-cooled, spaces should be left between packages using dunnage. However, note that refrigeration systems are not designed to cool produce except under very specialised circumstances, e.g. bananas.

To prevent bruising of contents, cases should be stowed with the bulge on the side. Careful attention to handling and provision of suitable protective walking boards, etc., is essential.

Dunnage should be laid in line with the air flow and in normal circumstances about 50 mm should be sufficient. In vessels equipped with a blower refrigeration system it should not be necessary for any other additional dunnage. In vessels equipped only with the brine grid system, laths should be laid at least between every second tier of cases.

Where cartoned apples are concerned, advice should be sought as to the number in height that can be stowed. If deep stowages have to be obtained over the prescribed number in order to use maximum space, false decks, break dunnage or tables should be built to obtain maximum lift.

From Australia, some fruit is carried in bins. These bins are approximately 2500 kg weight. They have the advantage of largely eliminating the considerable bruising which is incurred during the normal handling of apple cargoes. The most advantageous stowage is for these bins, if sufficiently robust, to be block stowed in a deep compartment in order that they can be placed with the aid of a fork lift and discharged in the same manner. Care should be taken to ensure that they are stowed in such a manner that there is no impediment to air flow. A mix of boxes and cartons with bins is an unwise practice, since it severely slows down the rate of loading or discharge.

ISO containers — depending on the packaging, vertical battens every second row may or may not be required. Bins may also be suitable for ISO containers, as may bulk loading under certain controlled conditions. If container loads of apples have to remain for any time without refrigeration (e.g. Port-hole insulated containers without clip-on Units), port-holes should be left open to assist ventilation.

Apples and pears may be stowed together under certain conditions, e.g. when carriage temperatures are compatible. See Pears.

APPLE JUICE

Specific Gravity 1.35 Bulk Bags
Drums Plastic.

Suitable for carriage in Bulk Bags in ISO general purpose containers, and in liquid containers.

APPLE PEELINGS (DRIED)



Bags. Cases.

May contain insects. Container may require fumigation after emptying. See Also fruit, dried.

APRICOT KERNELS



1.67

Bags or Cases

Dry stowage remote from moist and odorous goods. May itself take taint.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
APRICOTS		2.56/2.63	Cartons

May be carried as dried fruit — see Fruit, Dried. May be shipped fresh for carriage under temperature controlled conditions. See Part 2, Techniques, Refrigeration.

ARABIC	See Acid Arabic.
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ARACHIDES (Groundnuts)	1.90 1.81/1.95 2.79/3.34	Shelled in cases. In Bags Unshelled
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A ground nut which yields about 45 per cent of oil. See Nuts.

ARACHIS OIL (Groundnut Oil)	0.89 0.89	Bulk Drums
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This oil is obtained from certain varieties of ground nuts, such as Monkey Nuts, Peanuts, Arachides (which see) from which it takes its name. It has a very nutty taste and smell, and is of a very pale yellow colour. See Vegetable and Animal Oil Constants, Appendix 7. See Part 2, Oils and Fats.

ARAGOES	1.06/1.11	Cases
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A valuable stone use in the jewellery trade, varying in colour from white to deep red. Stow in special cargo locker.

ARCHIL		1.11/1.17 2.37/2.51	Casks Bales
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Extract of the Archil (orchil) weed, used for dyeing purposes. A weed which must be stowed well clear of moist or wet goods.

ARECA NUTS	  	1.62/1.67	Bags
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This, like almost all other nut cargoes is very much given to heating, a case having been known where the temperature of the hold was raised to the extent of 40 degrees C through this cause. If at all damp or wet, they should be rejected as they are totally unfit for shipment in that condition. They may also be infested.

Stow away from heat sources and apart from chillies and from all cargo liable to be affected by humid heat. Good ventilation is a first essential to their proper carriage.

The nuts lose weight up to about 10 per cent, on long passages. See Nuts.

ARNOTTO	See Annatto
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ARRACK		2.01 1.53	Drums Cases
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A spirit obtained by distillation from rice, sugar and the sap of the palm. Shipped principally from Indonesia. Leakage seldom less than 5 per cent; any loss above that is generally debited to ship. Should be carefully watched to avoid pilferage. Special stowage. See IMDG Code.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
ARROWROOT		1.95 1.48	Cases Bags

Is a starchy food extracted from the tuberous roots of various plants. Shipped in considerable quantities from Ceylon, West Indies, S. America. A very delicate cargo which absorbs moisture very readily. Must be stowed in a dry compartment containing no cargo likely to throw off moisture or odours.

ARSENIC	 	0.67 0.84/0.98	Cases Kegs
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A tin-white metallic powder. Generally packed in paper lined canvas covered cases. Highly poisonous. See Dangerous Goods and IMDG Code.

ARSENIC COMPOUNDS	 
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Stow away from foodstuffs of all kinds and should any packages be damaged and leakage of contents result, the greatest care is to be exercised in removing all traces of arsenic before receiving grain or similar cargo. See Dangerous Goods and IMDG Code.

ASBESTOS	  	1.53/1.67 2.51/3.62 3.34/3.80	Cases Bags On Pallets
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A fibrous white or grey mineral product which is incombustible and stows well with the finer cargoes. When shipped in sheets packed in crates, stow on edge and avoid any weight above. See IMDG Code.

Asbestos is the common name given to a number of naturally occurring inorganic silicates with complex compositions and of fibrous crystalline structure. There are four main types:—

1. Chrysotile (known as white asbestos) is the commonest type. It is a fine silky flexible white to grey/green fibre.
2. Amosite (known as brown asbestos) is a straight brittle fibre light to grey to pale brown.
3. Crocidolite (known as blue asbestos) is generally accepted as being the most harmful type of asbestos. It is a straight flexible blue fibre.
4. Anthophyllite. It is a brittle, white to brown fibre.

Unprotected exposure to asbestos dust may produce a risk of severe injury to the respiratory system if inhaled.

Packaging. Asbestos fibre of all types should be securely packed in impermeable bags. If deliveries are made up in to unitised loads these should be securely fastened and may be further enclosed in a cover of impermeable material, properly secured. If ISO containers are used the shipper should ensure that all projections inside the container are removed or adequately shielded to avoid damage to the bags in transit. Ideally should be loaded on last in, first out basis. Stow well away from foodstuffs.

Hooks or other sharp equipment should not be used.

Respirators of an approved type should be worn by those engaged in the collection and re-bagging of any loose materials. Suitable protective clothing should be worn and arrangements made for its cleaning and storage after use. Damaged bags should be over slipped as soon as possible into suitable impermeable bags, a supply of which should be available where asbestos consignments are being handled. The bags should be securely tied, clearly identified and forwarded with the consignment. Any remaining spilled material should be finally cleared either by vacuum equipment or by thoroughly wetting and sweeping. All spillage should be collected and disposed of in accordance with local regulations.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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Other transport including ISO containers used for the carriage of asbestos may become contaminated by asbestos. It is recommended that these containers be thoroughly cleaned by means of an approved vacuum cleaner after discharging each load.

Asbestos, and asbestos products, may be considered Dangerous Goods, if they are likely to release significant quantities of asbestos. Such products would require control under the asbestos entry in class 9 of the IMDG Code. These would include raw asbestos, treated asbestos (still in the form of free fibres) and furniture, cushions, etc., stuffed with asbestos.

Non-hazardous products would be cement/asbestos sheet or pipe, brake shoes and furniture where the asbestos is unlikely to escape as free fibres, e.g. when used as a toughening agent in structural plastics rather like glass fibres.

If in any doubt as to the classification, the product should be submitted to the appropriate Authority.

ASBESTOS CEMENT	 	1.78/1.84	Double Ply Bags
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A crude fibre mixed with Portland Cement. Very Dusty. See IMDG Code.

ASBESTOS POWDER	 	2.23/2.37	Bags
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See Asbestos.

ASBESTOS SHEETS, TILES, PIPES		1.59/1.73 0.84/1.11	In Cases or Loose Crates
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Very brittle and easily damaged if stowed or handled incorrectly. No heavy overstuff. See also Asbestos.

ASBESTOS ORE		1.95	Bags
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See Ores.

ASPARAGUS (Canned)	 	1.23/1.28	Cases
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Tinned vegetable. Cool stowage indispensable to avoid fermentation. See Part 2, Canned Goods. Carried under temperature control in crates and bundles. Carriage temperature 1.5 degrees C.

ASPARAGUS (Fresh)	 		Trays, Cartons.
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May be carried chilled at 0-2 degrees C.

ASPHALT Asphaltum	  	0.94/0.98 1.25/1.39 1.28/1.39	Bulk Barrels Drums
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Native asphalt is a mineral resin formed by the natural drying up of rock oil or petroleum in its bed, deposits of which are found in Trinidad, also Cuba, Venezuela, Peru, etc.

Asphalt or Asphaltum (Bitumen) is also obtained from petroleum by distillation and is exported in large quantities from the Caribbean and certain other oil producing and refining countries. It is

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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principally used as paving material and shipped in bulk, in barrels, open ended or otherwise and in drums.

In some form Asphalt is inflammable, see IMDG Code. Owing to its objectionable character the carriage of Asphalt, except in barrels or drums, is frequently excluded from Time Charter party.

Trinidad crude asphalt averages 10 per cent water content.

Bitumen is graded R.C. 5 to R.C. 0. All to a greater or lesser extent being diluted with naphtha.

R.C. 5 to R.C. 4 can only be carried in especially constructed tankers. Carrying temperature being about 132 degrees C.

R.C. 3 to R.C. 0 can be carried in bulk in normal tank ships. Carrying temperature being about 140 degrees C.

R.C. 3 and R.C. 0 is also carried in Drums or Barrels. Many of the drums are open headed and must of course, be stowed on end. Cool storage is desirable and remote from all edible and other goods liable to taint. Holds should be limewashed before loading. Care should be taken during handling to avoid "leakers". This is a most difficult cargo to clean up after, if the contents leak, the naphtha evaporates in the atmosphere and the residue sets solid. All bilges must be thoroughly protected. Cases have been known where the asphalt or bitumen has even penetrated and filled the bilge suction pipes which had to be renewed. Drums should be well dunnaged every tier and packed hard with dunnage or cordwood to avoid any movement of the stow. 200 litre drums should be restricted to eight high.

Emulsified Asphalt — is asphalt rendered into liquid form which involves the addition of water, and is not inflammable. Is shipped from U.S.A. ports in steel drums of 250 litre capacity measuring about 0.3 cubic metres and weighing about 230 kg. It is also carried in bulk in deep tanks.

Rock Asphalt — is exported from Cyprus etc., and consists of limestone rock with an average bitumen content of 12 per cent.

ASSAFOETIDA



1.17/1.23

Cases

The sap of a tree grown in India, Iran, etc., which has a very pungent offensive smell and a very nasty taste thus rendering this useful commodity wholly unsuitable for stowage anywhere near or with fine goods of whatever kind. Stow for Essential Oils, which see.

ATTAR OF ROSES OTTO OF ROSES



Protected Drums
or Tins in Cases

A very valuable extract obtained from various species of roses. It is mainly a product of the East and is generally adulterated with grass oil before packing for shipment.

A very valuable cargo, stow in strong room. See Essential Oils.

AUTOMOBILES

See Motor Cars

AVOCADO OIL

See Part 2, Oils and Fats.

AVOCADO PEARS



2.50/2.38

Cartons, Trays.

Normally carried under temperature control. General temperature for carriage is 7°C, although a range from 4.5°C to 13°C is permitted. Specific carriage instructions should be given by the shipper because there are variable responses to refrigeration by different varieties, and from the same variety at different times of the year.

Avocados accumulate the effects of exposure to a given temperature for a given amount of time

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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(in effect the amount of "cold" they have experienced) so their response to cooling depends on their history prior to loading. As a consequence, they are susceptible to chill damage.

Fresh air ventilation is necessary to maintain a low carbon dioxide level.

Avocados are very prone to mechanical damage from rough handling.

ISO containers — control after discharge. Port-hole closures of insulated containers loaded with avocados should be closed after discharge from the vessel and should remain closed thereafter (while without refrigeration). This is the exact opposite of what is required for citrus fruit.

AWABI

See Abalone

BACON

1.53/1.78

Cases/Cartons

Salted or smoked. When packed in salt it is apt to give off drainings and is to be treated as wet goods. Stow on ground or floor and not on or over dry goods.

When dry, stow in a cool place and avoid overstowing with heavy goods.

May be carried under temperature control, in cases, 1.73/1.84 M3 per tonne. Dunnage as for frozen goods, in cases, battens spaced to suit dimensions and weight of packages.

Liable to give off moisture which if permitted to percolate into the floor insulation will damage same.

BAGGED CARGO

See Part 2, Techniques

BAGGED MEAT — See Meat, Sundries.**BAGONG**

Local name (Philippines) for small shrimps. Treat as shrimps/prawns for carriage and stowage.

BAIRA

See Barjari

BALATA

1.39/1.67

Bags

A gum not unlike rubber obtained from the "bully tree" of S. America. Used very largely as an insulating material. Varies very considerably in its stowage factor. Stow in a dry and cool place, well removed from moist articles. See Gum, also Rubber.

BALES

See Part 2, Techniques

BALLAST

Double bottoms, deep tanks and special ballast tanks are the most common means by which ballast is introduced into a vessel. The ballast may take the form of fuel oil, fresh water, salt water. Recent legislation in some countries may prohibit the pumping out of liquid ballast which may be considered

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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to be detrimental or harmful to the maritime environment. The practice of taking on solid ballast has largely disappeared with the exception of permanent ballast. The following may be of historical interest.

In the event of solid ballast being required, reference should be made to appropriate government regulations and advice, particularly where there is risk of ballast shifting (i.e. necessitating the use of shifting boards, etc.).

Solid ballast may be easily installed in the form of concrete blocks which must be properly secured and fixed to prevent any lateral or fore and aft movement. Other forms of solid ballast (which have been used successfully in the past) Includes:—

Blue Billy — A species of quicklime refuse from gas works which is liable to take fire if overstowed with damp material.

Red Marl and Stones — Shipped as dry rubble ballast; is to a large extent soluble in water.

Coal Ballast — Especially anthracite peas, and small nuts. Shifting boards should be fitted.

Bog Ore — a loam containing oxide of iron — very liable to shift.

Sludge Iron Ore — shipped at Spanish ports, etc., very liable to shift. See Sludge Ore.

Flint Stones and single ballast very liable to shift. See Slurry, Mud, Coal or Duff.

If ballasting under dry cargo, the ballasting material should be dry and devoid of objectionable properties.

	<i>M3 per Tonne</i>
Dry rubble makes very suitable ballast	0.70/0.84
Shingle	0.64
Dry Fine Sand (bilges should be carefully protected)	0.53
Coarse Wet	0.56/0.59
Common Earth (see note below)	0.64/0.67
Clay — very messy	0.50/0.67
Gravel	0.56/0.61
Pit Slag	0.50/0.56

Attention is drawn to the danger of introducing foreign insects and plant disease by the use of top soil, such as that obtained from gardens, greenhouses and fields and even sand, as ballasting material. Advice should be sought as to what materials are unacceptable at the country of destination. To ignore such a requirement may involve a ship in heavy expense.

BALL CLAY

See China Clay



1.11

Bulk

This is liable to deteriorate into a slimy mass and cannot be trimmed. It cannot be overstowed and the proper cleaning of holds after this clay involves a great deal of labour and of time. A very high degree of hold or compartment cleanliness is required.

May also be shipped in bulk bags of 2–6 m.t.

BALSA WOOD



9.36

Bundles

Grown in Central and S. America, it is lighter even than cork. Used as an insulator, etc. Stow in a dry and cool space remote from moist or oily goods. Do not overstock with heavy goods.

BALSAM COPIVA



1.67/1.81

Bottles

1.53

In Cases

A very bad tasting oil, having a most offensive odour. Wet cargo. Should be stowed remote from all foodstuffs and crew quarters.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
BAMBARRA	 	1.81/1.95	Bags

A ground nut, native of Zanzibar and E. Africa. See Ground Nuts.

BAMBOO POLE	 	1.95	Bundles
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Liable to split, do not overstuff with heavy cargo nor should they be used for broken stowage. May be infested.

BAMBOO REEDS		1.81/1.90	Bundles
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Very useful for broken stowage and interlaying bag cargo provided they are not liable to split.

BAMBOO BLINDS		3.34/3.62	Bales
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BAMBOO SPLITS		2.79 5.57	Bales Bundles
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See Rattans

BANANAS	  	3.63/3.90 3.62/4.18	Cartons Bunches
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Most bananas are now being carried in cartons and on pallets, either as break-bulk or in containers. The introduction of palletisation has largely been dictated by the requirement for cheaper handling methods. Cartons are perforated and fitted with handholds to facilitate handling. Cartons usually contain 7/8 cut hands, each being wrapped separately in transparent plastic packaging.

The successful carriage of bananas requires much more fan power than is necessary for, say, frozen meat, so that while the banana carrier is quite suitable to carry citrus fruits, apples, etc., a vessel designed and equipped solely for the carriage of the latter would not necessarily carry bananas satisfactorily over a long voyage. Where the hands are packed in plastic wrappers, up to 90 air changes per hour may be necessary to ensure an even temperature and the removal of respiration gases. The respiration rate of bananas increases dramatically after cutting. This produces ethylene, and is followed several hours later by carbon dioxide. Unless these gases are removed the ripening process will continue inexorably. Bananas are both producers of, and sensitive to, ethylene.

Pre-Shipment Preparation

Prior to loading, compartments should be thoroughly cleaned out and the spaces well aired. The compartment should be ozonated, and if necessary fumigated in order to remove any trace of residual odours, more especially from citrus fruits. Because of the large amount of condensation produced from the cooling batteries during carriage (especially the first 24-48 hours after closing hatches), special attention must be paid to seeing that all scuppers are clear.

Compartments should be pre-cooled to the specified temperature, normally in the range 4.5 to 7 degrees C, although higher temperatures may be acceptable.

Prior to shipment, sample cartons should be opened to ascertain their condition. Pre-shipment condition is vital to successful transport of this fruit, i.e. fruit should be all green (it is not acceptable to just remove single ripened fingers from a bunch. The whole bunch should be rejected, even if one banana has turned yellow). Care also should be taken to ensure that the fruit is not suffering from stem



Note latex like strands linking together the two halves.

Testing for ripening



Skin of same banana peeled back.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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and rot. Bananas should not be accepted, where it is known that they have not been held in a controlled atmosphere, or have been cut more than 18–24 hours prior to shipment. To determine the suitability for transport, sample fingers should be cut in half with a sharp knife. On separating the two faces gently, filaments of a latex-like substance should link the cut surfaces until some distance apart. If this does not happen, the bananas are ripening and should be rejected. A further test may be to shave the toe of the banana, the flesh should be dry and have a slightly grainy feel. The presence of moisture may indicate the ripening process has commenced. Careful handling is necessary to prevent bruising when picking, grading and packing.

Pulp temperatures should be measured at the beginning, middle and end of loading of each compartment.

Stowage — General

Shippers' instructions for the stowage and care of the cargo are almost always issued to the vessel prior to the commencement of loading, and now often form part of the producer's Quality Management System. These instructions should be followed closely, and an accurate record kept of any enforced deviation from the letter of the instructions.

When stowing over gratings, which is the normal method of ventilation on modern refrigerated cargo vessels, precautions should be taken to avoid short circuiting of the air flow by blocking off any ventilation holes in the gratings, which are not overstowed with cargo. Ventilation holes may be blocked using dunnage, plywood or cardboard, secured in place to ensure that it does not become displaced during the voyage.

The stow should not extend up into spaces between underdeck beams or girders. Similarly, cargo should not obstruct the flow of air through the return air gratings to the fan room. A minimum clear space of 150 mm should be maintained at the top of the stow.

Palletised Cargo

The minimum under-deck height for the handling and stowage of standard pallets is 2.2 metres. Pallets are normally stowed close together to avoid short-circuiting of air flow. Gaps between pallets, or between the stow and the hold battens, may be filled using dunnaging or custom-made air bags.

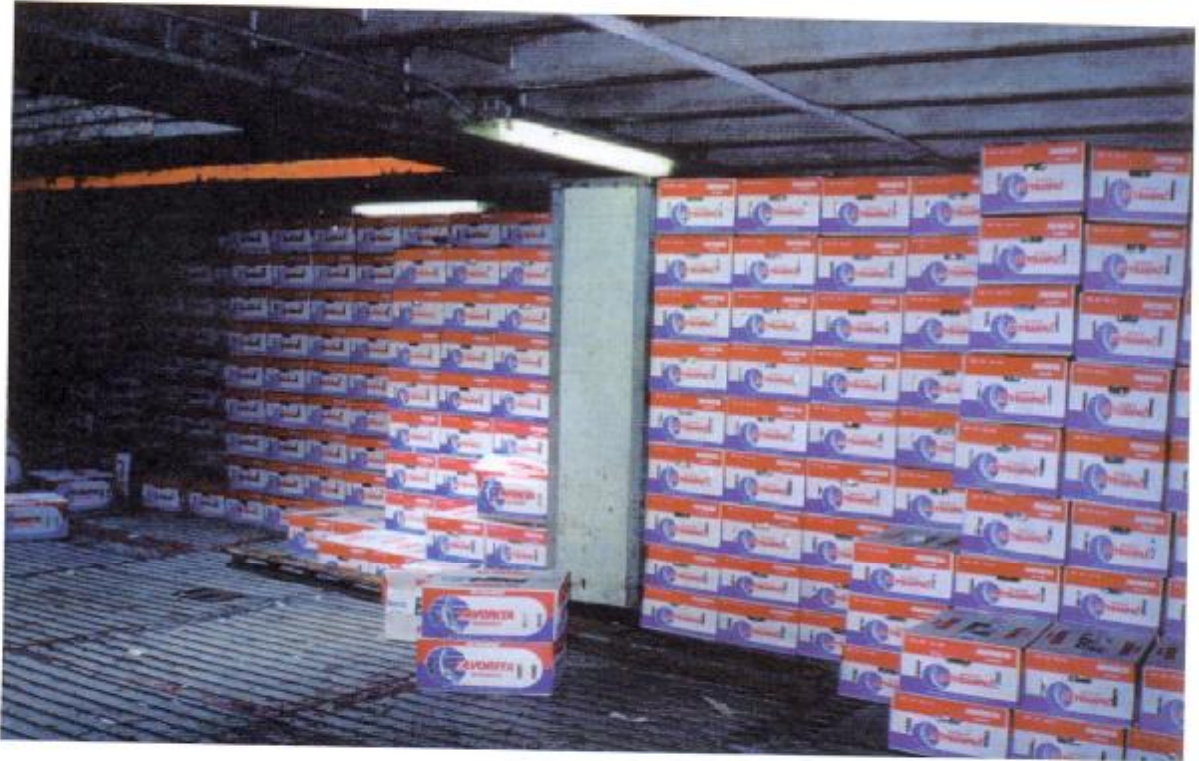
Cargo in Cartons

Cartons should be stowed on grating dunnage, up to 8/10 cartons in height, depending upon the deck height and proximity to the fan room gratings. Cartons should normally be stowed with the long side fore and aft. Tiers should not be allowed to overlap. Vertical dunnaging should be provided at regular intervals to guard against collapse of the stow in adverse weather conditions.

