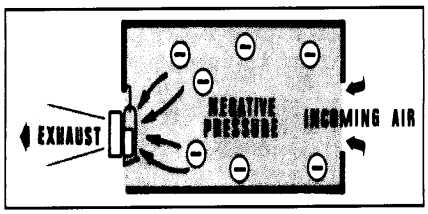
CALIFORNIA STATE FIRE MARSHAL

Ventilation Student Handout

Ventilation is essential to Fire Ground Operations. You need to understand all the principles and tools that apply and how to use them. Good Ventilation can make or break a fire or the people inside.

NEGATIVE PRESSURE VENTILATION

To ventilate a building using negative pressure, a smoke ejector is placed in a structural opening and a negative pressure is created as the heat, smoke and toxic gases are "sucked out of the building. By opening the window, the contaminants being "sucked" out will be replaced with fresh incoming air. Although this method performs satisfactorily, it has the following disadvantages:

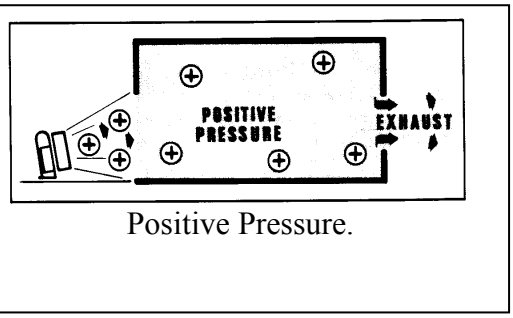


Negative Pressure.

-Contaminants are drawn through the blower, creating equipment clean-up and maintenance
-Blowers placed in doorways or hallways will block entry or exit to the building

POSITIVE PRESSURE VENTILATION

To ventilate a building using positive pressure, a blower is positioned outside a structural opening and the airflow is directed to force clean, fresh, pressurized air inside the building. The positive pressure will be equal at the top, bottom and corners of the building. When the window is opened, the contaminants from ALL parts of the building will exhaust to the exterior. Compared to negative ventilation, positive pressure ventilation has the following advantages:



Positive Pressure.

-Contaminants are not drawn through blowers, reducing clean up.
-Doorways, windows and halls do not need to be blocked by blowers.
-Positive pressure ventilation is approximately twice as efficient at removing contaminants.

IMPLEMENTATION

Control of the entrance opening, the exhaust opening, and the path of travel between the entrance and exhaust are the three keys to effective positive pressure ventilation.

Blowers must be positioned so the cone of air issued from a blower will completely cover the entrance opening.

An exhaust opening must be selected to provide horizontal or vertical ventilation of contaminants.

The flow or path of pressurized air between the entrance opening and the exhaust opening must be controlled and directed to achieve effective ventilation

These 3 keys can only be achieved in their proper relationship if all members engaged in the ventilation operation have been properly trained and are aware of the goal of the intended operation.