

1 Appliances Burning Solid Mineral Fuels & Wood



PREFACE

The wide range of appliances listed in this Part are designed to burn either solid mineral and/or wood based fuels.

Principally, the solid mineral based fuels consist of manufactured smokeless fuels which have been authorised for use in smoke control areas and have been subjected to approval testing themselves. The tests applied show these fuels to be suitable for either open or closed appliances or in some cases for both types of appliance. In selecting a suitable fuel for your appliance, reference should be made to the headings of the appliance sections and notes which accompany individual appliance listings and *Part 3 - Wood, Biomass & Solid Mineral Fuels* of this Guide. Additionally, naturally occurring smokeless fuels such as anthracite may also be burned in smoke control areas. These fuels are listed against the appliances they are suitable for.

Where the various grades of bituminous coal, wood logs and other wood products are listed against appliances, in general, they must not be burned in smoke control areas. However, a number of appliances are especially designed to burn specific grades of bituminous coal, wood logs and other wood products with a high degree of smoke reduction sufficient to permit their use in smoke control areas. These “exempted” appliances are designated with a  icon after their name in this Guide.

An up to date list of authorised fuels and exempted appliances, for use in smoke control areas, is available from DEFRA (*Department for Environment, Food and Rural Affairs*), *Air Quality Policy Division, Nobel House, 17 Smith Square, London SW1P 3JR* and are given on their website, www.smokecontrol.defra.gov.uk.

DEFRA Exempted Appliances must be operated in accordance with the specified conditions of the exemption and burning only the specified fuels in accordance with the manufacturer’s operating instructions. It is important to note that the appliances marked as DEFRA Exempt refer only to England. Exemption for the now devolved administrations of Wales, Scotland and Northern Ireland are subject to separate legal processes and the installer must verify the status of the exemption in relation to the country of the installation; see www.gov.uk/smoke-control-area-rules.

Wood logs and wood based products are of major importance following the implementing of the Energy Performance of Building Directive (see below). They should be from renewable sources to claim low CO₂ emission values. Where the appliance is a DEFRA exempted appliance designed to burn wood logs then specific conditions as to the quality of the wood fuel are imposed by the Statutory Instrument. Usually this requires the use of untreated dry wood i.e. without halogenated organic compounds or heavy metals as a result of treatment with wood-preservatives or coatings. Sometimes the SI refers to air-dried wood logs or untreated dry wood. Where appliances are designed to burn wood chips or wood pellets the fuel size, quality and type specified by the manufacturer should always be adhered to.

Petroleum coke is not recommended by HETAS for use on solid fuel burning appliances because its use can result in serious damage to grates and other appliance components in the fire chamber. However, a number of products which contain petroleum coke or are blends of petroleum coke with other fuels have been tested and approved.

With the adoption by the UK of the Energy Performance of Buildings Directive and its introduction via Building Regulations *Approved Document L*, we list the output and efficiency at nominal output of all the appliances listed. These have been obtained from Type Test Reports from Notified Laboratories in Europe against harmonized European Standards.

UK Building Regulations require that if a solid fuel burning appliance is to be installed it must have an efficiency which meets minimum levels. These levels are the same as those required for HETAS Approval and are detailed under Appliance Minimum Efficiency Standards in these introductory notes. Furthermore, if burning the same fuel, any replacement appliance must have an efficiency no more than two efficiency points less than the appliance it replaces. If the replacement appliance burns a different fuel, then a calculation based on relative carbon emissions is applied.

For new installations in new dwellings a SAP assessment should be carried out. These efficiency and output figures may then be used for SAP calculations - remembering that they are for nominal output conditions. Currently, when the appliance is for supplementary heating the nominal output efficiency is used. Where the appliance supplies full heating for the house and no slow combustion test figure is available a default figure is applied for slow combustion being 95% of that at nominal output. This usually results in a seasonal efficiency of 97.5% of the measured efficiency at nominal output.

The appliances listed provide a wide choice of styles and outputs ranging from open fires with and without water heating boilers, room heaters with and without boilers, to cookers and independent central heating boilers. Care should be taken in the selection of the appliance best suited to the specific needs of your house and your lifestyle.

