中国船舶工业市场研究中心
China Ship Marketing Research Center

Technological Trends for Bulk Carrier

China Ship Marketing Research Center

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The most important ship type in world fleet

- No.1 ship in the world fleet.

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- Dry bulk cargo refers to iron ore, coal, grain, steel products, fertilizer and etc., vital for world economic growth and human life.

- In 2012, the total tonnage of bulk carriers is around 680 m dwt, 44% of the world fleet.

Important ship type for shipbuilding

- In 2011, bulk carrier deliveries reached 96.8 million dwt, 60% of total vessel deliveries. From Jan.— Oct.,2012, the deliveries stand at 88.2 million dwt, 65% of the total.

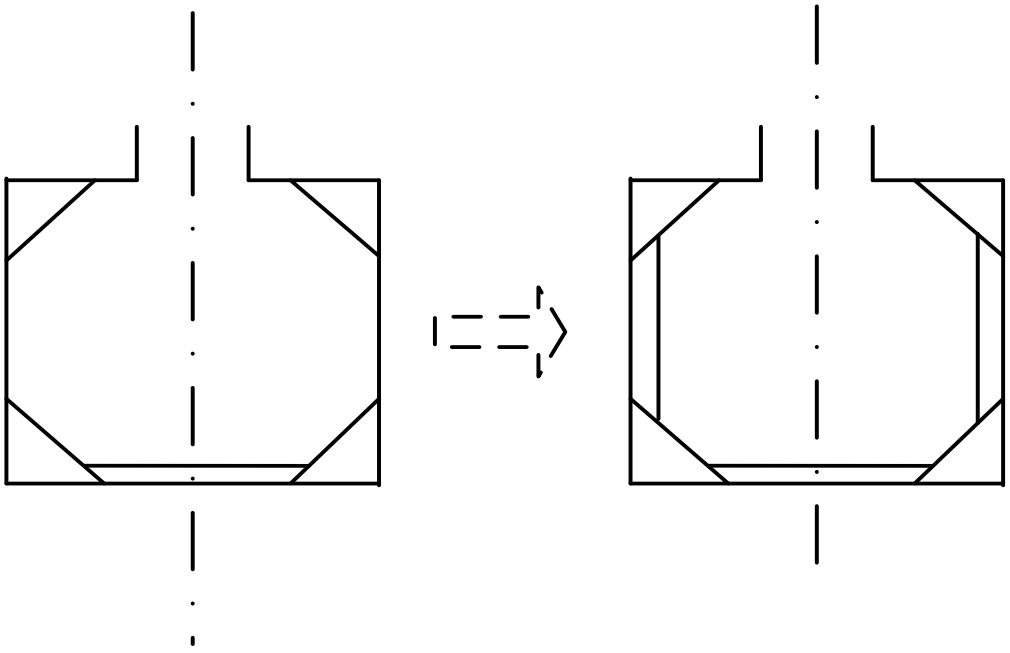
- Bulk carrier is very important for shipbuilding industries of China, Japan and South Korea.

Proportion of bulker deliveries by DWT				
	China	Japan	South Korea	World
2011	50%	23%	21%	100%
2012 (Jan.-Oct.)	52%	24%	17%	100%
Proportion of bulker orderbook by DWT				
End of Oct.2012	51%	34%	9%	100%

Source: Clarksons.

The summary of technological trend

- Bulk carrier is almost the simplest ship type in the world fleet.
- Over the last decades, there is no huge change in the bulk carrier technology .



Single Hull

Double Hull

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Diverse trend in technology

- Improvement of ship sci-tech.
- IMO rules and regulations, as well as Classification Societies.
- Requirements by shipowners and shipping companies.

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- New technological trends have been seen in recent years, but most are not specifically for bulk carrier.
- Larger and energy-saving vessels are more welcomed in recent years.

More large-sized vessels

- With the permitted conditions of berths, waterways, canals and trade volumes, larger ships can reduce unit cost and emission.
- However, the trend to becoming large is not so significant as containerships.
- Some shipowners and shipping companies still love standard type. Easy transaction is an important factor.

