



## Specifying Secondary Heating and Chimneys in Accordance with Document L

- Guidance for Approved Document L1A
- Advice on how to minimise carbon emissions
- Choosing the right appliance
- Specifying the appropriate chimney

The latest revisions to Building Regulations Approved Document L1A introduce new rules for the calculation of carbon emissions from houses. The changes not only continue to allow the use of open and glass fronted heating appliances within homes but also mean that their incorporation will offer a number of specific benefits in terms of meeting carbon requirements and homeowner appeal.

For the first time, secondary heating appliances have to be specified as an integral part of completing the Standard Assessment Procedure (SAP) calculation. The performance of these appliances, the specification of associated chimneys and flues and building elements such as thermal insulation and glazing must all be considered together to arrive at a carbon emissions calculation.

By adopting this approach, the Government is targeting a 20% reduction in carbon emissions from new homes, as part of its commitment to meeting international environmental objectives.

## The Changes In Summary

The new rules set out more stringent requirements for the energy efficiency levels achieved by houses. They offer the designer considerable flexibility. However, any elements which are likely to increase the use of energy must be balanced by greater thermal efficiency elsewhere. For example, if the window area is larger than normally expected, then higher levels of insulation may be required to offset this.

The methodology is relatively complex but will be made easier through the availability of special SAP calculation software. Guidance on completing the heating sections of the software is provided on page 4 of this document.

In theory the regulations allow all the options previously available, although the most common secondary heating options (open fires and decorative fuel effect fires) will have such low efficiencies that it may prove too costly to compensate for their use. However, alternative

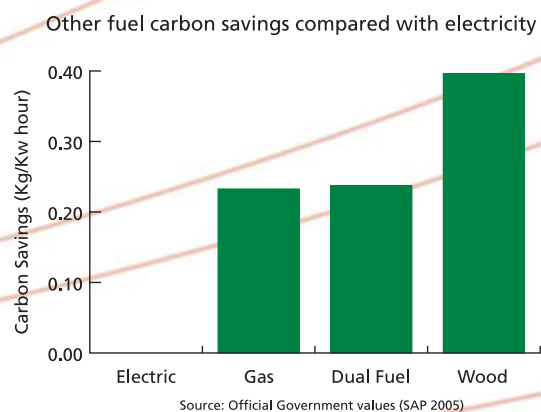
or modified heating appliances allow specification of secondary heating options that will readily surpass the Government's 20% carbon reduction target.

To take advantage of these options it is necessary to install a natural draught chimney. This will offer a number of significant performance and financial benefits.

## Benefits of Installing a Chimney

A key element within the calculation methodology is the adoption of electric heating as the 'default' secondary heating source. Electric is a carbon intensive energy source. This means that secondary heating appliances with carbon efficiencies better than an electric fire will offer a carbon credit which can be traded off in other areas of design.

The graph below shows the carbon savings of different fuel types relative to electricity.



■ Where a chimney/flue is installed and used in conjunction with a modern, efficient gas, wood or multi-fuel heating appliance this will offer a carbon positive benefit relative to

electric heating. This saving will allow economies in other aspects of construction, such as thermal insulation requirements and glazing specifications.

- A correctly specified flue will enable the use of a choice of heating appliances - allowing the builder to offer alternatives to the purchaser and so enhancing the bespoke element of the property.
- Chimneys and the 'fireplace' remain a highly desirable aspect of the home with much documented evidence of their appeal to the purchaser from an aesthetic, lifestyle and comfort viewpoint.
- Wood and dual fuel appliances open up the option for fuel independence, given the possibility of disruption to other supplies periodically and growing concerns about the long term security of supply as resources dwindle.
- The use of natural draught flues, in conjunction with appropriate appliances, represents the sustainable option.

## Chimney Specification

With open fires the requirement was to build chimneys with diameters greater than 200mm. Modern appliances can operate effectively with flues of diameters less than 200mm. This is advantageous as the assumption in the SAP calculation is that a flue with a diameter of less than 200mm reduces the natural or 'standing' ventilation from 40m<sup>3</sup>/hour for a chimney to 20m<sup>3</sup>/hour for a flue.

Significantly a ventilation rate of 40m<sup>3</sup>/hour is assumed for flueless gas fires so these offer no benefit relative to a natural draught flue.

## Appliance Choice

All of the following can normally be accommodated.

