



Volume 10

Number 5

Year 2024







EDITOR-IN-CHIEF

Ahmet Selim Dalkilic, Yildiz Technical University, İstanbul, Türkiye

ASSOCIATE EDITORS

Ali Celen, Erzincan Binali Yıldırım University, Erzincan, Türkiye Baha Zafer, İstanbul University, İstanbul, Türkiye Bekir Şener, Yildiz Technical University, İstanbul, Türkiye Erdal Çetkin, İzmir Institute of Technology, İzmir, Türkiye Emre Alpman, Marmara University, İstanbul, Türkiye Erman Aslan, İstanbul University, İstanbul, Türkiye Hasan Köten, İstanbul Medeniyet University, İstanbul, Türkiye Hatice Mercan, Yildiz Technical University, İstanbul, Türkiye Müslüm Arıcı, Kocaeli University, Kocaeli, Türkiye Mustafa Kılıç, Adana Science and Technology University, Adana, Türkiye Nader Javani, Yildiz Technical University, İstanbul, Türkiye Naime Filiz Özdil, Adana Science and Technology University, Adana, Türkiye Şevket Özgür Atayılmaz, Yildiz Technical University, Adana, Türkiye Özgen Açıkgöz, Yildiz Technical University, İstanbul, Türkiye Yaşar İslamoğlu, Sakarya University, Sakarya, Türkiye Yasin Karagoz, İstanbul Medeniyet University, İstanbul, Türkiye Zerrin Sert, Eskişehir Osmangazi University, Eskisehir, Türkiye

EDITORIAL BOARD

Adrian Bejan, Duke University, United States
Afshin J. Ghajar, Oklahoma State University, United States
Ali Chamkha, Prince Mohammad Bin Fahd University, Saudi Arabia
Bekir Sami Yilbas, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia
Chi-Chuan Wang, National Chiao Tung University, Taiwan
Gopal Nath Tiwari, Indian Institute of Technology, India
Hakan F. Oztop, Fırat University, Türkiye
Hari Mohan Srivastava, University of Victoria, Canada
Hamadiche Mahmoud, Université de Lyon 1, France
Hamid Niazmand, Ferdowsi University Of Mashhad, Iran





Kambiz Vafai, University of California, United States
Karan Surana, The University of Texsas, United States
Mehmet Kanoğlu, University of Gaziantep, Türkiye
Mohammad Mehdi Rashidi, Bu-Ali Sina University, Iran
Mohammad Hassan Saidi, Sharif University of Technology, Iran
Muhammad Ali Rob Sharif, The University of Alabama, United States
Moh'd A. Al-Nimr, Jordan University of Science and Technology, Jordan
Mohsen Sheikholeslami, Babol Noshirvani University of Technology, Iran
Mustafa Turkyilmazoglu, Hacettepe University, Türkiye
N.K. Anand, Texas A&M University, United States
Omid Mahian, Xi'an Jiaotong University, Xi'an, China
Sergio Nardini, Seconda Università degli Studi di Napoli, Italy
Wei-Mon Yan, National Chiao Tung University, Taiwan

Abstracting and Indexing: Directory of Open Access Journals (DOAJ), EBSCO Host Online Research Databases, Web of Science, Emerging Sources Citation Index (ESCI), Scopus, TRDizin, MIAR, Scilit, OUCI, Research4Life, Ideal Online, Sherpa Romeo, ASCI

Journal Description: The journal is supported by Yildiz Technical University officially, and is a blind peer-reviewed free open-access journal, published bimontly (January-March-May-July-September-November).

Publisher: Yildiz Technical University

Editor-in-Chief: Prof.Dr. Ahmet Selim Dalkılıç, dalkilic@yildiz.edu.tr

Language of Publication: English
Frequency: Bimontly (6 issues per year)

Regular Issues: January (1) - March (2) - May (3) - July (4) - September (5) - November (6)

Publication Type: Online e-version

Journal of Thermal Engineering is supported by Yildiz Technical University officially, and is a blind peer-reviewed free open-access journal, published bimontly. • Journal of Thermal Engineering is a peer reviewed open access journal established as an origin for research in Heat Transfer and Thermodynamics mainly. • Journal of Thermal Engineering make every effort to ensure the accuracy of all the information (the "Content") contained in our publications. However, Journal of Thermal Engineering, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Journal of Thermal Engineering. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Journal of Thermal Engineering shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to, or arising out of the use of the Content.





