

国家示范性高职高专规划教材·机械基础系列

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内容简介

本书介绍了机械方面的英语知识,内容包括金属、机械制图、公差、轴承、热处理、焊接、车削加工和车床、铣削加工和铣床、刨削加工和刨床、磨削加工和磨床、齿轮传动、带传动、计算机、计算机病毒、互联网和工业以太网、计算机辅助设计和计算机集成制造、数控技术和计算机数字控制技术以及坐标测量仪和电火花加工等内容。为了便于学习,书后还附有参考译文及练习参考答案。

本书以情境为基础,以任务为主线,递进式地展开教学,可以满足不同程度学生的学习需求。本书创意独特,实用性强,与专业课程紧密衔接。

本书既可作为高等职业学院、大中专机械及相关专业的专业英语教材或课外阅读材料,也可作为工程技术人员的自学参考书籍。

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前 言

本书是高职高专教学改革规划系列教材之一。全书共分3章(机加工基础、机床及传动机构和新技术),每章含6个单元,共计18个单元,各单元之间的内容既相互独立,又渗透互补。每个单元设两个学习情境:情境1(专业模块)和情境2(拓展模块)。

情境1(专业模块)旨在提高学生专业文章的阅读理解能力,该模块为学生提供和专业相关的某一主题的文章。专业模块的学习以任务为主线,递进式地展开:专业介绍——词汇学习——基础阅读——专业阅读。学生既可以就不同的主题进行广泛地学习,也可以就某一主题进行深入地探究,极大地增加了学习的灵活性。

情境 2(拓展模块)包括翻译技巧、拓展阅读和机械常识介绍,旨在扩大学生的知识面,提高学生的阅读、翻译及写作能力。翻译技巧包括翻译讲解、实例介绍和实际训练等内容;拓展阅读包括科技类和实用类两部分内容;配有插图的机械常识介绍,可以使学生掌握一些常用机械术语的含义和英文表达方法。

每个情境由不同的任务组成,任务的难度依次递进。除机械常识部分外,每项任务都配以相应的练习,考察学生的学习和掌握情况。

本书在选题时充分考虑高职学生的知识和能力特点,文章难度和长度均适中并具有一定的梯度。前两章内容的选题突出专业性、实用性、适用性;第3章内容的选题使学生和飞速发展的时代保持同步。文章的选择还考虑与先修及后续课程相衔接的问题,选题涵盖了大部分先修及后续课程的内容,突出了专业英语为专业课服务的功能。实用类阅读材料提供了学生可能用到的实用技能,包括简历、求职信等各类应用文,使学生走出校门就可以用上所学的知识,真正体现了教学以学生为中心,课程为学生服务的理念。

与其他专业英语教材不同的是,在每个主题的前面安排了一个内容简介,帮助学生了解本课的内容,使学生尽快进入学习状态。阅后终习包括正误判断、回答问题、完型填空、句子翻译和小组讨论等,为教师检查学生对本课! 理解情况提供了有利的工具。为了便于教学,书后配有参考译文和练习参考答案。全书共 18 个单元,教师可以根据学生的基础、课时和专业特点等选择不同单元、不同难度的任务进行讲授。本书的亮点在于每课后面出现的附有插图的机械常识,它们不但可以使学生进一步扩展专业知识,还可以增加学生的学习兴趣。

每单元的结构如下:

情境1 专业模块

Do you know? 主题简介,帮助学生了解本单元的内容,使学生尽快进入学习状态。 Task 1 Word Study 阅读 1 中重点词汇的音标、词义及例句。

