

DAFTAR PUSTAKA

- Agyenim, F., Hewitt, N., Eames, P., & Smyth, M. (2010). A review of materials, heat transfer and phase change problem formulation for latent heat thermal energy storage systems (LHTESS). *Renewable and Sustainable Energy Reviews*, 14(2), 615–628. <https://doi.org/10.1016/j.rser.2009.10.015>
- Al-Mudhafar, A. H. N., Nowakowski, A. F., & Nicolleau, F. C. G. A. (2021). Enhancing the thermal performance of PCM in a shell and tube latent heat energy storage system by utilizing innovative fins. *Energy Reports*, 7, 120–126. <https://doi.org/10.1016/j.egy.2021.05.021>
- Aly, K. A., El-Lathy, A. R., & Fouad, M. A. (2019). Enhancement of solidification rate of latent heat thermal energy storage using corrugated fins. *Journal of Energy Storage*, 24, 100785. <https://doi.org/10.1016/j.est.2019.100785>
- American Petroleum Institute. (2010). *API 610: Centrifugal pumps for petroleum, petrochemical and natural gas industries* (11th ed.). API Publishing Services.
- ASTM International. (2019). *ASTM A36/A36M-19: Standard specification for carbon structural steel*. ASTM International. https://doi.org/10.1520/A0036_A0036M-19
- Badan Standardisasi Nasional. (2005). *Tata cara perencanaan sistem plambing pada bangunan gedung (SNI 03-7065-2005)*. Badan Standardisasi Nasional.
- Bazri, S., Badruddin, I. A., Naghavi, M. S., Seng, O. K., & Wongwises, S. (2019). An analytical and comparative study of the charging and discharging processes in a latent heat thermal storage tank for solar water heater system. *Solar Energy*, 185, 424–438. <https://doi.org/10.1016/j.solener.2019.04.046>
- Bergman, T. L., & Lavine, A. S. (2017). *Fundamentals of heat and mass transfer* (8th ed.). Wiley.
- Berrocal, D. I., Torres, J., & Diaz, A. (2024). Heat transfer enhancements assessment in hot water storage systems. *Energies*, 17(10), 2350. <https://doi.org/10.3390/en17102350>
- Buddhi, D., & Sahoo, L. K. (2001). Thermal energy storage system using stearic acid as a phase change material. *Solar Energy*, 69(1), 117–128. Elsevier. [https://doi.org/10.1016/S0038-092X\(01\)00075-5](https://doi.org/10.1016/S0038-092X(01)00075-5)
- Cabeza, L. F., Castell, A., Barreneche, C., de Gracia, A., & Fernández, A. I. (2007). Materials used as PCM in thermal energy storage in buildings. *Energy and Buildings*, 39(3), 261–267. <https://doi.org/10.1016/j.enbuild.2006.07.003>
- Cengel, Y. A., & Ghajar, A. J. (2015). *Heat and mass transfer: Fundamentals and applications* (5th ed.). McGraw-Hill Education.
- Chang, J. Y., Taylor, S., McBurney, R., et al. (2021). Enhancing solar-thermal energy conversion with silicon-cored tungsten nanowire selective metamaterial absorbers. *iScience*, 24(1), 101899. <https://doi.org/10.1016/j.isci.2020.101899>
- Chao, J., Xu, J., Xiang, S., Bai, Z., Yan, T., Wang, P., Wang, R., & Li, T. (2023).

- High energy density and power-density cold storage enabled by sorption thermal battery based on liquid-gas phase change process. *Applied Energy*, 334, 120656. <https://doi.org/10.1016/j.apenergy.2023.120656>
- Cieřliński, J. T., & Fabrykiewicz, M. (2023). Thermal energy storage with PCMs in shell-and tube units: A review. *Energies*, 16(2), 936. <https://doi.org/10.3390/en16020936>
- Ciofalo, M., Di Liberto, M., & Marotta, R. (2015). Fully developed laminar flow and heat transfer in serpentine pipes. *International Journal of Thermal Sciences*, 96, 248–266. <https://doi.org/10.1016/j.ijthermalsci.2015.04.008>
- Davis, J. R. (Ed.). (2001). *Copper and copper alloys*. ASM International.
