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An Experimental Investigation of a Closed-loop Two-phase Thermosyphon System for Low Grade Heat Recovery from Gaseous Heat Sources - Bjorn Ystad - 1985

An Experimental Investigation of a Closed-loop Two-phase Thermosyphon System for Low Grade Heat Recovery from Gaseous Heat Sources - Glen Warren Rovang - 1985

An Experimental Investigation of a Closed-loop Two-phase Thermosyphon System for Low Grade Heat Recovery from Liquid Heat Sources - Glen Warren Rovang - 1985

Handbook of Phase Change - S.G. Kandlikar - 2019-01-22

Provides a comprehensive coverage of the basic phenomena. It contains twenty-five chapters which cover different aspects of boiling and condensation. First the specific topic or phenomenon is described, followed by a brief survey of previous work, a phenomenological model based on current understanding, and finally a set of recommended design equa

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Two-Phase Flow, Boiling, and Condensation - S. Mostafa Ghiaasiaan - 2007-10-22

This text is an introduction to gas-liquid two-phase flow, boiling and condensation for graduate students, professionals, and researchers in mechanical, nuclear, and chemical engineering. The book provides a balanced coverage of two-phase flow and phase change fundamentals, well-established art and science dealing with conventional systems, and the rapidly developing areas of microchannel flow and heat transfer. It is based on the author's more than 15 years of teaching experience. Instructors teaching multiphase flow have had to rely on a multitude of books and reference materials. This book remedies that problem by covering all the topics essential for a graduate course. Important areas include: two-phase flow model conservation equations and their numerical solution; condensation with and without noncondensables; and two-phase flow, boiling, and condensation in mini and microchannels.

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* Third edition of a well-known and well established text both in industry and for teaching * Fully up-to-date and includes extra problems This book is an aid to heat exchanger design written primarily for design and development engineers in the chemical process, power generation, and refrigeration industries. It provides a comprehensive reference on two-phase flows, boiling, and condensation. The text covers all the latest advances like flows over tube bundles and two-phase heat transfer regarding refrigerants and petrochemicals. Another feature of this third edition is many new problems at chapter ends to enhance its use as a teaching text for graduate and post-graduate courses on two-phase flow and heat transfer. - This book is written for practising engineers as a comprehensive reference on two-phase flows, boiling, and condensation. It deals with methods for estimating two-phase flow pressure drops and heat transfer rates. It is a well-known reference book in its third edition and is also used as a text for advanced university courses. Both authors write from practical experience as both are professional engineers. -


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Encyclopedia Of Two-Phase Heat Transfer And Flow IV - John R Thome - 2018-05-18

Set IV is a new addition to the previous Sets I, II and III. It contains 32 invited chapters from international specialists on the topics of numerical modeling of pulsatling heat pipes and of slug flows with evaporation; lattice Boltzmann modeling of pool boiling; fundamentals of boiling in microchannels and microfin tubes, CO2 and nanofluids; testing and modeling of micro-two-phase cooling systems for electronics; and various special topics (flow separation in microfluidics, two-phase sensors, wettability of anisotropic surfaces, ultra-compact heat exchangers, etc.). The invited authors are leading university researchers and well-known engineers from leading corporate research laboratories (ABB, IBM, Nokia Bell Labs).

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Advances in Applied Mechanical Engineering - Hari Kumar Voruganti - 2021-02-01

This book presents select peer reviewed proceedings of the International Conference on Applied Mechanical Engineering Research (ICAMER 2019). The book examines various areas of mechanical engineering namely design, thermal, materials, manufacturing and industrial engineering covering topics like FEA, optimization, vibrations, condition monitoring, tribology, CFD, IC engines, turbo-machines, automobiles, manufacturing processes, machining, CAM, additive manufacturing, modelling and simulation of manufacturing processing, optimization of manufacturing processing, supply chain management, and operations management. In addition, recent studies on composite materials, materials characterization, fracture and fatigue, advanced materials, energy storage, green building, phase change materials and structural change monitoring are also covered. Given the contents, this book will be useful for students, researchers and professionals working in mechanical engineering and allied fields.

