

Heat Pipes

P. Dunn, David Reay

Heat Pipes:

Heat Pipes David Reay, Ryan McGlen, Peter Kew, 2013-10-01 Heat Pipes Sixth Edition takes a highly practical approach to the design and selection of heat pipes making it an essential guide for practicing engineers and an ideal text for postgraduate students. This new edition has been revised to include new information on the underlying theory of heat pipes and heat transfer and features fully updated applications new data sections and updated chapters on design and electronics cooling. The book is a useful reference for those with experience and an accessible introduction for those approaching the topic for the first time Contains all information required to design and manufacture a heat pipe Suitable for use as a professional reference and graduate text Revised with greater coverage of key electronic cooling applications.

Design And Technology Of Heat Pipes For Cooling And Heat Exchange Cal Silverstein, 1992-08-01. This book describes the characteristics of heat pipes under steady state and transient operating conditions. It emphasizes the physical aspects of heat pipe behavior and develops design formulas on the basis of mathematical models and empirical observation. The author take a tutorial approach presenting information on the application of heat pipe technology design methods and data to heat pipe cooling and heat exchange requirements. He provides the nonspecialist with sufficient understanding of heat pipe technology to appreciate and assess its application potential while also meeting the needs of the experienced heat pipe designer and researcher.

Heat Pipe Theory and Practice S. W. Chi,1976 Heat Pipes P. D. Dunn, David Reay, 2012-12-02 A comprehensive up to date coverage of the theory design and manufacture of heat pipes and their applications. This latest edition has been thoroughly revised up dated and expanded to give an in depth coverage of the new developments in the field Significant new material has been added to all the chapters and the applications section has been totally rewritten to ensure that topical and important applications are appropriately emphasised. The bibliography has been considerably enlarged to incorporate much valuable new information Thus readers of the previous edition which has established itself as the standard text on the subject will find much additional data of interest whilst new readers will find the vast amount of useful data included in the appendices an indispensable source of reference Heat Pipes Hussam Jouhara, David Reay, Ryan McGlen, Peter Kew, Jonathan McDonough, 2023-10-20 Heat Pipes Theory Design and Applications Seventh Edition takes a highly practical approach to the design and selection of heat pipes making it an essential guide for practicing engineers and an ideal text for postgraduate students The expanded author team consolidate and update the theoretical background included in previous editions and include new sections on recent developments in manufacturing methods wick design and additional applications The book serves as an introduction to the theory design and application of the range of passive two phase heat transfer devices known as heat pipes serving as an essential reference for those seeking a sound understanding of the principles of heat pipe technology It provides an introduction to the basic principles of operation and design data which would permit the reader to design and fabricate a basic heat pipe It also provides details of the various more complex configurations and

designs currently available to assist in selecting such devices This new edition has been fully updated to reflect the latest research and technologies and includes four brand new chapters on various types of heat pipe theoretical principles of heat transfer and fluid mechanics additive manufacturing and heat pipe heat exchangers Fully revised with brand new chapters on Additive Manufacturing and Heat Exchangers Guides the reader through the design and fabrication of a heat pipe Includes detail on more complex configurations and designs available to assist in the election of devices and Heat Pipes: Theory and Applications Marcia Barbosa Henriques Mantelli, 2020-12-22 This book is about theories and applications of thermosyphons and heat pipes It discusses the physical phenomena that drive the working principles of thermosyphons heat pipes and related technologies Many applications are discussed in this book including rationalizing energy use in industry solar heating of houses decrease of water consumption in cooling towers improvement of the thermal performance of industrial and domestic ovens and driers and new devices for heating stored oil and gas in petrochemical plants Besides the book also presents heat pipe and thermosyphon technologies for the thermal management of electronic devices from portable equipment to airplanes and satellites The first part of the book explores the physical working principles of thermosyphons and heat pipes by explaining current heat transfer and thermal resistance models The author discusses the new heat pipe and thermosyphon technologies that have been developed in the last decade for solving a myriad of electronic environment and industrial heat and thermal problems The focus then shifts to the thermosyphon technology applications and the models and simulations necessary for each application including vehicles domestic appliances water conservation technologies and the thermal control of houses and other structures Finally the book looks at the new technologies for heat pipes mini micro and similar devices loop heat pipes including new models for prediction of the thermal performance of porous media This book inspires engineers to adopt innovative approaches to heat transfer problems in equipment and components by applying thermosyphon and heat pipe technologies It is also of interest to researchers and academics working in the heat transfer field and to students who wish to learn more about heat transfer devices Pipes P. Dunn, David Reay, 2016-04-06 It is approximately 10 years since the Third Edition of Heat Pipes was published and the text is now established as the standard work on the subject This new edition has been extensively updated with revisions to most chapters The introduction of new working fluids and extended life test data have been taken into account in chapter 3 A number of new types of heat pipes have become popular and others have proved less effective This is reflected in the contents of chapter 5 Heat pipes are employed in a wide range of applications including electronics cooling diecasting and injection moulding heat recovery and energy conservation de icing and manufacturing process temperature control and chapter 7 discusses some of the latest uses while retaining full data on those established for many years Appendices have been updated as appropriate Heat Pipes Peter D. Dunn, David Anthony Reay, 1978 Design And Technology Of Heat Pipes For Cooling And Heat Exchange Cal Silverstein, 2020-03-13 This book describes the characteristics of heat pipes under