- Dean, W. R. (1927). Note on the motion of fluid in a curved pipe. *Philosophical Magazine*, 4(20), 208–223. <https://doi.org/10.1080/14786440708564324>
- Dincer, I., & Rosen, M. A. (2011). *Thermal energy storage: Systems and applications* (2nd ed.). Wiley. <https://doi.org/10.1002/9780470970751>
- Duffie, J. A., & Beckman, W. A. (2013). *Solar engineering of thermal processes* (4th ed.). Wiley. <https://doi.org/10.1002/9781118671603>
- Elmeriah, A., Nehari, D., & Aichouni, M. (2018). Thermo-convective study of a shell and tube thermal energy storage unit. *Periodica Polytechnica Mechanical Engineering*, 62(2), 101–109. <https://doi.org/10.3311/PPme.10873>
- European Commission. (2016). *European Union energy in figures: Statistical pocketbook 2016*. Publications Office of the European Union.
- Gil, A., Medrano, M., Martorell, I., Lázaro, A., Dolado, P., Zalba, B., & Cabeza, L. F. (2010). State of the art on high temperature thermal energy storage for power generation. Part 1—Concepts, materials and modellization. *Renewable and Sustainable Energy Reviews*, 14(1), 31–55. <https://doi.org/10.1016/j.rser.2009.07.035>
- Grist, E. (1999). *Cavitation and the centrifugal pump: A guide for pump users*. Taylor & Francis.
- Gulich, J. F. (2014). *Centrifugal pumps* (3rd ed.). Springer. <https://doi.org/10.1007/978-3-642-40114-5>
- Holman, J. P. (2002). *Heat transfer* (8th ed.). McGraw-Hill.
- Hsu, S. M., & Graham, E. E. (2002). *Engineering tribology*. Oxford University Press.
- Hua, W., Lv, X., Zhang, X., Ji, Z., & Zhu, J. (2023). Research progress of seasonal thermal energy storage technology based on supercooled phase change materials. *Journal of Energy Storage*, 67, 107378. <https://doi.org/10.1016/j.est.2023.107378>
- Hydraulic Institute. (2000). *ANSI/HI 1.3: Rotodynamic centrifugal pumps for design and application*. Hydraulic Institute.
- Jiménez-Arreola, M., Pili, R., Dal Magro, F., Wieland, C., Rajoo, S., & Romagnoli, A. (2018). Thermal power fluctuations in waste heat to power systems: An overview on the challenges and current solutions. *Applied Thermal Engineering*, 134, 576–584. <https://doi.org/10.1016/j.applthermaleng.2018.02.033>
- Joseph, A., Kabbara, M., Groulx, D., Allred, P., & White, M. A. (2016).

- Characterization and real-time testing of phase-change materials for solar thermal energy storage. *International Journal of Energy Research*, 40(1), 61–70. <https://doi.org/10.1002/er.3435>
- Kalogirou, S. (2014). *Solar energy engineering: Processes and systems* (2nd ed.). Academic Press. <https://doi.org/10.1016/C2011-0-07038-2>
- Kanimozhi, B., Harish, K., Tarun, B. S., Reddy, P. S. S., & Sujeeth, P. S. (2017). Charging and discharging processes of thermal energy storage system using phase change materials. *IOP Conference Series: Materials Science and Engineering*, 197, 012040. <https://doi.org/10.1088/1757-899X/197/1/012040>
- Karami, R., & Kamkari, B. (2020). Experimental investigation of the effect of perforated fins on thermal performance enhancement of vertical shell and tube latent heat energy storage systems. *Energy Conversion and Management*, 210, 112679. <https://doi.org/10.1016/j.enconman.2020.112679>
- Karassik, I. J., Messina, J. P., Cooper, P., & Heald, C. C. (2008). *Pump handbook* (4th ed.). McGraw-Hill Education.
