Organic Rankine Cycle Technology All Energy

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Organic Rankine Cycle for Energy Recovery System - Andrea De Pascale 2020-06-18
The rising trend in the global energy demand poses new challenges to humankind. The energy and mechanical engineering sectors are called to develop new and more environmentally friendly solutions to harvest residual energy from primary production processes. The Organic Rankine Cycle (ORC) is an emerging energy system for power production and waste heat recovery. In the near future, this technology can play an increasing role within the energy generation sectors and can help achieve the carbon footprint reduction targets of many industrial processes and human activities. This Special Issue focuses on selected research and application cases of ORC-based waste heat recovery solutions. Topics included in this publication cover the following aspects: performance modeling and optimization of ORC systems based on pure and zeotropic mixture working fluids; applications of waste heat recovery via ORC to gas turbines and reciprocating engines; optimal sizing and operation of ORC under combined heat and power and district heating application; the potential of ORC on board ships and related issues; life cycle analysis for biomass application; ORC integration with supercritical CO2 cycle; and the proper design of the main ORC components, including fluid dynamics issues. The current state of the art is considered and some cutting-edge ORC technology research activities are examined in this book.
Thermodynamic Analysis and Optimization of Geothermal Power Plants - Can Ozgur Colpan 2021-03-01
Thermodynamic Analysis and Optimization of Geothermal Power Plants guides researchers and engineers on the analysis and optimization of geothermal power plants through conventional and innovative methods. Coverage encompasses the fundamentals, thermodynamic analysis, and optimization of geothermal power plants. Advanced thermodynamic analysis tools such as exergy analysis, thermoeconomic analysis, and several thermodynamic optimization methods are covered in-

depth for different configurations of geothermal power plants through case studies. Interdisciplinary research with relevant economic and environmental dimensions are addressed in many of the studies, along with optimization studies aimed at better efficiency, lower cost and lower environmental impact. Addresses the complexities of thermodynamic assessment in almost all operational plant configurations, including solar-geothermal and multi-generation power plants Includes an exemplary range of case studies, from basic to integrated Provides modern optimization methods, including entropy-based, exergoeconomic, artificial neural networks and multi-objective particle swarm Covers environmental impact considerations and integration with renewable energy systems

Virtual Modeling and Optimization of an Organic Rankine Cycle - Vetrivel Chandrasekaran 2014

Organic Rankine Cycles are used for Waste Heat Recovery from low temperature heat sources. In an Internal Combustion Engine, roughly one-third of the fuel energy is sent out through the exhaust. ORC's were investigated for fuel efficiency improvements for heavy duty trucks in the 70's during the oil crisis. ORC's have once again gained interest with the current energy scenario and advances in technology.

ORGANIC RANKINE CYCLE TECHNOLOGY PROGRAM. Quarterly Progress Report No. 3, October 1, 1966--January 1, 1967. Internal Report No. AER--468 - 1967

6 KW SYSTEM EVALUATION AND ENDURANCE. A.E.C. Organic Rankine Cycle Technology Program Topical Report - 1972

Exergy, Energy System Analysis and Optimization - Volume III - Christos A. Frangopoulos 2009-05-13

Exergy, Energy System Analysis, and Optimization theme is a component of the Encyclopedia of Energy Sciences, Engineering and Technology Resources which is part of the global Encyclopedia of Life Support Systems (EOLSS), an integrated compendium of twenty one Encyclopedias. These three volumes are organized into five different topics which represent the main scientific areas of the theme: 1. Exergy and Thermodynamic Analysis; 2. Thermoeconomic Analysis; 3. Modeling, Simulation and Optimization in Energy Systems; 4. Artificial Intelligence and Expert Systems in Energy Systems Analysis; 5. Sustainability Considerations in the Modeling of Energy Systems. Fundamentals and applications of characteristic methods are presented in these volumes. These three volumes are aimed at the following five major target audiences: University and College Students, Educators, Professional Practitioners, Research Personnel and Policy Analysts, Managers, and Decision Makers and NGOs.

