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## Some Properties of Eucalyptus Wood Flour Filled Recycled High Density Polyethylene Polymer-Composites

Fatih MENGELOĞLU, Kadir KARAKUŞ  
Department of Forest Industry Engineering, Faculty of Forestry, Kahramanmaraş  
Sütçü İmam University,  
Kahramanmaraş - TURKEY

 [Keywords](#)  
 [Authors](#)



[agric@tubitak.gov.tr](mailto:agric@tubitak.gov.tr)

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**Abstract:** The mechanical properties of eucalyptus wood flours (EWF) filled recycled high density polyethylene (HDPE) composites were investigated. First thermal gravimetric analysis (TGA) and differential scanning calorimetry (DSC) analysis were conducted for recycled HDPE and EWF. Later the effects of EWF and maleic anhydride grafted polyethylene (MAPE) concentrations were studied. TGA analysis revealed that EWF and recycled HDPE started degrading around 230 °C and 280 °C, respectively. Melting temperature of the recycled HDPE was around 129 °C. Mechanical property evaluation showed that the increased concentration of EWF in polymer-composites reduced the tensile, flexural, and impact strength while increased the tensile and flexural modulus. The addition of small amount of MAPE coupling agent improved the tensile and flexural strength but this increase was leveled off at higher concentrations. Impact strength of the composites was reduced by the coupling agent. This study showed that polymer-composites can be manufactured utilizing recycled HDPE and eucalyptus wood flours in the process temperature range of 130-230 °C and could provide additional income for the lumber mills and promote the recycling of HDPE.

**Key Words:** Recycled HDPE, polymer-composites, mechanical properties, coupling agent, TGA, DSC

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