**Container Ship**

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|  |
| --- |
| Two container ships pass each other |
| **Class overview** |
| Name: | Container ship |
| Subclasses: | * (1) Geared or gearless (as per cargo-handling type)
* (2) Freighter or pure Container (as per passenger carrier-type)
* (3) Feeder or World-wide foreign-going vessel (as per trade)
* (4) Panamax or post-Panamax vessel (as per breadth of vessel < or > than 32.2m respectively)
 |
| Built: | 1956–present |
| In service: | 9,535 ships as of 2010 |
| **General characteristics** |
| Propulsion: | Typically [diesel](https://en.wikipedia.org/wiki/Marine_diesel_engine) since 1990 |
| Speed: | Typically 21–25 knots (38.9-46.3 km/h)  |
| Capacity: | Up to 19,224 [TEU](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit) |
| Notes: | Reduced superstructure, containers stacked on deck, [bulbous bow](https://en.wikipedia.org/wiki/Bulbous_bow) |

**Container ships** (sometimes spelled [**containerships**](https://en.wiktionary.org/wiki/containership)) are [cargo ships](https://en.wikipedia.org/wiki/Cargo_ship) that carry all of their load in truck-size [intermodal containers](https://en.wikipedia.org/wiki/Intermodal_container), in a technique called [containerization](https://en.wikipedia.org/wiki/Containerization). They are a common means of commercial [intermodal freight transport](https://en.wikipedia.org/wiki/Intermodal_freight_transport) and now carry most seagoing non-bulk cargo.

Container ship capacity is measured in [twenty-foot equivalent units](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit) (TEU). Typical loads are a mix of 20-foot and 40-foot (2-TEU) ISO-standard containers, with the latter predominant.

Today, about 90% of non-[bulk cargo](https://en.wikipedia.org/wiki/Bulk_cargo) worldwide is transported by container, and modern container ships can carry over 19,000 TEU (e.g., [MSC Zoe](https://en.wikipedia.org/wiki/MSC_Zoe)). Container ships now rival [crude oil tankers](https://en.wikipedia.org/wiki/Crude_oil_tanker) and [bulk carriers](https://en.wikipedia.org/wiki/Bulk_carrier) as the largest commercial vessels on the ocean.

**History**

Container ships avoid the complex [stevedoring](https://en.wikipedia.org/wiki/Stevedore) of [break-bulk shipping](https://en.wikipedia.org/wiki/Break_bulk_cargo).

There are two main types of dry cargo: [bulk cargo](https://en.wikipedia.org/wiki/Bulk_cargo) and [break bulk cargo](https://en.wikipedia.org/wiki/Break_bulk_cargo). Bulk cargoes, like grain or coal, are transported unpackaged in the hull of the ship, generally in large volume. Break-bulk cargoes, on the other hand, are transported in packages, and are generally manufactured goods. Before the advent of containerization in the 1950s, break-bulk items were loaded, lashed, unlashed and unloaded from the ship one piece at a time. However, by grouping cargo into containers, 1,000 to 3,000 cubic feet (28 to 85 m3) of cargo, or up to about 64,000 pounds (29,000 kg), is moved at once and each container is secured to the ship once in a standardized way. Containerization has increased the efficiency of moving traditional break-bulk cargoes significantly, reducing shipping time by 84% and costs by 35%. In 2001, more than 90% of world trade in non-bulk goods was transported in ISO containers. In 2009, almost one quarter of the world's dry cargo was shipped by container, an estimated 125 million TEU or 1.19 billion metric tons worth of cargo.

The first ships designed to carrying standardized load units were use in the late 18th century in England . In 1766 [James Brindley](https://en.wikipedia.org/wiki/James_Brindley) designed the box boat “Starvationer” with 10 wooden containers, to transport coal from [Worsley](https://en.wikipedia.org/wiki/Worsley) Delph to Manchester by [Bridgewater Canal](https://en.wikipedia.org/wiki/Bridgewater_Canal). Before the [Second World War](https://en.wikipedia.org/wiki/World_War_II) first container ships were used to carrying baggage of the luxury passenger train from London to Paris, [Golden Arrow](https://en.wikipedia.org/wiki/Golden_Arrow_%28train%29)/[Fleche d'Or](https://en.wikipedia.org/wiki/La_Fl%C3%A8che_d%E2%80%99Or_%28train%29), in 1926 by [Southern Railway](https://en.wikipedia.org/wiki/Southern_Railway_%28UK%29). These containers were loaded in London or Paris and carried to ports, Dover or Calais, on flat cars in the UK and “CIWL Pullman Golden Arrow Fourgon of CIWL” in France.

The earliest container ships after Second Word War were converted [tankers](https://en.wikipedia.org/wiki/Tanker_%28ship%29), built up from surplus [T2 tankers](https://en.wikipedia.org/wiki/T2_tanker) after World War II. In 1951, the first purpose-built container vessels began operating in [Denmark](https://en.wikipedia.org/wiki/Denmark), and between [Seattle](https://en.wikipedia.org/wiki/Seattle) and [Alaska](https://en.wikipedia.org/wiki/Alaska). The first commercially successful container ship was the [*Ideal X*](https://en.wikipedia.org/wiki/SS_Ideal_X), a T2 tanker, owned by [Malcom McLean](https://en.wikipedia.org/wiki/Malcom_McLean), which carried 58 metal containers between [Newark, New Jersey](https://en.wikipedia.org/wiki/Newark%2C_New_Jersey) and [Houston, Texas](https://en.wikipedia.org/wiki/Houston%2C_Texas) on its first voyage. In 1955, McLean built his company, McLean Trucking into one of United States' biggest freighter fleets. In 1955, he purchased the small Pan Atlantic Steamship Company from [Waterman Steamship](https://en.wikipedia.org/wiki/Waterman_Steamship) and adapted its ships to carry cargo in large uniform metal containers. On April 26, 1956, the first of these rebuilt container vessels, the *Ideal X*, left the [Port Newark](https://en.wikipedia.org/wiki/Port_Newark) in New Jersey and a new revolution in modern shipping resulted.

