

NFPA CFPS

Certified Fire Protection Specialist (CFPS)

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Question: 1

When evaluating dipping and coating processes, flammable liquid vapors are usually.

- A. denser than air, therefore, flow to high points.
- B. lighter than air, therefore, flow to low points.
- C. denser than air, therefore, flow to low points.
- D. lighter than air, therefore, flow to high points.

Answer: C

Explanation:

4.3* Locations Below Grade.

Dipping and coating processes shall not be located below the surrounding grade level in cases where flammable vapors that are heavier (denser) than air cannot be captured and directed to the outside of the building.

<http://hamyarenergy.com/static/fckimages/files/NFPA/Hamyar%20Energy%20NFPA%2034%20-%202007.pdf>

Question: 2

Pre-incident planning for industrial and municipal emergency response includes all of the following data components. EXCEPT

- A. Interior finishes
- B. Building construction
- C. Site considerations
- D. occupancy

Answer: A

Question: 3

Temporary storage of more than 60 gal (227 L) of Class I and Class II liquids should be low for from buildings under construction?

- A. At least 30 ft (9 m)
- B. At least 40 ft (12 m)
- C. At least 50 ft (15 m)

D. At least 60 ft (18 m)

Answer: C

Explanation:

16.2.3.1 Storage:

„h Storage of flammable and combustible liquids shall be in accordance with Chapter 66, unless otherwise modified by

16.2.3.

„h Storage of Class I and Class II liquids shall not exceed 60 gal (227 L) within 50 ft (15m) of the structure.

„h Storage area shall be kept free of weeds, debris, and combustible materials not necessary to the storage.

„h Open flames and smoking shall not be permitted in flammable and combustible liquids storage areas.

„h Such storage areas shall be appropriately posted as „no smoking“ areas.

„h Storage areas shall be appropriately posted with markings in accordance with NFPA 704, Standard System for the

identification of Hazards of Materials for Emergency Response.

Question: 4

NFPA 220 identifies which of the following as a construction type in which the structural elements are entirely of noncombustible or limited combustible materials permitted by the code and protected to have some degree of fire resistance for one hour?

- A. Type II (222)
- B. Type II (111)
- C. Type III (211)
- D. Type III (200)

Answer: A

Explanation:

Type I & Type II (222) are:

„h Noncombustible

„h Equivalent for compliance

**Fire Resistance of Building Elements
in Accordance with NFPA 220**

| | Type I | | Type II | | | Type III | | Type IV | Type V | |
|--|----------------|----------------|----------------|----------------|----------------|----------------|-----|----------------|----------------|----------------|
| | 443 | 332 | 222 | 111 | 009 | 211 | 204 | 2HH | 111 | 040 |
| EXTERIOR BEARING WALLS | | | | | | | | | | |
| Supporting more than one floor, columns or other bearing walls | 4 | 3 | 2 | 1 | 0 ¹ | 2 | 2 | 2 | 1 | 0 ¹ |
| Supporting one floor only | 4 | 3 | 2 | 1 | 0 ¹ | 2 | 2 | 2 | 1 | 0 ¹ |
| Supporting a roof only | 4 | 3 | 1 | 1 | 0 ¹ | 2 | 2 | 2 | 1 | 0 ¹ |
| INTERIOR BEARING WALLS | | | | | | | | | | |
| Supporting more than one floor, columns or other bearing walls | 4 | 3 | 2 | 1 | 0 | 1 | 0 | 2 | 1 | 0 |
| Supporting one floor only | 3 | 2 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| Supporting a roof only | 3 | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| COLUMNS | | | | | | | | | | |
| Supporting more than one floor, bearing walls or other columns | 4 | 3 | 2 | 1 | 0 | 1 | 0 | H ² | 1 | 0 |
| Supporting one floor only | 3 | 2 | 2 | 1 | 0 | 1 | 0 | H ² | 1 | 0 |
| Supporting a roof only | 3 | 2 | 1 | 1 | 0 | 1 | 0 | H ² | 1 | 0 |
| BEAMS, GIRDERS, TRUSSES & ARCHES | | | | | | | | | | |
| Supporting more than one floor, bearing walls or other columns | 4 | 3 | 2 | 1 | 0 | 1 | 0 | H ² | 1 | 0 |
| Supporting one floor only | 3 | 2 | 2 | 1 | 0 | 1 | 0 | H ² | 1 | 0 |
| Supporting a roof only | 3 | 2 | 1 | 1 | 0 | 1 | 0 | H ² | 1 | 0 |
| FLOOR CONSTRUCTION | | | | | | | | | | |
| | 3 | 2 | 2 | 1 | 0 | 1 | 0 | H ² | 1 | 0 |
| ROOF CONSTRUCTION | | | | | | | | | | |
| | 2 | 1½ | 1 | 1 | 0 | 1 | 0 | H ² | 1 | 0 |
| EXTERIOR NONBEARING WALLS³ | | | | | | | | | | |
| | 0 ¹ | 0 | 0 ¹ | 0 ¹ | 0 ¹ |