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Two Phase Flow, Phase Change and Numerical Modeling - Amimul Ahsan - 2011-09-26

The heat transfer and analysis on laser beam, evaporator coils, shell-and-tube condenser, two phase flow, nanofluids, complex fluids, and on phase change are significant issues in a design of wide range of industrial processes and devices. This book includes 25 advanced and revised contributions, and it covers mainly (1) numerical modeling of heat transfer, (2) two phase flow, (3) nanofluids, and (4) phase change. The first section introduces numerical modeling of heat transfer on particles in binary gas-solid fluidization bed, and phase change numerical approaches to laser damage, and temperature and velocity distribution. The second section covers density wave instability phenomena, gas and spray-water quenching.
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ABSTRACT: To provide a high power density thermal management system for proton exchange membrane (PEM) fuel cell applications, a passive driven thermal management system was assembled to operate in a closed loop two-phase thermosyphon. This system has two major components: a microchannel evaporator plate and a condenser. The microchannel evaporator plate was fabricated with 56 square channels that have a 1 mm x 1 mm cross section and are 115 mm long. Experiments were conducted with a liquid cooled condenser with heat flux as the control variable. Measurements of mass flow rate, temperature field, and pressure drop have been made for the thermosyphon loop. A model is developed to predict the system characteristics such as the temperature and pressure fields, flow rate, flow regime, heat transfer coefficient, and maximum heat flux. When the system is subjected to a heat load that exceeds the maximum heat flux, an unstable flow regime is observed that causes flow reversal and eventual dryout near the evaporator plate wall. This undesirable phenomenon is modeled based on a quasi-steady state assumption, and the model is capable of predicting the heat flux at the onset of instability for quasi-steady two-phase flow. Another focus of this work is the performance of the condenser portion of the loop, which will be air cooled in practice.


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Recent 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 load, limited airflow over the heat-generating components, and space or weight constraints. This book is intended to 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 thermosyphon. The third chapter is about recent research into loop heat pipes (LHPs). The last chapter presents a novel liquid-vapor separator-incorporated gravitational LHP.

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Heat Transfer - Vyacheslav Vikhrenko - 2011-12-22

Heat transfer is involved in numerous industrial technologies. This interdisciplinary book comprises 16 chapters dealing with combined action of heat transfer and concomitant processes. Five chapters of its first section discuss heat effects due to laser, ion and plasma-solid interaction. In eight chapters of the second section engineering applications of heat conduction equations to the curing reaction kinetics in manufacturing process, their combination with mass transport or chemic and dielectric losses, heat conduction in metallic porous media and power cables are considered. Analysis of the safety of mine hoist under influence of heat produced by mechanical friction, heat transfer in boilers and internal combustion engine chambers, management for ultrahigh strength steel manufacturing are described in this section as well. Three chapters of the last third section are devoted to air cooling of electronic devices.

Heat Pipes - David Reay - 2013-10-01

Heat Pipes, 6th 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


Issues in Extreme Conditions Technology Research and Application: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Cryogenics. The editors have built Issues in Extreme Conditions Technology Research and Application: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Cryogenics in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Extreme Conditions Technology Research and Application: 2013 Edition has been produced by the world’s leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

http://www.ScholarlyEditions.com/

Thermosyphons 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.

Advanced Design and Manufacture to Gain a Competitive Edge - Xiu-Yan - 2008-07-30

Manufacturing industry has been one of the key drivers for recent rapid global economic development. Globalisation of manufacturing industries due to distributed design and labour advantage leads to a drive and thirst for technological advancements and expertise in the fields of advanced design and manufacturing. This development results in many economical benefits to and improvement of quality of life for many people all over the world. This rapid development also creates many opportunities and challenges for both industrials and academics, as the design requirements and constraints have completely changed in this global design and manufacture environment. Consequently the way to design, manufacture and realise products have changed as well. More and more design and manufacture tasks now have to be undertaken within computer environment using simulation and virtual reality technologies. These technological advancements hence support more advanced product development and manufacturing operations in such a global design and manufacturing environment. In this global context and scenario, both industry and the academia have an urgent need to equip themselves with the latest knowledge, technology and methods developed for engineering tasks.
Heat Pipe Science And Technology - Amir Faghri - 1995-03

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Advances in Heat Transfer - 1973-03-30

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Masters Theses in the Pure and Applied Sciences - Wade H. Shafer - 2012-12-06

