

Environmental benefits of using Fernox

Continual advancements in boiler technology are leading to increased efficiencies, reduced emissions and smaller heat exchangers. Nevertheless the reduced size means that the boiler is more prone to the negative effects of limescale and corrosion which are detrimental to performance levels and consequently impact on the advantages gained by technological advancement. The correct use of water treatment can however ensure that boiler efficiency is maintained over the long term and that CO₂ emissions are kept to a minimum. This is demonstrated by the research below.

Fernox Central Heating Protector

Work undertaken by *Advantica Technologies Ltd, Gas Research Centre* (formally BG Technology) has confirmed the environmental and cost benefits of using Fernox water treatment products. The efficiency of a cast iron boiler, 14.7kW, was measured before and after scaling in a recirculating rig containing 500 litres of hard water (Carbonate hardness = 300mg/L CaCO₃) for 3 weeks. After a short de-scale using Fernox DS-40 cleaner, the boiler was operated on the same scaling rig with Fernox Superconcentrate Protector F1 at 0.3% v/v in fresh hard water for 5 weeks. The efficiency measurements taken at full load with 47°C return temperature are given in the table below.

Condition	Efficiency (%)	Change in Efficiency (%)
Un-scaled new boiler	87.4	
After 3 weeks in scaling rig untreated hard water	81.0	-6.4
After short time de-scaling with DS-40	84.2	+3.2
After 5 weeks in scaling rig Superconcentrate Protector F1 treated hard water	84.3	0

Fernox Boiler Noise Silencer F2

In a separate piece of work, boiler efficiency was measured in both a scaled and un-scaled condition with Fernox Superconcentrate Boiler Noise Silencer F2 with the following results:

Condition	Mean efficiency increase at 4 loadings
Un-scaled boiler	0.8%
Scaled boiler	1.4%

CO₂ emissions

In industrialised countries, domestic households account for around 25% of all CO₂ emissions. By far the largest consumer of energy and hence CO₂ emissions in the home is the boiler for heating and hot water systems. The table below, taken from *The Building Research Establishment – Good Practice Guide 2000*, gives the annual costs (savings) and CO₂ emissions against change in efficiency for a modern non-condensing boiler (SEDBUK = 82%) in a typical 3-bedroom house.

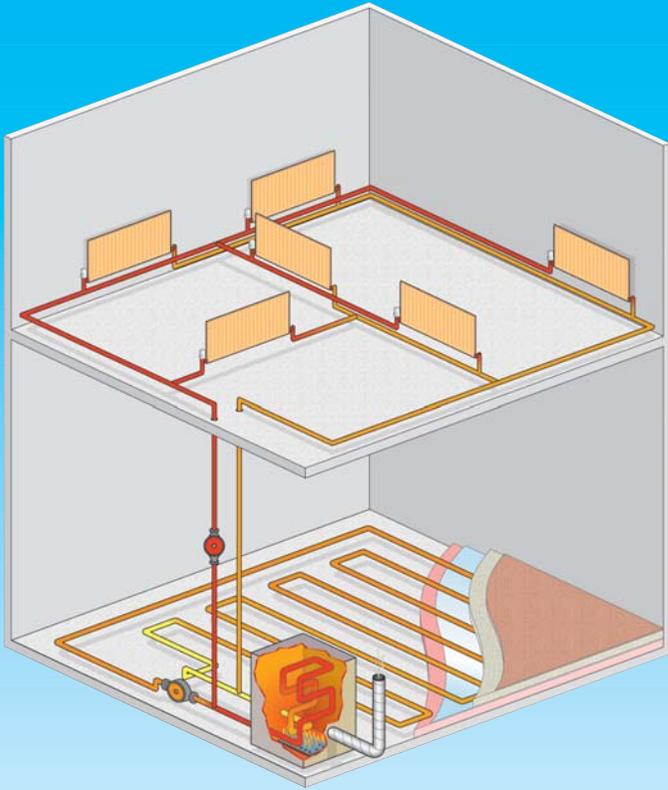
Reduction in Efficiency (%)	Annual Running Costs (£)	Annual Running Costs (€)	Annual Emissions of CO ₂ (Tonnes)
0	284.00	451.00	4.6
1	+2.84	+4.51	+0.046
2	+5.68	+9.02	+0.092
3	+8.52	+13.52	+0.138
4	+11.38	+18.06	+0.184
5	+14.20	+22.54	+0.230
6	+17.04	+27.05	+0.276

Environmental Benefits of using Fernox Products

- Low toxicity (KIWA-ATA approved)
- Manufactured to ISO 14001 environmental quality standard
- Eco-friendly – high biodegradability when discharged to environment (nitrite, phosphate and EDTA-free)
- Significant energy savings and reduced CO₂ emissions on treated systems



Correctly treated with Fernox



Untreated

