

ABSTRAK

Catalytic converter menjadi hal yang menarik dalam pengendalian emisi gas buang di dunia otomotif. Banyak penelitian yang dilakukan untuk meningkatkan kinerja *catalytic converter* dalam mengurangi polutan. Substrat keramik adalah yang paling banyak digunakan di pasaran, padahal substrat logam lebih unggul jika dilihat dari sifat fisiknya. FeCrAl sebagai substrat logam diterapkan dalam *catalytic converter* karena konduktivitas termalnya yang tinggi, kapasitas panas yang lebih rendah serta ketahanannya pada guncangan mekanis dan suhu tinggi. Tujuan dari penelitian ini adalah untuk membandingkan *catalytic converter* substrat keramik, logam dan FeCrAl berlapis Nikel-krom dalam mengurangi emisi gas buang dan performa. Pelapisan Nikel-krom pada substrat FeCrAl menggunakan metode elektroplating yang sebelumnya diberi pelapisan *zincate* sebagai *pretreatment*. Pengujian gas analyzer dan dynotest menggunakan Suzuki Carry-ST 150 pick up produksi tahun 2006 dengan dan tanpa *catalytic converter* pada berbagai kecepatan, dan variasi bahan bakar diuji dengan *dynamic test*. Diperoleh bahwa penggunaan *catalytic converter* substrat FeCrAl berlapis Nikel-krom paling efektif dalam menurunkan emisi gas buang HC berbahan bakar pertamax RON 92 sebesar 92,11%, gas buang NO_x berbahan bakar pertalite RON 90 sebesar 68,45% dan gas buang CO berbahan bakar pertamax turbo RON 98 sebesar 66,92%. Adapun hasil pengujian dynotest diperoleh kesimpulan bahwa penggunaan *catalytic converter* substrat FeCrAl dapat meningkatkan torsi (*torque*) dan menurunkan konsumsi bahan bakar.

Keyword : *Catalytic converter, FeCrAl berlapis Nikel-Krom, Performa Mesin*

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ABSTRACT

Catalytic converters are an interesting thing in controlling exhaust emissions in the automotive world. Many studies have been carried out to improve the performance of catalytic converters in reducing pollutants. Ceramic substrates are the most widely used on the market, even though metal substrates are superior in terms of their physical properties. FeCrAl as a metal substrate is applied in catalytic converters because of its high thermal conductivity, lower heat capacity and resistance to mechanical shocks and high temperatures. The aim of this research is to compare nickel-chrome coated ceramic, metal and FeCrAl substrate catalytic converters in reducing exhaust emissions and performance. Nickel-chrome coating on the FeCrAl substrate uses an electroplating method which is previously given a zincate coating as pretreatment. Gas analyzer and dynotest testing using a 2006 Suzuki Carry-ST 150 pick-up with and without a catalytic converter at various speeds, and fuel variations are tested using a dynamic test. It was found that the use of a Nickel-chrome coated FeCrAl substrate catalytic converter was the most effective in reducing HC exhaust emissions fueled with Pertamina RON 92 by 92.11%, NO_x exhaust gas fueled with Peralite RON 90 by 68.45% and CO exhaust gas fueled Pertamina turbo RON 98 of 66.92%. The results of the dynotest test concluded that the use of a FeCrAl substrate catalytic converter can increase torque and reduce fuel consumption.

Keywords: Catalytic converter, Nickel-Chrome plated FeCrAl, Engine Performance

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