



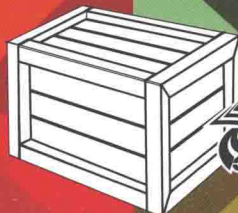
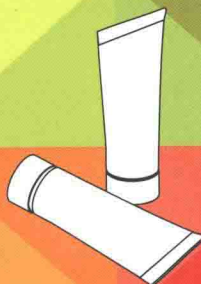
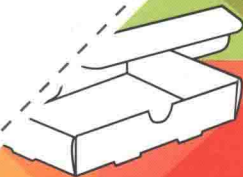
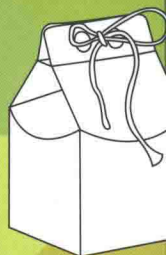
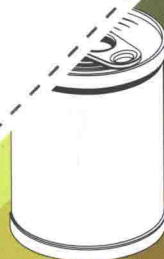
“十二五”普通高等教育包装本科规划教材

Baozhuang ZhuanYe Yingyu 包装专业英语

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主 审 彭国勋 吴宝惠



印刷工业出版社

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内容提要

专业英语(English for Special Purpose)是一种学术英语(Academic English)或科技英语(English for Science and Technology),是继大学公共英语之后的一种结合专业的外语语言再学习。本教材在内容的选取上力求基础性和全面性,包括6个单元,共18节课。每个单元由Section A、Section B和Section C三节课组成。内容涵盖了包装基本概念、包装历史沿革、包装材料和容器、运输包装、包装技法、缓冲包装研发等内容,同时在附录中还涉及英文简历的撰写。

本书的编写突出了三个特点:1.与大学公共英语的有效衔接。不仅设计了课前“热身”活动和课后“巩固”习题。2.专业外语的口语表达。全书共设计了12段情景对话,以助推学生口语表达水平的提升。3.专业外语的阅读理解。为了方便教学及读者自学,对每篇课文进行了详细的中文翻译。本书既可供高等院校及大专院校包装工程专业的包装专业英语课程做教材使用,也可供从事包装、轻工、外贸的科研人员、设计人员及高等院校其他相关专业的师生参考。

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出版说明

包装工业是国民经济产业体系的重要组成部分，在生产、流通、消费活动中发挥着不可或缺的作用。随着我国工业化与城市化进程的快速发展和人民物质文化生活水平的不断提高，包装工业也获得了强大的发展动力，取得了长足的进步。近年来，中国包装工业总产值一直呈现大幅度的递增趋势。2009年，中国包装工业总产值突破了1万亿元，包装产品的品种和质量已基本满足了国民经济发展的需要。

为了满足社会对新型人才的需要和适应包装新材料、新技术、新设备的更新和应用，作为包装工业发展支撑点和推动力的包装教育，必须与时俱进、不断更新和升级，努力提高教育质量。高等教育、教学的三大基本建设是师资队伍、教材和实验室建设，而教材是提升教育、教学的基础配套条件。

近20多年来，中国包装学科教育的兴起、发展，始终紧扣包装工程专业的教材建设。1985年首次开创高等学校适用教材建设，出版了第一套12本开拓性教材；1995年为推进全国包装统编教材建设，又出版了第二套12本探索性教材；跨入21世纪，2005年在中国包装联合会包装教育委员会与教育部包装工程专业教学指导分委员会联合组织、规划，全国包装教材编审委员会指导下，规划出版了第三套23本包装工程专业教材。印刷工业出版社作为国内唯一一家以印刷包装为特色的专业出版社，一直致力于包装专业教材的建设，积极推动教材的发展与更新，先后承担了三套包装工程专业教材的出版工作，并取得了可喜的成果。许多包装专业教材经过专家的审定，获得了国家级精品教材、国家级规划教材等荣誉称号，并得到了广大院校、教学机构和读者的认可。

目前，全国已有近70所高等学校开设包装工程本科专业。近年来，江南大学、天津科技大学等高校在轻工科学与技术一级博士点下设立了包装工程博士点和硕士点，西安理工大学、上海大学、北京印刷学院、陕西科技大学、浙江理工大学、湖南工业大学、哈尔滨商业大学等高校在相近专业以学科方向的形式开展包装工程专业硕士研究生教育，这给我国包装教育的发展注入了新的活力。

