

Speed control of spray booth fans saves energy

and boosts production.

Linpac Automotive of Scunthorpe identified a health and safety risk associated with adjusting the outlet dampers on their spray booth fans and decided to fit variable speed control. The results are the complete elimination of a time consuming and risky damper adjustment procedure, significant improvements in production and product quality and energy savings of over £1000 per month.

Linpac's three spray booths, used to spray large components for the automotive industry, such as car bumpers, are each fitted with a 30kW air inlet fan and 4 x 11kW outlet fans. The quality of the component's paint finish is critical and this means that there is extensive filtering of the input air to remove contaminant particles and water scrubbing of the outlet air to remove paint overspray particulates before the air is exhausted to the environment. In order that clean conditions are maintained within the booths, their internal pressure must be maintained slightly negative with respect to ambient pressure conditions. Contamination of the filters, compounded by constantly changing ambient temperatures and pressures, affected air volume and pressure differential.

These ever changing conditions meant that the existing method of control, air dampers in the outlets, had to be adjusted on a very regular basis, virtually daily. This entailed two men working up ladders at the top four corners of each booth, manually setting the dampers to achieve the



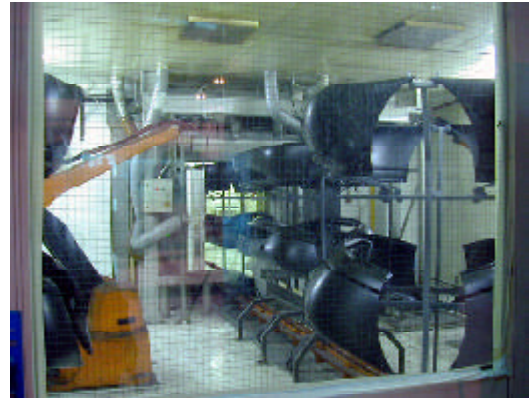
preferred flow and pressure conditions, a time consuming and hazardous procedure. Water carry-over from the scrubbers also contributed to corrosion and a maintenance problem.

Working with local Danfoss distributor Seltec Automation, Linpac engineer, Mark Wilson identified that fitting Danfoss VLT 6000 series ac inverters to both the existing inlet and outlet fan motors and running with the dampers wide open would be a simple task.

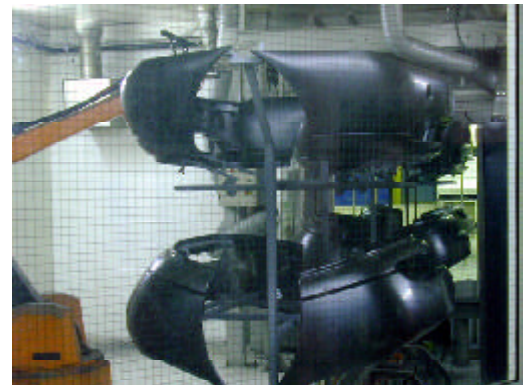


According to Mark Wilson; "For a total project expenditure of around £30k, balanced by energy savings amounting to over £1000 per month, we have more than achieved our objectives. There have been significant production benefits in terms of time and product quality, a safety hazard has been eliminated and at the same time we have partly offset the increased energy costs arising from the Climate Change Levy"

A VLT 6000 30kW drive was fitted to each main inlet motor. Simple manual speed control of the drive effects accurate control of the volume of air flowing through the booth, the speed being increased slightly to maintain airflow as the filter clogs up. Even with clean filters it was found that there was a significant energy saving as initial speed setting now is around 80% of full speed. The 11Kw outlet fan motors were also retrofitted with variable speed control and with the inlet drive set to control volume, the outlet fan speeds are then trimmed to provide the required negative booth pressure.



Linpac work a two shift system and a major energy benefit derives from the fact that overnight, the fans can now be set to a 30% standby setting. This low speed setting means that product can be left uncontaminated when spraying is not taking place and little airflow is needed, but maintaining the clean, negative pressure conditions within the booths.



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