The earliest container ships were converted [T2 tankers](https://en.wikipedia.org/wiki/T2_tanker) in the 1940s after [World War II](https://en.wikipedia.org/wiki/World_War_II).

Container vessels eliminate the individual hatches, holds and dividers of the traditional general cargo vessels. The hull of a typical container ship is a huge warehouse divided into cells by vertical guide rails. These cells are designed to hold cargo in pre-packed units – containers. Shipping containers are usually made of steel, but other materials like aluminum, fiberglass or plywood are also used. They are designed to be entirely transferred to and from smaller [coastal carriers](https://en.wikipedia.org/wiki/Coastal_trading_vessel), [trains](https://en.wikipedia.org/wiki/Rail_freight_transport), [trucks](https://en.wikipedia.org/wiki/Truck) and/or [semi-trailers](https://en.wikipedia.org/wiki/Semi-trailer) (and so are carried by different *modes* of transport during one voyage, thus giving the name [intermodal transport](https://en.wikipedia.org/wiki/Intermodal_freight_transport)) There are several types of containers and they are categorized according to their size and functions.

Today, about 90% of non-[bulk cargo](https://en.wikipedia.org/wiki/Bulk_cargo) worldwide is transported by container, and modern container ships can carry up to 16,020 [twenty-foot equivalent units](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit) (TEU) ([CMA CGM Marco Polo](https://en.wikipedia.org/wiki/CMA_CGM_Marco_Polo)). As a class, container ships now rival [crude oil tankers](https://en.wikipedia.org/wiki/Crude_oil_tanker) and [bulk carriers](https://en.wikipedia.org/wiki/Bulk_carrier) as the largest commercial vessels on the ocean.

Although containerization caused a revolution in the world of shipping, its introduction did not have an easy passage. Ports, railway (railroad in the US) companies, and shippers were concerned about the huge costs of developing the ports and railway infrastructure needed to handle container ships, and for the movement of containers on land by rail and road. Trade unions were concerned about massive job loss among port and dock workers at ports, as containers were sure to eliminate several manual jobs of cargo handling at ports. It took ten years of legal battles before container ships would be pressed into international service. In 1966, a container liner service from the USA to the Dutch city of Rotterdam commenced. Containerization changed not only the face of shipping, but it also revolutionized world trade as well. A container ship can be loaded and unloaded in a few hours compared to days in a traditional cargo vessel. This, besides cutting labor costs, has reduced shipping times between ports to a great extent; for example, it takes a few weeks instead of months for a consignment to be delivered from India to Europe and vice versa. It has also resulted in less breakage due to less handling; also, there is less danger of cargo shifting during a voyage. As containers are sealed and only opened at the destination, pilferage and theft levels have been greatly reduced.

Container ship Tan Cang 15 in the [Saigon river](https://en.wikipedia.org/wiki/Saigon_river) in [Ho Chi Minh City](https://en.wikipedia.org/wiki/Ho_Chi_Minh_City), Vietnam.

A Delmas container ship unloading at the Zanzibar port in Tanzania

Containerization has lowered shipping expense and decreased shipping time, and this has in turn helped the growth of international trade. Cargo that once arrived in cartons, crates, bales, barrels or bags now comes in factory sealed containers, with no indication to the human eye of their contents, except for a product code that machines can scan and computers trace. This system of tracking has been so exact that a two-week voyage can be timed for arrival with an accuracy of under fifteen minutes. It has resulted in such revolutions as [on time guaranteed delivery](https://en.wikipedia.org/w/index.php?title=On_time_guaranteed_delivery&action=edit&redlink=1) and [just in time manufacturing](https://en.wikipedia.org/wiki/Just_in_time_manufacturing). Raw materials arrive from factories in sealed containers less than an hour before they are required in manufacture, resulting in reduced inventory expense.

The aforementioned reduction in ship operating costs accrue to companies owning or operating container ships. But for others connected with trade, such as ports, railways, road transporters and trade (exporters and importers), the operating costs have risen exponentially. Several elements of costs that were borne in the past by ship operators are now borne by trade, as standard terms of carriage of goods by sea have now been drastically revised by container-shipping lines. Despite saving in operating costs, shipping freight have not fallen significantly because freight is globally fixed sector-wise by shipping cartels.

In short, containers have helped to optimize the operation of ships, while the additional burden of ancillary costs that has been transferred from ships onto other (i.e. onshore) entities is normally ignored in public perception.

Exporters load merchandise in boxes that are provided by the shipping companies. They are then delivered to the docks by road, rail or a combination of both for loading on to container ships. Prior to containerization, huge gangs of men would spend hours fitting various items of cargo into different holds. Today, cranes, installed either on the pier or on the ship, are used to place containers on board the ship. When the hull has been fully loaded, additional containers are stacked on the deck.

Today's largest container ships measure almost 400 meters (1,300 ft) in length. They carry loads equal to the cargo-carrying capacity of sixteen to seventeen pre-WWII freighter ships.

**Architecture**

Container ship under construction

USNS *Regulus* (T-AKR-292) began its career as Sea-Land's SL-7 class container ship [SS *Sea-Land Commerce*](https://en.wikipedia.org/wiki/SS_Sea-Land_Commerce).

There are several key points in the design of modern container ships. The hull, similar to bulk carriers and general cargo ships, is built around a strong keel. Into this frame is set one or more below-deck cargo [holds](https://en.wikipedia.org/wiki/Hold_%28ship%29), numerous tanks, and the [engine room](https://en.wikipedia.org/wiki/Engine_room). The holds are topped by hatch covers, onto which more containers can be stacked. Many container ships have cargo cranes installed on them, and some have specialized systems for securing containers on board.

