

## INTISARI

Peningkatan total kendaraan roda dua dan roda empat berbanding lurus dengan peningkatan limbah ban bekas. Serbuk karet ban bekas atau *crumb rubber* (CR) didapatkan melalui vulkanisir ban karet bekas, mempunyai peluang yang dapat dipakai untuk campuran beraspal dalam upaya mengurangi limbah karet ban bekas.

Tujuan penelitian untuk menganalisa dan membandingkan pengaruh penambahan CR ukuran butir besar (lolos ayakan #4 [4,75 mm], tertahan ayakan #8 [2,36 mm]) dan butir kecil (lolos ayakan #16 [1,18 mm]) sebagai aditif dalam campuran *asphalt concrete-binder course* (AC-BC) terhadap karakteristik marshall dan *indirect tensile strength* (ITS). Persentase penambahan CR 0%, 0,5% dan 1,5% dari berat total agregat. Bahan pengikat menggunakan aspal penetrasi 60/70 produksi Shell dengan variasi kadar aspal 4,5%, 5%, 5,5%, 6%, 6,5%.

Hasil penelitian menunjukkan penambahan dan peningkatan kadar CR dalam campuran AC-BC meningkatkan nilai *void in mineral aggregate* (VMA), *void in the mix* (VIM), dan *flow*, tetapi menurunkan nilai densitas, stabilitas, *marshall quotient* (MQ) dan *void filled with asphalt* (VFA). Penambahan persentase dan ukuran butir CR terbaik dalam campuran AC-BC adalah persentase 0,5% dari berat total agregat dan butir kecil atau variasi campuran 0,5H%, karena memenuhi karakteristik marshall, *retained marshall stability* (RMS) dan *tensile strength ratio* (TSR). Penambahan dan peningkatan kadar CR menurunkan nilai ITS. Butir kecil menaikkan nilai ITS lebih daripada butir besar.

Kata kunci: CR, AC-BC, Marshall, ITS

## **ABSTRACT**

*The total increase in the number of two-wheeled and four-wheeled vehicles is directly proportional to the increase in the number of tire waste. Crumb rubber (CR), which is obtained through the vulcanization of used rubber tires, has the potential to be used as asphalt mixtures in the effort to reduce tire rubber waste.*

*The objective of this research is to analyze and compare the effect of adding large particle size CR (passing #4 sieve [4.75 mm], retained on #8 sieve [2.36 mm]) and small particle size CR (passing #16 sieve [1.18 mm]) as additives in asphalt concrete-binder course (AC-BC) mixtures on their marshall characteristics and indirect tensile strength (ITS). The percentages of the addition of CR are 0%, 0.5%, and 1.5% of the total aggregate weight. The asphalt used in these experiments is produced by Shell with penetration grade 60/70. The asphalt contents are 4.5%, 5%, 5.5%, 6%, 6.5%.*

*The results of the research show that the addition of CR content in increasing proportion in AC-BC mixtures increase the void in mineral aggregate (VMA), void in the mix (VIM), and flow, but decrease the density, stability, marshall quotient (MQ) and void filled with asphalt (VFA). The best result in these experiments is produced by AC-BC mixture with small particles of CR of 0.5% of the total aggregate weight, or 0.5H% mixture variation, because it meets the marshall characteristics, retained marshall stability (RMS) and tensile strength ratio (TSR). The addition of CR content in increasing proportion resulted in decreasing ITS values. The addition of small-size CR particles increases the ITS values more than that of the large-size particles.*

**Keywords:** CR, AC-BC, Marshall, ITS.