



## The Case for Down Draught

For safe application within the spirit of the COSHH Regulations, Down Draught technology is the ideal way forward where dust and fume extraction is a key concern. This, in simple terms, is because alternative technologies predominantly pull gasses and debris upwards – dragging them past the operator's face and, in doing so, further contaminating the breathing zone, or are difficult to use whilst maintaining productivity.



It is a sad indictment, but the extraction marketplace has traditionally been dominated by conventional design approaches and procedures, which, in some cases work but often fail to provide true financial or in-process efficiency. A large proportion of systems are inevitably engineered to suit specific problems faced by individual processes, but too often these “one off” systems simply do not function correctly either as a result of inappropriate engineering criteria being applied or perhaps as where the client is unable or unwilling to alter established production methods to suit an extract system

Yet, even when long established criteria for hood or arm velocities are deployed in the designs of these systems, it is often not known whether they will or will not work on the specific task until they are commissioned. By this time, of course, the client or has committed to a hefty investment - and one that can cost more than just money where environmental safety/health and downtime are concerned. In our experience, there are a number of problems to be considered and among these is ‘usability’. Even in systems that would appear to function properly in so-much-as they remove debris and gasses, it is often the case that they are unusable in terms of maintaining productivity levels as they require near-constant adjustment and/or attention. Indeed, this is very often the case

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with 'flexible arm' solutions, which tend to grow into 'catch all, solve nothing' installations in many cases. In contrast, Down Draught ventilation solutions are capable of eliminating these hassle factors in almost all cases by meeting end-user requirements in head-on fashion. Essentially, very few dusts or fumes have any significant natural buoyancy. Other than the inherent velocity given to them for instance when grinding from a wheel or the heat imparted from a welding process, virtually every pollutant is heavier than air. As a result, they will sink to the ground as soon as any induced buoyancy velocity is removed.

It makes no sense, then, to hope that the pollutant can be picked up a practical distance away from its source to allow continued working, say 400mm from a slot or 600 – 800mm from a hood, when in the vast majority of cases gravity will have gained control long before. \*

Even welding fume loses its buoyancy extremely quickly when mixed with ambient air - and at surprisingly low velocities.

So, it is much better to "go with the flow" and entrain pollutants as nature intended: downwards! In predictability terms, many extraction projects are delivered by experienced engineers using textbook recommended methods that simply fail to properly function on the specific issue or, worse still, have been designed for a quite different application. Typically such projects include the installation of an arm or other dust extraction initiative where the face velocity is, for instance, too low to capture the dust and "in-duct"/arm velocity has insufficient strength to carry debris; or perhaps hoping for effective capture of fume 400 – 500mm away from source in a slot system.

Properly developed Down Draught systems are predictable. They can be demonstrated on site, or in the showroom on the actual process and velocities and therefore volumes can be adjusted easily and quickly to match the customer's particular task. While, in extraction systems, it is often considered that there is no such thing as too much air, it is equally often the case that too much air can be deleterious to the process and indeed shorten the filter life and push up operating costs; so the ability to match air need to actual delivery is significant. Importantly, a Down Draught table can in the vast majority of cases be substituted readily for the existing work bench – whether or not operative seating is required (with our AirBench solution, WorkPoint Environments has both variants readily available).

As soon as an AirBench Down Draught table is switched on it works! Operatives have no need to interfere with it, as it will require no adjustment. Indeed, it will not even be easily offended by acts of minor sabotage; for instance where partially blanking a unit off almost always results in improved performance in the area of work, by increasing the Down Draught velocity. Even in welding applications, such action fails to damage the gas shield as the velocities used for effective capture of welding fume are relatively low and many, many installations have proved that whilst this is a natural concern for welders it is not in fact well founded. On the other hand, high vacuum "on torch" or close proximity arms can be much more of a problem.



It is our opinion, then, that Down Draught technology is - in excess of 90% of the projects we investigate technically - the superior solution. It is also economic – and often far more viable than one-off solutions even using much-respected manuals such as Industrial Ventilation from AGCIH. This, of course, details many established solutions and specific approaches for particular problems but even these can still place the Client and his capital investment at risk.

But this is not the case with series produced such as AirBench which overcome the objections of one off designs whilst supplementing, not defying, the laws of gravity – without putting Client, process or investment at risk.

### **References**

\* HSE (EH55) considers that an arm extract or hood will only function if it is within its own diameter of the source of fume, and that a slot system will only work up to 75mm away.