¹ Those members listed that are permitted to be of approved combustible material.

¹ Requirements for fire resistance of exterior walls, the provision of spandrel wall sections, and the limitations or protection of wall openings are not related to construction type. They need to be specified in other standards and codes, where appropriate, and may be required in addition to the requirements of the standard for the construction type.

² "H" indicates heavy timber members.

³ Exterior nonbearing walls meeting the conditions of acceptance of NFPA 285, Standard Method of Test for the Evaluation of Fire Resistance Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components Using the Intermediate-Scale Multistory Test Apparatus, shall be permitted to be used.

Question: 5

The means of escape in lodging or rooming houses is defines as:

- A. A way out of a building that does not conform to the definition of means of egress, but does provide a safe way out
- B. A clear path of travel, which can be both vertical and/or horizontal, to means of egress leading to a public way or street
- C. An unusual archaic pathway that allows occupants to reach a protected, fire-rated stairwell, smoke tower, or exit door
- D. A convoluted or confusing pathway in a building designed and built before the adoption of building codes

Answer: A

Question: 6

When designing deflectors, the minimum water flow pressure needed to develop a reasonable spray pattern is:

- A. 4 psi (28 kPa)
- B. 5 psi (34 kPa)
- C. 6 psi (41 kPa)
- D. 7 psi (48 kPa)

Answer: D

Explanation:

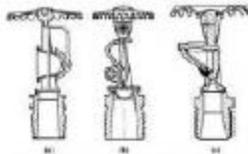


FIGURE 15.4 Three Illustrations of the Common Upright and Lower Connections for Class II Fire Sprinklers by Various Types (a) and (b) Fireable Type 5

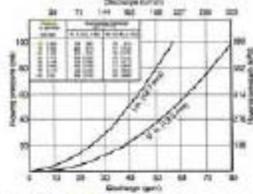


FIGURE 15.5 Water Discharge Rates of Typical Fire Sprinkler of 5.4 (K₁ = 0.07 and K = 0.07) (K₁ = 175, Automatic Grade-A)

Deflector Design
 Attached to the frame of the sprinkler is a deflector or umbrella for spreading the stream of water in a desired and controlled direction. The design of the deflector depends on the flow rate, pressure, and the size of the sprinkler orifice. A flow rate of 7 gpm (26 L/min) is generally considered a minimum for developing a stream of a reasonable spray pattern. A 1/2-in. (12.7-mm) orifice, a sprinkler having a nominal flow of 7.2 gpm (27.2 L/min) with a K of 5.4, at its rated pressure, K₁ = 0.07 will discharge approximately 17 gpm (63.8 L/min). (See Figure 15.5 for Sprinklers with Deflectors for Specific Discharge Rates for the Definition of K-Values.) At the same 7-gpm orifice, however, a nominal flow of 12.5 gpm (47.3 L/min) with a K of 8.4, at its rated pressure, K₁ = 0.113 will discharge approximately 21 gpm (79.1 L/min). (See Figure 15.5 for the quantity of water discharged at various water pressures.)

