

Air Quality Management

A number of scientific studies have shown that overall high levels of indoor air quality are both a desirable public health goal and are achievable at affordable costs to both small and large business owners. The role of adequate indoor air quality should be an even greater public health priority at a time when building regulations are seeking to ever more seal indoor spaces to tackle the issues raised by anthropological global warming (This is not strictly true, the Building Regulations are seeking to gain better control of the ventilation of buildings whilst reducing energy wasting uncontrolled infiltration). Additionally these studies have shown that the effective control of Environmental Tobacco Smoke (ETS) can be achieved for either localised or building wide indoor locations. For the purposes of public health protection, in general and in principle, adequate air exchange/filtration in smoking locales (which makes smoking insignificant) should be preferable to existing stagnant air conditions or poor air exchange where smoking is forbidden.

Dingle et al ¹¹ demonstrated that 19 out of 20 hospitality venues had deficiencies in the running and maintenance of their systems. Banning single and minor sources of pollution does nothing to address these problems when all of the constituents of tobacco smoke are present in the air from other sources. If ventilation systems are not turned on operated correctly or maintained it does little to further the goals of public health and given that many ventilation systems were installed primarily to remove smoke it stands to reason that this situation will only get worse now that smoking has been banned.

A study by Oak Ridge Laboratories ¹² found; that even simple, inexpensive, heat recovery, filtration can result in a 70% reduction in all respirable particulates resulting in smoking areas with a significant improvement in other air quality indicators aside from tobacco related compounds. In tests tobacco smoke levels and air quality were statistically indistinguishable from those in similar regulated non-smoking facilities.

Hyvarinen et al monitored the performance of a ventilation system specifically designed to protect bar staff from ETS. This Finnish study demonstrated significant improvement in all air quality for bar staff. ¹³

It has been regularly claimed that fine airborne particulate matter (PM 2.5) is associated with disease and much was made by the anti smoking lobby of the suggestion that ventilation could not remove such fine particles. This is completely fallacious; Geens et al ¹⁰ has shown that even with simple and inexpensive supply/extract fans it is achievable, in a hospitality environment, to maintain respirable suspended particles

(PM 2.5) at levels 8 times lower than Health and Safety Executive published Workplace Exposure Limits.¹⁴

Geens concluded that “The results of the tests reported in this paper provide further evidence that with ventilation systems readily available in the market, significant improvements in indoor air quality are achievable and that there are reasonable expectations of further improvements if bar and nightclub specific solutions are to be scientifically and critically evaluated.”¹⁰

A 2005 study analysed the ventilation efficiency in a ventilation system designed at the relatively low rate of 8 litres/person/second. Existing ventilation in a room of 225m³ was upgraded at a cost of £3 200 and PM 2.5, carbon monoxide, carbon dioxide and temperature were monitored during peak periods at weekends and compared against HSE workplace exposure limits. The conclusions stated that; “This study clearly demonstrates the ability of the ventilation system and filtration units in this building to limit and control the concentrations of the parameters under consideration. Appropriately designed ventilation systems, both with and without the support of filtration units, significantly improve the air quality in buildings where smoking is taking place, meeting all available Health and Safety Executive Occupational Exposure Limits.”¹⁵

Several studies have highlighted the simple technology available to operate smoking lounges/offices at negative pressure and thus eliminate the migration of ETS from smoking to no smoking areas.^{16 17 18}

Many facilities currently use effective negative pressure technology for separating indoor air spaces. Hospitals for example operate inexpensive systems that combine filtration with correctly positioned supply/exhaust extractors for Airborne Infection Isolation Rooms to effectively contain airborne diseases such as smallpox, plague and hemorrhagic fever. A 2005 Florida study showed that 1,627 HEPA filtered negative air rooms were operating in that state. The costs reported by the hospitals for converting rooms to negative pressure started from just \$500. These rooms are specifically designed for use during an infectious disease outbreak or a bioterrorist act. Containing the infection and protecting other hospital patients and hospital workers from exposure to the contagion is of critical importance. High-Efficiency Particulate Air Filters, that are designed to capture at least 99.97% of all particles greater than or equal to 0.3µm in diameter, are used to capture particulate matter in the extraction.¹⁹

Inexpensive air curtains can also be effectively used to separate smoking and no smoking rooms/areas

“The main uses of air curtains are threefold. First, they increase the energy efficient operation of a building by preventing or reducing the unwanted exchange of hot and cold air at an entrance. Secondly, they improve comfort conditions in the entrance area by preventing or warming any incoming cold draughts, thus creating a pleasant and welcoming environment that is comfortable for staff and visitors alike. Finally, air curtain technology can be used to separate atmospheric zones within a building. For example, between non smoking and smoking zones; to keep out air that has been

polluted by traffic fumes, smells, dust, pollen etc; to repel insects and also between areas of high and low humidity.”²⁰

Figure 1.

