

## Domestic Condensing Boilers: The Myths and Benefits

### Introduction

Condensing boilers are highly efficient boilers that have much lower fuel and running costs than non condensing boilers. Take up has been slow ever since they were first introduced in the early 1980s due to a number of misconceptions and a general lack of awareness. Since then the technology has improved and there has been an increase in the number of trained installers.

The objective of this guide is to provide concise information on the benefits associated with condensing boilers and to help dispel the popular myths surrounding them.

In dispelling the misconceptions or 'myths' associated with condensing boilers, it is hoped that the barriers to specifying and installing condensing boilers will be finally removed. This will result in a sustained increase in market share throughout the Island, benefiting both householders and the environment.

### The Benefits of Condensing Boilers

Condensing boilers offer tangible benefits by:

- Reducing CO2 emissions and helping to combat climate change.
- Improving household efficiency thus reducing fuel bills.

Condensing boilers work on the principle of recovering as much as possible of the waste heat which is normally rejected to the atmosphere from the flue of a conventional non-condensing boiler.

This is accomplished by using an extra-large heat exchanger or sometimes two heat exchangers within the boiler which maximises heat transfer from the burner as well as recovering useful heat which would normally be lost with the flue gases.

When in condensing mode (condensing boilers do not condense all the time) the flue gases give up their 'latent heat' which is then recovered by the heat exchanger within the boiler. As a result the temperature of the gases exiting the flue of a condensing boiler is typically 50-60°C compared with 120-180°C in a current non-condensing boiler. At the same time, an amount of water or 'condensate' is produced.

A condensing boiler will always have a better operating efficiency than a non-condensing one, due to its larger and more efficient heat exchanger.

The benefits of condensing boilers are therefore quite clear, and in order to encourage greater take-up of these benefits we now need to address the myths surrounding them.

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### Looking at the Myths Surrounding Condensing Boilers

#### ***Myth 1: They are only efficient when fully condensing***

Not true. Due to its larger heat exchanger, a condensing boiler does not have to condense in order to be more efficient. Typically a new gas condensing boiler will have a seasonal efficiency of between 86% and 92% compared with a new non-condensing boiler at 78% or an older boiler at 55-65% annual efficiency achieved in typical domestic conditions and is expressed as a percentage rating. An A to G scale of percentage bands was also in use until October 2010.

#### ***Myth 2: They are very expensive***

Not true. In the past, condensing boilers were more expensive, mainly due to the materials used in the construction of the heat exchanger. However, as with all new things, the cost of technology reduces over time, and some regular condensing boilers can now be obtained for no more than a regular non-condensing boiler.

#### ***Myth 3: They need larger radiators***

This is not the case, and no change is necessary. In most systems, radiators are already oversized for all but the severest weather. A marginal benefit of approximately 3% may be obtained from oversizing radiators for a new system, as this will allow slightly cooler return water to the boiler and maximise time spent in condensing mode, but this is usually uneconomic and impractical.

#### ***Myth 4: They are less reliable***

This is not the case. While this may have been true with the early models of condensing boilers, improvements introduced as a result of this early experience mean that the components in modern condensing boilers are as reliable as those in the equivalent non-condensing models.

#### ***Myth 5: They are difficult to install***

Not true. The only difference compared with non-condensing boilers is the requirement for a condensate drain. A competent installer will have no problem in deciding on a suitable location for the drain and fitting a normal, plastic overflow pipe. Condensate pumps are available where a boiler is sited in a basement or a drain point cannot be reached for gravity. Flue locations will also need consideration – see Myth 9 on ‘plumes’.

#### ***Myth 6: They are harder to maintain***

Not true. The only minor difference is the need to ensure that the condensate drain is clear when servicing.

#### ***Myth 7: They cannot be fitted to existing systems***

This is not the case. Condensing boilers are suitable for replacing most existing boilers. As with any replacement boiler, the effectiveness of the control system and type of hot water cylinder should be assessed when conducting a site survey. Central heating systems should be thoroughly cleansed and flushed before installing any new boiler. Wall hung condensing boilers are readily available, with extended fluing options if required.

## Domestic Condensing Boilers: The Myths and Benefits ...continued

### ***Myth 8: They have limited availability***

Not true. All manufacturers now offer a wide range of both regular and combination condensing boilers.

### ***Myth 9: The plume is a nuisance***

As the flue gases leaving a condensing boiler are cool, they tend to produce a noticeable mist or plume of water vapour around the flue terminal itself (as they condense upon contact with the atmosphere), especially under cold conditions. This is not a problem and in fact indicates that the boiler is working as intended. However, consideration should be given to boiler and flue location prior to installation so that the plume will not be too close to neighbouring properties or windows, doors and paths regularly used in the winter.

### ***Myth 10: The condensate is a problem***

Not true. With modern systems, only about one litre per hour of condensate is produced, which has a pH in the range of 3.5 to 5 – about the same acidity as tomato juice. As previously discussed, this is carried to a normal drain by means of a simple plastic overflow pipe.

## References

1. The Building (Guernsey) Regulations, 2012. Guernsey Technical Standard L1, Conservation of Fuel and Power in Dwellings, 2012 Edition. Available at [www.gov.gg/planning](http://www.gov.gg/planning)
2. For comparing individual boiler efficiency results and SEDBUK figures see the website [www.boilers.org.uk](http://www.boilers.org.uk) or [www.sedbuk.com](http://www.sedbuk.com).

This guidance note is intended to provide guidance to designers, developers and members of the public, to inform, promote good practice and encourage consistency of interpretation of the Regulations, if further guidance is required please do not hesitate in contacting us.



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