随着产业技术的发展，原有的包装工程专业教材无论在体系上还是内容上都已经落后于产业和专业教育发展的要求。因此，印刷工业出版社作为“教育部普通高等学校包装教学分指导委员会”的委员单位，根据教育部《全面提高高等教育教学质量的若干意见》的指导思想，紧密配合教育部“十二五”国家级规划教材的建设，在十二五期间对包装工程专业教材不断进行修订和补充，出版了一套新的包装工程专业教材。本套教材具有以下显著特点：

1. 时代性。教材引用了大量当今国际、国内包装工业的科技发展现状和实例，以及当前科技研发的成果和学术观点，内容较为先进。

2. 科学性。教材以科学发展观为统领，从理论的高度，全面总结了包装工业发展的成功经验，读者可以从中得到启发和借鉴。同时坚持以科学的态度，分析和判断了包装工业发展的趋势和方向。

3. 实用性。教材紧扣包装工业实际，并注重联系相关产业的基本知识和发展需求，实现知识面广、工理渗透，强调基础知识、技能的协调发展和综合提高。

4. 规范性。教材体系更符合教学实际，同时紧扣教育部新制定的普通高等学校包装工程专业规范，教材的内容涵盖了新专业规范中要求学生需要掌握的知识点与技能。

5. 实现立体化建设。本套教材大部分将采用“教材+配套PPT课件”的新模式，其中PPT课件免费供使用本套教材的院校教师使用。

“‘十二五’普通高等教育包装本科规划教材”、“普通高等教育包装工程专业教材”已陆续出版并稳步前进，我们真诚地希望全国相关院校的师生及行业专家将本套教材在使用中发现的问题及时反馈给我们，以利于我们改进工作，便于编者再版时对教材进行改进，使教材质量不断提高，真正满足当今包装工程专业教育、教学发展的需求。

印刷工业出版社
2011年5月

前言

PREFACE

编写一本本科生使用的专业英语教材出于两方面的考虑：一是适应不断加快的高等教育，特别是工程教育国际化步伐的形势。各高校的包装工程专业全面实施双语教学，用以推进与提升大学生在专业领域能用外语进行学术交流的程度，拓展他们的国际化视野和竞争力。“大学英语”后直接实施“双语教学”，因学生运用外语的能力有限（如专业英语术语生涩、外语听说困难等），会使得教学效果打折扣。所以，应该有一门“专业英语”课，作为大学公共英语的延续课和专业双语教学的先导课，为“应用英语”的双语教学奠定“基础”。二是顺应我国包装学科和包装工业发展趋势的要求。我们知道，我国包装工程的高等教育起步于 20 世纪 80 年代初期，到目前虽已有 70 多所高校开办了包装专业，办学有了规模，但在包装教学体系、教学内容和课程设置等方面仍借鉴的是美国等国家的模式，领先全球先进的包装科技资料也多源于这些国家，所以，要推进我国包装工业实现由“包装大国”向“包装强国”的战略转移，必须面向国际化培养包装专业人才，这就要求培养的大学生应具有快速检索和阅读包装英语文献资料的能力；具有流利的英语口语表达与沟通能力；具有准确的书面表达能力，真正达到既掌握较扎实的专业知识又具备良好的外语使用能力。

专业英语（English for Special Purpose）是一种学术英语（Academic English）或科技英语（English for Science and Technology），是继大学公共英语之后的一种结合专业的外语语言再学习，它强调的是专业词汇与术语、科技表达和翻译技能等。而双语教学则是将母语以外的另外一种语言（大多数为英语）直接应用于语言学科以外的其他各种学科专业的教学，使第二语言的学习与各学科专业的知识获取同步进行，它强调的是专业知识的连贯性、逻辑性和系统性。

全书有 6 个单元，共 18 节课。每个单元由 Section A、Section B 和 Section C 3 节课组成（其中 Section A 和 Section B 为基本课文，Section C 为扩展课文），每节课的具体模块组成详见下表：

Section A	Section B	Section C
I Objectives II Pre - Reading Questions III Discussions Text New Words Phrases and Expressions Notes	I Objectives II Pre - Reading Questions III Discussions Text New Words Phrases and Expressions Notes	Text New Words Phrases and Expressions Notes