Appliance Performance

1. The object of rating an appliance's performance is to ensure, as far as possible, that under normal conditions of domestic use, and burning one or other of the fuels shown as approved, the appliance will give satisfactory heat service; the outputs shown are those which it is recommended should not normally be exceeded.

This Guide does not cover dimensional and constructional features which affect frequency of attention although, in general, closed and closeable appliances are intended to give the rated output with less frequent attention than the open fire type. It must be appreciated, therefore, that a direct comparison between the different categories of appliance cannot be made without further advice if all aspects of performance are to be considered.

2. The rated output of an appliance is based upon tests under prescribed conditions using a standard test fuel. This allows performance to be assessed under conditions which are repeatable and enables the output and performance of appliances in the same category to be compared. The appliance listings give the periods used in the Type Tests for the outputs to be achieved. It should be appreciated, however, that under household conditions the performance may vary to some degree when different fuels are burned and under changing conditions of draught. A considerable amount of useful heat additional to that shown in the List is available from the chimney serving an appliance. This can vary from as much as 9% of the input for a room heater with high output boiler to 3% for other appliances, depending on the type of house and whether the chimney is built on an inside or an outside wall. It should be noted that where a factory made insulated chimney is used the heat passing to the house is significantly reduced and the draught applied to the appliance increased.

Eco Design

HETAS and Woodsure have been working with industry, Defra and other Government departments to support a pragmatic but effective transition to the impending Ecodesign Regulations coming in to force in Europe in January 2020 for independent boilers and January 2022 for room-heater stoves. The overall aim is to promote more energy efficient appliances and use of quality wood fuels to lower emissions and improve air quality.

We all want to offer customers an option to burn solid fuels, wood, biomass cleanly and efficiently in to the future. This means we must aim to reduce the emissions of particulate matter (PM) i.e. organic gaseous compounds (OGC), carbon monoxide (CO), nitrogen oxides (NOx) (and for some fuels sulphur).

CE Marking

HETAS check the validity of any CE marking during the HETAS approval process however HETAS Approval cannot be regarded as a substitute for CE marking.

HETAS Measured Efficiencies for Individual Appliances

The individual appliance gross efficiencies, measured at rated output, are shown against each appliance where relevant, in the tables of *Part 1 - Appliances Burning Solid Mineral Fuels & Wood*. They have been measured using the relevant BS or BS EN standard burning the appropriate test fuel, which is representative of the fuels recommended by the appliance manufacturer. Details of appliance construction, performance and recommended fuels are given in the appliance manufacturer's instruction manual.

Intermittent or Continuous Burning

Where necessary appliances will be classed either as Intermittent or Continuous. This refers to the way they are intended by the manufacturer to be operated by the end user.

Continuous burning appliances are intended to be turned down and operated at a slow burning rate and resultant low heat output, usually at the end of an evening but may also be before leaving for work in the morning. This enables the fire to be kept alight overnight or during the day to be revived again when the owner is next in attendance. This in turn reduces the need for repeated relighting and will also provide some background heating when the owner is either in bed or not at home. Appliances classed as continuous will have been tested to prove that they are capable of operating successfully in this way.

Intermittent appliances are designed to be refuelled at regular intervals to provide the required heat at the desired time and are not intended to be turned down.

Notes of caution: Continuous appliances operated for extended periods at low heat output can lead to detrimental conditions within the chimney resulting in damp and acidic deposits that can adversely affect chimney components made from metal. These conditions can lead to greatly reduced life expectancy of metal components. Users who are looking to operate appliances in this manner should consider installing chimney liners where necessary that are non-metallic. See also Part 2 of this guide, Factory Made Chimneys and Chimney Lining Systems. Also note that burning wood fuel on continuous appliances for extended periods at low output can result in tarry deposits and increased emissions unless the appliance has been exempted for use in smoke control areas in this mode of operation, as marked with the DEFRA exemption logo (DE) in this Guide.

