1. Record Nr. UNINA9910829989803321 Autore Gupta M (Manoj) Titolo Microwaves and metals [[electronic resource] /] / Manoj Gupta and Wong Wai Leong, Eugene Singapore; ; Hoboken, NJ, : John Wiley & Sons, c2007 Pubbl/distr/stampa **ISBN** 1-282-37136-3 9786612371363 0-470-82274-0 0-470-82273-2 Descrizione fisica 1 online resource (242 p.) Altri autori (Persone) WongWai Leong 620.1697 Disciplina 669.028 Microwave devices - Industrial applications Soggetti Metals - Effect of radiation on Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Microwaves and Metals: Preface: Acknowledgments: Introduction to Microwaves: 1.1 Microwaves and Electromagnetic Radiation: 1.2 Development of Microwaves; 1.3 Applications of Microwaves; 1.3.1 Microwave Heating/Processing of Materials: 1.3.2 Communications: 1.3.3 Radio Detection and Ranging (Radar); 1.3.4 Electronic Warfare; 1.3.5 Medical Applications; 1.3.6 Scientific Applications; 1.3.7 Industrial and Commercial Applications; 1.3.8 Potential Applications; 1.4 Frequency Allocation; 1.5 Microwave Generators; 1.6 Summary; References; Microwaves - Theory; 2.1 Introduction; 2.2 Fundamentals 2.2.1 Maxwell's Equations2.2.2 Permittivity; 2.2.3 Permeability; 2.2.4 Power Dissipated; 2.2.5 Penetration Depth; 2.2.6 Rate of Increase in Temperature; 2.3 Microwave-Material Interactions; 2.3.1 Electronic Polarization; 2.3.2 Orientation or Dipolar Polarization; 2.3.3 Ionic or Atomic Polarization; 2.3.4 Interfacial (Maxwell-Wagner) Polarization; 2.3.5 Frequency Dependence of Polarization Mechanisms; 2.3.6 Conduction Losses; 2.3.7 Hysteresis Losses; 2.4 Summary; References;

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Using microwaves to treat metal-based materials is rapidly emerging as an energy-efficient tool to interact with metals for a number of processes such as sintering, melting, brazing, carburizing and annealing. Microwaves can sinter a wide variety of metal compacts with comparable or enhanced end properties, while at the same time delivering tremendous energy savings over conventional sintering. Microwave processes are therefore gaining increasing attention and adoption in both academia and industry. Gupta and Wong have written this comprehensive text to introduce readers to the world of micr