

DEFRA Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (2005)

3.9 This guidance recognises that kitchen extract systems usually operate at sensitive times such as early in the morning and until late at night, where the amount of noise generated should be kept to minimum.

3.10 A range of noise mitigation methods are suggested; ranging from good design practice through to lagging and silencers. Typical noise transmission pathways in commercial kitchens are recognised within this document.

3.11 The following points should be taken into account when designing a ventilation system to minimise noise emissions:

The fan and its installation should be designed as a complete package for a specific task. Fans generally produce less noise if operated at the optimum efficiency relative to their characteristics;

Fans should be located within buildings at low level, that is, on side walls, rather than in the roofs of buildings, as ground effect and the local topography will far more readily reduce the noise transmission;

- *Correct selection of duct size and type; lined or lagged ducts, including bends, elbows or spigots, may be required if additional noise reduction is necessary.*

3.12 With regards to in-duct noise reduction:

Silencers may be required where additional attenuation is necessary. A range of silencers is available and it may be necessary to insert in-duct silencers both upstream and downstream to prevent radiation of fan noise through ductwork.

Dissipative duct attenuators should be fitted as close to the fan as possible (but not so close as to lead to a non-uniform air-flow velocity across the face of the silencer). Where this is not possible, the intervening ductwork should be acoustically lagged. It may also be necessary to enclose or lag the fan.

BS8233:1999 Sound Insulation and Noise Reduction for Buildings - Code of Practice

3.13 BS8233:1999 offers guidance on suitable internal noise levels for spaces when they are unoccupied.

3.14 To achieve a 'reasonable' design standard, noise levels should not exceed 40 dB LAeq,T within living rooms. Achieving a noise level of 30 dB LAeq,T would result in the 'good' design criteria being achieved.

3.15 The design criteria for bedrooms suggests that a noise level not exceeding 35 dB LAeq,T would achieve a 'reasonable' design standard. An internal noise level of 30 dB LAeq,T or less would achieve 'good' design criteria. For a reasonable standard in bedrooms at night, individual noise events (measured in F-time weighting) should not *normally* exceed 45dB LAmax.

World Health Organisation - Guidelines for Community Noise

3.16 With reference to the World Health Organisation guidelines for community noise, levels are recommended in line with those mentioned in BS8233:1999:

"The effects of noise in dwellings, typically, are sleep disturbance, annoyance and speech interference. For bedrooms the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 dB LAeq for continuous noise.... At night-time, outside sound levels about 1 metre from facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open. This value was obtained by assuming that the noise reduction from outside to inside with the window open is 15 dB. To enable casual conversation indoors during daytime, the sound level of interfering noise should not exceed 35 dB LAeq"

3.17 In addition to the above:

"The capacity of a noise to induce annoyance depends upon its physical characteristics, including the sound pressure level, spectral characteristics and variations of these properties with time. During daytime, few people are highly annoyed at LAeq levels below 55 dB(A), and few are moderately annoyed at LAeq levels below 50 dB(A). Sound levels during the evening and night should be 5-10 dB lower than during the day."

Our system will operate no later than 22.30 hours and meets both criteria set out above, and in terms of noise will not exceed 32dB - a conservative figure well below recommendations as above.