

船舶工程技术专业“3+3”中高职衔接系列教材

船舶专业英语

主 编 茅蓉蓉 副主编 马振伟
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内 容 简 介

本书内容分为中职篇和高职篇。中职篇包含船舶分类简介、船体结构和船舶建造工艺三个方面内容,供学生在中职阶段使用;高职篇包含船舶主尺度、船舶图样、船舶航海性能、保养和坞修、舾装、涂装和检验七个方面内容,供学生在高职阶段使用,书中每一章中都有一篇延伸阅读文章,供基础较好的学生课后阅读使用。附录共有五个与船舶相关的对话,供学生口语练习使用。

《船舶专业英语》是船舶工程技术专业"3+3"中高职衔接系列教材之一,除了供船舶工程技术专业作教材之用以外,还可供造船工程技术人员参考。

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前 言

近几年,国家大力推行“3+3”中高职衔接这一新型的培养模式。为适应和推进这一新的模式,必须加快中高职衔接的课程体系建设,而教材建设正是其中非常重要的部分。《船舶专业英语》主要为了满足“3+3”中高职衔接船舶工程技术专业的需要而编写的,其他形式的职业教育、职工培训、专业考证训练和相关技术人员也可参考使用。

按照“3+3”中高职衔接“船舶专业英语”课程标准的要求,《船舶专业英语》分为三块内容:中职篇、高职篇和附录。其中中职篇包括:船舶分类简介、船体结构和船舶建造工艺;高职篇包括:船舶主尺度、船舶图样、船舶性能、船舶保养与坞修、船舶舾装、船舶涂装和船舶检验;附录内容为船舶专业知识的对话与交流。

参加编写工作的有:主编南通航运职业技术学院茅蓉蓉(编写第二、三课和对话与交流);副主编南通航运职业技术学院马振伟(编写第五、九课和对话与交流);参编南通航运职业技术学院陆萍(编写第一、十课),南通航运职业技术学院李艳(编写第四、八课),南通航运职业技术学院吴灿(编写第六、七课)。

本书由南通航运职业技术学院蔡厚平担任主审,提出了许多宝贵意见。本书在编写过程中受到江苏科技大学陈淑玲、南通宏强重工薛建新的指导,在此一并表示感谢!

由于编者的水平有限,书中存在疏漏与不足之处,恳请读者批评指正,以便修改完善。

编者

2016年10月

目 录

中 职 篇

Lesson One Brief Introduction on Several Types of Ships	3
Text Reading	3
1. Container Ships	3
2. Multipurpose Ships	4
3. Tankers	5
4. Bulk Carriers	7
5. Cruise Ships	8
Exercises	12
Expanding Reading: Some Other Types of Ships	12
1. Refrigerated Ships	12
2. Chemical Tankers	12
3. Tugs	13
4. The "Maritime" Offshore	14
Lesson Two Hull Construction	17
Text Reading	17
1. General	17
2. Framing System	18
3. Frame	18
4. Shell	18
5. Bottom and Side	19
6. Deck and Bulkhead	20
7. Fore Ship	21
8. Aft Ship	22
9. Engine Room	22
Exercises	27
Expanding Reading	28
1. Holds	28
2. Engine Room	29

3. Accommodation	29
Lesson Three Workmanship for Hull Building	32
Text Reading	32
1. Lofting	32
2. Material Marking	33
3. Processing of Hull Members	33
4. Fabrication and Welding of Hull	34
5. Tightness Test	35
6. Ship Launching	35
7. Welding	36
Exercises	41
Expanding Reading	41
1. Preliminary Work	41
2. Design and Construction	44
3. Delivery	47

高 职 篇

Lesson Four Principal Dimensions	51
Text Reading	51
1. Principal Dimensions	51
2. Proportions & Form Coefficients	54
Exercises	58
Expanding Learning	59
1. Register Tonnage	59
2. Gross Tonnage	60
3. Net Tonnage	60
4. Displacement (m^3)	60
5. Displacement Δ (t)	61
6. Light Displacement(t)	61
Lesson Five Ship Drawings	62
Text Reading	62
1. Preface	62
2. Lines Plan	62
3. General Arrangement Plan	66

