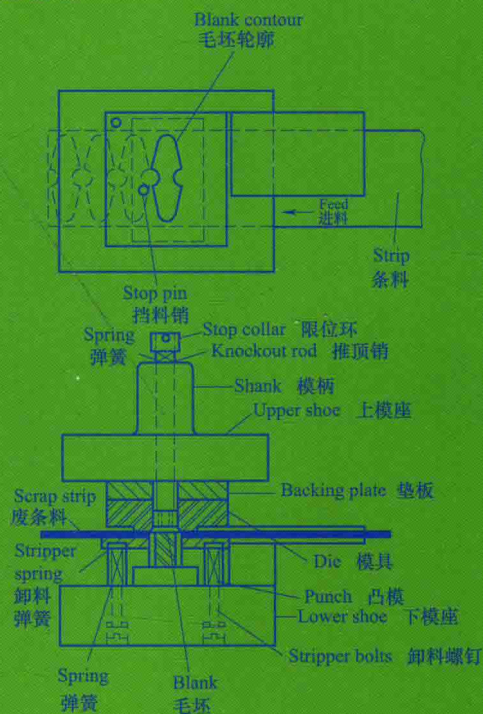
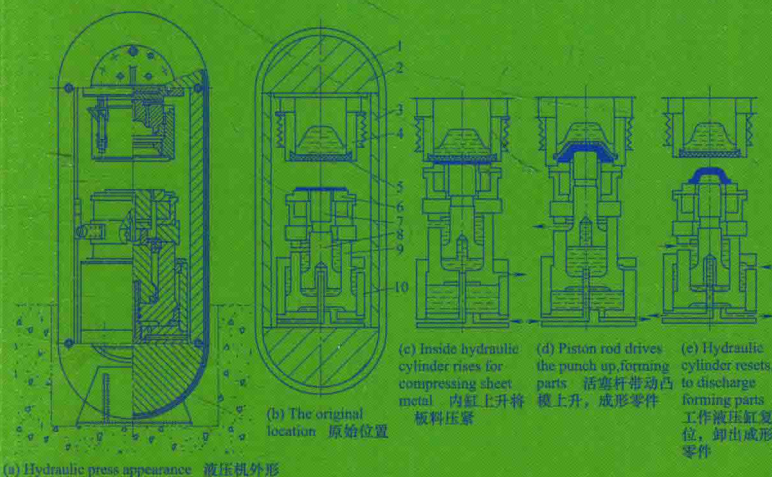


模具图+英文+中文
一目了然解读专业英语

模具专业英语 图解教程

吴拓 编著

Diagrammatic Professional
English of Mould



化学工业出版社

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· 北京 ·

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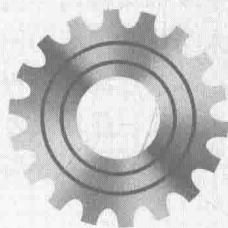
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前言

Foreword



英语不仅是开展国际交流的重要工具,也是科技信息的重要载体。随着我国科学技术的高度发展和全球经济一体化的快速形成,越来越多的企业对工程技术人员的专业外语水平提出了较高的要求。专业科技英语对于工程技术人员和理工科大学学生的重要性不言而喻。

本书旨在帮助模具专业的工程技术人员和学生提高直接阅读科技英语原文和翻译模具专业英语资料能力,学习和借鉴国外先进的模具设计和制造技术,特别是模具 CAD/CAM 等应用软件;能够用英语撰写模具专业科技论文和模具产品贸易文件,提高工程技术人员进行国际交流和开展国际业务的能力,从而大力推进我国模具制造工业的快速发展。

本书充分体现以下四大特点。

1. 契合专业,突出应用。本书全面、系统、完整地按模具类别划分单元结构,精选设计图样,适应各类模具工艺的需要。它既是一本英语学习书,也是一本可供模具技术人员参考的技术手册。

2. 图文并茂,英汉对照。本书以从事模具设计与制造的技术人员所熟知的图样为主导,直观、形象、具体地作出英语标示,做到图有所示,词有所指,图词对应,看图识词,伴有解说,帮助理解和记忆。为便于学习,采取英汉对照的形式,突出与模具紧密相关的内容,结合实用图样进行例释,有利于理解和掌握专业英语词汇,也有利于丰富模具设计知识。