The hull of a modern cargo ship is a complex arrangement of steel plates and strengthening beams. The hull is built around the [keel](https://en.wikipedia.org/wiki/Keel#Structural_keels). Resembling ribs, and fastened at right-angles to the keel are the ship's frames. The ship's main deck, the metal platework that covers the top of the hull framework, is supported by beams that are attached to the tops of the frames and run the full breadth of the ship. The beams not only support the deck, but along with the deck, frames, and transverse bulkheads, strengthen and reinforce the shell. Another feature of recent hulls is a set of double-bottom tanks, which provide a second watertight shell that runs most of the length of a ship. The double-bottoms generally hold liquids such as fuel oil, ballast water or fresh water.

A ship's engine room houses its main engines and auxiliary machinery such as the fresh water and sewage systems, electrical generators, fire pumps, and air conditioners. In most new ships, the engine room is located in the aft portion of the ship.

**Size categories**

Container ships are distinguished into 7 major size categories: small feeder, feeder, feedermax, [panamax](https://en.wikipedia.org/wiki/Panamax), post-panamax, new panamax and ultra-large. As of December 2012, there are 161 container ships in the VLCS class (Very Large Container Ships, more than 10,000 TEU), and 51 ports in the world can accommodate them.

The size of a panamax vessel is limited by the [Panama canal's lock chambers](https://en.wikipedia.org/wiki/Panama_Canal_Locks), which can accommodate ships with a beam of up to 32.31 m, a length overall of up to 294.13 m, and a draft of up to 12.04 m. The "post panamax" category has historically been used to describe ships with a molded breadth over 32.31 m, however the [Panama Canal expansion project](https://en.wikipedia.org/wiki/Panama_Canal_expansion_project) is causing some changes in terminology. The "new panamax" category is based on the maximum vessel-size that will be able to transit a new third set of locks. The new locks are being built to accommodate a container ship with a [length overall](https://en.wikipedia.org/wiki/Length_overall) of 366 meters (1,201 ft), a maximum width of 49 meters (161 ft), and tropical fresh-water draft of 15.2 meters (50 ft). Such a vessel would be wide enough to carry 19 rows of containers, have a total capacity of approximately 12,000 TEU and be comparable in size to a [capsize](https://en.wikipedia.org/wiki/Capesize) bulk carrier or a [suezmax](https://en.wikipedia.org/wiki/Suezmax) tanker.

Main article: [Feeder ship](https://en.wikipedia.org/wiki/Feeder_ship)

Container ships under 3,000 TEU are generally called feeders. Feeders are small ships that typically operate between smaller container ports. Some feeders collect their cargo from small ports, drop it off at large ports for transshipment on larger ships, and distribute containers from the large port to smaller regional ports. This size of vessel is the most likely to carry cargo cranes on board.

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| **Container Ship Size Categories** |
| **Name** | **Capacity(TEU)**  | [**Length**](https://en.wikipedia.org/wiki/Length_overall) | [**Beam**](https://en.wikipedia.org/wiki/Beam_%28nautical%29) | [**Draft**](https://en.wikipedia.org/wiki/Draft_%28hull%29) | **Example** |
| Ultra Large Container Vessel (ULCV) | 14,501 and higher | 1,200 ft (366 m) and longer | 160.7 ft (49 m) and wider | 49.9 ft (15.2 m) and deeper | With a length of 400 m, a width of 59 m, draft of 14.5 m, and a capacity of 18,270 TEU, ships of the [Maersk Triple E class](https://en.wikipedia.org/wiki/Maersk_Triple_E_class) are able to transit the Suez canal. (Photo: [MV *Mærsk Mc-Kinney Møller*](https://en.wikipedia.org/wiki/M%C3%A6rsk_Mc-Kinney_M%C3%B8ller_%28ship%29).) |  |
| New panamax | 10,000–14,500 | 1,200 ft (366 m) | 160.7 ft (49 m) | 49.9 ft (15.2 m) | With a beam of 43 m, ships of the *COSCO Guangzhou* class are much too big to fit through the Panama Canal's old locks, but could easily fit through the new expansion. (Photo: The 9,500 TEU [MV *COSCO Guangzhou*](https://en.wikipedia.org/wiki/MV_COSCO_Guangzhou) pier side in Hamburg. ) |  |
| Post panamax | 5,101–10,000 |
| Panamax | 3,001 – 5,100 | 965 ft (294.13 m) | 106 ft (32.31 m) | 39.5 ft (12.04 m) | Ships of the Bay-class are at the upper limit of the Panamax class, with an overall length of 292.15 m, beam of 32.2m, and maximum depth of 13.3 m. (Photo: The 4,224 TEU MV *Providence Bay* passing through the Panama Canal.) |  |
| Feedermax | 2,001 – 3,000 |  |  |  | Container ships under 3,000 TEU are typically called feeders. In some areas of the world, they might be outfitted with cargo cranes. (Photo: The 384 TEU [MV *Transatlantic*](https://en.wikipedia.org/wiki/MV_TransAtlantic) at anchor.) |  |
| [Feeder](https://en.wikipedia.org/wiki/Feeder_ship) | 1,001 – 2,000 |
| Small feeder | Up to 1,000 |

**Cargo cranes**

*See also:* [*Lift-on/lift-off*](https://en.wikipedia.org/wiki/Lift-on/lift-off)

Cargo cranes on a US navy container ship.

A major characteristic of a container ship is whether it has cranes installed for handling its cargo. Those that have cargo cranes are called *geared* and those that don't are called *ungeared* or *gearless*. The earliest purpose-built container ships in the 1970s were all gearless. Since then, the percentage of geared newbuilds has fluctuated widely, but has been decreasing overall, with only 7.5% of the container ship capacity in 2009 being equipped with cranes.

While geared container ships are more flexible in that they can visit ports that are not equipped with pier side [container cranes](https://en.wikipedia.org/wiki/Container_crane), they suffer from several drawbacks. To begin with, geared ships will cost more to purchase than a gearless ship. Geared ships also incur greater recurring expenses, such as maintenance and fuel costs. The United Nations Council on Trade and Development characterizes geared ships as a "niche market only appropriate for those ports where low cargo volumes do not justify investment in port cranes or where the public sector does not have the financial resources for such investment."

