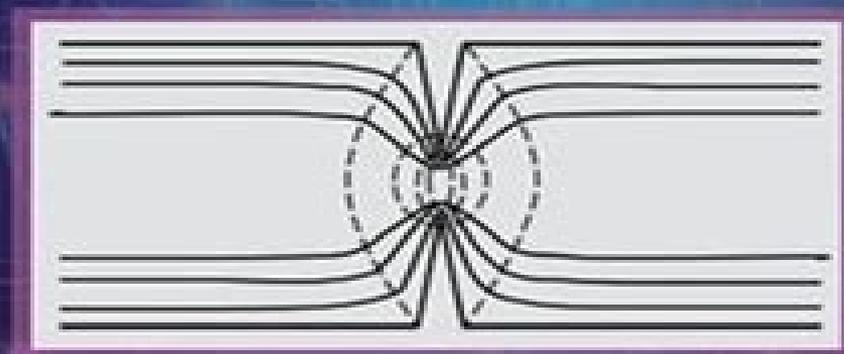




SECOND EDITION

# ELECTRICAL CONTACTS

PRINCIPLES AND APPLICATIONS



Edited by  
**Paul G. Slade**



CRC Press  
Taylor & Francis Group

# Electrical Contacts Principles And Applications

**Zhe Xu**

A decorative graphic element consisting of a light blue horizontal bar with a rounded right end, and a red semi-circular shape behind it.

## **Electrical Contacts Principles And Applications:**

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Electrical Contacts Paul G. Slade,2017-12-19 Covering the theory application and testing of contact materials Electrical Contacts Principles and Applications Second Edition introduces a thorough discussion on making electric contact and contact interface conduction presents a general outline of and measurement techniques for important corrosion mechanisms considers the results of contact wear when plug in connections are made and broken investigates the effect of thin noble metal plating on electronic connections and relates crucial considerations for making high and low power contact joints It examines contact use in switching devices including the interruption of AC and DC circuits with currents in the range 10mA to 100kA and circuits up to 1000V and describes arc formation between open contacts and between opening contacts Arcing effects on contacts such as erosion welding and contamination are also addressed Containing nearly 3 000 references tables equations figures drawings and photographs the book provides practical examples encompassing everything from electronic circuits to high power circuits or microamperes to mega amperes The new edition Reflects the latest advances in electrical contact science and technology Examines current research on contact corrosion materials and switching Includes updates and revisions in each chapter as well as up to date references and new figures and examples throughout Delivers three new chapters on the effects of dust contamination electronic sensing for switching systems and contact phenomena for micro electronic systems MEMS applications With contributions from recognized experts in the field Electrical Contacts Principles and Applications Second Edition assists practicing scientists and engineers in the prevention of costly system failures as well as offers a comprehensive introduction to the subject for technology graduate students by expanding their knowledge of electrical contact phenomena

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contacts and between opening contacts Arcing effects on contacts such as erosion welding and contamination are also addressed Containing nearly 3 000 references tables equations figures drawings and photographs the book provides practical examples encompassing everything from electronic circuits to high power circuits or microamperes to mega amperes The new edition Reflects the latest advances in electrical contact science and technology Examines current research on contact corrosion materials and switching Includes updates and revisions in each chapter as well as up to date references and new figures and examples throughout Delivers three new chapters on the effects of dust contamination electronic sensing for switching systems and contact phenomena for micro electronic systems MEMS applications With contributions from recognized experts in the field Electrical Contacts Principles and Applications Second Edition assists practicing scientists and engineers in the prevention of costly system failures as well as offers a comprehensive introduction to the subject for technology graduate students by expanding their knowledge of electrical contact phenomena Electrical Contacts Milenko Braunovic, Nikolai K. Myshkin, Valery V. Konchits, 2017-12-19 Various factors affect the performance of electrical contacts including tribological mechanical electrical and materials aspects Although these behaviors have been studied for many years they are not widely used or understood in practice Combining approaches used across the globe Electrical Contacts Fundamentals Applications and Technology integrates advances in research and development in the tribological material and analytical aspects of electrical contacts with new data on electrical current transfer at the micro and nanoscales Taking an application oriented approach the authors illustrate how material characteristics tribological behavior and loading impact the degradation of contacts formation of intermetallics and overall reliability and performance Coverage is divided broadly into three sections with the first focused on mechanics tribology materials current and heat transfer and basic reliability issues of electrical contacts The next section explores applications such as power connections electronic connections and sliding contacts while the final section presents the diagnostic and monitoring techniques used to investigate and measure phenomena occurring at electrical contact interfaces Numerous references to current literature reflect the fact that this book is the most comprehensive survey in the field Explore an impressive collection of data theory and practical applications in Electrical Contacts Fundamentals Applications and Technology a critical tool for anyone investigating or designing electrical equipment with improved performance and reliability in mind **Electrical Contacts - 1986**, 1986 **The Vacuum Interrupter** Paul G. Slade, 2020-11-29 Title The Vacuum Interrupter Theory Design and Application Shelving guide Electrical Engineering Dr Paul Slade draws from his nearly six decades of active experience to develop this second edition of The Vacuum Interrupter Theory Design and Application This book begins by discussing the design requirements for high voltage vacuum interrupters and then the contact requirements to interrupt the vacuum arc It then continues by describing the various applications in which the vacuum interrupter is generally utilized Part 1 of this book begins with a detailed review of the vacuum breakdown process It continues by covering the steps necessary for the design and the manufacture of a