Break-Bulk

Some bananas are still shipped in the green condition a few hours after cutting, the cut ends being smeared with vaseline, and are stowed in bulk, bins of portable horizontal sparring being provided to avoid crushing, due to the motion of the vessel. The bunches are stowed on end, generally two heights with one tier on the flat on top. While deep stowage is to be avoided, especially for voyages exceeding 10 or 12 days in duration, bananas carry well, under favourable conditions when stowed to a depth of 3 m. Gratings of a depth which will ensure not less than 75 mm air space should underlie the cargo, and all vertical plain surfaces overlaid with 50 mm battens, to facilitate air circulation. Every care should be taken to avoid bruising.

Single cartons weigh about 60 kg. For voyages of a few days' duration, bananas, if harvested at



Cartons of bananas in stow.



Ripening of bananas within carton (Photo: Cargo Solutions).

the right time, are carried, on deck, loosely stowed on end with good results. In such cases, they are entirely at shippers' risk. Protect from sun's rays by awnings which, however, should not damp the circulation of air through the cargo.

Carriage

Normally delivery air should be in the range +12.5 to +13.5 degrees C, but individual varieties and trades require different conditions, which will be specified in the shippers' instructions. In some cases, a two stage temperature reduction will be required with a lower air delivery temperature for the first 24 hours, being raised to the normal carrying temperature when the return air reaches +14 degrees C. Fresh air ventilation should be restricted for the first 24 hours to expedite cooling, and then maintained at a level to keep the carbon dioxide level below the specified maximum (normally 0.5%).

During carriage, the temperature should not be allowed to drop below the specified minimum temperature (normally 11 degrees C), otherwise bananas are subject to a form of peel injury known as chilling. Banana carriers which deliver their cargoes in cold northern ports require to be fitted with means for warming the cargo spaces when cold weather prevails, especially when discharging during cold weather.

It is essential that a detailed and accurate log of delivery and return temperatures is maintained during the voyage. Comprehensive preloading checks should be carried out and recorded in the reefer log. These should include the condition of the cargo holds, clean and free from odours, air ducts free from obstruction, bilge wells clean and suctions freed, cooling system run and proven and the dates, and times and scope of shippers' inspections.

ISO Containers

Bananas may be shipped in closed box containers without refrigeration for very short journeys. Container doors should remain open and fruit green at time of stuffing. Up to 25% wastage must be expected over 2 or 3 days' carriage.

In insulated containers under refrigeration, payload of cartoned bananas in 20 ft unit can be 7.5 tonnes. Suggested carriage temperature for Pacific Island fruit is 12 to 13 degrees C air delivery, with air freshening.

Stuffing containers with fruit at field heat may be possible for limited transport distances, but is not recommended because:—

- (a) It puts a great strain on container refrigeration equipment.
- (b) Temperature control of all parts of the stow becomes less likely.
- (c) Exact timing between picking and stuffing is too open to chance — e.g. ship delays, harvest dates coming forward etc.

Controlled Atmosphere (CA)

Bananas may be carried under controlled atmosphere conditions. (See Controlled Atmosphere.)

BANQUE

See Hasheesh

BARBED WIRE

See Wire, Barbed

BARILLA



0.92/0.98

Casks

An alkali obtained from the ashes of a plant largely cultivated in Spain. Dry stowage remote from edible goods.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
BARIUM NITRATE	   		Bulk
Will intensify burning and give off toxic fumes. Toxic. Avoid inhalation of dust. (See IMO Code of Safe Practice for Solid Bulk Cargoes).			
BARJARI		1.48/1.53	Bags
An Indian pea. See also Seeds.			
BARKS	 	2.51/5.37	Bales
A great variety of barks are shipped from various places and for various purposes. Most of these are for medicinal purposes, others for tanning, notably oak bark. If free from smell may be stowed with fine goods, but all should be stowed clear of odorous, oily, or moist cargoes. A large number of varieties used for medicinal and other purposes are valuable commodities and being, for the most part, put up in bales, require gentle handling. Do not overstuff with heavy cargo.			
Australian, ground bark		2.09/2.15	Bags
Australian, chopped bark		2.65/2.79	Bags
Various barks are dealt with herein under their specific names. They are all very light cargo — varying from 2.51 to 5.57 cubic metres per tonne, and should not be overstuff with weighty cargo.			
BARLEY		1.45/1.67 1.67/1.81	Bulk Bags
Is principally used for malting; valuable also as a foodstuff for man and beast, and is extensively grown in most countries. See IMO Grain Rules. Bagged barley should be stowed separately from other grain with burlap or other suitable separation.			
BAROLYTE			See Witherite
BARRELS			See Part 2, Techniques
BARWOOD			See Camwood
BARYTE		0.34	Bags, Bulk
Industrial Sand, crystalline ore mineral; a sulphate of Barium. Used in paints, textiles and as filler for paper. Angle of repose 37 degrees. See Sand.			
BASIC SLAG		See Slag, Basic	
BASIL	 	2.79/3.90	Bales
Aromatic herb used for culinary purposes. Keep dry.			

Commodity	Characteristics	M3 per Tonne	Packaging
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BASIS

2.79/3.90

Bales

Soft tanned sheep and lambskins. Liable to damage by wetting. See also Leather.

BATHS

3.07

Crates

Top with light cargo to avoid damage from crushing.

BATCHING OIL

See Part 2, Petroleum

BATTERIES

1.48

Cartons, Boxes

Lead Acid. Nickel Alkaline. Dry Cells. Vulnerable to damage by excessive heat or damp. If filled with acid may be subject to D.G. regulations. See IMDG Code.

**BAUXITE
ALUMINIUM ORE**0.98/1.11
0.69/0.85Bags
Bulk

The principal ore of aluminium. A reddish earthy ore, both lumps and powder. Moisture content may be 7 to 13 per cent. Angle of repose 29°–34°.

BDELLIUM

20.9/2.23

Cases

A pungent aromatic gum resin known as Olibanum or Frankincense. See Gums.

BEANS

Alexandria	1.34	Bulk
Black	1.45	Bags
Castor	1.67	Bags
Cocoa	21.7	Bags
Dried	1.39	Bags
Horse	1.73/1.90	Bags
Jarry	2.79	Bags
Lima	1.87	Bags
Locust	2.34	Bulk
Soya	1.39/1.53	Bags
Soya	1.28/1.39	Bulk

Almost all varieties of beans are apt to heat. They very quickly deteriorate if shipped in a damp condition which will cause them to heat, sweat and ferment. If in doubt as to their condition, the B/L should be qualified accordingly. Generally clean, but inspect for bean beetle which will attack bran, etc.

In any case, B/L should contain the written endorsement "Shipped in apparent good condition". The above applies in a special degree to Soya beans intended for production of sauce.

Be careful that the bags are not bled and empty bags removed on shore during loading. Many cases of short deliveries are to be attributed to this cause.

Dunnage well and pay careful attention to ventilation. See Part 2, Ventilation, also Bag Cargoes.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
BEAN CAKE (Soya Bean) See Seed Cake.	   	1.11	Cake Bulk
BEAN OIL		1.08 1.39/1.53 1.76	Bulk Cases See Part 2, Oils and Fats

Shipped in bulk from Far East, U.S.A., etc. Solidifies at about 12 degrees C.

It may also be shipped in barrels.

The cases, sometimes, are tied with straw cord which renders good firm stowage impossible; the cross hitch at top and bottom pierces the cases above and below under pressure. If the roping is cut off, the cases will stow much firmer, with consequent less leakage.

Leakage of this oil, whether in barrels or cases, is very considerable and great care should be taken, by suitable boarding over, to keep other cargo from getting into contact with the oil containers.

BEAVER BOARD		2.23	Skeletal Cases
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Beaverboard and plaster board may be easily damaged if overstowed with heavy cargo. Normally 'tween deck stowage only. Shape and size give poor utilisation in a closed box ISO container.

BECHE-DE-MER Trepang	 	3.79/4.18	Bale
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A large sea slug, caught off New Guinea and East Australian coasts, cured and dried before shipment — generally put up in bales or in bags. Dry stowage, away from goods likely to be tainted by odours.

BEEF	 	1.67/1.73 1.53/3.76 2.79/3.76 2.37/2.79 3.90 1.39/1.67 2.65/2.93	Barrels or Tierces Cartons Chilled Frozen Quarters Frozen/Cartons Bagged Boneless
	Hard Frozen		

Pickled, Salt, Wet Cargo. Stow well apart from dry and odorous goods like turpentine, etc., and in a cool place, not more than 7 heights. See also Part 2, "drums, barrels, etc."

Carried under temperature control, beef may be chilled or hard frozen; boneless or on the bone; bagged or cartoned. Tempered beef is a combination of frozen and chilled, i.e. the beef is shipped in the hard frozen condition, and stowed in a chilled locker (often in the dead space beneath hanging chilled beef), and allowed to reach the chilled condition during the voyage. The main reason for this technique is to take advantage of the freight rate which does not take into account the dead space mentioned above.

Chilled Beef is probably the most difficult of all meat cargoes to carry successfully. Unlike frozen meat, chilled meat is carried as near to its freezing temperature as possible, without actually freezing it. The reason is that if ice is allowed to form in the meat cells they will rupture, and on thawing allow the blood to escape on which the flavour of a good juicy steak so richly depends. However it is necessary to keep the temperature as low as possible without actually freezing in order to limit the growth and multiplication of micro-organisms — all of which calls for very careful temperature

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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control. Normally shippers require 0.0–0.5 degrees C. Pay careful attention to shippers instructions. Since the meat is not frozen it is not hard, and must either be hung or packed in cartons to prevent bruising, crushing and inhibiting the air flow. When hung, special rails — insulated from the locker deck-heads — must be used, and never the overhead grids (if any). If ISO containers are to be used for hung beef, portable rails have to be installed to carry the weight of the meat, and this of course reduces possible payload by adding weight and reducing cube. The meat must not be packed too tight for fear of bruising, nor too slack to allow movement and therefore chafe. Often the fore quarters are stowed around the periphery as they are of less value and more suited to take the brunt of any pressure or movement. If height of compartment permits, quarters are hung on hooks, with fores beneath them on chains.

Because of the nature of the cargo and the possibility of continued mould growth in the relatively high temperature, great cleanliness must be observed at time of preparation and loading. Before shipment, locker or container must be tested for air-tightness, thoroughly cleaned and washed out with an approved disinfectant. After drying the space should be fumigated to remove all bacteria and moulds. During this time the appropriate fans should be run to ensure air trunks and fan spaces are similarly treated. The spaces should be precooled to remove all heat from the insulation — this may be 24 hours before loading in the case of lockers; a few hours in the case of containers. Each space should be loaded as quickly as possible in one continuous movement, then the doors closed and sealed to ensure air-tightness. The space should then be brought down as swiftly as possible to the carrying temperature using full fans to ensure an even temperature throughout. With carrying temperature achieved the fans should be slowed and frequently reversed to ensure even temperature throughout. Too great an air circulation tends to dry out the meat to its detriment. Very fine temperature control is essential and warm brine may be needed on occasion to ensure the cargo never reaches its freezing temperature. The stowage life of chilled beef under these conditions is strictly limited, but may be extended by holding the cargo in an atmosphere of about 10% CO₂ — hence the necessity for air-tightness of the compartment. It is important that at any time of discharge the gas concentration is removed by ventilation before entering.

Chilled beef in cartons is usually boned, and each cut, hermetically sealed in plastic film. This keeps a minute concentration of CO₂ within each pack next to the meat itself, thereby inhibiting growth of mould and bacteria. It is important that this film is never broken. Cartons should be stowed to ensure that the refrigerating air circulates and reaches at least one side of every carton — with the insertion of vertical and horizontal battens where necessary. Because the cartons are not packed out with meat (as is the case with frozen meat in cartons); the cartons are susceptible to crushing and collapsing damage. Tiers should not, therefore, be more than 10 high, and care has to be taken when stowing in ISO containers to avoid those cartons at the sides collapsing into the air channels in the floor.

Carton Beef from South America stows at about 2.51 M3 per tonne.

Hard frozen beef may be shipped in bulk, the quarters being wrapped in hessian cloth. Clean canvas or duraluminium slings should always be used when loading frozen meat. Mouldy meat should be rejected as should meat with a bone temperature warmer than –7 degrees C. Beef being considerably heavier than lamb or mutton should, from consideration of stability be stowed in the lower holds and the latter in the 'tween decks. If stowed in the same compartment the beef should be lowermost.

Quarters of beef should be stowed on the flat, as if stowed on edge, air circulation will be impeded. As fore and hind quarters do not stow well together, better results will follow if they are stowed at different ends.

In stowing at ends or sides, care should be observed to ensure that the shanks do not protrude into and interlay the brine pipes, which if permitted will bring strain to bear on the pipes through settling of cargo as weight is superimposed and the natural settling of cargo occurs, neither should the meat be allowed to get into contact with pipes or insulation.

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

The breaking of stowage and the further use of dunnage battens is not necessary with frozen

Commodity	Characteristics	M3 per Tonne	Packaging
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quarters of beef or mutton and lamb carcasses, as their regular forms of such, when hard frozen, does not permit of stowage sufficiently compact as to impede air circulation.

If over stowing quarters of beef with other cargo, a separation of timber battens should be made.

Boneless beef in Cartons — laid on dunnage, 50 mm clear of floor, to allow cold air circulation. 25 mm board dunnage laid over (and possibly nailed to) to 50 mm. Cartons if bulged are best stowed fore and aft on edge. If overstowed with butter, bagged beef, carcase meat, etc., at least 50 mm dunnage to be laid in line with the air flow over the cartons. Also see Offal, etc.

ISO refrigerated containers — frozen beef must be at or below carriage temperature when being stuffed. No intermediate dunnage normally required if container has permanent floor and wall battening. See Part 2, Refrigeration.

BEER

1.50/1.56
1.56/1.62
1.95/2.09
1.39/1.84

Casks
Hogs'd
Bottles
In Cases
Canned in Cartons
Bulk Bags

Specific Gravity 1.005

Beer in Casks should always be stowed in a cool well ventilated space, well removed from engine and boiler spaces and from cargo (or bunkers) that are apt to heat, as beer deteriorates if heated. May also be damaged by excessive low temperature, e.g. sub-zero C.

Beer is also readily damaged by strong scent or fumes, which should be safeguarded against when arranging the stowage.

All stained, leaky or damaged casks (whether repaired or not), should be rejected and a sharp watch kept for part-empty casks.

Bottled and canned beer is shipped in cases and cartons. Cartons of bottles are liable to collapse if wet from condensation or breakage. Stow in special locker if possible, in any case, cool stowage is essential. Watch carefully to prevent pilferage.

See also spirits.

Beer and wine are sometimes carried under refrigeration at shipper's request. Generally wines are carried at 10 degrees C, and beer at about 7 degrees C. Beer and wine must not be frozen. Usually packed in cases or cartons. Watch for broaching.

BEESWAX

1.95/2.09
1.81/1.95

Barrels
Cases

This commodity melts at about 62.8 degrees C (145 degrees F). It is clean cargo, stow in a dry, cool place.

BELLADONNA

2.51/2.65

Bags

Or Deadly Nightshade, a poisonous herb valued for its medicinal properties. Dry stowage apart from moist and edible goods. See IMDG Code.

BENJAMIN

1.39/1.53

Bundles

A gum resin used in the manufacture of incense, benzoic acid, etc. See Gums.

BENNIN SEED

1.45/1.59

Bags

A fine oil bearing seed, shipped from West Africa. See Bag cargo and Grain.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
BENTONITE		2.20/1.59	Bags
A colloidal clay used as a lubricant mud for oil well drilling and various industrial purposes. Stow away from cargoes that emit moisture.			
BENZINE PETROLEUM		See Part 2, Chemical Cargoes.	
BENZOIN		See Benjamin	
BERYLLIUM ORE		0.56 See Part 2, Ores.	Bags
A hard metallic element used in the making of alloys. See IMDG Code.			
BETEL NUT		1.67/1.81	Bags
See Areca Nut.			
BIDI LEAVES		6.97 and over	Bags
Clean dry stowage, away from tea.			
BILLETS		See Steel	
BINDER TWINE		See Twine, Binder	
BIRIE LEAVES		6.97 and over	Bags
Dried leaves of an Indian tree used as a wrapper for cheap cigarettes. Dry stowage, away from tea.			
BISCUITS— "Cookies"		Variable	Tins or Cartons
May be damaged by taint, high temperatures (chocolate coated and filled) or crushing. Stow upright to prevent "crumbling".			
BISMUTH ORE		0.84	Bags
BISMUTH METAL		0.28/0.33 0.20/0.22	Boxes Ingots
A brittle yellowish or dish white metal used medicinally and as an alloy in the manufacture of solder. Stow clear of fine goods and of copper and zinc. See Ores. See IMDG Code.			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
BISULPHIDE OF CARBON		See Part 2, Petroleum.	
BITUMEN	 	1.25/1.35 1.28/1.39 1.53	Barrels Drums Casks
A Bitumen tar, an inflammable commodity, shipped in the solid and in the liquid form. Stow away from taintable cargo. See Asphalt.			
In some forms it is classified as Dangerous Goods. See IMDG Code.			
BLACK LEAD See Plumbago		1.34/1.39	Paper Lined Kegs
BLACK SAND		See Ilmenite Sand	
BLACK SEEDS			Bags
Very fine seeds, will perculate, minutely. Although dry should not be stowed with dried fruit, grain or other bagged cargoes. See Seed.			
BLACK SHEETS		0.56	Envelopes
In bundles and envelopes. Very heavy, care may be needed to spread load in 'tween decks and on ISO container floors.			
BLACKWADD		The ore of Manganese, which see	
BLACKWOOD		1.35/1.53	Logs
A dark hardwood used for furniture making. Stow clear of grease and oils.			
BLEACHING POWDER Chloride of Lime, Sodium and Potash, Calcium Hypochlorite (which see)	  	2.12/2.23	Drums
Packed in plastic or steel drums. A strong disinfectant and deodorant white powder; it releases corrosive pungent fumes (chlorine), and oxygen.			
Cases have occurred where packages, carefully stowed, were discovered to be smouldering, eventually breaking into flames. Calcium Hypochlorite is shipped in various degrees of purity. The strongest product (70%) is an oxydising agent and will decompose explosively if heated. It reacts strongly with some types of organic matter. Leaking containers must be rejected and all spilled material swept up.			
The most suitable stowage is "on deck", or in poop, or forecastle well clear of crew's quarters. See Aniline Dyes and Oils. See IMDG Code.			
BLENDE		0.56/0.67	Bulk
The principal ore of Zinc. See Part 2, Ores, See Appendix 5.			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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BLOOD, DRIED

See Dried Blood

BLUE ASBESTOS

See Asbestos

BLUE COPPERAS

See Copper Sulphate

BLUE VITRIOL

See Copper Sulphate

BOLTS AND NUTS

0.47

Casks, Bags.

Very heavy. Distribute weight as necessary — particularly in ISO containers.

BONES

1.67

Bags

Generally shipped in plastic or hessian bags. B/L should be claused "Not responsible for loss of weight".

Bones accepted for shipment should be clean, dry and free from extraneous matter and may have to be accompanied by a Sanitary Certificate visaed by the Consul of the country of destination. Stow in well ventilated spaces away from foodstuffs. Thoroughly clean and ventilate upon completion of discharge. See IMDG Code.

BONE ASH

See Fertilisers.

Bags

Very Dusty. Heats when moist. See IMDG Code.

BONE GRIST

1.81/1.95

Bags

BONE MEAL

1.11/1.25

Bags

Dry stowage, clear of edible goods. Shipped in bags, condition of which should be carefully noted. Is very clear in handling, and odorous.

B/L should be claused "Not accountable for cost of rebagging, consequent upon deterioration of bags through the action of their contents".

Stow clear of dry goods and below other cargo to avoid mixing with same owing to the rotting of bags. See Manures.

BONE MANURES

1.67/1.35

Bags

See Fertilisers

BORACIC ACID

1.91

Barrels

1.59

Cases

Quite harmless cargo. Ordinary dry stowage. Shipped in considerable quantities from West Coast of South America, Canada, etc.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
BORAX ANHYDROUS	 	0.78	Bulk
Highly refined white crystalline appearance. Can be dusty. Dust is irritating but not toxic if inhaled. Hygroscopic and will cake if wet. Very abrasive.			
BORAX (Pentahydrate Crude, "Rasorite 46")	 	0.92	Bulk
Fine powder and granules. Dusty, irritating but not toxic if inhaled. Hygroscopic and will cake if wet. Angle of repose 37 degrees. Used as the major source of borax and boron products.			
BORAX (Tincal)		1.50 1.17/1.25	Casks Bags
Powdered. A chemical compound of Boracic Acid (which see) and soda, used as a flux for metal working and many domestic purposes, including the preservation of foodstuffs. Obtained in California, where it is known as Tincal — F. East, S. America, etc. Keep dry.			
BOUSSIR		1.78/1.84	Bags
A rice offal used as camel food. See Rice.			
BOTTLES (Empty)		2.00/4.04	Bags
May be suitable for stowing or stuffing with temperature controlled cargo as "space filler" provided any cross-taint cannot adversely affect packaging. Caution: condensation may form on packaging and contents when unloaded or unstuffed to ambient conditions.			
BOXWOOD		1.53/1.81	
This heavy, close grained hardwood, which does not float in water, is exported from Central and S. America, West Africa, etc., in logs approximating Pitprops in length, etc. Also in short billet form varying from 610 mm to 1200 mm in length and up to 152 mm to 178 mm in diameter. Dry stowage — avoid oil and acid stains and mixing of billets with dunnage wood.			
BRAID		See Hemp, also Strawboard	
BRAN		2.79/3.34 2.23/2.37	Bags Bales
A very light cargo — usually put up in bags, but sometimes compressed into bales. Dry stowage. Requires to be well ventilated to prevent heating and caking internally as distinct from external caking due to sweat and moisture. Prone to red beetle infection which will attack all agricultural produce. See Rice Bran.			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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BRANDY

See Wines

BRAZIL NUTS
 2.29/2.37
 2.51/2.65

 Bulk
 Bags

An edible high value nut used largely for sweet making, etc., it is also oil bearing. Shipped in large quantities from Amazon and other South American ports. Must be carefully protected from rain, and should be rejected if at all in a damp condition. Shipped in bulk and on occasion in bags. When the former is the case and a number of consignments are shipped by the same vessel, it is necessary to keep them from mixing by erecting bins or dividing compartments into sections of a suitable size. These nuts are very liable to heat, and require maximum air circulation to avoid deterioration. See Nuts.

BRICKS
 0.56/0.61
 0.70
 0.70/0.84

 Bulk
 Crates
 Bulk

Firebricks

Weigh approximately 3 tonnes per 1000. Stow on ceiling, deck or firm platform; if spar ceiling fitted, board same over to keep the block firm in seaway.