续表

Section A	Section B	Section C
Exercises I Reading Comprehension II Oral Practice III Translation	Exercises I Reading Comprehension II Oral Practice III Translation	Exercises Theme – Related Writing

本教材的主要特色体现在以下几个方面：

1. 突出了与大学公共英语的有效衔接。设计了课前“热身”活动，引导、启发学生进行包装专题的讨论；还设计了课后“巩固”习题，注重阅读、写作、口语、翻译等方面的综合练习。最后，还针对包装专业应届毕业生留学或就业的需求，编写了英文简历的撰写方法和简历范文，以增强学生专业英语的实用能力。

2. 突出了专业外语的口语表达。全书共设计了 12 段情景对话。对话内容涉及了出国留学、就业面试、科研工作、业务交流等方面，以助推学生口语表达水平的提升。

3. 突出了专业外语的阅读理解。为了方便教学及读者自学，对每篇课文进行了详细的中文解释。包括生词及短语、包装术语、难句注解等。另外，为方便使用本书的教师备课与教学，本书还免费提供了所有课文的中文翻译和 PPT 演示文稿，请与出版社联系索取。

本书在内容的选取上力求全面性和基础性。第 1 单元为包装基本概念，由安徽农业大学舒祖菊编写，含包装功能、软包装和包装法规；第 2 单元为包装历史沿革，由陕西科技大学陈满儒编写，含包装与社会、包装废弃物管理和现代包装工业；第 3 单元为包装材料和容器，由陕西科技大学赵郁聪编写，含纸包装材料、塑料包装材料和其他包装材料；第 4 单元为运输包装，由天津科技大学宋海燕编写，含运输包装的作用、运输包装设计十步骤和集合包装；第 5 单元为包装技术与方法，由西安工业大学曹乐编写，含食品包装、医药包装和成型－充填灌装－封口工艺；第 6 单元为缓冲包装研发，由北京林业大学苟进胜编写，含包装开发过程、缓冲包装设计五步法和破损边界曲线。除此之外，陈满儒编写了附录一即英文简历的撰写。苟进胜负责了附录二即生词与词组的汇总工作。

在编写本书的过程中，得到了北美包装教育资深教授 Walter Soroka 博士和美国 Wisconsin – Stout 大学教授 Louis Moegenburg 博士等的大力支持，在此一并表示感谢。

本书难免存在疏漏和错误，敬请读者批评指正。

编 者
2013 年 7 月

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UNIT 1

WHAT IS PACKAGING? 何谓包装?

- Section A Packaging Functions
包装功能
- Section B Flexible Packaging
软包装
- Section C Packaging Laws and Regulations
包装法规

UNIT 1

Section A

Packaging Functions 包装功能



Objectives

1. Grasp packaging terms.
2. Be aware of the classification of “packaging” according to packaging levels.
3. Understand the difference between consumer package and industrial package.
4. Be familiar with the four principal functions of a package.



Pre-reading questions

1. What do you think packaging is?
2. What is the difference among the primary package, the secondary package and the distribution package?
3. What are the fundamental functions of packaging?



Discussions

Work in pairs or groups and describe “Packaging Functions” using the words given below: packaging, material, container, product, containment, protection/preservation, transport, information/sales, handling, convenient

Text

1 Packaging Definition

- 1 *Packaging has been defined by the Packaging Institute, USA, in their GLOSSARY OF*

PACKAGING TERMS, as the enclosure of products, items or packages in pouches, bags, boxes, cups, trays, cans, tubes, bottles or other container forms to perform one or more of the following major functions.

2 (1) Containment for handling, transportation, and use. This was probably the original function. The basic reason for the package is to enable product movement. Packaging allows one to carry not only what can be held in a hand, but also products such as liquid products, and dry free flowing powders, which are simply not transportable in consumer size units if they are not contained.

3 (2) Protection and/or preservation of the contents for required **shelf life**, use life, and sometimes protection of the external environment from ant **hazard** of contact with the contents. For example, most dry products **are susceptible to** loss of moisture damage, and most wet products are susceptible to loss of moisture. **Oxygen** in the air can also affect certain products and the package can protect the products from it. For example, as a **barrier**, packaging **retards** the **rapid oxidation** of fat. **Carbonated liquids** such as beer, champagne and soft drinks use packaging to assure that the dissolved **carbon dioxide** is retained and the pressure maintained. Further, the combination of product in the inner and outer packaging must also provide protection against crushing from stacking and palletizing, and from breakage due to vibration and dropping, either in shipment or while waiting for the consumer to purchase and use it.