steady state and transient operating conditions It emphasizes the physical aspects of heat pipe behavior and develops design formulas on the basis of mathematical models and empirical observation. The author take a tutorial approach presenting information on the application of heat pipe technology design methods and data to heat pipe cooling and heat exchange requirements He provides the nonspecialist with sufficient understanding of heat pipe technology to appreciate and assess its application potential while also meeting the needs of the experienced heat pipe designer and researcher Advances in Heat Pipes Wael I.A. Aly, 2019-09-18 Heat pipes are considered as an effective thermal solution particularly in high heat flux applications and in situations where there is a combination of nonuniform heat loading limited airflow over the heat generating components and space or weight constraints This book is intended to explore some of the recent advances in heat pipes and their applications in thermal systems. The first chapter is an introductory chapter about the recent advances in heat pipes in general The second chapter is about thermosyphon heat pipe technology working principles advantages and disadvantages application ranges and using computational fluid dynamics in modeling thermosyphons The third chapter is about recent research into loop heat pipes LHPs The last chapter presents a novel liquid vapor separator incorporated gravitational LHP Heat Pipes: Construction and Application M. Terpstra, J.G. van Veen, 2012-12-06 This analysis of invention is the result of a study of patents patent applications and some other technical and scientific lite rature published in the United States Japan Great Britain Western Germany and France as well as European Munich and PCT Patent Cooperation Treaty patent applications in the period from about January 1975 to about January 1985 It provides a systematic review of research activities on the structural and operational development of heat pipes in the period covered and on their applications. The study is in two parts Part I relating to aspects of individual heat pipes and Part II concerning the application of heat pipes to heat exchangers and mechanical and electrical components in which the construction and operation of the in dividual heat pipes are of secondary importance The material studied during the search has been derived from the search files of the European Patent Office Rijswijk The Nether lands classified in accordance with the following international patent classes IPC F 28 D 15 02 relating to heat exchange apparatus with the intermediate heat transfer medium in closed tubes passing into or through the conduit walls in which the medium condenses and evaporates e.g. heat pipes F 24 J 2 32 relating to heat pipes of solar heat collectors VIII G 21 D 5 02 relating to arrangements of nuclear reactor and engine in which reactor produced heat is converted into mechanical energy and in which reactor and engine are structurally combined

Functionality, Advancements and Industrial Applications of Heat Pipes Bahman Zohuri, 2020-03-24 Functionality Advancements and Industrial Applications of Heat Pipes introduces heat pipe technologies and highlights a variety of applications for passive thermal control The book begins with a thorough analysis of heat pipe infrastructure including principles of operation temperature limits reliability and lessons learned from worked examples and case studies It also presents a concise design guideline for the assembly of heat pipes The second part moves on to consider a variety of modern