Bricks should not under any circumstances be used for chocking off cargo.

BRIMSTONE

See Sulphur

BRISTLES

1.91/2.09

Cases

Pig bristles, etc., shipped in considerable quantities from Far East, Russia, Denmark, etc.

A Sanitary certificate issued by the Health Authorities, endorsed by the appropriate Consular Official is usually necessary for this commodity.

Sometimes packed in cases containing naphtha, therefore treat as odorous cargo. Bristles are very valuable and should be carefully guarded to prevent pilferage.

Examine the packages and seals carefully when delivered alongside for any indications of tampering.

Tally on board by marks and numbers and stow in strong room, special locker or amongst fine cargo, provided they can be over stowed with other cargo immediately.

They require the same careful watching on discharge.

BROWNTOP SEED
 2.84/3.09
 1.39

 Sacks
 Bulk

See Grass Seeds.

**BRUNAK
(Poonac)**
 2.17/2.23
 2.09/2.15

 Bags
 Bales

An oil cake, the residuum of the coconut (Copra, which see) after as much of the oil is extracted as possible. Liable to spontaneous combustion. Stow in a cool well ventilated space away from fine goods and do not overstuff with weighty cargo. See Oil Cake. See IMDG Code.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
BULBS	 		Cases Casks and Cartons

A great variety of bulbs are shipped during the winter season, especially from Holland. Packed in well made cases or cartons, sometimes containing husks, dried mould, sand, etc. Being a perishable cargo it is carried at Shipper's risk and B/L should be claused accordingly. For stowage for long voyages, see Lily Bulbs. There may be claims from receiver that the bulbs have matured on the voyage. Care should be taken to separate real damage from a commercial claim which may be based on the anticipated "shelf life".

BULLION

Gold and silver bullion, i.e. uncoined gold and silver respectively. Shipped in ingot or bar form, and sometimes packed in strong well made boxes which usually are fitted with strong rope becketts for handling. Unless vessel is fitted with a proper strong room or safe of suitable capacity, bullion should not be received on board.

See Part 2, Specials.

BULK, DRY AND LIQUID CARGOES

See Part 2.

BUNDLES

See Part 2, Timber.

BURLAP



1.76/1.81

Bales

This is the name by which Hessian is commonly referred to by seamen.

Burlap should be carefully dried before stowing away in peaks, etc., after use, otherwise it will heat and quickly rot. Cases are known where men have lost their lives through fumes emitted by this jute material having rotted in badly ventilated compartments. Burlap is very liable to spontaneous combustion if stained with vegetable oil, especially linseed oil. Cloths or bags so stained should be destroyed and never stowed away in peaks or holds.

As cargo, the use of hooks in handling should be strictly prohibited. See Hessians. Also Gunnies. See IMDG Code.

BUTTER



Hard Frozen

1.45/1.50

1.67/1.78

1.95/2.09

1.34/1.39

Cases/Tins

Kegs

Tins

Cartons

Butter is packed in cases, boxes or cartons, and occasionally in kegs, and is very suitable for lower hold stowage on account of its weight, added to which is the fact that it stows safely with frozen meat.

Australian cartons. Stow at 0.44/0.47 L.H.'s, 0.52/0.55 T.D.'s.

New Zealand cartons. Stow at 0.45/0.42 L.H.'s, 0.52/0.55 T.D.'s.

Butter which shows signs of having melted should be rejected if claims are to be avoided.

Loading temperature should not exceed -1 degree C.

Stow on 50 mm x 50 mm battens, suitably spaced to ensure adequate support to the cases or alternatively stow on 22 mm battens at about 450 mm centres, overlaid with 150 mm x 25 mm boards spaced to ensure adequate support to the cases. Where there is a turn of bilge, it is necessary to build timber bridges or steps to ensure sound stowage.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
Plain boxes or cartons of butter stowed in brine cooled compartments should be interlaid with wooden lathes at least every four tiers high. It is often required that parcels of butter be separated and the most effective way of doing this is to mark off with well diluted colour wash marking paint. Ordinary paints must never be used. Butter is extremely susceptible to taint; butter therefore should not be stowed in the same compartment as fish, calf vells, rabbits, hares or poultry. It is recommended that whenever possible butter should not be stowed between the same bulkheads as fresh or citrus fruit. The most prevalent damage to butter — if carried loose — is caused by the practice of dock workers' hooks holing the boxes or cartons during loading or discharging. It is essential to avoid considerable claims, to have adequate supervision in order to check labour from the use of hooks. Canned butter may also require refrigeration (chilled probably 5 degrees C, 41 degrees F) to maintain texture. Cargo sweat may form on the cans immediately on discharge from vessel or refrigerated container. Adequate ventilation during subsequent storage should be sufficient to remove this without ill effect. <i>ISO containers</i> — Butter is suitable for refrigerated containers. Must be at or below carriage temperature at time of stuffing. No requirement for intermediate dunnage provided container has adequate fixed battens. Typical payload for 20 ft Insulated Container 16.8 tonnes (New Zealand). Cases of tinned butter, also kegs of butter are sometimes shipped on certain short routes as ordinary cargo. Stow in a cool place and well removed from all odorous cargo, such as fish, manures, turpentine, etc. Very liable to taint. See Part 2, Refrigerated Cargoes.			

BUTTERFAT DRIED

2.09/2.23

Cases

Processed butterfat used in the manufacture of foodstuffs, etc. Cool, dry stowage.

BUTTERNUTS

2.79/2.93

Bags

Shipped from America. See Nuts.

**CABLE
(Chain)**

See Chain Cable

Stow in holds by flaking athwartships.

**CABLE
(Insulated)**

1.11

Drums

Stow fore and aft, on firm platform, as solid as possible, and chock off with timber to preclude any possibility of movement and chafage. Certain cable cores are encased in oil and subject to exceptionally large claims if damaged.

Insulated cable should not be stowed over dry or fine goods, as drainage of the tar from insulating material is to be anticipated in warm weather. The liberal use of sawdust to absorb the tar is advisable to protect wood ceiling.

Sling reels by means of stout bar passed through hole in wood core provided for that purpose. Protect wire if exposed from chafing by overstow. In ISO containers, if possible stow fore and aft. May constitute "overheight" cargo — especially if carried in half height containers. Good lashings and chocking nailed to container floor.

CABOGE

See Gamboge.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CACAO BUTTER		1.81	Cartons
Obtained from the Cocoa bean. See Vegetable Fats.			
CAJAPUT			See Essential Oils
CAKE LAC			See Lac
CALABA BEANS	 	2.23	Bags
Poisonous. Stow away from cargoes intended for human or animal consumption. See IMDG Code.			
CALAENA ORE	 	0.45/0.50	Bags
A lead concentrate, shipped from E. Africa. Absorbs moisture and is very liable to heat. Deck stowage. See IMDG Code.			
CALCINED COKE			See Petroleum Coke
CALCINED PYRITES (Pyritic Ash, Fly Ash)	  	0.43	Bulk
Must be kept and loaded dry. Harmful if dust is inhaled. Stow away from foodstuffs. (See IMO Code of Safe Practice for Bulk Carriers).			
CALCIUM CITRATE			Bags
Non hazardous. Subject to heavy condensation.			
CALCIUM CYANAMIDE		See Cyanide	
CALCIUM HYPOCHLORITE	   		Steel Drums
White or yellowish granules with chlorine smell and used as an oxidising substance. Soluble in water. May combust if contaminated with impurities or poor packaging. Liable to heat slowly, and ideally should be stowed on deck where ventilation is possible and away from direct sunlight or other sources of heat.			
Calcium Hypochlorite is thought to be the seat of disastrous fires in containers. Expert opinion is divided as to whether package size is critical and contributes to the generation of heat. The International Group of Clubs recommend that the cargo should be packed in clean steel drums not exceeding 45 kg in weight, and should be stowed on deck, clear of living quarters. Corrosive to most metals if moist, and reacts to acids by producing toxic chlorine gas.			

Commodity	Characteristics	M3 per Tonne	Packaging
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CALCIUM NITRATE

0.91/1.12

Bulk

Fertiliser. Granules consisting mainly of double salt with ammonium nitrate and water. Non-combustible but if mixed with combustible material will burn fiercely and give off toxic fumes. Check specification as commercial grade. May be non-hazardous. (See IMO Code of Safe Practice for Solid Bulk Cargoes).

CALNITRO

See Fertilisers

CALVES

2.51/2.65

Sides

2.51/2.79

Qrs.

2.23/2.51

Bags

Calf carcasses are shipped in the hard frozen condition covered in cloth. Inspection and stowage as for mutton, which see. Bags of boneless veal should be given stowage similar to boneless beef, which see.

CAMATA

See Valonia

CAMATINA (CAMATA)

See Valonia

CAMELS

See Part 2, Livestock.

On deck, at shipper's risk, B/L to be claused "Ship not responsible for mortality".

For short passages in fine weather latitudes they are just tethered to a line spread fore and aft along the decks.

Some of these animals are very vicious and given to biting any stranger within reach. Wounds so inflicted are very apt to become septic, and however slight, should be given early and careful treatment. To prevent accidents of this kind the animals should, where possible, be confined to one side of the deck. Camels should be well watered before embarkation. For other than short passages, allow 30 litres of water, about 2 kg of grain, in addition to green foodstuffs per day. See Part 2, Livestock.

CAMOTE

Local name (Philippines) for Sweet Potatoes. See Potatoes.

CAMPINE

1.67/1.81

Drums

A very dangerous liquid. Owing to its highly inflammable properties, the utmost care should be taken to keep lights away from its vicinity, smoking etc. It has also the additional property of being one of the strongest smelling articles likely to be offered for shipment — the smell persists long after the stuff itself has been removed. For this reason it is not at all suitable for under deck stowage in a vessel likely to carry fine goods shortly after, and owing to its extreme inflammability, its carriage on deck is attended with considerable risk. See IMDG Code.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CAMPHOR	 	1.67/1.81	Tin Lined Cases
Has a strong persistent odour which can contaminate timber, insulation and ship's paintwork.			
CAMPHOR OIL	   	1.95	Drums
A white, solid, semi-transparent oily substance with a bitter taste, obtained from the camphor laurel trees, native to Far East, India, etc. May also be synthetic. Very pungent smell which will spoil any foodstuff stowed in the same compartment; the oil is highly volatile. Should not be stowed in holds. Stow in a dry, well ventilated peak, and if essential oils are stowed in the same compartments, stow camphor oil below and not over essential oils. Residual odour may be discernable for some considerable time after discharge. See Part 2, Obnoxious Cargoes. See IMDG Code.			
CAMWOOD (BARWOOD)			
A red dye wood. Dry stowage. Salt water causes discolouration.			
CANADA BALSAM		1.48	Casks
A thick gum resin — odorous and bitter. Stow away from foodstuffs and delicate cargoes.			
CANARY SEED		1.39/1.67 1.36/1.37	Bags Bulk
A small seed.			
CANDLES	 		Boxes, Cartons.
Fragile. Avoid crushing. See also Paraffin Wax.			
CANELLA ALBA		3.62	Bales
The inner bark of the white cinnamon tree — apt to taint fine cargoes. See Barks.			
CANES		2.79/3.34	Bundles or Bales
Tsinglee, Malacca, etc. Dry stowage. See Rattans.			
CANNED GOODS		Variable	
Usually in cartons. May be palletised or on skids. Cans provide inherent strength to carton and the stow should be tight and even to prevent crushing of chafe. See Part 2, Cartons. Subject to damage by sweat. Stow in separate compartment to moisture inherent cargoes. See Part 4, Damage and Claims.			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CANOLA	 	See Rape seed	
CANVAS	 	1.39	Bales and Rolls

Stow as for carpets. Tarred canvas may be classed as Dangerous Goods.

CAOUTCHOUC		See Rubber	
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CAPSICUMS		4.18/4.32	
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Dried pods used in cooking. Shipped from East and West Indian Ports in bags, baskets, etc. See Pepper.

CARAWAY SEED		1.67	Bags
The seed of a small plant — shipped from Germany, Holland, England. See Seeds.			

CARBON BLACK	  	1.67	Bags
See Lampblack. See IMDG Code.			

CARBORUNDUM		0.56	Bulk
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A hard black crystalline compound of carbon and silicon. Odourless. Slightly toxic by inhalation. Used as an abrasive and for refractory purposes. Angle of repose 40 degrees.

CARDAMON SEED		2.65 2.09/2.93	Cases Bags
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A plant seed used for medicinal and culinary purposes. Shipped from Sri Lanka, Malabar Coast, Singapore, etc. They are odorous and should be stowed away from tea, tapioca, sago and other delicate foodstuffs.

CARNARINA	 	1.25/1.39	Bags
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A manure composed of powdered bones — strong smelling. See Manures.

CARNAUBA		See Vegetable Fats.	
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CARNE SECA (DRIED MEAT)			
May give off grease.			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CAROB		2.34/21.51	Bulk

A bean shipped in fair quantities from Cyprus, etc. See also Locust Beans.

CARPETS		2.79/3.34	Bales
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These constitute very valuable cargo at times. The more expensive carpets are packed in cases or made up in rolls, while the common kind are made up into tightly packed bales. Rubber/foam backed carpets are susceptible to damage by crushing. Should not be stowed more than 3 rolls high. The use of hooks in handling this cargo should be strictly forbidden. Ordinary dry stowage. *ISO container stowage* — bales at front of container and rolls in way of doors allows more speedy container unpacking.

CARTHAMUS SEED		See Safflower
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CARTONS	See Part 2, Techniques
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CASE OIL		See Part 2, Petroleum Cargoes
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This term is applied to cargo, consisting of various kinds of oil — mostly Petroleum Products, classed as "Dangerous" or "Hazardous" Goods — contained in 5 gallon cans packed, usually two in a case the following being the most important of such :—

	<i>Size of U.S. Cases</i>	<i>Approx. Wt. Kg</i>	<i>M3/Tonne</i>
Kerosene	1.6 c.f.	37.19	1.39/1.45
Refined Petroleum	1.6	34.02	1.50/1.53
Petroleum	1.6	36.74	1.39/1.45
Gasolene	1.6	36.29	1.39/1.45
Mineral Lubricating	1.6	40.02	1.25/1.31
Mineral Turpentine	2.0	36.29	1.53/1.56
Benzine	2.0	34.02	1.56/1.59

Holds must be thoroughly clean and provided with adequate means of ventilation before they will be accepted as fit to receive case oil. Clean dunnage only will be accepted.

Electric power mains should be cut off from all compartments in which inflammable liquids are carried. All leaky or stained cases should be rejected.

In all instances, prior to loading low flash point liquids either on or under deck, the IMDG Code or other appropriate reference consulted. Similarly it will be necessary to establish local port authority regulations for ports of call as well as port of discharge. It will also be necessary for vessels transiting the Suez or Panama Canals, etc., to conform to their requirements on stowage and carriage.

The Authorities in most countries require to satisfy themselves as to the flash point of case oil before granting permission for discharge to commence. In some cases they demand samples of each brand to be sent on shore. Time will be saved by arranging for a sample case of each brand to be on hand for landing immediately on arrival.

Petroleum products give off vapour at ordinary temperatures, which when combined with air, forms an explosive and inflammable mixture. The use of naked lights, smoking, etc., should never be allowed in or near compartments containing case oil. Ventilation of holds should receive constant attention and conform to the requirements as set out in the IMDG Code for the particular category of cargo concerned.

Before receiving any delicate or edible goods into a compartment which has recently contained case oil, all oil stains should be removed by the use of limewash and bilges thoroughly cleaned and washed out.

Commodity	Characteristics	M3 per Tonne	Packaging
CASEIN	 	1.84/2.26 1.76/1.84	Bags Cases

The coagulated cheesy substance of milk in powdered form, used for a variety of purposes including as foodstuff. Dry stowage — treat as Flour. Obnoxious smell when damp. See Milk Powder.

CASES	See Part 2, Techniques
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CASHEW KERNELS		1.95	Tin Lined Cases
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Valuable cargo, shipped from East Africa and other tropical ports. The Malabar cases weigh 30 kg, and measure 0.05 M3. Inflammable.

CASHEW NUTS			Bags
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The kidney shaped, greyish fruit of the Cashew tree. A tropical product containing a highly inflammable black oil. See Nuts. See IMDG Code.

CASHEW NUT OIL		1.48 0.92 S.G.	Cases Drums Bags Bulk
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This nut oil is corrosive to the flesh and clothing and requires special chemicals to clean the tanks after discharge. See Vegetable Oils. See Part 2, Oils and Fats.

CASHMERE	
See Mohair.	

CASINGS	   	1.39/1.67	Cask Kegs
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Animal intestines shipped in the pickled condition packed in barrels, which should be stowed as Wet Cargo liable to leakage; also as Refrigerated Cargo, which see. Cool stowage, liable to fermentation if heated.

Treat as Special Cargo and valuable. *ISO containers*. Line container floor with plastic and sawdust to absorb leakage. Protect container from direct sunlight on board and in the terminal stack.

CASKS	See Part 2, Techniques.
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CASSAVA		See Manioc
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<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CASSIA (Cassian Lignea) (Cassia Fistula)	 	2.79/3.62	Cases, Bundles Bales
The dried bark of the "false cinnamon" used as a cheap substitute for cinnamon. Stow clear of tea, and, as it is put up in frail packages, do not overstuff with heavier packages. It is sometimes put up in mats when it comes in very useful for beam fillings with clean cargo. Can be dusty and is sometimes weevil infested. See Barks.			
CASSIA BUDS		3.62/3.76	Cases
Are somewhat heavier than the bark. Stowage as for Cassia.			
CASSIA LEAVES		See Senna Leaves	
CASSITERITE		See Tin Ore	
CASTOR OIL		1.67/1.73 0.945/0.965 S.G.	Drums Bulk
The composition of castor oil makes it unique amongst the vegetable oils. Major producers of the oil are India and Brazil, with both countries very active in the export market. The oil has a viscosity much higher than all other vegetable oils, and this makes it more difficult to pump than other vegetable oils. It has therefore been recommended that the temperature for loading and discharge should be 30-35 degrees C. The unusual composition of the oil is also the cause of it having a higher density than other vegetable oils, this being approximately 960 kg/m ³ at 25 degrees C. The oil is normally traded with a maximum Acid Value of 2 mg KOH/gm. equivalent to 1% free fatty acid.			
Castor oil is used as a lubricant, in the production of cosmetics and a range of chemicals and also in the production of various surface coatings. These applications make it important to avoid discolouration of the oil during handling. See Part 2, Oils and Fats.			
CASTOR SEEDS (Beans)		1.95/2.37	Bags
The seeds from which castor oil is obtained, which being of a poisonous nature must not be stowed with or near grain and foodstuffs. Heavy claims have had to be met where such stowage was permitted. Separate stowage compartment if possible. Avoid stowing in a 'tween deck when there are foodstuffs in bulk in the lower hold. Clean stowage space or container thoroughly after discharge. Contact with the dust or crushed beans can cause severe irritation to the eyes or skin. Respirators should be used when the dust is agitated. See Seeds.			
CATECHU		See Cutch	
CATTLE		See Part 2, Livestock	
CATTLE MEAL CAKE	  	1.95/2.09	Bags, Bulk.
Can be dusty and odorous. Dry, well ventilated stowage. See also Seed Cake.			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CAUSTIC SODA LIQUOR (Sodium Hydrate)	 	0.95	Drums Bulk

Is classified as Dangerous Goods. It is strongly caustic to the skin and attacks organic matter, e.g. wood fibres, clothing, food, etc., also aluminium and zinc or their alloys.

In small quantities it is packed in glass and earthenware containers, suitably protected; in tin cans, also in steel drums of 100 gallons capacity.

Stow on deck or under deck (See Part 2, Techniques, Deck Cargo). Not in contact with ammonia compounds, aluminium, zinc or their alloys.

In Bulk — this commodity can be carried in bulk in Deep Tanks which must be free of aluminium and zinc or their alloys.

On discharge the tanks should be filled with water and pumped out. Any dilute solution left on the sides, etc., of the tank will lose its causticity by chemical reaction with CO₂ in the air, leaving behind carbonate of soda which is harmless. See IMDG Code. See Part 2, Chemical Cargoes.

CAVIARE		1.39/1.50	Cases
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The prepared roe of the sturgeon and certain other large freshwater fish. Shipped in considerable quantities from Russia and Iran. A valuable food delicacy which should be protected from pilferage. Dry cool stowage.

CELERY SEED		2.09/2.12	Bags
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A valuable seed. Bags should be well made of good material. Double bagged at times. Dry stowage.

CELLOPHANE (Regenerated Cellulose Film)			Rolls. Cylinders.
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Stow upright. Ensure reels are not snagged or compressed.

CELLULOID GOODS	 
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Inflammable. See IMDG Code.

CEMENT	  	0.72/0.79 0.65/0.70 0.98/1.11 0.60/1.00	Unitised Bags Drums Bulk
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Major exporters include Spain, Greece, Japan, Korea, France, Cyprus, Poland and Romania. Large shipments tend to be in bulk rather than bags. When in bulk cargo, should be trimmed to near level stow and cargo allowed to "settle" before embarking on voyage. Many kinds of cement are in use and are obtained from various carbonates, the different kinds varying considerably in their specific gravities and therefore in their stowage factor. Most bag shipments are pre-slung. Clean stowage. See cement, Portland.



Port of Bala Loading Plant (Photo: Port of Bala)

<i>Commodity</i>	<i>Characteristic:</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CEMENT BOILER		1.76/1.81	Double Bags

A mixture of vegetable fibre — sometimes asbestos fibre is used — with special heat insulating earths. See IMDG Code.

CEMENT CLINKERS		0.61/0.84	Bulk
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Unground cement. Angle of repose 24 to 45 degrees.

CEMENT COLOUR		1.67/1.81	Drums
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Ordinary drum stowage.

CEMENT, PORTLAND	 	0.61/0.64 0.65/0.70	Bulk Bags
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When pure, cement sets only in dry air, but when mixed with clay it sets when immersed in water, from which it follows that the latter variety is useful for stopping underwater leakages in ships, etc.

It is a very dusty cargo and fine cargoes should be carefully covered when cement is being worked into or from the same compartments, etc.

Cement may be packaged in Kraft paper bags.

For the most part large parcels of cement are carried in bulk with suitable mechanical loading and discharging facilities. Discharge is normally by siwertell or grab. The use of grabs may be prohibited by environmental authorities due to the dusty nature of the cargo.

The majority of bulk cement is carried in dedicated ships. The double-bottomed holds are inclined by 9-12 degrees in both directions. On top of the steel structure fluidisation panels are installed to allow the cement to move to the discharge point, and within reach of the unloading pumps.

When pumped into vessel through hoses, cement flows like a liquid whilst in motion, and it is important that the ship remains upright at all times. On completion cargo should be reasonably level. A period of time should be allowed for the cement to settle and any air to escape. Once settled cement is not liable to shift and shifting boards, or bagging, is not considered necessary. Discharge normally by elevator or grab.