Instead of the rotary cranes, some geared ships have [gantry cranes](https://en.wikipedia.org/wiki/Gantry_crane) installed. These cranes, specialized for container work, are able to roll forward and aft on rails. In addition to the additional capital expense and maintenance costs, these cranes generally load and discharge containers much more slowly than their shoreside counterparts.

The introduction and improvement of shoreside cranes have been a key to the success of the container ship. The first crane that was specifically designed for container work was built in California's Port of Alameda in 1959. By the 1980s, shoreside gantry cranes were capable of moving containers on a 3-minute-cycle, or up to 400 tons per hour. In March 2010, at [Port Klang](https://en.wikipedia.org/wiki/Port_Klang) in Malaysia, a new world record was set when 734 container moves were made in a single hour. The record was achieved using 9 cranes to simultaneously load and unload the [MV *CSCL Pusan*](https://en.wikipedia.org/w/index.php?title=MV_CSCL_Pusan&action=edit&redlink=1), a ship with a capacity of 9,600 TEU.

Vessels in the 1,500–2,499 TEU range are the most likely size class to have cranes, with more than 60% of this category being geared ships. Slightly less than a third of the very smallest ships (from 100–499 TEU) are geared, and almost no ships with a capacity of over 4,000 TEU are geared.

A view into the holds of a container ship. Of note are the vertical cell guides that organize containers [athwartships](https://en.wikipedia.org/wiki/Athwartships).

**Cargo holds**

Efficiency has always been key in the design of container ships. While containers may be carried on conventional break-bulk ships, cargo holds for dedicated container ships are specially constructed to speed loading and unloading, and to efficiently keep containers secure while at sea. A key aspect of container ship specialization is the design of the hatches, the openings from the main deck to the cargo holds. The hatch openings stretch the entire breadth of the cargo holds, and are surrounded by a raised steel structure known as the *hatch* [*coaming*](https://en.wikipedia.org/wiki/Coaming). On top of the hatch coamings are the hatch covers. Until the 1950s, hatches were typically secured with wooden boards and tarpaulins held down with battens. Today, some hatch covers can be solid metal plates that are lifted on and off the ship by cranes, while others are articulated mechanisms that are opened and closed using powerful hydraulic rams.

Another key component of dedicated container-ship design is the use of *cell guides*. Cell guides are strong vertical structures constructed of metal installed into a ship's cargo holds. These structures guide containers into well-defined rows during the loading process and provide some support for containers against the ship's rolling at sea. So fundamental to container ship design are cell guides that organizations such as the [United Nations Conference on Trade and Development](https://en.wikipedia.org/wiki/United_Nations_Conference_on_Trade_and_Development) use their presence to distinguish dedicated container ships from general break-bulk cargo ships.

A system of three dimensions is used in cargo plans to describe the position of a container aboard the ship. The first coordinate is the *row*, which starts at the front of the ship and increases aft. The second coordinate is tier, with the first tier at the bottom of the cargo holds, the second tier on top of that, and so forth. The third coordinate is the *slot*. Slots on the starboard side are given odd numbers and those on the port side are given even numbers. The slots nearest the centerline are given low numbers, and the numbers increase for slots further from the centerline.

Container ships only take 20 foot, 40 foot, and 45 foot containers. 45 footers only fit above deck. 40 foot containers are the primary container size, making up about 90% of all container shipping and since container shipping moves 90% of the world's freight, over 80% of the world's freight moves via 40 foot containers.

**Lashing systems**

Twist-locks and lashing rods (*pictured*) are widely used to secure containers aboard ships.

Numerous systems are used to secure containers aboard ships, depending on factors such as the type of ship, the type of container, and the location of the container. Stowage inside the holds of fully cellular (FC) ships is simplest, typically using simple metal forms called container guides, locating cones, and anti-rack spacers to lock the containers together. Above-decks, without the extra support of the cell guides, more complicated equipment is used. Three types of systems are currently in wide use: lashing systems, locking systems, and buttress systems. Lashing systems secure containers to the ship using devices made from wire rope, rigid rods, or chains and devices to tension the lashings, such as turnbuckles. The effectiveness of lashings is increased by securing containers to each other, either by simple metal forms (such as stacking cones) or more complicated devices such as twist-lock stackers. A typical [twist-lock](https://en.wikipedia.org/wiki/Twist-lock) is inserted into the casting hole of one container and rotated to hold it in place, then another container is lowered on top of it. The two containers are locked together by twisting the device's handle. A typical [twist-lock](https://en.wikipedia.org/wiki/Twist-lock) is constructed of forged steel and ductile iron and has a shear strength of 48 metric tons.

The buttress system, used on some large container ships, uses a system of large towers attached to the ship at both ends of each cargo hold. As the ship is loaded, a rigid, removable stacking frame is added, structurally securing each tier of containers together.

**Bridge**

Containerships have typically had a single bridge and accommodation unit towards the rear, but to reconcile demand for larger container capacity with [SOLAS](https://en.wikipedia.org/wiki/SOLAS_Convention) visibility requirements, several new designs have been developed. As of 2015[[update]](https://en.wikipedia.org/w/index.php?title=Container_ship&action=edit), some large containerships are being developed with the bridge further forward, separate from the exhaust stack. Some smaller containerships working in European ports and rivers have liftable wheelhouses, which can be lowered to pass under low bridges. HHI has developed the [Skybench](https://en.wikipedia.org/w/index.php?title=Skybench&action=edit&redlink=1) movable bridge to allow more capacity on large containerships.