Masters Theses in the Pure and Applied Sciences was first conceived, published, SId by the Center for Information and Numerical Data Analysis and Synthesis (CINDAS) at Purdue University in 1957, starting its coverage of theses with the academic year 1955. Beginning with Volume 13, the printing and dissemination phases of the activity were transferred to University Microfilms/Xerox of Ann Arbor, Michigan, with the thought that such an arrangement would be more beneficial to the academic and general scientific and technical community. After five years of this joint undertaking we had concluded that it was in the interest of all concerned if the printing and distribution of the volumes were handled by an interna and broader dissemination, tional publishing house to assure improved service Hence, starting with Volume 18, Masters Theses in the Pure and Applied Sciences has been disseminated on a worldwide basis by Plenum Publishing Cor poration of New York, and in the same year the coverage was broadened to include Canadian universities. All back issues can also be ordered from Plenum. We have reported in Volume 30 (thesis year 1985) a total of 12,400 theses titles from 26 Canadian and 186 United States universities. We are sure that this broader base for these titles reported will greatly enhance the value of this important annual reference work.

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Heat Pipes and Solid Sorption Transformations - L.L. Vasiliev - 2013-05-06

Developing clean energy and utilizing waste energy has become increasingly vital. Research targeting the advancement of thermally powered adsorption cooling technologies has progressed in the past few decades, and the awareness of fuel cells and thermally activated (heat pipe heat exchangers) adsorption systems using natural refrigerants and/or alternatives to hydrofluorocarbon-based refrigerants is becoming ever more important. Heat Pipes and Solid Sorption Transformations: Fundamentals and Practical Applications concentrates on heating and cooling, the principles of adsorption, adsorption dynamics, and the availability of three-phase boundaries. Other chapters cover successful heat pipe applications and heat-pipe-based thermal control of fuel cells, solid sorption transformers, and electronic components and air-condition devices. The final chapters summarize the achievements in the field of heat and mass transfer study in heat pipes with variable properties such as gas loaded heat pipes. Several configurations of thermosyphons are showcased, with suggested applications. A number of examples of equipment using the thermosyphon technology are presented and, in the final chapter, the concept of flow boiling and flow condensation heat transfer in microchannels is analyzed in detail.

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This report is concerned about the comparative analysis of the boiling heat transfer behavior of different refrigerants and nanofluids. The experimental apparatus was a thermosyphon loop with an evaporator composed of five vertical boiling channels heated by cartridge heaters. In the first part, experiments in boiling heat transfer were done for three different refrigerants: n-pentane, R-134a and isobutane. For all tests, saturation temperature was fixed at 16 oC and a wide range of heat fluxes were applied in order to calculate the heat transfer coefficient for each case. On the experimental results were analyzed, a comparative discussion was developed based on their thermal properties. In the second part, nanofluids with n-pentane and 1.0 vol. % of carbon nanotubes (CNT) were prepared following the two-step method. Although CNT stable suspension was not achieved, it was run in the rig with the same conditions as the pure n-pentane test. The results showed that non-dispersed CNT decreased nucleate boiling heat transfer coefficient down to 20.5% at 120W. The main predicted reasons of this decreasing were the low interaction between CNT and n-pentane and the proximity between CNT average size and surface roughness, which promoted the coverage of the nucleate cavities. However, an increase of approximately 25% in the critical heat flux was registered with the n-pentane nanofluid. Furthermore, fouling on the boiling wall surfaces was observed after the nanofluid test, which was monitored in SEM. An attempt to improve CNT dispersion was performed with the addition of oleylamine, although it was not successful. Optimum suspension of CNT should be further examined to get a noticeable enhancement in nucleate boiling heat transfer, and some suggested procedures are detailed to improve such CNT dispersion.

**Oscillating Heat Pipes - Hongbin Ma - 2015-05-22**

This book presents the fundamental fluid flow and heat transfer principles occurring in oscillating heat pipes and also provides updated developments and recent innovations in research and applications of heat pipes. Starting with fundamental presentation of heat pipes, the focus is on oscillating motions and its heat transfer enhancement in a two-phase heat transfer system. The book covers thermodynamic analysis, interfacial phenomenon, thin film evaporation, theoretical models of oscillating motion and heat transfer of single phase and two-phase flows, primary factors affecting oscillating motions and heat transfer, neutron imaging study of oscillating motions in an oscillating heat pipes, and nanofluid’s effect on the heat transfer performance in oscillating heat pipes. The importance of thermally-excited oscillating motion combined with phase change heat transfer to a wide variety of applications is emphasized. This book is an essential resource and learning tool for senior undergraduate, graduate students, practicing engineers, researchers, and scientists working in the area of heat pipes. This book also includes detailed descriptions on how an oscillating heat pipe is fabricated, tested, and utilized. Covers fundamentals of oscillating flow and heat transfer in an oscillating heat pipe. Provides general presentation of conventional heat pipes.