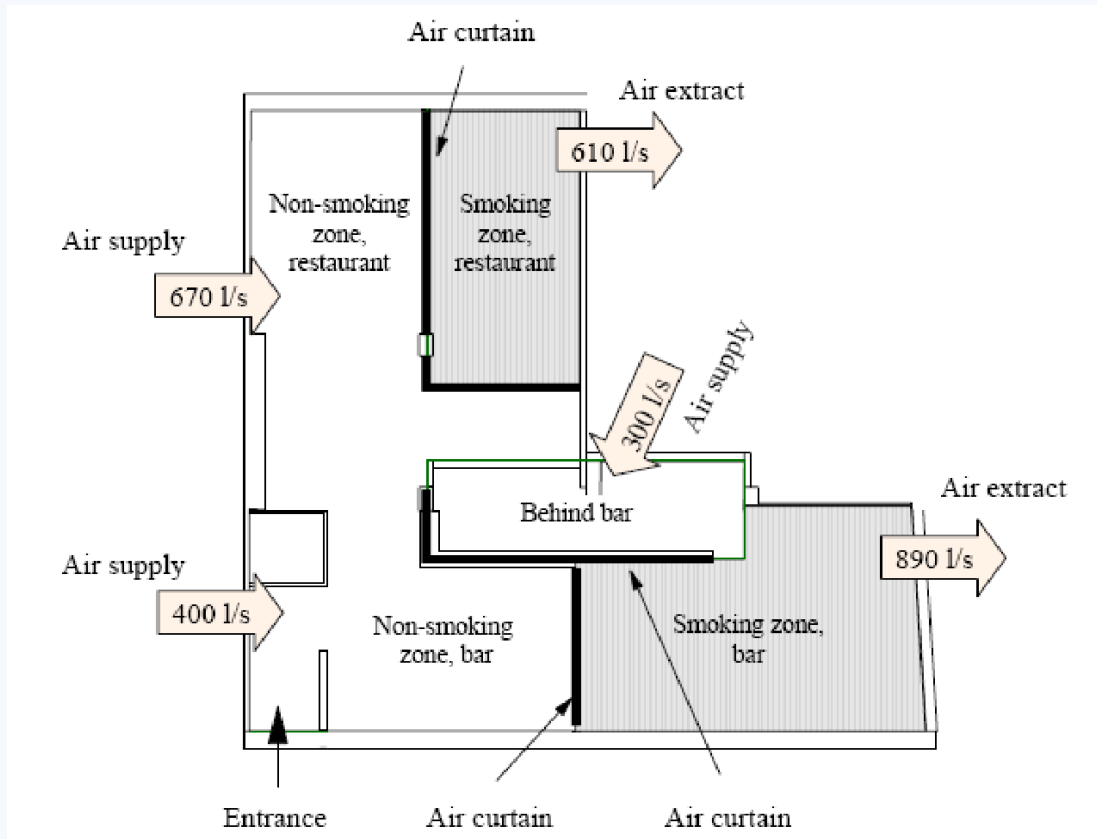


Figure 2

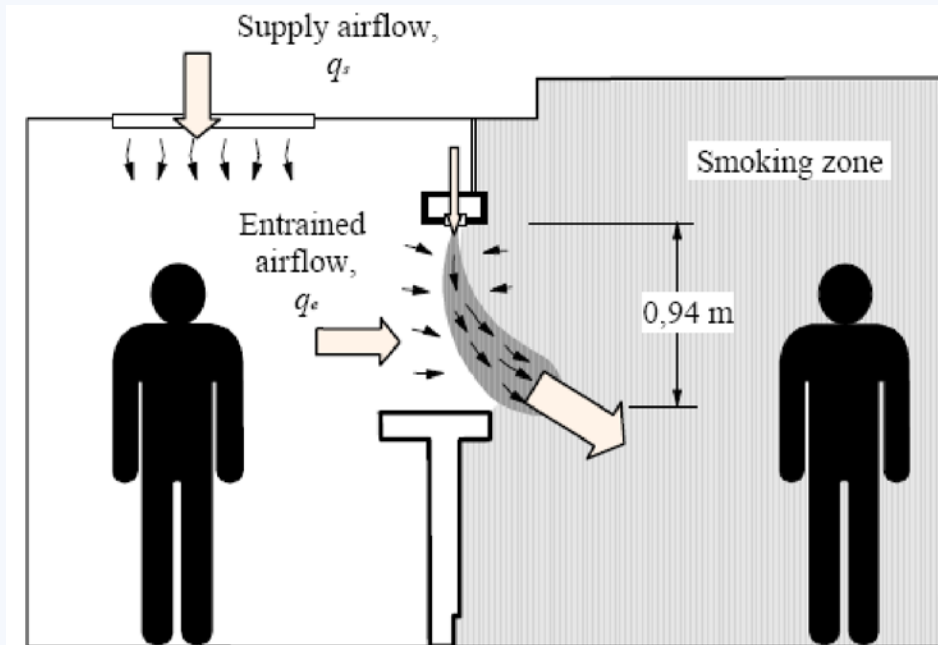


Figure 2 shows a cross section of the zone behind a bar. “To ensure that the air curtain flows outside the bar, the supply air flow inside the bar must not be less than the airflow entrained at the inner side of the air curtain. In this way, we ensure that smoke-contaminated air is not flowing into the area behind the bar.”²¹

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