

# THE BAKER COMPANY

161 Gatehouse Rd., Sanford, Maine 04073 USA

*“Creating Immaculate Atmospheres”*

## **DESIGN AND VERIFICATION OF BUILDING EXHAUST SYSTEMS USED ON BAKER SterilchemGARD & ChemoSHIELD CABINETS**

Bakers SterilchemGARD and ChemoSHIELD cabinets are designed to provide customers with product, personnel, and environmental protection. A critical element of providing that protection is the operation of the building exhaust system that is hard ducted to the cabinet. If the exhaust ducting doesn't deliver the negative static pressure and airflow requirements for the cabinet, then the cabinet cannot perform as designed.

Baker recommends that the building exhaust system be designed with some way of controlling the airflow such as a blower speed control and/or damper in the ducting. This can greatly help balance the negative static pressure and airflow at the connection to the cabinet.

Before any cabinet is shipped Baker balances its airflow and records the results in a factory test report located in the back of your Operators Manual. Exhaust static pressure and airflow measurements are included in the report. The static pressure is measured at the cabinets exhaust collar connection. The exhaust airflow is measured in our building exhaust ducting.

### **IMPORTANT**

Before you connect a cabinet to the building exhaust ducting you need to verify that the building exhaust system can deliver the maximum negative static pressure at the airflow stated in our general arrangement drawing or product literature. This will insure that the cabinet can continue to perform properly as its exhaust filter loads up with particulate.

The building exhaust system should have a means of airflow control (blower speed control and/or damper) to allow balancing of the cabinet exhaust.

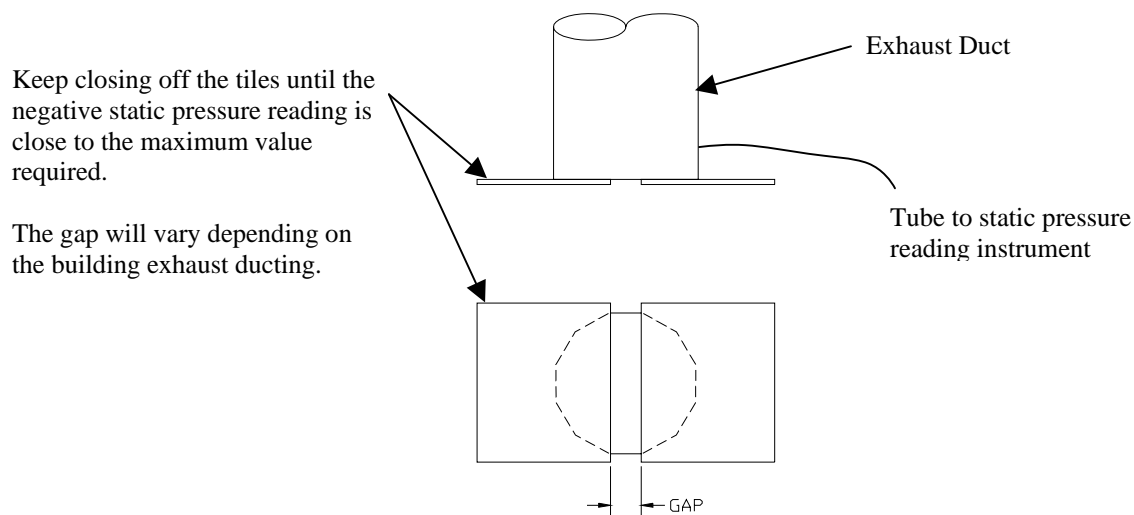
### **Verification equipment needed:**

- Magnehelic or digital pressure reading instrument with tubing and pressure probe that can read up to -2.5" water column.
- Two 12" square pieces of tile. (Cardboard or thin plywood/masonite will also work)
- Thermal anemometer probe (Hot-wire) or pitot tube. (For velocity duct traverse)

### **Verification steps:**

1. The static pressure reading should be taken near the end of the ducting where it will be connected to the cabinet. Position the two tiles to block the exhaust duct inlet opening leaving a gap between the tiles for air to enter the duct. This will create resistance in the duct system. [Reference Figure 1]