Organic Rankine Cycle for Energy Recovery System - Andrea De Pascale 2020

The rising trend in the global energy demand poses new challenges to humankind. The energy and mechanical engineering sectors are called to develop new and more environmentally friendly solutions to harvest residual energy from primary production processes. The Organic Rankine Cycle (ORC) is an emerging energy system for power production and waste heat recovery. In the near future, this technology can play an increasing role within the energy generation sectors and can help achieve the carbon footprint reduction targets of many industrial processes and human activities. This Special Issue focuses on selected

research and application cases of ORC-based waste heat recovery solutions. Topics included in this publication cover the following aspects: performance modeling and optimization of ORC systems based on pure and zeotropic mixture working fluids; applications of waste heat recovery via ORC to gas turbines and reciprocating engines; optimal sizing and operation of ORC under combined heat and power and district heating application; the potential of ORC on board ships and related issues; life cycle analysis for biomass application; ORC integration with supercritical CO2 cycle; and the proper design of the main ORC components, including fluid dynamics issues. The current state of the art is considered and some cutting-edge ORC technology research activities are examined in this book.

Chapter 19 Concentrated solar energy driven multi-generation systems based on the organic Rankine cycle technology - Nishith Desai 2020

The use of renewable energy sources for multi-generation plants (plants with multiple products, e.g., heat, power, cooling, fresh water) is beneficial to mitigating climate change and to achieving sustainable development. Concentrated solar power plants take advantage of producing heat that can be used for power generation, thermal energy driven refrigeration, desalination, and other heating purposes. Moreover, concentrated solar power plants combined with thermal energy storage provide a cost-effective solution for long-term storage and solve the mismatch problem between supply and demand. For small to medium-scale applications (a few kWe to a few MWe), organic Rankine cycle power systems have been demonstrated to be efficient solutions for multi-generation plants. In this chapter, different concentrated solar power technologies for small to medium-scale applications are reviewed, and multi-generation systems based on the organic Rankine cycle technology are presented. Furthermore, the technical and economic viabilities of using concentrated solar energy powered organic Rankine cycle plants for multi-generation are discussed. Issues related to the system design and integration with different systems (e.g., vapor absorption system for cooling, multi-effect desalination for fresh water generation, etc.) are also addressed.

ORGANIC RANKINE CYCLE TECHNOLOGY PROGRAM. Quarterly Progress Report No. 7, October 1, 1967--January 1, 1968 - 1968

Progress in Sustainable Energy Technologies: Generating Renewable Energy - Ibrahim Dincer 2014-10-29

This multi-disciplinary volume presents information on the state-of-the-art in sustainable energy technologies key to tackling the world’s energy challenges and achieving environmentally benign solutions. Its unique amalgamation of the latest technical information, research findings and examples of successfully applied new developments in the area of sustainable energy will be of keen interest to engineers, students, practitioners, scientists and researchers working with sustainable energy technologies. Problem statements, projections, new concepts, models, experiments, measurements and simulations from not only engineering and science, but disciplines as diverse as ecology, education, economics and information technology are included, in order to create a truly holistic vision of the sustainable energy field. The contributions feature coverage of topics including solar and wind energy, biomass and biofuels, waste-to-energy, renewable fuels,

geothermal and hydrogen power, efficiency gains in fossil fuels and energy storage technologies including batteries and fuel cells.

Organic Rankine Cycle Technology for Heat Recovery - Enhua Wang 2018-11-07

This book on organic Rankine cycle technology presents nine chapters on research activities covering the wide range of current issues on the organic Rankine cycle. The first section deals with working fluid selection and component design. The second section is related to dynamic modeling, starting from internal combustion engines to industrial power plants. The third section discusses industrial applications of waste heat recovery, including internal combustion engines, LNG, and waste water. A comprehensive analysis of the technology and application of organic Rankine cycle systems is beyond the aim of the book. However, the content of this volume can be useful for scientists and students to broaden their knowledge of technologies and applications of organic Rankine cycle systems.

