

Method of test for establishing the efficiency of decorative fuel effect gas fires

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Foreword

This Product Assessment Specification is sponsored by the Society of British Gas Industries and developed through the British Standards Institution.

This specification is not to be regarded as a British Standard. It will be withdrawn upon publication of its content in, or as, a British Standard.

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This document has been prepared by the Technical Panel of the Gas Fire Group sector of the Society of British Gas Industries as a method of measuring the thermal efficiency of decorative fuel effect gas fires.

This document describes a method of measuring the efficiency of decorative fuel effect gas fires. It complements BS EN 509, which includes requirements and test methods for construction, safety and marking of decorative fuel effect gas fires. The use of this method is not required by BS EN 509, which does not include requirements for the efficiency of decorative fuel effect gas fires.

These test methods are based on existing, accepted techniques for obtaining the output on other types of gas fire. These methods have been adapted and modified to be appropriate for a decorative fuel effect gas fire as described in **2.4**.

It is intended that this document will allow accurate and reproducible efficiencies to be calculated to enable fair comparisons between decorative fuel effect gas fires of differing designs, and also between decorative fuel effect gas fires and gas fires of other categories.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with this Product Assessment Specification does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 13 and a back cover.

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1 Scope

This Product Assessment Specification specifies requirements and test methods for measuring the efficiency of decorative fuel effect gas fires not exceeding a nominal heat input of 20 kW (based on net calorific value), hereinafter referred to as appliances.

Generally the safety and construction of these appliances is specified in European Standard BS EN 509.

This document is not applicable to the following:

- a) radiant convector and inset live fuel effect fires specified in BS 7977-1;
- b) closed fronted and balanced flue appliances specified in BS EN 613;
- c) appliances incorporating a fan to assist the transportation of combustion air and/or combustion gases covered by EN 1266 and prEN 13278.

2 Terms and definitions

For the purposes of this Product Assessment Specification the following definitions apply.

2.1

radiant convector [see Figure 1(a)]

gas fired appliance designed to heat a room mainly by the emission of air heated by convection. Such an appliance also contains vertical, or near vertical, mounted radiant elements designed to give maximum radiant output to the room. It is designed to be mounted on a hearth, floor or wall. It may be mounted wholly or partially inset into the void behind the fireplace opening

2.2

live fuel effect fire (LFE) [see Figure 1(a)]

gas fired appliance designed to heat a room mainly by the emission of air heated by convection. Such an appliance also contains radiant elements designed to simulate a solid fuel fire bed. It is designed to be mounted on a hearth, floor or wall

2.3

inset live fuel effect fire (ILFE) [see Figure 1(b)]

live fuel effect fire (2.2) designed to be installed wholly or partially inset into the void behind the fireplace opening

2.4

decorative fuel effect gas fire [see Figure 1(c)]

gas fired appliance designed to simulate a solid fuel appliance for decorative purposes and intended to be installed so that the products of combustion pass unrestricted from the firebed to the chimney or flue

2.5 Gases

2.5.1 reference conditions

- for calorific values (temperature: 15 °C);
- for gas and air volumes dry (brought to 15 °C and to an absolute pressure of 1 013.25 bar)¹).

2.5.2

calorific value

quantity of heat produced by the complete combustion of gas, at a constant pressure equal to 1 013.25 bar, of unit volume or unit mass of gas, the constituents of the combustible mixture being taken at reference conditions and the products of combustion being corrected back to the reference conditions specified in **2.5.1**

A distinction is made between the following:

- the gross calorific value in which the water produced by combustion is assumed to be condensed (symbol H_s);
- the net calorific value in which the water produced by combustion is assumed to be in the vapour state (symbol H_i);
- units are either:
 - megajoules per cubic metre (MJ/m^3) of dry gas at reference conditions; or
 - megajoules per kilogram (MJ/kg) of dry gas.

2.5.3

relative density

ratio of the masses of dry gas and dry air at the same conditions of temperature and pressure (symbol: d)

2.5.4

Wobbe index

ratio of the calorific value of a gas per unit volume to the square root of its relative density under the same reference conditions. The Wobbe index is said to be gross or net according to whether the calorific value is the gross or net calorific value

- symbol: gross Wobbe index: W_s
- net Wobbe index: W_i
- units are either:
 - megajoules per cubic metre (MJ/m^3) of dry gas at the reference conditions; or
 - megajoules per kilogram (MJ/kg) of dry gas.

¹) 1 bar = 10^5 N/m^2