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Evaluation of wind resistance for an innovative recycled plastic greenhouse

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A recycled plastic material made of polyethylene Aterephthalate (PET), nylon, and glass fiber reinforced nylon and designated as PA6GF plastic was applied to the main structural members of a simple greenhouse in this study. Comparisons between the mechanical properties of the traditional galvanizing steel and the PA6GF plastic were made to estimate the section dimensions required for the recycled plastic simple greenhouse. Structural performance of galvanized steel and PA6GF plastic greenhouse models

were evaluated under designated wind loads. Under the Beaufort-scale 11 wind loadings, the greenhouse models designed with plastic pipes of 5 cm diameter and 1 cm thickness and with plastic tubes of 5 cm width and 1 cm thickness could have maximum displacement response and section forces similar to that of the galvanized steel greenhouse. The analysis results indicated that with appropriate design, the PA6GF plastic could be an alternate material for the construction of the simple greenhouse frames.

Biography

Meng-Hao Tsai is an Associate Professor at National Pingtung University of Science and Technology, Taiwan. He has received his PhD degree in civil engineering from the National Taiwan University in 1998. After graduation, he had worked as a short-term post-doctoral research associate in the State University of New York at Buffalo and Tokyo Institute of Technology. He entered the Structural Engineering Sector (II) of Taiwan CECI Engineering Consutant Inc. in 2002. After two years industrial experience, he joined the Department of Civil Engineering at the National Pingtung University of Science and Technology in 2004.

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