

# Solid Rocket Components And Motor Design

Motor design for maximum material exploitation and magnetization procedure with in-line quality check for mass production Electric Drive System Design for Electric Vehicles Decision-Based Design Design Manual, Mechanical Engineering Multidisciplinary Design Optimization Methods for Electrical Machines and Drive Systems Design of Small Electrical Machines Computational Fluid Dynamics - Analysis, Simulations, and Applications Engines and Powertrains Mechanical Design and Manufacturing of Electric Motors Mechanical Circulatory and Respiratory Support Annual Report Covering Calendar Year ... The Electrical Engineer Electromagnetic Fields in Electrical Engineering Electric Motor Design The Electrical World Theory and Design of Electric Machines Brushless Permanent-magnet Motor Design Engineering Magazine Electrical Engineer Proceedings of the International Machine Tool Design and Research Conference Dinca, Christian Yunqi Zheng Wei Chen United States. Naval Facilities Engineering Command Gang Lei Essam S. Hamdi Mahboub Baccouch Ronald K. Jurgen Wei Tong Shaun D. Gregory United States. National Aeronautics and Space Administration. Aerospace Safety Advisory Panel Andrzej Krawczyk Arturo R. Miles Frederick Creedy Duane C. Hanselman International Machine Tool Design and Research Conference Motor design for maximum material exploitation and magnetization procedure with in-line quality check for mass production Electric Drive System Design for Electric Vehicles Decision-Based Design Design Manual, Mechanical Engineering Multidisciplinary Design Optimization Methods for Electrical Machines and Drive Systems Design of Small Electrical Machines Computational Fluid Dynamics - Analysis, Simulations, and Applications Engines and Powertrains Mechanical Design and Manufacturing of Electric Motors Mechanical Circulatory and Respiratory Support Annual Report Covering Calendar Year ... The Electrical Engineer Electromagnetic Fields in Electrical Engineering Electric Motor Design The Electrical World Theory and Design of Electric Machines Brushless Permanent-magnet Motor Design Engineering Magazine Electrical Engineer Proceedings of the International Machine Tool Design and Research Conference *Dinca, Christian Yunqi Zheng Wei Chen United States.*

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to reduce the amount of rare earth elements in high efficient permanent magnet electric motors the magnetic stray flux has to be reduced additionally a temperature reduction inside the motor reduces the necessary amount of the so called heavy rare earth elements which account for the bulk part of the magnet material costs in this thesis a permanent magnet motor in wet rotor configuration for an automotive application is designed it was shown that by simple thermal improvements of the electric insulation system the maximum temperature of the stator can be reduced extensive measurements on different combinations of insulation material of the stator and the development of a new thermal model for orthocyclic wound stators were performed due to the use of fiber cans eddy current losses could be eliminated and the stray flux minimized in a second stage a magnetizing fixture was build up which is able to magnetize the buried magnets inside the rotor the rotor and the magnetizing fixture was developed so that the magnets can be optimal magnetized to check the quality of the magnets the magnetizing coil was developed in a way such that the hysteresis curve of every single magnet during magnetization can be measured different magnets were tested and ways to calculate parasitics are given um die menge an selten erden in hoch effizienten permanent erregten elektromotoren zu reduzieren muss der magnetische streufluss verringert werden eine temperaturreduktion im motor verringert zudem die nötige menge an so genannten schweren selten erden welche einen großteil der kosten der magnetmaterialien ausmachen in dieser arbeit wird dazu ein permanent erregter nassläufer für eine automotive anwendung ausgelegt es konnte gezeigt werden dass durch einfache maßnahmen im bereich der elektrischen isolation die maximale temperatur im stator reduziert werden konnte umfangreiche messungen an verschiedenen kombinationen von elektrischen isolierungen des stators und die entwicklung eines neuen thermischen models für orthozyklisch gewickelte statoren wurden getätigten durch Einsatz von spaltrohren aus faserverbundwerkstoffen konnten die wirbelstromverluste beseitigt werden und der streufluss minimiert werden in einem zweiten schritt wurde eine magnetisierungsvorrichtung

