

纺织服装高等教育“十二五”部委级规划教材

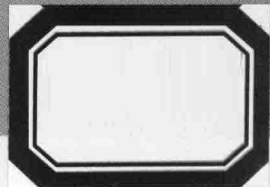
非织造 专业英语

Nonwoven English

薛少林 韩玲 编著

东华大学出版社

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内容提要

本书涉及非织造材料与工程专业的相关知识,内容包括非织造布的概述、纤维原料、非织造布成网、固网、整理、产品、测试及新技术八个部分,每小节后附有生词表、注释,最后附有总词汇表。

本书是为非织造材料与工程专业本(专)科学生提供的专业英语教材,也可作为纺织工程等相关专业的“非织造布概论”课程的双语课教材,亦可供从事非织造材料与工程相关工作的人员参考使用。

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前 言

非织造工业是纺织工业中的一个新兴领域。与传统的纺织生产技术相比,非织造布生产技术具有工艺流程短、产量高、原料来源广、产品品种多、应用范围广等突出优点,近年来一直保持高速发展的势头。与此同时,对非织造材料与工程专业的技术人员也提出了更高的要求:不仅要掌握广博的专业知识,而且还应具备较高的专业英语应用能力。后者包括在研究开发中查阅专业英文资料、撰写学术报告或论文的能力;在设备引进、原料进口和产品出口中阅读、翻译和撰写有关专业英文资料或文件的能力;在国际学术研讨会及各种业务活动中与国外同行用英语进行专业沟通与交流的能力等。因此,必须加强专业英语的学习,提高专业英语水平,使学生从英语学习过渡到实际应用,即是本教材的编写动机。

本教材为满足非织造材料与工程专业的专业英语教学需求而编写,其目的是使学生熟悉和掌握本专业常用的词汇、词组和句式,提高专业文献的阅读、翻译、写作及与国外同行进行专业沟通与交流的能力。

本书由薛少林和韩玲编写。全书共分八章,其中前四章由薛少林编写,后四章由韩玲编写。在编写过程中,付婷婷对书中的语法问题提出了许多有益的意见和建议,书中还参考和选编了许多国外经典著作、学术期刊等作者的成果,在此一并表示诚挚的谢意。

由于编者水平有限,书中纰漏之处在所难免,恳请广大读者批评指正。

编 者

2012年10月

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CHAPTER 1

General Introduction

1.1 Definition of Nonwovens

Nonwovens are textiles/sheet products in form of webs of separate fibers. Different from the conventional textile fabrics and paper, nonwovens are not made from yarns and thus normally do not contain them. Usually nonwovens entirely consist of or at least contain a big proportion of long fibers, which are bonded intermittently. Although paper is composed of fiber web, the fibers are bonded to each other so completely that the entire sheet comprises one unit. In nonwovens the fibers are not rigidly bonded and, to a large degree, act as individuals.

The definitions of the nonwovens most commonly used nowadays are those adopted by the Association of the Nonwovens Fabrics Industry (INDA), the European Disposables and Nonwovens Association (EDANA) and the American Society for Testing Materials (ASTM).

1.1.1 Definition of INDA

Nonwoven fabrics are broadly defined as sheet or web structures bonded together by entangling fibers or filaments (and by perforating films) mechanically, thermally or chemically. They are flat, porous sheets that are made directly from separate fibers or from molten plastic or plastic film. They are not made by weaving or knitting and do not require converting the fibers to yarn.

1.1.2 Definition of EDANA

Nonwovens are a manufactured sheet, web or batt of directionally or randomly oriented fibers, bonded by friction, and/or cohesion and/or adhesion, excluding paper or products which are woven, knitted, tufted stitch bonded incorporating binding yarns or filaments, or felted by wet milling, whether or not additionally needed. The fibers may be of natural or man-made origin. They may be staple or continuous or be formed in situ.

1.1.3 Definition of ASTM

A nonwoven is a textile structure produced by the bonding or interlocking of fibers, or

both^[1], accomplished by mechanical, chemical, thermal or solvent means and combinations thereof. The term does not include paper or fabrics that are woven, knitted or tufted.