**Heat Transfer Analysis with Nanofluids in a Closed Two-phase Thermosyphon Loop - Anna Rivera Jovi - 2008**

This report is concerned about the comparative analysis of the boiling heat transfer performance in oscillating heat pipes with n-pentane and 1.0 vol. % of carbon nanotubes (CNT) were prepared. For all tests, saturation temperature was fixed at 16 oC and a wide range of heat fluxes were applied in order to calculate the heat transfer coefficient for each case. Once the experimental results were analyzed, a comparative discussion was developed based on their thermal properties. In the second part, nanofluids with n-pentane and 1.0 vol. % of carbon nanotubes (CNT) were prepared following the two-step method. Although CNT stable suspension was not achieved, it was run in the rig with the same conditions as the pure n-pentane test. The results showed that non-dispersed CNT decreased nucleate boiling heat transfer coefficient down to 20.5% at 120W. The main predicted reasons of this decreasing were the low interaction between CNT and n-pentane and the proximity between CNT average size and surface roughness, which promoted the coverage of the nucleate cavities. However, an increase of approximately 25% in the critical heat flux was registered with the n-pentane nanofluid. Furthermore, fouling on the boiling wall surfaces was observed after the nanofluid test, which was monitored in SEM. An attempt to improve CNT dispersion was performed with the addition of oleylamine, although it was not successful. Optimum suspension of CNT should be further examined to get a noticeable enhancement in nucleate boiling heat transfer, and some suggested procedures are detailed to improve such CNT dispersion.

**Dynamics and Control of Energy Systems - Achintya Mukhopadhyay - 2019-10-14**

This book presents recent advances in dynamics and control of different types of energy systems. It covers research on dynamics and control in energy systems from different aspects, namely, combustion, multiphase flow, nuclear, chemical and thermal. The chapters start from the basic concepts so that this book can be useful even for researchers with very little background in the area. A dedicated chapter provides an overview on the fundamental aspects of the dynamical systems approach. The book will be of use to researchers and professionals alike.

**2021 20th IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm) - IEEE Staff - 2021-06**

The ITherm Conference series is the leading international venue for scientific and engineering exploration of thermal, thermomechanical, and emerging technology issues associated with electronic devices, packages, and systems.

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**Cooling of Electronic Components with Closed Loop Two-phase Thermosyphon - - 1996**

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**Applied Mechanics Reviews - - 1982**

**Applied Mechanics Reviews - - 1982**

**Proceedings - - 1991**

**Proceedings - - 1991**


The complete editorial contents of Opedia Thermal eMagazine, Volume 3, Issues 1 - 12 features in-depth, technical articles covering the most critical...
Closed-loop-two-phase-thermosyphon-of-small-dimensions-a

The complete editorial contents of Qpedia Thermal eMagazine, Volume 3, Issues 1 - 12 features in-depth, technical articles covering the most critical areas of electronics cooling.

Journal of Heat Transfer - 2002

Advanced Engineering and Technology - Liquan Xie - 2014-03-18
Advanced Engineering and Technology contains 110 technical papers from the 2014 Annual Congress on Advanced Engineering and Technology (CAET 2014, Hong Kong, 19-20 April 2014, including the 4th Workshop on Applied Mechanics and Civil Engineering, AMCE 2014). The contributions focus on advanced theories and technologies related to building engineering, geotechnical engineering, road and bridge engineering, hydraulic engineering, environmental engineering, pollution and control, water resources and water treatment, mechanics in engineering, water and soil conservation, numerical software and applications, climate change and environmental dynamics, intelligent safety systems, chemistry, biochemical and food engineering, and modelling and data analysis. Advanced Engineering and Technology will be useful to academics and professionals involved in civil engineering, hydraulic engineering, environmental engineering, modelling & data analysis, chemistry and biochemical engineering, and other related fields.

Reflux Condensation and Operating Limits of the Two-phase Closed Thermosyphon - Syh-Jou Chen - 1984

Reflux Condensation and Operating Limits of the Two-phase Closed Thermosyphon - Syh-Jou Chen - 1984

Two-Phase Heat Exchanger Symposium - Joseph T. Pearson - 1985

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