ORC Using Solar Energy - Mohamed Adly Darwish 2015-02-06

How to effectively utilize low and medium temperature energy is one of the solutions to solve the energy shortage and environmental pollution problems. Solar-thermal power-plants have enjoyed limited success in the energy market to date. The ability to better characterize the performance of existing solar-thermal technologies as well as investigate the potential of new technologies is a crucial step in developing more economically viable designs. Organic Rankine cycles have unique properties that are well suited to solar power Generation and also suitable to our country topography especially in remote areas. This book contributes to the knowledge and the characterization of small scale Organic Rankine Cycles (ORC). It is based on experimental data, thermodynamic models and case studies. The experimental studies include: A prototype of small-scale waste heat recovery ORC using an open-drive oil free scroll expander. Comparison of different working fluids and selecting the suitable one for the cycle.

ORC-HP-technology - VDI-Gesellschaft Energietechnik 1984

Heat Conversion Into Power Using Small Scale Organic Rankine Cycles - Bertrand Tchanche Fankam 2012

The world economy heavily relies on fossil fuels. Their use leads to carbon dioxide emissions responsible of global warming and fuels international tensions. Renewable energy sources and energy efficiency are alternatives. An Organic Rankine Cycle is similar to a steam cycle but uses an organic fluid instead of water. It is suitable for conversion of solar radiation, geothermal energy, biomass energy, ocean thermal gradient, and waste heat into power. Although investigated in the 1970s, it was soon abandoned after the oil crisis. With the growing concern on the environment, the interest for this technology for electricity generation was renewed. The technology for medium and large scale systems is already mature but solutions are still sought for small systems. This book presents results of investigation on micro organic Rankine cycles of less than 2 kW power output. Overview of different organic Rankine cycle applications, working fluid selection, cycle performance analysis, and economic evaluation constitute the content of the book and will be useful to energy professionals, researchers working on thermodynamics and those interested in next generation power systems.

Power Generation from Low-grade

Energy Source Using Organic Rankine Cycle Technology - Adefemi Oluwaniyi Owoputi 2017

Advances in Carbon Management Technologies - Subhas Sikdar 2020-03-19

Advances in Carbon Management Technologies comprises 43 chapters contributed by experts from all over the world. Volume 1 of the book, containing 23 chapters, discusses the status of technologies capable of yielding substantial reduction of carbon dioxide emissions from major combustion sources. Such technologies include renewable energy sources that can replace fossil fuels and technologies to capture CO2 after fossil fuel combustion or directly from the atmosphere, with subsequent permanent long-term storage. The introductory chapter emphasizes the gravity of the issues related to greenhouse gas emissionglobal temperature correlation, the state of the art of key technologies and the necessary emission reductions needed to meet international warming targets. Section 1 deals with global challenges associated with key fossil fuel mitigation technologies, including removing CO2 from the atmosphere, and emission measurements. Section 2 presents technological choices for coal, petroleum, and natural gas for the purpose of reducing carbon footprints associated with the utilization of such fuels. Section 3 deals with promising contributions of alternatives to fossil fuels, such as hydropower, nuclear, solar photovoltaics, and wind. Chapters 19 of this book is freely available as a downloadable Open Access PDF under a Creative Commons Attribution-Non Commercial-No Derivatives 4.0 license. The links can be found on the book's Routledge web page at https://www.routledge.com//9780367198428

ORGANIC RANKINE CYCLE TECHNOLOGY PROGRAM. Quarterly Progress Report No. 2, July 1-October 1, 1966 - 1967

Modelling and Control of Organic Rankine Cycle Based Waste Heat Recovery Systems - Jianhua Zhang 2017-11-01

