

Effect of Swirling Mixer on the Exhaust Flow in a Diesel SCR Aftertreatment System

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Abstract : The widespread utilization of mixer in selective catalytic reduction (SCR) system marks a remarkable advantage in diesel engines. In the automotive selective catalytic reduction (SCR) system, the de-NOX efficiency can be improved by highly uniform flow with effective turbulent mixing. In this paper, the exhaust pipe is complemented with the swirling mixers of three different vane angles installed at the upstream of the SCR reactor. The attributes of the mixer are established by the variation in flow behavior followed by the drawback owing to the absence of mixer. In particular, the information pertaining to the selection of proper static mixer is provided based on the correlation between the uniformity index (UI) and the pressure drop. The uniform distribution of the flow at the entrance of the SCR reactor aids to determine the configuration which gives high mixing performance and comprehend the function of the mixer.

Keywords : pressure drop, selective catalytic reduction, static mixer, turbulent mixing, uniformity index

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