New Words and Expressions

nonwoven	[nɒ'wəʊvən]	adj.	非纺织的
		n.	非织造布
textile	[ˈtekstaɪl]	n.	纺织品; 织物; 纺织
yarn	[jɑ:n]	n.	纱; 纱线
fiber	[ˈfaɪbə]	n.	纤维
bind	[baɪnd]	vt.	(使)黏合
filament	[ˈfɪləmənt]	n.	长丝
weave	[wi:v]	vt. & vi.	织; 机织
knit	[nɪt]	vt. & vi.	针织; 编织
batt	[bæt]	n.	棉层; 棉网; 棉絮
tuft	[tʌft]	vi.	形成一簇
		n.	一簇; 一束
stitch	[stɪtʃ]	vt.	缝编
in situ	[ɪn'saɪtju:]		在原位置; 在原处

Notes

[1] A nonwoven is a textile structure produced by the bonding or interlocking of fibers, or both, ... 非织造布是通过纤维间黏合、缠结或两者相结合而制成的一种纺织结构材料, ... produced by... 为过去分词短语作 textile structure 的后置定语, 意为“通过……制成(生产)的”, 在意思上与定语从句“which is produced by...”相当, 但文体更简洁。

1.2 Classification of Nonwovens

The production of nonwovens can be divided into three stages, which are web formation, web bonding and finishing treatment.

Web formation methods: dry-laid, wet-laid, spun-laid and meltblown.

Web bonding methods: adding an adhesive, thermally fusing the fibers or filaments to each other or to the other meltable fibers or powders, creating physical tangles among the fibers, stitching the fibers or filaments.

Finishing treatment methods:

① Dry finishing: shrinkage, calendaring and pressing, perforating and slitting, splitting, grinding and singeing.

② Wet finishing: washing, dyeing, printing, chemical finishes (antistatics, antimicrobials, water repellents, lubricants, UV absorbers, flame retardants...), coating, laminating, flocking.

According to method of web formation, nonwovens can be classified into the following types^[1]: dry-laid nonwovens, wet-laid nonwovens, spunbond nonwovens, meltblown nonwovens.

New Words and Expressions

dry-laid			干法
wet-laid			湿法
spun-laid			纺丝成网; 纺黏法
meltblown			熔喷法
adhesive	[əd'hi:siv]	<i>n.</i>	黏合剂
calendar	['kælɪndə]	<i>vt.</i>	轧光
slit	[slɪt]	<i>vt.</i>	开缝
split	[splɪt]	<i>vt.</i>	剖层; 劈开
grind	[graɪnd]	<i>vt. & vi.</i>	磨; 磨光
singe	[sɪndʒ]	<i>vt. & vi.</i>	烧毛
dye	[daɪ]	<i>vt. & vi.</i>	染色
		<i>n.</i>	染料
antistatic	[æntɪ'stætɪk]	<i>adj.</i>	抗静电的
antimicrobial	[æntɪmaɪ'krəʊbiəl]	<i>adj.</i>	抗菌的
retardant	[rɪ'tɑ:dənt]	<i>adj.</i>	延缓的; 使迟滞的
laminate	['læməneɪt]	<i>vt.</i>	叠层
flocking			植绒
spunbond			纺黏法

Notes

[1] According to method of web formation, nonwovens can be classified into the following types: ... 根据成网方式, 可将非织造布分为以下几种类型:

主句为被动语态, 被动语态是科技英语中使用较多的语态, 翻译时要根据中文习惯译, 如该句译为“可将非织造布分为以下几种类型”比“非织造布可被分为以下几种类型”更好。

1.3 Development of Nonwovens

1.3.1 History and Background

The concept of making fabrics directly from fibers on needlepunch machinery

achieved commercial viability in North America and Europe more than 75 years ago. Much of the early work with nonwovens was done by cotton mills, which were seeking to upgrade cotton waste into salable products such as furniture stuffing and wipes. Facilities for commercially producing nonwoven fabrics using wet-laid technology were established in the United States during the 1930s. Large-scale commercial production facilities for chemically bonded nonwovens were placed in operation in the United States during the early 1940s as well as in Europe and Japan since World War II. The earliest nonwoven products recognized by consumer were wipes, developed by Chicopee's in the mid-1950s.

