

ABSTRAK

Penelitian ini bertujuan menganalisis pengaruh penambahan *crumb rubber* (serbuk karet ban bekas) pada campuran *Hot Rolled Sheet Wearing Course* (HRS-WC) terhadap karakteristik campuran aspal berdasarkan pengujian Marshall, pengaruh perlakuan *acid leaching* dengan larutan 50% asam sulfat dan 50% akuades, serta pengujian kuat lentur menggunakan uji *Three Point Bending*. Kadar aspal optimum untuk campuran HRS-WC normal didapatkan sebesar 7,7%, campuran HRS-WC ditambah dengan *crumb rubber* pada kadar 5% dan 10% dari berat aspal optimum menggunakan metode pencampuran kering (*dry process*). Perlakuan *acid leaching* dilakukan dengan variasi waktu perendaman 5, 10, dan 15 menit pada suhu 60°C. Hasil uji Marshall menunjukkan bahwa hanya campuran dengan *crumb rubber* 10% yang memenuhi spesifikasi Bina Marga 2018 revisi 2, dengan parameter stabilitas, *flow*, VIM, VMA, dan *Marshall Quotient* yang baik. Perlakuan *acid leaching* mempengaruhi karakteristik campuran, namun penambahan *crumb rubber* meningkatkan daya tahan terhadap perendaman asam secara signifikan dibandingkan campuran tanpa bahan tambah. Uji *Three Point Bending* menegaskan bahwa penambahan *crumb rubber* meningkatkan kuat lentur campuran, baik sebelum maupun setelah perlakuan *acid leaching*. Penelitian ini memberikan informasi penting tentang pemanfaatan limbah ban bekas sebagai bahan tambahan dalam campuran perkerasan aspal untuk meningkatkan kinerja dan ketahanan lapisan permukaan perkerasan jalan.

Kata Kunci: *Crumb rubber*, HRS-WC, *Dry Process*, *Marshall*, *Acid Leaching*, *Three point bending*.

ABSTRACT

This research aims to analyze the effect of adding crumb rubber (waste rubber powder) to the Hot Rolled Sheet Wearing Course (HRS-WC) asphalt mix on the mixture's characteristics based on Marshall testing, the influence of acid leaching treatment with a solution of 50% sulfuric acid and 50% distilled water, as well as flexural strength testing using the Three Point Bending test. The optimum asphalt content for the normal HRS-WC mixture is obtained at 7.7%. The HRS-WC mixture was modified with crumb rubber at percentages of 5% and 10% of the optimum asphalt weight using the dry mixing method. Acid leaching treatment was performed with soaking times of 5, 10, and 15 minutes at a temperature of 60°C. The Marshall test results show that only the mixture with 10% crumb rubber meets the specifications of Bina Marga 2018 Revision 2, with good stability, flow, VIM, VMA, and Marshall Quotient parameters. The acid leaching process influences the mixture characteristics; however, the addition of crumb rubber significantly improves resistance to acid soaking compared to unmodified mixes. The Three Point Bending test confirms that adding crumb rubber increases the flexural strength of the mixture both before and after acid leaching treatment. This study provides important information on the utilization of waste rubber tires as an additive in asphalt mixtures to enhance the performance and durability of road surface layers.

Keyword : Crumb rubber, HRS-WC, Dry Process, Marshall, Acid Leaching, Three point bending.