Vocabulary Practice 对所学习的词汇进行训练。

Task 2

Reading 1 基础阅读

Reading Practice 1 就基础阅读的文章内容展开训练。

Task 3

Reading 2 专业阅读

Reading Practice 2 就专业阅读的文章内容展开训练。

情境2 拓展模块

Task 4

Translation Skills 介绍一些常用的翻译方法和技巧。

Translation Practice 针对本单元所介绍的翻译方法和技巧加以训练。

Task 5

Extension Reading 第1、2章的拓展阅读介绍最新的科学发展以及学生感兴趣的一些科技常识。第3章的拓展阅读为实用类阅读材料,包括广告、说明书、产品介绍、简历和求职信等。

Reading Practice 3 就拓展阅读的文章内容展开训练。

Task 6

Mechanical Knowledge 一些常用机械术语的表达方法、简单介绍及插图。

本书由北京电子科技职业学院的吴燕、田方、戈峰、师海歌、高岩和马兰共同编写,其中第1章的专业模块部分由戈峰、吴燕编写;第2章的专业模块部分由吴燕编写;第3章的专业模块部分由田方编写;全书的翻译技巧部分由师海歌编写;第1、2章的拓展阅读由高岩编写;第3章的拓展阅读由马兰、吴燕编写;全书的机械常识部分由吴燕编写。本书由吴燕担任主编并进行策划和统稿,田方、戈峰担任副主编。

本书在编写过程中得到了邱坤副教授、牛荣华高级讲师的大力支持,同时,王苏石、张唯秦等老师的热情帮助也对本书顺利结稿提供很大帮助,在此向他们表示衷心的感谢。

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由于编者水平有限,不妥之处难免存在一敬请广大读者批评指正。

编 者 2009年9月

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Chapter 1

Foundation of Mechanical Production

Unit 1 Metals



情境1 专业模块



Do you know?

金属是化学元素,如铁、铜和铝等。合金是两种或两种以上的金属的混合物,通常它由一种基体金属和少量其他金属或非金属组成。在工程上,金属与合金一般通称为金属。金属分为两类:黑色金属和有色金属。



Task 1 Word Study

1. hammer ['hæmə] v. 锤击, 锤打

When you've packed the box, hammer the lid on.

箱子装好后,就把盖子钉上。

2. weapon [wepən] n. 武器

They were testing a new weapon then.

当时他们在试验一种新式武器。

3. sharp [faɪp] a. 锋利的

You must be very careful with this sharp knife.

你用这把锋利的刀子必须很小心。

4. civilization [ˌsivilai zeiʃən] n. 文明

Chinese civilization is one of the oldest in the world.

中国文明是世界上最古老的文明之一。

5. layer [ˈleiə] n. 层

A fine layer of dust covers everything.

所有的东西都盖了一层薄薄的灰尘。

6. crust [krʌst] n. 外壳

The earth's crust is between 5 and 25 miles thick.

地壳有5~25英里厚。

7. tin [tin] n. 锡

Tin can be used to make cans.

锡可以用来生产饮料罐子。

8. compound ['kompaund] n. 化合物

Mercury is an important component in the compound.

水银是这种化合物的重要成分。

9. lump [lamp] n. 块儿

The artist started with a big lump of clay.

艺术家用一大块黏土开始雕塑。

10. ore [ox] n. 矿石, 含有金属的岩石

Iron ore has been discovered in the area.

这个地区发现了铁矿。

11. mixture ['mikstfə] n. 混合物

Air is a mixture of gases.

空气是各种气体的混合物。

12. alloy [ˈælɔi] n. 合金

Brass is an alloy of copper and zinc.

黄铜是铜和锌的合金。

13. carbon ['kaːbən] n. 碳

The main elements of the material are water and carbon.

这种材料的主要成分是水和碳。

14. engineering [ˌendʒi'niəriŋ] n. 工程

The T-square is a necessary tool for engineering charts.

丁字尺是工程制图的必要工具。

15. ferrous ['ferəs] a. 铁的, 含铁的, 黑色的 (金属)

Mammoth machines are always made of ferrous metal.

大型机械的材质一般是黑色金属。

16. percentage [pəˈsentidʒ] n. 百分比

The percentage of cancer patients keeps rising.

