

INTISARI

Ban kendaraan truk tangki yang sudah tidak layak ini dikategorikan sebagai limbah industri ini yang bila dibiarkan begitu saja tentu akan mencemari lingkungan. Dengan semakin meningkatnya jumlah karet bekas ban kendaraan tersebut maka harus adanya upaya penggunaan teknologi tepat guna. Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan dan penuaan limbah karet bekas ban yang digunakan sebagai bahan pengganti agregat halus pada campuran *Asphalt Concrete Binder Course* (AC-BC).

Awal penelitian ini merancang gradasi agregat dengan menggunakan perbandingan volume agregat halus yang lolos saringan No. 30 dan tertahan saringan No.50 diganti dengan karet bekas ban sebesar 0%, 25%, dan 50%, kemudian dilanjutkan pengujian Marshall. Hasil pengujian Marshall standar masing-masing variasi limbah karet bekas ban 0%, 25%, 50% didapat nilai kadar aspal optimum sebesar 5,7% ; 6,4%; 6,3%. Selanjutnya pengujian kekuatan campuran dilakukan dengan metode *Indirect Tensile Strength Test*. Adapun untuk mengetahui pengaruh penuaan aspal dalam suatu campuran yaitu melalui proses simulasi penuaan campuran beraspal *short term oven aging* (STOA) dan *long term oven aging* (LTOA).

Berdasarkan hasil pengujian Marshall dengan kadar aspal optimum didapatkan nilai stabilitas tertinggi 1605kg pada campuran 0% karet dan terendah 606kg pada campuran 50% karet. Hasil pengujian Marshall Immersion Test didapatkan nilai RMS tertinggi 92,14% pada campuran 0% karet, sedangkan nilai terendah 77,49% pada campuran 25% karet. Hasil pengujian ITS didapatkan nilai TSR tertinggi 94,9% pada 0% karet, sedangkan nilai terendah 46,77% pada campuran 50% karet, ini menunjukkan bahwa penggunaan limbah karet bekas ban sebagai pengganti agregat halus sebanyak 50% belum mampu menahan pengaruh rendaman terhadap kuat tarik campuran. Berdasarkan hasil pengujian akibat penuaan aspal melalui proses STOA dan LTOA diperoleh nilai stabilitas maksimum sebesar 1350kg pada campuran 0% karet dengan kondisi STOA (unconditioned) dan nilai stabilitas minimum 506kg pada campuran 25% karet kondisi LTOA (unconditioned) nilai ini sudah tidak memenuhi spesifikasi. Sehingga dapat disimpulkan bahwa pada kondisi STOA (simulasi masa konstruksi) maupun LTOA (masa layanan) penggunaan limbah karet bekas ban ini belum dapat mengantisipasi besarnya proses penuaan yang terjadi.

Kata Kunci: AC-BC, Limbah, Karet Ban Bekas, Marshall, Penuaan

ABSTRACT

This unfeasible tank truck tyre is categorized as a waste of this industry which, if left alone, will pollute the environment. By increasingly remembering the amount of rubber used in these vehicles, there must be efforts to use appropriate technology. This study aims to determine the influence of use and aging of waste rubber tire used as a fine aggregate substitute material in the mixture of Asphalt Concrete Binder Course (AC-BC).

The beginning of this study designed the aggregate gradation by using a comparison of the fine aggregate volume that passed the filter No. 30 and the No. 50 filter was replaced with a tyre used rubber of 0%, 25%, and 50%, then continued the Marshall test. The results of the standard Marshall test of each variation of a tyre waste of 0%, 25%, 50% obtained the optimum asphalt content value of 5.7%; 6.4%; 6.3%. Further mixed strength testing is done by the Indirect Tensile Strength Test method. As for knowing the influence of aging asphalt in a mixture is through the process of aging simulation of a mixture of paved short term oven aging (STOA) and long Term oven aging (LTOA).

Based on Marshall test results obtained the highest stability value of 1605kg at a mixture of 0% rubber and the lowest 606kg at a mixture of 50% rubber. Test result of Marshall Immersion Test obtained the highest RMS value of 92,14% in a mixture of 0% rubber, while the lowest value is 77,49% on a mixture of 25% rubber. ITS test results obtained the highest TSR value of 94,9% at 0% rubber, while the lowest value was 46,77% at a mixture of 50% rubber, this indicates that the use of tire rubber waste as a substitute for fine aggregate of 50% has not been able to withstand the influence of To strong tensile mixture. Based on the results of the test due to aging asphalt through the process of STOA and LTOA obtained maximum stability value of 1350kg on a mixture of 0% rubber with a condition of STOA (unconditioned) and a minimum stability value of 506kg on a mixture of 25% rubber condition LTOA (unconditioned) This value already does not meet the specifications. So it can be concluded that in the case of STOA (construction period) and LTOA (service period) use of rubber waste used this tyre has not been able to anticipate the magnitude of the aging process that occurred.

Kata Kunci: AC-BC, Waste, Used Rubber Tires, Marshall, Ageing