Modelling and Control of Organic Rankine Cycle Based Waste Heat Recovery Systems is a systematic study of modeling and control of ORC-based systems for waste heat recovery, bringing together rapidly developing research in this area. The organic Rankine cycle (ORC) is now commonly accepted as a viable technology to convert low grade heat in the thermal power plant, the diesel engine and the fuel cell. In response to limited reserves, increases in cost and the environmental impact of fossil fuels, the cumulative global capacity of ORC power systems for the conversion of renewable and waste thermal energy is undergoing rapid growth. Recovery utilization for low-grade heat energy has become one of the important energy-saving methods. In addition, technological advancements and cost reduction allow for competitive organic Rankine cycle machines on the market. Chapter 1 introduces the current status of organic Rankine cycle systems and reviews advances and challenges in organic Rankine cycle (ORC) systems modeling and control strategies. Chapter 2 presents the configuration of ORC power systems, analyzes the performance of ORC systems and summarizes their features, including both the operating modes and control objectives of ORC systems. Chapter 3 establishes the physical model for ORC power systems after building basic component models (evaporator, condenser, expander, receiver and pump). The model of an ORC power

system is identified using input/output data. Chapter 4 designs controllers for ORC power systems operating on both, following electric power mode and waste heat mode respectively, using optimized set-points of controlled ORC power systems. Chapter 5 focuses on using simulation tools for building development systems that experimentally validate the physical model and control strategies of ORC power systems. Engineers and professionals, as well as recent graduates in the power generation industry will find this a valuable reference. Covers all of the topics related to both modeling and controller design for organic Rankine cycle systems Focuses on the approaches for creating mathematical models and controlling for the ORC systems Illustrates clearly the multi-disciplinary nature of the subject Includes an appendix of MATLAB/Simulink code for modeling and controlling ORC

Geothermal Power Plants - Ronald DiPippo 2011-04-08

Ron DiPippo, Professor Emeritus at the University of Massachusetts Dartmouth, is a world-regarded geothermal expert. This single resource covers all aspects of the utilization of geothermal energy for power generation from fundamental scientific and engineering principles. The thermodynamic basis for the design of geothermal power plants is at the heart of the book and readers are clearly guided on the process of designing and analysing the key types of geothermal energy conversion systems. Its practical emphasis is enhanced by the use of case studies from real plants that increase the reader's understanding of geothermal energy conversion and provide a unique compilation of hard-to-obtain data and experience. An important new chapter covers Environmental Impact and Abatement Technologies, including gaseous and solid emissions; water, noise and thermal pollutions; land usage; disturbance of natural hydrothermal manifestations, habitats and vegetation; minimisation of CO2 emissions and environmental impact assessment. The book is illustrated with over 240 photographs and drawings. Nine chapters include practice problems, with solutions, which enable the book to be used as a course text. Also includes a definitive worldwide compilation of every geothermal power plant that has operated, unit by unit, plus a concise primer on the applicable thermodynamics. * Engineering principles are at the heart of the book, with complete coverage of the thermodynamic basis for the design of geothermal power systems * Practical applications are backed up by an extensive selection of case studies that show how geothermal energy conversion systems have been designed, applied and exploited in practice * World renowned geothermal expert DiPippo has including a new chapter on Environmental Impact and Abatement Technology in this new edition

A Thermodynamic and Economic Simulation Modelling Study of Utilizing Low-temperature Sources to Power Absorption and Organic Rankine Cycles - Salah A. A. Masheiti 2011

14th International Conference on Turbochargers and Turbocharging - Institution of Mechanical Engineers 2020-09-30

14th International Conference on Turbochargers and Turbocharging addresses current and novel turbocharging system choices and components with a renewed emphasis to address the challenges posed by emission regulations and market trends. The contributions focus on

the development of air management solutions and waste heat recovery ideas to support thermal propulsion systems leading to high thermal efficiency and low exhaust emissions. These can be in the form of internal combustion engines or other propulsion technologies (eg. Fuel cell) in both direct drive and hybridised configuration. 14th International Conference on Turbochargers and Turbocharging also provides a particular focus on turbochargers, superchargers, waste heat recovery turbines and related air managements components in both electrical and mechanical forms.
Power Engineering and Technology - H. D. Baehr 1986-01-01