Should sugar have been recently carried in a compartment into which cement is to be loaded, the cleaning of floors, brackets, stringers, etc., should be thorough, and an officer should inspect every part of the compartment before loading commences.

Sugar — to the extent of only .001 per cent — mixing with cement renders the cement worthless as a binding mixture. Sugar should never be stowed on top or above, cement, neither is cement to be stowed with or near Ammonia or its Sulphate as their fumes or gas alters the character of the cement to a quick setting cement.

Pockets and Kraft paper packages are made up to a net weight of 1 cwt or 50 kg according to country of destination. To avoid excessive losses must be handled carefully and must not be dragged over packages in stow.

When overstowing other cargo with bag cement a firm and level floor or platform composed of boards suitably disposed to withstand the weight is indispensable, while care must be exercised not to overstore cargo which will be adversely affected by cement dust with any class of cement package.

Parcels of cement should be separated by mats or old separation cloths, but in most cases when cement is shipped in paper bags, a separation is not necessary because the bags are differently coloured for the various deliveries. Should not be stored in the same compartment/container as sulphate of ammonia, because of resultant fumes.

When cement is loaded direct into a ship alongside factory premises it may be loaded at a high temperature, cases being known where the temperature varied between 160 and 165 degrees F.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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Exception to such a condition need not be taken when loading a full cargo of cement, but, if only parcels of cement are received, it becomes necessary to avoid stowing any other cargo in the same compartment or in one connecting with same which will be affected by the high hold temperature thus artificially produced.

Before receiving cement the holds should be well swept (and the limber boards made dust tight) to enable cement siltage, of which usually there is a great deal, to be recovered as clean as possible, *ISO containers*. Possible to achieve a payload of 18 tonnes in 20 ft closed box containers.

CEMENT, PALLETISED

0.72/0.79

Shipped on pallets with poly-wrapping, may either be strapped or shrunk wrapped.

CERASIN

Cases

A gum which exudes from the cherry and plum tree. See Gums for stowage.

CERASINE

1.81/1.95

Barrels

A flammable wax like substance — a petroleum product. See Petroleum Products.

CHAIN CABLE (See Cable)

Stud Link Cable

Approximate weight and space required for stowage:—

per 100 metres			per 100 metres		
DIAM	KG	M3	DIAM	KG	M3
mm			mm		
13	389	0.14	43	4000	1.52
18	666	0.26	45	4305	1.62
19	805	0.31	50	5278	2.25
21	944	0.35	55	6667	3.25
24	1250	0.48	60	7445	3.87
25	1417	0.54	65	9111	5.19
27	1610	0.60	70	10472	6.12
30	2000	0.76	75	11973	7.12
33	2445	0.93	80	14084	8.36
38	3166	1.24	85	15195	8.98
40	3444	1.33	90	17000	10.07

CHALK

1.17/1.25

Drums

1.00/1.11

Bulk

Familiar form of limestone, shipped in barrels and in bulk.

Do not stow over fine goods and when carried in bulk protect other cargo from the dust which arise during handling.

CHALCO PYRITE

0.40/0.60

Bulk

May liquify if shipped wet. Relevant information including moisture content should be obtained prior to shipment.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CHAMOTTE		1.50	Bulk

Burned clay. Shipped in the form of fine crushed stone. Used by zinc smelters and in manufacture of firebrick (road metal). Angle of repose 32 degrees.

CHAR	 	1.60/1.70	Bulk (IBC) Briquettes
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Processed and crushed brown coal briquettes. May give off a fine dust.

CHARCOAL (Wood)	   	2.79/5.02	Bags, Bulk.
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Wood burnt in a high temperature with as little exposure to air as possible. Sometimes packed in bags, baskets, or made up into trusses. Usually shipped in bulk. Very dusty and light cargo: protect fine cargo from dust when handling. Oak charcoal is fairly heavy. Beware coconut husks which may be shipped as charcoal. Not permitted for transport in bulk if class 4.2. If carried in bulk must be accompanied by a certificate from shipper stating cargo is not class 4.2 based on definitive test.

Stow clear of all chlorates, and not over any cargo liable to be damaged by charcoal dust.

This cargo absorbs moisture equal to about 18–20 per cent, of its weight. See IMDG Code. (Also see IMO Code of Safe Practice for Bulk Cargoes).

CHASAM		See Chussums	
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CHEESE	 	1.48/1.62 1.00/1.34 1.20/1.25	Crates Cartons Cases
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Is either packed in crates having solid heads, either round or elongated in shape, usually fitted with a centre division — two or three cheeses in a crate. Or more usually in cases or cartons. N.Z. cartons 21.23 kg, stowing at 1.00 M3 per tonne. Carrying temperature 4–7.5 degrees C.

When stowing crates of cheese on an insulated or sheathed deck no dunnage is ordinarily required. However, because of the possibility of heating from the oil in double bottom tanks some shipping lines recommend that in lower holds 150 × 25 mm boards should be laid over the ceiling to support ends and centre of crates. In unsheathed decks 150 × 25 mm boards should be laid to support ends and centres of crates.

When cheese is stowed over a hard frozen compartment beneath, at least 125 mm of dunnage and about 50 mm of sawdust on the deck, should be used to avoid damage from condensation or the effects of the low temperature in the compartment below striking through to the cheese stowage.

Case and carton cheese should be stowed on a floor of dunnage of 50 × 50 mm spaced at approximately 450 mm centres, covered with 150 × 25 mm boards, spaced to give adequate support to the bottom tier of packages.

When cheese is carried in a compartment immediately below low temperature goods, special precautions are needed to reinforce the insulation of the intervening deck, in order to avoid the cold striking through from the low to high temperature compartment, and to guard against condensation, and its adverse effects, especially when the cheese is in the lowermost position. At least 125 mm of dunnage and some 50 mm of sawdust should be laid on the deck immediately above the cheese stowage.

Cheese in close proximity to brine pipes must be protected from injury by the low temperature there prevailing, by vertical battens over which are nailed boards or hard mats in such a manner as not to impede circulation.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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The internal temperature and condition of cheese at loading should be determined and recorded. Cheese is occasionally loaded at atmospheric temperature without any pre-cooling, and it is preferred by many refrigeration engineers to complete loading the compartment and seal hatches before commencing to cool down, this in order to reduce, as much as possible, the formation of snow on the brine pipes.

The roof grids (if fitted) should not be used with cheese if the proper temperature can be maintained without them on. Owing to the relatively high temperature at which cheese is carried the use of roof grids produces "dripping" which renders necessary the fitting of elaborate arrangements of zinc lined wooden trays with pipes leading from same to convey the water to the bilges — a very costly item.

Felt lined wooden troughs are usually fitted to collect the water which is formed on side and end grids with pipes leading to the bilges.

See Preparing Holds for Refrigerated Cargo. (Part 2, Techniques, Refrigeration).

Fluctuations of temperature cause cheese to become friable which reduces its marketable value, and the injurious effect on cheese of freezing or low temperature should be borne well in mind.

Under certain conditions cheese gives off poisonous fumes. Men should not be permitted to enter chambers in which cheese has been for some time before they are cleared of fumes.

Handling — where conveyors are not used in handling cheese, it should always be slung on trays. Avoid rough handling to avoid bruising contents. Damaged packages should be rejected. Every possible supervision must be exercised to avoid hook hole damage to cartons. If the wrapping within the cartons is pierced mould will form and the cheese will have no marketable value. In order to avoid hooks being used to "break out" the stow, it is often the practice to insert clean hessian strips for the first few tiers in the square of the hatch.

Stowage — crates of cheese should be laid in line with the airflow of the compartment to enable the air to circulate through the mass of cheese. Cases and cartons stowed fore and aft.

ISO containers — suitable for carriage in ISO refrigerated containers. Typical payload 20 ft insulated containers 17.5 tonnes (Australia).

Cheese must be at correct carriage temperature at time of stuffing.

CHEESE Processed



1.53/1.67

Cases
Cartons

Processed cheese shipped in small quantities from Australasia. Cool, dry stowage with adequate ventilation. Avoid stowage in compartments with other cargoes which are liable to give taint.

CHEMICALS

See Part 2, Liquid Chemical Cargoes

CHESTNUTS



3.34/3.48

Cases

5.02/5.57

Bags

From the Far East. Stow in a cool place. Preferably under refrigeration. Carrying temperature 0-1 degree C.

CHICK PEA



See Gram

CHICKLE



1.53/1.67

Bags

A gum largely used in the manufacture of "chewing gum" usually shipped in cake form packed in bags. See Gums.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CHICORY (CRUDE) (KILN DRIED)		1.62/1.67 1.78/1.84 2.09	Bags Bags Tins in Cases

A plant with a carrot-like root which is shipped in the crude form; kiln dried and in roasted form ground up and ready to mix with coffee. The kiln dried variety absorbs moisture very readily, gains weight and is apt to develop mould if stowed in a damp place. Chicory (fresh) carried as refrigerated cargo at 0-1 degree C.

CHILLERS (DRY)	  	2.65/3.07 5.57/6.97	Bags Bundles
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Pods of the capsicum annual, shipped from the East and West Indies, etc., in the dry and green condition for use as condiments. Stow in a well ventilated place away from delicate goods, onions, areca nuts and like goods.

CHINA BARK		See Cinchona	
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CHINA CLAY (Kaolin)	 	1.06/1.11	Bulk
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Is decomposed felspar of granite, sometimes called Kaolin. Shipped from England, Belgium, France, Germany, U.S.A., etc., in bulk or I.B.C.

Charterers stipulate that holds must be perfectly clean to receive clay in bulk. The clay is shipped in the form of China clay, China stone, or Ball clay — which see. Container stowage — particular care must be taken to line the container floor with impervious (e.g. plastic) material, taking the lining up the container walls and taping it in place. This will permit China clay to be carried in Reefer containers — when used on a "general" leg of the voyage.

China clay slurry is usually shipped in specialist carriers on account of its liability to shift.

CHINA GRASS (Rhea fibre)		1.34 1.95	Presses Bales
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A nettle fibre used for fine cloth making. See Fibres.

CHINA ROOT		2.56/2.68 2.79/2.93	Cases Bags
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Ordinary dry stowage.

CHINA STONE		See China Clay	
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CHINAWARE		3.34/5.57	
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Porcelain. Put up in various kinds of packages — crates, cases, casks, baskets, tubs, etc. Very fragile cargo, requires careful handling. Avoid dragging out of wings and ends of compartments by winches — the packages usually will not stand that form of handling — or overstowing with weighty goods.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CHINA WOOD OIL Also see Tung Oil		1.78/1.81 1.59/1.62 1.07	Drums Tins in Cases Bulk

This oil, which readily dries on exposure to the air is extensively used in the paint and kindred industries and in the manufacture of artificial silk, is obtained from the nuts of the tung tree, extensively grown in North China, Japan, etc. It is also produced in Florida, New Zealand and East Africa. The leakage of this oil is considerable and sometimes very heavy, resulting in vexatious claims. A very sharp watch should be kept, when loading this cargo, to detect leaky containers and those which have been but temporarily stopped or patched up. It not infrequently happens that the proportion of receptacles brought alongside which are leaky is very high. All leaky packages should be rejected.

Special care should be exercised in stowing and plenty of suitable dunnage wood should be to hand.

Avoid stowing too many heights — never exceed six with second-hand receptacles, five tiers is enough in the case of some drums.

If light cargo is stowed over the drums, dunnage should be laid to avoid contamination.

It is best to arrange for a cargo surveyor of good standing to superintend the stowage and to certify same as having been properly carried out.

The condition of drums should be carefully endorsed on mate's receipts and on Bs/L which should contain a clause exempting ship from all claims for leakage and the cost of re-coopering.

Bulk shipments — Wood oil is also shipped in bulk; it has a specific gravity of about .938, solidifies at about 3.0 degrees C and occupies about 1.07 cu. m per tonne. See table of Vegetable Oil Constants.

This oil is capable of holding water in suspension for a very considerable time.

A cloudy condition of the oil, which is sometimes experienced, may be due either to contamination or it may result from the oil having been exposed to very low temperatures, such as is experienced in country of origin, etc. In the latter case normal colour may be restored by raising the temperature of the oil to a certain high point.

Steam can seriously damage the oil and if heating coils are used every care must be taken to ensure that all joints are tight.

If the discharge is to be made under low temperature conditions steam heating will be necessary, otherwise not. For other conditions cleaning, testing and heating of tanks, etc. See Vegetable Oils in Bulk. Owing to the quick drying nature of this oil the tank should be cleaned with paraffin as soon as possible after discharge and before the film of oil left adhering to steel is allowed to harden.

ISO containers — Suitable for carriage in bulk bags inside ISO closed box containers. Compatibility of the oil with the bag material must first be established.

CHINESE GROCERIES



Wet cargo — generally not too well packed. Be careful to stow marks up and guard against damage to other cargo from leakage, also against broaching and pilfering during loading. Must be stowed in a cool place.

CHINESE VEGETABLE TALLOW



See Vegetable Fat
See Part 2, Oils and Fats.

CHIRETTA



9.75/11.15

Bundles

An aromatic herb valued for its medicinal properties — dry stowage remote from odorous goods.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CHLORIDE OF LIME		See Bleaching Powder See Calcium Hypochlorite	
CHOCOLATE		See Confectionery	
CHOW CHOW		See Chinese Groceries	
CHROME ORE (Chromic Iron) (Lead Chromate)		0.33/0.42 0.42/0.45	Bulk Cases
A heavy ore from which a very brittle almost infusible metal is obtained. When Chrome Ore and Manganese Ore are carried they should be stowed in such a manner that precludes 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. History of stowage prior to shipment should be ascertained as this cargo if stored for long periods in open may contain excessive moisture content which may sift out on passage. The ore is used in its natural state and is not smelted or otherwise treated before use. It is therefore most important that no foreign matter becomes mixed with it. If loading over especial care is needed in effecting adequate separation. See Part 2, Ores.			
CHROME PELLETS		0.60	Bulk
Angle of repose 23 degrees.			
CHUNAM		See Lime, Hydrated	
CHURRAH			
A gum extracted from the hemp plant. See Gums.			
CHUSSUMS		2.09/2.23	Bales
Silk waste used in the textile trade. Dry stowage remote from moist goods.			
CHUTNEY		1.06/1.11	Casks
A condiment much used in the East. Wet stowage remote from odorous goods.			
CIGARS		4.74/5.02	Cases

Very carefully packed in strong cases — require careful watching for broaching. Stow in a dry cool place, strong room for preference, clear of goods such as tea, tapioca, sago, etc., which are likely to suffer from the smell thrown off by these goods. Examine cases carefully before receiving. Cases with damaged seals or with signs of tampering should be rejected.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CIGARETTES See Cigars.		3.34	Cardboard Cartons Tin Lined Cases
CHINCHONA (Peruvian Bark) (China Bark)		3.90 2.79/3.34 2.09	Bales Bales Hydraulic pressed
A bark valuable for its medicinal properties. Packed in bales usually and shipped from Bolivia, Peru, also from India, Indonesia, Japan, Mauritius, etc. This bark is free from objectionable properties. Stow in a dry place and clear of odorous goods. See Barks.			
CINNABAR		0.50/0.56	Bags
A quick silver bearing ore, shipped from California, Peru, Austria, Germany, etc. See Part 2, Ores.			
CINNAMON	 	3.62/3.90 2.79	Bundles Cases
The inner bark of an evergreen tree native of Sri Lanka, shipped also from Indonesia, W.C. of India, China and from S. America. Highly scented. Stow in a dry place clear of all foodstuffs and other cargo liable to suffer from the scent. See Barks.			
CINNAMON SEEDS	 	2.79/3.07	Double Bags
See Cinnamon for stowage.			
CITRON	 	1.95	Bags, Cases.
A fruit which is shipped in considerable quantities from Madeira, either pickled in salt or candied ready for consumption, also as fresh fruit. Citron oil, obtained from the rind, is used for the manufacture of perfumery.			
CITRONELLA	 	2.09/2.23	Drums
Fragrant ethereal oil, obtained from tropical grass.			
CITRUS FRUITS ORANGES LEMONS/GRAPEFRUIT etc.	  	2.50/2.68 2.50/2.65 2.39/2.65	Cartons Cartons
These are usually shipped under temperature control, although some varieties do not need to be chilled. In general, the instructions for Fruit should be followed. Shippers usually give specific instructions and these should be followed. For guidance, the following carriage temperatures are acceptable.			

Commodity	Characteristics	M3 per Tonne	Packaging
Oranges	4 to 4.5°C	Some shippers now prefer to have lemons carried at lower temperatures, i.e. 4 to 5°C and will issue specific instructions. Lower temperatures are also recommended for some shipment from the USA. For some cargoes to be shipped long distances, e.g. from Australia, a lower carriage temperature may be recommended of 5°C to 6.5°C.	
Lemons	10 to 11.5°C		
Grapefruit	10 to 11.5°C		
Tangerine	4 to 5°C		
Satsuma			
Clementine			
Mandarin			

Small consignments of citrus are often carried as a mixed cargo in the same compartment. When this is done, a compromise carriage temperature of 6.5°C to 8°C is recommended. However, the shippers' instructions must be complied with if they differ from this recommendation.

Ventilation of citrus is important. The maximum possible should be maintained. If carbon dioxide measurement equipment is available, do not allow the level to go above 1% in the compartments. Note that citrus has a penetrating odour, and holds must be cleaned and de-odourised after carriage, otherwise subsequent cargoes may be tainted.

Most citrus is reasonably insensitive to mechanical damage during carriage, although the packaging should be examined carefully since inadequate packaging has been the cause of serious shipboard damage.

Citrus being generally a hardy fruit, may carry for long distances without refrigeration. However ventilation of the fruit is still essential, and where *insulated containers* of citrus have to stand without refrigeration (e.g. port-hole containers without Clip-on Units, port-holes should be left open to assist ventilation.

In certain trades the practice of loading citrus at ambient temperature and reducing to carriage temperature on voyage has been successful. However instructions to this effect must be received from the shipper or fruit authority before such a course of action is embarked upon, and full understanding (in writing) that some fruit may not reach carriage temperature prior to discharge.

Mandarines etc., may be damaged by crushing. Height of stow should, therefore, be limited to about 10 cartons high. When stuffing *ISO containers* care should be taken that cartons do not collapse into the side channels due to the excessive top weight and moisture. Great care at time of picking and packing of this fruit is necessary to ensure good out-turn.

CITRUS PELLETS



1.61/1.64

Bulk

Shipped in bulk in considerable quantities from Florida to Europe for cattle feed. Dry stowage, no ventilation required. May heat to combustion if wet.

CIVET LEAVES



6.41/6.97

Bags

Very strong smelling leaves from which is obtained the essential oil Citronella. Dry stowage remote from edible goods and other liable to taint damage.

C.K.D.

2.79/3.07

See Motor Cars.

Commodity	Characteristics	M3 per Tonne	Packaging
CLAY		0.50/0.61	Bulk

Ballast Clay. See China Clay and Ball Clay.

CLINKER		1.5	Bulk
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A partially fused product of a kiln which is ground, usually with gypsum, to make cement. In appearance cement clinker is greyish black, nodules about the size of golf balls. Frequently handled by conveyors.

CLOTHING		See Garments, hanging.
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CLOVER SEED	 	1.39/1.53 1.39	Bags Barrels
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See Grass Seed. Should be packed in well made or double bags of good material to avoid loss. Must be stowed in a thoroughly dry place otherwise it will quickly deteriorate.

CLOVES	   	3.07/3.21 3.07/3.34 3.38/3.42	Chests Bales Bags
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The unexpanded flower buds of a small tropical tree. Shipped from Mauritius, Zanzibar, East and West Indies. Are highly aromatic and are particularly liable to damage by moisture.

Stow in a dry well ventilated space, away from tea and all goods liable to be damaged by the odours of cloves — also well removed from moist or wet goods.

ISO containers — may be carried in open-sided containers, with floor dunnage or pallets laid to permit cross-ventilation. Tilts rolled up when weather permits, and stowed on board below decks in spaces where ventilation may be effected.

CLOVE OIL		1.57/1.81	Drums
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Liable to taint other cargoes, give separate stowage. Valuable, examine all drums before accepting.

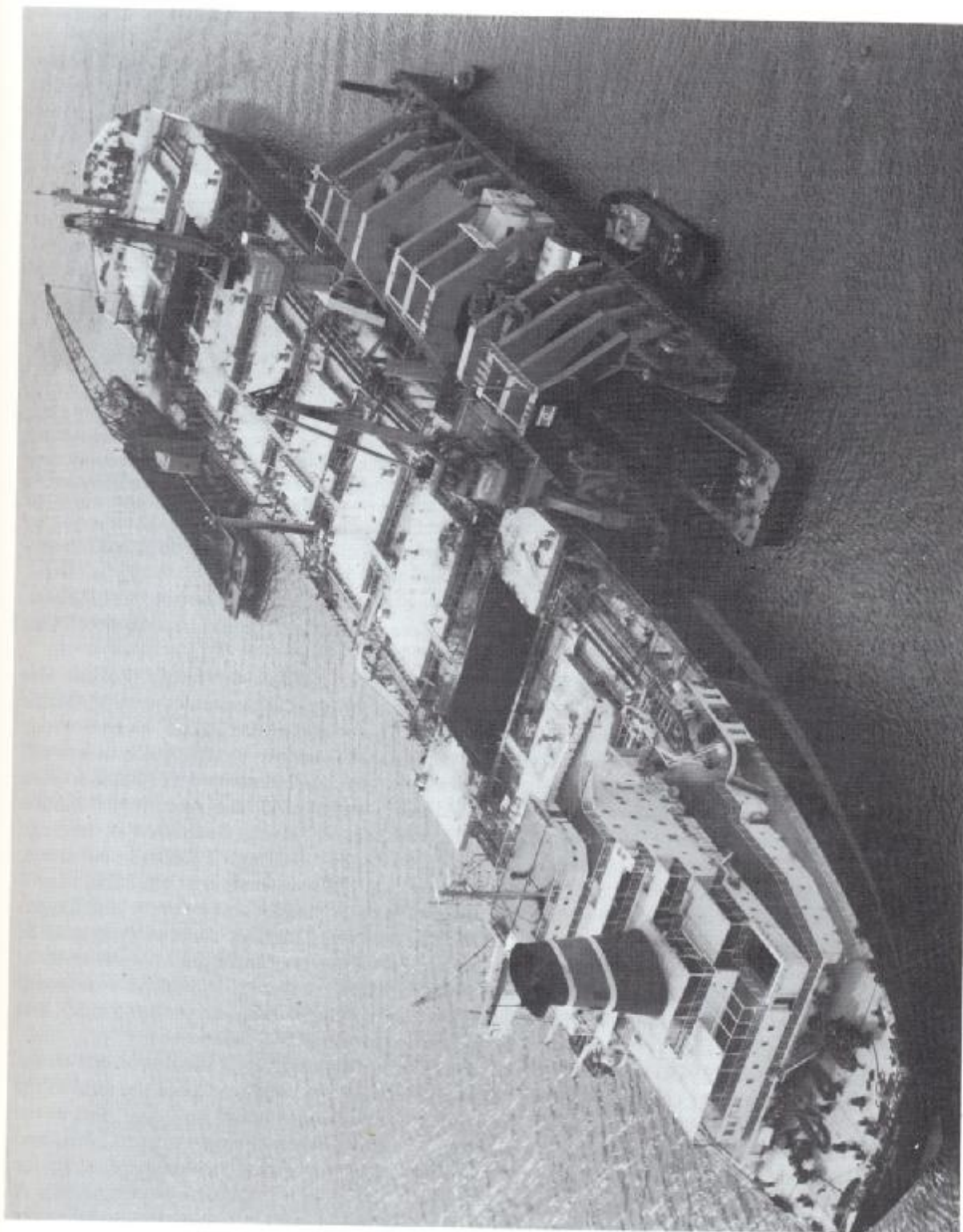
COAL	   	1.08/1.39	Bulk
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See IMDG Code.