3. 检索方便,学用结合。本书配有英文索引和中文索引,既方便阅读模具专业英文资料,又方便撰写模具专业英文文件。

4. “一石二鸟”,事半功倍。本书虽然名为模具技术专业英语,以模具设计与制造为主,但也适用其他机械制造技术;虽然是为学习专业英语而作,但也对学习模具设计与制造的知识有一定帮助,可达到“一石二鸟”的双重效果。

本书内容丰富、实用性强,全书共分六个单元,包括模具技术概述、冲压模具、塑料成型模具、热工模具、模具钳工工作及模具加工常用机械装置和模具商务英语。内容比较全面,涉及模具的分类和作用、各种成型模具的结构设计、模具的加工工艺、模具的加工设备及工具等知识,提供了近 2000 个专业英语词汇。

本书可供高等院校模具设计与制造专业作为教材使用，也可供模具设计与制造专业的技术人员作为简明的图解模具技术英汉词汇手册学习、使用。

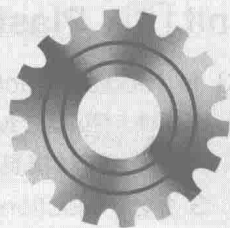
本书在编写过程中，得到各位同仁的支持和帮助，熊锡源博士为本书的关键内容作了校改，在此一并表示衷心感谢！

由于编者水平所限，书中难免有疏漏和欠妥之处，恳请各位专家和读者不吝指正。

编 者

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Unit 1

Summarize of Mould Technology 模具技术概述

1.1 Role and Type of Mould 模具的作用及类型

1.1.1 Mould Role in Industrial Production 模具在工业生产中的作用

Mould (mold) is the foundational process equipment of industrial production, is the mother of industry. In industrial production, all kinds of parts or products are obtained by machining or mould forming, including mould based on their specific shape and through certain way makes raw materials conform to the required shape parts or products. For example, stamping and forging are acquired by the way that metal materials occur plastic deformation in the mould. Metal squeeze casting, powder metallurgy parts and non-metallic products such as plastic, ceramic, rubber, glass etc., the vast majority are in mould forming. Because the mould forming has characteristics of high quality, high yield, save material and low cost, so the mould has become one of the important process equipment that is used most widely in modern industrial production. That technique and technology is used in mould forming so that processes parts have been used extremely extensively in various fields of national economy, especially in the automobile, tractor, aerospace, instrument and meter, machinery manufacturing, petrochemical industry, household electrical appliances, daily necessities of light industry and other industrial departments. The products with mould have high precision, high complexity, high consistency, high productivity and low consumption, is can't be matched by other manufacture methods. 模具是工业生产的基础工艺装备, 是工业之母。在工业生产中, 各类零件或产品都是通过机械加工或模具成形而获得的, 其中模具是以其特定的形状并通过一定的方式使原材料成为符合所需形状的零件或产品的。例如, 冲压件和锻件是通过冲压或锻造方式使金属材料在模具内发生塑性变形而获得的制件; 金属压铸件、粉末冶金零件以及塑料、陶瓷、橡胶、玻璃等非金属制品, 绝大多数也是用模具成形而获得的。由于模具成形具有优质、高产、省料和低成本的特点, 所以模具已成为当代工业

生产中使用最为广泛的重要工艺装备之一。利用模具成形来加工零部件的技术和工艺已在国民经济各个领域，特别是汽车、拖拉机、航空航天、仪器仪表、机械制造、石油化工、家用电器、轻工日用品等工业部门得到极为广泛的应用。用模具生产制件所具备的高精度、高复杂程度、高一致性、高生产率和低消耗，是其他加工制造方法所不能比拟的。

According to the prediction of the international technology association, in industrial field in the world, 75% of rough machining of the mechanical parts and 50% of finishing parts can be complete by mould. In the meantime, the mould is “benefit amplifier”, the value of the final product with mould, is often several times or even one hundred times of mould's own value. 根据国际生产技术协会的预测，在世界工业生产领域内，机械零件粗加工的 75% 和精加工的 50% 都可以用模具来完成。同时，模具又是“效益放大器”，用模具生产的最终产品的价值，往往是模具自身价值的几十倍甚至上百倍。

