

## INTISARI

PT. Pertamina Unit Refinery IV Cilacap mengeluarkan 15 ton material limbah *spent catalyst* hasil dari pengolahan minyak mentah oleh mesin *Residual Fluid Catalytic Cracking* (RFCC) setiap harinya. Berdasarkan beberapa penelitian, terdapat persamaan antara *spent catalyst* dengan *filler* campuran beraspal. Penelitian ini meneliti potensi penggunaan *spent catalyst* sebagai pengganti *filler* debu batu pada campuran *Asphalt Concrete-Binder Course* (AC-BC).

Penelitian ini dilakukan dengan cara membuat benda uji menggunakan 5 variasi kadar *filler*, yaitu variasi 1 (100% debu batu: 0% *spent catalyst*), variasi 2 (75% debu batu: 25% *spent catalyst*), variasi 3 (50% debu batu: 50% *spent catalyst*), variasi 4 (25% debu batu: 75% *spent catalyst*), dan variasi 5 (0% debu batu: 100% *spent catalyst*). Selanjutnya dirancang campuran pada masing-masing variasi dengan metode Marshall. Setelah diperoleh hasil perancangan campuran, kemudian dilakukan uji karakteristik campuran dengan menguji kekuatan sisa berdasarkan uji Marshall dan uji kuat tarik tak langsung.

Hasil pengujian perancangan campuran secara umum menunjukkan semakin besar persentase penggunaan *spent catalyst* sebagai pengganti *filler* akan menaikkan kebutuhan akan aspal. Hasil uji karakteristik campuran semua variasi memenuhi persyaratan spesifikasi umum 2010 revisi 3 (2014). Komposisi penggunaan *spent catalyst* sebagai pengganti *filler* yang optimum terdapat pada variasi 2 (75% debu batu: 25% *spent catalyst*) dengan nilai indeks stabilitas Marshall sisa dan nilai rasio kuat tarik berturut-turut sebesar 96,25% dan 83,34%.

**Kata kunci :** limbah, Marshall, kuat tarik tak langsung, optimum.

## ABSTRACT

PT. Pertamina Unit Refinery IV Cilacap released 15 tons of spent catalyst waste material from crude oil processing by Residual Fluid Catalytic Cracking (RFCC) machine every day. Based on several studies, there is an equation between spent catalyst with asphalt mixture filler. This study investigated the potential use of the spent catalyst as a replacement of filler in Asphalt Concrete-Binder Course (AC-BC) mixture.

This study was conducted by making the specimen using 5 variations of filler content, that is variation 1 (100% stone dust: 0% spent catalyst), variation 2 (75% stone dust: 25% spent catalyst), variation 3 (50% stone dust : 50% spent catalyst), 4 variations (25% stone dust: 75% spent catalyst), and variation 5 (0% stone dust: 100% spent catalyst). Furthermore, the mixture design of each variation was based on the Marshall method. Test characteristic of the mixture is then performed after obtaining the optimum asphalt content by testing the remaining strength based on the Marshall test and Indirect Tensile Strength test.

The result of laboratory mix design generally showed that the greater used percentage of spent catalyst, the greater asphalt needed. The test results of mixed characteristics of all variations meet the requirements of the general specification of 2010 revision 3 (2014). The use of spent catalyst composition as a replacement of filler optimum was found in the variation of 2 (75% stone dust: 25% spent catalyst) with remaining Marshall stability index value of 96,25% and tensile strength ratio of 83,34%.

**Keywords:** waste material. Marshall, Indirect Tensile Strength, Optimum.