The carriage of coal is attended with the risk of both fire and explosion. Whilst many millions of tonnes of this commodity are carried safely each year, the attendant risks should not be forgotten.

Coal is a mineral of organic origin, formed from the remains of vegetation which has, over the course of millions of years, been transformed by the effects of heat and pressure from overlying rock or water. As might be expected, therefore, the term "coal" covers a wide range of products with a correspondingly wide range of properties. In spite of this, coals of all types may be carried safely if they are handled, loaded and stowed properly, with due regard being given to their particular properties.

The ship itself must also be suitable for the carriage of coal: it is essential that hatch covers and ventilators are in good condition, and capable of being sealed effectively. Ships with ventilation shafts which extend below the surface of the coal are generally not suitable because of the potential for



Discharging coal at Rotterdam.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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introducing air directly into the body of the coal. Ventilation, when required, should be surface ventilation only, and should be restricted to the minimum necessary to ensure safe carriage, in line with the considerations set out below.

The principal hazards associated with coal which are of importance when shipping the commodity are:

1. The potential for self-heating, in extreme cases to ignition.
2. The potential to emit methane (a flammable gas).
3. The potential to cause corrosion to the ship's structure.

Whilst all classes of coal are susceptible to self-heating under appropriate conditions, some coals, particularly the lower rank (geologically immature) coals, have a particular propensity in this regard: the blending of different types of coal may also enhance this property. Very little can be discerned about the potential properties of a cargo simply by visual inspection at the time of loading. Thus, given the wide, variability in the properties of coal, it is essential that full details of the specific characteristics of the cargo to be carried, and recommended procedures for its safe carriage, are obtained from the shipper prior to loading.

For cargoes which are described as "liable to self-heat", ventilation should not be used unless there are indications that the cargo is emitting methane, and it is particularly important that cargoes of this type are trimmed as level as is reasonably possible. An increase in temperature is clearly one manifestation of self-heating, and temperature probes in the cargo can be of assistance in monitoring the process. However, the nature of the cargo is such that a hot spot in the stow is unlikely to be detected in the early stages, unless there happens to be a temperature probe in precisely the right location. Evidence of self-heating, therefore, is generally most readily detected in the early stages by monitoring carbon monoxide (CO) gas levels in the hold atmosphere (CO is a by-product of the self-heating process).

Because self-heating is an oxidation process, the oxygen concentration in the hold atmosphere, under conditions of restricted ventilation, is likely to become depleted: it should also be noted that carbon monoxide is toxic.

Coal emits a flammable gas, methane, particularly when newly worked or freshly broken. This gas, when mixed with certain proportions of air, will explode if brought into contact with a suitable ignition source such as an electrical or frictional spark, flame, or heated surface. Again, given the wide variability in the properties of coal, some cargoes will be particularly prone to this, while others will emit little or no methane during normal carriage. For cargoes which are described as "liable to emit methane", therefore, the greater hazard is that associated with an explosion, and precautions must be taken to avoid the accumulation of a flammable atmosphere. Adequate surface ventilation of the cargo will prevent the build up of a flammable atmosphere in the holds, although excessive ventilation, particularly into the body of the coal, could promote self-heating. As with coals that are liable to self-heat therefore, the cargo should be trimmed as flat as is reasonably possible, and methane and oxygen concentrations in the hold atmospheres should be monitored. Ventilation in such cases should be restricted to the absolute minimum that is required to maintain the gas concentration at a safe level.

It is now a requirement under the Bulk Code, that ships which carry coal should have on board reliable, calibrated instruments (suitable for measuring methane, oxygen and carbon monoxide), and that a responsible member of the crew should be competent in the use of that equipment.

It is also a requirement under the Bulk Code, that ships which carry coal should have a means whereby the hold atmospheres can be monitored remotely, without the need to expose the hold to the ingress of fresh air. Practically, this is readily achievable by attaching a small sampling port in the hatch coamings, through which a sample tube can be introduced when taking measurements, and which can be sealed at all other times. Details of gas measurement procedures, including a diagram for a typical sampling point, are provided in Appendix G to the Bulk Code (1996 Amendment). A sampling port orifice with a diameter between 1.5 and 2 cm, should be adequate to accommodate most types of proprietary sampling equipment.

It should be apparent from the above, that if the ship is able reliably to monitor the atmospheres in each hold, there is no need for automatic ventilation of the cargo. In fact, it will be seen that ventilation and monitoring are incompatible. This for the simple reason, that if the hold atmospheres

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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are continually being refreshed, there is no reliable way of establishing whether there is a build up of carbon monoxide, nor the extent to which the coal is emitting methane.

At some coal loading ports, the Master might be presented with a "Declaration By Shipper . . ." which states that the coal to be loaded has no established historical record of shipment. If the shipper is unable, or unwilling, to provide to the Master with any further reliable information regarding the cargo, expert advice should be sought.

Whilst specific safety arrangements will vary with each ship, the following general precautions should be observed:—

1. Warning notices against smoking and the use of naked lights, should be posted at the entrance to cargo compartments and adjoining spaces, where flammable gases may accumulate.
2. Electrical circuits in cargo compartments, mast houses, deck houses, hatch trunks, or other spaces where gas may accumulate should be isolated. These circuits should not be reconnected until the space has been adequately ventilated and checked to ensure there is no danger.
3. Torches, specifically designed for safe use in potentially flammable atmospheres, should be carried on board.

Where cargoes have both a tendency to self-heat and emit methane, the more immediate hazard should be considered to be that, due to methane, and the precautions appropriate to that risk should be adopted.

Some coals, particularly those with a high sulphur content, may react with water to produce solutions which are corrosive to the ship's structure: this risk can be monitored by measuring the pH value (a measure of acidity/alkalinity) of cargo hold bilge samples.

The Master of a ship carrying coal should ensure that the requirements of the relevant Authority are complied with.

If the Master is not satisfied that he has been provided with sufficient information concerning the properties of the cargo, or has reason for concern about the safe carriage of the cargo, he should seek expert advice.

Explosives are not permitted to be carried in a hold carrying coal, in any compartment over that in which coal is carried, nor in one that is not separated from a coal compartment by a steel bulkhead.

Vessels carrying part cargoes of coal, separated from other cargo by bulkheads, should have the latter in a perfect dust-tight condition, otherwise claims for coal dust damage will likely result. Cases have occurred where vessels have been declared "unseaworthy" on it being proven that bulkheads were not dust-proof and of proper construction at the time of loading the cargo.

Coal shipped in a wet condition will turn out about 3% less in weight. B/Ls should adequately cover the ship against any claims arising from short delivery from this cause.

"Pond Coal" is the term used to describe coal which has been reclaimed after having been abandoned and dumped into fresh water ponds. The moisture content is usually high, and it may also have a high sulphur content. This latter can lead to the release of sulphuric acid, with the attendant risk of damage to the carrying vessel.

The Stowage Factor of coal, depending as much as it does upon trimming, varies very considerably for the same class and port. In respect of 2 and 3 deck vessels it is considerably higher than for single deck vessels or the large bulk carrier.

Sample stowage factors are shown below, but these may be exceeded to a substantial degree:—

<i>Origin</i>	<i>M3/Tonne</i>	<i>Origin</i>	<i>M3/Tonne</i>
American	1.17/1.28	North Country U.K.	1.31/1.39
Japanese	1.20/1.31	(small)	1.25/1.34
Lancashire	1.20/1.28	Scottish	1.25/1.34
New South Wales	1.08/1.25	(small)	1.20/1.25
Queensland	1.08/1.20	Welsh	1.20/1.23
S. Africa	1.19	(small)	1.11/1.14

ISO containers may be successfully used for the carriage of bagged coal. Specially treated coal, in multi-ply paper sacks for domestic use, has little risk of heating or sifting. If Open-top, Half-height, or

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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even Closed Box containers are used for bulk (e.g. when otherwise empty containers would be moved), the containers should be properly lined against abrasive damage (by lining ends and walls with plywood sheets, hardboard, etc.) and against dirt — lining the whole container with plastic sheet or similar.

COBALT

1.60

0.50

Drums

Bulk

Is a mineral ore from which is obtained a reddish white, highly magnetic metal. Various kinds of this ore exist which are known as cobalt glance, black oxide, cobalt bloom, etc. See Part 2, Ores. See IMDG Code.

COCA

2.23

Bags

The leaves of a shrub native to Bolivia and Peru, valued for their medicinal properties. Being very lightly packed, it constitutes exceptionally light cargo. Stow in a dry, well-ventilated place.

COCA COLA (concentrate)

Drums. Cartons.

High value. May have alcohol base — See IMDG Code. Susceptible to high temperature damage. May be carried under temperature control +2/7 degrees C.

COCHINEAL

1.67/1.81

Tin Lined Cases

A small insect (plant bug) used for dyeing purposes. It is a valuable cargo and peculiarly liable to deterioration through heat or moisture. Stow in strong room or other special stowage but place must be cool and well ventilated.

COCKSFOOT SEED

5.74

Sacks

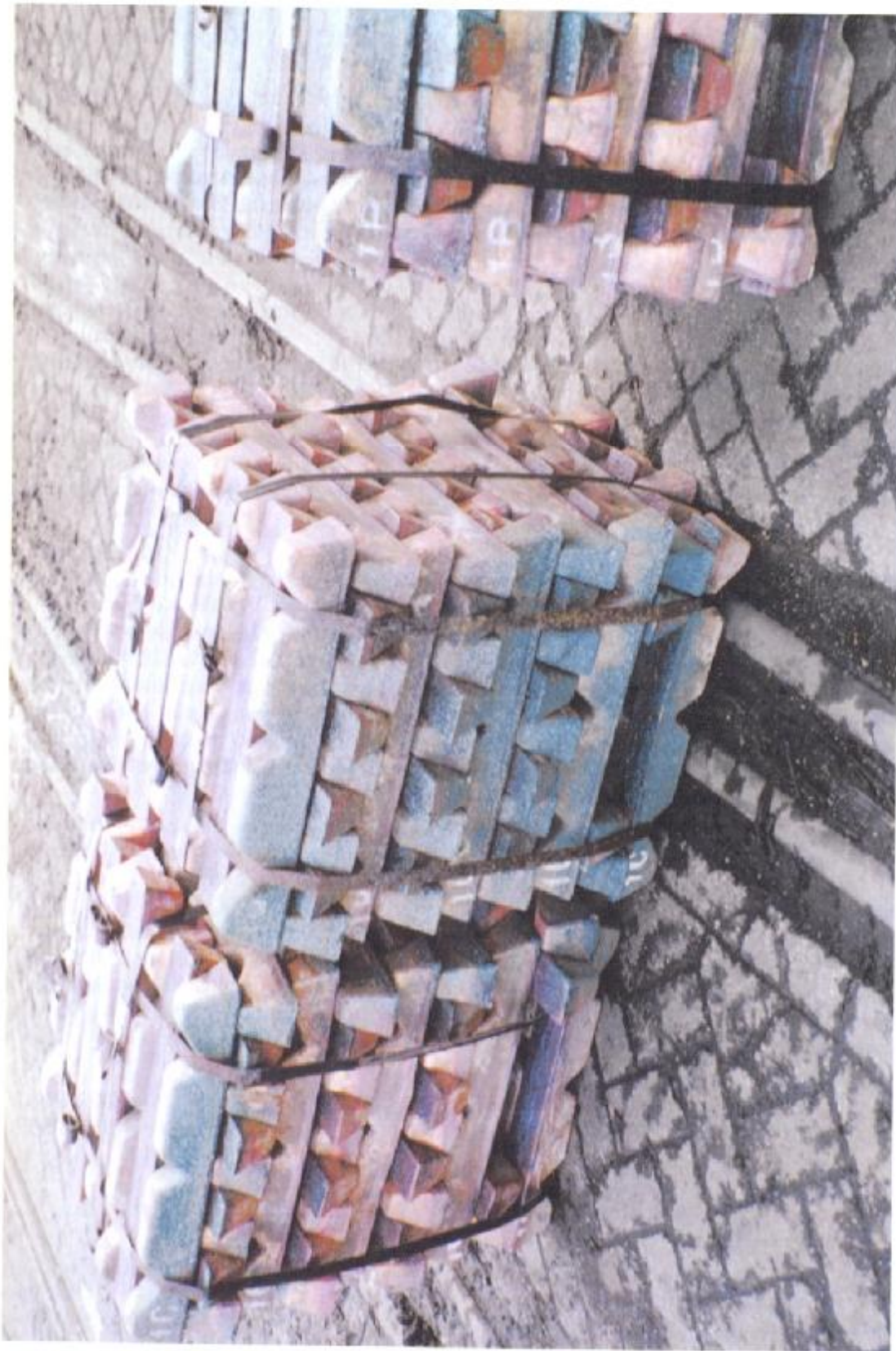
See Grass Seeds.

**COCOA
(Cacao)**

2.0/2.15

Bags

Cocoa beans are the seed obtained from the pods of the cacao tree, a native of the tropics. They are oilseeds, although they are processed mainly for chocolate production. Some are used as a source for cocoa butter. Shipped in new or good bags, this cargo has a high value. Very apt to heat, stow in a dry place preferably 'tween decks. Good ventilation is essential. Shippers normally require a minimum of 20 air changes per hour basis empty hold. Protect from metal stanchions, hatch coamings, etc., with mats or similar. Cocoa is liable to take taint, arrange stowage accordingly. Stow on sound separations to assist in picking up loose cargo on completion discharge. Loses value if allowed to become too dry and brittle. Well dried beans should have a moisture content of no more than 7.5%. Values above 8% are considered to be unstable, and may be subject to microbiological attack. Microbial heating can occur, but cocoa beans are not known to undergo spontaneous heating or combustion. *ISO containers* — due to high moisture content is usually unsuitable for carriage in closed box containers — particularly if moisture content exceeds 7%. Super ventilated containers with double lining to channel excess moisture away from the cargo, are ideal and produce good results. Payload in 20ft containers approximately 12.5 tonnes.



Strapped Copper Ingots damaged by salt water (Photo: Cargo Solutions)

Commodity	Characteristics	M3 per Tonne	Packaging
COCOA BUTTER	 		Cartons, Bags.

Protect from excessive heat. Protect ISO containers from direct sunlight. May travel under temperature control 10 degrees C (50 degrees F).

May be shipped in Polythene bags enclosed in cardboard cartons. Melting point of Cocoa Butter is 85-90 degrees F. Readily absorbs aroma taint odours. Cool dry stowage essential. Do not stow cartons more than 4-5 tiers high. Avoid exposure to heat or direct sunlight. Check temperature at loading and reject cartons with temperature in excess of 50 degrees C.

25 kg carton may measure 470 × 350 × 230 mm
 380 × 290 × 280 mm
 330 × 330 × 300 mm

Payload in 20 ft closed box container approximately 15 tonnes.

COCOA CAKE	 	2.26/2.46	Bags
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Hygroscopic, may give off moisture. See IMDG Code. Usually palletised. Weight per bag 40.5 kg. Weight per pallet 1080/1095 kg.

COCONUTS	2.51/2.79 2.65/2.79	Bags Bulk
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Usually shipped (with or without the husks) in nets or bags, but on occasions in bulk when, if B/L does not specify to the contrary, they are used as dunnage for light goods or for broken stowage.

Do not stow under or with dry sugar or delicate goods as the nuts heat and steam very considerably. Will give up moisture copiously to a drier ambient temperature and liable to heat. Notwithstanding the coarse nature of the cargo it requires gentle handling. *ISO containers* — by fitting a temporary wooden bulkhead in way of the container doors (see section 2, Bulk in Containers) loose coconuts may be suitably carried in closed box containers.

COCONUT (Desiccated)	1.95/2.23	Cases
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The kernel of the coconut, specially dried and prepared, the better class being usually packed in tin lined cases. Similar carriage requirements to sugar confectionery.

Frequently shipped lined multiwall paper bags which may be liable to damage and weakening by moisture. The oily nature of the contents sometimes results in external staining of bags. This staining may not necessarily denote deterioration of product.

COCONUT CAKE	 	1.40/2.10	Bulk
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See Seed Cake.
 (See IMO Code of Safe Practice for Bulk Carriers).

COCONUT FIBRE (Cair)	2.79 4.74/5.30	Bales Dholls
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The fibrous outer covering of coconuts used in the manufacture of mats, brushes, ropes, etc. Made up for shipment in bales and dholls. If the oily yarn is shipped it should be stowed clear of goods liable to be damaged by oil. See Coconut Oil.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
COCONUT OIL	 	1.53/1.81 1.81/1.95 1.05/1.11	Drums Tins Bulk

Coconut oil is produced by crushing copra, the dried "meat" of the coconut. The principal producer and exporter of coconut oil is the Philippines, which exports large quantities of the oil to North America and Europe. Smaller quantities of the oil are also exported by Indonesia as well as other countries. Coconut oil is in many respects similar to palm kernel oil, the two oils being the most important members of the oils referred to collectively as the "lauric" oils. Coconut oil is semi-solid at ambient temperature, is very light in colour and has a density of approximately 890 kg/m³ at 60 degrees C (920 kg/m³ at 15 degrees C). The oil is normally exported in the form of the crude oil with a maximum free fatty acid content of 5%, calculated as lauric acid.

The recommended temperature range for the storage and bulk shipment of coconut oil is 27–32 degrees C, and a temperature range of 40–45 degrees C is recommended for loading and discharge of the oil.

Coconut oil is prized for its sharp-melting properties and is widely used as a confectionery fat in North America, Europe and Japan. It has also found numerous applications in the oleochemicals industry. See Part 2, Oils and Fats.

COCONUT OIL PRODUCTS



As the result of splitting coconut oil into two parts High Acid (Acid Oil or Fatty Acid) and Glycerine are obtained. Coconut oil splits into 90 per cent High Acid and 10 per cent Glycerine both of which commodities are shipped from the Philippines and other copra producing countries. This weighs approximately 890 kg per M3 at 37.8 degrees C being about 3 per cent lighter than coconut oil and is practically black in colour.

(High Acid)		1.16	Bulk
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Owing to the corrosive effect of acid it is essential that the tank in which it has been carried be thoroughly cleaned and all traces of the acid removed immediately after completion of discharge.

See Part 2, Oils and Fats.

COCONUT SHELL (Broken)		1.67/1.81	Bags
Clean, dry stowage.			

CODFISH: STOCKFISH	   	Salted	1.39/1.56 1.90/2.00 1.67/1.73 1.95/2.01 1.56/1.62	Bales Barrels Cases Kegs & Drums Bulk
		Cod Roe	1.39/1.45	Barrels

The fish is prepared for salting by removing the head, backbone and interiors. It is then kept under salt for 10 to 15 days, when it is well washed in clean water and afterwards stacked up in airy sheds to a height of about 6 ft, each layer of fish being kept well covered again with salt and left so for about two weeks. So treated, it is known as Wet Salted Codfish.

The fish is then ready for drying, which is done by laying it out in single layers on a stone lined floor, where it is exposed to the action of the sun and air. It is collected and stacked every evening and

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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covered with waterproof cloths to protect it from dew and rain; this process being continued until the drying is completed when it becomes variously known as Salted Codfish or Sundried Codfish.

The fish as it comes out of the trawler, after removal of head, backbone and interiors and well salted, is known as Fresh Salted Codfish. This kind is carried in bulk.

Wet Salted Codfish in bales, care should be taken to avoid pressure damage.

Sundried Salted Fish — the holds and bilges must be thoroughly cleaned and dried; sides, bulkheads and floors overlaid with thin wooden battens about a foot apart, secured in position by nailing to ceiling and cargo battens. The floor is then covered with sawdust to a depth of about 4 inches and then with clean separation cloths; the sides, bulkheads, pillars, etc., being also covered with separation cloths, as the fish quickly deteriorates if permitted to come into contact with metal. The 'tween decks are prepared in a similar manner.

Bales or "parcels" of fish are stowed, without wood ventilators, one over another. The drainage from "Sundried" is comparatively light.

Fresh Salted Codfish — the ground is covered with a layer of salt and stowage proceeds, each layer of fish being covered with salt, stowing as compactly as possible, approximately one ton of salt for every five tons of fish. Check for infestation.

Frozen Codfish — See Fish.

COD ROE



See Codfish. Wet stowage and away from delicate and odorous goods.

CODILLA

Bales

The coarse part of Hemp and Flax. For stowage, see Hemp and Flax.

COFFEE



1.72/1.81

1.81/2.09

Bags (Brazil)

Bags

Green bean coffee is a sensitive product which is prone to moisture absorption during transport and storage. Care must be taken that the cargo is received in sound condition. Coffee may be carried in break-bulk mode or pre-slung but nowadays most frequently in containers. Except for short voyages these should be of the ventilated or insulated type, as coffee is vulnerable to moisture damage. The bags, normally 60 kg, may also be susceptible to taint, contamination and infestation. Cleanliness of the cargo space or container is essential. Weight loss of up to 0.5% of beans is normal.

