

Performance comparison of a modulating oil-fired boiler with an on/off oil-fired boiler

The modulating boiler significantly reduced oil consumption by 10-17% while maintaining the same property conditions. Additionally, it cut electricity usage by 66% compared to the non-modulating system.

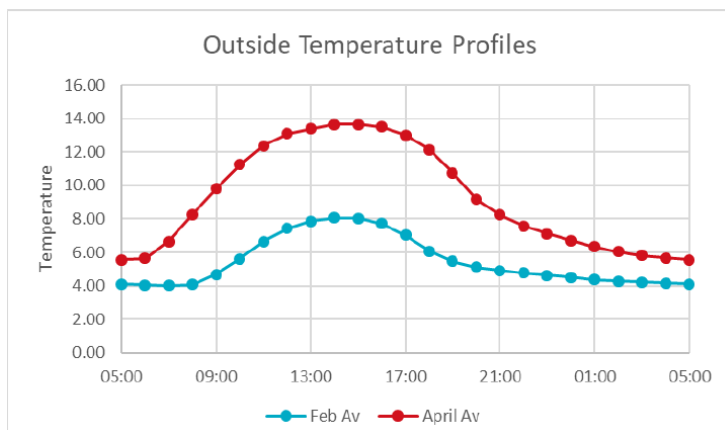
Situation

EOGB has requested a notified test house to carry out comparative testing to show how the performance of the Sapphire modulating oil boiler compared to a modern oil fired condensing boiler with fixed combustion.



Test conditions

- The boilers were tested in a dynamic heat load test rig to simulate real world environment.
- The Sapphire boiler has been tested with a range of OpenTherm compatible thermostats. The standart boiler was tested with a Generic Standart thermostat.
- The design conditions were based on the CIBSE guide, with a design temperature of -2C, internal temperature of 21C and a property heat loss factor of 600 W/K.
- Both boilers were set to 20KW Maximum heat output.
- The temperature profiles used represent an average UK winter and spring day, and ran over 24 hour cycles.



Testing result summary

The Sapphire boiler testing showed promising results in reducing energy consumption while maintaining consistent heating performance. The modulating boiler demonstrated a significant reduction in oil usage, achieving a 10-17% decrease compared to conventional systems. Additionally, it was more energy-efficient, with a 66% reduction in electricity consumption. These findings suggest that Sapphire boilers can offer substantial long-term savings and enhanced energy efficiency.

Martin Cooke, Managing director Sapphire Boilers, said: It's a very interesting advancement in liquid fuel boilers to achieve modulation and to finally prove the improvement in boiler technology can have a huge impact on overall system efficiency.

It's worth highlighting that these tests were conducted on boilers that have very similar boiler efficiency, however it's the modulating technology that achieved up to 17% saving and this will be far more if you replace older non condensing boiler for Sapphire fully modulating.

For more information about Sapphire boilers and how to improve the efficiency of your heating system, visit website sapphireboilers.co.uk or call 01480 477066

Technical

The Sapphire boiler is a modern fully modulating liquid fuel boiler, delivers the best energy efficiency and carbon emission reduction.

- Heat Output: 6-32 KW
- Total Consumption: 0.66 kWh
- Efficiency Rating: 98% (ErP A-rated)
- Water Content: 62 litres
- Fuel Type: Oil (compatible with standard heating oil and biofuel blends)
- Heat Exchanger: Stainless Steel (high durability and corrosion resistance)
- Burner Type: Low-NOx, modulating burner
- Control System: Integrated Smart Controls with Wi-Fi connectivity, allowing remote monitoring and adjustment via a mobile app, plus option to use standart controls.
- Emissions: NOx emissions below 30 mg/kWh
- Dimensions: 425mm (W) x 860mm (H)
- Weight: 88 kg
- Warranty: 25 years on heat exchanger
- Maximum hearth temperature - 100 °C
- Maintenance: Low maintenance design with easy access for service and cleaning
- Additional Features:
 - OpenTherm thermostat
 - Multi-zone heating capability
 - Digital flame monitoring
 - Automatic fault diagnosis