### OPEN FRONTED

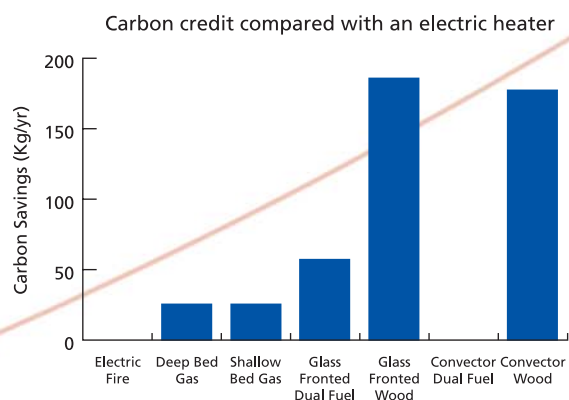
Convactor, wood and multi-fuel burners  
Open fronted deep and shallow bed fuel effect (ILFE) gas fires

### GLASS FRONTED

Inset fires (wood, gas and multi-fuel)  
Stoves (wood, or multi-fuel/dual fuel)

## Carbon Benefits of Glass and Open Fronted Fires

The graph below shows the carbon benefit of different types of open and glass fronted appliances, relative to the default electric secondary heating option. The values shown are for a typical 100m<sup>2</sup> detached house.



# Completing the SAP calculation to minimise carbon usage through secondary heating specification

By making the appropriate choices in just three key areas important savings in carbon emissions can be achieved, giving markedly better performance than the default electric heating used in the SAP calculation. The three areas relate to ventilation rate, appliance efficiency and fuel.

Ventilation

Chimneys	0
Flues	1
Flueless gas heaters	0

## Ventilation Rate

Using a flue (less than 200mm diameter) will reduce the standing air loss within the calculation by 50%. Therefore an appliance used with a flue will give a better result than an appliance used with a larger diameter chimney. Most modern appliances will work efficiently with a flue of less than 200mm. It should be noted that a flueless gas fire has the same standing air loss penalty as a chimney.

Heat Source

Gas
<b>Solid fuel (HETAS approved)</b>
Electric
Oil
Dual fuel

System Type

Open fire in grate
Open fire with back boiler (no rads)
<b>Closed room heater</b>
Closed room heater with back boiler
Stove (pellet fired)

Efficiency of secondary/supplementary heating system %

70
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## Appliance Efficiency

The SAP calculation assumes the fraction of heating which will be supplied by a secondary heat source to be 10%. The appliance efficiency, in conjunction with the fuel, has a major impact on carbon emissions. It is, therefore, necessary to select the appliance and its associated efficiency. Generally efficiencies above 50% will be the starting point, with improvements in results as the appliance efficiency increases.

For example, when planning for a glass fronted appliance, the closed room heater option would be selected and the efficiency entered in the appropriate box.

Fuel	CO <sub>2</sub> /kWh
Electric	0.422
Manufactured Smokeless Fuel (coal)	0.393
Oil	0.265
LPG	0.234
Gas	0.194
Dual Fuel (wood & coal)	0.187
Wood	0.025

## Fuel

Calculation software requests selection of generic and specific fuel types. The lower the carbon content of the fuel, the less carbon will be used.

The list on the right gives the CO<sub>2</sub>/kWh of some of the fuels.

The overall combination of a low carbon fuel, used with an efficient appliance, with a flue for the exhaust gas can give the best carbon savings.

## Further Information

A detailed explanation of the calculation method and further information on the performance of different types of appliances in conjunction with natural draught flues can be obtained by visiting [www.chimneys-in-houses.com](http://www.chimneys-in-houses.com) or contacting

Hepworth Building Products [www.hepworth.co.uk](http://www.hepworth.co.uk) 01226 763561

Hanson Red Bank Manufacturing Company [www.redbankmfg.co.uk](http://www.redbankmfg.co.uk) 01530 273737

Schiedel Chimney Systems [www.schiedel.co.uk](http://www.schiedel.co.uk) 028 8774 0436 or 01788 860930



The members of the Chimney Development Association are also members of the British Flue and Chimney Manufacturers' Association which has been instrumental in drafting the chimney and flue requirements of Document L1A. The BFCMA is an association of the Federation of Environmental Trade Associations (FETA). More details at [www.feta.co.uk](http://www.feta.co.uk)