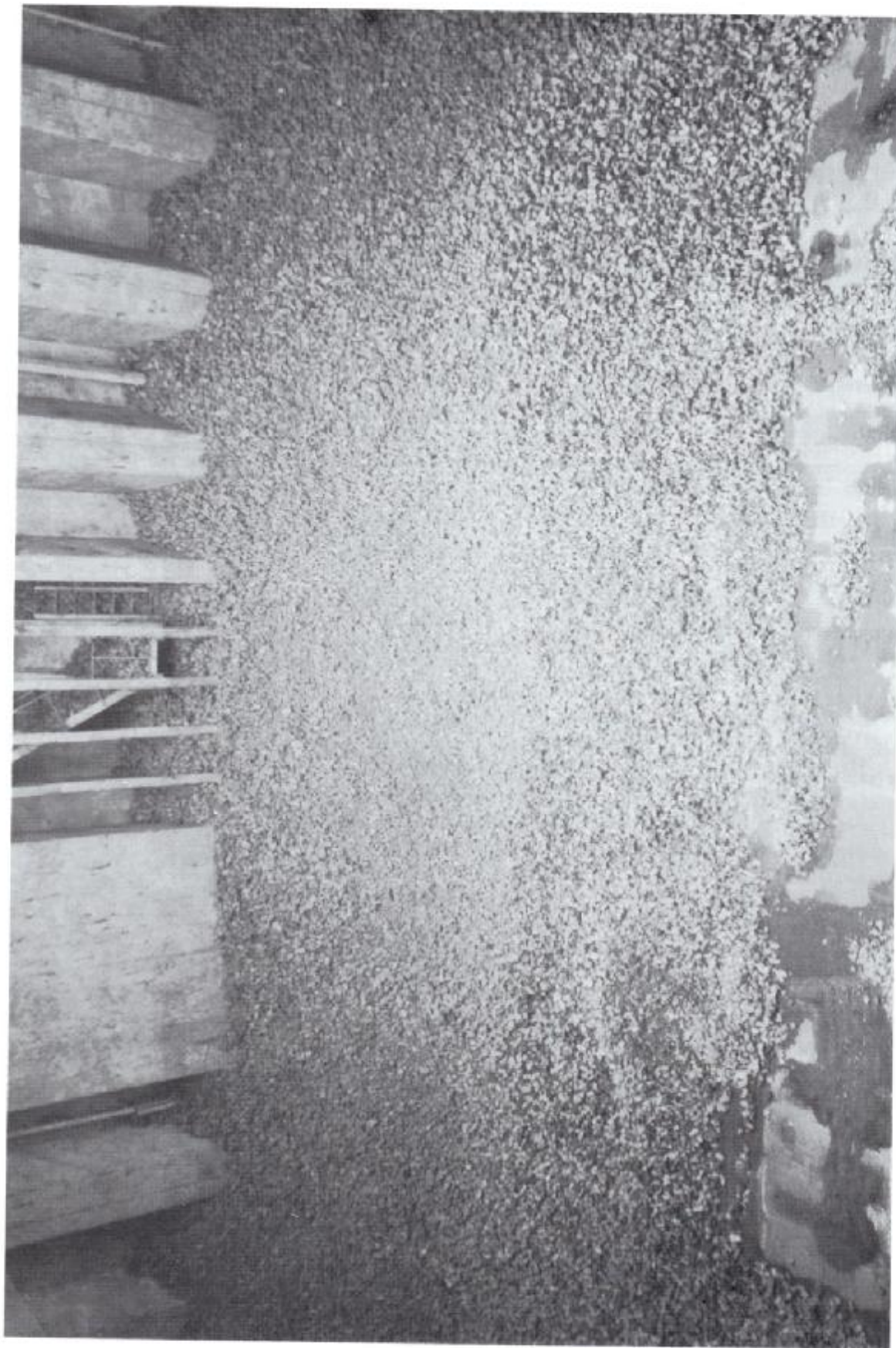
With particular regard to moisture damage, it must be appreciated that normally the coffee is loaded in warm and moist conditions and transported to Europe where it may be winter. Ventilation of the cargo may not be possible for the last few days of the voyage due to rain and stormy conditions. During this time the sea temperature and air temperature may fall dramatically and produce shipsweat. It is essential, where practical, to apply prudent ventilation in order to avoid drip damage due to condensation forming on the internal surfaces of ships holds and the walls and ceilings of the containers. Uninsulated stuffed containers awaiting shipment and left in the tropical sun, may damage the cargo (unless properly protected), due to box sweat. The cargo may be loaded at around 30°C. The noonday temperature of the roof will be about 85°C, which will produce an air temperature above the coffee of about 70°C. Before dawn, the roof temperature will have dropped to 24°C, and internally to 40°C.

Coffee beans are readily susceptible to taint. This may be due to "field damage" caused by the burning of husks or improperly applied chemicals in the form of fungicides or insecticides.

Risk of contamination may be minimised by covering adjacent metallic parts of the ship or the internal surfaces of containers with paper.

Provided all normal cleaning of spaces and containers are properly observed, infestation is normally of pre-shipment origin. Coffee may be stowed for many days in infested warehouses. These may be purged from time to time with insecticide and care should be taken that the fumigant is fully dissipated before the coffee is loaded on board the ship or into containers.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
COFFEE, INSTANT	 		
Dried instant coffee normally shipped in large plastic bag within cardboard liners, and strapped onto pallets. Contents are very hygroscopic and good ventilation is essential. Spillage should be cleaned off as soon as possible.			
COILS Steel Sheet	See Part 2, Iron and Steel Products.		
COILS Wire Rods	See Part 2, Iron and Steel Products.		
COIR (Coir Yarn)	 	2.79 4.74/2.30	Bales Dholls
See Coconut Fibre. When coir yarn is shipped in the oily condition it should not be stowed on top or over dry goods. See IMDG Code.			
COIR ROPES		2.51/2.79	Coils
Oiled coir rope should be stowed apart from and not above textile or fine goods or fibres such as cotton, jute, etc. See IMDG Code.			
COKE (Coal Origin)		1.25/2.80	Bulk
Used as fuel for furnace work, etc. See also Petroleum Coke.			
COKE BREEZE		1.80	Bulk
May liquefy if shipped wet. Check origin and history of storage and moisture content prior to loading.			
COLEMANITE		0.61	Bulk
A natural hydrated calcium borate. Used in boric acid and sodium borate. Light grey lumps. Angle of repose 47 degrees.			
COLOMBITE ORE		0.56/0.61	Bags
Dusty, but non-odorous cargo. Valuable cargo. Only clean dunnage to be used.			
COLOCYNTH		6.97/8.36	Pressed Bales
Ground plant used as a purgative drug. Dry, cool stowage.			



Metallurgical coke in stow, section of Australian hold ladders in background.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
COLOMBO ROOT	 	2.79/3.07	Bales Bags

A root valued for its medicinal properties. Dry well ventilated stowage away from tea and edible goods.

COLOMBO ROOT (Meal)	 	2.79/3.07 1.95/2.09	Bags Bags
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Bitter taste, used medicinally. Stow as for Bark, which see, Dusty.

COLZA OIL		1.67/1.73	Barrels/Drums
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Colza, otherwise rape oil, which is pale yellow in colour is obtained from the seeds of the cole and rape plants (see Rape Seed), the unrefined oil being known as brown rape oil, while "colza oil" denotes the most refined product of these seeds.

COLZA SEED	See Rape Seed
See Vegetable Oil. See Part 2, Oils and Fats.	

COMPRESSED GASES



Compressed gases, which are inflammable and otherwise dangerous in varying degrees, include the following:—

Ammonia Anhydrous	Oxygen
Blaugas	Coal Gas
Carbon Acid Gas (Carbon Dioxide)	Hydrocarbon
Nitrous Oxide (Dental Gas)	Pintsch or Iolite
Aragon	Acetylene
Hydrogen	Chlorine
Nitrogen	Sulphur Dioxide

These and other gases of like properties are, by law, to be shipped in metal cylinders, protected by rope or matting in accordance with approved specifications, and tested periodically. The valves fixed to the cylinders must be properly protected by metal caps that cannot become detached by the rolling of the cylinders, and strong enough to protect the valves from damage.

They should be stowed in a cool, well ventilated place, and, if their nature calls for it, on deck, well away from living quarters and steam pipes, and effectively protected from the sun's rays. *ISO containers* — particular care must be exercised in securing cylinders within the container to prevent any movement during transit, and avoid cylinders tumbling out when the doors are opened. See IMDG Code.

CONCENTRATES



Partially washed or concentrated ores from flotation process. Copper, lead, and zinc concentrates are shipped in bulk. Usually concentrates, which are powdery in form or character, carry a moisture content, however this is normally controlled by legislation of the exporting country.

May liquify. Relevant physical properties including moisture content should be furnished by the shipper. Trim below angle of repose.

See Part 2, Bulk Cargoes, also Sludge, Ore, Slurry Coal and Ores. See IMDG Code. (See IMO Code of Safe Practice for Solid Bulk Cargoes).

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CONDENSED MILK		1.25/1.28	Tins in Cases

Fine cargo very liable to pilferage. Must be stowed in cool place remote from boilers and machinery space, otherwise it quickly deteriorates. Because of the high density of the contents, is susceptible to condensation damage particularly when loaded in a cool climate and transported to a warmer one. In these circumstances the practice of loading the cargo in a warm condition has proved successful on occasion, and in such circumstances no ventilation should be required.

CONFECTIONERY	  	2.34 & var.	Cases, Cartons
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Fine cargo very liable to pilferage. Most kinds are very liable to melt and mass if stowed in a warm place. Cool dry stowage and apart from odorous goods indispensable. Chocolate confectionery may suffer from "bloom" as a result of varying temperature or condensation. While this "bloom" does not alter the taste, the change in appearance affects the value. At 24 degrees C (75 degrees F) chocolate will melt and run. Sugar confectionery is less susceptible to temperature damage. Can be carried under refrigeration at a temperature of 4.4–7.2 degrees C (40–45 degrees F), but beware condensation problems when refrigerated goods are finally exposed to warm humid air. *ISO containers* — if carrying confectionery highly susceptible to temperature change (e.g. chocolate filled or covered) in closed box GP containers, better carriage conditions may be achieved by putting such sensitive a consignment in the centre and low down, surrounding it with less sensitive cargo (e.g. sugar confectionery, etc.).

CONGOLEUM

A class of linoleum, shipped in rolls with wooden cores. See Linoleum.

CONTAINERS	See Part 2.
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COODIE		See Rice
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COPAIBA		See Balsam Copivi
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COPAL, GUM	 	2.23	Cases
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A semi-fossilised resin used for varnish making, etc. A clean dry cargo, usually packed in cases.

Must be stowed in a cool place, well removed from boilers and from goods liable to heat or throw off moisture such as jelatong, gambier, areca nuts, etc. See Gums.

COPPER	0.28/0.33 0.39/0.42 0.84	Loose Ingots or Strapped In Barrels Coils
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This should be carefully tallied and watched to prevent pilferage. Given the opportunity, unscrupulous stevedores will drop ingots overboard and recover same after vessel has left. Anodes, Cathodes, Slabs, and Blisters may be 1200 × 900 × 200 mm. 350–920 kg stowing at 0.34 M3 per tonne. This cargo should be overstowed with some other goods immediately after loading in order to minimise risk of loss. Should not be stowed adjacent to zinc.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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Intake tally should be taken in the hold if possible — never on the lighter or wharf. Avoid working this cargo at night if possible. Stow on ceiling or deck and, if receiving a large amount, not too many heights. For stowage in refrigerated compartments see Refrigerated Cargo. *ISO containers* — spread load as evenly over the container floor as possible. Any local concentrations of weight should be positioned adjacent to the walls where greatest floor strength prevails. Essential to provide sufficient chocking off (nailing timber dunnage to the floor, etc.) to prevent even the smallest movement during transit.

COPPER CONCENTRATES



0.39/0.50

0.61/0.78

0.33

Bulk

Bags

Slabs

See Concentrates, also Ores. Maybe self heating. Moisture content is critical. May liquify. Relevant physical properties including moisture content must be checked prior to loading. Cases have occurred where very considerable damage was caused to cereal and to coffee cargoes stowed in the same compartment as a parcel of copper concentrates, which, it was alleged, generated great heat causing discolouration, sweat and fume (taint) damage. See IMDG Code. (See IMO Code of Safe Practice for Solid Bulk Cargoes). See Appendix 5.

COPPER CUTTINGS



3.07/3.34

Bales

Liable to spontaneous combustion. Stow in or near hatchway. See IMDG Code.

COPPER GRANULES

0.22/0.25

Bulk

Sphere shaped pebbles. Odourless. Angle of repose 25 to 30 degrees.

COPPER MATTE



0.42/0.53

0.56

Bulk

Bags

The crude black copper ore (native metal). See Ores.

COPPER ORE



0.39/0.56

Do not overstuff with oils or other cargo of any oily nature. See Part 2, Ores.

COPPER PYRITES YELLOW SULPHUR



0.56/0.61

Bulk

A mineral sulphide from which is obtained about 10 per cent of copper. Very dusty and dirty. Becomes free flowing when wet. See Ores, also Pyrites.

COPPER SULPHATE BLUE COPPERAS BLUE VITRIOL



1.23/1.28

Drums

A highly corrosive, poisonous substance soluble in water. The fumes given off if wetted or damp attack other articles in the vicinity and corrode the hoops binding the packaging. Dry stowage remote from edible goods. See IMDG Code.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
COPPERAS (Iron Sulphate)	 	1.53	Drums

Sulphate of iron or green vitriol, largely used in the manufacture of ink and black dyes. Must be stowed in a dry place, away from moist or wet goods and from perishable cargo. B/L should embody a clause to the effect that re-cooperage of packages be to the account of consignees.

COPRA	  	2.65/3.07 1.95/2.09	Bags Bulk
	 		

Is the dried kernel of the coconut, having an oil content as high as 66 per cent. The oil obtained from the copra (coconut oil) is extensively used in the manufacture of butter, cream and milk substitutes, soap, candles, etc.

Shipped in large quantities — both in bulk and in bags — from the Philippines, East Indies, South Sea Islands, India, etc.

The rank, oily odours thrown off by copra are very penetrating, this and other properties rendering it very unsuitable for stowage with, or even near, fine and edible goods, especially tea.

Copra, should not be received into a vessel carrying tea unless stowage can be arranged for it whereby it will be effectively separated from the tea.

Two kinds of copra are shipped, i.e. white copra (sun dried) and black copra (kiln dried) these being divided into 25/30 grades or classes. The degree to which copra is dried varies very considerably; that shipped on the Malabar Coast which has an average shrinkage due to evaporation of about 3 per cent, being regarded as the best dried, while the shrinkage of copra shipped from other countries varies between 3 per cent and 7 per cent, even touching 10 per cent in some cases from the East Indies and Philippines.

Copra being very liable to heat, special care should be exercised to allow the moisture, as well as the odours thus thrown off, to escape.

Imperfectly dried copra, or that which is shipped wet, is liable to deteriorate in the course of the voyage when Carbon Dioxide gases are generated — cases having occurred where loss of life has resulted from the presence of "copra fumes" in ships' holds.

Smoking and the use of naked lights in holds or near open hatches should be strictly prohibited.

Opinions differ as to whether copra is liable to spontaneous combustion, but owing to the high oil content (about 66 per cent) it certainly burns fiercely when once it "gets away". Some are inclined to attribute the origin of fires to the jute material, of which the bagging is made, jute being very liable to fire when in the wet or oily condition. Copra dust readily ignites when brought into contact with flame. A certificate of origin, temperature, and moisture content should be supplied by competent authority. See IMDG Code. (See IMO Code of Safe Practice for Solid Bulk Cargoes).

Copra Bugs — these little insects are bred in myriads in copra cargoes and this fact should be taken into consideration when arranging the stowage of copra. They are most troublesome to human beings.

These bugs readily attack any other cargo in its vicinity and, though they do not always destroy the cargo by eating it, they lay their eggs therein, round which cocoons form. Subsequently the larvae emerge from the cocoons leaving behind the cocoons which are very difficult to remove. In such a case it would be very difficult to resist a claim for bad stowage.

Receiving — wet copra, wet or damp bags should be peremptorily refused and a careful watch kept for same.

B/L should be claused "Not responsible for loss of weight through evaporation or for deterioration through inherent vice or properties".

If in bulk — ideally, suitable precautions should be taken to avoid contact with steel, but in practice much of the copra is simply bulk stowed.

If in bags — suitable methods should be adopted to keep the bags from working between and so touching the sides, it being preferable not to mat sides in this case as the circulation of air through the cargo is made easier. Copra should not be allowed to come into contact with iron.

Commodity	Characteristics	M3 per Tonne	Packaging
Dunnage particularly well on box beams, stringers and cement caps, and on no account should the contents of torn bags be allowed to get inside spar ceiling. Ventilation — constant attention to ventilation of holds is absolutely necessary to ensure the proper carriage of copra and immunity from damage to other fine cargoes that may be carried. The ventilators should be assisted in clearing the holds of copra smells, moisture and fumes, by keeping some of the hatch covers off at each end of the hatches when ever weather conditions permit, at which time all the ventilators should be kept on the wind to assist in expelling the fumes, etc. Great advantage in this direction follows the fitting of thick rough gratings along and inside the hatch coamings, extending slightly below the lower edge of the same — this serving as an easy escape for the moisture charged and heated air, fumes, etc. All ventilators should be fitted with wire mesh guards. Temperature should be regularly taken and recorded. Stowage factors — these vary very considerably owing to the different degrees to which copra is dried and fineness of chopping:— Well dried copra should stow— In bulk in about 1.95 M3 tonne hold and 2.09–2.15 M3 tonne T.D. space. In bags in about 2.09 M3 tonne hold and 2.37 M3 tonne T.D. space. It is not unusual, however, for these figures to be exceeded by 20 per cent. ISO containers. Do not stuff in same container as other cargoes. Container may require fumigation after stripping. Limited quantities have been carried in ISO containers with due regard to stowage positions on board to reduce possibilities of self-heating and permit access in case of fire. About 12 tonnes can be loaded into a 20 ft closed box container — if IMDG regulations permit such carriage.			
COPRA CAKE See Seed Cake (See IMO Code of Safe Practice for Solid Bulk Cargoes).	 	1.67/1.81	Bags Bulk
COPRA EXPELLER PELLETS See Seed Cake (See IMO Code of Safe Practice for Solid Bulk Cargoes).	 	1.67/1.81	Bulk
COPRA MEAL See Seed Cake (See IMO Code of Safe Practice for Solid Bulk Cargoes).	 	2.23/2.37	Bags Bulk
COQUILLA NUTS		1.67/1.81	Bags
A vegetable ivory; the fruit of the Brazilian palm coquilhos, which yields a brown substance used in the manufacture of buttons, door knobs, etc. Dry stowage and away from moist goods.			
CORAL	 	2.23/2.79	Bags
Of which there are many varieties, red, black or white in colour. Very fragile, requires handling carefully and must not be overstowed except with light goods. Owing to the smell given off, stow in well ventilated space clear of edible goods. Coral ornaments should be stowed in special cargo locker to prevent pilferage.			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CORESTOCK Similar to plywood.		3.90	Crates

CORIANDER SEED

3.43/3.62

Bags

The highly aromatic seeds of a tropical plant extensively used for culinary purposes. Never shipped in large quantities. Dry stowage away from tea and other delicate goods.

CORK8.36/11.71
4.18

Bales

Bags

The outer bark of trees native to Spain, Portugal, Algeria, etc. Can be discoloured by sweat. Becomes brittle when cold. Due to the variety of uses to which the end product is put, it should not be stowed in the same compartment or container as highly odorous cargoes. Dry cargo. Do not permit slinging by the bands. Cork board in cartons stows at 9.75 M3/tonne. Cork blocks, Cork discs and cork (agglomerated), all in cartons, stow at 4.18 M3/tonne.

**CORK SHAVINGS
GRANULATED**7.80/8.36
7.80/8.36

Bales

Bags

Dry cargo. Do not permit slinging by the bands.

CORN

In the U.K. this term is usually applied to all kinds of grain, but in the U.S.A. it is applied to Maize, which see.

CORNFLOUR

1.25/1.39

Bags

A farinaceous food. Dry stowage, remote from odorous cargo.

COROZO NUTS

1.67/1.81

Bags

A vegetable ivory; the fruit of a South American dwarf palm, largely used by turners in the manufacture of various articles.

Dry stowage and away from moist goods.

CORPSES

The coffin should be packed in lead lined cases and properly sealed. A sanitary certificate should be obtained from the Health Authorities, endorsed by the proper Consular official, before shipment. May also be carried under refrigeration.

CORRUGATED IRON

See Galvanised Iron.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CORUNDUM (ORE)		1.11/1.25 0.67/0.61	Bags Bulk

An oxide of aluminium being, next to the diamond, the hardest of minerals — used in the manufacture of emery, etc. Shipped from India, etc. See Part 2, Ores.

COSTUS ROOT		3.07/3.34	Bags
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An aromatic root possessing medicinal properties. Dry stowage remote from edible and odorous goods.

COTTON	  
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Is the delicate fibre which clothes the seeds of the cotton herb, an annual, and the seeds of the cotton shrub and tree which live for 2 to 3 and 6 to 10 years respectively. Extensively cultivated in the Southern United States, India, China, Egypt, and to a lesser degree in Brazil, Peru, West Indies, Turkey, Australia, etc.

Cotton is packed in bales, pressed to varying densities, the highest density bales being shipped from India and China. The bales are covered with coarse gummy cloths and are bound by steel, wire or rope bands.

The following are the average sizes of bales and stowage factors for the principal cotton exporting countries:—

		<i>Cu. M. per Tonne</i>
Australia,	Pressed	3.62–3.76
China,	High Density	1.39–1.67
India,	High Density	1.53–1.67
Turkey,	Pressed	3.07–3.62
U.S.A.,	Standard Bale = 22½ lbs per cu. ft.	
	Standard Hand stowed, 29–30 cu. ft per bale	3.62–3.76
	Standard Screwed 27 cu. ft. per bale	3.34–3.43
	Webb or high density = 34½ lbs per cu. ft.	2.37–2.45
	Hand stowed 22½–22 cu. ft.	
	Screwed 18 cu. ft.	2.17–2.23

Owing to the great risk of fire which is ever present with cotton cargoes, the handling, stowage, and carriage of same calls for the greatest care and attention.

The National Cargo Bureau have issued Rules which govern the loading of cotton in all U.S.A. ports, and these may, with advantage and confidence, be adopted when loading cotton in ports where no specific rules are enforced.

Fire Extinguishers — before commencing to receive cotton, the ships fire fighting system should be thoroughly examined. Fire extinguishers should be placed adjacent to working hatch. Stevedores forklift truck should be battery driven and checked that arresters are in proper and good condition.

While loading or discharging cotton, the fire hoses should be connected and ready for use. "No Smoking" notices conspicuously displayed, and the order rigidly enforced, "spark arresters" fitted on main and galley funnels and the use of forges or naked lights prohibited.

Wet cotton, if stowed in a confined space, will heat and deteriorate but no danger of spontaneous ignition is to be expected. Wet and dry cotton should not be stowed together.

On the other hand, cotton which is or has been in contact with oil or grease is very liable to spontaneous combustion, for which reason holds, and especially spar ceiling, should not be painted shortly before loading cotton unless it is certain that there is sufficient time for the paint to harden before cotton is stowed up against it.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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Receiving — bales of cotton must be carefully examined on wharf or lighter, and all wet, damp or oil stained bales, also those with wrappers torn off and marks missing, or, with burst or missing bands should be rejected. Loose cotton should never be received on board.

When bales are wrapped in hessian wrappers, as usually is the case, many countries (Canada especially) insist on bales being fumigated before entry is permitted where second-hand material has been used for wrapping. It is therefore advisable for a certificate to be obtained from Shippers certifying the wrapper used to be new material and that such be visaed by the consul of the country of destination.

Where bales are partly opened up for sampling and grading only new material should be used to replace parts of wrappers cut off for that purpose.

Stowing — the bales stow on flat, edge or end according to which arrangement will ensure the greatest number being carried in the compartment, the particular arrangement depending on dimensions of bales and depth of compartment.

