# LUBRICANTS FOR LOW-EMISSIONS DIESEL ENGINES

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The design of diesel engines that meet ever-tightening emissions standards has placed unprecedented stringency on the specifications that dictate lubricant performance. These requirements have been met without compromise to customer-related demands for extended oil drain intervals, improved fuel economy, and long engine life. Strategies for controlling $NO_x$ emissions including retarded injection timing and cooled exhaust gas recirculation (EGR) have been the impetus for the most recent changes, prompting the need for improved wear protection and viscosity increase control at elevated lube oil soot levels. Cooled EGR will present additional challenges and will require improved corrosion protection, oxidation resistance, and wear control at potentially higher soot loadings.

The aftertreatment-forcing emission standards that will go into effect in 2007 are prompting research in the area of catalyst-compatible diesel engine oils. If sulfur- and ash-containing species present in diesel engine lubricant additives and base oils are found to hinder the performance and durability of advanced emissions control systems, novel approaches to meet potentially conflicting demands will be required. This paper will summarize recent trends in diesel lubricant formulation to bring perspective to the impact of current and future regulations.