4 (3) Communications or **identification** of content, quality, quantity, and manufacturer, usually by means of printing, decoration, labeling, package shape or transparency. *The design and decoration must facilitate selection and motivate sales and, increasingly, they must meet government requirements including ingredients listing and nutritive value.*

5 (4) Utility or performance which would facilitate dispensing and use of products, including **ease of opening**, reclosure (if required), portioning, application, unit of use, multipacks, safety, second use or reuse and working features such as are found in **aerosol** sprays, cook-in-the-bag, memory-packs and especially provision for instructions or directions.

6 If the device or container performs one or more of these functions, it is considered a package.

7 Packaging is also the development and production of packages (filling, closing, labeling), by trained professionals or operators employing methods and equipment designed for specific product lines in types of packages. Some 30 different categories of packaging machines are employed. For example, fillers, counters, cappers, labelers, wrapping equipment, cartoners, **case** loaders and sealers, as well as a wide range of support equipment for package making, inspection, monitoring, and handling. Increasingly, **packaging machinery** is designed and integrated to provide a complete system.



2 Packaging Functions

2.1 Introduction

8 From the definition of packaging, the functions of a package were given as: containment, protection/preservation, transport, information/sales. When discussing packaging functions, keep in mind the different packaging levels:

9 **Primary package.** The first **wrap** or containment of the product that directly holds the product for sale.

10 **Secondary package.** A wrap or containment of the primary package.

11 **Distribution package (shipper):** A wrap or containment whose prime purpose is to protect the product during distribution and to provide for efficient handling.

12 **Unit load.** A number of distribution packages bound together and unitized into a single entity for purposes of mechanical handling, storage, and shipping.

13 Figure 1-1 illustrates some of these levels. In addition, packages are often defined by their intended destination.

14 **Consumer package.** A package that will ultimately reach the consumer as a unit of sale from a merchandising outlet.

15 **Industrial package.** A package for delivering goods from manufacturer to manufacturer. Industrial packaging usually, but not always, contains goods or materials for further processing.

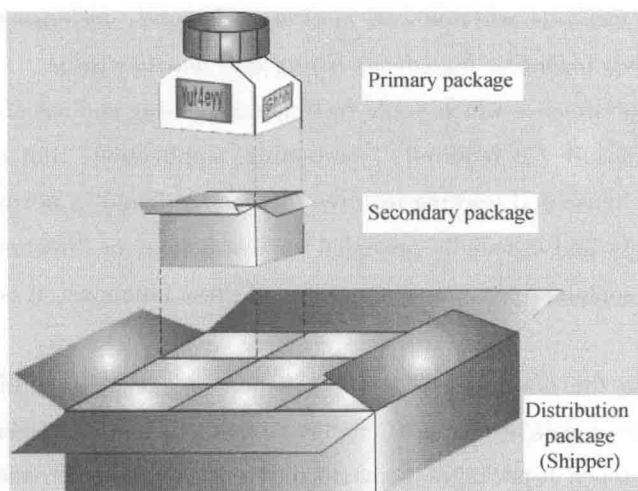


Figure 1-1 Packaging can have many levels. All levels of the system must work together

16 The basic packaging functions have different degrees of importance, depending on the particular packaging level and intended destination. It is common for several packaging levels to

contribute to a single function.

17 The primary package for a breakfast **cereal** is the inner undecorated bag. Its main function is to contain and preserve the product, to a lesser extent, and to protect it. The secondary package, a paperboard **carton**, provides physical protection, informs the consumer and motivates the purchase decision. Twelve cartons are packed into a **corrugated** shipping container to protect the product and to facilitate distribution. The information printed on the corrugated shipper primarily identifies the product for distribution purposes. Finally, corrugated shippers are assembled into a unit load, whose primary purpose is to facilitate transport and distribution.

18 In some instances, a package will be required to assume all the functions. The primary package for a **power tool** may be strong enough to protect the product and withstand the rigors of shipping. This single package may feature all the necessary information to inform and motivate the consumer.