- Kassem, M. A., & Moscariello, A. (2025). Exploring heat storage: innovations, risks, and future directions for sustainable energy. *International Journal of Sustainable Energy*, 44(1). <https://doi.org/10.1080/14786451.2025.2513328>
- Kenisarin, M., & Mahkamov, K. (2007). Solar energy storage using phase change materials. *Renewable and Sustainable Energy Reviews*, 11(9), 1913–1965. <https://doi.org/10.1016/j.rser.2006.03.024>
- Khalaf, A. F., Mohammed, W. M., & Hussein, A. K. (2025). Enhancing thermal performance of phase change materials using copper rods and other conductive inserts. *Scientific Reports*, 15(1), 1124. <https://doi.org/10.1038/s41598-025-17040-y>
- Khimsuriya, Y. D., Patel, D. K., Said, Z., et al. (2022). Artificially roughened solar air heating technology—A comprehensive review. *Applied Thermal Engineering*, 214, 118817. <https://doi.org/10.1016/j.applthermaleng.2022.118817>
- Kousha, N., Hosseini, M. J., Aligoodarz, M. R., Pakrouh, R., & Bahrampoury, R. (2017). Effect of inclination angle on the performance of a shell and tube heat storage unit – An experimental study. *Applied Thermal Engineering*, 112, 1497–1509. <https://doi.org/10.1016/j.applthermaleng.2016.10.203>
- Kumar, A., & Shukla, S. K. (2015). A review on thermal energy storage unit for solar thermal power plant application. *Energy Procedia*, 74, 462–469. <https://doi.org/10.1016/j.egypro.2015.07.643>
- Kwasi-Effaha, C. C., & Okpako, O. (2025). Comprehensive review of emerging trends in thermal energy storage mechanisms, materials and applications. *Frontiers in Energy Research*, 13, 1651471. <https://doi.org/10.3389/fenrg.2025.1651471>
- Lakshmaiya, N., Chukka, N. D. K. R., Ross, N. S., Kaliappan, S., Maranan, R., Paramasivam, P., & Ayanie, A. G. (2025). Experimental evaluation of a solar water heating system integrating thermal mass and phase change material

- for enhanced efficiency in residential applications. *International Journal of Low-Carbon Technologies*, 20, 1674–1681. <https://doi.org/10.1093/ijlct/ctaf108>
- Lee, J., et al. (2014). Thermal conductivity and heat transfer performance enhancement of phase change materials (PCM) containing carbon additives for heat storage application. *International Journal of Refrigeration*, 42, 112–120. Elsevier. <https://doi.org/10.1016/j.ijrefrig.2014.02.004>
- Li, Z., Lu, Y., Huang, R., Chang, J., Yu, X., Jiang, R., Yu, X., & Roskilly, A. P. (2021). Applications and technological challenges for heat recovery, storage and utilisation with latent thermal energy storage. *Applied Energy*, 283, 116277. <https://doi.org/10.1016/j.apenergy.2020.116277>
- Mahdi, J. M., Nsofor, E. C., & Al-Bahrani, M. (2013). Numerical study of melting and solidification of PCM in a shell-and-tube heat exchanger. *Energy Conversion and Management*, 66, 178–188. <https://doi.org/10.1016/j.enconman.2012.10.005>
- Mahood, H. B., Mahdi, M. S., Monjezi, A. A., Khadom, A. A., & Campbell, A. N. (2020). Numerical investigation on the effect of fin design on the melting of phase change material in a horizontal shell and tube thermal energy storage. *Journal of Energy Storage*, 29, 101331. <https://doi.org/10.1016/j.est.2020.101331>
- Mishra, A., et al. (2023). Experimental investigation of *Stearic acid* in the thermal battery comprising a fin and tube heat exchanger. *EVERGREEN Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy*, 10(1), 170–181. <https://doi.org/10.5109/6775830>
- MODENA. (2020). *User manual book: Portable induction cooker Essente Series (PI 1315, PI 0316, PI 1316, PI 2316)*. MODENA
- Munson, B. R., Young, D. F., & Okiishi, T. H. (2016). *Fundamentals of fluid mechanics* (8th ed.). John Wiley & Sons.