HETAS Approved Appliances Minimum Efficiency Standards

The minimum appliance efficiencies quoted below are measured at normal rated output. UK legislation is based on the efficiency reported to a Gross CV basis. In this Guide the net efficiency is also given as these are commonly the reported values of the test laboratories and are often quoted in Manufacturers' literature. These are not seasonal efficiencies.

The majority of appliances listed in the HETAS Guide have efficiencies well above the minimum values required.

There is also evidence to show that with solid fuel appliances efficiency does not fall off greatly as the output of the appliance reduces. Additional useful heat, which is not included in these minimum values, can be available from the chimney and fireplace particularly if the chimney is centrally placed and enclosed in the building structure.

Testing has, until recently, been carried out to British Standards (BS) using an appropriate standard test fuel. It is against these earlier BS that some of the appliances listed in this Guide have been tested. After 1 January 2003 Type Testing is now carried out to the relevant BS ENs. These new European Standards now adopted as British Standards are as follows:- Independent boilers BS EN 12809; or when wood pellets fired to BS EN 14785 or BS EN 303-5; Cookers BS EN 12815; Freestanding Room Heaters BS EN 13240; Inset Room heaters BS EN13229; or when wood pellets fired to BS EN 14785; Open Fires BS EN 13229.

The standard test fuels used are representative of those DEFRA Authorised Fuels which can be used in Smoke Control Areas (SCAs). Bituminous House coal, Wood Logs and Wood Pellets are not permitted to be used in SCAs unless they are burned in specially designed, smoke reducing, DEFRA Exempted Appliances.

The minimum efficiency pass values for the various appliance types are listed in section 1.8 of the Government's Domestic Building Services Compliance Guide, which can be viewed at:

www.planningportal.gov.uk/uploads/br/domestic_building_services_compliance_guide.pdf

Open Fires

Type B : Simple Open Fire – 37% (Radiation only)

Type B1: Open Fire Freestanding Convector – 47%

Type B2: Open Fire Inset Convector – 45% mineral fuel, 43% wood

Type C: Open Fire with domestic hot water boiler - 50%

Type D: Open Fire with high output boiler – Trapezium or rectangular grate – 63%

Please Note:

The standard test fuel used for open fires is a reactive smokeless fuel and/or wood logs as specified in the appropriate BS EN. Additionally, heat is given out from the appliance by convection and conduction which provides added heat to that measured in the earlier BS tests on which these minimum figures are based.

Room Heaters/Stoves

Type E: Room heater without boiler – 65%

Type F: Room heater with boiler – 67%

Note. The standard test fuel for room Heaters is an anthracite based briquette and/or wood logs.

Type E: Pellet Fired Stoves without boiler – 70% (at nominal load), 65% (at part load).

Type F: Pellet Fired Stove with boiler – 75% (at nominal load), 70% (at part load)

Please Note:

The standard test fuel for Pellet Fired Stoves is a low ash content high quality wood pellet as specified in the appropriate BS EN.

Slow heat release appliances 65%

One-off tiled/mortared stoves 70%

Cookers

Type G1: Cooker without boiler or with boiler not exceeding 3.5 kW – 65% mineral fuel, 55% wood logs

Type G2: Cooker with integral oven and boiler exceeding 3.5 kW – 65% mineral fuel, 60% wood logs.

Please Note:

The test fuel for cookers is an anthracite based briquette as specified in the appropriate BS EN.

Independent Boilers

Type J1: Hand Fired Batch Fed – 65% mineral fuel, 75% wood logs

Note. The test fuel for hand fired independent boilers is an anthracite based briquette and/or wood logs.

Type J4: Gravity Feed (up to 20.5 kW) – 70%

Type J4: Gravity Feed (above 20.5 kW) – 75%

Please Note:

The test fuel for Gravity Feed boilers is a grain or bean sized low ash content anthracite as specified in the appropriate BS EN.

Type J5: Automatic Feed fired by wood pellets/chips – 75% (at nominal load), 70% (at part load).

Please Note:

The standard test fuel for Pellet Fired Boilers is a low ash content high quality wood pellet/chips as specified in the appropriate BS EN.