

ПМ  
А 67/т

Volume 62, Issue 1, 10 January 2014

ISSN 1359-4311



ELSEVIER

# APPLIED THERMAL ENGINEERING

Editor-in-Chief: *David A. Reay*

Regional Editors: *J. J. Klemeš, S. Srinivasa Murthy, W.M. Worek, T.S. Zhao*

DESIGN . PROCESSES . EQUIPMENT . ECONOMICS

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

**ScienceDirect**



# APPLIED THERMAL ENGINEERING

DESIGN · PROCESSES · EQUIPMENT · ECONOMICS

Volume 62, Issue 1

10 January 2014

## CONTENTS

---

### Articles

- |   |    |   |
|---|----|---|
| Z.-W. KANG and T.-C. CHEN   | 1  | Longitudinal residual warpage of strip in continuous annealing line   |
| A. FAN, J. WAN, Y. LIU, B. PI, H. YAO and W. LIU  | 13 | Effect of bluff body shape on the blow-off limit of hydrogen/air flame in a planar micro-combustor  |
| A. A. TSENG, H. BELLEROVÁ, M. POHANKA and M. RAUDENSKY  | 20 | Effects of titania nanoparticles on heat transfer performance of spray cooling with full cone nozzle  |
| B. S. YILBAS, S. AKHTAR and O. KELES  | 28 | Laser cutting of triangular blanks from thick aluminum foam plate: Thermal stress analysis and morphology   |
| J. SAARI, J. KAIKKO, E. VAKKILAINEN and S. SAVOLAINEN   | 37 | Comparison of power plant steam condenser heat transfer models for on-line condition monitoring   |
| Z. SONG, B. T. MURRAY and B. SAMMAKIA   | 48 | A dynamic compact thermal model for data center analysis and control using the zonal method and artificial neural networks                                  |
| I. B. SEBASTIÃO and W. F. N. SANTOS   | 58 | Gas-surface interaction impact on heat transfer and pressure distributions of a high speed microchannel flow  |
| X. F. ZHENG, C. X. LIU, R. BOUKHANOUF, Y. Y. YAN and W. Z. LI   | 69 | Experimental study of a domestic thermoelectric cogeneration system   |
| J. NAVARRO-ESBRÍ, F. MOLÉS, B. PERIS, Á. BARRAGÁN-CERVERA, J. M. MENDOZA-MIRANDA, A. MOTA-BABILONI and J. M. BELMAN | 80 | Shell-and-tube evaporator model performance with different two-phase flow heat transfer correlations. Experimental analysis using R134a and R1234yf         |
| C. OFORI-BOATENG and K. T. LEE  | 90 | An oil palm-based biorefinery concept for cellulosic ethanol and phytochemicals production: Sustainability evaluation using exergetic life cycle assessment |

[continued on inside back cover



Abstracted/Indexed in: *Appl. Mech. Rev.*, *Res. Alert*, *Cam. Sci. Abstr.*,  
*Chemical Abstracts Service*, *Curr. Cont./Eng. Tech. & Appl. Sci.*, *Curr.*  
*Tech. Ind.*, *EIC Intell.*, *Eng. Ind.*, *Metals Abstr.*, *Curr. Cont. SCISEARCH Data.*,  
*TCEA*. Also covered in the abstract and citation database *Scopus*®.  
Full text available on *ScienceDirect*®



# APPLIED THERMAL ENGINEERING

DESIGN · PROCESSES · EQUIPMENT · ECONOMICS

Volume 62, Issue 1

10 January 2014

---

*CONTENTS—continued from outside back cover]*

R. SOTO and J. VERGARA	105	Thermal power plant efficiency enhancement with Ocean Thermal Energy Conversion
E. DI MAIO, R. MASTRULLO, A. W. MAURO and D. TOTO	113	Thermal management of a multiple mini-channel heat sink by the integration of a thermal responsive shape memory material
Z. SHU, L. ZIXUE, D. YANXIANG and Z. HUAICHUN	123	Development of a distributed-parameter model for the evaporation system in a supercritical W-shaped boiler
M. WANG, S. QIU, G. SU and W. TIAN	133	Research on the leak-rate characteristics of leak-before-break (LBB) in pressurized water reactor (PWR)
X.-Y. HAN and J. WANG	141	Effect of Mach number on thermoelectric performance of SiC ceramics nose-tip for supersonic vehicles
J. XUE, M. LIU and Y. DENG	148	Effects of ambient temperature and humidity on the controlled cooling of hot-rolled wire rod of steel
H. GHAEBI, M. N. BAHADORI and M. H. SAIDI	156	Performance analysis and parametric study of thermal energy storage in an aquifer coupled with a heat pump and solar collectors, for a residential complex in Tehran, Iran
P. DUTTA, P. KUMAR, K. C. NG, S. SRINIVASA MURTHY and K. SRINIVASAN	171	Organic Brayton Cycles with solid sorption thermal compression for low grade heat utilization
C. GUO, X. DU, L. YANG and Y. YANG	176	Performance analysis of organic Rankine cycle based on location of heat transfer pinch point in evaporator
W. PENG and P.-X. JIANG	187	Effect of shock waves on supersonic film cooling with a slotted wall
W. BALMANT, B. H. OLIVEIRA, D. A. MITCHELL, J. V. C. VARGAS and J. C. ORDONEZ	197	Optimal operating conditions for maximum biogas production in anaerobic bioreactors
K. M. TAN and K. T. OOI	207	Experimental study of fixed-vane revolving vane compressor
M. BEIZA, J. C. RAMOS, A. RIVAS, R. ANTÓN, G. S. LARRAONA, J. GASTELURRUTIA and I. DE MIGUEL	215	Zonal thermal model of the ventilation of underground transformer substations: Development and parametric study
N. D. CHATURVEDI and S. BANDYOPADHYAY	229	Indirect thermal integration for batch processes
X. ZHANG, D. HU and Z. LI	239	Performance analysis on a new multi-effect distillation combined with an open absorption heat transformer driven by waste heat
K. THU, Y.-D. KIM, G. AMY, W. G. CHUN and K. C. NG	245	A synergetic hybridization of adsorption cycle with the multi-effect distillation (MED)

*[continued on BM I*

*CONTENTS—continued from inside back cover]*

R. A. BEIER	256	Transient heat transfer in a U-tube borehole heat exchanger
O. GARCÍA-VALLADARES and E. SANTOYO	267	Numerical simulation and validation of HFC-134a fluid flow through short-tube orifices considering metastable conditions
A. S. PADALKAR, K. V. MALI and S. DEVOTTA	277	Simulated and experimental performance of split packaged air conditioner using refrigerant HC-290 as a substitute for HCFC-22
P. PROMVONGE, N. KOOLNAPADOL, M. PIMSARN and C. THIANPONG	285	Thermal performance enhancement in a heat exchanger tube fitted with inclined vortex rings
H. YIN, J. DING and X. YANG	293	Experimental research on thermal characteristics of a hybrid thermocline heat storage system
E. AHMETOVIĆ and Z. KRAVANJA	302	Simultaneous optimization of heat-integrated water networks involving process-to-process streams for heat integration