TRAINING REPS

T.R.

Positive Pressure Ventilation

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Ventilation is the process of removing heat and products of combustion from a structure by use of natural, negative, hydraulic or mechanical means. A primary cause for ventilation is that it saves lives. A victim's environment becomes more survivable by the removal of heat and smoke and reduces dangers to trapped occupants. The improved environment also serves to protect the lives of firefighters operating inside a structure by removing heat and smoke and improves our ability to locate victims. While our current SOP on positive pressure ventilation is dated, PPV remains a prominent and effective tactic on the fireground. Most of the procedures described in TAC-01 remain applicable today.

Career and many of our volunteer apparatus are equipped with BlowHard PPV fans, powered by both battery and AC and are collapsible for ease of transport and storage.

From BlowHard: Ventilation is the process of airflow entering a system, flowing through the system, then exiting the system. Volumetric airflow, commonly known as cubic feet per minute (CFM) or "m3/h") is important because this is what feeds the airflow. The more air in, the more air out, and in ventilation, you want to maximize the "air out" part! Airflow into the system is also important much of the time in that the higher the volume, the more clean, cool air is introduced into the structure. Positive pressure ventilation tries to maximize the airflow, while driving up pressure inside the structure. When a pressure differential is present, there will always be air movement flowing from high pressure to low pressure until the pressure in the structure equals the external atmospheric pressure. Higher pressure inherently results in increased airflow as it naturally tries to equalize itself. When looking at pressurizing the structure, good entrance and exit points must be selected. Things such as the size of openings, external wind speed and direction, and pressure loss points (structural leakage) are examples of things to take into consideration with respect to the capabilities of your fan.

Basically, PPV fans move fresh air at a high velocity to build pressure inside a structure to blow out the bad air (smoke, and other contaminants). A large inlet, coupled with a smaller outlet will increase the pressure to ventilate a structure faster. In a structure full of smoke on several levels and/or rooms, closing and opening doors and windows will compartmentalize the structure and will greatly increase the efficiency of ventilation process. Ventilating on the lower levels and working up will increase the effectiveness of the operation. Of note, negative pressure is often a better tactic for basements/subdivisions. Once visible smoke is evacuated, atmospheric monitoring should always be conducted to confirm the removal of known toxins.

The BlowHard fans in use in the BCoFD include the BH-20 (older model), Quickie, and Commando models. New apparatus will be equipped with Milwaukee Supervac fans. The BlowHard PPV fans are designed with a "jet" configuration, different than the former PPV fans we used. The need to create a "cone" around the inlet is no longer needed with these particular PPV fans. Setting the fan about three to five feet from the inlet opening is still an effective technique. The air from the fan is moving at such a high velocity, it will pull in air and create a seal around the opening.

The most critical takeaway when it comes to ventilation is that it must be coordinated! The hasty breaking of windows and cutting roofs can prove catastrophic for both victims and interior fire crews.

TIP: I.C.'s should consider requesting a wind report from dispatch to obtain wind speed & direction. Wind is a critical factor in fire spread and ventilation decision-making.