aufgebaut mit der die zu anfang unmagnetisierten eingebetteten magneten im rotor aufmagnetisiert werden konnten der rotor wurde zudem zusammen mit der magnetisierungsspule so ausgelegt dass die magnete optimal magnetisiert werden können um die qualität der magnete zu testen wurde die magnetisierspule zudem so ausgelegt dass eine messung der hysteresekurve jedes einzelnen magneten während der magnetisierung möglich ist verschiedene magnete wurden vermessen und möglichkeiten zur bestimmung von parasitären effekten gegeben

electric drive system design for electric vehicles bridges the gap between specialized research on electric vehicle ev electric drive system design principles and developing industry driven solutions it addresses best practices for ensuring the performance and reliability of ev electric drive systems including battery motor and power electronic components based on the author s hands on experience the book takes a multidisciplinary approach to ev drive system design combining electrical engineering thermal design mechanical engineering and manufacturing expertise to deliver efficient reliable and high performance solutions it includes case studies and practical examples from the industry reviewing state of the art electric system technologies in current evs such as lucid tesla chevrolet vw nissan and more readers will also obtain insight into how fundamental physics plays a critical role in those technological advancements and innovations this book will benefit academic researchers and graduate students studying power electronic packaging and electric drive systems it will also serve industry professionals involved in ev design and general power electronic system packaging

building upon the fundamental principles of decision theory decision based design integrating consumer preferences into engineering design presents an analytical approach to enterprise driven decision based design dbd as a rigorous framework for decision making in engineering design once the related fundamentals of decision theory economic analysis and econometrics modelling are established the remaining chapters describe the entire process the associated analytical techniques and the design case studies for integrating consumer preference modeling into the enterprise driven dbd framework methods for identifying key attributes optimal design of human appraisal experiments data collection data analysis and demand model estimation are presented and illustrated using engineering design case

studies the scope of the chapters also provides a rigorous framework of integrating the interests from both producer and consumers in engineering design analytical techniques of consumer choice modelling to forecast the impact of engineering decisions methods for synthesizing business and engineering models in multidisciplinary design environments and examples of effective application of decision based design supported by case studies no matter whether you are an engineer facing decisions in consumer related product design an instructor or student of engineering design or a researcher exploring the role of decision making and consumer choice modelling in design decision based design integrating consumer preferences into engineering design provides a reliable reference over a range of key topics

this book presents various computationally efficient component and system level design optimization methods for advanced electrical machines and drive systems readers will discover novel design optimization concepts developed by the authors and other researchers in the last decade including application oriented multi disciplinary multi objective multi level deterministic and robust design optimization methods a multi disciplinary analysis includes various aspects of materials electromagnetics thermotics mechanics power electronics applied mathematics manufacturing technology and quality control and management this book will benefit both researchers and engineers in the field of motor and drive design and manufacturing thus enabling the effective development of the high quality production of innovative high performance drive systems for challenging applications such as green energy systems and electric vehicles

designing electrical machines requires multi disciplinary skills engineers must not only be expert in electromagnetic design but also in selecting materials and choosing production techniques employing a range of examples the author covers various design procedures from specification to performance prediction featuring selection and specification of components and materials production techniques focus on both the electrical and mechanical construction aspects introduction to cad detailed exploration of thermal design unified approach to permanent magnet and wound field d c motor design design of 50 hz and 400 hz induction motors typical designs this timely book highlights the latest advances in design techniques and materials by presenting a self contained and unified treatment it

will prove invaluable to both professional engineers and senior students

this book comprehensively explores numerical methods and their applications across diverse fields strongly focusing on computational fluid dynamics cfd and advanced modeling techniques starting with numerical approaches for solving the viscous and inviscid burgers equations establishes a foundation for understanding complex fluid dynamics subsequent chapters delve into cutting edge topics including large eddy simulations les for turbulence modeling heat transfer analysis and the influence of working fluids on vortex dynamics in industrial pipelines the book also explores emerging areas such as nanoscale simulations plasmonic excitations and biomedical applications like hemodynamics in atrial fibrillation real world case studies and practical examples demonstrate the versatility of cfd in addressing challenges in engineering biology and energy systems this book combines theoretical rigour with practical insights and is designed for advanced undergraduate and graduate students researchers and professionals it bridges the gap between numerical theory and real world applications providing readers with the tools to solve complex problems across various scientific and engineering domains whether you're looking to deepen your understanding of numerical methods enhance your cfd expertise or explore innovative applications this book is a valuable resource for gaining actionable insights and fostering innovation in computational modeling

