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A review of ethanol-diesel blend as a fuel in compression-ignition engine

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The use of ethanol blended with diesel is receiving more attention by many researchers in the recent time. It was shown that ethanol–diesel blends were technically acceptable for existing diesel engines. Ethanol as an attractive alternative fuel is a renewable bio-based resource and it is oxygenated, thereby providing the potential to reduce particulate emissions in compression–ignition engines. In this review the properties and specifications of ethanol blended with diesel fuel are discussed. Special emphasis is placed on the factors critical to the potential commercial use of these blends. These factors include blend properties such as stability, viscosity and lubricity, safety and materials compatibility. The effect of the fuel on engine performance, durability and emissions is also considered. The formulation of additives to correct certain key properties and maintain blend stability is suggested as a critical factor in ensuring fuel compatibility with engines. However, maintaining vehicle safety with these blends may require special materials and modification of the fuel tank design. Further work is required in specifying acceptable fuel characteristics, confirming the long-term effects on engine durability, and ensuring safety in handling and storing ethanol–diesel blends.

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Triple Dixel modeling of complex mechanical part

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The development of machining simulation techniques on multi-axis machines (03 axes and 05 axes) is the key of quality and productivity evolution in the manufacture of mechanical parts with complex shapes, which are often present in the automobile industry. These parts must meet the requirements functional and/or style, which need special attention in their production phase. In this paper, our work focuses on the work-piece volume representation with a complex geometric form in a precise and rapid manner by using the Triple Dixel model from STL model, and the K-means algorithm to optimize the calculation time in the simulation of material removal for the prediction of the finished surface quality.

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