**Fleet characteristics**

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| **Largest containership operators, 2010** |
| 1. [Maersk Line](https://en.wikipedia.org/wiki/Maersk_Line) – Denmark
2. [MSC](https://en.wikipedia.org/wiki/Mediterranean_Shipping_Company) – Switzerland
3. [CMA CGM Group](https://en.wikipedia.org/wiki/CMA_CGM_Group) – France
4. [Evergreen Line](https://en.wikipedia.org/wiki/Evergreen_Marine) – Taiwan
5. [APL](https://en.wikipedia.org/wiki/American_President_Lines) – Singapore
6. [COSCO](https://en.wikipedia.org/wiki/China_Ocean_Shipping_Company) – China
7. [Hapag-Lloyd Group](https://en.wikipedia.org/wiki/Hapag-Lloyd_Group) – Germany
8. [CSCL](https://en.wikipedia.org/wiki/China_Shipping_Container_Lines) – China
9. [Hanjin](https://en.wikipedia.org/wiki/Hanjin_Shipping) -Rep. of Korea
10. [NYK](https://en.wikipedia.org/wiki/Nippon_Yusen_Kaisha) – Japan
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| **Fleet capacity, June 29, 2015** |
| fleet |  |  |  | TEU |
| APM-Maersk |   | 3078491 |
| Mediterranean Shg Co |   | 2638883 |
| CMA CGM Group |   | 1744724 |
| Hapag-Lloyd |   | 971287 |
| Evergreen Line |   | 944355 |
| COSCO Container L |   | 861242 |
| CSCL |   | 701.596 |
| Hanjin Shipping |   | 622440 |
| MOL |   | 598987 |
| Hamburg Süd Group |   | 587353 |
| **worldwide capacity** |
| year |  |  |  | million TEU |
| 1990 |   | 1.5 |
| 2000 |   | 4.3 |
| 2008 |   | 10.6 |
| 2012 |   | 15.4 |

As of 2010[[update]](https://en.wikipedia.org/w/index.php?title=Container_ship&action=edit), container ships made up 13.3% of the world's fleet in terms of deadweight tonnage. The world's total of container ship deadweight tonnage has increased from 11 million [DWT](https://en.wikipedia.org/wiki/Deadweight_tonnage) in 1980 to 169.0 million [DWT](https://en.wikipedia.org/wiki/Deadweight_tonnage) in 2010. The combined deadweight tonnage of container ships and general cargo ships, which also often carry containers, represents 21.8% of the world's fleet.

As of 2009[[update]](https://en.wikipedia.org/w/index.php?title=Container_ship&action=edit), the average age of container ships worldwide was 10.6 years, making them the youngest general vessel type, followed by [bulk carriers](https://en.wikipedia.org/wiki/Bulk_carrier) at 16.6 years, [oil tankers](https://en.wikipedia.org/wiki/Oil_tanker) at 17 years, general cargo ships at 24.6 years, and others at 25.3 years.

Most of the world's carrying capacity in fully cellular container ships is in the [liner service](https://en.wikipedia.org/wiki/Cargo_liner), where ships trade on scheduled routes. As of January 2010, the top 20 liner companies controlled 67.5% of the world's fully cellular container capacity, with 2,673 vessels of an average capacity of 3,774 TEU. The remaining fully 6,862 fully cellular ships have an average capacity of 709 TEU each.

The vast majority of the capacity of fully cellular container ships used in the liner trade is owned by German [shipowners](https://en.wikipedia.org/wiki/Shipowner), with approximately 75% owned by Hamburg brokers. It is a common practice for the large container lines to supplement their own ships with chartered-in ships, for example in 2009, 48.9% of the tonnage of the top 20 liner companies was chartered-in in this manner.

**Flag states**

Container fleet in 2006

International law requires that every merchant ship be registered in a country, called its [flag state](https://en.wikipedia.org/wiki/Flag_state). A ship's flag state exercises regulatory control over the vessel and is required to inspect it regularly, certify the ship's equipment and crew, and issue safety and pollution prevention documents. As of 2006[[update]](https://en.wikipedia.org/w/index.php?title=Container_ship&action=edit), the United States [Bureau of Transportation Statistics](https://en.wikipedia.org/wiki/Bureau_of_Transportation_Statistics) count 2,837 container ships of 10,000 long tons [deadweight](https://en.wikipedia.org/wiki/Deadweight_tonnage) (DWT) or greater worldwide. [Panama](https://en.wikipedia.org/wiki/Panama) was the world's largest [flag state](https://en.wikipedia.org/wiki/Flag_state) for container ships, with 541 of the vessels in its registry. Seven other flag states had more than 100 registered container ships: [Liberia](https://en.wikipedia.org/wiki/Liberia) (415), [Germany](https://en.wikipedia.org/wiki/Germany) (248), [Singapore](https://en.wikipedia.org/wiki/Singapore) (177), [Cyprus](https://en.wikipedia.org/wiki/Cyprus) (139), the [Marshall Islands](https://en.wikipedia.org/wiki/Marshall_Islands) (118) and the [United Kingdom](https://en.wikipedia.org/wiki/United_Kingdom) (104). The Panamanian, Liberian, and Marshallese flags are open registries and considered by the [International Transport Workers' Federation](https://en.wikipedia.org/wiki/International_Transport_Workers%27_Federation) to be [flags of convenience](https://en.wikipedia.org/wiki/Flags_of_convenience). By way of comparison, traditional maritime nations such as the United States and Japan only had 75 and 11 registered container ships, respectively.

**Vessel purchases**

In recent years, oversupply of container ship capacity has caused prices for new and used ships to fall. From 2008 to 2009, new container ship prices dropped by 19–33%, while prices for 10-year-old container ships dropped by 47–69%. In March 2010, the average price for a geared 500-ton container ship was $10 million, while gearless ships of 6,500 and 12,000 TEU averaged prices of $74 million and $105 million respectively. At the same time, secondhand prices for 10-year-old geared container ships of 500-, 2,500-, and 3,500-TEU capacity averaged prices of $4 million, $15 million, and $18 million respectively.

In 2009, 11,669,000 gross tons of newly built container ships were delivered. Over 85% of this new capacity was built in the Republic of Korea, China, and Japan, with Korea accounting for over 57% of the world's total alone New container ships accounted for 15% of the total new tonnage that year, behind bulk carriers at 28.9% and oil tankers at 22.6%.

