2.0 SYSTEM DESIGN

To maintain a low contaminant concentration in a room, inleakage must be eliminated by maintaining the room under a positive pressure. This requires that make up air be supplied at a rate equal to the outleakage at the desired operating pressure. This flow rate can be estimated from the open areas available for leakage. (Note that the frequency with which the doors are opened must be taken into account.) The number of room air changes per hour provides a convenient criterion. Exchange rates from 2 to 5 per hour are typical, with the lower value applying to tightly sealed rooms where passage through doorways is infrequent. The higher value applies to rooms with higher leakage areas and frequent traffic. Figure 2 delineates the room air exchanges versus the room volume for all adsorbers. Room pressurization should be maintained at 0.08 to 0.25 inches H_2O.

The design velocity across all filters is 500 feet per minute, and the velocity across the activated carbon bed is 100 feet per minute. Retention time in the carbon bed is 1.8 seconds.

The airflow into the adsorber can be changed by using the adjustable damper downstream of the fan to decrease the airflow below 500 cfm. Ducts should be designed so that the pressure drop is no greater than 1 inch water. If greater drops are anticipated, consult Westvaco.

The outlet from the Series 500 adsorber is 12 inches square, as shown on Drawing W-NVA-M-500. The transition from the outlet duct to the electrical control room should be concentric and gradual, with no more than a 1-inch change from square to round per 3 inches of length. For example, a transition from 12 inches square to 8 inches diameter would be a minimum of 12 inches long. Duct velocity should not be greater than 1200 feet per minute.