The high-low of the mould manufacturing technology level has become one of the important marks which measures manufacturing level of a country, because the mould decides the quality of products, benefits and development capability of new product in a large part. Not only that, but many of the development of modern industry and the improvement of technical level depends on the development level of die and mould industry in a large part. Today, die and mould industry is gradually becoming independent industry to keep pace with the machine tool industry, become an important part of modern industrial production and technology development direction, become the important basis for the development of national economy. 模具制造技术水平已成为衡量一个国家机械制造水平的重要标志之一，因为模具在很大程度上决定着产品的质量、效益和新产品的开发能力。不仅如此，许多现代工业的发展和技术水平的提高，在很大程度上都取决于模具工业的发展水平。如今，模具制造业正逐步成为与机床工业并驾齐驱的独立行业，成为当代工业生产的重要组成部分和工艺发展的方向，成为国民经济发展的基础。

1.1.2 Mould and the Type of Mould 模具及模具的类型

Mould is made of the mechanical parts. It is a forming tool that with match of the corresponding pressure forming machines, such as punching machine, plastic injection machine, die-casting machine, etc., can be directly changing the shape, size, position and nature of the metal or nonmetal material, makes them forming qualified parts or semi-finished products. 模具是由机械零件构成的，在与相应的压力成形机械（如冲压机、塑料注射机、压铸机等）相配合时，可直接改变金属或非金属材料的形状、尺寸、相对位置和性质，使之成形为合格制件或半成品的成形工具。

Mould is basic process equipment of the forming parts of metal, plastic, rubber, glass, ceramic etc. Many parts must use mould to take shape. Mould used the flow and deformation of materials to get the parts with required shape and size, so it can realize less chip, non-chip, saving raw materials. 模具是成形金属、塑料、橡胶、玻璃、陶瓷等制件的基础工艺装备。许多制件必须用模具才能成形。模具常利用材料的流动、变形获得所需形状和尺寸的制件，因此可实现少切屑、无切屑，节约了原材料。

Many different kinds of mould are there. According to the forming characteristics of the

material in the mould, mould can be divided into two types of cold die and cavity mould. 模具的种类很多, 按材料在模具内成形的特点, 模具可分为冷冲模及型腔模两大类型。

1.2 Processing Technology of Mould 模具加工工艺

1.2.1 Technical Requirements of Mould 模具的技术要求

Mould is an important process equipment in modern industrial production. Compared with other mechanical products, mould has specific requirements for design, manufacture and use, which are illustrated as follows. 模具作为现代工业生产的重要工艺装备, 与其他机械产品相比, 模具在设计、制造、使用过程中有其特殊的要求, 具体表现如下。

① Mould parts should have high strength, rigidity, abrasion resistance, impact resistance, hardenability and good cutting processability. 模具零件应具有较高的强度、刚度、耐磨性、耐冲击性、淬透性和较好的切削加工性。

② Precision demand of shape and size of mould parts is high, requirement of surface roughness value of mould is small. 模具零件的形状、尺寸精度要求高, 表面粗糙度数值要求低。

③ The standardization of mould parts. The standardization of mould parts directly affect the mould manufacturing cycle, manufacturing cost and manufacturing quality, with the development of the mould manufacturing technology, a growing number of mould parts will use a standardized production. 模具零件的标准化。模具零件的标准化直接影响到模具的制造周期、制造成本及制造质量, 随着模具制造技术的发展, 越来越多的模具零件会采用标准化生产。

④ Mould should have reasonable clearance between punch and cavity die. 模具凸、凹模之间应具有合理的间隙。

1.2.2 Mould Manufacturing Process 模具制造工艺过程

Mould manufacturing process includes five stages: production technology preparation, stock, machining parts and components, assembly and debugging, test and appraisal. 模具制造工艺过程包括 5 个阶段: 生产技术准备, 备料, 零件、组件加工, 装配调试和试模鉴定。

