

IT TRALEE

Executive Summary Of Tests Carried Out On Tadpole Product In An Oil Fired Open Vent Gravity fed Central Heating System

Report

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Executive Summary of Tests Carried out at Tralee Institute of Technology on the Tadpole Device

Introduction

Tadpole Energy Ltd commissioned Dr James Prendergast and Mr. Chris O Donoghue of the Institute of Technology Tralee to carry out tests on their product Tadpole. The tests were carried out over a period between January 2010 and November 2010. The initial tests were carried out between January and March 2010 which culminated in the final report dated June 15th 2010. A second series of tests were carried out from June to November 2010 culminating in the report dated 19th of November. At the request of Tadpole Energy a consolidated report dealing with the removal of oxygen was issued on the 27th of January 2011.

The Tadpole Device

Tadpole is a unique energy saving device which can deliver considerable energy savings when installed in a domestic heating system. The Tadpole is a cylindrical device which is placed up stream of the pump on the return to the boiler and is easily installed as seen below.



Tadpole Installed

The Tadpole by virtue of its design creates a vortex within the cylinder which allows entrained air and dissolved oxygen to be easily vented from the heating system providing an oxygen free system which as a result is more efficient in terms of energy usage, hot water regeneration and higher radiator temperatures. Also by eliminating oxygen from the system the Tadpole reduces the incidences of corrosion and thereby maintains the efficiency of the heating system over time and extends its life.

Tests Conducted

The Tadpole was tested using an open vent oil fired central heating system firstly under constant operation on the boiler thermostat and secondly using an air thermostat and time clock to control the boiler cycle. The purpose of the tests were to examine the ability of Tadpole to:

(1) Reduce the Dissolved Oxygen in the water of a domestic heating system to an inert level thereby removing corrosion and maintaining the efficiency and extending the life of the heating system.

(2) Improve the hot water recovery rate and

(3) Improve the efficiency of the heating system with resultant savings in fuel.

Conclusion of Results

In all the tests the results on the heating system with the Tadpole installed outperformed the system without the Tadpole installed.

Initial tests 15th June Report

With the boiler thermostat controlling the heating system and the system running constantly the level of dissolved oxygen in the system reduced much quicker and reached a level of 0.2 ppm, with the Tadpole installed as opposed to 1.2 ppm without the Tadpole installed. As any level of dissolved oxygen at or below 0.5 ppm would be regarded as inert the fitting of Tadpole would greatly reduce the incidence of corrosion and increase system life.

(See separate report on Oxygen Reduction 27th January 2011)

The flow and return temperatures were along with the hot water cylinder temperature higher with the Tadpole installed as the Tadpole was more efficient at venting entrained air and dissolved gasses from the system resulting in less bleeding of the system.

The radiator temperature was recorded throughout the tests and even though outside temperatures were colder (4^o C on average) than for the non Tadpole tests there was no decrease in the radiator temperature with the Tadpole installed.

This increase in performance corresponded to a similar improvement in the boilers performance resulting in energy savings. A savings of 23.7% was calculated with the Tadpole installed.

Subsequent Testing 19th November Report

With the boiler thermostat and a timer controlling the system, the performance was found to be excellent. The timer for these tests was set to 2 hours on in the morning and 5 hours in the evening. The system with Tadpole installed reduced the dissolved Oxygen in the heating water to an inert level of 0.5 ppm in just over one week and was continuing to reduce this level further.

(see separate report on Oxygen Reduction 27th January 2011)

When 40 litres of hot water were drawn from the system the recovery rate was measured. The results indicated that the system with the Tadpole installed recovered faster and to temperature of 2.1 ^oC higher than the system without Tadpole.

When the system was controlled by an air thermostat the performance of the boiler was equally impressive. The boiler on time for the duration of both tests was 37.5% for the non Tadpole installed system and 37.86 % for the Tadpole installed system. However the average outside temperature was 9.6 °C lower when testing with Tadpole installed. When the concept of Heating Degree days is applied this equates to an overall improvement in efficiency of 21.75%

Summary

In summary the systems with the Tadpole installed outperformed the base system in term of Oxygen depletion, temperatures achieved, hot water temperature recovery and more importantly boiler efficiency leading to considerable savings in fuel and electricity.