

Containers

Containers in general

A container is a protective housing for safe transportation and storage of goods. Safe means, in this context, the characteristics of the containers content remain unchanged under all relevant mechanical and climatic conditions. The stress a substance might be exposed to is varied and may include:

- mechanical (static and dynamic)
- climatically (railway, truck and ship over various climate zones)
- chemical (aggressive gases and fluids)
- biological (insects, fungal attack, mildew, bacteria, microorganisms).

Depending on the potential level of the threat, a container may have to be equipped with special controls, restraints, protective gear or environmental management to preserve the condition of the contents.

Facts & Figures

- As of 2010, Shanghai China is the busiest container port in the world with more than 29,000,000 containers passing through the port each year.
- The Port of Los Angeles processes 6,500,000 containers each year, ranking it #17 in the world and #1 in the United States.
- The largest container ship in the world is the Emma Maersk, 1300 feet long and capable of carrying 14,000 20 foot containers.
- 95% of the world cargo moves by ship.
- There are more than 10,000 containers lost at sea every year.



Clockwise from left: cargo container . . . medical containers . . . chemical containers . . . humidors.



Specialized Containers

Depending on the application, there are myriad container variations. For example, the humidor is designed specifically to preserve the taste and aroma for precious cigars ensuring the maximum pleasure of the cigar connoisseur.

Another example of a highly specialized container is for the transportation of organs for critical transplant surgery to save lives. The conditions must be maintained at specific temperature and, in some cases, specific humidity and CO2 levels. Each of these examples demonstrate the need for controlled environmental conditions (humidity, temperature or CO2) in the surroundings of their contents.

Standard Shipping Containers

When most of us hear the word "Container" we think of the large transportation containers used for air, sea and road cargo. These containers have been standardized by the International Organization for Standardization (ISO) under cooperation of the International Maritime Organization (IMO) to a length of 20 or 40 feet and a width of 8 feet. The significant advantage of standardization is the seamless integration between the different modes of a modern transportation chain decreasing transportation time and cost.

continued

Why the need to measure the relative humidity, temperature and Carbon Dioxide?

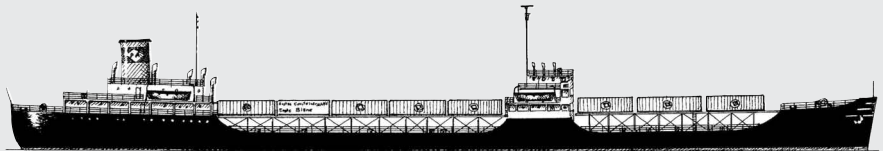
In addition to ensuring physical protection of its contents, a container can maintain a certain temperature and/or a certain controlled atmosphere. For example, the transportation of dried, fresh or deep freeze food requires a mixture of different conditions including a cool or cold temperature and low relative humidity. Certain goods like fruit and vegetables produce heat and Carbon Dioxide and consume oxygen during the transportation. In such cases it is necessary to exchange the stale air in the container with fresh and well-temporised air or a special gas atmosphere in order to delay the ripening process.

For air cargo, special container formats have been developed to make optimal use of the round shape of an airplane's loading space.

In addition to the examples mentioned above, there are hundreds of container types for other specialized purposes: liquids, gases under pressure, aggregates for power, water treatment, compression stations for gas pipelines, exhibition stands, sanitary and accommodation, workshops and so on. All of them have a common need—the control of specific parameters.



Malcolm McLean pioneer of containerization.



Container steamship Ideal-X, built in 1944 as the tanker Potrero Hills.

History

Wood packing cases were first used in the 18th century. These forerunners of today's metal, standardized containers accelerated the transfer of goods from railway to horse-drawn vehicles. In the 1920s, the British Railway Clearing House (RCH) defined the first general standard for containers to allow the easy transfer between different railway companies. In 1956, an American named Malcolm McLean is credited for building the first container ship, the *SS Ideal-X* which sailed on its maiden voyage from Newark to Houston carrying 58 containers.

McLean is regarded as the "Father of Containerization". When he was a small-scale hauler at the end of the 1930s at the port of Hoboken, he had the idea to stan-

dardize goods transport by avoiding the constant loading and unloading from one means of transport to another.

The benefits in terms of speeding up the shipping of containers were obvious and led to a revolution. This new mode of container transport ultimately cut the cost of loading freight by 90%.

In 1961, the International Organization for Standardization (ISO) defined the first internationally accepted dimensions for the ISO container still in use today.

In the year 2000, Malcolm McLean was awarded the title "Man of the Century" by the International Maritime Hall of Fame, just one of many awards for his achievements throughout his life.