TECHNICAL BULLETIN 200

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Title: Room-sealed fanned draught flue systems concealed within voids

Introduction

With the advent of modern fanned draught flue systems, appliance manufacturers are now able to design longer flue systems, sometimes up to as much as 30 metres in length to enable greater flexibility when siting the appliance.

Some building designers are taking the opportunity to site central heating appliances centrally away from external walls within some building developments and then utilising a duct or void, for example a intermediate ceiling void, as a route for the flue system to external air. This is particularly prevalent in multi-storey flats and apartments where space is at a premium. Technically, an intermediate ceiling void is acceptable as a route for a flue system, but building designers, for whatever reason, are often not considering the provision for access to the flue system. Access is needed to enable a gas operative to comply with the requirements of the Gas Safety (Installation and Use) Regulations (GSIUR). These require that flues are examined prior to initial commissioning of the appliance and during routine servicing or maintenance of the appliance.

CORGI are aware of this problem and following discussions with representatives from the Health and Safety Executive (HSE), the gas industry and also representatives from the wider building trade, including Local Authority Building Control (LABC) and the NHBC (National House Building Council), it has been agreed that a uniform approach to the situation is required.

Therefore the information outlined below will be made available to all of the associated professions and trades involved in the design and construction of buildings to ensure the requirements of legislation, installation standards and appliance manufacturer's installation instructions are consistently applied by all.

Current requirements

It is a requirement of GSIUR that flues are examined prior to initial commissioning of the appliance and during routine servicing or maintenance of the appliance. This examination needs to verify the effectiveness and general safety of the flue system to ensure the safe continued use of the appliance it serves.

With regard to a room-sealed fanned draught flue system, it is necessary to check that:

- the flue is continuous throughout its length
- all joints are correctly assembled and are appropriately sealed
- the flue is adequately supported throughout its length

To achieve this, it is necessary to be able to visually inspect the flue system throughout its route, both prior to initial commissioning of the appliance and subsequently during routine servicing or maintenance of the appliance.

Note 1: It is not intended that additional provision for inspection should be provided for short flue sections connecting an appliance to a terminal and passing directly through an external wall, whether that flue be of a natural or fanned draught flue system design.

Note 2: The provisions for checking open flues are outside the scope of this Technical Bulletin and are covered by the procedures given in GSIUR and other industry standards including British Standard (BS) 5440-1: 2000 Installation and maintenance of flues and ventilation for gas appliances of rated input not exceeding 70kW net (1st, 2nd and 3rd family gases) – Part 1: Specification for the installation and maintenance of flues.

Note 3: Consideration should also be given to the ability of replacing the flue system when the appliance becomes obsolete and needs replacing.

It is therefore necessary for means of access to be provided at strategic locations so that the flue system can be visually inspected along its route. The means of access should allow for visual inspection to be achieved for the entire length of the flue system, including any separately routed air supply pipe, particularly where there are deviations or joints and supports. It is not envisaged that a means of access is provided at every joint, deviation or support, but it is important that each aspect can at least be visually inspected in some way.

Note 4: The means of access to be provided needs to be sufficiently sized to allow a visual inspection to be undertaken. It is not intended that any means of access should be sized to allow physical access to the flue system, for example to carry out maintenance of the system.

The location of any means of access should be decided upon through liaison taking place between the property architect/builder/owner and the CORGI registered business installing the flue system/appliance. It is likely that this will need to be done on a "property by property" or "site by site" basis, but consideration needs to be given at the design stage.

Where access panels are used as a method of gaining visual access to a duct or void, it is important that any fire resisting qualities or acoustic requirements of the building structure are not impaired.

It is of course imperative that the appliance manufacturer's installation instructions are strictly adhered to with regard to the maximum length of the flue system, the appropriate flue material, correct jointing methods and the maximum distances between supports. Where the appliance is of the condensing type, the flue system needs to have a uniform gradient back to the appliance throughout its length as specified by the appliance manufacturer.

It is important that both flue and appliance maintenance is considered at the earliest planning stages of any construction project. The requirements of the Construction (Design and Management) Regulations (CDM), in particular the requirement for relevant flue information to be contained within the 'Health and Safety File', may also need to be considered depending on the size of the development.

Existing installations without access

It is accepted that there will be many installations across the UK that do not meet the minimum requirements outlined above, but the requirement to examine the effectiveness of the room-sealed fanned draught flue system still exists.

Therefore, when work is carried out on an appliance where access to visually inspect the flue system is not provided to enable an examination of that flue, a risk assessment of the installation should be carried out to determine the action required. In particular, the following points need to be considered when carrying out a risk assessment of the installation:

Question the gas user

Before commencing any work, through discussions with the gas user, establish the age of the appliance/installation and whether it has been regularly maintained. Also try to establish the route of the flue through the duct or void and whether there have been any previous problems arising from the routing of the flue. It is important that this initial investigation takes place so that the gas operative is aware of the history of the appliance and the installation, which will help in the assessment of the installation.

Flue system

The flue system should then be assessed to ensure it is of the type specified by the appliance manufacturer, typically either concentric or twin pipe and that the correct materials have been used.

Where a concentric flue system is used, it will typically comprise of a metallic outer air duct with either a metallic or plastic inner flue duct. It is important to check that the flue system is connected correctly to the appliance in the manner described by the appliance manufacturer. The flue termination should also be checked to ensure it is installed in accordance with the appliance manufacturer's installation instructions, or if these are not available, BS 5440-1: 2000.