**Scrapping**

Most ships are removed from the fleet through a process known as [scrapping](https://en.wikipedia.org/wiki/Ship_breaking). Scrapping is rare for ships under 18 years old and common for those over 40 years in age. Ship-owners and buyers negotiate scrap prices based on factors such as the ship's empty weight (called light ton displacement or LTD) and prices in the scrap metal market. Scrapping rates are volatile, the price per light ton displacement has swung from a high of $650 per LTD in mid-2008 to $200 per LTD in early 2009, before building to $400 per LTD in March 2010. As of 2009[[update]](https://en.wikipedia.org/w/index.php?title=Container_ship&action=edit), over 96% of the world's scrapping activity takes place in China, India, Bangladesh, and Pakistan.

The global economic downturn of 2008–2009 resulted in more ships than usual being sold for scrap. In 2009, 364,300 TEU worth of container ship capacity was scrapped, up from 99,900 TEU in 2008. Container ships accounted for 22.6% of the total gross tonnage of ships scrapped that year. Despite the surge, the capacity removed from the fleet only accounted for 3% of the world's containership capacity. The average age of container ships scrapped in 2009 was 27.0 years.

**Largest ships**

|  |
| --- |
| Twelve largest container ship classes, listed by [TEU capacity](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit) |
| **Built** | **Name** | **Classsize** | **Maximum** [**TEU**](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit) | **Sources** |
| 2013 | [*Mærsk Mc-Kinney Møller*](https://en.wikipedia.org/wiki/Maersk_Triple_E_class) | 20 | 18,270 |  |
| 2012 | [*CMA CGM Marco Polo*](https://en.wikipedia.org/wiki/CMA_CGM_Marco_Polo) | 8 | 16,020 |  |
| 2006 | [*Emma Mærsk*](https://en.wikipedia.org/wiki/Emma_M%C3%A6rsk) | 8 | 15,200–15,550 |  |
| 2009 | [*MSC Danit*](https://en.wikipedia.org/wiki/MSC_Danit) | 7 | 14,000 |  |
| 2009 | [*MSC Beatrice*](https://en.wikipedia.org/wiki/MSC_Beatrice) | 7 | 14,000 |  |
| 2010 | [*MSC Fabiola*](https://en.wikipedia.org/wiki/MSC_Fabiola) | 7 | 12,600 |  |
| 2008 | [*CMA CGM Thalassa*](https://en.wikipedia.org/wiki/CMA_CGM_Thalassa) | 2 | 10,960 |  |
| 2005 | [*Gudrun Mærsk*](https://en.wikipedia.org/wiki/Gudrun_M%C3%A6rsk) | 6 | 10,150 |  |
| 2002 | [*Clementine Maersk*](https://en.wikipedia.org/wiki/Clementine_Maersk) | 7 | 9,600 |  |
| 2006 | [*COSCO Guangzhou*](https://en.wikipedia.org/wiki/COSCO_Guangzhou) | 5 | 9,500 |  |
| 2006 | [*CMA CGM Medea*](https://en.wikipedia.org/wiki/CMA_CGM_Medea) | 4 | 9,415 |  |
| 2003 | [*Axel Mærsk*](https://en.wikipedia.org/wiki/Axel_M%C3%A6rsk) | 6 | 9,310 |  |

Main article: [List of largest container ships](https://en.wikipedia.org/wiki/List_of_largest_container_ships)

Economies of scale have dictated an upward trend in sizes of container ships in order to reduce expense. However, there are certain limitations to the size of container ships. Primarily, these are the availability of sufficiently large main engines and the availability of a sufficient number of ports and terminals prepared and equipped to handle ultra-large container ships. Furthermore, the permissible maximum ship dimensions in some of the world's main waterways could present an upper limit in terms of vessel growth. This primarily concerns the [Suez Canal](https://en.wikipedia.org/wiki/Suez_Canal) and the [Singapore Strait](https://en.wikipedia.org/wiki/Singapore_Strait).

In 2008 the South Korean shipbuilder [STX](https://en.wikipedia.org/wiki/STX_Corporation) announced plans to construct a container ship capable of carrying 22,000 [TEU](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit), and with a proposed length of 450 meters and a [beam](https://en.wikipedia.org/wiki/Beam_%28nautical%29) of 60 meters. If constructed, the container ship would become the largest seagoing vessel in the world.

Since even very large container ships are vessels with relatively low draft compared to large tankers and bulk carriers, there is still considerable room for vessel growth. Compared to today's largest container ships, Maersk Line's 15,200 [TEU](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit) [*Emma Mærsk*](https://en.wikipedia.org/wiki/Emma_M%C3%A6rsk)-type series, a 20,000 [TEU](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit) container ship would only be moderately larger in terms of exterior dimensions. According to a 2011 estimate, an ultra-large container ship of 20,250 [TEU](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit) would measure 440m x 59m, compared to 397.71 × 56.40m for the *Emma Mærsk* class. It would have an estimated deadweight of circa 220,000 tons. While such a vessel might be near the upper limit for a Suez Canal passage, the so-called [Malaccamax](https://en.wikipedia.org/wiki/Malaccamax) concept (for [Straits of Malacca](https://en.wikipedia.org/wiki/Straits_of_Malacca)) does not apply for container ships, since the Malacca and Singapore Straits' draft limit of about 21 meters is still above that of any conceivable container ship design. In 2011, Maersk announced plans to build a new "[Triple E](https://en.wikipedia.org/wiki/Maersk_Triple_E)" family of containerships with a capacity of 18,000TEU, with an emphasis on lower fuel consumption.

[*CSCL Globe*](https://en.wikipedia.org/wiki/CSCL_Globe) is one of the largest container ships in the world

In the present market situation, main engines will not be as much of a limiting factor for vessel growth either. The steadily rising expense of [fuel oil](https://en.wikipedia.org/wiki/Fuel_oil) has prompted most container lines to adapt a slower, more economical voyage speed of about 21 knots, compared to earlier top speeds of 25 or more knots. Subsequently, new-built container ships can be fitted with a smaller main engine. Engine types fitted to today's ships of 14,000 [TEU](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit) are thus sufficiently large to propel future vessels of 20,000 [TEU](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit) or more. Maersk Line, the world's largest container shipping line, nevertheless opted for twin engines (two smaller engines working two separate propellers), when ordering a series of ten 18,000 TEU vessels from Daewoo Shipbuilding in February 2011. The ships will be delivered between 2013 and 2014.

