1. Record Nr. UNINA9910827544003321

Titolo	Unit manufacturing processes : issues and opportunities in research / / Unit Manufacturing Process Research Committee, Manufacturing Studies Board, Commission on Engineering and Technical Systems, National Research Council
Pubbl/distr/stampa	Washington, D.C., : National Academy Press, 1995
ISBN	0-309-17667-0 1-280-19322-0 9786610193226 0-309-59644-0 0-585-08479-3
Edizione	[1st ed.]
Descrizione fisica	1 online resource (228 p.)
Disciplina	670.42
Soggetti	Manufacturing processes
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Unit Manufacturing Processes -- Copyright -- ACKNOWLEDGMENTS -- PREFACE -- Contents -- EXECUTIVE SUMMARY -- FUNDAMENTALS OF UNIT MANUFACTURING PROCESSES -- SETTING PRIORITIES FOR UNIT MANUFACTURING PROCESSES -- ENABLING TECHNOLOGIES -- Understanding Material Behavior -- Use Of Simulation And Modeling -- Application Of Sensors -- Implementation Of Process Control -- Development Of Process-Related Precision And Measurement Technology -- Design Of Process Equipment -- CONCLUSIONS AND RECOMMENDATIONS -- Conclusions -- Recommendations -- REPORT ORGANIZATION -- PART I: FUNDAMENTALS OF UNIT MANUFACTURING PROCESSES -- INTRODUCTION -- RECOMMENDATIONS -- REFERENCES -- 1 Why Manufacturing Matters -- OVERVIEW -- UNIT MANUFACTURING PROCESSES: THE COGS THAT DRIVE MANUFACTURING PRODUCTIVITY -- References -- 2 What Are Unit Manufacturing Processes? -- COMPONENTS OF A UNIT PROCESS -- TAXONOMY OF UNIT MANUFACTURING PROCESSES -- IDENTIFYING PRIORITY OPPORTUNITIES FOR UNIT PROCESS RESEARCH -- ENABLING

TECHNOLOGIES -- PROCESS STREAMS AND INTEGRATED PROCESSES -- References -- PART II: RESEARCH OPPORTUNITIES IN ILLUSTRATIVE UNIT MANUFACTURING PROCESSES -- INTRODUCTION -- WHY CONDUCT R&amp -- D ON UNIT PROCESSES? -- 3 Mass-Change Processes -- TRADITIONAL CHIP-MAKING PROCESSES -- TRADITIONAL GRINDING AND FINISHING OPERATIONS -- NONTRADITIONAL MASS-CHANGE PROCESSES -- Laser Machining -- Electrodischarge Machining -- Electrochemical Machining -- RESEARCH OPPORTUNITIES -- High-Speed Machining -- Machining And Drilling Process -- Grinding Operations -- Laser Processes -- Edm, Edwm, And Ecm -- Other Nontraditional Processes -- References -- 4 Phase-Change Processes -- METALS -- POLYMERS -- METAL-MATRIX COMPOSITES -- RESEARCH OPPORTUNITIES -- Metal-Casting Processes -- Advanced Polymeric Unit Processes -- Mmcs -- References -- 5 Structure-Change Processes -- MATERIALS.
Metals And Alloys -- Ceramic And Glassy Materials -- Polymers -- SURFACE TREATMENT -- LASER PROCESSING -- RESEARCH OPPORTUNITIES -- Thermal Treatment -- Surface Treatment -- Laser Processing -- References -- 6 Deformation Processes -- CLASSIFICATION AND CHARACTERISTICS OF PROCESSES -- SIGNIFICANT PROCESS VARIABLES -- Incoming Material-Billet Or Sheet Blank -- Product -- Deformation Zone And Mechanics -- Tooling -- Conditions At Tool-Material Interface -- Equipment -- Safety And Environmental Factors -- RESEARCH OPPORTUNITIES -- References -- 7 Consolidation Processes -- POWDER PROCESSING -- Advanced Powder Alloys -- Powder Production -- Shaping -- Sintering -- Densification -- Instrumentation And Control -- POLYMERIC COMPOSITES -- WELDING AND JOINING PROCESSES -- RESEARCH OPPORTUNITIES -- Powder Processing -- Consolidation Of Polymeric Composites -- Welding And Joining Processes -- References -- 8 Integrated Processes -- RESEARCH OPPORTUNITIES -- References -- PART III: UNIT MANUFACTURING PROCESS ENABLING TECHNOLOGIES -- INTRODUCTION -- KEY RECOMMENDATIONS -- 9 Behavior Of Materials -- OVERVIEW -- RESEARCH OPPORTUNITIES -- 10 Simulation And Modeling -- OVERVIEW -- RESEARCH OPPORTUNITIES -- References -- 11 Sensor Technology -- OVERVIEW -- RESEARCH OPPORTUNITIES -- References -- 12 Process Control -- ARCHITECTURES FOR A SELF-SUSTAINING WORK ENVIRONMENT -- CONTROLLERS -- OPEN SYSTEMS FOR CONTROL AND COMMUNICATION -- RESEARCH OPPORTUNITIES -- References -- 13 Process Precision And Metrology -- RESEARCH STATUS AND NEEDS -- DIMENSIONAL SCALE AND PRECISION IN MANUFACTURING -- DIMENSIONAL TOLERANCES AND METROLOGY -- PROCESS PLANNING -- PROCESS MODELING -- RESEARCH OPPORTUNITIES -- References -- 14 Process Equipment Design -- RESEARCH OPPORTUNITIES -- References -- PART IV: POLICY DIMENSIONS -- INTRODUCTION -- KEY CONCLUSIONS -- KEY RECOMMENDATIONS.
15 Technical And Economic Contexts -- References -- 16 Resources In Unit Process Research And Education -- RESOURCES FOR RESEARCH -- INDUSTRIAL RESEARCH -- Federal Research Programs -- Department Of Defense -- National Institute Of Standards And Technology -- Department Of Energy -- National Science Foundation -- National Center For Manufacturing Sciences -- ROLE OF HIGHER EDUCATION IN UNIT MANUFACTURING PROCESSES -- Overview -- KEY RECOMMENDATIONS -- References -- 17 International Experience -- R&amp -- D IN GERMAN MANUFACTURING -- R&amp -- D IN JAPANESE MANUFACTURING -- R&amp -- D IN EUROPEAN MANUFACTURING -- CONCLUSIONS -- References -- BIOGRAPHICAL INFORMATION -- UNIT