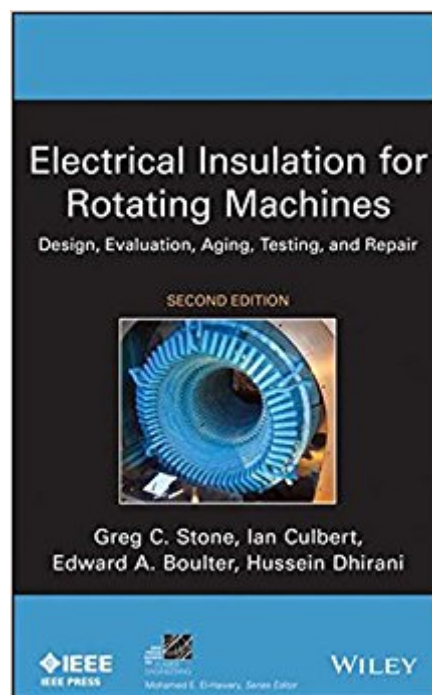




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# Electrical Insulation For Rotating Machines: Design, Evaluation, Aging, Testing, And Repair (IEEE Press Series On Power Engineering)



## Synopsis

A fully expanded new edition documenting the significant improvements that have been made to the tests and monitors of electrical insulation systems **Electrical Insulation for Rotating Machines: Design, Evaluation, Aging, Testing, and Repair, Second Edition** covers all aspects in the design, deterioration, testing, and repair of the electrical insulation used in motors and generators of all ratings greater than fractional horsepower size. It discusses both rotor and stator windings; gives a historical overview of machine insulation design; and describes the materials and manufacturing methods of the rotor and stator winding insulation systems in current use (while covering systems made over fifty years ago). It covers how to select the insulation systems for use in new machines, and explains over thirty different rotor and stator winding failure processes, including the methods to repair, or least slow down, each process. Finally, it reviews the theoretical basis, practical application, and interpretation of forty different tests and monitors that are used to assess winding insulation condition, thereby helping machine users avoid unnecessary machine failures and reduce maintenance costs. **Electrical Insulation for Rotating Machines: Documents** the large array of machine electrical failure mechanisms, repair methods, and test techniques that are currently available **Educates** owners of machines as well as repair shops on the different failure processes and shows them how to fix or otherwise ameliorate them **Offers** chapters on testing, monitoring, and maintenance strategies that assist in educating machine users and repair shops on the tests needed for specific situations and how to minimize motor and generator maintenance costs **Captures** the state of both the present and past "art" in rotating machine insulation system design and manufacture, which helps designers learn from the knowledge acquired by previous generations **An ideal read** for researchers, developers, and manufacturers of electrical insulating materials for machines, **Electrical Insulation for Rotating Machines** will also benefit designers of motors and generators who must select and apply electrical insulation in machines.

## Book Information

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## Customer Reviews

“This book is incredibly useful for engineers diagnosing problems in rotating machines. . . Engineers, researchers, developers, and manufacturers of insulation systems for rotating electrical machines will benefit greatly from this book.” (IEEE Electrical Insulation Magazine, 1 January 2015)

A fully expanded new edition documenting the significant improvements that have been made to the tests and monitors of electrical insulation systems **Electrical Insulation for Rotating Machines: Design, Evaluation, Aging, Testing, and Repair, Second Edition** covers all aspects in the design, deterioration, testing, and repair of the electrical insulation used in motors and generators of all ratings greater than fractional horsepower size. It discusses both rotor and stator windings; gives a historical overview of machine insulation design; and describes the materials and manufacturing methods of the rotor and stator winding insulation systems in current use (while covering systems made over fifty years ago). It covers how to select the insulation systems for use in new machines, and explains over thirty different rotor and stator winding failure processes, including the methods to repair, or least slow down, each process. Finally, it reviews the theoretical basis, practical application, and interpretation of forty different tests and monitors that are used to assess winding insulation condition, thereby helping machine users avoid unnecessary machine failures and reduce maintenance costs. **Electrical Insulation for Rotating Machines: Documents the large array of machine electrical failure mechanisms, repair methods, and test techniques that are currently available** Educates owners of machines as well as repair shops on the different failure processes and shows them how to fix or otherwise ameliorate them Offers chapters on testing, monitoring, and maintenance strategies that assist in educating machine users and repair shops on the tests needed for specific situations and how to minimize motor and generator maintenance costs Captures the state of both the present and past art in rotating machine insulation system design and manufacture, which helps designers learn from the knowledge acquired by