19 Typically, the information/sales function plays a less significant role in industrial packaging.

2.2 The Containment Function

20 The first step in preparing a package design is to consider the nature of the product and the kind of packaging needed to contain the product. These considerations include:

21 • The product's physical form: mobile fluid, viscous fluid, solid/fluid mixture, gas/fluid mixture, granular material, paste, **free-flowing powder**, non-free-flowing powder, solid unit, discrete items, multicomponent mix.

22 • The product's nature: corrosive, **corrodible**, flammable, **volatile**, **perishable**, **fragile**, **aseptic**, **toxic**, abrasive, **odorous**, subject to odor transfer, easily marked, sticky, **hygroscopic**, under pressure, irregular in shape.

23 Throughout this discussion, we will examine the characteristics of various packaging materials and how their qualities influence effective containment packaging design.

2.3 The Protection/Preservation Function

24 In the context of this discussion, "protection" refers to the prevention of physical damage, while "preservation" refers to stopping or **inhibiting** chemical and biological change. To provide physical protection, specifics on what will cause loss of value (damage) must be known. Specifics means knowing not only the general condition, but also a quantified measure of the level of that condition at which unacceptable damage starts to occur (Table 1-1).

Table 1-1 Examples of protective packaging problems and concerns

Condition	Quantification or Design Requirement
Vibration	Determine resonant frequencies
Mechanical shock	Determine fragility factor (drop height)
Abrasion	Eliminate or isolate relative movement



(continued)

Condition	Quantification or Design Requirement
Deformation	Determine safe compressive load
Temperature	Determine critical values
Relative humidity	Determine critical values
Water	Design liquid barrier
Tampering	Design appropriate systems

25 The preservation function most often refers to the extension of food shelf life beyond the product's natural life or the maintenance of **sterility** in food or medical products. Like the protective function, the preservation function needs to be defined and quantified (Table 1-2).

Table 1-2 Typical preservation packaging problems and concerns

Condition	Quantification or Design Requirement
Oxygen	Determine required barrier level
Carbon dioxide	Determine required barrier level
Other volatiles	Determine nature and barrier level
Light	Design opaque package
Spoilage	Determine nature/chemistry
Incompatibility	Determine material incompatibilities
Loss of sterility	Determine mechanism
Biological deterioration	Determine nature
Deterioration over time	Determine required shelf life

2.4 The Transport Function

26 The transport function entails the effective movement of goods from the point of production to the point of final consumption. This involves various transport modes, handling techniques and storage conditions. In addition to the general physical rigors of distribution, there are a number of carrier rules that will influence package design. Examples of some of the information required to design successful distribution packaging appear in Table 1-3.

Table 1-3 Typical transport handling and storage information

truck	rail	aircraft
cargo ship	storage duration	storage conditions
handling methods	unitizing methods	specific shipping unit
weight considerations	stock-picking	dimension limits
carrier rules	environmentally controlled storage	—

27 Transportation and distribution are generally regarded as an activity that is hazardous to the product being moved. In many instances, the stresses that the product will experience are greater than the durability of the unprotected product. *In such instances, it will be necessary to design additional packaging to isolate or cushion the product from the external forces.*

28 Packaging contributes to the safe, economical, and efficient storage of a product. Good package design takes into account the implications of transport and warehousing, not just for the distribution package and unitized load, but for every level of packaging.

2.5 The Information/Sales Function

29 The communication role of packaging is perhaps the most complex of the packaging functions to understand, measure and implement because of the many levels at which this communication must work. Law or customs dictate certain messages without much **leeway** in their presentation. Examples of such message are:

- Specific name of the product (what is this?)
- Quantity contained
- Address of the responsible body

30 However, to promote the contained product effectively, a package must appeal to the potential customer at all levels. A good package is said to have a “**persona**”, or personality. If the designer has done an effective job, that persona will appeal to the targeted audience.

31 The targeted audience itself needs to be identified and studied. This is the realm of **demographics** and **psychographics**.

32 The package itself communicates by many channels such as: selected material, shape and size, color, predominant **typography**, recognizable symbols or **icons**, illustrations.