4. Basic Structural Plan	67
Exercises	71
Expanding Reading	71
1. Shell Expansion Plan	71
2. Frame Body Plan	72
3. Midship Section Plan	73
Lesson Six Seakeeping Performance	76
Text Reading	76
1. Floatability	76
2. Stability	76
3. Fast Speed	77
4. Roll and Pitch	78
5. Floodability	78
6. Maneuverability	78
Exercise	81
Expanding Learning	81
1. Add-on stability systems	81
2. Outriggers	82
3. Antiroll tanks	82
4. Paravanes	82
5. Active systems	82
6. Stabilizer fins	83
7. Gyroscopic internal stabilizers	83
Lesson Seven Maintenance and Docking	84
Text Reading	84
1. Construction Materials for Ships	84
2. Corrosion	86
3. Paint	86
4. Painting	86
5. Docking	86
6. Maintenance and Repairs	87
Exercise	90
Expanding Learning	90
1. Preparation for Painting	90
Lesson Eight Outfitting	91
Text Reading	91

1. Engine Outfitting	91
2. Ship outfitting	95
3. Electricity outfitting	104
Exercises	110
Expanding Learning	111
1. Auxiliary Systems of Diesel Engines	111
2. The Power Systems of Diesel Engines	112
3. The Fire – Fighting	114
4. The Bilge System	116
5. The Ballast System	117
6. The Water Supply System	117
7. The Steam and Aux. Boiler System	117
8. The Ventilation and Air Conditioning System	118
9. The Refrigerating Plant	118
10. The Fresh Water Production Plant	119
Lesson Nine The Coating Application	120
Text Reading	120
1. Preface	120
2. Brusher Application	121
3. Roller Application	122
4. Conventional (Air) Spray	122
5. Airless Spray	123
Exercises	126
Expanding Reading	126
1. High Volume Low Pressure (HVLP) Spray	126
2. Air-Assisted Airless Spray	127
3. Plural Component Spray	128
Lesson Ten Survey	130
Text Reading	130
1. Periodical Surveys	130
2. Hull Surveys of Very Large Crude Carriers	132
3. Examination in Drydock	132
Exercises	134
Extending Reading	134
1. The Shipyard	135
2. The Ship's Owner	135

3. The Classification Society	136
Dialog 1 Brief Discussion on Ship	137
Scene I	137
Scene II	138
Dialog 2 Brief Discussion on Ship Structure	139
Scene I	139
Scene II	140
Dialog 3 Brief Introduction of Ship Equipment and Outfitting Item	142
Scene I	142
Scene II	142
Dialog 4 Gain the Knowledge of Hull Construction Process	144
Scene I	144
Scene II	145
Dialog 5 Surface Preparation and Coating Application	147
Scene I	147
Scene II	148
Scene III	149
Scene IV	150
参考文献	152

中 职 篇

Lesson One Brief Introduction on Several Types of Ships

学习目标

知识目标

1. 掌握常规型船的特点及用途;
2. 了解新型船舶的技术特点。

能力目标

1. 熟知常规型船的英语名称及技术术语;
2. 能用英语介绍船型技术特征。

Text Reading

The introduction to vessels below includes general description, dimensions and other characteristics. For instance, important features for a container vessel are the maximum number of containers it can carry as well as its deadweight. In respect of a passenger liner, the deadweight is not so important whereas the number of passengers is essential. A tug boat has to possess a high bollard pull while that is not important for a dredger.

1. Container Ships

Since 1960's the transport of containers has continued to grow. The unique advantage of the application of containers is that cargo can be transported directly from customer to customer instead of from port to port. The transport by water has become a strong link in the whole chain of transport.

Container vessels have swiftly grown from a capacity of 1,500 TEU (1966) to approximately 8,000 TEU (2002).

The size of containers vary from each other. The ISO standards distinguish TEU from FEU, which may differ in height.

TEU = twenty feet equivalent unit. The nominal length of these containers is:

$$20' = 20' \times 0.305 = 6.10 \text{ m}$$

The actual length is 1.5" (38 mm) shorter, leaving some space between the containers.

FEU = forty feet equivalent unit. The nominal length of these containers is:

$$40' = 40' \times 0.305 = 12.20 \text{ m}$$

Possible cargo: Containers.

Characteristics: Maximum amount of TEUs or FEUs; Number of container tiers; Presence of cargo gear; Open or closed ship.

Container vessels (Fig. 1.1) are divided into generations. Big container ships can only sail into the largest harbour as limited by ship's size and the transfer capacity of the harbour.



