

# Noise Emissions from Oil Fired Domestic Heating and Cooking Appliances with outputs from 4kW to 45kW

Complaints about noise emissions from properly installed and maintained oil fired heating and cooking appliances are very rare. This factsheet provides information on the average sound pressure levels that domestic heating and cooking appliances could emit, together with minimum distances to noise sensitive locations. It does not offer advice relating to sound pressure levels expected in areas within the sound envelope created by the heating and cooking appliance in use. Although the intention is to minimise disturbance to adjacent properties, the method advocated uses measures which can be made by the manufacturer together with locations to noise sensitive areas.

When noise emissions are experienced your Local Authority Environmental Health department would have to decide whether or not the noise complaint is deemed to be a statutory nuisance which may require enforcement action.

The heating or cooking appliance manufacturer has no control over the location of their appliances and the location could have a considerable effect on the noise emitted from the operation of the appliance. The sound pressure levels recommended for each type of appliance take into account current practice and the acceptability of the noise created against average background noises. If noise levels exceed the guideline figure additional measures may need to be taken to reduce noise levels in noise sensitive areas.

The guidance given in this factsheet does not guarantee that there will be no noise complaints as different sound pressure levels are recommended for different types of oil fired appliance and this can change depending on the property type in which it is installed and the effect of the flue discharge height.



Because the measurement of noise is on the border between the objective and subjective, it is difficult to find a unit of noise that can be both measured objectively and at the same time describe peoples' subjective reactions to the noise. The present tendency is to use units which not only give an indication of the level of the noise, but also how long it lasts. So the familiar dB(A) has become modified to include an element of time in it.

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dB(A)	This is probably the longest lasting of the noise units. It combines ease of measurement with a reasonable correlation with the average person's annoyance. Unfortunately, it only gives a measure of overall noise at the instant it is measured and does not give any indication of the different frequencies of sound contained within the measured noise.
$L_A$	This is almost dB(A), but written in a different way. In an effort to standardise, acoustics engineers represent noise levels by the letter L with a suffix to describe exactly which particular unit is being used. A level in dB(A) is now more properly written XdB $L_A$ (X being the level).
$L_{Aeq}$	This is a noise level measured in dB(A), but which has been averaged over a specified time, possibly 5 minutes, 1 hour or even 24 hours. The average period should be indicated with the unit (e.g. 72dB $L_{Aeq}$ 1 hr) The $L_{Aeq}$ or A- weighted equivalent noise level is being used more and more to describe noise levels which vary with time.
$L_{A90}$	This is the noise level which is exceeded for 90% of the time during the measurement period and is usually used as a measure of the background noise.
$L_{Amax}$	This is the maximum noise level reached during a period measured as an RMS level (the measurement used to obtain the instantaneous noise levels which are used to calculate the $L_{Aeq}$ and $L_{A90}$ ). The time response of the meter should be specified (e.g. F (fast) or S (slow)).

The noise heard by the receiver depends on the sound being emitted by the source, the distance the receiver is away from the source and other physical barriers to the noise, such as a wall. The further the receiver is away from the source creating the noise, the lower the level of sound. There are some situations where the noise could be increased by distance for example, by placing the flue close to the junction of two walls.

The subjective effect of noise is more difficult to define and is affected by non-acoustic factors as well as the known acoustic factors such as the noise level, the presence of tones and impulsive qualities. The discussion of the subjective effects of noise is beyond the scope of this guideline, but because of this subjective effect, among other things, this guidance refers specifically to domestic boilers in single family dwellings.

The guidance in this document is concerned only with noise levels outside the building to

which the appliance serves (e.g. affecting the adjacent buildings and outside areas). There are factors which cannot be specified and are difficult to quantify such as the sound insulation of buildings, the length of time the boiler will operate for and various operating conditions throughout the year. Furthermore, boilers will operate most in the colder months when people are indoors and equally in the warmer months when people want to make the use of their garden areas the boiler will be operating least.

The average noise level,  $L_{Aeq}$ , 1m, and maximum noise level  $L_{Amax}$  should be measured at a distance of 1m from the flue outlet using an integrating sound level meter which complies with Type 0, 1 or 2 and as defined in BS EN 61672 Parts 1 and 2.

