

## **An introduction to a homogeneous charge compression ignition engine**

### **ABSTRACT**

Homogeneous charge compression ignition (HCCI) engine technology is relatively new and has not matured sufficiently to be commercialised compared with conventional engines. It can use spark ignition or compression ignition engine configurations, capitalizing on the advantages of both: high engine efficiency with low emissions levels. HCCI engines can use a wide range of fuels with low emissions levels. Due to these advantages, HCCI engines are suitable for use in a hybrid engine configuration, where they can reduce the fuel consumption even further. However, HCCI engines have some disadvantages, such as knocking and a low to medium operating load range, which need to be resolved before the engine can be commercialised. Therefore, a comprehensive study has to be performed to understand the behaviour of HCCI engines.

**Keyword:** Diesel; HCCI; Gasoline; Natural gas; Hydrogen