① Preparation for production technologies stage. In this stage, all preparations for the production and the technologies are made before the mould production. It is the foundation of the whole production, having great impact on the quality, costs, schedule and management of the moulds. This stage is featured by different aspects of work about the mould, such as the empirical research and design, process design, design and production of the special purpose processing equipment, preparation of various production information, formulate of material consumption norm and norm of working hour, estimation of mould costs, and organizing production. 生产技术准备阶段。主要是完成模具产品投入生产前的各项生产和技术准备工作, 是整个生产的基础, 对模具的质量、成本、进度和管理都有重大的影响。生产技

术准备阶段工作包括模具产品的试验研究设计、工艺设计和专用工艺装备的设计与制造、各种生产资料的准备、材料定额和加工工时定额制定、模具成本的估算以及生产组织等方面。

② Stock stage. To determine the mould part blank's type, form, size and the related technical requirements. 备料阶段。确定模具零件毛坯的种类、形式、大小及有关技术要求。

③ Processing of parts and components stage. This stage includes mould machining, special processing, welding, heat treatment, and other surface treatment and so on. 零件、组件加工阶段。如模具的机械加工、特种加工、焊接、热处理和其他表面处理等。

④ Assembly and debugging stage. Include the assembly of parts, final assembly, debugging and marking, etc. 装配调试阶段。包括部装、总装、调试和打标记等。

⑤ Test and appraisal stage. To make a evaluation of rationality and validity for mould design and manufacturing quality, determine whether the mould can achieve the desired function. 试模鉴定阶段。对模具设计及制造质量做合理性与正确性的评估,判定模具是否能达到预期的功能要求。

It is evident to see from the above process that the mould production process is complicated. In order to facilitate the organization of production and improve labor productivity, there is a development trend of modern mould industry towards automation and specialization, which does not only make the factory production process simple, but also helps to guarantee product quality, improve efficiency and reduce costs. 由上述过程不难看出,模具产品的生产过程是相当复杂的。为了便于组织生产和提高劳动生产率,现代模具工业的发展趋势是自动化、专业化生产,使得各工厂的生产过程变得简单,有利于保证质量、提高效率和降低成本。

1.2.3 Mould Manufacturing Characteristics 模具的制造特点

Strictly speaking, mould manufacturing belongs to the category of machinery manufacturing, but even an enterprise with powerful capability of machinery manufacturing may not be able to undertake tasks of mould manufacturing; it may be still harder to produce high quality moulds. This is because mould manufacturing is difficult and has many particularities compared with general machinery manufacturing. 严格来说,模具制造也属机械制造的范畴,但即使是一个机械制造能力较强的企业,也未必能承担模具制造任务,更难保证制造出高质量的模具。这是因为模具制造难度较大,与一般机械制造相比,有许多特殊性。

① Mould parts have complicated shape and high processing requirements. 模具零件形状复杂,加工要求高。

② The processing process of mould parts is complex, and the processing cycle takes much time. The processing of each part requires the cooperation between several machines, workers, workshops or even in collaboration with factories to complete. 模具零件加工过程复杂,加工周期长。每一个零件加工需要有多台机床、多个工人、多个车间甚至多个工厂共同协作完成。

③ Mould parts processing belongs to a single small batch production. Therefore, in terms of its process, should have the following characteristics. 模具零件加工属于单件小批

量生产。因此,就其工艺过程来讲,应具备以下一些特点。

a. No or less use special tools, as far as possible the use of general tools. 不用或少用专用工具,尽量采用通用工具。

b. In principle, by general cutting tools as much as possible to avoid non-standard cutting tools. 原则上采用通用刀具,尽可能避免非标准刀具。

c. As far as possible uses the general duty measure tools for test. 尽可能采用通用量具检验。

d. Mould processing mostly use the general duty machine tools, and rarely use dedicated machine tools. 模具加工大都使用通用机床,而很少使用专用机床。

④ Mould processing precision is high. Mould machining accuracy is mainly manifested in two aspects: one is the processing precision requirement of mould parts is high, the second is the interrelated parts with high cooperating accuracy. 模具加工精度高。模具的加工精度主要表现在两方面:一是模具零件本身的加工精度要求高,二是相互关联的零件其配合精度要求高。