CONTENTS

Research Articles

- 1107 Influence of buoyancy forces in MHD non-Newtonian convective nanofluid utilizing Buongiorno's Model induced by 3D exponential sheet

 Saloni GUPTA, Parmod Kumar SHARMA, Sanjay KUMAR, Chinta Mani TIWARI
- 1120 Performance and fluid flow analysis of double pipe heat exchanger using AL₂O₃-nanofluid

 Azhar Hussain SHAH, Liaquat Ali MEMON, Muhammad Ramzan LUHUR,

 Qadir Buksh JAMALI, Sajjad Hussain BHANGWAR, Umair Ahmed RAJPUT
- 1137 Heat transfer characteristics of magnetohydrodynamic Casson stratified hybrid nanofluid flow past a porous stretching cylinder

 Jintu Mani NATH, Ashish PAUL, Tusar Kanti DAS
- 1149 Thermal analysis of photovoltaic-thermoelectric hybrids
 Rida Y. NUWAYHID, Mohamad S. RAHAL, Yamen Z. MAKAREM, Roger R. ACHKAR
- 1164 Energy, exergy and performance analysis of a 380 kW_p roof-top PV plant assisted with data-driven models for energy generation

 Abhijeet RATHORE, ALMAS, Sivasankari SUNDARAM
- Optimizing the thermal performance of a double-pipe heat exchanger using twisted tapes with variable cuts and Fe₃O₄ nanofluid

 K. P. V. Krishna VARMA, N. S. NAVEEN, P. S. KISHORE, Satish PUJARI, Krishna JOGI, V. Dhana RAJU
- 1198 Optimum insulation thickness for external building walls for different climate zone in India

 Mohd SHAHID, Munawar Nawab KARIMI, Atul Kumar MISHRA
- 1212 Effect of compression ratio and load on performance and emission behavior of VCR-CRDI engine fueled with Moringa oleifera biodiesel

 Vasant PATEL, Vyomesh BUCH





1226 Experimental study on the combustion of gaseous based fuel (LPG) in a tangential swirl burner of a steam boiler

Karrar S. HASAN, Mohammed AL-FAHHAM, Wisam A. Abd AL-WAHID, Hasan Hadi KHWAYYIR, Ahmed R. KAREEM, Saif S. HASAN, Jameel AL-NAFFAKH

1241 The effect of operating conditions and climate change on the performance of the photopholtaic Trombe wall: An empirical estimate

Abdullah A. ABDULLAH, Faris S. ATTULLA, Omer K. AHMED, Sameer ALGBURI, Raid W. DAOUD

1253 Thermodynamic entropy of a magnetized nanofluid flow over an inclined stretching cylindrical surface

Mahesh GARVANDHA, Nagaraju GAJJELA, Vamsikrishna NARLA, Devendra KUMAR

1266 Estimation and analysis of exergy loss and performance evaluation of marine freshwater generating system

Jitendra Singh PAL, S. N. SAPALI, P. W. DESHMUKH

1275 Experimental and computational study of heat transfer and flow structure of slotted impinging jet

S. Mohamed ILLYAS, B. R. Ramesh BAPU, A. Muthu MANOKAR

1292 An experimental study for a single-pass solar air heater integrated with artificial roughness

Nabaa M. BADER, Khudheyer S. MUSHATET

1306 Investigation of a standard gate valve in terms of flow rate, opening distance and wedge angle with CFD

Soner ENEKCİ, Usame DEMİR, Kadir YILMAZ

1323 New design for the cold part of heat pipes using functionally graded material in heat sink with variable thickness fins: An analytical approach

Mojtaba BABAELAHI, Mohammad Amin BABAZADEH, Mahdi SAADATFAR





- 1335 Experimental investigation to evaluate thermal performance of a solar cooker with evacuated tube solar collector using different heat transfer fluids

 Yunis KHAN, Abhishek TEVATIA, D. APPARAO, Nagendra SINGH, Subhash MISHRA
- 1347 Estimation of wind speed by artificial intelligence method: A case study

 Enas F. AZIZ, Raid W. DAOUD, Sameer ALGBURI, Omer K. AHMED, Khalil F. YASSEN

Review Articles

Alibakhsh KASAEIAN

- 1362 Biodiesel production from waste cooking oil: A review on production methods, recycling models, materials and catalysts

 Atefeh AHMADBEIGI, Mahdi MAHMOUDI, Leila FEREIDOONI, Mojtaba AKBARI,
- 1390 A state-of-the-art review on thermo fluid performance of brazed plate heat exchanger for HVAC application

Madhu Kalyan Reddy PULAGAM, Sachindra Kumar ROUT, Sunil Kumar SARANGI