

**Ambixtra system tested on Pulse-R
multi-gas engine**



**Ambixtra and Oaktec teams
present for 2 days of testing**

What is the Pulse-R multi-gas engine

- A novel patent protected 4 stroke piston engine
- Low cost engine optimised for gaseous fuels
- High fuel efficiency
- High power density
- High torque at low RPM
- Low emissions
- Ideally suited to fixed speed applications
- Robust and durable for sustained high load running



Pulse-R advantages are based partly on an excellent twin-spark combustion system with optimised chamber shape and mixture preparation. Could Ambixtra deliver further benefit?

Oaktec /Ambixtra ignition tests 22/23 February 2016

- Tests were conducted at both high power points and lower power ultra lean air/fuel mixtures.
- The Ambixtra supplied spark plug was compared with the standard NGK Pulse-R plug.
- Lean misfire limits and knock limits were evaluated.
- Initial tests used LPG sequentially port injected at 2bar.
- Final test ran on kerosene to assess ignition capability of Ambixtra with heavy oil.
- The aim was to assess differences in power and fuel efficiency between Pulse-R twin and single spark ignition and a single spark Ambixtra system .

Results

- Power output on all tests was broadly the same between the two systems when the settings were optimised
- Ambixtra demonstrated a small yet consistent advantage in BSFC (fuel efficiency)
- This fuel efficiency advantage was 2% when compared with the single plug Pulse-R
- The NGK spark plug gave better BSFC than the Ambixtra supplied plug
- Time constraints prevented a lean burn test using the NGK plug with the Ambixtra coil, but trends suggest this would have delivered the biggest advantage
- Pulse-R started and ran with kerosene using the Ambixtra coil but the test engine compression ratio was too high for sustained running on low octane fuel

Oaktec's conclusions

- Pulse-R has a fundamentally efficient ignition system so we were surprised that the Ambixtra system showed consistent improvement in BSFC.
- The Ambixtra system allows us to run with a single plug without compromise
- It is likely that the biggest improvements for Pulse-R will be at extremes of lean mixture and with poorer quality fuels
- We are very keen to work with Ambixtra on future projects allowing more sustained development