⑤ Mould parts need to be repeated making repairs and supplying replacements, and adjustment. The mould after the test, according to the test case, need to adjust the mould shape and size. For the convenience of replacement and adjustment of mould parts, in processing process, sometimes put heat treatment and surface treatment into last of parts processing, i. e. after the test. 模具零件需反复修配、调整。模具在试模后,根据试模情况,需重新调整模具的形状及尺寸。为了方便模具零件的修配、调整,加工过程中,有时把热处理、表面处理等工序放在零件加工的最后,即试模后进行。

⑥ Considering the influence of wear and expand on heating and contract on cooling in the working process of the mould, in the mould parts processing, often consciously control select direction of values of mould parts. 考虑模具在工作过程中的磨损及热胀冷缩的影响,模具零件加工中,常常有意识控制模具零件的选取值方向。

1.2.4 The Compiling of Mould Manufacturing Process Planning 模具制造工艺规程的编制

(1) Mould Manufacturing Process Content 模具制造工艺内容

Like other mechanical processing technology content, mould processing technology work content is as follows. 与其他机械加工工艺内容一样,模具加工时工艺人员的工作内容如下。

① Compiling process documents. Mould process documents include mould parts processing technological procedure, key points of mould assembly process or technological procedure, list of raw material, purchased parts list and cooperation parts list, etc. 编制工艺文件。模具工艺文件主要包括模具零件加工工艺规程、模具装配工艺要点或工艺规程、原材料清单、外购件清单和外协件清单等。

② Design of secondary tools and formation of their processing methods. Secondary tools refer to all types of special tools used in the machining and assembling of moulds. Such tools are normally designed by mould technicians who are also responsible for the formation of

their processing methods. 二类工具的设计和工艺编制。二类工具是指加工和装配模具时所用的各种专用工具。这些专用的二类工具,一般都由模具工艺技术人员负责设计和编制工艺。

③ Processing technical problems of machining site. 处理加工现场技术问题。

④ The punch test and pressure test for all kinds of mould after assembling is an important link of the mould production, mould process technicians and other related personal through the punch test and pressure test, analyze technical problems and propose solutions, and make the right conclusions for the final technical status of the mould quality. 各种模具在装配之后的试冲和试压是模具生产的重要环节,模具工艺技术人员和其他有关人员通过试冲和试压,分析技术问题和提出解决方案,并对模具的最终技术质量状态做出正确的结论。

(2) The Compiling of Mould Manufacturing Process Rules 模具制造工艺规程的编制

① The concept of process rules. Process file of stipulating manufacturing process and operation method of products or parts called process rules. Mechanical machining process rules should stipulate generally process contents, test methods, cutting parameters, the time quota and used machine tools and process equipment, etc. Reasonable process rules have the very vital significance to ensure product quality, improve labor efficiency, reduce raw material and power consumption, improve labor conditions. 工艺规程的概念。规定产品或零件制造工艺过程和操作方法的工艺文件称为工艺规程。机械加工工艺规程一般应规定工序的加工内容、检验方法、切削用量、时间定额以及所采用机床和工艺装备等。合理的工艺规程对保证产品质量、提高劳动效率、降低原材料及动力消耗、改善工人的劳动条件等有十分重要的意义。

② The role of process rules. Process rules are established on the basis of summarizing the practical experience, on the basis of scientific theory and the necessary process test, reflect the objective law of processing. It's role in the production process has the following several aspects. 工艺规程的作用。工艺规程是在总结实践经验的基础上,依据科学的理论和必要的工艺试验后制订的,反映了加工中的客观规律。其在生产过程中的作用有以下几个方面。

a. Process rules are important technical documents for guiding the production. 工艺规程是指导生产的重要技术文件。

b. Process rules are the basic foundation of production organization and management. 工艺规程是生产组织和生产管理工作的基本依据。

c. Process rules are the basic data of construction or expansion of the factory or workshop. 工艺规程是新建或扩建工厂或车间的基本资料。

