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Structural Engineering Group

Design and development of pultruded GFRP lightweight framed structure to hold PVT assembly Under Development of Photo Voltaic/ Thermal (PVT) Collector for Generation of Electricity and Hot Water

Period:	2 years (April 2024 to March 2026)
Project Investigator:	M. M. Ansari (Co-PI)
Type of Project:	CSIR Funded
Sponsored by:	CSIR, New Delhi
Cost:	Rs. Rs. 30 Lakh
Objectives:	To Design and develop an optimised pultruded GFRP lightweight framed structure to hold PVT panels and assembly

Description of task:

The increasing demand for efficient and durable Photovoltaic-Thermal (PVT) systems necessitates innovative support structures that enhance the performance while reducing maintenance and material costs. The Pultruded Glass Fiber Reinforced Polymer (PGFRP) offers a promising alternative to traditional steel and aluminium due to its high strength-to-weight ratio, corrosion resistance and superior durability. This study focuses on the design and development of a lightweight PGFRP framed structure to support PVT assemblies, ensuring structural stability, ease of installation and extended service life. The research explores the mechanical performance, environmental adaptability and energy-absorbing capability of PGFRP, demonstrating its suitability for structural applications. The proposed design aims to optimize load-bearing capacity, thermal stability and cost-effectiveness, making PGFRP-based structures a viable solution for sustainable energy infrastructure. The performance of PGFRP sections under compression and flexure has been analysed experimentally and numerically.