

Advances in Spraybooth Technology

It's never easy to turn in a decent profit repairing cars, but in recent times the challenges are even greater.



While modern cars are increasingly complex and expensive to repair, their value is no higher. This means there is a higher incidence of insurance write offs, and insurance companies continue to put the squeeze on margins for repairs that do take place. Worse still, energy costs continue to rise, and it is this vital area that is overlooked bodyshop owners and managers at their peril.

Let's put this into context and consider the scenario of a bodyshop running two spraybooths, repairing 30 to 40 cars a week, with a total site energy bill of around £20,000 per year, and retuning a gross profit of 5% per year. A rise in energy prices of 15% would require an additional £60,000 worth of extra work each year JUST to cover the extra costs. Bodyshops simply cannot afford to bury their heads in the sand about this issue.

By far the biggest culprit in the traditional bodyshop is the spraybooth, accounting for as much as 80% of energy used. It is a sad truth that conventional spraybooths are, by their nature, very wasteful with regard to energy, as they work on a continuous cycle of drawing in large quantities of cold air from outside, heating it up, and then dumping all this heat to atmosphere, all to dilute and disperse relatively small quantities of solvent. This is exacerbated by modern, high airflow booth design, required for effective processing with waterborne paints, yet at the same time, the typical quantities of paint sprayed per job these days are smaller than they used to be due to the high paint transfer efficiencies achieved by modern spray guns.

And so it is fitting that much of the recent developments in spraybooth technology have sought to address this issue.

This article covers some of the huge advances made by leading spraybooth manufacturers in reducing energy consumption, improving operating efficiency and increasing productivity.

Variable speed controls / Economy stand by mode

Older, conventional spraybooths typically feature just two modes of operation, i.e. spray and bake. This means that when the booth is not in use, e.g. for loading, unloading, masking, it is typically running in full spray mode, which means that huge volumes of energy are being wasted unnecessarily.

The most up to date spraybooths now come with variable speed drives fitted as standard, which can be programmed to automatically match fan speed to operator requirements. For example, high speed running is selected automatically when an airflow detector in the compressed air line detects that the operator has begun spraying. On completion of spraying the booth will remain at high speed for a timed period before reverting to economy standby mode, whereby fan speed reduces to tick over, reducing energy consumption by over 80%.

Direct gas firing

The use of direct gas firing consists of introducing heat into an air intake system by a controlled combustion of gas directly into the air stream. This results in all of the available generated heat being utilized, giving virtually 100% heating efficiency. By comparison, an indirect system, where the combustion occurs within a chamber and the products of production along with a substantial amount of heat is vented to atmosphere, rarely achieve better than 75% efficiency.

If you're not sure whether your booth is direct fired or not, a simple way to check is to count your ducts, as an indirect-fired spraybooth has an additional flue in addition to the main inlet and

extract ducting. This type of booth could be replaced with a direct fired system and immediately reduce your fuel costs by 25%!

As well as the running costs, direct gas firing offers other advantages, including faster heat up times, more rapid response to temperature demands, closer temperature control and lower maintenance. Where some locations in the UK are not connected to mains gas, these booths are typically run on oil, which of course has to be indirect-fired. In such circumstances, LPG may be considered as a viable alternative, which means that the efficiencies gained through direct firing can be taken advantage of.

Air agitation



A well-designed air agitation system reduces energy consumption by reducing the time taken to dry water based paints and solvent based clear/topcoats by as much as two-thirds (bake times as low as 15 minutes are achievable).

Typically, a series of high-level, wall-mounted nozzles direct pre-heated filtered air into the laminar airflow above the vehicle.

This creates high velocity airflows over the vehicle, which accelerates the evacuation of the water from the paint system, substantially improving drying times and reducing temperature differential between top panels and sills.

Conventionally such turbulent air movement in a spraybooth would be avoided because of the risk of increased paint contamination, so careful thought should be given to the airflow characteristics within the booth and to the choice of system installed, because time saved on drying can be lost on expensive de-nibbing, polishing and rework.