previous generations. An ideal read for researchers, developers, and manufacturers of electrical insulating materials for machines, *Electrical Insulation for Rotating Machines* will also benefit designers of motors and generators who must select and apply electrical insulation in machines.

Good reference on motor insulation and other motor features.

Good easy read. Much more expanded than 1st edition. Still missing some material that I would expect either kept out (know how) or included in the 3rd edition.

Excellent book for a very specific field.

Such a great book!

good book in a very good condition, like new

GOOD

This is a very thorough textbook and a valuable tool for the AC mechanic and operator. This book focuses on AC induction and synchronous motors rated at 1kW or more. Types of rotating machines are introduced. types of generators, classification of cooling. Winding components and their construction are introduced. Insulation systems are covered, how to evaluate them, test them. The chapters also cover construction, operation, repair, trouble shooting and offer many diagrams and photographs for illustration. There is even information on certain brand names and their history/imageSources are mentioned at the end of each chapter. Insulation material tables are in the back of the book as appendiElectrical engineers, machine operators, machine designers would all benefit from this very concise book.

This second edition of *Electrical Insulation for Rotating Machines* has much of the original material, but has been expanded to add information on "the effect of drives on insulation, the addition of a number of relatively new failure mechanisms, and new diagnostic tests. The concentration of the material applies to 1 k W machinery. Application can be made for smaller machinery if needed. Standards looked at are from the perspective of the IEC and IEEE guidelines. The book, in addition to covering a lot of history and

theory, has a lot of practical applications. There are case studies, so to speak, of problems and how to solve them. For example, we learn about such things as thermal deterioration. We are given a historical overview, read about the material degradation, the cause of deterioration, and symptoms. Other parts of the book are referenced in each problem and additional recommended book references are included at the end of each chapter. The book has numerous informative charts, graphs, sketches, and some calculations. In the back of the book are appendices that carry Insulation Material Tables, Insulation System Tables, as well as a comprehensive index.

CHAPTER 1: ROTATING MACHINE INSULATION SYSTEMS  
 CHAPTER 2: EVALUATING INSULATION MATERIALS AND SYSTEMS  
 CHAPTER 3: HISTORICAL DEVELOPMENT OF INSULATION MATERIALS AND SYSTEMS  
 CHAPTER 4: STATOR WINDING INSULATION SYSTEMS IN CURRENT USE  
 CHAPTER 5: ROTOR WINDING INSULATION SYSTEMS  
 CHAPTER 6: ROTOR AND STATOR LAMINATED CORES  
 CHAPTER 7: GENERAL PRINCIPLES OF WINDING FAILURE, REPAIR AND REWINDING  
 CHAPTER 8: STATOR FAILURE MECHANISMS AND REPAIR  
 CHAPTER 9: ROUND ROTOR WINDING FAILURE MECHANISMS AND REPAIR  
 CHAPTER 10: SALIENT POLE ROTOR WINDING FAILURE MECHANISMS AND REPAIR  
 CHAPTER 11: WOUND ROTOR WINDING FAILURE MECHANISMS AND REPAIR  
 CHAPTER 12: SQUIRREL CAGE INDUCTION ROTOR WINDING FAILURE MECHANISMS AND REPAIR  
 CHAPTER 13: CORE LAMINATION INSULATION FAILURE AND REPAIR  
 CHAPTER 14: GENERAL PRINCIPLES OF TESTING AND MONITORING  
 CHAPTER 15: OFF-LINE ROTOR AND STATOR WINDING TESTS  
 CHAPTER 16: IN-SERVICE MONITORING OF STATOR AND ROTOR WINDINGS  
 CHAPTER 17: CORE TESTING  
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