癌症病人的百分比在不断上升。

17. nonferrous [non feros] a. 非铁的,不含铁的,有色的(金属)

All the outer castings of aircrafts are made of nonferrous compound metal.

飞机的外壳都是由有色金属合金制造的。

18. strength [strengθ] n. 强度,力量

He hasn't got enough strength to remove that stone.

他没有足够的力气搬走那块石头。

19. machinery [məˈʃiːnəri] n. [总称] 机器, 机械

Many products are made by machinery rather than by hand.

许多产品是机器造的而非手工做的。

20. practically ['præktikəli] ad. 几乎

The town was practically deserted.

该镇几乎已空无一人。

21. aluminum [əˈljuːminəm] n. 铝

These cooking utensils are made of aluminum.

这些炊具是铝制的。

22. copper ['kɔpə] n. 铜

Copper is a good medium for conducting heat.

铜是传热的良导体。

23. cable [ˈkeibl] n. 电缆

Inside the cable, there are 8 color coded wires.

电缆有8根色线。

24. electricity [ilek trisiti]

n. 电

The electricity supply was cut for an hour.

停止供电一小时。

25. nickel ['nikl]

n. 镍, 镍币

Nickel can be used to make coins.

镍可以用来制造硬币。

26. zinc [ziŋk] n. 锌

Zinc can be used to cover other metals to stop them rusting.

a. 机器

锌可用来涂在其他金属表面以防生锈。

27. pure state

原始状态

28. stainless steel

不锈钢



Vocabulary Practice

1. Match the following two columns.

ferrous
copper

(2) copper b. 百分比 (3) electricity c. 文明

(4) cable d. 强度

(5) strength e. 含铁的

(6) percentage f. 武器 (7) machinery g. 铝

(8) aluminum h. 铜

(9) weapon i. 电缆

(10) civilization j. 电

2. Fill in the table by giving the corresponding translation.

English	Chinese	
engineering		
	碳	
compound	·	

/adm	-	
34	70	

English	Chinese
	合金
stainless steel	
	矿石
pure state	
	混合物



Task 2 Reading 1

Metals (1)

Man first began using metals at least 5 000 years ago. He found that they could be hammered into tools and weapons that remained sharp. From small beginnings the use of metals has grown to such an extent that civilization as we know it today could not exist without them.

Metals make up a large part of the earth's outer layer, or crust. But only a few of them appear in the metal form we are familiar with. Most metals, such as iron and tin, are found combined with other chemical elements. Most of these compounds do not look anything like metals. They are often lumps of rocks. But many of them can be treated to produce metals. These are called ores (Fig. 1).

Not many metals are used widely in their pure state. Other metals are usually added to them to form mixtures called alloys. Sometimes chemical elements other than metals[®] are included in alloys. The most important is carbon. In engineering, metals and alloys are usually called metals. Metals are divided into two groups, the ferrous (Fig. 2), which contain a large percentage of iron, and the nonferrous (Fig. 3), which contain no iron.



Fig. 1 Ores



Fig. 2 Ferrous metal



Fig. 3 Nonferrous metal

Steel, our most useful metals, is alloy of iron and carbon. Because of its strength, steel is used in large buildings and bridges. It is also used to make motor cars, railways and ships. Most of the machinery that makes practically everything we use is made of iron or steel.



Many other metals are important to us, too. The spoons, knives and forks we eat with are made of stainless steel. We cook in aluminum boilers. Copper cables carry electricity to factories and families. The coins we carry in our pockets contain copper, nickel, and zinc. The list of the uses of metals is endless.

