

# HANDBOOK OF MATERIALS FOR MEDICAL DEVICES

Edited by  
J.R. Davis  
Davis & Associates

The *Handbook of Materials for Medical Devices* provides an in-depth review of the properties, processing, and selection of materials used in the environment of the human body—an environment that is surprisingly hostile and aggressive. Among the application areas described are orthopaedics (hips, knees, and spinal and fracture fixation), cardiology (stents, heart valves, pacemakers), surgical instruments, and restorative dentistry. Materials discussed include metals and alloys, ceramics, glasses, and glass-ceramics, polymeric materials, composites, coatings, and adhesives and cements.

The book is divided into three major sections. The first section provides an expansive overview of biomaterials and their use in medical devices. Charts and diagrams illustrate/list the many parts of the body that can be replaced by manmade materials. Case histories document some of the more common and successful medical device applications. Biocompatibility and mechanical requirements for implantable devices are also reviewed.

The second section of the handbook deals with medical (nondental) applications. Stainless steels, cobalt-chromium alloys, titanium and titanium alloys, shape memory alloys, and tantalum are among the metallic materials described. Similar information is provided on nonmetallic materials, including new coatings that offer lubricity, biocompatibility, and antimicrobial action to device surfaces. Other coatings can be used to release drugs or make implanted devices more visible to imaging systems.

The final section addresses biomaterials for dental applications. Emphasis is placed on corrosion and tribological behavior and corresponding test procedures to determine corrosion and wear resistance.

**Review:**

"The editor J.R. Davis and his associates has provided us with a well-organized and well-written volume, rich in valid information, presenting practical applications of biomaterials in advanced medicine. Materials scientists and engineers; medical doctors, surgeons, orthopaedists, and dentists; corrosion researchers and practitioners; chemists, electrochemists, and biologists; and designers and manufacturers of body and dental implants will profit from the sound, updated, and useful information presented in this handbook." -- NACE *Corrosion* Review, August 2005

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