Up until the 1960s, the major technology for nonwovens was based on dry-laid technology. The 1960s, however, saw the introduction of spunbonded, meltblown, needlepunch and wet-laid nonwoven technology^[1]. By the 1970s, the establishment of a trade association for nonwovens, the Association for the Nonwoven Fabrics Industry (INDA), provided a focal point for nonwovens as useful and distinct materials differentiated from conventional textile materials.

In the decade of 1980s, nonwovens, particularly spunbonded and meltblown products, dramatically increased throughout the world.

The 1990s marked the era of widespread acceptance of nonwovens as performance and problem solving materials for industries as diverse as civil engineering and healthcare. Many of the products that came into use during this time were based on composites made by combining different types of nonwovens and/or nonwovens with other materials, such as films and foams^[2]. By the mid-1990s about half of the worldwide nonwoven fabric production capacity was located in North America, a third in Europe. Capacities in these areas were expanding at annual growth rates ranging 6 to 10 percent through both productivity improvements and the installation of new facilities. In addition, new nonwoven enterprises were being launched throughout Asia and South America. At that time about two-thirds of all nonwovens were made directly from fibers and one-third were made directly from polymers. Some portions of the nonwovens industry were technology driven while others were market driven. Many nonwovens producers continued the quest for new markets and more opportunities to compete with traditional textiles, papers, and plastics. Commodity materials definitely have their place in nonwovens, but in order to strengthen industry competitive, special value-added products and unique technology are crucial.

1.3.2 Trends in Materials, Process and New Products

Consumption of nonwovens is proportional to disposable income to households. Demand for nonwovens will increase as middle classes grow in developing countries.

INDA reports that hydroentangling will become more prevalent as the process continues to become more energy efficient and economies of scale are realized. Process will be required to change as the cost increases and in short of inexpensive water. Emphasis

should be placed on increasing of composite fabrics made by combining processes or different fabrics. Besides, value added treatments will become more prominent.

Affected by globalization, nonwoven industry is, rapidly spreading new technologies around the world.

The technical activity in the industry is focused on higher value markets, e. g. textile substitution and value added applications. The industry is exerting strong pressure for faster market tactics, value addition and cost reduction in manufacturing. Product differentiation is considered as the key to competition and innovation the key for nonwovens industry growth.

New Words and Expressions

needlepunch			针刺
viability			可行性
stuffing	[ˈstʌfɪŋ]	n.	填充物; 填料
wipe	[waɪp]	vt. & vi.	擦; 拭
		n.	抹布; (湿)纸巾
healthcare			卫生保健; 医疗保健
foam	[fəʊm]	n.	泡沫; 泡沫材料
		vi.	起泡沫
turnkey	[ˈtɜːnki]	adj.	可立即投入使用的
disposable	[dɪˈspəʊzəbəl]	adj.	用即弃的; 一次性的; 可自由支配的
household	[ˈhaʊshəʊld]	adj.	家庭的; 家用的
hydroentangling			水刺法
prevalent	[ˈprevələnt]	adj.	普遍的; 盛行的; 流行的
tactic	[ˈtæktɪk]	n.	方法; 策略

Notes

[1] The 1960s, however, saw the introduction of spunbonded, meltblown, needlepunch and wet-laid nonwoven technology. 然而, 20 世纪 60 年代, 非织造布采用了纺黏法、熔喷法、针刺和湿法技术。 saw(see)的意思为“经历”, introduction 作“采用”解。

[2] Many of the products that came into use during this time were based on composites made by combining different types of nonwovens and/or nonwovens with other materials, such as films and foams. 此时期应用的许多产品都基于不同类型的非织造布、非织造布与其他材料(如薄膜和泡沫)复合制成的复合材料。

that came into use during this time 是定语从句, 说明 products, 其中 during this time 作该从句的时间状语。

CHAPTER 2

Fibers for Nonwovens

2.1 Introduction

Fibers are the basic elements of Nonwovens. Almost any kind of fibers, including traditional textile fibers and recently developed hi-tech fibers^[1], can be used to produce nonwovens. The selection of raw fibers, to considerable degree^[2], determines the properties of the final nonwoven products. Besides, the selection of fibers depends on customer requirement, cost, processability, changes of properties caused during web formation and consolidation. The fibers can be in the form of filament, staple fiber or even yarn.