The Handbook of Biomass Combustion and Co-firing - Sjaak Van Loo 2012-05-16
This unique handbook presents both the theory and application of biomass combustion and co-firing, from basic principles to industrial combustion and environmental impact, in a clear and comprehensive manner. It offers a solid grounding on biomass combustion, and advice on improving combustion systems.Written by leading international academics and industrial experts, and prepared under the auspices of the IEA Bioenergy Implementing Agreement, the handbook is an essential resource for anyone interested in biomass combustion and co-firing technologies varying from domestic woodstoves to utility-scale power generation. The book covers subjects including biomass fuel pre-treatment and logistics, modelling the combustion process and ash-related issues, as well as featuring an overview of the current R&D needs regarding biomass combustion.
Organic Rankine Cycle (ORC) Power Systems - Ennio Macchi 2016-08-24
Organic Rankine Cycle (ORC) Power Systems: Technologies and Applications provides a systematic and detailed description of organic Rankine cycle technologies and the way they are increasingly of interest for cost-effective sustainable energy generation. Popular applications include cogeneration from biomass and electricity generation from geothermal reservoirs and concentrating solar power installations, as well as waste heat recovery from gas turbines, internal combustion engines and medium- and low-temperature industrial processes. With hundreds of ORC power systems already in operation and the market growing at a fast pace, this is an active and engaging area of scientific research and technical development. The book is structured in three main parts: (i) Introduction to ORC Power Systems, Design and Optimization, (ii) ORC Plant Components, and (iii) Fields of Application. Provides a thorough introduction to ORC power systems Contains detailed chapters on ORC plant components Includes a section focusing on ORC design and optimization Reviews key applications of ORC technologies, including cogeneration from biomass, electricity generation from geothermal reservoirs and concentrating solar power installations, waste heat recovery from gas turbines, internal combustion engines and medium- and low-temperature industrial processes Various chapters are authored by well-known specialists from Academia and ORC manufacturers
ORGANIC RANKINE CYCLE TECHNOLOGY PROGRAM. Quarterly Progress Report No. 12, January 1, 1969--April 1, 1969 - 1969

Solar Organic Rankine Cycle Power System for Developing Countries - Kim Kyung Chun 2015-08-06

The concept of appropriate technology has been addressed for electricity production in remote areas of developing countries through the solar ORC technology. The selection of working fluids plays an important role in ORC system. R245fa and R134a are recommended for power generation. In addition, R245fa works well for the heat source temperature of the range 100-120 C whereas R134a below 100 C. Vacuum type solar collector is used for obtaining the hot water which can produce the temperature of 120 C. The commercial scroll expander that adopt magnetic coupling has been used in the experiment. The experimental investigation of the small-scale ORC showed acceptable characteristics for the temperature of the 120 C that uses R245fa working fluid. The system efficiency is 8.5 % with the power output of 1.4 kW. From the economic point of view the solar ORC system cannot recover its investment until 19 years of installation and operation currently without any subsidies. The concept in this book is helpful for solar ORC developers, manufacturers, energy planners, rural practitioners, different aid and donor agencies for adopting the sustainable energy system technology."

The Development and Application of Organic Rankine Cycle for Vehicle Waste Heat Recovery - Yiji Lu 2018

The development of engine waste heat recovery (WHR) technologies attracts ever increasing interests due to the rising strict policy requirements and environmental concerns. Organic Rankine Cycle (ORC) can convert low medium grade heat into electrical or mechanical power and has been widely recognized as the most promising heat-driven technologies. A typical internal combustion engine (ICE) converts around 30% of the overall fuel energy into effective mechanical power and the rest of fuel energy is dumped through the engine exhaust system and cooling system. Integrating a well-designed ORC system to ICE can effectively improve the overall energy efficiency and reduce emissions with around 2-5 years payback period through fuel saving. This book chapter is meant to provide an overview of the technical development and application of ORC technology to recover wasted thermal energy from the ICE with a particular focus on vehicle applications.

Market Potential Study for Organic Rankine Cycle Technology in India - Jochen Fink 2014

Organic Rankine Cycle Power Systems - Sylvain Quoilin 2018-02-14

Authored by authoritative experts in the field, this long–awaited book provides multidisciplinary insights into the technological, economic, design, and optimization aspects of organic Rankine cycle (ORC) systems. Following an introduction presenting the fundamentals of Rankine cycles and thermodynamics, subsequent chapters discuss ORC technology, including the selection of working fluid, the expansion machines and pumps, and the applications of ORC. A chapter on modeling, optimizing and controlling ORC systems is also included. The book concludes with a look at future technological advances. For newcomers to this hot topic as well as experts in industry already working with the technology, from organic chemistry via simulation and modeling to power plant engineers.