33 A brand of peanut butter aimed at family consumption might come in a plastic tub with a **snap-on lid**. The text may simply state that it is an economy peanut butter. The tub would have minimal or no illustration. A gourmet peanut butter, on the other hand, would more likely come in a glass jar with an old-fashioned-looking **screw-on closure**. The label would have an upscale name in a carefully selected old-fashioned font. *Features such as embossing or gold stamp printing would further promote the gourmet persona.* The whole package might be offered in a wooden box or placed in a **wicker** basket. Similar products and two totally different packaging treatments might result in the different personas.

34 All of the communication channels must be balanced and supportive of one another to produce a persona with appeal and instant recognition. All supporting material, such as promotions and advertisements, must agree with the image **projected** by the package.

35 Producing a well-balanced package persona requires an intimate familiarity with not just the structural qualities of packaging materials, but also the emotional qualities that they project. *A thorough understanding of the various printing processes and the specialized decorating techniques used to create particular effects or decorate unusual surfaces is essential.*



New Words

hazard ['hæzəd] *n.* 冒险、危险oxygen ['ɒksɪdʒən] *n.* 氧气barrier ['bæriə] *n.* 阻隔性、屏障retard ['ri:tə:d] *v.* 延迟、阻止identification [aɪ,dentɪfɪ'keɪʃ(ə)n] *n.* 辨别、识别aerosol ['ɛərəsɒl] *n.* 气雾剂、气溶胶case [keɪs] *n.* 运输箱 (总称)wrap [ræp] *n.* 包、裹cereal ['siəriəl] *n.* 谷类食品carton ['kɑ:t(ə)n] *n.* 纸盒、硬纸盒corrugated ['kɒrəgeɪtɪd] *adj.* 起波状的、瓦楞的corrodible [kə'rɒdəbl] *adj.* 会腐蚀的、可侵蚀的volatile ['vɒlətaɪl] *adj.*, *n.* 挥发性的, 挥发物perishable ['perɪʃəbl] *adj.* 易腐烂的、易坏的fragile ['frædʒaɪl] *adj.* 易碎的、脆的aseptic [æ'septɪk] *adj.* 无菌的toxic ['tɒksɪk] *adj.* 有毒的、中毒的odorous ['əʊdərəs] *adj.* 有气味的hygroscopic [ˌhaɪgrəʊ'skɒpɪk] *adj.* 吸湿的inhibit [ɪn'hɪbɪt] *v.* 抑制、约束tamper ['tæmpə] *v.* 偷盗、篡改sterility [stə'rɪlɪtɪ] *n.* 无毒性opaque [əʊ'peɪk] *n.* 不透明物; *adj.* 不透明的spoilage ['spɔɪlɪdʒ] *n.* 损坏、(食物等) 腐败incompatibility [ˌɪnkəm.pətə'bɪlɪtɪ] *n.* 不相容hazardous ['hæzədəs] *adj.* 冒险的、危险的leeway ['li:wei] *n.* 灵活性、回旋余地persona [pə'səʊnə] *n.* 人、角色demographics [ˌdɪmə'græfɪks] *n.* 人口统计学psychographics [ˌsaɪkə'græfɪks] *n.* 消费心理学typography [taɪ'pɒɡrəfi] *n.* 印刷 (术)、印刷样式icon ['aɪkɒn] *n.* 图标wicker ['wɪkə] *n.* 柳条; *adj.* 柳条制的project [ˈprɒdʒekt] *v.* 凸显

Phrases and Expressions

shelf life 货架寿命、保存期限

be susceptible to 易受影响的、对……敏感

rapid oxidation 快速氧化

carbonated liquid 碳酸饮料

carbon dioxide 二氧化碳

ease of opening 容易开启

packaging machinery 包装机械

primary package 一次包装 (件) (内包装)

secondary package 二次包装 (件) (中包装)

distribution package 运输包装 (件)

unit load 单元化装载 (集装)

consumer package 销售包装 (件)

industrial package 工业包装 (件)

power tool 电动工具

free-flowing power 自由流动粉料

resonant frequency 共振频率

mechanical shock 机械冲击

fragility factor 脆值因子

drop height 跌落高度

critical value 临界值

relative humidity 相对湿度

storage conditions 贮藏 (仓储) 条件

handling method 搬运/装卸方式 (方法)

snap-on lid 按扣盖、搭锁盖 (可咯嗒一声盖住的)

screw-on closure 旋盖



Notes

1. Packaging has been defined by the Packaging Institute USA, in their GLOSSARY OF PACK-