Welcome to BPS’s technical brochure on Acoustic reduction.

Recently there has been a great deal of misunderstanding and confusion in the industry with regard to the performance of slot ventilators and so called ‘acoustic slot ventilators’. Numerous customers have called us regarding the latter, confused about what type they should go for and very concerned about the increased cost of an ‘acoustic ventilator’ as opposed to the standard ventilator.

Customers have been inundating BPS with questions and looking for answers, particularly concerning the implications of choosing a basic vent as opposed to an ‘acoustic’ vent. This brochure has been created as an attempt to clarify the situation and set the record straight. Set out in a straightforward, nonsensical fashion, the following pages will hopefully shed some light on a bewildering subject.

As many readers will be aware, there is an enormous amount of information about at the moment with regard to acoustic performance and the majority of which seems to be contradictory or confusing at best, or you need to be a rocket scientist to wade through it all. Unfortunately (for the majority of us), there is never a rocket scientist around when you need one and particularly when it comes to deciding what type of ventilator to buy or specify. BPS will now try and guide you through this process, simplifying the language so that most of us can grasp it.

The fact is that numerous tests have been done and the consensus is that so called ‘acoustic trickle vents’ are no better than ‘standard’ trickle vents in terms of acoustic performance. The apparently high figures quoted for ‘acoustic’ vents are entirely due to the method of test and not (as you might expect) to any sound lessening effect.

What is Noise / Sound / Acoustics?

Silly question? Well not really, the answer is not as obvious as you might think. Noise, quite simply, is unwanted sound and thus our response to it is partly subjective. One person’s noise may well be another’s music. Sound is produced when something vibrates. It is these vibrations that produce variations in air pressure and adjacent air molecules transmit this motion. It is the measurement of this sound or noise that is termed acoustics.

In brief, sound is measured as pressure and as most people know, is expressed in decibels (dB). A measurement of 0dB is defined as the pressure level at the threshold of hearing and at the other end of the spectrum; 120dB marks the onset of actual pain.

What many people fail to realise, is that when measuring sounds, corrections must be built in to mimic the response of a human ear. Naturally, this is a vital distinction to make when measuring sound performance. Sound readings so modified are measured in dBA – it is essential when making comparisons that the unit’s dB and dBA should not be confused, or used together in calculations.

As a general guide, the average office is between 50-60dBA and your typical traffic noise comes in at 70-80dBA.

Now, armed with a bit of technical detail, we are ready to explode some of the myths surrounding acoustic ventilation.

The Myth

Contractors and building owners spend literally thousands of pounds every year on acoustic slot ventilation, in the belief that it reduces the amount of noise passing through the vent compared to a basic slot ventilator. Reality – or just a myth?

The Reality

Recent lab tests have demonstrated that there is no significant difference between the two products, yet ‘acoustic’ slot vents are being specified at additional expense, in the vain attempt to cut out noise from nearby motorways and airports, despite affording no greater noise insulation than a simple slot vent.

The Test Results

At the request of ventilation manufacturer Titon, the Sound Research Laboratories (SRL) put two 4000mm² vents to the test – a standard Titon slot vent and a so-called ‘acoustic’ slot vent.

As expected, the standard vent was not very successful in keeping out noise. What was surprising was the result of testing the ‘acoustic’ slot vent, for which a 35dB reduction was claimed. When the vent was removed, leaving just the opening, there was no difference in the amount of noise coming through!

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The Confusion

The confusion surrounding the performance of ‘acoustic’ slot vents comes from the way in which their initial tests were conducted. British and international test methods calculate the reduction in noise by fitting the vent in a wall – not in a window, as you would expect!

There are technical reasons for doing this, but the relative area of the slot to the wall is instrumental in determining the overall insulation rating. The fact is, that any 4000mm² opening by itself gives at least a 34dB reduction – only one decibel less than an ‘acoustic’ slot vent.

While this is a better performance, it must be borne in mind that noise must be increased by two to three decibels for the

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When tested by an independent UKAS accredited body, a standard slot ventilator when tested with and without a standard canopy displayed the same level of acoustic performance as a ‘Acoustic’ canopy and ventilator. Throughout the frequency range, neither product showed any measurable advantages over the other. These variations are neither significant nor detectable by the human ear.

Confused?

