

# EFFECT OF IN-CYLINDER ENVIRONMENT ON SPRAY CHARACTERISTICS OF DIESEL AND BIODIESEL

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**T**he objective of this paper is to investigate the spray characteristics of diesel and biodiesel in different in-cylinder environments, including spray tip penetration, spray cone angle, projected spray area, and spray tip velocity. The in-cylinder environment was set to two different ambient pressures and five temperature gradients. The results showed that both ambient pressure and temperature had a significant effect on the spray characteristics of diesel and biodiesel. Higher ambient temperatures under non-evaporating conditions increased the spray tip penetration and projected spray area of the fuel. Biodiesel in the same in-cylinder environment exhibited different spray characteristics due to different physical properties compared to diesel. In addition, the initial breakup mechanism of the spray was analyzed using dimensionless numbers.

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