More large-sized vessels

- overall length increased : Handymax: 190m→195m→200m;
  Panamax: 225m→229/230m
  Capesize: 300m
- block coefficient enlarged
- beam wiended: Capesize: 46m →50m
- depth/draft increased (with owner permission)

Handysize	focus on 30,000 — 40,000 dwt
Handymax	up to 66,000 dwt
Panamax	up to 83,000 dwt
Capesize	focus on 200,000 — 210,000 dwt
VLOC	up to 400,000 dwt

More large-sized vessels

Average deadweight of bulk carrier contracts

	2009	2010	2011	2012
Handysize (10-40k dwt)	30,476	32,171	33,341	34,426
Handymax (40-66k dwt)	56,373	53,283	55,205	55,596
Capesize (150-210k dwt)	180,273	188,822	192,429	——

Source: Clarksons.

More large-sized vessels

Proportion of Larger Handymax contract by numbers

	2009	2010	2011	2012
40-60k dwt	89%	≈99%	81%	65%
60-66k dwt	11%	≈1%	19%	35%

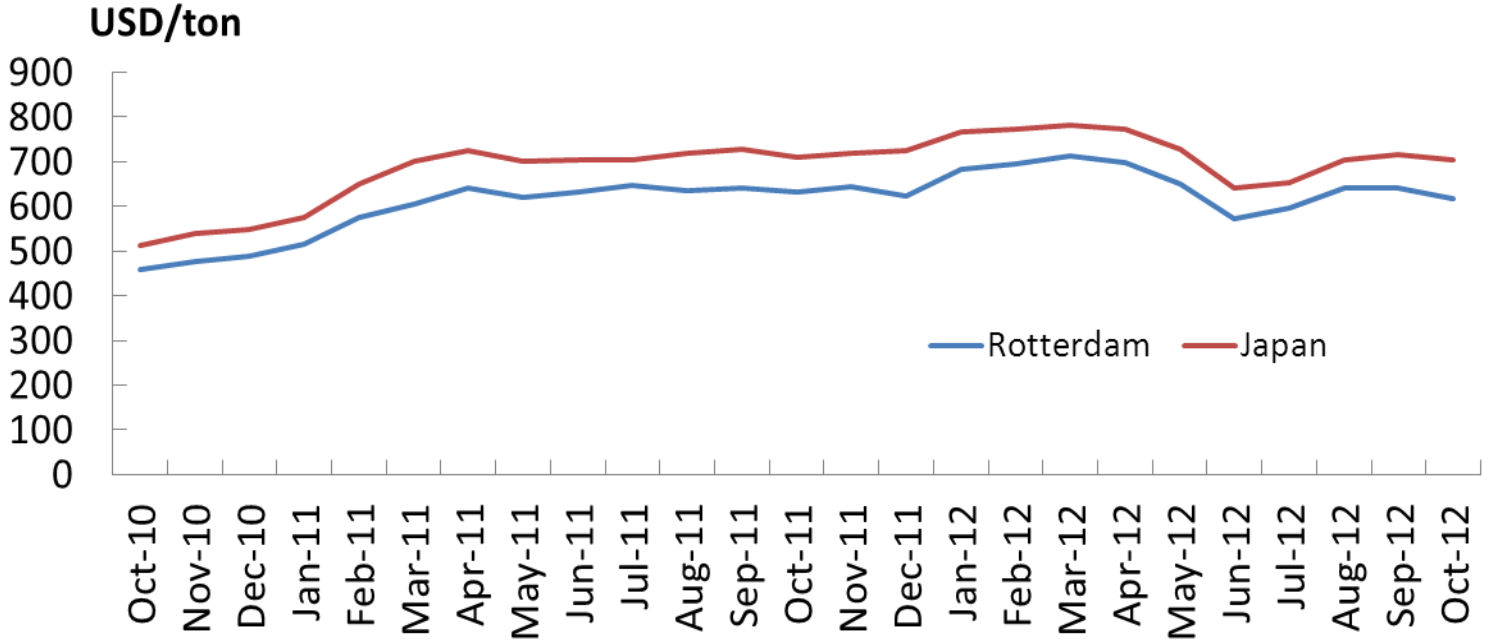
Proportion of larger Capesize contract by numbers

	2009	2010	2011
150-200k dwt	90%	64%	50%
200-210k dwt	10%	36%	50%

Source: Clarksons.

Energy-saving

- Emission reduction required by IMO, EEDI
- Environmental protection observed by more countries
- Less fuel consumption required by operators



380CST price

Reduce speed ?

- Although many bulk carriers's operating speed has reduced to 10-11 knots, as a low-speed vessel, the design speed of bulk carrier may not reduce more, even in Capesize and VLOC, they will keep at 14-15 knots.

- Operating speed is dependent on operators demand.

