<<制造技术第1卷 铸造、成形和焊接>>

图书基本信息

书名：<<制造技术第1卷 铸造、成形和焊接>>

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前言

由美国北依阿华大学（University of Northern lowa）工业技术系P N Rao教授所著的《制造技术第1卷铸造、成形和焊接》（Manufacturing Technology Volume 1 Foundry，Forming and Welding）和《制造技术第2卷金属切削和机床》（Manufacturing Technology Volume 2 Metal Cutting and Matchine Tools）已经分别出版到第3版和第2版，它们已经被国外多所大学选为工程类本科学生学习制造技术的专业基础教科书。

几年前，作为国外优秀原版教材，机械工业出版社引进出版了该书的前一个版本，国内部分高校已经采用它们作为“工程材料及成形技术”、“机械制造技术基础”或“制造工程基础（包括成形加工和切削加工）”等机械工程及自动化类专业核心课程的教材或主要教学参考书。

该书的引进出版和教学应用，对于促进国内机械工程本科教学中更新教材、教学研究和双语教学等工作，产生了重要作用。

以使用本教材的教师和学生的反馈信息为基础，最新出版的这两卷书对第1卷的主要内容进行了大幅度的修订，也对第2卷的部分内容进行了调整和补充，从而使全书内容能够尽可能地反映出制造工艺与装备技术的新进展，使各章节内容更加简明和紧凑，从而更加便于教师和学生使用。

第1卷修订后将原来的29章内容重新组织改写为12章，删去了以前章节中一些重复的内容；重新绘制了部分示意图，使之更加清晰和易于学生理解；增加了有关抗拉试验、激光热处理、快速原型等10余处内容，重写了钎焊的全部内容。

第2卷修订后各章标题变化不大，只是将原书中第14章“工艺规划”整个一章改写为“工装与夹具”，但在具体内容上，也进行了较大的修改和补充。

第2章增加了介绍涂层硬质合金的内容，第3章加强了机床传动系统及作动器方面的内容，改写了第11章“特种加工”的内容，增加了水切割等新工艺方法，第15章对摩擦学方面的通用测量设备内容进行了更新。

此外，该书还别开生面地在正文之前增加了“图示预览（Visual Walkthrough）”，将该章主要内容组成，如教学目的、发展历史、图示范例、已解决的问题、小结、思考题和习题等，用图示和文字做了一个概要描述，这将帮助读者更好地利用该书各章节的内容。

通过以上修订、补充和改写，新版本制造技术的内容更加系统完整，文字更加简洁易读，图例更加清晰明了。

内容概要

本书是一本适合于我国高校机械工程及自动化以及相关专业的优秀英文原版教材，同时也不失为一本专业的教学参考书，可用于相关专业的专业英语教学，并可供机械工程和制造工程领域的专业技术人员参考。

· 本书侧重机械制造的基本内容，包括工程材料及性能、金属铸造生产过程、金属成形过程和焊接生产四大部分。

· 每章后都有习题及参考文献，便于学生自学自查。

· 与上一版本相比，本版将原来的29章内容归纳、整理为12章，语言更加精炼。

· 增加了抗拉实验、激光热处理、快速原型等十余处内容，使知识点更为丰富。

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书籍目录

章节摘录

插图：Low Carbon Steel This is generally known as 'soft' or mild steel. It is used where ductility and softness are important and high tensile strength is not required. These are tough but not resistant to wear, since these are soft, can be very easily formed and later can be carburized to increase the hardness and wear resistance.Low-carbon steels are used for such operations as spinning, cold bending, rivetting, swaging, etc. These are not responsive to normal heat treatment but for case hardening. They form the largest percentage of steel produced, being the cheapest engineering material. Products such as screws, nails, nuts, bolts, washers, wire fences, light and heavy structural members, machine parts, forged parts can be made from low-carbon steel. It is also used for tin plate and automobile body sheet. It is available in form of sheets, squares, rounds, plates, and wires.Medium Carbon Steel They are less ductile but harder and have greater tensile strength than low-carbon steels. They also have better machining qualities and are more responsive to heat treatment.These are widely used in the industry. Medium carbon steels are used for making shafts, connecting rods, spindles, rail axles, gears, turbine bucket wheels, steering arms and other machine parts requiring medium strength and wear-resisting surfaces.High Carbon Steel They have higher tensile strength and are harder than other plain- carbon steels. They also readily respond to heat treatment. These are used for making hand tools such as wrenches, chisels, punches, files, cutting tools such as drills, wood-working tools, railroad wheels, rails, bars for reinforcing of concrete, etc.Effect of Small Quantities of Other Elements In addition to carbon, the plain carbon steels contain small quantities of other elements more as impurities. They affect the properties in the following way.Sulphur Iron forms iron sulphide, FES with sulphur which solidifies along the grain boundaries making the steel brittle and lowers hot working properties such as ductility. If equal amount of manganese is present in the steel then manganese sulphide, MnS, forms and the harmful effects of sulphur are reduced. It is generally recommended that manganese should at least be 3 times that of sulphur. However, very small quantities （0.075 to 0.15%） that are generally present contribute to the better machinability.Phosphorous Phosphorous in small amounts increases the strength and hardness of steels. Most of the steels contain a very small percentage of about 0.05% phosphorous.

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