Trends and Challenges in Maritime Energy Management - Aykut I. Ölçer 2018-05-03

This book provides an overview of contemporary trends and challenges in maritime energy management (MEM). Coordinated action is necessary to achieve a low carbon and energy-efficient maritime future, and MEM is

the prevailing framework aimed at reducing greenhouse gas emissions resulting from maritime industry activities. The book familiarizes readers with the status quo in the field, and paves the way for finding solutions to perceived challenges. The 34 contributions cover six important aspects: regulatory framework; energy-efficient ship design; energy efficient ship and port operation; economic and social dimensions; alternative fuels and wind-assisted ship propulsion; and marine renewable energy. This pioneering work is intended for researchers and academics as well as practitioners and policymakers involved in this important field.

Organic Rankine Cycle (ORC) Power Systems - Ennio Macchi 2016-09-09

Organic Rankine Cycle (ORC) Power Systems: Technologies and Applications provides a systematic and detailed description of organic Rankine cycle technologies and the way they are increasingly of interest for cost-effective sustainable energy generation. Popular applications include cogeneration from biomass and electricity generation from geothermal reservoirs and concentrating solar power installations, as well as waste heat recovery from gas turbines, internal combustion engines and medium- and low-temperature industrial processes. With hundreds of ORC power systems already in operation and the market growing at a fast pace, this is an active and engaging area of scientific research and technical development. The book is structured in three main parts: (i) Introduction to ORC Power Systems, Design and Optimization, (ii) ORC Plant Components, and (iii) Fields of Application. Provides a thorough introduction to ORC power systems Contains detailed chapters on ORC plant components Includes a section focusing on ORC design and optimization Reviews key applications of ORC technologies, including cogeneration from biomass, electricity generation from geothermal reservoirs and concentrating solar power installations, waste heat recovery from gas turbines, internal combustion engines and medium- and low-temperature industrial processes Various chapters are authored by well-known specialists from Academia and ORC manufacturers

Energy Management and Efficiency for the Process Industries - Alan P. Rossiter 2015-03-25

Provides a unique overview of energy management for the process industries Provides an overall approach to energy management and places the technical issues that drive energy efficiency in context Combines the perspectives of freewheeling consultants and corporate insiders In two sections, the book provides the organizational framework (Section 1) within which the technical aspects of energy management, described in Section 2, can be most effectively executed Includes success stories from three very different companies that have achieved excellence in their energy management efforts Covers energy management, including the role of the energy manager, designing and implementing energy management programs, energy benchmarking, reporting, and energy management systems Technical topics cover efficiency improvement opportunities in a wide range of utility systems and process equipment types, as well as techniques to improve process design and operation

Thermal Cycles of Heat Recovery Power Plants - Tangellapalli Srinivas 2021-04-02

Thermal Cycles of Heat Recovery Power Plants presents information about thermal power plant cycles suitable

for waste heat recovery (WHR) in modern power plants. The author covers five thermal power cycles: organic Rankine cycle (ORC), organic flash cycle (OFC), Kalina cycle (KC), steam Rankine cycle (SRC) and steam flash cycle (SFC) with the working fluids of R123, R124, R134a, R245fa, R717 and R407C. The handbook helps the reader to understand the latest power plant technologies suitable for utilizing the waste heat generated by thermal industrial processes. Key Features: - Comprehensive modeling, simulation, analysis and optimization of 5 power cycle types with different working fluids - Clear information about the processes and solutions of thermal power cycles to augment the power generation with improved energy conversion. - Simple, reader friendly presentation - bibliographic references after each chapter for further reading This handbook is suitable for engineering students in degree courses and professionals in training programs who require resources on advanced thermal power plant operation and optimal waste heat recovery processes, respectively. It is also a handy reference for energy conversion efficiency in heat recovery power plants. The book is also of interest to any researchers interested in industrial applications of thermodynamic processes.

