Continuing Education Course #228
What Every Engineer Should Know
About Fire Protection

1. When using water to fight a fire, NFPA 13 is primarily concerned with
- a. how much water is needed to fight a fire.
- b. how the water is distributed over a fire area.
- c. both a. and b.
- d. the purity of the water.

2. As water changes from a liquid to a gas
- a. it absorbs heat, thus cooling the immediate spaces around the molecules of water.
- b. it gives off heat, thus raising the temperature in the immediate area.
- c. there is no thermodynamic change due to this change in state.
- d. visible steam is produced which is not combustible.

3. Who is an Authority Having Jurisdiction?
- a. Any person who is responsible for enforcing a particular code or standard.
- b. The municipal fire marshal if there is one.
- c. The municipal building inspector if there is one.
- d. All of the above.

4. Two products from different manufacturers are identical in every way, and equal in performance. One of those products is listed under one of the ASTM requirements in NFPA 13 while the other is not. Can either one be installed in a sprinkler system?
- a. Yes.
- b. No.

5. What is the most common type of sprinkler system in use today?
- a. Dry pipe system.
- b. Pre-action system.
- c. Wet pipe system.
- d. None of the above.

6. What is the difference between a dry pipe system and a pre-action system?
- a. A dry pipe system utilizes an air compressor, whereas a pre-action system does not.
- b. The dry pipe system releases the water only when a sprinkler head is opened.
- c. The pre-action system charges the piping with water when a supplemental device senses a fire condition.
- d. Both b. and c. above.

7. When is a waterless system considered for fire protection?
- a. Waterless systems are only used in marine applications, not in buildings.
- b. When the equipment in the protected space is valuable and would be ruined by water.

○ c. In high rise buildings where there is not enough water pressure on the upper floors.
○ d. None of the above.

8. Water mist systems are most commonly used in
○ a. Office buildings.
○ b. Factories.
○ c. Storage Occupancies.
○ d. Museums.

9. In buildings without a lay-in ceiling, upright sprinklers are commonly installed.
○ a. True.
○ b. False.

10. A decorative finish on a sprinkler:
○ a. May be applied by the building owner as long as the applied finish is listed for use on sprinklers.
○ b. May be applied only by a licensed fire alarm installer.
○ c. May be applied only by a licensed fire alarm installer, and must be listed for use on sprinklers.
○ d. Can only be applied by the manufacturer of the sprinkler.

11. ESFR sprinklers are
○ a. Advantageous when protecting high piled storage compared to conventional methods.
○ b. Can only be used in Light Hazard occupancies.
○ c. Can only be used in in-rack sprinkler systems.
○ d. Are obsolete and are not allowed in the most recent NFPA 13.

12. The frangible glass bulbs in sprinklers have a variety of colors because
○ a. Owners want an assortment of decorative colors for aesthetic reasons.
○ b. The colors indicate the operating temperature of the sprinklers.
○ c. The colors indicates the amount of water that the sprinkler can deliver in gpm.
○ d. The colors are cross-referenced to the size of the sprinkler orifice.

13. Which occupancy classification covers the hazards created by combustible vapors?
○ a. Light Hazard.
○ b. Ordinary Hazard.
○ c. Extra Hazard Group 2.
○ d. Extra Hazard Group 3.

14. The most common sprinkler system layout is
○ a. Loop system.
○ b. Tree system.
○ c. Wishbone system.
○ d. Gridded system.

15. In an industrial factory with exposed open bar joists that support the roof
○ a. The sprinklers must be tight to the ceiling, and hvac duct-work, lighting, piping, and cable racks may be installed below them with no additional concern.
○ b. The sprinkler layout may need to be adjusted for any obstructions below the sprinklers.
○ c. Any high sprinklers that are obstructed from reaching a fire can be removed from the layout.
○ d. The sprinklers must have a minimum 200 degree F rating and must be quick response.

16. Which types of pipes may be acceptable for use in sprinkler systems?

○ a. Steel pipes.
○ b. Copper pipes.
○ c. PVC pipes.
○ d. Both a and b.

17. Outside stem and yoke (OS&Y) valves are acceptable based on what feature?
○ a. They are always rated at 175 psi as a minimum.
○ b. They are more durable than butterfly valves.
○ c. Because of their exposed stems, one can readily determine if they are open or closed.
○ d. They are the only valve on the market that can be equipped with a supervisory switch.

18. Fire pumps are required when
○ a. Water system pressure is below 40 psi.
○ b. Water flow is less than 25 gpm.
○ c. The Authority Having Jurisdiction wants one.
○ d. The water supply cannot provide sufficient pressure to meet the hydraulic design requirements of the sprinkler system.

19. Storage in a Light Hazard Occupancy is not allowed.
○ a. True.
○ b. False.

20. Why are flue spaces important in storage occupancies?
○ a. They allow any smoke to be vented directly to the outside of the building.
○ b. They allow the heat from the fire to reach the sprinkler heads as quickly as possible.
○ c. They provide alternate egress paths for people to safely escape.
○ d. They create problems for sprinkler systems and must be kept to an absolute minimum.

21. Plastic pallets and wooden pallets are treated differently in NFPA 13 because
○ a. Wooden pallets burn much more intensely than plastic pallets.
○ b. Plastic pallets burn much more intensely than wooden pallets.
○ c. The smoke from a plastic pallet is very thick compared to a wooden pallet.
○ d. Wooden pallets are more difficult to extinguish.

22. If a storage area has 70% of its stored material as paper or wood, and 30% of its stored material as plastic products, what is the design approach for such a space?
○ a. The sprinkler design is based on the plastic storage.
○ b. The sprinkler design is based on the paper and wood storage.
○ c. The sprinkler design is based on the paper and wood load with a increase in sprinkler density over the area where there is plastics storage.
○ d. There is not enough information to make a determination for sprinkler design.

23. Sprinklers are required
○ a. In all commercial buildings, with no exceptions.
○ b. Only in commercial buildings that can be connected to a municipal water supply.
○ c. Only in commercial buildings that exceed the minimum requirements of the local building codes.
○ d. Only in commercial buildings that do not have sufficient water pressure.

24. Water flow in pipes for sprinkler systems is calculated using
○ a. The gravity method for open channel flow.
○ b. Ohms Law.

○ c. The Hazen-Williams formula.
○ d. Trial and error iteration method for polynomial equations.

25. In California, only deluge sprinklers are acceptable in single family residential occupancies.
○ a. True.
○ b. False.