

Auburn University

Lab tests showed that allowing dirt build-up on fan shutters can cut airflow by one-fourth

Dirt build-up can be fast – a quarter pound or more per shutter per day

Dirty shutters cause air leaks, inefficient ventilation, and higher fuel bills in winter

In tunnel ventilation dirty shutters can mean lower air velocity and less cooling for birds

Payoff – Check shutters daily & clean often to keep good airflow and top bird performance

## Poultry Ventilation Pointers

# Value of Clean Shutters Proven in Laboratory Test

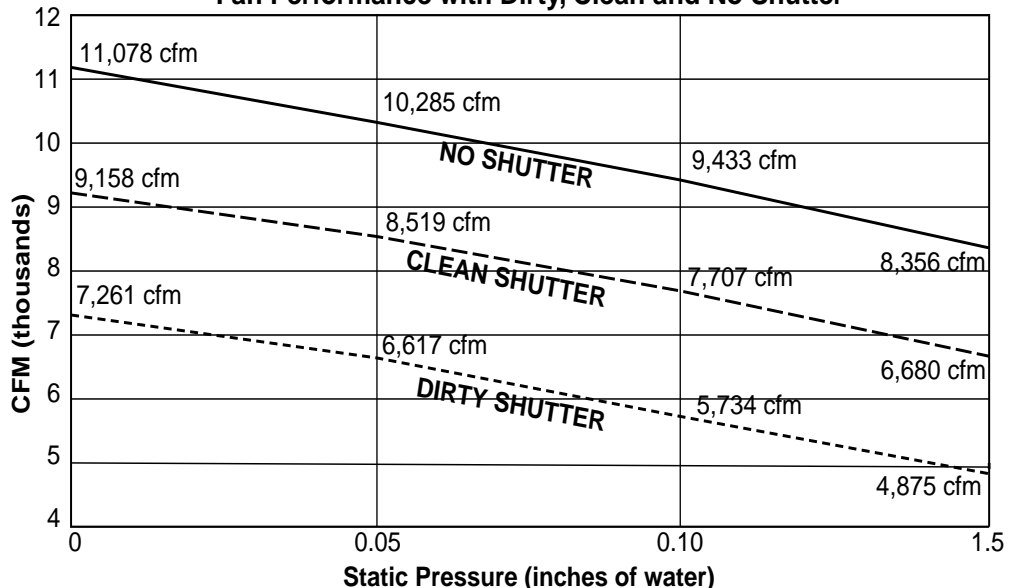
By Jim Donald, *Extension Agricultural Engineer and Professor* Biosystems Engineering Department, Auburn University  
334-844-4181, fax 334-844-3548, [jdonald@acesag.auburn.edu](mailto:jdonald@acesag.auburn.edu)

Any reduction in needed air flow in a poultry house can reduce bird performance and increase mortalities. That's why flock supervisors, ag engineers, poultry scientists and equipment manufacturers have long counseled frequent monitoring, adjustment and cleaning of air-handling equipment. We now have laboratory confirmation of just how important one of these maintenance checklist items is: Accumulated dirt on fan shutters was found to reduce air flow by 20 to 27 percent

The test was conducted by Auburn University in cooperation with an Alabama-based fan and equipment manufacturer. A typical shutter in use on a 36-inch exhaust fan in a poultry house in Cuilman County was removed and tested in the company's fan lab and wind tunnel. The shutter, which had not been cleaned, was first weighed, then placed on a new 36-inch four-blade exhaust fan. CFM tests were run in the wind tunnel under several static pressures. The shutter was then removed from the fan, cleaned, weighed again – showing dirt accumulation had totaled 3½ pounds – then placed back on the fan for the same series of CFM tests. For comparison, the test was also run with no shutter on the fan.

The graph shows tested airflow in cubic feet per minute (CFM) for the fan with no shutter, the clean shutter, and the dirty shutter. In each case, as static pressure was increased, the air flow rate decreased. Even a clean shutter reduces airflow below the no-shutter flow rate (the high number often found in fan manufacturer ratings). The shocker here is the airflow drop from clean to dirty shutter conditions, losses ranging from 20.7 percent at zero static pressure to 27.0 percent at 0.15 inches. Losses due to dirty shutters on larger fans would probably be similar.

Fan Performance with Dirty, Clean and No Shutter



**Conclusion:** In a typical poultry house, dirt can build up on shutters at a rate of one-fourth pound a day or more, depending on humidity, number and capacity of fans, how long fans are run, etc. This test shows that clean shutters are critical for proper fan performance, and that it will pay to check and clean them frequently, perhaps as often as every other day. Lowered fan performance means you pay more in electricity per unit of air moved. Most important: top bird performance depends on the ventilation system operating as designed, not at reduced efficiency.

Thanks to Hired Hand Manufacturing Co. of Bremen, Alabama, for use of their wind tunnel in these tests.