Development of a Solar-energy Activated Organic Rankine-cycle Pilot Power Plant - E. J. Bala 1984

Gas Turbine Combined Cycle Power Plants - S. Can Gülen 2019-12-06

This book covers the design, analysis, and optimization of the cleanest, most efficient fossil fuel-fired electric power generation technology at present and in the foreseeable future. The book contains a wealth of first principles-based calculation methods comprising key formulae, charts, rules of thumb, and other tools developed by the author over the course of 25+ years spent in the power generation industry. It is focused exclusively on actual power plant systems and actual field and/or rating data providing a comprehensive picture of the gas turbine combined cycle technology from performance and cost perspectives. Material presented in this book is applicable for research and development studies in academia and government/industry laboratories, as well as practical, day-to-day problems encountered in the industry (including OEMs, consulting engineers and plant operators).

ORGANIC RANKINE CYCLE TECHNOLOGY PROGRAM. Quarterly Progress Report No. 8, January 1--April 1, 1968 - 1968

What Every Engineer Should Know about the Organic Rankine Cycle and Waste Energy Recovery - Ali H. Tarrad 2022-08-05

This book deals with issues related to the efficient utilization of available energy in industrial sites. It also provides a recipe for minimizing the Global Warming Potential (GWP) and reducing the impact of Ozone Depletion Potential (ODP) on nature, and presents a variety of insights into thermodynamics, heat transfer, and energy management for teaching purposes. The book will assist beginner and senior engineers to deal with energy issues from a more global perspective.

Closed Power Cycles - Costante Mario Invernizzi 2013-06-03

With the growing attention to the exploitation of renewable energies and heat recovery from industrial processes, the traditional steam and gas cycles are showing themselves often inadequate. The inadequacy is due to the great assortment of the

required sizes power and of the large kind of heat sources. Closed Power Cycles: Thermodynamic Fundamentals and Applications offers an organized discussion about the strong interaction between working fluids, the thermodynamic behavior of the cycle using them and the technological design aspects of the machines. A precise treatment of thermal engines operating in accordance with closed cycles is provided to develop ideas and discussions strictly founded on the basic thermodynamic facts that control the closed cycles operation and design. Closed Power Cycles: Thermodynamic Fundamentals and Applications also contains numerous examples which have been carried out with the help of the Aspen Plus®R program. Including chapters on binary cycles, the organic Rankine cycle and real closed gas cycles, Closed Power Cycles: Thermodynamic Fundamentals and Applications acts a solid introduction and reference for post-graduate students and researchers working in applied thermodynamics and energy conversion with thermodynamic engines.

Organic Rankine Cycles for Waste Heat Recovery - Silvia Lasala 2020-05-13

This book comprises five chapters on developed research activities on organic Rankine cycles. The first section aims to provide researchers with proper modelling (Chapter 1) and experimental (Chapter 2) tools to calculate and empirically validate thermophysical properties of ORC working fluids. The second section introduces some theoretical and experimental studies of organic Rankine cycles for waste heat recovery applications: a review of different supercritical ORC (Chapter 3), ORC for waste heat recovery from fossil-fired power plants (Chapter 4), the experimental detailed characterization of a small-scale ORC of 3 kW operating with either pure fluids or mixtures (Chapter 5).

Development of a Direct Evaporator for the Organic Rankine Cycle - 2011

This paper describes research and development currently underway to place the evaporator of an Organic Rankine Cycle (ORC) system directly in the path of a hot exhaust stream produced by a gas turbine engine. The main goal of this research effort is to improve cycle efficiency and cost by eliminating the usual secondary heat transfer loop. The project's technical objective is to eliminate the pumps, heat exchangers and all other added cost and complexity of the secondary loop by developing an evaporator that resides in the waste heat stream, yet virtually eliminates the risk of a working fluid leakage into the gaseous exhaust stream. The research team comprised of Idaho National Laboratory and General Electric Company engineers leverages previous research in advanced ORC technology to develop a new direct evaporator design that will reduce the ORC system cost by up to 15%, enabling the rapid adoption of ORCs for waste heat recovery.