**Freight market**

Year-average daily charter rates for a 1 TEU (14 metric ton) slot have varied from $2.70 to $35.40 between 2000 and 2010.

The act of hiring a ship to carry cargo is called chartering. Outside special [bulk cargo](https://en.wikipedia.org/wiki/Bulk_cargo) markets, ships are hired by three types of [charter](https://en.wikipedia.org/wiki/Chartering_%28shipping%29) agreements: the [voyage charter](https://en.wikipedia.org/wiki/Voyage_charter), the time charter, and the [bareboat charter](https://en.wikipedia.org/wiki/Bareboat_charter). In a voyage charter, the charterer rents the vessel from the loading port to the discharge port. In a time charter, the vessel is hired for a set period of time, to perform voyages as the charterer directs. In a bareboat charter, the charterer acts as the ship's operator and manager, taking on responsibilities such as providing the crew and maintaining the vessel. The completed chartering contract is known as a [charter party](https://en.wikipedia.org/wiki/Charter_party).

The [United Nations Conference on Trade and Development](https://en.wikipedia.org/wiki/United_Nations_Conference_on_Trade_and_Development), or UNCTAD, in its 2010 *Review of Maritime Trade* tracks two aspects of container shipping prices. The first is a chartering price, specifically the price to time-charter a 1 TEU slot for a 14 metric ton cargo on a container ship. The other is the [freight rate](https://en.wikipedia.org/wiki/Freight_rate), or comprehensive daily cost to deliver one-TEU worth of cargo on a given route. As a result of the [late-2000s recession](https://en.wikipedia.org/wiki/Late-2000s_recession), both indicators showed sharp drops during 2008–2009, and have shown signs of stabilization since 2010.

UNCTAD uses the [Hamburg Shipbrokers’ Association](https://en.wikipedia.org/w/index.php?title=Hamburg_Shipbrokers%E2%80%99_Association&action=edit&redlink=1) (formally the *Vereinigung Hamburger Schiffsmakler und Schiffsagenten* [*e. V.*](https://en.wikipedia.org/wiki/Eingetragener_Verein) or VHSS for short) as its main industry source for container ship freight prices. The VHSS maintains a few indices of container ship charter prices. The oldest, which dates back to 1998, is called the *Hamburg Index*. This index considers time-charters on fully cellular containerships controlled by Hamburg brokers. It is limited to charters of 3 months or more, and presented as the average daily cost in U.S. dollars for a one-TEU slot with a weight of 14 metric tons. The Hamburg Index data is divided into ten categories based primarily on vessel carrying capacity. Two additional categories exist for small vessels of under 500 TEU that carry their own cargo cranes. In 2007, VHSS started another index, the *New ConTex* which tracks similar data obtained from an international group of shipbrokers.

The Hamburg Index shows some clear trends in recent chartering markets. First, rates were generally increasing from 2000 to 2005. From 2005 to 2008, rates slowly decreased, and in mid-2008 began a "dramatic decline" of approximately 75%, which lasted until rates stabilized in April 2009. Rates have ranged from $2.70 to $35.40 in this period, with prices generally lower on larger ships. The most resilient sized vessel in this time period were those from 200–300 TEU, a fact that the United Nations Council on Trade and Development attributes to lack of competition in this sector. Overall, in 2010, these rates rebounded somewhat, but remained at approximately half of their 2008 values. As of 2011, the index shows signs of recovery for container shipping, and combined with increases in global capacity, indicates a positive outlook for the sector in the near future.

|  |
| --- |
| **Recent liner freight rates (in 1000 US$/TEU)**  |
| **From** | **To** | **2008** | **2009** |
| **Q1** | **Q2** | **Q3** | **Q4** | **Q1** | **Q2** | **Q3** | **Q4** |
| Asia | U.S. | 1.8 | 1.8 | 1.9 | 1.9 | 1.7 | 1.4 | 1.2 | 1.3 |
| U.S. | Asia | 0.8 | 1.0 | 1.2 | 1.2 | 0.9 | 0.8 | 0.8 | 0.9 |
| Europe | Asia | 1.0 | 1.1 | 1.1 | 1.1 | 0.9 | 0.7 | 0.8 | 0.9 |
| Asia | Europe | 2.0 | 1.9 | 1.8 | 1.6 | 1.0 | 0.9 | 1.0 | 1.4 |
| U.S. | Europe | 1.3 | 1.4 | 1.6 | 1.7 | 1.5 | 1.4 | 1.4 | 1.5 |
| Europe | U.S. | 1.6 | 1.6 | 1.6 | 1.6 | 1.3 | 1.2 | 1.1 | 1.3 |

UNCTAD also tracks container [freight rates](https://en.wikipedia.org/wiki/Freight_rate). Freight rates are expressed as the total price in U.S. dollars for a shipper to transport one TEU worth of cargo along a given route. Data is given for the three main container liner routes: U.S.-Asia, U.S.-Europe, and Europe-Asia. Prices are typically different between the two legs of a voyage, for example the Asia-U.S. rates have been significantly higher than the return U.S.-Asia rates in recent years. Generally, from the fourth quarter of 2008 through the third quarter of 2009, both the volume of container cargo and freight rates have dropped sharply. In 2009, the freight rates on the U.S.–Europe route were sturdiest, while the Asia-U.S. route fell the most.

Liner companies responded to their overcapacity in several ways. For example, in early 2009, some container lines dropped their freight rates to zero on the Asia-Europe route, charging shippers only a surcharge to cover operating costs. They decreased their overcapacity by lowering the ships' speed (a strategy called "[slow steaming](https://en.wikipedia.org/wiki/Slow_steaming)") and by laying up ships. Slow steaming increased the length of the Europe-Asia routes to a record high of over 40 days. Another strategy used by some companies was to manipulate the market by publishing notices of rate increases in the press, and when "a notice had been issued by one carrier, other carriers followed suit."