Fig. 1.1 Container vessels

As it is known to all, if there are no hatches it means water will pour into the holds (tropical rains, seawater). However, ships without hatches have been built since 1991. Therefore special provisions have to be made for the bilge pumping systems.

Advantages: More efficient cargo handling, this reduces the lay time and harbour fees. Guide rails, to keep the containers in position instead of lashings. No hatch covers to be carried. High freeboard and strong construction due to the guide rails.

Disadvantages: The high freeboard has an adverse effect on the GT measurement of the vessel. The price is high because of the amount of steel used and the intricate engineering.

2. Multipurpose Ships

Multipurpose means that these ships can transport different types of cargo (Fig. 1.2, Fig. 1.3). These ships use hatchcovers as bulkheads as well as tweendecks in the hold. These hatchcovers can be placed at varying heights and positions. Usually, the headledges and hatch coamings are of the same dimensions as the holds, which make loading and discharging easier. The holds are sealed with hatches with the assistance of various systems. Cargo like wood or containers can be carried on top of the hatches. Often, the bulwark is heightened to support the containers.

Possible cargo: Containers; General cargo; Dry bulk cargo like grain; Wood; Cars; Heavy items (project cargo).

Characteristics: Deadweight (t); Hold capacity (m^3); Number of containers and their dimensions; Maximum deck load (t/m^2); Lifting capacity of cargo gear.

Multipurpose vessels can be subdivided into: Ships with cargo gear (up to 120 tons lifting capacity per crane); Ships without cargo gear; Coastal trade liners.

A multipurpose vessel can also be equipped with one or more ramps on the side of the ship.

Loading and discharging can then commence through these ramps by forklifts. This handling is faster and less dependent on the weather.



Fig. 1.2 Multipurpose ships(1)

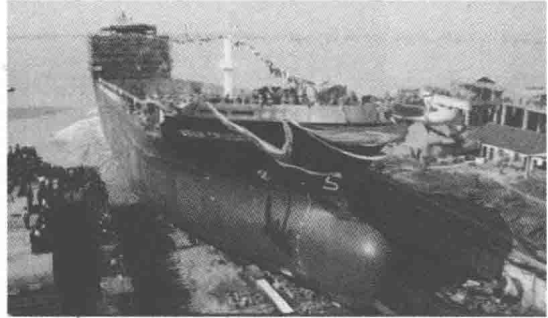


Fig. 1.3 Multipurpose ships(2)

2.1 Ships with Cargo Gear

Multipurpose ships with cargo gear are heavier than comparable vessels without cargo gear. As a result, their carrying capacity is less. Some vessels can not pass under a bridge because of the height of the cranes. The advantage of a multipurpose ship is that she can work in harbour or industrial zones where no cranes are available.

2.2 Ships without Cargo Gear

Ships without cargo gear are dependent on the presence of loading gear in the harbour and, therefore, limited in their employability.

2.3 Coastal Trade Liners

In order to navigate from the sea into the inland waterways, coastal trade liners have a small draught, usually not more than 3.60 meters, a small air draught of approximately 6.5 meters, and compared with other ships of the same size, a large ballast tank capacity. Like inland vessels, coastal trade liners (also called sea-river ships) often have a hydraulically adjustable wheelhouse. When the ship has to pass under a bridge, the wheelhouse can be lowered. Masts must also be able to be lowered.

Additional characteristics: Draught when loaded; Vertical clearance when loaded; Draught when not loaded; Ballast tank capacity.

3. Tankers

3.1 Gas Tankers

Gas tankers are ships that are used to carry liquefied gas. In general, there are two kinds of liquefied gases (Fig. 1.4, Fig. 1.5): Liquefied Petroleum Gas (LPG); Liquefied Natural Gas (LNG).



Fig. 1.4 LPG tankers



Fig. 1.5 LNG tankers

LPG consists largely of propane and butane with freezing points respectively of $-42\text{ }^{\circ}\text{C}$ and $-0.5\text{ }^{\circ}\text{C}$ at atmospheric pressure. LNG is a mixture of methane and ethane and one of the two pearls on the crown in the shipbuilding industry. Under normal atmospheric pressure the former has a freezing point of $-161\text{ }^{\circ}\text{C}$ and the latter freezes at $-88\text{ }^{\circ}\text{C}$. Other similar liquefied gases can also be transported by gas tankers. LPG and similar compounds can be kept liquid at moderate pressures and temperatures, but higher pressures and lower temperatures are often needed to keep the gases in their liquid state. The tanks have to be well insulated because of the following reasons:

Heat leaking into the tanks can vaporize part of the liquid. If, as a result of this, the fluid level drops and the free liquid surface increases, this can lead to sloshing of the liquid against the inside of the tank, which will damage the tank wall.