Cotton has excellent inherent properties for nonwovens fabrication. Viscose rayon has been widely used in the nonwovens industry in the area of disposables and sanitary products. Rayon fibers can be easily made into webs and readily bonded into nonwovens fabrics. All these cellulosic fibers, such as cotton, rayon and acetate are absorbent, and they possess adequate strength combined with biodegradability^[3]. Among the synthetic fiber polypropylene (PP) is widely used. PP is inexpensive and has very good rheological characteristics to form fine fibers^[4]. PP fibers are hydrophobic, voluminous, and thermoplastic in nature. Polyethylene terephthalate (PET) is used where strength and mechanical properties are of prime importance. Nylon fibers are used for their excellent recovery (resiliency) properties. Bicomponent fibers with different polymers in the core and sheath are widely used in thermally bonded nonwovens. Recent developments in bicomponent fiber structure include segmented pie, islands in sea structures. Fiber requirements for nonwovens depend on the product being produced and the fabrication process being used^[5].

With nonwovens products successfully moving into more technical end-uses, the fiber requirements have also become more exacting with regard to the fiber properties^[6]. The cooperation between fiber supplier and fabric producers is now seen as important criteria for additional advancements to come about in the nonwovens field.

Although a large number of fibers are available, commercially important nonwoven fabrics have been limited to relatively few types, the dominant fibers include polyolefins, polyester, and rayon. These three fiber types made up a substantial part of the overall

nonwovens markets for fibers.

The Nonwoven textile industry has made dramatic technical and commercial progress in recent years. World consumption of fibers in nonwoven production is 63% polypropylene, 23% polyester, 8% viscose rayon, 2% acrylic, 1.5% polyamide and 3% other high performance fibers. Future advancements will be in bicomponent fibers, micro fibers (split bicomponent fibers or meltblown non-wovens), nano fibers, biodegradable fibers, super-absorbent fibers and high performance fibers.

New Words and Expressions

microbial	<i>adj.</i>	微生物的
Polyethylene terephthalate		聚对苯二甲酸乙二醇酯
criteria	[kraɪ'tɪəriə]	(criterion 的复数) (批评、判断的)标准; 尺度
polyolefin		聚烯烃纤维
incontinence	[ɪn'kɒntənənt]	<i>adj.</i> (大小便)失禁的; 不能自制的

Notes

- [1] recently developed hi-tech fibers. 最近开发的高科技纤维。
developed 为过去分词, 相当于一个形容词, 作前置定语, 修饰 hi-tech fibers; hi-tech 为合成形容词, 其构词法为 high 和 technology 两个词各取其前面一部分合在一起, 作“高科技”或“高技术”解。
- [2] to considerable degree 在很大程度上。
介词短语作状语表示程度, 修饰 selection of raw fibers。
- [3] All these cellulosic fibers, such as cotton, rayon and acetate are absorbent, and they possess adequate strength combined with biodegradability. 所有的纤维素纤维, 如棉、人造丝和醋酸纤维都具有较强的吸水性, 并具有合适的强力及生物降解性。
句中的 such as 连接同位语, 即 cotton, rayon and acetate 皆为 cellulosics 的同位语, such as 作“例如”解。
- [4] PP is inexpensive and has very good rheological characteristics to form fine fibers. 聚丙烯价格低廉, 具有形成细特纤维的良好的流变学特性。
句中 to form fine fibers 为不定式短语作定语, 修饰 rheological characteristics。
- [5] Fiber requirements for nonwovens depend on the product being produced and the fabrication process being used. 对非织造布纤维的要求取决于生产的产品和使用的制备工艺。
being produced 和 being used 都是现在分词被动语态, 分别作 product 和 fabrication process 的后置定语。
- [6] With nonwovens products successfully moving into more technical end-uses, the fiber requirements have also become more exacting with regard to the fiber properties. 随着非织造布产品成功地进入更多的产业用领域, 它对纤维性能的要求也越来越严格。
With 引导的介词短语作状语, With 作“随着”解, 此短语也可改为由连接词 as 引导的状语从句“*As nonwovens products successfully move into more technical end-uses*”, 意思相同。