



## ***ABSTRACT***

The latest development of asphalt road pavements in Indonesia has begun to apply the use of waste material/plastic waste Low-density polyethylene (LDPE film, plastic bags) for asphalt pavement mixtures aimed at reducing the environmental pollution. On the other hand, the factors that cause road infrastructure accidents include low road roughness (slippery) that causes vehicles to slip or slip, so it is necessary to examine the use of plastic waste for asphalt pavement mixtures and whether it can affect the skid resistance of the road surface. This research aims to know the effect of LDPE film plastic waste as an additive on Skid Resistance with British Pendulum Tester, Marshall characteristics, and Indirect Tensile Strength (ITS). The waste plastic LDPE film levels used were 0%, 4%, 5%, 6%, and 7% with a dry and wet process.

The results of Marshall stability, ITS, and Skid Resistance obtained the highest value of control specimens, dry process, and wet process are 1491 kg, 1550 kg, 1564 kg (0%, 6%, 4% LDPE Film), ITS Testing the value of Tensile Strength Ratio (TSR) of 82.94%, 85, 29%, 92.39% (0%, 7%, 5% LDPE Film), the British Pendulum Number (BPN) Skid Resistance test was 72, 86, 89 (0%, 7%, 6% LDPE Film).

There is an increase in skid resistance value with the addition of plastic waste LDPE film 19% dry process and 23% wet process to the control test object. Overall, the wet process mixing has higher Marshall stability, TSR, and BPN values than the dry mixing process and control specimens.

**Keywords:** Plastic waste, LDPE film, dry and wet process, Skid Resistance, British Pendulum Tester.



## INTISARI

Perkembangan terbaru perkerasan aspal jalan di Indonesia mulai diaplikasikan pemanfaatan material limbah/sampah plastik *Low-density polyethylene* (LDPE *film*, kantong plastik) untuk campuran perkerasan aspal yang bertujuan mengurangi pencemaran lingkungan. Disisi lain faktor penyebab kecelakaan prasarana jalan diantaranya akibat kekesatan jalan yang rendah (licin) sehingga menyebabkan kendaraan mengalami slip atau tergelincir, sehingga perlu untuk meneliti penggunaan limbah plastik untuk campuran perkerasan aspal apakah dapat mempengaruhi kekesatan (*skid resistance*) permukaan jalan. Penelitian ini bertujuan mengetahui pengaruh limbah plastik LDPE *film* sebagai aditif atau bahan tambah terhadap *Skid Resistance* menggunakan alat *British Pendulum Tester*, karakteristik *Marshall*, dan *Indirect Tensile Strength* (ITS). Kadar limbah plastik LDPE *film* yang digunakan 0%, 4%, 5%, 6%, dan 7% dengan proses pencampuran kering (*dry process*) dan basah (*wet process*).

Hasil pengujian stabilitas Marshall, ITS, dan Skid Resistance diperoleh nilai tertinggi benda uji kontrol, pencampuran kering dan basah sebesar 1491 kg, 1550 kg, 1564 kg (0%, 6%, 4% LDPE *Film*), Pengujian ITS nilai *Tensile Strength Ratio* (TSR) sebesar 82,94%, 85, 29 %, 92,39% (0%, 7%, 5% LDPE *Film*), pengujian Skid Resistance nilai *British Pendulum Number* (BPN) sebesar 72, 86, 89 (0%, 7%, 6% LDPE *Film*).

Terdapat peningkatan nilai skid resistance dengan penambahan limbah plastik LDPE *film* 19% *dry process* dan 23% *wet process* terhadap benda uji kontrol. Secara keseluruhan proses pencampuran basah memiliki nilai stabilitas, TSR, dan BPN lebih tinggi dibandingkan proses pencampuran kering dan benda uji kontrol.

Kata Kunci: Limbah plastik, LDPE *film*, proses kering dan basah, *Skid Resistance*, *British Pendulum Tester*.