day applications for the heat pipe principles discussed covering nuclear and solar thermal energy engineering facilities as well as applications in space in the sea and in the air A final section works through manufacturing elements of different types of heat pipe to ensure they are well maintained and remain fully operational This section includes the cleaning of parts the assembly of the heat pipe an analysis of gas blockages and how to deal with them as well as performance versification Analyzes a wide variety of heat pipes used in various settings including constant conductance heat pipes loop heat pipes and wrap around heat pipes Considers applications at sea in the air on land and in space including the nuclear and solar energy industries heat pipes in spacecraft and heat pipe reactors Includes a heat pipe assembly and design guide as well as an analysis of lessons learned from different case studies **Transport Phenomena in Capillary-Porous Structures and Heat Pipes** Henry Smirnov, 2009-07-29 Two phase nano and micro thermal control device research is now proving relevant to a growing range of modern applications including those in cryogenics thermal engineering MEMS and aerospace engineering Until now researchers have lacked a definitive resource that provides a complete review of micro and nano scale **Heat Pipes** Yuwen Zhang, 2018 Heat pipes are efficient passive devices that can transfer evaporative heat and mass large amounts of heat over long distances with small temperature differences between the heat sources and sinks by evaporation and condensation of the working fluid Heat can be transferred without the use of any mechanically moving parts such as pumps and active controls in heat pipes The vapor and liquid circulate in the conventional heat pipes including thermosiphons via evaporation condensation and capillary or gravitational forces For pulsating heat pipes liquid slug and vapor plugs in the capillary tube oscillate due to evaporation and condensation The effective thermal conductivity of a heat pipe can be three orders of magnitude higher than that of a copper rod with the same size A heat pipe can find its applications in many sectors of industries including electronics cooling energy systems spacecraft thermal control permafrost cooling and manufacturing This book presents current research and development related to the design applications and technology of various heat pipes including conventional heat pipes and thermosyphon pulsating heat pipes loop heat pipes and variable conductance heat pipes Design tools based on computational fluid dynamics simulation and HSHPTM

 materials characteristics operating temperature ranges thermal resistance and operating orientation With its presentation of mathematical models to calculate heat transfer limitations and temperature gradient of both high and low temperature heat pipes the book compares calculated results with the available experimental data It also includes a series of computer programs developed by the author to support presented data aid design and predict performance **Heat Pipe Applications** in Fission Driven Nuclear Power Plants Bahman Zohuri, 2019-02-14 This book presents a new and innovative approach for the use of heat pipes and their application in a number of industrial scenarios including space and nuclear power plants The book opens by describing the heat pipe and its concept including sizing composition and binding energies It contains mathematical models of high and low temperature pipes along with extensive design and manufacturing models characteristics and testing programs A detailed design and safety analysis concludes the book emphasizing the importance of heat pipe implementation within the main cooling system and within the core of the reactor making this book a useful resource for students engineers and researchers The MEMS Handbook Mohamed Gad-el-Hak, 2001-09-27 The revolution is well underway Our understanding and utilization of microelectromechanical systems MEMS are growing at an explosive rate with a worldwide market approaching billions of dollars In time microdevices will fill the niches of our lives as pervasively as electronics do right now But if these miniature devices are to fulfill their mammoth potential today s engineers need a thorough grounding in the underlying physics modeling techniques fabrication methods and materials of MEMS The MEMS Handbook delivers all of this and more Its team of authors unsurpassed in their experience and standing in the scientific community explore various aspects of MEMS their design fabrication and applications as well as the physical modeling of their operations Designed for maximum readability without compromising rigor it provides a current and essential overview of this fledgling discipline

Advances in Heat Pipe Technology D. A. Reay,2015-11-24 Advances in Heat Pipe Technology covers the proceedings of the Fourth International Heat Pipe Conference held at the Royal Aeronautical Society in London United Kingdom on September 7 10 1981 This conference focuses on the advances in heat pipe and thermosyphon technology This book is organized into seven parts encompassing 69 chapters The first part describes the design and features of heat pipes as well as their terrestrial and spacecraft applications The subsequent parts deal with the performance heat transfer and hydrodynamic properties and entrainment of thermosyphon and heat pipes with an emphasis on their application to energy conservation The last parts discuss the heat pipe theory and the experimental techniques and life tests of heat pipes Heat Pipe Science And Technology Amir Faghri,1995-03 Presents basic and advanced techniques in the analytical and numerical modeling of various heat pipe systems under a variety of operating conditions and limitations It describes the variety of complex and coupled processes of heat and mass transfer in heat pipes The book consists of fourteen chapters two appendices and over 400 illustrations along with numerous references and a wide variety of technical data on heat pipes

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