

g - Gravity constant; m/s^2 .
 ρ_l, ρ_v - Density of liquid and vapor respectively; kg/m^3 .
 σ - Surface strain; N/m .
 C_{pl} - Liquid specific heat; $J/kg K$.
 ΔT_g - Temperature difference between outer surface and saturation temperature; K .
 Pr_l - Prandtl number
 q_{st} - Heat flow transferred from the cylinder Surface, W
 q_{st} - Heat flux transferred from the cylinder surface, W/m^2
 C_m - Mineral specific heat, $J/kg K$
 T_{mi} - Inlet mineral temperature, K
 T_{mx} - Mineral temperature as a function of the length, K

REFERENCES

- [1]Gongora, E. et al (2007). Mathematical model for an industrial cooling process of solids in rotating cylinders. *Journal of Energetic*, Vol. XXVIII (2), pp. 15-25. ISSN 1815-5901.
- [2]Hamad F (2017). Heat Transfer from a Cylinder in Cross-Flow of Single and Multiphase Flows. *International Journal of Mechanical, Aerospace, Industrial, Mechatronic and Manufacturing Engineering* Vol. 11 (3), pp. 370-374.
- [3]Hamad, F.; Dllir A. & Ganesan, P. (2014). Study of kerosene-water two-phase flow characteristics in vertical and inclined pipes. *Journal of Chem Eng*, Vol 92, pp. 905-917.
- [4]Pavlovich, N. & Jakgrit S. (2009). Numerical simulation of flow and forced convection heat transfer in crossflow of incompressible fluid over two rotating circular cylinders. *Journal of Sci. Technol.* Vol 17(1), pp 87-104.
- [5]Blanka, S. et al (2018). Forced convection and heat transfer around a bounded cylinder. *MATEC Web of Conferences* 157, 02045 (2018). <https://doi.org/10.1051/mateconf/201815702045>.
- [6]Huang C. K., Y. J. Cheng, Y. P. Kang, (2007). Combined effect of grid turbulence and unsteady wake on convective heat transfer around a heated cylinder. *Int. Comm. Heat Mass Transfer* 34, 1091-1100.
- [7]Quintino A. (2012). Experimental analysis of the heat transfer coefficient enhancement for a heated cylinder in cross-flow downstream of a grid flow perturbation. *App. Thermal Eng.* 35, 55-59
- [8]Billah M. et al. (2011). Numerical analysis of fluid flow due to mixed convection in a lid-driven cavity having a heated circular hollow cylinder. *Int. Com. Heat Mass Trans.* 38, 1093-1103.
- [9]Akram W. & Hassan W (2013). Forced Convection Heat Transfer around Heated Inclined Cylinder. *International Journal of Computer Applications.* 73 (8), 04-11.
- [10]Sarkar S., A. Dalal, G. Biswas, (2011)“Unsteady wake dynamics and heat transfer in forced and mixed convection past a circular cylinder in cross flow for high Prandtl numbers”*Journal of Fluid Mechanics*, Vol.54 ,pp. 3536-3551.
- [11]Mohammed K., Muna K. & Louay M. (2013). Predicting of steam condensation heat transfer coefficient in horizontal flattened tube. *Journal of*

- Engineering and Sustainable Development.* 24 (6), 115-126.
- [12]Kumar A. et al (2021). Performance of heat transfer mechanism in nucleate pool boiling -a relative approach of contribution to various heat transfer components. *Journal of Thermal Engineering.* 24 (1), 1-11. <https://doi.org/10.1016/j.csite.2020.100827>.
- [13]Davletshin I. (2020). Data on distribution of heat transfer coefficient and profiles of velocity and turbulent characteristics behind a rib in pulsating flows. *Journal of Data in Brief* 33 (2020) 106485. <https://doi.org/10.1016/j.dib.2020.106485>.
- [14]Tamayo E. et al (2016). Overall heat transfer coefficients, pressure drop and power demand in plate heat exchangers during the ammonia liquor cooling process. *International Journal of Mechanics*, vol. 12, pp. 08–13. ISSN: 19984448.
- [15]Oliva C. et al (2019). Mathematical modeling of the coal activation process in rotary cylindrical kiln. *International Journal of Mechanics*, vol. 13, pp. 15–20. ISSN: 19984448.
- [16]Nield D. A. & Bejan A [2013]. *Convection in Porous Media*. 4th Edition. Springer. London. p 778. ISBN 978-1-4614-5541-7. <https://www.springer.com/gp/book/9781489998224>
- [17]Christopher G. Provatidis, "Teaching the Fixed Spinning Top Using Four Alternative Formulations", *WSEAS Transactions on Advances in Engineering Education*, vol. 18, pp. 80-95, 2021
- [18]Incropera, F. P. & David P. W. *Fundamentals of Heat and Mass. Transfer*, John Wiley & Sons. 2011. New York. U.S.A. p. 886. ISBN 13 978-0470-50197-9.
- [19]Torres T. E., et al (2017). Energy consumption and simulation of pneumatic conveying lateritic mineral in dense and fluid phase. *International Journal of Mechanics*, vol. 11, pp. 12–17. ISSN: 19984448.

Creative Commons Attribution License 4.0 (Attribution 4.0 International, CC BY 4.0)

This article is published under the terms of the Creative Commons Attribution License 4.0

https://creativecommons.org/licenses/by/4.0/deed.en_US