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standard human ear to tell the difference. In other words, an improvement of only 1dB is simply worthless.

As if that were not enough, only one 4000mm² vent had been tested to obtain the 35dB rating quoted. In practice of course, two units must be fitted to give the 8000mm² area required by the current building regulations, which will obviously lessen the overall sound reduction still further.

Change the laws of Physics?
In summary then, there is no such thing as an ‘acoustic’ slot vent – because you would need to change the laws of physics to make one. And as any self-respecting rocket scientist will tell you, that is not an event anticipated in the near future!

But what about the window?
At the end of the day, we are still discussing the acoustic performance of a window in practice and misconceptions abound in this area also. For example, you would expect that a window and slot vent with the same decibel rating would produce that level of sound reduction when used together, wouldn’t you?

Well, you would be wrong! You might well conclude that a 35dB acoustic slot vent fitted in a 35dB window would give a combined 35dB sound reduction. In practice, it does not, since when taken together, the slot vent impairs the performance of the window on its own. In simple terms, any slot vent, acoustic or otherwise lessens the sound reduction properties of a window. It really is as simple as that.

Single glass of 4mm will provide (on its own) sound insulation of approximately 30dBA, but the overall performance of a window frame incorporating this glass will be dependant upon the number of opening vents and the quality of seals provided between these vents and frames. For example, gaps and cracks representing just 1% of a window area can reduce the sound reduction by as much as 10dBA!

Even the inclusion of a sealed unit with equal weights of glass produces negligible improvement. However, if an unequal weight of glass is specified, for example 4mm and 6mm, an improvement of 3dBa can be obtained. This is due to the different weights not working in harmony, and disrupting the vibration or resonance.

What do I do?
The maths of adding a vent or vents to a window is not straightforward at the best of times and can prove a difficult issue to resolve. Not so difficult is the issue of what to use in place of an ‘acoustic’ slot vent.

In the overwhelming majority of cases, you will be just as well using a standard trickle vent, particularly when given a difference of just 1dB! True, you will get increased ‘performance’ but with a much larger price tag. Is it really worth it for such a minimal improvement? You decide, or ask a rocket scientist.

Checking the figures
When people send you vast quantities of bewildering test results, charts and statistics, its well worth bearing a few points in mind:

- Are the sound lessening figures quoted in the open or closed position?
- Closed values are not very useful, since the purpose of a vent is to be open!

How have the figures been quoted? There are various ways of ‘weighting’ the test data!

You must always compare like with like, i.e. dBA, Rw or Av SRI
Watch out for those comparing dBA with dB, they are not the same!

How big is the vent? To have any effect, an ‘acoustic’ ventilator will be physically large with a substantial mass of acoustic foam.

Another factor is the air opening you are looking to achieve. If more than one vent is required to give 8000mm², the sound reduction is further reduced and figures have to be re-calculated.

Many common ‘acoustic’ vents only give 1600mm². Therefore, three vents would be needed to give 4000mm²! This would further inhibit the sound reduction, not to mention cost and practicality problems and would offer a far worse acoustic performance than a basic 4000mm² vent!

How have the figures been ‘normalised’? Windows are normalised to their own area and vents to 10m². The two types of figure are not directly compatible!

At BPS we are constantly reviewing all our products, to ensure they are the best available to the market. If there were any benefit to be gained from using so called ‘acoustic’ vents, then we would already be using them!

We are continually monitoring any and all new developments in the industry, to ensure that we remain at the forefront of any new innovations – indeed, in the case of our new multi chamber profile; we are often the inventor of them. Or new profile is inherently good in terms of sound insulation: extruded by Kömmerling, all our profiles come up to the DIN standard for sound insulation, Class 5 (high acoustic insulation) DIN 4109.

Titon, our suppliers of slot ventilation also guarantee that the acoustic performance of any window fitted with their ventilator will be equal that of the same window fitted with a comparable ‘acoustic’ alternative.

Alternatively, you can turn the issue on its head and say that since the difference in performance is negligible, BPS have already been fitting ‘acoustic’ slot vents for years!

As such, you can be confident that when choosing BPS products, you are not loosing out in terms of acoustic performance and your rocket scientist can get on with his day job and you can get on with yours, safe in the knowledge that your customers are not loosing out when it comes to acoustic performance.

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