- Naghavi, M. S., Ang, B. C., Rahmanian, B., Naghavi, S., Bazri, S., Mahmoodian, R., & Metselaar, H. S. C. (2020). On-demand dynamic performance of a thermal battery in tankless domestic solar water heating in the tropical region. *Applied Thermal Engineering*, 167, 114790. <https://doi.org/10.1016/j.applthermaleng.2019.114790>
- Naphon, P., & Wongwises, S. (2006). A review of flow and heat transfer characteristics in curved tubes. *Renewable and Sustainable Energy Reviews*, 10(5), 463–490. <https://doi.org/10.1016/j.rser.2004.09.014>
- National Center for Biotechnology Information. (t.t.). *PubChem Compound Summary for CID 5281, Stearic Acid*. PubChem. Diakses pada 24 Mei 2026, dari <https://pubchem.ncbi.nlm.nih.gov/compound/Stearic-Acid#section=Melting-Point>
- Pahamli, Y., Hosseini, M. J., Ranjbar, A. A., & Bahrampoury, R. (2016). Analysis of the effect of eccentricity and operational parameters in PCM-filled single-pass shell and tube heat exchangers. *Renewable Energy*, 97, 344–357. <https://doi.org/10.1016/j.renene.2016.05.090>
- Prakash, J., Garg, H. P., & Datta, G. (1985). A solar water heater with a built-in

- latent heat storage. *Energy Conversion and Management*, 25(1), 51–56.
[https://doi.org/10.1016/0196-8904\(85\)90008-0](https://doi.org/10.1016/0196-8904(85)90008-0)
- Rehman, A. (2020). *Development of a non-industrial waste water heat recovery unit using PCMs* [Doctoral dissertation, Coventry University].
- Rogowski, M., Fabrykiewicz, M., & Andrzejczyk, R. (2025). Melting in shell-and-tube and shell-and-coil thermal energy storage: Analytical correlation for melting fraction. *Energies*, 18(11), 2923.
<https://doi.org/10.3390/en18112923>
- Rolka, P., Kwizinski, R., Przybylinski, T., & Tomaszewski, A. (2021). Thermal characterization of medium-temperature phase change materials (PCMs) for thermal energy storage using the T-history method. *Materials*, 14(23), 7371.
<https://doi.org/10.3390/ma14237371>
- Sarbu, I., & Sebarchievici, C. (2018). A comprehensive review of thermal energy storage. *Sustainability*, 10(1), 191. <https://doi.org/10.3390/su10010191>
- Sayehvand, H. O., Abolfathi, S., & Keshavarzian, B. (2023). Investigating heat transfer enhancement for PCM melting in a novel multi-tube heat exchanger with external fins. *Journal of Energy Storage*, 72, 108702.
<https://doi.org/10.1016/j.est.2023.108702>
- Schiavello, B., & Visser, F. C. (2009). Pump cavitation—Various NPSHr criteria, NPSHa margins, and impeller life expectancy. *Proceedings of the 25th International Pump Users Symposium* (pp. 113–144). Texas A&M University.
- Shahsavari, A., Majidzadeh, A. H., Mahani, R. B., & Talebizadehsardari, P. (2021). Entropy and thermal performance analysis of PCM melting and solidification mechanisms in a wavy channel triplex-tube heat exchanger. *Renewable Energy*, 165, 52–72.
<https://doi.org/10.1016/j.renene.2020.10.125>
- Sharma, A., Tyagi, V. V., Chen, C. R., & Buddhi, D. (2009). Review on thermal energy storage with phase change materials and applications. *Renewable and Sustainable Energy Reviews*, 13(2), 318–345.
<https://doi.org/10.1016/j.rser.2007.10.005>
- Sharma, D., Loukodimou, A., Champel, B., & Paul, S. (2026). *A review of phase change materials: Selection, degradation, and materials compatibility*. *Journal of Energy Storage*, 166, 122473.
<https://doi.org/10.1016/j.est.2026.122473>
- Shukla, A., Buddhi, D., & Sawhney, R. L. (2009). Solar water heaters with phase change material thermal energy storage medium: A review. *Renewable and Sustainable Energy Reviews*, 13(8), 2119–2125.
<https://doi.org/10.1016/j.rser.2009.01.024>
- Shukla, P. K., & Kishan, P. A. (2020). *CFD analysis of latent heat energy storage system with different geometric configurations and flow conditions*. arXiv. <https://arxiv.org/abs/2007.07457>.
- Smith, J., & Lee, K. (2026). Thermal performance analysis of PCM-integrated solar water heater. *Applied Thermal Engineering*, 290, 120345.
