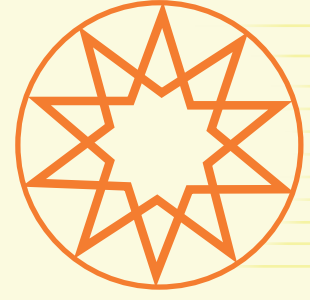


ISSN 2148-7847



Journal of Thermal Engineering

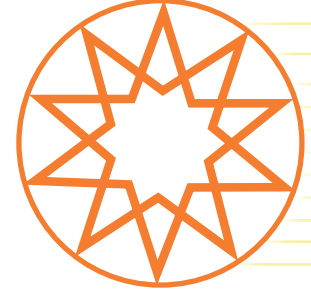
Volume 9
Number 6
Year 2023

YTÜ
PRESS

www.jten.yildiz.edu.tr



Journal of Thermal Engineering



Volume 9 Number 6 Year 2023

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*

Tolga Taner, *Aksaray University, Aksaray, Türkiye*

Özgen Açıkgöz, *Yildiz Technical University, İstanbul, Türkiye*

Yakup Karakoyun, *Hakkari University, Hakkari, Türkiye*

Yaşar İslamoğlu, *Sakarya University, Sakarya, Türkiye*

Yasin Karagoz, *İstanbul Medeniyet University, İstanbul, Türkiye*

Zerrin Sert, *Eskişehir Osmangazi University, Eskişehir, 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, *Firat University, Türkiye*

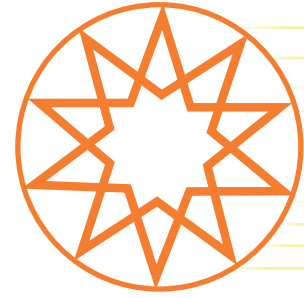
Hari Mohan Srivastava, *University of Victoria, Canada*

Hamadiche Mahmoud, *Université de Lyon 1, France*

Hamid Niazmand, *Ferdowsi University Of Mashhad, Iran*



Journal of Thermal Engineering



Volume 9 Number 6 Year 2023

Josua P. Meyer, *University of Pretoria, South Africa*
Kambiz Vafai, *University of California, United States*
Karan Surana, *The University of Texas, 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

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

Publisher: Yildiz Technical University

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

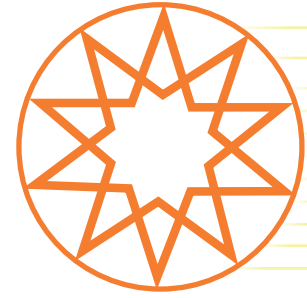
Language of Publication: English

Frequency: Bimonthly (6 issues per year)

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

Publication Type: Online e-version

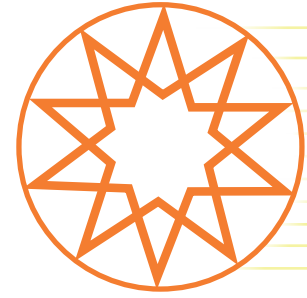
Journal of Thermal Engineering is supported by Yildiz Technical University officially, and is a blind peer-reviewed free open-access journal, published bimonthly. • Journal of Thermal Engineering is a peer reviewed open access journal established as an origin for research in Heat Transfer and Thermodynamics 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