Energy-saving methods

- Excellent engine
  (MAN — ME Wärtsilä — RT Flex)
- Energy-saving equipment
  (rudder fin, hub fin, duct …)
- Improvement of hull lines
  (especially in stem and stern)
- Others

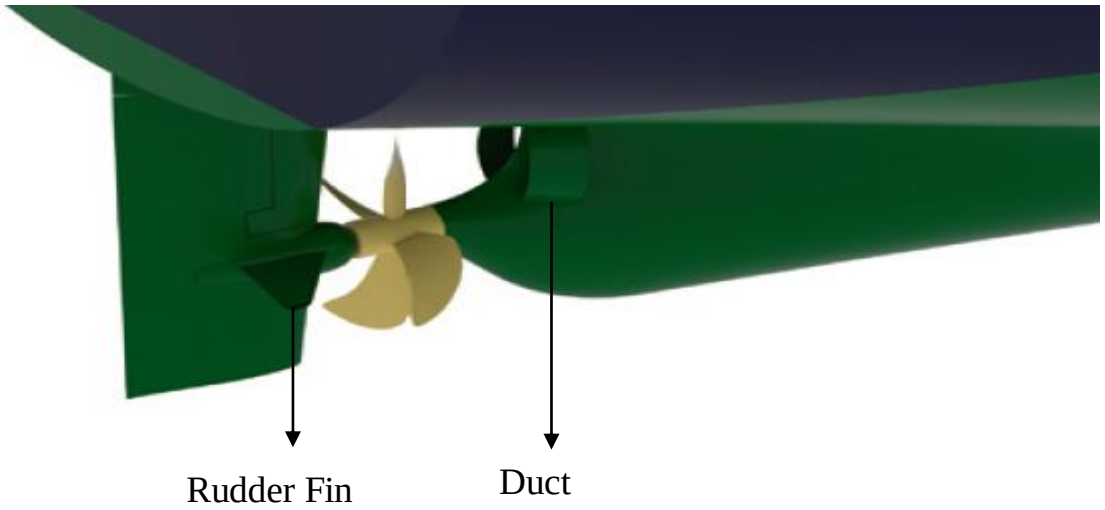
Engines

- Engine plays the most important part in energy-saving effort；
- Engine makers provide excellent diesel, which can get better fuel-saving in many operating conditions；
- Ship designer can get more choices to improve propulsive efficiency, such as MAN-G engine, which can use more diameter propeller at lower rotating speed.

Energy-saving equipment

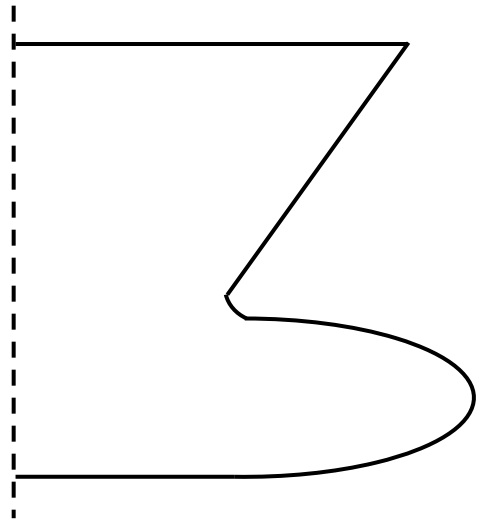
- Different equipments may be used together or individually, the actual effect need exactitude calculation and hydrodynamic test.

- In fact, many equipments are not new, but have more attention now.

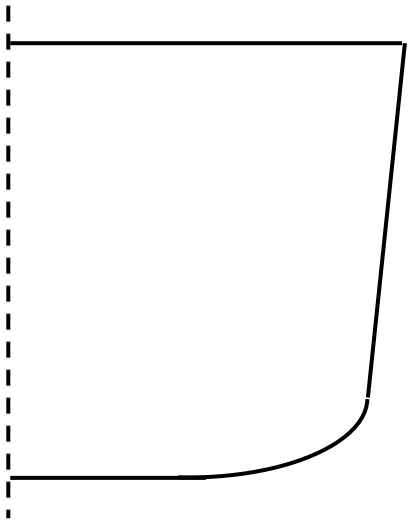


Improvement of hull lines

- Over the past, designers take more time on stern, but the change in stem now gets more attention now.



Bulbous Bow



Vertical Bow

Other trends

- Load on the weather deck
- Change structure of hatch
- Box-shape or half-box shape cargo hold
- Shallow-draft design, lower draft to 12m even 11m

  … …

- All these changes focus on Handysize/Handymax, first depend on owner’s demand.

Thank you!