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Laboratory Assessment Report
Structural Performance Wonderboard Panel

PKA/PPSB/2025/01/001

PLYTEC Polymer Sdn Bhd.
No. 1, Jalan 13, Kawasan Perindustrian Olak Lempit,
42700 Banting, Kuala Langat, Selangor

Wonderboard panels, a form of plastic panel, of PLYTEC Polymer Sdn Bhd has been evaluated for their structural performance at service and ultimate, and peak loads and modes of failure. Product samples for structural and material characterisations delivered to the School of Civil Engineering of Universiti Teknologi MARA (UiTM) for testing. Results of laboratory assessment are as below:

No	Item	Results
1	Flexural strength and modulus of individual panels. To check the flexural strength of the panel due to the applied load using three-point bending test. *Ref: ASTM D790 – Plastics and Composites*	Flexural modulus and strength of individual panels. Based on testing, all wonderboard panels of 10mm thickness, virgin and recycled materials, are able to withstand with the ultimate loads of 536.98 N and 509.38 N respectively. Ultimate bending moment, virgin and recycled materials, of 0.498 kNm/m and 0.488 kNm/m respectively, are slightly higher than the bending moment of 12mm thick plywood (0.2 kNm/m). Ultimate bending moment (at extreme temperature of 90 degrees), virgin and recycled materials, are 0.161 kNm/m and 0.193 kNm/m respectively.
2	Direct compressive strength measured over 100 mm x 100 mm of individual panels to observe the distress or permanent deformation (at service and ultimate conditions). *Ref: ISO 604 – Determination of Compressive Properties*	The direct compressive strength, measured over 100 mm x 100 mm and based on an average of three samples each, virgin and recycled materials, are 39.59 N/mm^2 and 38.60 N/mm^2. No sign of distress or permanent deformation at the service load and ultimate load of 7 kN and 14 kN respectively.
3	Shear strength. *Ref: ASTM D732 – Shear Strength of Plastics*	The shear stresses, virgin and recycled materials, of 22.48 kN/m and 21.65 kN/m is considerably higher than shear of plywood (19mm) having threshold value of 9.75 kN/m.
4	Tensile test. To assess the performance of the materials proposed including but not limited to tensile test under ambient and extreme temperatures. *Ref: ISO 527-1 – Determination of Tensile Properties*	Tensile strength captured at room temperature (27 ^{o}C), virgin and recycled materials, are 18.14 N/mm^2 and 16.15 N/mm^2. Effect of temperature on tensile strength - Values of tensile strength, virgin and recycled materials, having readings of 3.51 N/mm^2 and 4.62 N/mm^2, are reduced to approximately 80% and 70% at 90 ^{o}C respectively. Results showed that as the temperature increases the tensile strength reduces but the ductility increases.

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5	Skidding Test *Ref: ASTM E303-22, EN 13036-4, BS 7986-2*	The values of Pendulum Test Value of more than 36, dry conditions for both virgin and recycled materials, are generally considered safe (low slip potential). For wet conditions, PTV values for recycled materials are positoned under low slip potential category. Virgin materials situated under moderate category.

Thank you,
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