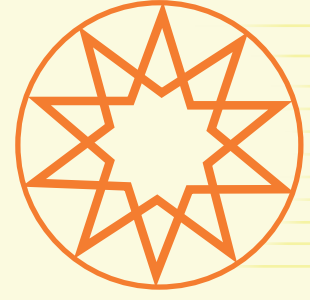


ISSN 2148-7847



Journal of Thermal Engineering

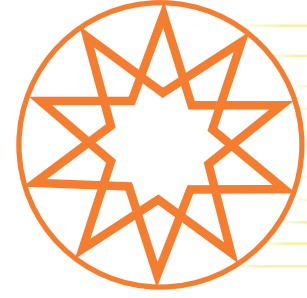
Volume 7
Number 5
Year 2021

YTÜ
PRESS

www.jten.yildiz.edu.tr



Journal of Thermal Engineering



Volume 7 Number 5 Year 2021

EDITOR-IN-CHIEF

Ahmet Selim Dalkilic, *Yildiz Technical University, İstanbul, Turkey*

ASSOCIATE EDITORS

Ali Celen, *Erzincan Binali Yıldırım University, Erzincan, Turkey*

Baha Zafer, *İstanbul University, İstanbul, Turkey*

Bekir Şener, *Yildiz Technical University, İstanbul, Turkey*

Erdal Çetkin, *İzmir Institute of Technology, İzmir, Turkey*

Emre Alpman, *Marmara University, İstanbul, Turkey*

Erman Aslan, *İstanbul University, İstanbul, Turkey*

Hasan Köten, *İstanbul Medeniyet University, İstanbul, Turkey*

Hatice Mercan, *Yildiz Technical University, İstanbul, Turkey*

Müslüm Arıcı, *Kocaeli University, Kocaeli, Turkey*

Mustafa Kılıç, *Adana Science and Technology University, Adana, Turkey*

Nader Javani, *Yildiz Technical University, İstanbul, Turkey*

Naime Filiz Özdil, *Adana Science and Technology University, Adana, Turkey*

Şevket Özgür Atayılmaz, *Yildiz Technical University, Adana, Turkey*

Tolga Taner, *Aksaray University, Aksaray, Turkey*

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

Yakup Karakoyun, *Hakkari University, Hakkari, Turkey*

Yaşar İslamoğlu, *Sakarya University, Sakarya, Turkey*

Yasin Karagoz, *Istanbul Medeniyet University, İstanbul, Turkey*

Zerrin Sert, *Eskişehir Osmangazi University, Eskişehir, Turkey*

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, Turkey*

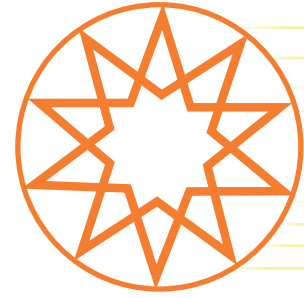
Hari Mohan Srivastava, *University of Victoria, Canada*

Hamadiche Mahmoud, *Université de Lyon 1, France*

Hamid Niazmand, *Ferdowsi University Of Mashhad, Iran*



Journal of Thermal Engineering



Volume 7 Number 5 Year 2021

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, Turkey

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, Turkey

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.