For twin pipe flue systems, it is again important to check that the flue is of the type specified by the appliance manufacturer and that the termination is correct. Twin pipe systems will be either metallic or plastic in construction and it is particularly important that the correct material has been used for a plastic flue system and the joints have been made using an approved method. The appliance manufacturer will specify a particular size and grade of plastic as well as the particular method of jointing to be used and these requirements need to be strictly adhered to. Where it is found that the plastic used or jointing method are not as specified by the appliance manufacturer, further investigation will need to be undertaken to ascertain whether it is considered safe to allow the continued use of the gas appliance. Advice will need to be sought from the appliance manufacturer prior to making this decision.

The route of the flue should be 'walked' to ensure that there are no stains or discoloration to the material used to construct the duct or void below the flue system, as this may indicate that there is a break or defect in the flue system.

The length and size of the flue system will also need to be assessed to ensure it again meets the requirements of the appliance manufacturer. If it is found that the flue system is incorrectly sized or of excessive length, the appliance manufacturer will again need to be consulted to seek their advice.

Operational checks

In all cases there is a need to carry out the minimum safety checks as required by Regulation 26(9) of GSIUR as far as reasonably practicable, to ensure that the appliance itself is operating safely.

The minimum checks as specified by Regulation 26(9) are:

a) The effectiveness of any flue
b) The supply of combustion air
c) Its operating pressure or heat input or, where necessary, both
d) Its operation so as to ensure safe functioning

Where the appliance manufacturer requires combustion readings to be taken as part of the routine servicing or maintenance, carry out a flue gas analysis check of the combustion products using a suitable electronic portable combustion gas analyser (ECGA) to ensure the appliance meets the specified requirements.

Where the appliance manufacturer does not provide specific combustion readings, but a suitable ECGA is available, it is advisable to carry out a flue gas analysis check of the products of combustion following the recommendations given in BS 7967-2 *Carbon monoxide in dwellings and the combustion performance of gas-fired appliances. Part 2 – Guide for using electronic portable combustion gas analysers in the measurement of carbon monoxide and the determination of combustion performance* and BS 7967-3 *Carbon monoxide in dwellings and the combustion performance of gas-fired appliances. Part 3 - Guide for responding to measurements obtained from electronic portable combustion gas analysers* for the particular appliance type.

If the combustion analysis readings exceed those specified by the appliance manufacturer or those outlined in BS 7967-3 and cannot be rectified, the appliance should be deemed as 'At Risk' in accordance with the current Gas Industry Unsafe Situations Procedure (GIUSP) and made safe. Further investigation will need to be undertaken.

Note 5*: Additional information on the requirements of the BS 7967 suite of standards can be found in CORGI Technical Bulletin 170.*

Note 6*: In certain circumstances, it may* ***not*** *be possible to undertake all of these checks fully. The checks should therefore be undertaken on a 'best endeavours' basis and a judgement will need to be made as to whether sufficient information is available to complete an adequate risk assessment. Where this is not the case, further investigation may be necessary e.g. exposure of part of the flue system to achieve visual inspection.*

If the results of the risk assessment are satisfactory, i.e. any risks identified are adequately controlled (see Table 1 below for examples), the installation should be deemed as 'Not to Current Standards' (NCS) in accordance with GIUSP. The responsible person for the property should be advised of this (preferably in writing), together with the measures necessary for the installation to comply with current industry standards.

Where there are any concerns with the installation following the above risk assessment, the installation should be deemed as either 'At Risk' (AR) or 'Immediately Dangerous' (ID) (see Table 1 below) as appropriate and the GIUSP implemented as necessary.

Table 1: Examples of possible defects and actions required

Possible defect	Immediately Dangerous	At Risk	Not to Current Standards
Incorrect grade of plastic flue pipe used **with no** signs of distress and it has been possible to visually inspect to entire flue system including every flue joint which was satisfactory			✓
Incorrect grade of plastic flue pipe used **with** signs of distress such as cracking or discolouration or it has not been possible to visually inspect the entire flue system		✓	
Break in the flue system	✓		
Incorrect jointing method used with no visible break or leakage		✓	
Signs of distress to the material of the enclosure/ceiling below the flue and the gas user will not allow further investigation	✓		
Appliance does not achieve satisfactory results following a flue gas analysis		✓	
Flue system longer than that specified by the appliance manufacturer but after the risk assessment the appliance is found to be operating safely			✓
Following risk assessment of the flue system and installation it is deemed that any risks identified are being adequately controlled			✓

New installations and the way forward

There is a need across several trades to recognise the importance of ensuring that where room-sealed fanned draught flue systems are to be routed within a ceiling void that access for visual examination will always be required. Appliance and flue manufacturers will no doubt be researching methods for 'in-situ' testing of flue systems that are robust enough to meet the minimum requirements of GSIUR, without the need for visual examination, but this is unlikely to happen in the foreseeable future.

It is therefore necessary to highlight to all of those involved in the building design, the actual construction of the building and the CORGI registered businesses installing the appliances and flue systems, of the importance of the on-going legal requirement to be able to visually examine the flue systems, both during commissioning and any subsequent servicing and maintenance of the connected appliance.

It may also be possible to persuade building designers to consider using alternative options such as locating appliances adjacent to an external wall or using a central riser (which incorporates suitable access points) with proprietary vertical flue systems, either individually or as part of modern shared-flue system, so that intermediate ceiling voids are not considered or used as a route for the flue system in the future.

With the current building trend for more flats and apartments, it is important that all of the related industries understand the minimum requirements and appreciate the need to ensure that means of visually inspecting the flue system along its route are provided at strategic locations.