

## **ABSTRAK**

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### ***DESIGN OF STRUCTURE AND MANUFACTURING PROCESS OF A SOLAR-POWERED BASED ON THE INTERNET OF THINGS AERATOR FOR SHRIMP FARMING***

*Final Project. Department of Mechanical Engineering. Faculty of Industrial Technology. Gunadarma University. 2025*

*Keyword : Aerator, Solar Panel, Internet of Things, SolidWorks, Galvanized Steel, Manufacturing Process.*

*(xv + 97 + Appendices)*

*The rapid development of renewable energy technology and the Internet of Things (IoT) has been widely utilized in the agricultural and aquaculture sectors. One such innovation is the use of solar panels as an environmentally friendly alternative energy source to operate aerators in shrimp pond cultivation. Vannamei shrimp (*Litopenaeus vannamei*) is a rapidly growing aquaculture commodity in Indonesia. Water quality, particularly the dissolved oxygen (DO) level, is a crucial factor in supporting optimal shrimp growth. Lack of oxygen may cause stress, disease, and even crop failure. This study aims to design and manufacture a solar-powered aerator integrated with IoT technology to improve shrimp quality while being energy-efficient and environmentally friendly. The frame design was carried out using SolidWorks software for 3D modeling and structural strength analysis, employing hot-dip galvanized steel material. Simulation results showed values of 20.21 MPa, 0.3720 mm, and a safety factor of 10.09. Theoretical analysis and static simulation proved that the aerator frame has sufficient strength and safety factor to support component loads. The manufacturing process involved precise stages, including measuring, cutting, SMAW welding, and drilling, with a total welding electrode consumption of 155.14 grams. The integration of IoT using the ESP32 microcontroller enables remote control and monitoring of aerator performance via mobile phones, thus facilitating the work of shrimp farmers. This innovation is expected to support sustainable vannamei shrimp cultivation efficiently and adaptively to modern technology*

***BIBLIOGRAPHY (2015-2025)***