with production and planning for new electric vehicles gaining momentum worldwide this book the third in a series of five volumes on this subject provides engineers and researchers with perspectives on the most current and innovative developments regarding electric and hybrid electric vehicle technology design considerations and components this book features 13 sae technical papers published from 2008 through 2010 that provide an overview of research on electric vehicle engines and powertrains topics include hybrid electric vehicle transmissions and propulsion systems the development of a new 1.8 liter engine for hybrid vehicles vehicle system control software validation the impact of hybrid electric powertrains on chassis systems and vehicle dynamics high torque density motors and interior permanent magnet synchronous motors

this second edition of mechanical design and manufacturing of electric motors provides in

depth knowledge of design methods and developments of electric motors in the context of rapid increases in energy consumption and emphasis on environmental protection alongside new technology in 3d printing robots nanotechnology and digital techniques and the challenges these pose to the motor industry from motor classification and design of motor components to model setup and material and bearing selections this comprehensive text covers the fundamentals of practical design and design related issues modeling and simulation engineering analysis manufacturing processes testing procedures and performance characteristics of electric motors today this second edition adds three brand new chapters on motor breaks motor sensors and power transmission and gearing systems using a practical approach with a focus on innovative design and applications the book contains a thorough discussion of major components and subsystems such as rotors shafts stators and frames alongside various cooling techniques including natural and forced air direct and indirect liquid phase change and other newly emerged innovative cooling methods it also analyzes the calculation of motor power losses motor vibration and acoustic noise issues and presents engineering analysis methods and case study results while suitable for motor engineers designers manufacturers and end users the book will also be of interest to maintenance personnel undergraduate and graduate students and academic researchers

mechanical circulatory and respiratory support second edition continues to provide a comprehensive overview of the past present and future development of mechanical circulatory and respiratory support devices this new edition provides an update on the field while also introducing new elements within the field such as ex vivo perfusion devices for hfpf design for manufacture oxygenator design and more content on route to market chapters from over 60 internationally renowned experts focuses on the entire life cycle of mechanical circulatory and respiratory support from the descent into heart and lung failure alternative medical management device options device design implantation techniques complications and medical management of the supported patient patient device interactions cost effectiveness route to market and a view to the future this second edition is a useful resource for biomedical engineers and clinicians who are designing new mechanical circulatory or respiratory support devices while also providing a comprehensive guide of the entire field for those who are already familiar with some areas and want to learn more

reviews of the most cutting edge research are provided throughout each chapter along with guides on how to design new devices and which areas require specific focus for future research and development presents an engineering pathway to develop the most advanced medical devices features a clinical summary of how to select the right patients and treat them optimally while supported with these devices includes a detailed path to market for those developing new devices in this field

this volume includes contributions on field theory and advanced computational electromagnetics electrical machines and transformers optimization and interactive design electromagnetics in materials coupled field and electromagnetic components in mechatronics induction heating systems bioelectromagnetics and electromagnetics in education

written for electrical electronics mechanical engineers responsible for designing specifying motors the book provides details of brushless dc synchronous motors as well as both radial axial motor topologies beginning with a discussion of the fundamentals of generic motor design it logically progresses to a set of more advanced yet easily understandable concepts for designing brushless permanent magnet motors in addition the author fully explains techniques for magnetic modeling circuit analysis shows how magnetic circuit analysis applies to motor design describes all major aspects of motor operation design in simple mathematical terms develops rigorous design equations for radial flux axial flux motors illustrates basic motor drive schemes all common motor design terms are clearly defined a wealth of charts tables equations are included

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