③ The principle of making process rules. The basic principle of compiling mould manufacturing process rules is under certain production conditions, to make sure the production with the lowest cost and highest production efficiency, to work out reliably the conform to the requirements of the design drawings and technical requirements of product parts. A reasonable process rule must reflect the basic requirement of the following aspects. 制定工艺规程的原则。制定工艺规程的基本原则是在一定的生产条件下,所编制的工艺规程能保证以最低的生产成本和最高的生产效率,可靠地加工出符合设计图样要求及技术要求的零件。一个合理的工艺规程要体现出以下几方面的基本要求。

- a. The reliability of the product quality. 产品质量的可靠性。
- b. Advanced technology. 工艺技术的先进性。
- c. The good economic efficiency. 良好的经济效益性。
- d. The good working conditions. 良好的劳动条件。

④ Mould manufacturing process rules preparation steps. Mould manufacturing process rules establishment steps are as follows. 模具制造工艺规程编制的步骤。模具制造工艺规程编制的步骤如下。

- a. Mould manufacturability analysis. 模具工艺性分析。
- b. Determine the workblank form. 确定毛坯形式。
- c. Protocol process route. 拟定工艺路线。
- d. Determine the machining allowance of each process and the process dimension and its tolerance. 确定各工序的加工余量，计算工序尺寸及其公差。
- e. Select using machine equipment and tool, fixture and measuring tool and auxiliary means in each the process. 选择各工序使用的机床设备及刀具、夹具、量具和辅助工具。
- f. Determine the cutting dosage and time quota. 确定切削用量及时间定额。
- g. Fill in the process documents. 填写工艺文件。

1.3

Process Method and Equipment of Mould 模具制造方法及设备

1.3.1 Manufacturing Method of Mould 模具的制造方法

Mould manufacturing refers to the production of moulds. It comprises of two procedures. First, material used to make mould parts (normally metals) is processed with certain manufacturing equipment and technology and is changed in shape, size, relative position, and quality to become the mould parts in accordance to the requirements. Second, these parts are matched, positioned, connected, fixed, and assembled into moulds. 模具制造是指模具的生产，它包括两个步骤。首先，在一定的制造装备和制造工艺条件下，直接对模具零件材料（一般为金属材料）进行加工，以改变其形状、尺寸、相对位置和性质，使之成为符合要求的模具零件。其次，再将这些零件经配合、定位、连接与固定、装配成为模具。

Major methods used to process mould materials (metallic or non-metallic) into moulds include the conventional mechanical processing, special processing, and plastic processing, casting and welding. 将模具材料（金属或非金属）加工成模具的方法，主要有常规机械加工、特种加工以及塑性加工、铸造和焊接加工方法等。

(1) Conventional Mechanical Processing 常规机械加工

Conventional mechanical processing (i. e., the traditional cutting and grinding) is an indispensable, important processing method in mould manufacturing. Even moulds are manufactured with other processing methods, some work is still done with cutting or grinding, such as the mould base processing, mould blank processing, moulded surface processing and

hole machining. 常规机械加工（即传统的切削与磨削加工）是模具制造中不可缺少的一种重要的加工方法。即使是用其他加工方法制造模具，也需要采用切削或磨削加工来完成某些工作。例如模架加工、模坯加工、模具型面加工以及孔类加工等。

The obvious advantages of the conventional mechanical processing are its high machining accuracy, high production efficiency, and adaptability workpieces of different shapes and sizes can be manufactured with the same machine and tools. However, it also has several disadvantages. It is slow to process workpieces of a complicated shape; it is difficult to process hard materials; its material utilization is not high; it requires a skilled operator. In spite of all these, the conventional mechanical processing method is still the principal processing method in mould manufacturing. 常规机械加工的明显特点是加工精度高、生产效率高，而且用相同的机床和工具可以加工出各种形状和尺寸的工件。但是，用常规机械加工方法加工复杂的形状时，其加工速度很慢，硬的材料也难以加工；材料的利用率不高；而且还要求有熟练的操作工人。尽管如此，在模具制造过程中常规机械加工仍然是主要的加工手段。

