

Innovative material for new wood burning stove

A collaborative project between a West Midlands SME, Landy Vent, and the University of Birmingham has evaluated the performance of the Company's unusual heating system and provided some interesting results.

Landy Vent's new 'ECCO Stove' uses age old principles but is made with state-of-of-the-art silicon carbide to maximise efficiency, create lower emissions and decrease running costs. The whole structure of the ECCO Stove features silicon carbide which enables very high temperatures to be reached in the combustion chamber (typically 900-1000°C). The benefit of using such material is that silicon carbide is able to reflect heat back into the fire chamber for higher burn; absorb these extreme temperatures and then release the heat slowly. The heat conduction properties of silicon carbide are primarily used in electrical conductors and furnaces but have not been traditionally used in home heating systems.

Landy Vent wanted to show that the ECCO Stove is more efficient than the conventional metal stove and approached the Manufacturing Advisory Service (MAS) for advice. MAS suggested that they talk to experts in thermofluids from the University of Birmingham.

Researchers from the University's department of Mechanical Engineering, Dr Raya Al-Dadah and Dr Saad Mahmoud, set about installing temperature measuring devices connected to dataloggers and continuously monitored the temperature in a two-storey 'test' cottage where the ECCO Stove had been installed. Of particular interest was the temperature distribution throughout the cottage, in various positions and levels, not just at the location of the stove. Both the ECCO Stove and a more conventional metal stove were tested consecutively with temperatures being logged every 10 minutes over a three day period in cold January.

The results showed that there was a greater reduction in the temperature difference with distance from the metal stove, indicating that the effect of the metal stove decreases with distance. This could be due to the innovative use of silicon carbide producing a lower thermal capacity than that of the metal stove. The larger thermal mass of the Ecco Stove allowed heat to be released more evenly and consistently allowing the stove to maintain uniform temperature throughout the building.

"Breaking into the established stove market with our new Ecco Stove has been a challenge and the results from this project with the University of Birmingham will certainly help to demonstrate the benefits that it can bring." David Ashmore, Managing Director, LandyVent UK Ltd