The [Trans-Siberian Railroad](https://en.wikipedia.org/wiki/Trans-Siberian_Railroad) (TSR) has recently become a more viable alternative to container ships on the Asia-Europe route. This railroad can typically deliver containers in 1/3 to 1/2 of the time of a sea voyage, and in late 2009 announced a 20% reduction in its container shipping rates. With its 2009 rate schedule, the TSR will transport a forty-foot container to Poland from Yokohama for $2,820, or from Pusan for $2,154.

**Shipping industry alliances**

|  |
| --- |
| Container ship industry alliances, as of March 2015 |
| **Alliance name** | **Alliance participating companies** |
| 2M | [Maersk Line](https://en.wikipedia.org/wiki/Maersk_Line), [MSC](https://en.wikipedia.org/wiki/Mediterranean_Shipping_Company) |
| Ocean Three | [CMA CGM](https://en.wikipedia.org/wiki/CMA_CGM), [CSCL](https://en.wikipedia.org/wiki/China_Shipping_Container_Lines), [UASC](https://en.wikipedia.org/wiki/United_Arab_Shipping_Company) |
| CKYHE Alliance | [COSCO](https://en.wikipedia.org/wiki/COSCO), [K Line](https://en.wikipedia.org/wiki/K_Line), [Yang Ming](https://en.wikipedia.org/wiki/Yang_Ming_Marine_Transport_Corporation), [Hanjin](https://en.wikipedia.org/wiki/Hanjin_Shipping), [Evergreen](https://en.wikipedia.org/wiki/Evergreen_Marine) |
| G6 | [APL](https://en.wikipedia.org/wiki/American_President_Lines), [MOL](https://en.wikipedia.org/wiki/Mitsui_O.S.K._Lines), [Hyundai](https://en.wikipedia.org/wiki/Hyundai_Merchant_Marine), [OOCL](https://en.wikipedia.org/wiki/OOCL), [NYK Line](https://en.wikipedia.org/wiki/NYK_Line), [Hapag-Lloyd](https://en.wikipedia.org/wiki/Hapag-Lloyd) |

In an effort to control costs and maximize capacity utilization on ever larger ships, vessel sharing agreements, co-operative agreements and slot-exchanges and have become a growing feature of the maritime container shipping industry. As of March 2015, 16 of the world’s largest container shipping lines had consolidated their routes and services accounting for 95 percent of container cargo volumes moving in the dominant east-west trade routes.

Carriers remain operationally independent, forbidden by antitrust regulators in multiple jurisdictions from colluding on freight rates or capacity.

**Container ports**

Big Chinese container vessel in the [port of Rotterdam](https://en.wikipedia.org/wiki/Port_of_Rotterdam)

*For more details on this topic, see* [*List of world's busiest container ports*](https://en.wikipedia.org/wiki/List_of_world%27s_busiest_container_ports)*.*

Container traffic through a port is often tracked in terms of [twenty foot equivalent units](https://en.wikipedia.org/wiki/Twenty_foot_equivalent_unit) or TEU of throughput. As of 2009[[update]](https://en.wikipedia.org/w/index.php?title=Container_ship&action=edit), the [Port of Singapore](https://en.wikipedia.org/wiki/Port_of_Singapore) was the world's busiest container port, with 25,866,000 TEU handled. That year, six of the busiest ten container ports were in the People's Republic of China, with [Shanghai](https://en.wikipedia.org/wiki/Port_of_Shanghai) in 2nd place, [Port of Hong Kong](https://en.wikipedia.org/wiki/Port_of_Hong_Kong) in 3rd, [Shenzhen](https://en.wikipedia.org/wiki/Port_of_Shenzhen) 4th, [Guangzhou](https://en.wikipedia.org/wiki/Port_of_Guangzhou) 6th, [Ningbo](https://en.wikipedia.org/wiki/Port_of_Ningbo) 8th, and [Qingdao](https://en.wikipedia.org/wiki/Port_of_Qingdao) 9th. Rounding out the top ten ports were [Busan](https://en.wikipedia.org/wiki/Port_of_Busan) in South Korea at number 5, [Dubai](https://en.wikipedia.org/wiki/Dubai) in the United Arab Emirates at number 7, and [Rotterdam](https://en.wikipedia.org/wiki/Port_of_Rotterdam) in the Netherlands in the 10th position with 9,743,290 TEU served. In total, the busiest twenty container ports handled 220,905,805 TEU in 2009, almost half of the world's total estimated container traffic that year of 465,597,537 TEU.

**Safety issues**

Three pier-side gantry cranes tower over a container ship.

In March 2007, a London-based container ship capsized in Antwerp, Belgium while loading.

Maneuvers in coastal waters and ports managed in the [wheel house](https://en.wikipedia.org/wiki/Bridge_%28nautical%29) may be dangerous, as evidenced by a [container ship hitting](https://en.wikipedia.org/wiki/Cosco_Busan_oil_spill) the [San Francisco–Oakland Bay Bridge](https://en.wikipedia.org/wiki/San_Francisco%E2%80%93Oakland_Bay_Bridge) on November 7, 2007.

It has been estimated that container ships lose between 2,000and 10,000 [containers](https://en.wikipedia.org/wiki/Containerization) at sea each year, costing $370 million per year. Most go overboard on the open sea during storms but there are some examples of whole ships being lost with their cargo. When containers are dropped, they immediately become an environmental threat – termed "[marine debris](https://en.wikipedia.org/wiki/Marine_debris)". Once in the ocean, they fill with water and sink if the contents cannot hold air. Rough waters smash the container, sinking it quickly.

The threat of [piracy](https://en.wikipedia.org/wiki/Piracy) can cost a container shipping company as much as $100 million per year due to longer routes and higher speed, particularly near East Africa.

* This page was last modified on 7 March 2016, at 19:22.