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## ENHANCEMENT OF HOT MIX ASPHALT (HMA) PROPERTIES USING WASTE POLYPROPYLENE

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### Abstract

Recycling of waste and disposal has become a vital environmental issue that generates serious concern worldwide, especially after the COVID-19 pandemic. The use of waste material in the form of disposable facemasks, based on polypropylene (PP) fibre in pavement structures is one of the essential initiatives for the future toward a sustainable environment. This study imparts a review of repurposing this waste and its use in asphalt pavements. The waste materials act as modifiers and can upgrade the performance of pavement and provide green technology with an eco-friendly environment. Utilization of waste material as an asphalt binder enhanced the engineering properties of asphalt pavements. In this research, different percentages of polypropylene as per weight of binder were used, such as 3%, 6%, 9%, 12% 15% and 3% were found to be optimum. Along with it, some important mechanical properties were assessed using hot mix asphalt (HMA). Marshall Stability was calculated at every concentration and contrasted with the control binder sample at 4% Optimum Asphalt Content (OAC). The rutting and cracking performance of the PP-modified binders was superior to that of the control binder, according to the results of the test on HMA mixed at OAC. The findings of the mix performance showed that the PP-modified binders improved the mixes' stiffness, durability, and stability. Overall, findings from the study suggest that waste PP has a good prospect of being utilized in asphalt binder modification.

*Key words:* modified asphalt, rutting, stability, sustainable infrastructure, waste polypropylene

*Received:* January, 2024; *Revised final:* May, 2024; *Accepted:* June, 2024; *Published in final edited form:* December, 2024

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