successful vacuum interrupter The vacuum arc is then discussed including how it is affected as a function of current An overview of the development and use of practical contact materials along with their advantages and disadvantages follows Contact designs that are introduced to control the high current vacuum arc are also analyzed Part 2 on application begins with a discussion of the arc interruption process for low current and high current vacuum arcs It examines the voltage escalation phenomenon that can occur when interrupting inductive circuits The occurrence of contact welding for closed contacts subjected to the passage of high currents and for contacts when closing on high currents is explored The general requirements for the successful manufacture and testing of vacuum circuit breakers is then presented The general application of vacuum interrupters to switch load currents especially when applied to capacitor circuits is also given The interruption of high short circuit currents is presented along with the expected performance of the two major contact designs Owing to the ever increasing need for environmentally friendly circuit protection devices the development and application of the vacuum interrupter will only increase in the future At present the vacuum circuit breaker is the technology of choice for distribution circuits 5kV to 40 5kV It is increasingly being applied to transmission circuits 72 5kV to 242kV In the future its application for protecting high voltage DC networks is assured Audience This is a practical source book for engineers and scientists interested in studying the development and application of the vacuum interrupter Research scientists in industry and universities Graduate students beginning their study of vacuum interrupter phenomena Design engineers applying vacuum interrupters in vacuum switches vacuum contactors vacuum circuit breakers and vacuum contactors It provides a unique and comprehensive review of all aspects of vacuum interrupter technology for those new to the subject and for those who wish to obtain a deeper understanding of its science and application Scientists and engineers who are beginning their research into vacuum breakdown and aspects of the vacuum arc will find the extensive bibliography and phenomenological descriptions to be a useful introduction

*Mechanical and Manufacturing Design of Antennas* Richard L. Burge, 2025-07-31

*Mechanical and Manufacturing Design of Antennas* addresses the critical link between an RF design and its successful mechanical implementation This groundbreaking book offers mechanical and manufacturing engineers a roadmap to understanding how physical design directly affects antenna performance Author Richard L Burge provides detailed guidance on design for manufacturability and assembly creating a practical blueprint for bridging the gap between RF intent and mechanical execution This ensures the reader will be able to create antennas that perform exactly as designed both in the lab and in the field Uncover how tolerances materials coatings and assembly precision profoundly affect an antenna s electromagnetic behavior Recognize how component interfaces alignment errors and physical assembly can introduce unanticipated variances in RF behavior Walk through common performance degradations caused by physical misalignments improperly supported apertures and unaccounted for environmental loads including wind thermal cycling ice buildup and dynamic vibration *Mechanical and Manufacturing Design of Antennas* addresses how flexing shifting or degrading happens

under real world conditions and how to design against such failures Furthermore this book demystifies the critical challenge of tolerancing for antennas by offering specific field tested guidelines that ensure the manufactured components stay within acceptable RF performance limits Learn to identify which tolerances truly matter how to prioritize them and where to relax specifications to reduce cost without sacrificing performance This is an indispensable resource for both mechanical engineers who will gain the confidence to create manufacturable drawings and RF designers who will better understand how mechanical constraints influence electromagnetic outcomes Whether you are creating prototypes or high volume systems this essential reference will help ensure that your antennas not only perform but do so reliably and economically

**Electrical Connectors** San Kyeong, Michael G. Pecht, 2020-12-29 Discover the foundations and nuances of electrical connectors in this comprehensive and insightful resource *Electrical Connectors Design Manufacture Test and Selection* delivers a comprehensive discussion of electrical connectors from the components and materials that comprise them to their classifications and underwater power and high speed signal applications Accomplished engineer and author Michael G Pecht offers readers a thorough explanation of the key performance and reliability concerns and trade offs involved in electrical connector selection Readers both at introductory and advanced levels will discover the latest industry standards for performance reliability and safety assurance The book discusses everything a student or practicing engineer might require to design manufacture or select a connector for any targeted application The science of contact physics contact finishes housing materials and the full connector assembly process are all discussed at length as are test methods performance and guidelines for various applications *Electrical Connectors* covers a wide variety of other relevant and current topics like A comprehensive description of all electrical connectors including their materials components applications and classifications A discussion of the design and manufacture of all parts of a connector Application specific criteria for contact resistance signal quality and temperature rise An examination of key suppliers materials used and the different types of data provided A presentation of guidelines for end users involved in connector selection and design Perfect for connector manufacturers who select design and assemble connectors for their products or the end users who concern themselves with operational reliability of the system in which they re installed *Electrical Connectors* also belongs on the bookshelves of students learning the basics of electrical contacts and those who seek a general reference with best practice advice on how to choose and test connectors for targeted applications

*Electrical Contacts - 1985*, 1985 **IEICE Transactions on Electronics**, 2008  
**Proceedings**, 2002 **Journal of Zhejiang University**, 2007 **34th Annual IICIT Connector & Interconnection Symposium and Trade Show**, 2001 *IEEE Circuits & Devices*, 1991 **Materials Science of Microelectromechanical Systems (MEMS) Devices II: Volume 605** Maarten De Boer, 2000-10-02 The MRS Symposium Proceeding series is an internationally recognised reference suitable for researchers and practitioners **Electrical Contacts**, *Multi-physics Modeling and Experimental Investigation of Low-force MEMS Switch Contact Behavior* Brian D.

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