- 1419** Insight of boundary layer structure with heat transfer through a diverging porous channel in Darcy-Forchheimer porous material with suction/injection: A study of separation control
Astick BANERJEE, Sanat Kumar MAHATO, Krishnendu BHATTACHARYYA, Sohita RAJPUT, Ajeet Kumar VERMA, Ali J. CHAMKHA
- 1428** Numerical simulation to study mixing vane spacer effects on heat transfer performance of supercritical pressure fluid in an annular channel
Satish Kumar DHURANDHAR, Shobha Lata SINHA, Shashi Kant VERMA
- 1442** Single-phase and two-phase models of a hybrid nanofluid traveling through a non-uniformly heated (PTC) receiver: A comparative study
Amina BENABDERRAHMANE, Ahmed Kadhim HUSSEIN, Obai YOUNIS, Abdelylah BENZAZZA
- 1452** The evaluation of the performance of the heat exchanger of a triple concentric tube configuration with ionic liquid (imidazolium) and MWCNT ionanofluid
Huda Majid HASAN, Basma Abbas ABDULMAJEED
- 1466** Analysis of thermophysical properties of novel hybrid nanoparticles based vegetable nanofluid
Amol J. ASALEKAR, D.V. A. RAMA SASTRY, M.B.S. Sreekara REDDY, Surendra D. BAREWAR
- 1478** Experimental investigation of impact of fire size on heat transfer and flame behavior of initial stage unsteady pool fires inside a cubical enclosure
Akanksha MATHUR, Anjan RAY, S R KALE
- 1490** Experimental study on a novel waterless solar collector
Asaad H. SAYER, Wed AL-GRAITI, Samia Mezhr MERDAS, Hameed B. MAHOOD, Alasdair N. CAMPBELL
- 1502** Analysis of solar water desalination using hybrid nanofluids: An experimental study
Ajit, Harshit PANDEY, Naveen Kumar GUPTA

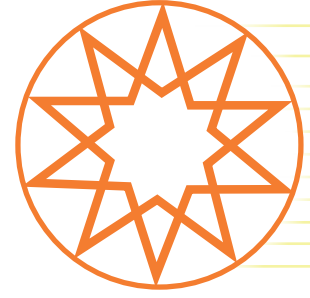


- 1516** Experimental analysis of heat transfer characteristics using ultrasonic acoustic waves
Ali Bousri HAMADOUCHE, Nebbali RICHARD
- 1531** Heat transfer enhancement of electronic devices by using flexible printed circuit boards
Mustafa EMAD, Sattar ALJABAIR, Ahmed Abdulnabi IMRAN
- 1548** Drying model based on the relative humidity profile of thin-layer tomatoes in an indirect solar dryer
Ahmed ALAMI, Lala RAJAOARISOA, Mohammed-Hichem BENZAAMA, Abdeldjalil BENBAKHTI
- 1559** Experimental and theoretical investigation of thermal efficiency and productivity of single slope basin type solar distillation system using honey-comb
Manish Kumar CHAUHAN, Akhilesh Kumar CHAUHAN, Yunis KHAN, Abhendra Pratap SINGH
- 1572** Mathematical modelling of evaporation rate and heating of biodiesel blends of a single-component droplets
Madan BASNET, D. SENTHILKUMAR, R. YUVARAJ
- 1585** Numerical analysis on heat transfer, flow structure and exergy loss of combined truncated and circular ribs in a square duct
S. Mohamed ILLYAS, Kumaresan VELLAISAMY, A. MUTHUMANOKAR
- 1604** A thermohydrodynamic performance analysis of a fluid film bearing considering with geometrical parameters
Abdurrahim DAL, Mahir ŞAHİN, Mustafa KILIÇ
- 1618** Geometric modification and placement of high heat flux ic chips on substrates of different materials for enhanced heat transfer
Shankar DURGAM, Ajinkya BHOSALE, Vivek BHOSALE
- 1632** Experimental study on heat transfer from rectangular fins in combined convection
Mehdi BASIRI, Hamid Reza GOSHAYESHI, Issa CHAER, Hadi POURPASHA, Saeed Zeinali HERIS



Journal of Thermal Engineering

Volume 9 Number 6 Year 2023



- 1643** Design and development of air ventilated air bed for hospitalized patients
Darshan KARANJE, Sanket HON, Shivroop PATIL, Shivraj GURSAL, Prafulla HATTE
- 1655** Determination of optimum insulation thickness in submarines
Savaş DURMAZ, Andaç BATUR ÇOLAK, Hatice MERCAN, Ahmet Selim DALKILIÇ
- 1667** Flow field and heat transfer of ferromagnetic nanofluid in presence of magnetic field inside a corrugated tube
Aram Soleimani VARKANEH, Ghanbar Ali SHEIKHZADEH NOOSHABADI, Ali Akbar ABBASIAN ARANI