

Thermal performance of domestic gas appliances —

Part 5: Specification for thermal performance of fanned-circulation ducted-air heaters

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The preparation of this British Standard was entrusted by the Gas Standards Committee (GSE/-) to Technical Committee GSE/17, upon which the following bodies were represented:

- British Gas Corporation
- British Non-ferrous Metals Federation
- Consumer Standards Advisory Committee of BSI
- Consumers' Association
- Department of Energy (Energy Efficiency Office)
- Department of the Environment (Building Research Establishment Engineering Division)
- Department of Trade and Industry (Consumer Safety Unit, CS Division)
- Department of Trade and Industry (Mechanical and Electrical Health and Safety Executive)
- Institution of Gas Engineers
- Liquefied Petroleum Gas Industry Technical Association (UK)
- National Brassfoundry Association
- National Gas Consumers' Council
- Royal Society for the Prevention of Accidents
- Society of British Gas Industries

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Department of the Environment
- Coopted member

This British Standard, having been prepared under the direction of the Gas Standards Committee, was published under the authority of the Board of BSI and comes into effect on 28 February 1986

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Foreword

This Part of BS 6332 has been prepared under the direction of the Gas Standards Committee. BS 6332 is intended to provide specifications for the thermal performance requirements and associated test methods for domestic space and water heating appliances burning 1st, 2nd and 3rd family gases. When it was first proposed that such a standard be prepared, the new standard was seen as complementing the Parts of BS 5258 that cover safety requirements and associated test methods for these appliances. The two standards, BS 5258 and BS 6332, together with Parts 1 and 2 of BS 5386, which relate to instantaneous water heaters but, being based on CEN standards, specify both safety and performance requirements, would then supersede and allow the withdrawal of the then existing British Standards for 1st family gas appliances, BS 1250-3 and BS 1250-4, and for 3rd family gas appliances, 2773 and 2883.

This reasoning persists but the need for up-to-date minimum values for thermal performance of gas appliances has been accentuated by the passing of the Energy Conservation Act in implementation of the EEC Heat Generator Directive. Because of this, each Part of BS 6332 will be subject to review two years after the date of its publication.

With the continuing participation of the UK in European standardization, it is probable that Parts of BS 6332 will be withdrawn, in due course, and replaced by new British Standards aligned with CEN standards.

In anticipation of this standard being the subject of third party certification schemes, it provides for a claim by the appliance manufacturer of a numerical value for the thermal efficiency of a product model. The test authority will then ascertain that a sample submitted for type approval meets this claimed value within a specified test equipment tolerance. Any sample selected from subsequent production of the particular model will be expected to comply with a verification value, which will also take into account a specified production tolerance.

Another departure from established practice is the adoption of net instead of gross calorific value as the basis of thermal performance. This change is a consequence of European harmonization.

Parts of BS 6332 already published are as follows.

- *Part 1: Specification for thermal performance of central heating boilers and circulators;*
- *Part 2: Specification for thermal performance of gas fires;*
- *Part 3: Specification for thermal performance of combined appliances: gas fireback boiler;*
- *Part 4: Specification for thermal performance of independent convector heaters.*

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard 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 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 6332 specifies the thermal efficiency requirements and associated methods of test for gas-fired fanned-circulation ducted-air heaters with rated heat input up to and including 60 kW¹⁾.

This Part covers appliances of the following categories, as described in BS 4947:

I_T , I_N , I_L , $I_{L/B}$, $I_{L/P}$;
 II_{TN} , II_{NL} , $II_{NL/B}$, $II_{NL/P}$;
 III , $III_{TNL/B}$, $III_{TNL/P}$;

and of the following types, as defined in BS 1179:

type B : open-flued appliances;
 type C : room-sealed appliances;
 type C₁ : balanced flue appliances;
 type C₂ : Se-duct appliances.

This Part of BS 6332 is applicable only to the appliances listed above that comply with BS 5258-4.

NOTE The titles of the publications referred to in this Part of BS 6332 are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 6332, the definitions given in BS 1179:1967 and in BS 1179-6:1980 apply, together with the following.

2.1

claimed efficiency

the net efficiency of an appliance claimed by the manufacturer (E_c)

2.2

gross efficiency

the efficiency of an appliance calculated on the assumption that the heat content of the test gas is its gross calorific value

2.3

net efficiency

the efficiency of an appliance calculated on the assumption that the heat content of the test gas is its net calorific value

2.4

test house efficiency

the net efficiency of an appliance measured at the test house on a sample submitted for type approval purposes (E_t)

2.5

verification efficiency

the net efficiency of an appliance measured during any surveillance or check testing of production appliances (E_v)

3 Thermal performance

3.1 General requirements

3.1.1 The appliance shall comply with the requirements of 3.2 and, as appropriate, of 3.3.1, 3.3.2 or 3.3.3.

3.1.2 Efficiency values shall pertain to and shall be measured by the method described in clause 4.

3.2 Efficiency requirements: still air conditions (all types of appliance)

3.2.1 The manufacturer shall claim a net efficiency value, E_c , which shall be not less than that given in Table 1.

3.2.2 The test house efficiency, E_t , shall be not less than E_c minus 2.

3.2.3 The verification efficiency, E_v , shall be not less than E_c minus 5.

Table 1 — Minimum net efficiency under still air conditions: claimed value

Appliance		Heat input at which measurement made	Minimum claimed efficiency (net) ^a
Type	Rating		
all	fixed	rated	%
	range	minimum of range	77
		maximum of range	80

^a The gross efficiency value is related to the net value for the four reference gases as follows.

for TGA (4) gross value = $0.899 \times$ net value
 for NGA gross value = $0.901 \times$ net value
 for LPGA gross value = $0.926 \times$ net value
 for LPGC gross value = $0.922 \times$ net value

3.3 Efficiency requirements: adverse flue conditions

3.3.1 Type B appliances

3.3.1.1 The test house efficiency, E_t , measured under the conditions specified in 3.3.1.2, shall be not less than E_c minus 9 when the appliance is operated at the rated heat input or at the maximum of the rated range, as appropriate.

¹⁾ Based on gross calorific value.