

**Title: Analytical and experimental analysis for comparison of performance characteristics of catalytic converters including simulation**

In recent times Government of India has promoted use of after-treatment devices and alternative fuels in public and private sectors in the light of worsening emission scenario of country. To achieve this goal after-treatment devices and low emission fuels are the hopes. One of the most important after-treatment device nowadays fitted in exhaust line is Catalytic Converter. Also Compressed Natural Gas (CNG) has got reputation as one of the promising alternative fuels due to its low exhaust emissions. Therefore purpose behind this paper is to present the results of analytical and experimental study of the performance and conversion efficiencies of ceramic monolith three-way catalytic converters (TWCC) employed in automotive exhaust lines for the reduction of CNG emissions and compare them with simulated model for the same.

Two ceramic converters of different cell density, hydraulic channel diameter, substrate length and wall thickness were studied analytically and experimentally to estimate the effect of varying key parameters on performance characteristics such as conversion efficiencies and pressure drop. Further simulation model using GT-Power 7.4 is generated following analytical and experimental considerations. Based on the emission test results, the conversion efficiencies from both converters were calculated and evaluated for all three approaches. It was interesting to check their compliance with BS-IV CNG emission standards.

**Keywords:** Catalytic converter, CNG exhaust emissions, Conversion efficiency, Pressure drop.