

J & B 3ed. Ch. 15 Ventilation Quiz

1. Two terms we hear a great deal about in the fire service are backdraft and flashover. They are sometimes confused as both deal with high heat and serious danger to building occupants whether they be civilian or firefighters. Which of the following comparisons is most accurate in describing these fire ground phenomenon:
 - a. Both are nearly identical as they rarely give any warning signs and can result in extreme temperatures unsurvivable even in turn out gear.
 - b. Backdraft is the result of an opening created in a compartment fire in which high heat has created a vacuum in the room and it draws in fresh air at rapid rates. Flashover is visible flaming across the ceiling as smoke and heat begin to mushroom and bank down.
 - c. Flashover can occur when room temperatures become super heated, often over 1,000 deg., resulting in nearly simultaneous ignition of all combustible contents in the room. Backdraft is the result of fresh air being introduced into an oxygen starved fire with little visible flame but an accumulation of hot gases containing unburned fuels resulting in explosive reignition.
 - d. Backdraft can be most expected when fire is showing at at least one high point in the building involved thus leaving lower levels to develop backdraft conditions. Flashover can be prevented by venting near the opposite end of the building from the fire.
2. Leap frogging is a term used to describe one way a fire may spread to other parts of a building. Which of the following statements best explains what leap frogging is:
 - a. Leap frogging takes place when fire finds its way to utility chases and interior vertical openings allowing the fire to quickly spread to upper levels.
 - b. Leap frogging, also known as auto-exposure, happens when fire breaks out of an exterior window and extends vertically to windows and floors above.
 - c. Leap frogging can be the result of changing flow paths of the fire, sometimes due to improper ventilation practices.
 - d. Leap frogging is the rapid interior spread of a fire in multiple directions, often the result of careless or improper positive pressure ventilation.
3. Ideal conditions are usually pretty hard to come by at most fires. However, under ideal conditions, should you want to vent a room of smoke (say an extinguished mattress fire or food on the stove) without a lot of damage and using natural ventilation, how would you do this:
 - a. Vent opening high on the windward side, low on the leeward side.
 - b. Vent opening low on the windward side, high on the leeward side.
 - c. Vent openings high on both sides.
 - d. Vent opening larger on the windward side, smaller on the leeward side.
4. One phenomenon of negative pressure ventilation which sometimes occurs is churning. Which of the following is the best description of churning:
 - a. Air being ejected by a fan in a window is immediately drawn back into the building through openings around the fan.
 - b. Air is pushed back against the fan if it is placed in a window facing outdoor wind gusts.
 - c. The exhaust fan (or smoke ejector) is positioned too far outside the window frame causing it to pull air that is already outside the building.
 - d. Multiple fans are in use creating turbulence within the building.

5. Positive pressure ventilation can be very effective if done properly. However, there are a number of important details which must be followed, any number of which can not only render positive pressure ineffective but also rapidly spread the fire. Which of the following four statements regarding positive pressure ventilation is INCORRECT:
 - a. The vent fan air cone must completely cover the vent opening.
 - b. There must be an exhaust opening near the opposite end of the building, preferably close to the fire.
 - c. The vent opening and the exhaust opening should be approximately the same size.
 - d. Multiple exhaust openings will help speed the process of expelling contaminated air.
6. Hydraulic ventilation is very effective in rapidly removing large amounts of contaminated air from a room or space. Which of the following is most accurate in describing proper hydraulic ventilation:
 - a. Hose stream should be operated from near the center of the room with the stream being directed out the window in a counter clockwise circular pattern.
 - b. Hose stream should be operated several feet back from the window with a fog pattern which nearly fills the window without overlapping it.
 - c. Hydraulic ventilation can be enhanced by directing a hose stream through an already operating vent fan.
 - d. Outside icing in cold weather is rarely a problem as a fog stream exiting a hot environment will be nearly evaporated before it can coat anything outside.
7. Roof top ventilation may be necessary and can be effective but is inherently dangerous and often considered a last resort to other types of safer ventilation practices. All of the following statements regarding roof vent operations are true except one. Which is NOT true:
 - a. Skylights and bulkheads can (and should) be opened first before cutting.
 - b. There should be 2 means of exit from a roof.
 - c. Sounding can be effective in determining the stability of a truss or lightweight roof.
 - d. Antennas and guy lines can present tripping hazards especially in low light conditions.
8. If it is determined a roof should be cut for venting, which of the following steps is INCORRECT regarding roof vent cuts:
 - a. The hole should be a minimum of 4 ft. by 4 ft. providing 16 square feet of opening.
 - b. If a 4x4 hole is inadequate, the same hole should be enlarged.
 - c. A power saw may be used to cut the initial hole but hand tools may still be needed to punch through interior ceilings.
 - d. Several auxiliary holes may be cut near the same end of the building as the primary hole to speed up venting heat and smoke.
9. Which of the following statements regarding a peak cut are most accurate:
 - a. A peak cut is a multi step process which results in vent openings on both sides of a peaked roof.
 - b. A peak cut is most effective on slate or terra cotta roof materials.
 - c. A peak cut is one of the few techniques considered safe for use on a truss roof.
 - d. Peak cuts are limited to the width between 2 rafters only.
10. Of the following descriptions of a trench cut, one is FALSE. Which one is FALSE:
 - a. The trench cut should be made before the primary cut.
 - b. The primary cut should be made before the trench cut.

- c. A trench cut is considered to be a defensive vent tactic.
 - d. Trench cut is also referred to as a strip cut.
11. Which is considered the best tactical response to ventilating a concrete roof:
- a. Use of a heavy duty circular saw with a diamond tip concrete cutting blade.
 - b. Use of a jack hammer with concrete tip.
 - c. Use of alternative vent openings such as skylights or other roof penetrations.
 - d. Cutting through the wall just below the roof edge.
12. Attacking and venting basement fires has many unique and dangerous issues which must be considered. All but of the following statements about basement fires is true except one. Which statement is FALSE:
- a. Create as many vent openings as possible on one side of the basement.
 - b. Firefighters working on the floor above the basement may be in as much danger as ones in the basement.
 - c. Interior stairways can act as chimneys carrying heat and smoke vertically.
 - d. Cutting the floor above a basement should never be done as that may result in rapid fire spread to the next floor up.
13. Stack effect in high rise buildings can occur due to temperature variants between inside and outside. Which of the following choices is true regarding stack effect:
- a. Cold outside air has less impact on stack effect than warm outside air.
 - b. A summer stack effect occurs when the interior temperature is much cooler than outside.
 - c. A pressurized stairway can dramatically increase stack effect.
 - d. A winter stack effect takes place on lower floors than a summer stack effect.
14. Rising smoke and heat encounter a barrier in a compartment such as a ceiling, causing the smoke to spread horizontally and back down. This is known as:
- a. Smoke inversion
 - b. Mushrooming
 - c. Vertical stratification
 - d. Horizontal extension
15. Which of the following statements regarding venting metal roofs is FALSE:
- a. Metal roofs are inherently noncombustible and are usually safer to work on than combustible roofs.
 - b. Metal roofs are often supported by lightweight metal bar joists which can fail early in a fire.
 - c. Metal roofs frequently have tar as part of the final roof coating which can melt and burn both above and below the roof deck.
 - d. A triangular cut can help prevent decking from rolling away.