Cotton fires — in the event of a fire breaking out in a cotton cargo at sea, prompt measures are necessary:—

Batten down and close all apertures by which air may find its way into the holds — turn on the CO₂, according to instructions. See IMDG Code.

COTTON PIECE GOODS



1.68/7.0

Cases, Cartons,
Bales

Top stow. Do not stow in same compartment with goods liable to leak or stain. Use no hooks.

COTTON SEED



2.23/2.51

Bags

Shipped from all cotton growing countries, the stowage factor varying considerably.
See IMDG Code.

COTTON SEED CAKE (See Seed Cake)



1.34/1.53

Bales

1.56/1.67

Bulk

Is readily damaged by moisture and susceptible to tainting damage if stowed near or with odorous goods. Particular care should be observed if loading in Southern U.S.A. ports to keep this cargo clear of turpentine fumes. Usually put up in bales covered with gunny or in bags, but at times shipped in the loose condition. Requires to be well dunnaged and well ventilated.

Shipped in bulk may heat and ignite if excessive moisture content. Commodity should be properly aged prior to shipment in order to reduce oxygen content and certificates of moisture and oil content should be furnished prior to shipment.

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

COTTON SEED OIL



1.09

Bulk

This oil is obtained from the seed of the cotton plant, whose oil yield is about 25 per cent and is shipped from most of the cotton growing countries — sometimes in bulk (see Vegetable Oil in Bulk) when it sometimes (according to season) is necessary for heating coils to be fitted, as the oil solidifies at between 10 and 11 degrees C (50 and 54 degrees F) but care should be exercised to ensure that the temperature does not approach boiling point otherwise the oil will deteriorate greatly. Pumping temperature about 18.3 degrees C (65 degrees F).

See Vegetable Oil Constants, See Part 2, Oils and Fats.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
COTTON WASTE	 	3.90/4.46	Bales
Is liable to spontaneous combustion, depending upon the percentage of oil — vegetable or mineral — that it contains. If certified to be free of oil, ordinary stowage. Waste containing not more than 5 per cent of oil — properly baled — stow in open bridge deck, poop space, or where it is readily accessible and remote from Cotton. Reject all wet bales. See IMDG Code.			
COWGRASS SEED		1.73	Sacks
See Grass Seeds.			
COWRIE SHELLS		1.25/1.50	Bags
Small white glossy shells abundant on certain African and Asiatic shores.			
COWTAIL HAIR	 	1.95/2.09	Bales
Stow in a dry well ventilated space and apart from all heat throwing goods. See Hair, Animal.			
CRATES		See Part 2, Techniques	
CRAYFISH		1.53/2.70	Boxes, Cartons.
Careful stowage. Liable to pillage and therefore should be given locker stowage whenever possible. Properly prepared frozen crustaceans will keep for 6 months at -29 degrees C (-20 degrees F) and 3 months at -23 degrees C (-10 degrees F). Pre-packing hygiene and treatment is most important to the successful stowage of these products. Carriage and temperature to shippers instructions. See Fish.			
CREAM		1.39/1.53	Cartons
Stow as for cartons, -15/-18 degrees C.			
CREAM OF TARTAR (Argal)	  	1.62/1.67 1.81	Drums Casks
A white crystalline compound, susceptible to damage by taint or very high temperatures. ISO containers — Protect containers from direct sunlight.			
CREOSOTE	  	1.67/1.87	Drums Bulk
A tar oil — is colourless — and inflammable with a highly pungent smell. Often shipped in second-hand drums which are prone to leak. A very undesirable cargo, and should only be received on a vessel carrying fine and clean cargo if fumes cannot come into contact with cargo, ships' stores, or			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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find their way into living quarters. It should be handled and stowed very carefully to avoid leakage, and the greatest care should be taken to remove all traces of creosote stains and smells after discharge before shipping the next cargo. Lower holds with wooden ceiling should be completely lined with impervious material (e.g. plastic). See Sleepers, Creosoted. *ISO containers* — containers should be lined (floors, and well up the walls) with impervious material (e.g. plastic). Preferably not in containers subsequently to be used for foodstuffs or fine goods. In any case never in insulated or refrigerated containers. Fumes/spillage will almost certainly damage the fabric of container tilts (open sided, open topped containers).

When carried in bulk, the oil must be carried in completely self contained tanks to avoid contamination of the creosote. In bulk it is normally carried at a temperature of between 32.2 and 37.8 degrees C (90 and 100 degrees F) throughout the voyage. See IMDG Code.

CRUDE OIL

0.8/0.9 S.G.

Bulk

See Part 2, Petroleum.

CRYOLITE

0.70

Bulk

A fluoride of sodium and aluminium used in production of aluminium and for ceramic glazes. Grey pellets. Slightly pungent odour. Prolonged contact may cause serious damage to the skin and nervous system. Angle of repose 45 degrees.

CUBEBS

Tailed Pepper



2.23

Bags

Oily berries having a pungent smell. Not to be stowed in the vicinity of fine cargo such as tea, coffee, cigars, nor in the vicinity of tapioca, sago. Should be well ventilated.

CUBE GAMBIE

3.07/3.34

Package

A substance prepared from the leaves of certain East Indian shrubs used in dyeing and tanning. In the cube form it has no objectionable properties and may be stowed with fine cargo provided it is in a cool place. Good ventilation, liable to damage from damp heat. Should not be confused with Gambier which see.

CUDBEAR

2.37/2.51

Bales

A weed from which a dye similar to Orchil is obtained. Stow away from any damp cargo, as it will absorb moisture. Dry stowage.

CUMMIN SEED

2.23/2.93

Bags

The aromatic seeds of an annual plant which have a bitterish warm taste, used for medicinal purposes and as a substitute for pepper. Dry stowage and away from fine and delicate goods.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
CURIOS		4.18/5.02	Cases

Shipped from the Far East, mostly in large cases fairly well constructed. This cargo loses a lot of space in stowage unless a lower hold can be allocated for it but unless plenty of bottom weight is assured this is difficult to arrange owing to the extreme lightness of this class of cargo.

CURRENTS	 	1.25/1.50	Cases/Bags
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Shipped in considerable quantities from North America, Greece and other ports of the Mediterranean. Must be well ventilated to avoid heating and fermenting.

CURRENCY NOTES	See Bullion, also Part 2, "Specials"		
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CUSPARIA BARK			Bales
See Barks.			

CUTCH	  	1.45/1.56 1.67/1.81	Cases Bags
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The resin of a thorny tree grown in India and Malaysia, used for dyeing and tanning purposes. Is a form of refined gambier. Odorous. Put up in cases and bags, also made up into small square bales covered with gunny. It melts at 32-33 degrees C (90-100 degrees F) during the tropical part of the voyage and sets very hard when the ship gets into lower temperature. Stow apart from perishable goods, bulk latex and cargoes likely to throw off moisture such as jelatong (may become mouldy if exposed to damp). Give floor space stowage, well dunnaged and with a bed of sawdust. Also sprinkle sawdust between each tier. Adjacent cargoes should be well dunnaged. Good ventilation.

CUTTLEFISH		4.18	Cases
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A mollusc with an internal soft shell called cuttlebone used in polishing fine metals and for making dental powders. Ordinary dry stowage.

CYANIDE	 		Drums
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All cyanides are highly poisonous, the packing and stowage of which are prescribed by Official Regulations. See IMDG Code.

DAMAR	  	1.81/1.95 1.91	Cases Bags
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A resin obtained from several kinds of East Indian pine, also from the Kauri pine, the largest tree of New Zealand. Used for varnish making.

Damar is very liable to melt in hot weather, setting hard when cold weather is reached, and to get into a "matted" condition or even to "block", the latter very seriously affecting its value.

Stow in a cool, well ventilated 'tween deck compartment or, as top stowage in the lower hold, avoiding pressure as damar gives off heat, etc., when under pressure. Dunnage well, and for bag damar, separate each tier with matting leaving about 150 mm air space at ends, if possible, to assist ventilation and keep the damar cool. Avoid stowing with or near goods that give off heat or moisture. See Gums.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
DANGEROUS GOODS		See Part 2	
DARI JOWAREE		1.48/1.56	Bags
An Indian grain used as a rice substitute or poultry food. Also known as Indian millet, Turkish millet and Guinea corn. See Seeds.			
DATES		1.14/1.20 1.25/1.31 1.23/1.39	Cases Wet Cases Dry Baskets Wet
The fruit of the date palm, exported in considerable quantities from Tunis, Persian Gulf ports, Far East, etc., both in the wet and dry condition. When in the wet condition from which there is considerable drainage, treat and stow as wet cargo. Dry dates, ordinary stowage for edibles.			
DEAL; DEAL ENDS		See Part 2, Timber	
DECK CARGO		See Part 2, Techniques	
DEEP FROZEN PRODUCTS , see Part 2, Techniques. Also individual commodities.			
DETERGENTS		1.25	Bulk
A variety of detergents are now carried in bulk liquid form. Most of these are of a non-hazardous nature, although many have an offensive odour. It is essential that tanks are thoroughly cleaned prior to loading and it is advisable to call survey of space before the cargo is accepted. Suitable for carriage in bulk bags in ISO Closed Box containers. Detergent concentrate has a specific gravity of 0.98.			
If carried in plastic containers or cartons, should be stowed on own ground to avoid affecting other cargoes if leakage occurs.			
DEVILS DRUG		See Assafoetida	
DHALL, DAL		1.39/1.53 1.95/2.09	Bags Bags
A pea grown in India and E. Africa. Clean stowage.			
DIAMMONIUM PHOSPHATE		1.20	Bulk
Fertilizer. Slightly pungent odour. Angle of repose 30 degrees. See also Fertilizers.			
DIAMONDS		See Part 2, Specials	

Commodity	Characteristics	M3 per Tonne	Packaging
DICHLOROPHENOL	  	1.11	Drums

Dichlorophenol is a chemical which has an extremely potent odour. A minute quantity of which is capable of contaminating a vessel's entire hold. Contamination in foodstuffs can be detected with only one part of this chemical in 200 million.

Must on no account be carried adjacent to any foodstuffs nor stowed in insulated compartments. All drums should be thoroughly examined before acceptance.

ISO containers — extreme care to ensure no leaking or potentially leaking drums. Container floor and walls should be lined with a single piece of impervious material (e.g. plastic). The slightest spillage can render the container unsuitable for subsequent carriage of foodstuffs or fine goods. Under no circumstances should this commodity be carried in insulated or reefer containers. Destroy any dunnage or timber after unpacking container.

See IMDG Code. See also Part 2, Obnoxious cargoes.

DIRECT REDUCED IRON	  	0.5	Bulk
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It is essential that DRI is properly and accurately described prior to shipment. The Code of Safe Practice for Solid Bulk Cargoes must be consulted and preshipment requirements and carrying procedures strictly observed.

Cold moulded briquettes, lumps or pellets are the most hazardous. Hot moulded DRI is less so having a greater density. In both types a certificate attesting to the suitability of the DRI for shipment must be issued by the competent authority.

DIVIDIVI	  	3.21/3.24	
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Extract from pod of Divi Divi tree. Used in tanning and dyeing. Damp reduces its value. May be infested. Do not stow in same compartment as foodstuffs.

DJARAK		See Castor Seed	
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DODDER		2.79/3.07	Bags
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A leafless parasitic plant known also as "Hell-weed" used as a Manure and is to be stowed as such, which see.

DOGS DROPPINGS	 	1.81/1.95	Bags
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Used in the dyeing industry and manure works. Shipped from the Arabian Gulf in bags containing 68 kg to 90.7 kg weight. Should be protected by tarpaulins from rain and spray, as moisture and heat causes it to throw off very offensive smells.

On deck only.

DOGSKINS		2.51/3.34	Bales
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Like all other skins, is a very odorous cargo. Put up in bales, hand or machine pressed. Dry stowage, clear of tea and delicate goods. See Skins.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
DOGTAIL SEED See Grass Seeds.		2.45	Sacks
DOLOMITE		0.56/0.65	Bulk
A carbonate of calcium and magnesium. Used for refractory purposes, road construction and as a fertilizer compound. Odourless. Angle of repose 35 to 42 degrees.			
DOM NUTS		2.79/3.34 1.53/1.67	E. Africa Bags Red Sea Bags
Shipped mostly from E. Africa. Non-odorous but very dusty cargo. Dry stowage.			
DRAGONS BLOOD	 	2.37	Cases
A resin obtained from several varieties of E. and W. Indian trees and large rattans used for colouring. For Stowage, see Gums. Liable to taint. Inflammable.			
DRIED BLOOD	 	1.11/1.67	Bags
An animal manure — packed in bags generally double, not very dusty, neither does it give off offensive smell if kept dry. May be infested. <i>ISO containers</i> — containers may require fumigation after emptying. Insulated and reefer containers may be used (if properly lined with plastic or similar) for "general" leg of voyage.			
DRIED MEAT		See Carne Seca	
DRIPPING Cool dry stowage.	 	1.95/2.09	Casks
DROSS			Slabs Pigs
Metallurgical refuse. Stowage factor varies according to nature. Check specification, may be IMDG Code cargo.			
DRUMS		See Part 2, Techniques	
DUNNAGE		See Part 2, Techniques	
DUR-DUR		2.37/2.51	Bags
An astringent vegetable pod used for dyeing and tanning. Well ventilated stowage remote from greases and oils.			

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
DURRA Turkish Millet Negro Corn		1.48/1.67	Bags

A species of small seed, same as millet, used in some countries as a rice substitute, also for poultry food. Grown in E. and W. Indies, U.S.A., etc.

DYES

Drums
Bags

See Aniline Dyes.

Many vegetable commodities used for dye making are referred to herein, such as cochineal, fustic, lac, logwood, madder, myrabolams, turmeric, etc. Stow away from foodstuffs. May be powder, liquid, paste. May sift or stain. See IMDG Code.

DYNAMITE

See Part 2, Dangerous Goods

EARTHENWARE

1.81/1.95
1.48/1.67
2.79/3.34
5.57

Cases
Pipes
Crates
Unpacked

This cargo is shipped both in bulk, either protected by straw binding or totally unprotected, and in large crates. Loss through breakage is almost unavoidable, but unless very carefully handled the loss is apt to be serious and productive of claims.

Earthenware pipes are usually nested in pairs when the nature of shipment permits such.

When fairly large shipments of earthenware pipes and like ware are made, it is not unusual for shippers to have their representative in attendance to direct the stowage and in some ports it is the practice for freight to be based on actual space occupied by the ware, measured, after stowing.

Should always be stowed in 'tween deck spaces, and if these are deep it is best to stow over a tier or two of firm cargo laid on deck in order to reduce the top weight on bottom tier of earthenware as much as possible. Straw is usually used for stowing this cargo (which should be dry to avoid self heating). If light case goods are available they should be used for beam fillings and so act to secure top tier from movement when vessel rolls.

B/L should be claused so as to protect vessel from claims for breakage of this class of goods.

EBONY

1.53/1.67

Bulk

Is the black heart wood of a tree grown in Madagascar, Mauritius, Sri Lanka, West and East Indies, etc. Is a comparatively valuable commodity and should be carefully tallied in and out.

Shipped loose, in short lengths sometimes used for dunnaging dry cargo. Ends are sometimes painted or tarred.

EGG ALBUMEN

2.65/3.07

Cases
Crates

See Albumen. Eggs are not only fragile but a very delicate cargo liable to be rendered worthless by tainting if stowed near scented or strong smelling goods, such as spices, sugar, onions, cheese, oranges, apples or other green fruit, hay, newly sawn timber, etc.

Commodity	Characteristics	M3 per Tonne	Packaging
EGGS	  	2.65/4.46 2.93/3.48	Cases/Crates Boxes
Eggs in the shell are packed in crates or cases with bran, odourless wood shavings, fine straw or husks and shaped plastic trays. Stowage factor can vary greatly. If not carried under temperature control, stow in a cool dry well ventilated space, well removed from boiler or machinery spaces, and from odorous goods. A separate compartment should be set aside for the stowage of eggs. Suggested carriage temperature for chilled eggs -0.5 to +0.5 degrees C. Liquid eggs, without their shells (usually in cans or packs) are hard frozen. Handle gently. Packages should always be handled to the hatchway from the wings and ends of the compartment, and not dragged or hove out. Cases and crates should be stowed on a firm platform on close laid dunnage. Packages should be stowed fore and aft in line with the air flow, on their flat (never on edge). If vessel is equipped with brine grid system only, then intermediate lathes should be laid between each tier to assist air circulation. Bran, husks or odourless wood shavings may be used for packing. It is important that such material is not allowed to become damp, or damaging heat may be evolved. Treat as cargo liable to leak, and do not stow over goods liable to take damage from leakage of egg contents. See Part 2, Refrigerated Cargoes.			
EGGS DESICCATED	 	2.03/2.09	Cases
From Far East, etc. Stow in cool place clear of odorous cargo if not carried in refrigerated chambers.			
EGGS LIQUID	  	1.11/1.25	Cases and Packs
Hard frozen. Suitable for stowage with clean frozen meat of compatible temperature. See Part 2, Techniques, Refrigeration.			
EGG YOLK POWDER	 	1.95/2.23	Tins in Cases
From Far East. Dry cargo. Stow in a cool place clear of odorous cargo if not carried in refrigerated chambers.			
ELEPHANTS			
On deck, at shippers risk, B/L to clause "Ship not responsible for mortality". A full grown animal weighs 3 tonnes and over and varies from 2.28 m to 2.75 m in height. Special slings must be used for lifting these animals. Allow 120 litres of water and 280 kg of green foodstuff per day to each full grown animal.			
ELEPHANTS TEETH	See Ivory		
EMERY	0.56/0.84		
The coarser form of corundum.		Bags	

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
EMPTIES		8.36/9.75	Drums

Returned empties, i.e. wine, spirit and beer casks, drums, etc., are usually shipped as deck cargo, but on occasions are stowed below. Empty soft drink cases may stow at approximately 7 M3/tonne.

As the packages may have lain some time in the open, it not infrequently happens that water is retained, or that a small residue of former content is present, either of which will damage fine or dry cargo if overstowed with empties. For this reason a consignment of empties has potentialities for trouble, so that care should be exercised in disposing of same. Stow with bunghole up. Empty drums, cans, barrels, etc., which have contained inflammable spirit should be thoroughly drained and screw plugs firmly fitted — guard against risk of gas explosion. Gas cylinders may still be under pressure. Any empties which have carried dangerous goods must be handled and stored in accordance with the requirements of the dangerous goods previously carried. This rule may only be relaxed when the empty is certified free of all previous contents.

EMULSIFIED ASPHALT		See Asphalt
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ERNODI		See Podophyllum
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ESPARTO GRASS Alfa	 	3.62/4.74	Bales
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A strong grass fibre grown in N. Africa and Southern Europe, used in the manufacture of paper, cordage, etc.

Packed in bales and said to be liable to spontaneous combustion from which, or some other cause, many serious fires have occurred on ships carrying this commodity. Guard against fire from sparks (galley and main funnels should be fitted with spark arresters) smoking, etc.

The bales are frequently bound either with grass rope or iron bands and vary greatly, as between one port of shipment and another, as to the density to which they are pressed.

It is the practice in some ports to open a certain percentage of bales so as the better to fill up broken stowage, a most reprehensible practice which should never be permitted. In other ports 5 per cent, loose grass is shipped for filling up broken stowage. Loose grass, like loose hay, adds to the risk of fire.

All bales which are not properly bound up should be rejected, thus saving a lot of trouble at discharging ports.

B/L should adequately protect the ship for any loss of weight as this cargo suffers such to a considerable degree in the course of a long voyage. Wet bales should be rejected.

When ore is carried under the grass the vessel has to level same down. See IMDG Code.

ESSENTIAL OILS



These are all of plant origin, are charged with a concentration of the odour of the particular plant from which they are obtained, are highly volatile and inflammable, have an acrid taste and extremely pungent smells. A very small package of essential oil, stowed in a compartment containing tea, edible goods, tobacco, etc., would, if broken damage the whole contents of the compartment. Proposed loading should consider whether leaking oil could penetrate into another compartment through common hatchways, scuppers, or ventilation.

Whilst all varieties of essential oils are valuable, some are extremely so. The oils are variously packed — according to their value — in hermetically sealed drums, tin lined containers crated or boxed up, etc., some of the more valuable kinds being delivered on board in sealed containers.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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The packages should be carefully examined and checked, any showing signs of leakage to be rejected on the spot. Stow in a dry, well ventilated peak — never in holds — where it can be safely locked up. Dunnage and chock off well. Dunnage used for this cargo should not be used a second time, in order to avoid the risk of damaging fine cargo.

The following is a list of the most important Essential Oils of Commerce:—

Aniseed	Cinnamon	Lime	Peppermint
Almond	Citron	Marjoram	Rose
Attar of	Cloves	Mint	Rosemary
Roses	Copaiba	Mustard	Rosewood
Bay	Eucalyptus	Myrrh	Sandalwood
Bergamot	Fennel	Myrtle	Sassafras
Cajaput	Garlic	Nutmeg	Spearmint
Calamus	Ginger	Oolang	Thyme
Caraway	Jasmine	Ooland	Valerian
Cassia	Lavender	Orange	Verbena
Cedarwood	Lemon	Patchouli	Wormwood

Note — a number of the above are specially referred to in the alphabetical section of this book.

ISO containers — as well as the extreme care against leakage mentioned above, the container floors and walls should be lined with a single piece of impervious material (e.g. plastic). Spillage will render the container totally unfit for the carriage of foodstuffs and fine goods. On no account should insulated or reefer containers be used. Destroy any dunnage or shoring timber after unpacking containers.

ETHANOL (Ethyl Alcohol)



See Chemical Cargoes, Part 2.

ETHYL ACETATE



1.50/1.78

Drums

Flammable liquid. See IMDG Code.

ETHYL CHLORIDE



3.62

Drums

Flammable liquid. See IMDG Code.

ETHYL DICHLORIDE (EDC)

See Part 2, Chemical Cargoes

ETHYL HEXANOL



Bulk

Non-hazardous cargo with a flash point of about 74.2 degrees C.

Absolute cleanliness of the tanks is essential prior to loading. Tanks should be steamed, washed out in caustic soda, hosed down and dried. It is important to remove any kind of organic matter such as grain from the tank. No kerosene or similar cargoes should have been contained in the tanks for at least three voyages prior to loading Ethyl Hexanol.

It has an objectionable odour and tanks should be well ventilated after discharge, before men are allowed to enter.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
EUCALYPTUS OIL White Wood Oil Kavu Putch		1.23/1.39	Drums

A resinous oil obtained from the Australian "blue gum" tree, mainly used for medicinal purposes. It is not of the same class, as regards value, as essential oils (which see) but owing to its very pungent smell it should be stowed in the same manner as such.

EUPHORBIIUM		Cases
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The inspissated sap of an East Indian plant having an exceedingly sharp and bitter taste, valued for its medicinal properties. Exported from Morocco, East Africa, etc. For stowage see Gums.