The noise should be free from any distinct tones or other characteristics which would draw attention to it. If it contains tones or other characteristics, the measured noise level

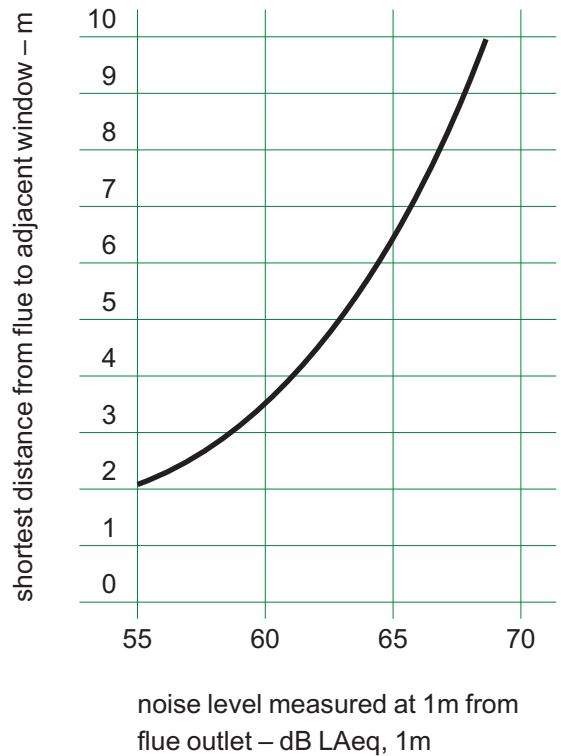
should have 5dB added to it and this higher figure used as its characteristic level.

The maximum noise level,  $L_{Amax}$  measured when the boiler starts should be no more than 5dB higher than the measured average noise level  $L_{Aeq}$ , 1m.

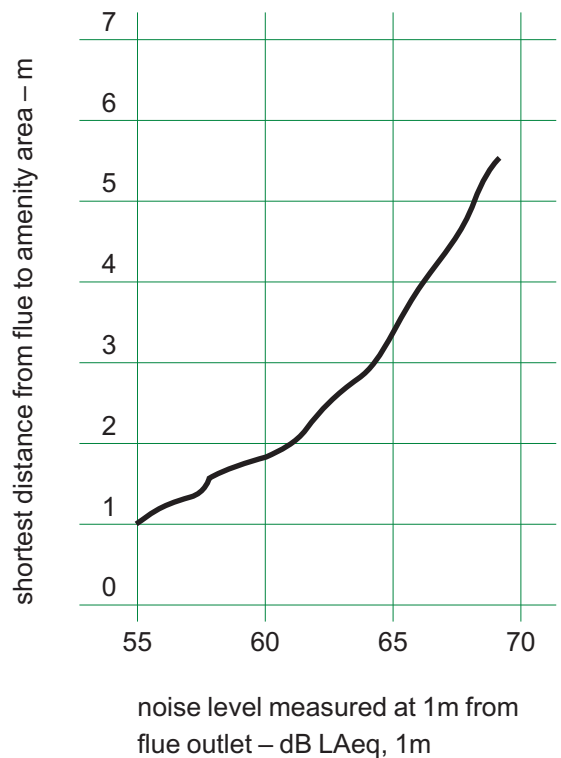
No window on adjacent premises should be closer than the distance indicated in chart 1 and no amenity areas should be closer than the distance indicated in chart 2, based on the average noise level measured at 1m and corrected, if necessary, for tonal or other characteristics.

The flue outlet should be positioned to avoid focusing effects of the sound such as between two walls which are angled to each other, unless the minimum distance to the windows or amenity areas, e.g, from 1m to 2m or 2m to 4m or unless a barrier is introduced to reduce the noise, provided that this does not increase the noise significantly in another direction.

**Chart 1**



**Chart 2**



## Standards

Other applicable standards that may be referred to are:

### **BS EN 15036 Part 1**

Heating boilers, Test regulations for airborne noise emissions from heat generators.

### **BS EN 15036 Part 2**

Heating boilers, Test regulations for airborne noise emissions from heat generators. Flue gas noise emissions at the outlet of the heat generators.