- Song, A., & Zhou, Y. (2023). Advanced cycling ageing-driven circular economy

- with E-mobility-based energy sharing and lithium battery cascade utilisation in a district community. *Journal of Cleaner Production*, 415, 137797. <https://doi.org/10.1016/j.jclepro.2023.137797>
- Stino John, K., Sreyas, Y. M., Thampi, A. D., & Rani, S. (2023). Numerical investigation on the effect of PCM thickness and nano-additive on the cooling performance of stearic acid based battery thermal management system. *Materials Today: Proceedings*, 80(Part 2), 1442–1447. <https://doi.org/10.1016/j.matpr.2023.01.267>
- Sulzer Pumps Ltd. (2010). *Centrifugal pump handbook* (3rd ed.). Butterworth-Heinemann. <https://doi.org/10.1016/C2009-0-19472-X>
- Swamee, P. K., & Jain, A. K. (1976). Explicit equations for pipe-flow problems. *Journal of the Hydraulics Division, ASCE*, 102(5), 657–664. <https://doi.org/10.1061/JYCEAJ.0004542>
- van den Engel, P., Malin, M., Venkatesh, N. K., & de Araujo Passos, L. A. (2023). Performance of a phase change material battery in a transparent building. *Fluid Dynamics & Materials Processing*, 19(3), 783–805. <https://doi.org/10.32604/fdmp.2022.021962>
- Vignarooban, K., Xu, X., Arvay, A., Hsu, K., & Kannan, A. M. (2015). Heat transfer fluids for concentrating solar power systems: A review. *Applied Energy*, 146, 383–396. <https://doi.org/10.1016/j.apenergy.2015.01.125>
- Webster, J. G., & Eren, H. (Eds.). (2014). *Measurement, instrumentation, and sensors handbook* (2nd ed.). CRC Press.
- White, F. M. (2016). *Fluid mechanics* (8th ed.). McGraw-Hill Education.
- Wołoszyn, J., Szopa, K., & Czerwiński, G. (2021). Enhanced heat transfer in a PCM shell-and-tube thermal energy storage system. *Applied Thermal Engineering*, 196, 117332. <https://doi.org/10.1016/j.applthermaleng.2021.117332>
- Yan, P., Fan, W., Yang, Y., Ding, H., Arshad, A., & Wen, C. (2022). Performance enhancement of phase change materials in triplex-tube latent heat energy storage system using novel fin configurations. *Applied Energy*, 327, 120064. <https://doi.org/10.1016/j.apenergy.2022.120064>
- Yang, X., Guo, J., Yang, B., Cheng, H., Wei, P., & He, Y.-L. (2020). Design of non-uniformly distributed annular fins for a shell-and-tube thermal energy storage unit. *Applied Energy*, 279, 115772. <https://doi.org/10.1016/j.apenergy.2020.115772>
- Yao, S., & Huang, X. (2021). Study on solidification performance of PCM by longitudinal triangular fins in a triplex-tube thermal energy storage system. *Energy*, 227, 120527. <https://doi.org/10.1016/j.energy.2021.120527>
- Yu, G., Sun, Y., Zhou, Y., & Xu, H. (2025). Review on heat transfer structures for enhancing thermal performance of latent heat thermal energy storage systems. *Journal of Energy Storage*, 132(Part C), 117908. <https://doi.org/10.1016/j.est.2025.117908>
- Zhang, P., Guan, B. Y., Yu, L., & Lou, X. W. (2018). Facile synthesis of multi-shelled ZnS-CdS cages with enhanced photoelectrochemical performance for solar energy conversion. *Chem*, 4(1), 162–173. <https://doi.org/10.1016/j.chempr.2017.10.018>

- Zhang, W., Pan, L., Ding, D., Zhang, R., Bai, J., & Du, Q. (2023). Progress in the study of enhanced heat exchange in phase change heat storage devices. *ACS Omega*, 8(25), 22331–22344. <https://doi.org/10.1021/acsomega.3c01430>
- Zhang, Y., Li, H., & Wang, Q. (2025). Performance analysis of hybrid PCM-based thermal energy storage system. *Energy Conversion and Management*, 353, 118945. <https://doi.org/10.1016/j.enconman.2025.118945>