

Geared Ship Design

There are two basic types of geared ship that carry containers. Fully cellular geared container ships designed specifically for the container market and multipurpose geared ships which can handle containerised and non-containerised cargo. Geared ships use their cranes at terminals without suitable quay cranes or when requested by the terminal.



This ship, the NYK Clara is a fully cellular geared container ship. With a capacity of 2,664 TEUs, it was sailing between the United States, Mexico and Central America when this video was taken in Los Angeles. Operated by NYK, this Japanese container shipping line, is now part of Ocean Network Express which is marketed as ONE. The ship has 4 cranes each with a safe working load (SWL) of 45 tonnes.

In this next video, the Victoria at MPET in Antwerp (Belgium), is also a fully cellular geared container ship. It is being worked by the terminal's quay cranes which are able to load and unload quicker than using the ship's own cranes. When this happens, the ship's cranes are swung out over the water to limit interference with the quay cranes.

This ship, the Floragracht, is an example of a multipurpose geared ship with a container capacity of 658 TEUs. It is also designed to carrying project cargo and its cranes have a SWL of 65 tonnes at their maximum outreach of 24m or 80 tonnes at 18m. By using the two cranes together to perform a single lift, known as twinning, greater weights can be lifted.

To maximise the lifting capacity and outreach, the ship's cranes are not located along the centreline but at the side of the ship, close to the starboard side rail. To maximise the crane's outreach the Floragracht would berth starboard side so its cranes are adjacent to the quay. By contrast the NYK Clara and Victoria whose cranes are located along their centrelines can berth port or starboard side.

Key Terms

- Centerline
- Containerised cargo
- Fully cellular geared container ship
- Geared ship
- Multipurpose geared ship
- Non-containerised cargo
- Outreach
- Port
- Project cargo
- Safe Working Load (SWL)
- Ship's rail
- Starboard
- Twinning

Glossary

Centreline

Vertical line running the length of a ship from the fore to the aft

Containerised cargo

Cargo that is stuffed into a container for shipment

Fully cellular geared container ship

A ship designed with its own cranes to specifically carry containers both above and below deck, incorporating structures such as cell guides and lashing bridges

Geared ship

A ship equipped with its own cranes for cargo handling operations

Multipurpose geared ship

A ship equipped with its own cranes and built for a wide range of cargoes with movable tween decks, a box shaped hold and hatch openings across the width of the hold

Non-containerised cargo

Cargo that is either unsuited to shipment in a container or due to shipping requirements is not transported in a container

Outreach

Maximum distance to the front of a crane from which an object can be lifted – for quay cranes it is the distance from its seaward legs to the furthest accessible location on the ship

Port

Left hand side of a ship when facing forward

Project cargo

Cargo which is large and bulky or heavy which is critical to the timeline of completing a project

Safe working load (SWL)

Maximum load a crane is designed to lift or a vehicle is designed to transport safely under usual operating conditions

Related terms

Maximum load limit, rated capacity, rated load value, resulting safe working load, working load limit (WLL)

Ship's rail

Real or imaginary rail around the deck or edge of a ship – when cargo is being loaded and crosses this line it is considered to be onboard the ship

Starboard

Right hand side of a ship when facing forward

SWL (safe working load)

Maximum load a crane is designed to lift or a vehicle is designed to transport safely under usual operating conditions

Related terms

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Twinning

When two cranes work together to lift a heavy load