Efficient lighting systems

One shouldn't underestimate the amount of power a poorly designed lighting system may use. Look at the number of tubes required, because every extra tube needed to maintain decent levels increases the base electrical load of the spraybooth. Use of modern electronic ballast will eliminate flicker, double tube lifespan, and produce more light while using 25-30% less energy than systems with traditional ballast.

Right first time productivity

The best spraybooths now come fitted with full roof filtration.

The key advantage of this is that clean filtered air is presented uniformly throughout the spraybooth cabin, ensuring there are no airflow dead spots and that you achieve as close to perfect laminar airflow conditions as possible.



This means that once the booth has been running for a few seconds you can be sure you are working in a clean, dust-free environment, which is proven to result in cleaner jobs. This has a knock on effect of reducing time and money spent on de-nibbing, polishing, rework and paint contamination issues.

Direct drive fan motors

Many older style spraybooths feature fan motors that sit outside the air handling plant, with belts to drive the fans. By contrast, new direct-drive fans are not only maintenance free, but are more efficient, meaning higher airflows can be achieved with smaller fan motors.

Choice of fans

Aerofoil fans are a popular choice for many spraybooth manufacturers, as they offer high performance at a relatively low cost. Another popular choice is the centrifugal fan, which while generally considered quieter in operation, are typically less efficient, requiring larger motors to achieve comparable airflows. A more recent alternative is the mixed-flow fan, known to be exceptionally quiet, with consistent performance and capable of generating airflows comparable to aerofoil fans.

Insulated spraybooth cabins

At the cheaper end of the market, single skinned spraybooth cabins are common. A key issue here is heat loss during bake cycle, which can be overcome with the choice of a double skinned and insulated spraybooth cabin, which are typically more robust and thermally efficient.

Alarmingly, many spraybooth manufacturers often overlook the spraybooth roof, which is where most heat is dissipated (think loft insulation in a house!). The better manufacturers will install a solid, double-skinned and insulated roof, further enhancing the efficiency, noise control and performance of the spraybooth.

Efficient workflow

The best spraybooth manufacturers offer a complete bodyshop design service, which enables you to take advantage of their experience and expertise in making best and most productive use out of the available space you have in your workshop.

Energy efficiency loans

While all of the above may sound very nice, but of course it comes at a cost. Some more progressive spraybooth manufacturers now include much of the equipment mentioned as part of their standard specification, which helps keep the cost manageable, and the best news is that there are now grants available to assist with the funding of energy efficient equipment.

Energy-Efficiency Loans from the Carbon Trust are a cost effective way to replace or upgrade your existing equipment with a more energy efficient version. Small or medium-sized enterprises (SMEs) in England and Scotland, or all businesses in Wales* that have been trading for at least 12 months, could borrow from £5,000 to £100,000. Businesses based in Northern Ireland that have been trading for at least 12 months may be eligible to apply for an unsecured interest free loan of up to £400,000 (* subject to eligibility. Regional variations apply.)

It is unsecured, interest free and repayable over a period of up to 4 years. There are no arrangement fees and applying is straightforward. Most spraybooth suppliers are now able to assist by providing documentation of the energy savings that can be achieved and will work with their customers to ensure that the correct calculations and information is supplied to the Carbon Trust.

What to do next?

Firstly, look at your energy bills to get an idea of the true costs, and take a pragmatic approach to how this can be managed and reduced. Don't be fooled by unrealistic claims you might hear from other manufacturers, and set sensible limits on your proposed spend, or you may not see the savings that you expect.

Secondly, give STL a call!

Summary

There has never been a better time to invest in a new spraybooth, with so much advancement made in recent years. The bodyshop we mentioned earlier, if it chooses its equipment supplier wisely, could reduce its energy costs by over £10,000. This would equate to an increase in revenue of over £200,000!!

There's only one way to make a profit, and that's to ensure your revenues exceed your costs. There's two ways to increase profits, and that's by increasing revenue, and decreasing costs. The good news is that with the right choice of spraybooth you could do both!

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