(2) Special Processing 特种加工

Special processing, also known as electric processing, is unconventional machining, which is different from the conventional machining method. Broadly speaking, it refers to any processing method that does not use tools harder than the workpiece or exert obvious mechanical forces during the machining process, but directly uses electrical energy, chemical energy, sound energy, light energy to remove redundant parts on the workpiece in order to meet requirements for shape, size and surface roughness. It includes the electric spark forming processing, wire cut electrical discharge machining (WEDM), electrolytic machining, electrochemical polishing, electrolytic grinding, electroforming, chemical etching, ultrasonic machining, laser processing, etc. 特种加工是有别于常规机械加工方法的非传统加工方法，也称电加工。从广义上来说，特种加工是指那些不需要用比工件更硬的工具，也不需要在加工过程中施加明显的机械力，而是直接利用电能、化学能、声能、光能等来除去工件上的多余部分，以达到一定的形状、尺寸和表面粗糙度要求的加工方法，其中包括电火花成形加工、电火花线切割加工、电解加工、电化学抛光、电解磨削、电铸、化学蚀刻、超声波加工、激光加工等。

Special processing relative to the conventional mechanical processing, has the following features. 特种加工相对于常规机械加工，有如下特点。

- ① The processing situation has nothing to do with the hardness of workpiece, can be achieved conquering the unyielding with the yielding.
- ② Tool and the workpiece is generally not contact, don't have to exert obvious mechanical force during the machining process.
- ③ Processing all kinds of complicated shape parts.
- ④ Easy to implement process automation.

Because of the special processing has the characteristic of these precious, so special processing get more and more widely used in mould manufacturing, and become an important method of mould processing.

- ① 加工情况与工件的硬度无关，可以实现以柔克刚。
- ② 工具与工件一般不接触，加工过程不必施加明显的机械力。
- ③ 可加工各种复杂形状的零件。
- ④ 易于实现加工过程自动化。

正因为特种加工有上述这些可贵的特点，所以特种加工在模具制造中得到越来越广泛的应用，并成为模具加工中的一种重要方法。

(3) Plastic Processing 塑性加工

Plastic processing mainly refers to cold extrusion moulding, in which the quenched forming mould (the original male mould) is forced by pressure into the blank made of steel or other soft material without previously undergoing hardening treatment, leaving a duplicate shape of the original male mould on the blank, and producing the mould needed.

塑性加工主要是冷挤压模法，即将淬火过的成形模（原阳模）强有力地压入未进行硬化处理的模坯（钢或其他软质材料）内，使原阳模的形状复印在被压的模坯上，制成所需要的模具。

Cold extrusion moulding method has several advantages. Moulds obtained through this method do not need moulded surface finishing, so it saves time and material. It can be used to make moulds with different moulded surfaces in precision and so a master mould can be used to make many identical moulds. One disadvantage of this method is that an original male forming mould is required in advance, and the mould produced through pressure tends to deform during quenching. 冷挤压模法有几个优点。冷挤压模法所成形的模具完全不需要将型面进行精加工，它制模速度快、省料，可以制成各种复杂型面的模具，且形状精确，利于用一套原模制作多副相同模具。这种制模法一定要事先制作一个成形的原阳模，而且压制后的模具在淬火时易引起变形。

(4) Casting 铸造

Moulds the demand for whose precision and service life is not high can be produced quickly through simple and convenient casting process. 对于一些精度和使用寿命要求不高的模具，人们往往会用简单方便的铸造法快速制成。

① Iron casting. Moulds that are large and irregular such as the car shell are normally produced through casting. The advantages of producing moulds through casting include: it is easy to produce moulds of complicated shapes; there is no limit for the size of the mould; the cost is low; the process is well lubricated and so there is little conglutination during the process. Chief shortcomings of the method are that the producing moulds have poor wear resistance and poor precision. 铸铁。像加工汽车外壳等大件且不规则形状的模具，一般都用铸造方法制成。铸铁模在制造上的优点是，可以很容易铸出复杂的形状，尺寸不受限制，便于进行机械加工，而且价格低，润滑性好，胶着少。它的缺点是耐磨性差，精度差。

② Zinc-base alloy. Zinc-base alloy is a typical material used to make simple mould through casting. It has the following advantages: low melting point, good castability and relatively high precision, and good strength, abrasion resistance and lubricity the same as mild steel. The technology of casting moulds with low-melting-point zinc-base alloys is known as