

## EMERGING TECHNOLOGIES SHOWCASE WEBINAR: DEMAND-CONTROLLED VENTILATION FOR COMMERCIAL KITCHEN VENTILATION



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Question and Answer session

**Q: Can side panels be easily retrofitted to existing hoods? I envision the kitchen would need to be rebalanced. However does code allow reduced exhaust flow-rates on most hoods after adding side panels?**

A: (Don) Yes and No. We've used side panels extensively in our field work to make a hood work better. We've had very little resistance from local authorities. Many of the leading hood manufacturers have actually had their hoods UL listed with and without side panels. So, in that case we are not in a grey area. But regardless, I have yet to go into a kitchen and make a hood work better by installing side panels and having any kick back from the authority having jurisdiction. That said, the challenge you have is that's to make the hood work better; if you went in and made the hood work better, now you can slow the exhaust ventilation rate down. Again, you're usually well within...you are not violating any code at that point so it's never been a problem. What is a problem though; nobody goes in and puts side panels on a hood and then goes up and changes sheaves (i.e., pulleys) on an exhaust fan to reduce the exhaust flow – too much effort. But the side panels integrate well with the DCV system where turn down is more easily accomplished.

**Q: Do you know why McDonald's stopped installing VSDs on their clam-shell grills?**

A: (Don) It was ROI probably. They spent a lot of time taking costs out of their stores to get the franchise package more attractive. The other challenge was it wasn't perfect because when they were using 2-speed exhaust fans they were sort of rudimentary, they went from full speed to half speed which gave you maybe, approximately half your airflow and maybe you wanted 60%. So I think it wasn't...the deployment wasn't perfect. To my knowledge McDonald's Canada may still be using these systems. So it was just economics, not so much ROI but to get costs out of their store; to make them simpler. Best answer I have.

Q: How long were the 11 California DCV case studies monitored? Also, have they been re-visited for optimal operation and persistence of savings?

A: (Don) We generally monitored them for a month that was somewhere in the 4-6 week range, or 4 to 8 week range. We have not gone back to many of those places. Some of them we have gone back and we know they are working. I'm gonna be real honest: one of the challenges is X percent of these DCV systems that have been installed in the last decade are not operating. They decommission very nicely; it's really easy to override them and another critical factor if the operation's side of either the restaurant or the university operating engineering team, if it's not embraced, if it's not desired and it's just shoved down somebody's throat through a LEED project, they are not necessarily going to stay functioning. The other Y percent, some number they're working perfectly because the operations side of the restaurant has embraced it and they see the value. One of the real key attributes, and I forgot to mention this, is that when that fan speed drops to 20% the fan power drops to 60% and the noise level drops to 60% so it's very comfortable, you get rid of a lot of noise during the light duty times of the kitchen.

Q: How much time, effort and cost does "tuning up" the single-speed system represent?

A: (Don) Nobody is doing this. This is only being done to fix hoods that aren't working. We're doing it in concert with our DCV case studies but this is not an activity that is really being done on a wide scale basis. It's being done by the kitchen ventilation industry to fix hoods that aren't functioning but there has been very little incentive to tune the hood up because the energy savings don't just automatically fall in. You have to then do an air balance, and re-balance, know what your air flow is; you have to change the air flow. You have to rebalance the system. It's not as simple as just putting a side panel on unless you are just putting the side panel on to get capture and containment. At that point the air flows don't change and you walk away and the customer is happy, so this is part of the palette that I think the DCV industry should be using is going in with a complete tune-your-hood-up and we'll get most out of it. One of the things that DCV system can do is take the "head room" out of the equation. It may be possible to make a system operate at full speed at 20% less air. I can take that out with my control system and then start to modulate. But, really we haven't pushed that envelope very far.

Q: How often do the smoke/steam/temperature sensors need to be checked and cleaned?

A: (Don) That's pretty much a function of the type of operation in a hospital kitchen or in a hotel kitchen where you are not doing heavily with appliances like char broilers. They might go once a month, but if you get something like a Chili's or an Appleby's, they probably need to be cleaned on a weekly basis. But again, if they plug up, then the system overrides and goes to full speed. I don't have a lot experience on that area. I just know that it's not that big of deal, usually. On the other hand, sometimes it doesn't get done and the system just stays in override.

*Comment by Bruce Lukens:* I would like to point out that Gaylord's base system uses room temperature and the delta between the room temp and hood temp to determine fan speed.