Gas tankers are often steam turbine ships, the boil-off of the cargo can be used as fuel for the boilers (boil-off is gas evaporated from the cargo in order to maintain a low temperature). Possible cargo: LNG; LPG; Similar liquefied gases.

Characteristics: Tank capacity (m^3); Minimum allowed tank wall temperature; Maximum ullage in the tanks; Time needed for loading and discharging.

3.2 Crude Oil Tanker

Crude oil tankers (Fig. 1.6) are adopted to carry the crude oil from a loading harbour close to an oil field or from the end of a pipeline to a refinery. In general, these vessels are very large. The carrying capacity of these crude oil tankers has risen to as much as 500,000 tons. In contrast to product tankers, crude oil tankers have a limited number of tanks, usually approximately 15 tanks plus two slop tanks.



Fig. 1.6 Crude oil tankers

Large crude oil tankers are subdivided into the following classes: Ultra Large Crude Carrier (ULCC) >300,000 DWT. Very Large Crude Carrier (VLCC) 200,000 – 300,000 DWT. Suez max (old max Suez draught) Carrier 120,000 – 160,000 DWT.

When such a large ship like a crude oil tanker is damaged by collision, vast amount of oil will leak into the ocean. Therefore, regulations now require that such vessels shall have a double hull.

Possible cargo: Crude oil.

Characteristics: Carrying capacity (tons); Tank volume (m^3); Discharging speed (m^3/h); Maximum laden draught (m).

4. Bulk Carriers

Bulk carriers are ships specially designed to carry loose cargo in bulk. There are three types of bulk carriers:

(1) Handysize, 30,000 tons dead weight, often with own cargo gear. Cargo: precious ore, sand, scrap, clay, grain.

(2) Panamax, 80,000 tons dead weight, without cargo gear. Cargo: grain and ore.

(3) Capesize, 160,000 tons dead weight, without cargo gear. Cargo: coal, ore.

Bulk carriers (Fig. 1.7) are usually discharged by grabs or by suction pipes. Pouring the cargo through a shooter or via a conveyor belt will perform the loading. Bulk carriers have large upper and lower ballast tanks to give the empty vessel enough draught and a better behaviour

whilst in transit.

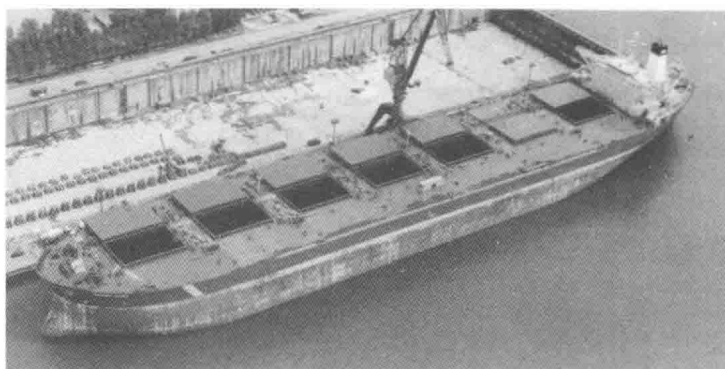


Fig. 1.7 Bulk carriers

Ships transporting ore are to have a special design. Ore is very heavy (stowage factor is approximately $0.5 \text{ m}^3/\text{t}$) and thus ships only need small holds to be loaded completely. To prevent a too large stability the holds must not be situated too low or too close to the sides of the ship. Some bulk carriers can also function as a tanker. This combination carrier is called Ore Bulk Oil (OBO) carriers (Fig. 1.8).

Possible cargo: Coal; Ore; Grain and other agricultural products; Fertiliser; Cement.

Characteristics: Carrying capacity (tons); Cargo volume (m^3).



Fig. 1.8 Ore Bulk Oil carriers

5. Cruise Ships

Except in such archipelagos areas as the Philippines and Indonesia, the traditional passenger liners have disappeared. International and intercontinental transport of passengers is now almost completely fulfilled by aircraft. The modern cruise ships (Fig. 1.9) are employed for making luxurious holiday trips to distant countries and harbours. On board there is a whole range of