ANALISIS VARIASI KADAR LIMBAH PLASTIK *LOW DENSITY POLYETHYLENE (LDPE)* DALAM ASPAL MODIFIKASI TERHADAP KARAKTERISTIK DASAR ASPAL

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ABSTRAK

Perkerasan jalan raya adalah bagian jalan raya yang diperkeras dengan lapis konstruksi tertentu, yang memiliki ketebalan, kekuatan, kekakuan dan kestabilan agar mampu menyalurkan beban lalu lintas di atasnya ke tanah dasar secara aman. Struktur perkerasan jalan harus didesain kuat dan tahan lama untuk memberikan keamanan dan kenyamanan bagi pengguna jalan. Salah satu cara mengurangi kerusakan pada struktur perkerasan jalan yaitu dengan meningkatkan mutu aspal. Menambah bahan aditif, salah satunya seperti polimer, plastik, arang atau dikenal dengan aspal modifikasi adalah cara yang sering digunakan untuk menaikkan mutu aspal. Penelitian ini menggunakan plastik jenis *Low Density Polyethylene* (LDPE) yang dicampurkan kedalam aspal dengan penetrasi 60/70. Plastik jenis LDPE apabila dicampurkan kedalam campuran aspal memiliki sifat dapat menaikkan titik lembek aspal, menurunkan nilai penetrasi aspal, dan meningkatkan stabilitas aspal sehingga tidak mudah berubah bentuk. Penelitian ini bertujuan untuk untuk mengetahui karakteristik dasar aspal modifikasi plastik LDPE meliputi: penetrasi, titik lembek, titik nyala dan titik bakar, berat jenis, daktilitas, dan viskositas serta mengetahui rentang kadar plastik LDPE maksimal untuk menghasilkan aspal modifikasi yang memenuhi standar Bina Marga. Peneliti menggunakan variasi kadar plastik 0%, 1%, 2%, 3%, 4%, 5%, 6%, 7%, 8%, 9%, 10%, 20%, 30%, 40%, dan 50%. Hasil pengujian menunjukkan bahwa aspal modifikasi dengan plastik LDPE dapat meningkatkan titik lembek aspal serta menurunkan nilai penetrasi, titik nyala dan titik bakar, berat jenis, daktilitas, dan viskositas aspal. Mengacu pada spesifikasi umum persyaratan Bina Marga untuk aspal modifikasi polimer, penambahan kadar plastik LDPE maksimal yang memenuhi persyaratan sebesar 5%.

Kata kunci: plastik, *Low Density Polyethylene* (LDPE), aspal modifikasi, karakteristik dasar aspal.

ANALYSIS OF PLASTIC WASTE VARIATION LEVEL OF LOW DENSITY POLYETHYLENE (LDPE) IN MODIFICATION ASPHALS TO ASPHALITY BASIC CHARACTERISTICS

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ABSTRACT

The highway pavement is part of highway paved with a particular construction layers, having a thickness, strength, stiffness and stability to be able to distribute traffic loads on it to ground base safely. The structure of the pavement should be strong and durable designed to provide safety and comfort for road users. The way to reduce the damage to the road pavement structure is to improve the quality of asphalt. Add additives, such as the one polymer, plastics, charcoal or known by asphalt modification is a way that is often used to raise the quality of asphalt. This research uses a plastic type of Low Density Polyethylene (LDPE) which is mixed into the asphalt with penetration 60/70. LDPE plastic types when mixed into the asphalt mixture properties can raise the melting point of asphalt, bitumen penetration decreases the value, and improve the stability of the asphalt so it is not easily deformed. This research aims to determine the basic characteristics of LDPE plastic modified asphalt include: penetration, softening point, flash point and burning point, density, ductility, and viscosity as well as knowing the maximum level range LDPE plastic to produce bitumen modification that meets the standards of Highways. Researchers used a variation of the levels of plastic 0%, 1%, 2%, 3%, 4%, 5%, 6%, 7%, 8%, 9%, 10%, 20%, 30%, 40%, and 50% , The test results showed that the asphalt modified with LDPE plastics can increase the melting point of asphalt and lower penetration value, flash point and burning point, density, ductility, and asphalt viscosity. Referring to the general specifications of *Bina Marga* requirements for polymer modified bitumen, the addition of LDPE plastic grade that meets the requirements of a maximum of 5%.

Keywords: plastics, Low Density Polyethylene (LDPE), modified asphalt, basic characteristics of bitumen