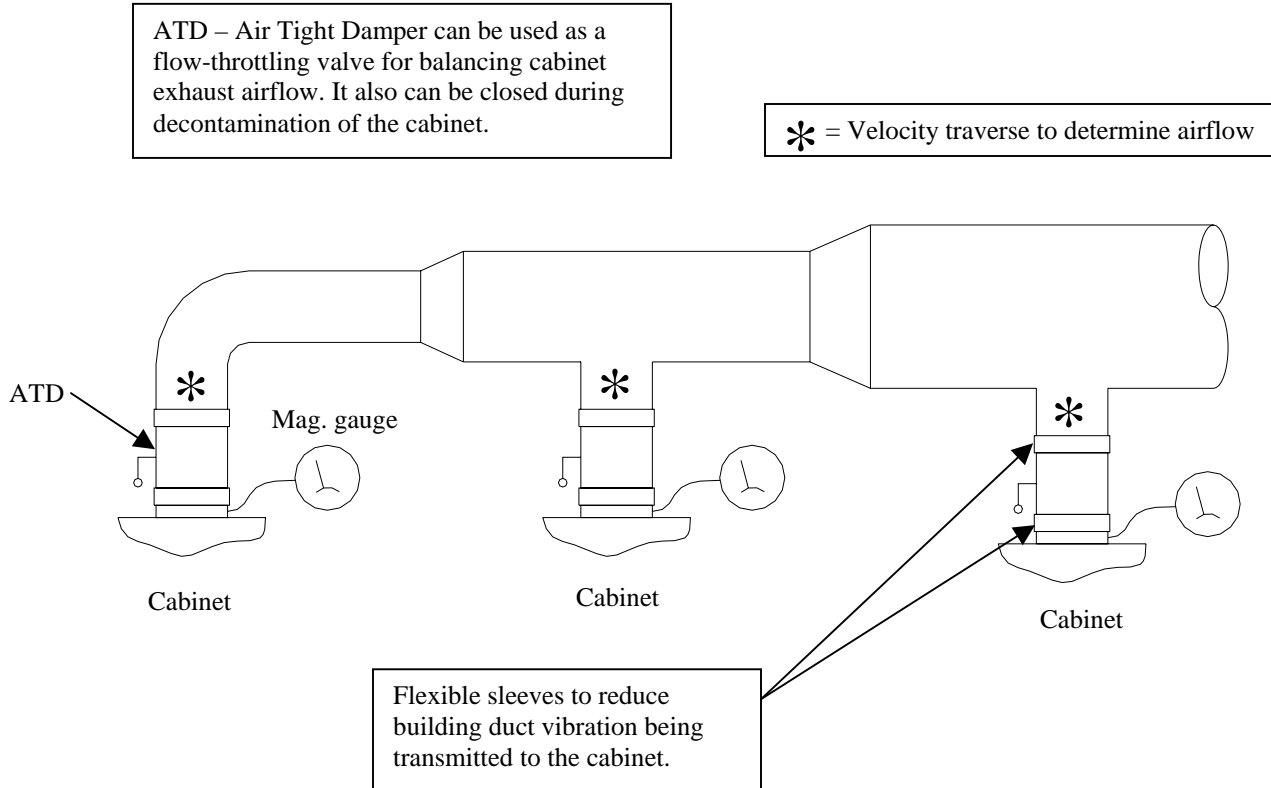
2. Measure the negative static pressure above the blockage. Compare this reading to the required maximum static reading stated in our general arrangement drawing or product literature.
  - If your reading is slightly greater than (more negative) or equal to the maximum required, you should be ok to connect and balance the cabinet as long as the exhaust airflow is within the range specified in the factory test report.
  - If your reading is less than (less negative) the maximum required you need to rebalance the building exhaust until a static reading is obtained that is slightly greater than (more negative) or equal to the maximum required. Now you should be ok to connect and balance the cabinet as long as the exhaust airflow is within the range specified in the factory test report.
3. While the blockage is in place perform a velocity traverse in a straight length of ducting that is away from elbows or transitions. Knowing the average velocity (FPM) in the duct multiplied by the open area of the duct ( $FT^2$ ) will allow you to calculate the airflow (CFM). The airflow needs to be within the range specified in the factory test report.



**Figure 1: Blocking exhaust duct opening to verify static pressure & airflow**

## IMPORTANT

If multiple cabinets are sharing the same building exhaust ducting, you need to make sure that controls are in place so that each cabinet will maintain its static and airflow balance individually and as a collective group. [Reference Figure 2]



**Figure 2: Multiple cabinets sharing the same exhaust ducting**