Word List

hammer	v. 锤击, 锤打	weapon	n. 武器
sharp	a. 锋利的	civilization	n. 文明
layer	n. 层	crust	n. 外壳
tin	n. 锡	compound	n. 化合物
lump	n. 块儿	ore	n. 矿石,含有金属的岩石
mixture	n. 混合物	alloy	n. 合金
carbon	n. 碳	engineering	n. 工程
ferrous	a. 铁的,含铁的	percentage	n. 百分比
nonferrous	a. 非铁的,不含铁的	strength	n. 强度,力量
machinery	n. [总称] 机器, 机械	practically	ad. 几乎
aluminum	n. 铝	copper	n. 铜
cable	n. 电缆	electricity	n. 电
nickel	n. 镍, 镍币	zinc	n. 锌

Phrase List

pure state	纯状态,原始状态	stainless steel	不锈钢

Notes

- 1. as we know it today 这是一个插入语 (状语从句)。
- 2. could not exist without them 该句为虚拟语气。
- 3. other than metals "other than"原意为"不同于, 非"。



Reading Practice 1

- 3. Mark the following sentences with T (true) or F (false) according to Reading 1.
- (1) The civilization could exist without metals.
- (2) Many metals appear in the metal form we are familiar with.
- (3) Only a few of metals are used in their pure state.
- (4) Metal mixtures are called alloys.
- (5) Carbon is the most important element to form alloy.
- 4. Answer the following questions according to Reading 1.
- (1) When did man first begin using metals?
- (2) How many groups of metals? What are they?

- (3) What kind of metal is most useful in engineering?
- (4) Is steel an alloy? What is it made from?
- (5) Please list the usages of iron and steel in daily life.

5. Translate the following sentences into Chinese.

- (1) In the old days, man found that metals could be hammered into tools and weapons that remained sharp.
- (2) Most metals, such as iron and tin, are found combined with other chemical elements.
- (3) Other metals are usually added to pure metals to form mixtures called alloys.
- (4) Metals are divided into two groups, the ferrous, which contain a large percentage of iron, and the nonferrous, which contain no iron.
- (5) Most of the machinery that makes practically everything we use is made of iron or steel.



Task 3 Reading 2

Metals (2)

Pure iron is quite a weak metal, and it is not very hard, either. But add a little carbon as well as traces of certain other metals, and it becomes both strong and hard. According to what is added, the iron can be given other desirable properties as well. Adding other substances to a metal to change its properties is called alloying, and the product an alloy[©].

Most of the alloys of iron are better known to us as steels. Many other metals form useful alloys, too. Brass and bronze are common alloys of copper. Solder is a well-known lead alloy. Aluminum and zinc alloys are also in widespread use. However, it is the iron alloys that are by far the most important.

The pig iron that is made in the blast furnace can be considered one kind of iron alloy, but it is a very crude one. It contains far too many impurities and other materials as well as being uneven in composition. By only slight refining, it can be made into cast iron. Cast iron is an ideal material for making engine blocks and machine frames. It is strong, hard, rigid, and absorbs shock well. Its main disadvantage is that it is brittle.

Wrought iron is a more refined form of pig iron which is quite pure iron (0.1 ~ 0.2 per cent carbon) with threads of slag running through it. Wrought iron is made by heating the pig iron with iron oxide in a "puddling" furnace. The oxygen in the oxide combines with the impurities, which either boil away as gas or form a slag. But the temperature of the furnace is not high enough to make the metal melt. That is why it contains threads of slag. Wrought iron is seldom used directly in industry.

Refining pig iron in the various steelmaking furnaces reduces the carbon content and removes other unwanted substances. The steel-maker stops the refining process when the metal has reached the carbon content he wants. Then he adds controlled amounts of other elements to bring the steel to the desired composition.

There are two principal kinds of steels, carbon steels and alloy steels. The properties of carbon steels depend mainly on the amount of carbon present. Mild steel (up to 0.25 per cent carbon) is the ordinary kind of steel that is used for girders, automobile bodies, bicycle frames, and so on. Medium-carbon steel (0.25 ~ 0.45 per cent) is stronger than mild steel and is used for bridge members, nuts and bolts, and tools of many kinds. High-carbon steel (0.45 ~ 1.5 per cent) is hard and tough, and is used for cutting tools, drill bits, saws, and so on.