EXPLOSIVES		See Part 2, Dangerous Goods
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EXTRACTS

Many varieties of extracts are shipped in liquid paste and powder form. Such have to be dealt with according to their nature and properties. Valuable commodity.

FARINA	 	1.53/1.67 1.59/1.67	Bags Cases
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A starchy substance — very susceptible to damage if stowed near odorous or wet goods. Stow as for Flour.

FATTY ACID

May be in second hand drums. Do not stow with fine goods. See Coconut Oil Products.

FEATHERS (ORDINARY)		1.81/2.51 9.75/11.15	Pressed Bales Hand Packed Sacks
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The commoner kinds of feathers used for bedding and upholstery are shipped in considerable quantities from the Far East, Russia, etc., in bales, pressed to various densities or unpressed in large sacks. In most cases the production of a Sanitary Certificate obtained from the country of origin and endorsed by Consular officer is necessary in respect of this commodity.

FEATHERS (VALUABLE)

Feathers are variously packed in cases, bags or bales, according to quality and value.

Certain classes of feathers constitute very valuable cargo, amongst which are the following: Argus, Pheasant, Adjutant, Bird of Paradise, Egret, Ostrich, Peacock and White Heron.

Valuable feathers are shipped in sealed boxes or cases.

Packages and seals should be carefully examined and tallied. Any packages showing signs of having been tampered with should be rejected. Should be stowed in strong room or special cargo locker and well guarded against pilferage.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
FEEDSTUFF	Fodder Pellets	1.39/1.67	Bulk

The minimum quantity of feedstuff to be carried on vessels carrying livestock is laid down in Regulations appropriate to the country of shipment; generally speaking not more than two days supply is permitted to be carried on the weather deck (except in the case of containers). The feedstuff mostly carried is the following:—

Barley	1 tonne in bags = 1.95 M3
Bran	1 tonne in bags = 3.62
Chaff	1 tonne in bags = 3.36
Gluten	1 tonne in bags = 1.87
Hominy	1 tonne in bags = 1.81
Oats	1 tonne in bags = 2.17
Rye	1 tonne in bags = 2.12
Hay	1 tonne in bags = 3.62/4.46

FELDSPAR		0.98/1.11	Bags
FELSPAR		0.60	Bulk

Crystalline white or red mineral. Used in ceramics and enamelling. Angle of repose 35–45 degrees. Cool, dry stowage.

FELT	Variable	Rolls Bales
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A rough fabric or cloth made by rolling and pressure, from wool, hair, etc. Ordinary dry stowage. (Do not confuse with Inodorous Felt, a dangerous cargo, which see). Stowage factor varies over a very wide range according to class of material, etc., being in some cases 1.67 and 4.18 M3/tonne and more.

FELT, INODOROUS	 	Variable	Rolls Bales
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Owing to its liability to spontaneous combustion, this commodity is classed as a Dangerous Cargo. It is made from flax, jute or similar refuse treated with rosin previously moistened by mixing with oils of various kinds.

Most shipping companies only receive this for carriage on deck. If stowed below, stow in a cool place near the hatch where it is easily accessible. The stowage factor varies very considerably. See IMDG Code.

FENNEL SEED	2.51/2.79	Bags
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The seeds of an aromatic hay-like plant used for medicinal purposes.

FERROCHROME	0.18/0.26	Bulk
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Raw material of iron mixed with chrome. Angle of repose 45 degrees.

FERROCHROME exothermic	0.18/0.26	Bulk
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Alloy of iron and chromium. No welding or hot work should be permitted in the vicinity. Angle of repose 45 degrees.

Commodity	Characteristics	M3 per Tonne	Packaging
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FERRO MANGANESE

See Manganese Ferro

FERROPHOSPHORUS

0.20

Bulk

If mixed with water may produce toxic and inflammable gases. Stow only in mechanically ventilated space.

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

FERROSILICON

(See Ferrophosphorus)



0.47/0.71

Bulk

Mixed with water and air may produce explosive mixture. Pay strict attention to description of cargo. Preloading certificate must be provided by manufacturer. Stow only in mechanically ventilated space. Exhaust gases must not reach living accommodation. Detectors for presence of phosphine and arsine gas should be carried.

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

FERROUS METAL

Iron Swarf, Steel Swarf, Turning or Cuttings. Liable to heat and ignite spontaneously particularly if oil or other impurities are present.

Careful monitoring of temperatures prior to and during loading essential. Continue monitoring temperatures on passage. See Metal Borings and Cuttings.

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

FERTILISERS**AND CHEMICALS****FOR SOIL TREATMENT**

1.39/1.67

Bags

Bulk

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

These may be classified as natural materials which comprise, guano, chalk, lime, bone meal, rock phosphate, gypsum, dried blood and rarely organic manures, peat etc., and by-products such as basic slag and artificial fertilisers. The latter materials are produced chemically and constitute the principal quantity of fertilisers carried on ships.

Organic materials, guano dried blood and bone meal often have a strong unpleasant odour and should not be stowed in the same holds as foodstuffs, tobacco, paper and other sensitive products.

Fertilisers are designed to be added to the soil to provide nutrients necessary for plant growth (they may also be applied to control the acidity of the soil), and these are principally:—

1. Nitrogen (abbreviation N) which is provided by guano, nitrates, ammonium compounds and urea
2. Phosphorus (abbreviation P) which is provided by dried blood, basic slag, phosphates, super phosphates and triple super phosphate
3. Potassium (abbreviation K) which is provided by potassium chloride (also known as muriate of potash) and potassium sulphate.
4. Other nutrients, principally sulphur (S) but also certain trace elements which may be added to artificial fertilisers.

It is common to supply mixed fertilisers under the designation NPK. The numbers following the term NPK indicate the proportion of each nutrient present on the basis of a trade terminology. They do not indicate the actual chemical composition of the particular fertiliser.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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Most artificial fertilisers are shipped as bulk cargoes and are bagged off subsequent to discharge for distribution to end users. Modern practice is to produce such fertilisers in prill form to facilitate distribution in fields by means of mechanical spreaders. If such fertilisers are wet or caked they cannot be used in mechanical spreaders. All artificial fertilisers are hygroscopic to varying degrees. Furthermore if moist fertiliser dries out caking occurs. There is no necessity to ventilate these products apart from the requirement to remove traces of ammonia gas which are sometimes produced during a voyage before either the ship's crew or stevedores enter cargo spaces.

Fertilisers incorporating ammonium salts or urea must not come into contact with alkaline materials such as basic slag or lime. As most NPK fertilisers contain ammonium salts these must not be allowed to come into contact with alkaline materials. Most NPK fertilisers also undergo self-sustaining decomposition with the release of toxic gases when significantly heated. They are classified in the IMDG Code because of this property. Hence great care must be taken to ensure that such materials cannot come into contact with steam pipes, cargo lamps and any other hot surfaces. Under no circumstances should hot work be conducted in the vicinity of holds containing artificial fertilisers.

Table of Compatibility of Stowage of Fertilisers

	Basic Slag	Tri Basic Slag	Nitro Plus	Sulphate of Am- monia	Calnitro 20%	Sodium Sulphate	Super Phos- phate	Triple Super Phos- phate	Nitro Phoska	Nitro Chalk	Muriate of Potash
Basic Slag	—	Yes	No	No	No	Yes	Yes	Yes	No	No	Yes
Tri Basic Slag	Yes	—	No	No	No	Yes	Yes	Yes	No	No	Yes
Nitro Plus	No	No	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sulphate of Ammonia	No	No	Yes	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calnitro 20%	No	No	Yes	Yes	—	Yes	Yes	Yes	Yes	Yes	Yes
Sodium Sulphate	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes	Yes
Super Phosphate	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes
Triple Super Phosphate	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes	Yes
Nitro Phoska	No	No	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes
Nitro Chalk	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes
Muriate of Potash	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—

The above table refers to bagged cargo, and care should be taken to ensure that separation does not allow admixture. More so, with bulk cargo; the separation must be graintight, and sufficiently robust to withstand grabs. Any failure allowing admixture will cause the chemicals to become off-specification, and result in damage claims. Great care must be taken to thoroughly clean the holds prior to loading, particularly not readily accessible horizontal surfaces such as underdeck H-beams. Any residue such as grain, may become dislodged due to ship movement or vibration. In the past, entire cargoes have been rejected, where grain was found on top of the fertiliser. The authorities take the view that the grain may be infected with fungal disease (Karnal Bunt/Dwarf Bunt, etc.), and spreading the fertiliser over vast areas would produce disastrous infestation.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
FESCUE SEED See Grass Seeds.		3.62	Sacks

FIBRE

2.79/3.34

Fibre is the raw material used in the textile industries for weaving various classes of cloths, etc., a large variety of which is shipped from most parts of the world.

The principal fibres of commerce are:—

Asbestos	Cotton	Jute
Bristles	Flax	Kapok
China Grass	Hemp	Rarnie
Coconut	Horn	Rhea
Coir	Istle	Rice

all of which are dealt with herein. See IMDG Code.

FIBRE ROOT

5.02/5.30

Bales

Shipped from Far East ports.

FIGS

1.25/1.39

Cases

1.34/1.45

Baskets

1.25/1.39

Bags

Shipped in boxes and baskets from Mediterranean ports. Care should be exercised not to overstuff dry cargo with figs unless satisfied that the fruit is thoroughly dried. Should be kept apart from odorous goods. May be infested. May require refrigeration for long passages (green figs) where suitable temperature might be -1 degree C (30 degrees F). See Part 2, Techniques, Refrigeration.

FILMS

Some cinema and picture films, being readily inflammable, may be classified as Dangerous Goods. Susceptible to damage by heat or moisture.

Stow in a dry cool place, removed from engine and boiler rooms and near the hatchway.

X-ray film will "fog" if subjected to high temperature, i.e. in excess of 18.3 degrees C (65 degrees F). May require temperature control. Typical carriage temperature being +5 degrees C (41 degrees F).

FIRE CRACKERS

2.51/2.79

Cases

Shipped in considerable quantities from Hong Kong and other Eastern ports. Usually are packed in very fragile cases covered with matting which are quite unsuitable for overstuffing with other cargo; come in very handy for beam filling over dry cargo, but not for broken stowage. Should not be slung with other cargo to avoid crushing.

Requires careful watching to avoid broaching and pilferage.

See IMDG Code.

Commodity	Characteristics	M3 per Tonne	Packaging
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FIREWOOD

Firewood C/Ps usually contain the following provision:—

"The cargo to be loaded and discharged in tiers of lengths, as customary in the firewood trade".

Cases have been brought before the Courts where this requirement of the C/P has not been respected. Consignees as a result, having been involved in expense in sorting out the cargo, the claim including loss of despatch money in some instances.

FISH**SHELLFISH****CRUSTACEANS****SALTED****FROZEN**

2.28

2.34

1.95/2.23

2.50

Crates, Cartons.

Crates, Cartons.

Bales, Crates, Casks

Boxes, Cartons,

Loose

Fish for refrigerated stowage should be received in the hard frozen condition and unless under deep freeze, stowed in a compartment by itself to avoid tainting damage to other cargoes. Where fish is carried under deep freeze conditions, i.e. -18 degrees/ -15 degrees C, there is little danger of taint to other cargoes provided they are suitably wrapped in watertight cellophane bags. It will be necessary to deodorize the compartment and where applicable lower hold bilges after discharge.

Dried fish which may be carried without refrigeration for limited periods, depending on ambient temperatures, etc., may have a strong odour and must not be stowed adjacent to cargo susceptible to damage by taint. Suggested carriage temperature $+4$ to $+7$ degrees C.

Salted fish, suggested carriage temperature -1 to $+1$ degree C, has a high moisture content, is very odorous and may leak brine. If packed in bales, intermediate horizontal dunnage (50 mm $\times$ 50 mm) will be required every second tier to allow cooling air full access.

Shellfish — scallops, oysters, etc., are hard frozen or deep frozen. Suggested carriage temperature -15 to -18 degrees C. May be stowed in the same compartment or container as other hard frozen fish or clean meat if carriage temperatures are compatible. Must be hard frozen at, or below, carriage temperature at time of loading. The minimum time must elapse between presenting the cargo and putting it under refrigeration.

Fish fingers — cartons deep frozen. Due to bread and batter content they are susceptible to damage by taint. Also the quality may be adversely affected by fluctuations in temperature during transport.

Fish white — hard or deep frozen. The lower the temperature the longer the shelf life. Must be at the correct carriage temperature at time of loading/stuffing. May be carried in the same compartment/container as clean meat if temperatures are compatible. Very susceptible to damage by taint.

Fish with high fat content, e.g. Mackerel, herrings, etc. Very susceptible to damage by taint, also provide a source of taint. They may be susceptible to fat migration manifesting itself in the form of brown rust spores on the outer flesh if exposed to wide temperature deviation above -18 degrees C. Indications of loss of quality are haemorrhaging from the gills and opaque glazing in the eyes. Stow away from other frozen produce that may take taint or be a source of taint.

Crustaceans are normally carried between -18 degrees C and -25 degrees C being wet block glazed or spray glazed to prevent oxidation and dehydration. The deep water red shrimp caught off Greenland and Northern Canada are handled in a different manner to their warm water counterparts. They are normally frozen at sea and spray glazed after initial freezing prior to packing into retail type cartons and thence into market cartons. If the post freezing glaze technique is improperly carried out starvation of glaze to product block can lead to dehydration and white spots under the skin after two to three months in storage. Further, by applying a cold water glaze to a frozen block at -20 degrees C will cause the overall block temperature to rise due to temperature equalisation, often as high as -4 to -5 degrees C necessitating the needs to further blast freeze. Failure to do so by placement in conventional cold chamber will result in slow freezing, changing the structure of the glaze and tissue ice crystals. This will allow tissue to break down which is irreversible and will shorten the product finite storage life.

<i>Commodity</i>	<i>Characteristics</i>	<i>M3 per Tonne</i>	<i>Packaging</i>
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In most Far East exporting countries, the shrimp are normally finger/block packed and frozen totally immersed in a wet block. By doing so, dehydration and oxidation is reduced, minor variations in temperature during commercial breaks in the cold chain during handling are less likely to have detrimental effect on product tissue.

Spray glazed products require a storage/carrying temperature of 3 to 5 degrees C below 18 degrees C due to time voids between the product; not present in a solid wet glaze block.

FISHMEAL



1.73/1.81
1.34

Bags
Bulk

Fishmeal is a protein supplement valuable for aminoacids, which exist naturally in fish, and greatly assist in growth of poultry and other animals.

Shipments should be covered by certificates from a recognized authority, stating: moisture content (between 6 and 12%), fat content (should not exceed 15%) and details of antioxidant treatment (which should be no less than 100 ppm at time of shipment). It is either transported in loose bags or in bulk. More recently, dry box containers.

It may be liable to spontaneous combustion, thus ships should have holds fitted with CO₂ fire fighting system. Cases of serious heating have been detected in the past, and it is suspected this is due to ineffective treatment of anti-oxidant at the time of production.

It may be susceptible to damage by moisture migration or condensation. Care should be taken also regarding taint, due to its strong and persisting smell. It can also be a source of infestation.

Holds should be clean, dry and free of residues from previous cargoes. Bagged fishmeal should not be allowed to come into contact with bare metal surfaces, and any permanent dunnage or spar ceiling should be complete and in place.

Trade practice has it that three types have been adapted for bagged fishmeal, IMO Class 9.

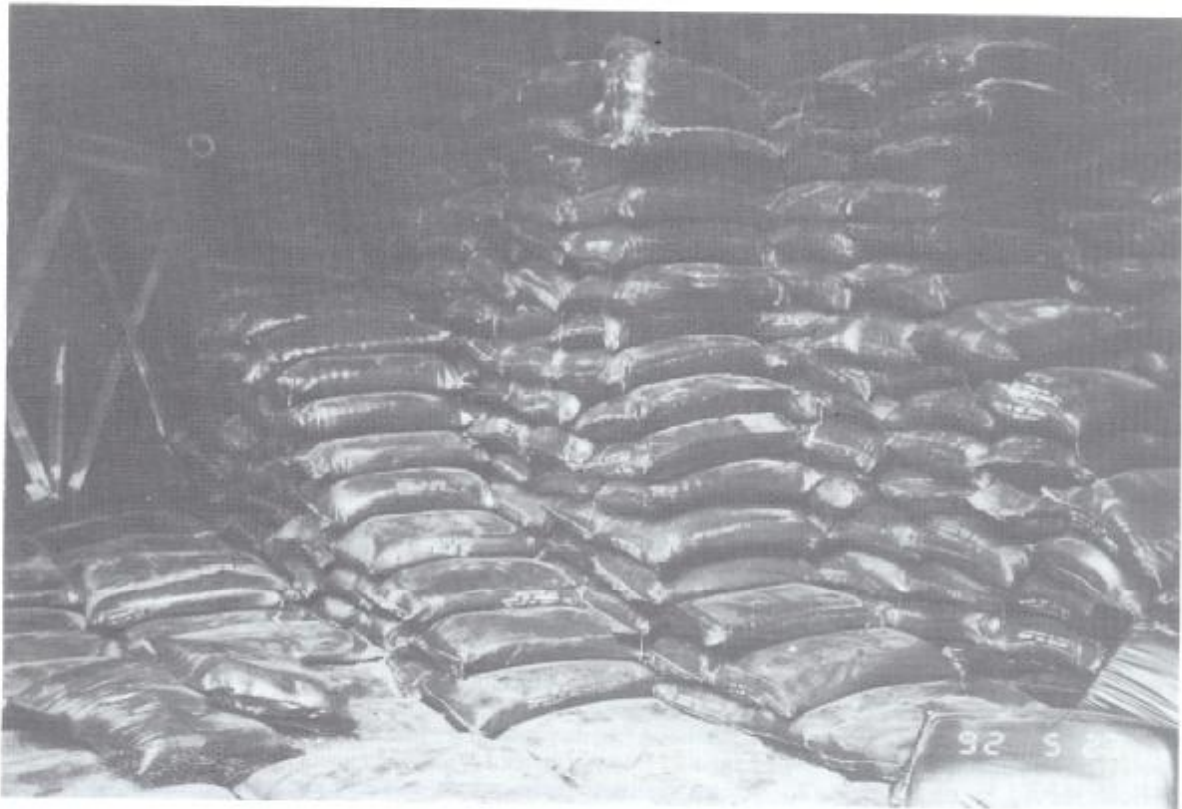
1. Compact Stow — which incorporates limited channelling.
2. Conventional Stow — which incorporates extensive athwartships channelling, and may also be known as "Double Strip Stow". (This is the stow recommended by IMO and non anti-oxidant treated Class 4.2.)
3. Block Stow (i.e. no internal channelling) — which is recommended by IMO for Class 9 fishmeal.

Fishmeal cargo provided with the proper certification attesting to it, having been properly antioxidant treated, should be loaded as per the IMO code. It is recommended that tank tops and decks should be adequately dunnaged to insulate cargo from moisture, in case of condensation, and space left at the shipside and topstow, to allow for air circulation.

During loading bags that are: wet, damaged or have a temperature exceeding 35 degrees Centigrade, or 5 degrees above ambient temperature (whichever is highest, should be rejected for shipment.

Temperatures of cargo should be taken three times daily during voyage. If temperature exceeds 55 degrees and heating continues, ventilation should be excluded, the holds and spaces sealed, and CO₂ released.

Shipments in bulk may be in granular or pelletised form. Serious heating in this stow has also occurred in the past. However it is suspected that this was due to ineffective treatment of anti-oxidant at the time of production. It cannot be over emphasised the effective treatment of the fishmeal by the anti-oxidant is vital in precluding over heating of the cargo. Bagged fishmeal may be carried in containers provided relevant certification is produced. It is recommended that the containers be carried on deck. Internal surfaces must be clean and dry. Stow must be tight with minimum air space. Doors and ventilators to be sealed after stuffing. In case of heating container should be cooled with water. If combustion occurs top of container should be punctured and contents flooded with water.



Fishmeal in stow.

Discharging sound bags. Fishmeal fire in background.



Commodity	Characteristics	M3 per Tonne	Packaging
FISH OIL	  	1.39/1.48 1.09	Bulk

The oil generally referred to as fish oil may in fact be obtained by the processing of one of a variety of fish, the principal types of fish harvested for oil recovery being capel, anchovy, herring, sardine and menhaden. This range of types of fish harvested for oil recovery means that the chemical composition of fish oil can straddle a wide range, but it is generally the case that fish oils are highly unsaturated and therefore easily oxidised oils. The high level of unsaturation means that the oils are predominantly liquid, though in some cases solid fat may be present in the oil in small quantities and may settle to the bottom of storage tanks. The fish oils are generally dark in colour.

Most of the fish processed for oil are harvested in the North Atlantic and the north and south Pacific regions. South American exports of fish oils are substantial, but Japanese exports have tended to decline in recent years. Fish oil is always shipped as a crude oil, with the free fatty acid content generally required to be not more than 2%. It is refined and processed further for use as an edible fat.

1.09 Bulk

Seal oil, shipped from Greenland, Newfoundland, Aleutian Islands, etc., is a very odorous oil, of light yellow to brown in colour; used principally for soap making.

1.13 Bulk

Sperm oil — of two kinds, i.e., the Southern sperm and the Arctic sperm, the oil of the former being the higher priced. Both are pale yellow in colour, with strong fishy smell. This oil is of a particularly light specific gravity.

Most bulk fish oils are carried at a temperature of 20–25 degrees C. Pumping temperature 30–35 degrees C.

1.09/1.11 Bulk

Whale oil differs considerably in colour, some being dark brown, and has a very strong smell.

Whale oil is also called "train oil".

Whale oil carried in bulk, should not be allowed to fall below a temperature of 20 degrees C. If the temperature falls below this figure, there is the risk of separation of solids which are difficult to absorb by heating.

Carrying temperatures should be at about 23.9 degrees C or as indicated by shippers. Where it is required to heat the oil to a requisite temperature for pumping out, the temperature should be raised at the maximum rate of 0.5 degrees C per day.

The most effective way of cleaning the tank after discharge is to first cover the bottom coils in a solution of water and detergent, close the tank down and heat the water to a temperature of at least 48.9 degrees C and leave for about 12 hours. After, wash down the tank with the detergent treated water and afterwards wash down with fresh water. After pumping out, again pass heat through the coils to dry out the tank. It is then advisable to coat the tank with a mixture of boiled and raw linseed oil.

See Part 2, Oils and Fats.

FLAVINE	1.23/1.34	Cases
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A vegetable extract from which is obtained an olive yellow dye. Stow apart from edible goods.

FLAX		2.93/3.34 4.18/4.32 2.37/3.62	Bales Baltic Bales Bales
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Is the fibre of the inner layer of an annual herb from which linen is made. Grown and shipped from Russia, Italy, India, Argentina, Australia, New Zealand, etc. Flax is not pressed to a great density to avoid damaging the fibre. The size and weight of bales differ for various ports and countries, but generally they average 181 to 204 kg per bale. Should be well dunnaged and matted and kept well ventilated. See IMDG Code.