

## **Abstract**

The acoustic prediction of internal combustion engine exhaust systems is an important aspect to meet customer expectations and legislation targets. One dimensional gas dynamic simulation tools are used for the prediction of the exhaust orifice noise in the early stages of the engine development process. This includes the prediction of the acoustic performance of individual components in the exhaust line. One common element used in exhaust systems to increase the acoustic damping is the plug flow muffler. This study looks at the prediction of acoustic performance of various plug mufflers at different flow velocities. These include a single plug muffler, a double plug muffler and an eccentric plug muffler with different porosities for the perforated sections. In each case a single simulation model is used to simulate the muffler using linear and non linear theory. These results are validated against experimental measurements of the transmission loss. Also, for the non linear simulations, the predicted pressure drop across the plug flow muffler is validated against measurements.