The properties of alloy steels depend not on the carbon they contain, but on other alloying elements. One of the most familiar alloys is stainless steel. As we all know, ordinary steel corrodes, or rusts if it is left out in the rain, is stained by fruit juices[®], and so on. But adding chromium and nickel to steel makes it resist corrosion and stains. Both chromium and nickel resist corrosion well, and they tend to impart that property to their alloys. One of the most common kinds of stainless steels contains about 18 per cent chromium and 8 per cent nickel.

Word List

trace	n. 痕迹,微量	desirable	a. 合意的, 理想的
property	n. 性质, 特性	substance	n. 物质
brass	n. 黄铜, 黄铜制品	bronze	n. 青铜
solder	n. 焊锡	lead	n. 铅
widespread	a. 普遍的	crude	a. 天然的,未加工的
impurity	n. 杂质	uneven	a. 不平坦的, 不均匀的
composition	n. 成分	refine	vt. 精炼,精制
rigid	a. 刚硬的, 刚性的	absorb	vr. 吸收
brittle	a. 易碎的, 脆的	thread	n. 线, 细丝, 螺纹
slag	n. 矿渣, 炉渣	oxide	n. 氧化物
puddling	n. 搅炼	melt	υ. (使) 熔化
content	n. 内容	principal	n. 主要的, 首要的
girder	n. 梁	nut	n. 螺母
bolt	n. 螺钉	saw	n. 锯
corrode	v. (使) 腐蚀, 侵蚀	chromium	n. 铬
resist	ve. 抵抗	impart	vt. 给予,传授

Phrase List

pig iron	生铁	blast furnace	鼓风炉
cast iron	铸铁	engine block	发动机组
machine frame	机器底座	wrought iron	熟铁
bridge member	桥梁构件	drill bit	钻头

Notes

- 1. and the product an alloy 这是一个省略句,全句为 "and the product is called an alloy"。
- 2. it is the iron alloys that are by far the most important 这是一个强调句, 其句型为 "it is +被强调的部分 + that…"。
- 3. is stained by fruit juices 此句是一个省略句, 和前面的"if it is left out in the rain"相并列, 全句为"if it is stained by fruit juices"。

C Readi

Reading Practice 2

- 6. Mark the following sentences with T (true) or F (false) according to Reading 2.
- (1) Solder is a well-known iron alloy.
- (2) The pig iron is a kind of iron alloy.
- (3) Iron alloys are the most important alloys in engineering.
- (4) Most engine blocks and machine frames are made of cast iron.
- (5) Wrought iron can be used directly in industry.
- (6) The properties of alloy steels depend mainly on the amount of carbon present.
- (7) Carbon steels and alloy steels are two main kinds of steels.
- (8) Cutting tools and drill bits are made of medium-carbon steel.
- 7. Fill in the blanks with the words or expressions given below and change the forms where necessary.

corrosion, contain, element, stain, property, corrode, depend, leave, alloy, add
The properties of alloy steels(1) not on the carbon they contain, but on other alloying
(2) One of the most familiar (3) is stainless steel. As we all know, ordinary
steel(4), or rusts if it(5) out in the rain,(6)_ by fruit juices, and so on. Bu
(7)chromium and nickel to steel makes it resist(8) and stains. Both chromium and
nickel resist corrosion well, and they tend to impart that(9) to their alloys. One of the most
common kinds of stainless steels (10) about 18 per cent chromium and 8 per cent nickel.

○ 情境2 拓展模块



Task 4 Translation Skills-1

词量的增加(一)

- (1) 增加名词
- 例句 1: The flow sheet shown in Fig. 3 is intended to illustrate how the computer works. 图 3 中的流程图阐明了计算机的工作原理。
- 例句2: The complex automatic control system monitors over the process by means of computers.