Do not check the ability of fire-flowing sprinklers to cover the area to be protected with their working spray pattern. Factory Mutual Research Corporation (FMRC) applies an additional distribution factor one which acts in the area covered between two adjacent sprinklers.

In order to have even the maximum distance between adjacent sprinklers that has passed from the point of water supply, to be protected, a number of sprinklers are operating simultaneously, water supply pressure in the range of 70 to 100 psi (4.8 to 6.9 MPa) are commonly provided. The normally selected systems are designed around the normally available water supply volume and pressure.
 The distribution of water from a sprinkler varies according to the orifice diameter, the orifice frame, arms, and the spray pattern; and the rounded edges of the deflector create a "lapping" effect. A typical plot of the flow pattern of a standard-type sprinkler is shown in Figure 15.6.¹ Because the distribution of water from sprinklers is an erratic phenomenon, the working distances are normally based on experience in the area. For upright and pendant spray sprinklers, for example, Underwriters Laboratories Inc. (UL) requires a minimum wet to "dampness" in the open pattern. For a sprinkler with an orifice of 1/2 in. (12.7 mm) K = 5.4 (K₁ = 0.07), a wet to "dampness" wet perimeter outside a 14-ft (4.3 m) diameter circle in a horizontal plane at 13.5 ft (4.1 m) below the sprinkler when operating at its rated pressure. A separate "10-gpm" distribution

TEMPERATURE RATINGS OF AUTOMATIC SPRINKLERS

Automatic sprinklers have a rated temperature rating that are based on standard tests in which temperature is increased in a liquid and the temperature of the liquid is raised very slowly until the sprinkler operates (Table 15.1).

The temperature rating of all fusible element-type automatic sprinklers is marked on the standard list. For non-sprinklers, the temperature rating must be stamped or cast on some readily seen, color-coded, non-removable, fire glass bulb and the frame area of the fusible element sprinkler.

The recommended maximum temperature is indicated for both bulbs and fusible element sprinklers. The recommended water height is lost by sprinklers somewhat before the actual rating point. Maximum operation of a water sprinkler usually depends on the extent to which the actual conditions pressure is exceeded, the maximum temperature, and the load on the operating parts of the sprinkler. Although glass bulb sprinklers do not lose strength at temperatures other than their operating temperature, using them at such temperatures can result in continuous flow and releasing of the air bubble, which causes siphoning on the bulb.

The general rule of wetting operation of ordinary 100 to 170°F (37 to 77°C) temperature rating when temperatures exceed 100°F (38°C) is necessary to provide a margin of safety. General practices regarding the use of automatic sprinklers of higher than the ordinary rating are given in Tables 15.2 and 15.3.

Question: 7

What is the maximum size for solid particles capable of passing through a U.S. 40 standard sieve to be classified as dust?

- A. 0.016 in. (390 µm)
- B. 0.017 in. (420 µm)
- C. 0.018 in. (450 µm)
- D. 0.019 in. (480 µm)

Answer: B

Question: 8

Heat flow from the flame to the burning fuel of a small pool fire is mostly due to:

- A. Convective heat transfer
- B. Conduction heat rise
- C. Conduction heat transfer
- D. Convective heat loss

Answer: A

Question: 9

Fire alarm wire failure can be classified as:

- I) Conductor breakage
- II) Short circuits
- III) Insulation loss
- IV) Trouble signals

- A. I
- B. II
- C. I and III
- D. II and IV

Answer: D

Question: 10

What special storage precautions are required for zirconium castings?

- A. Store in containers with 25 percent water by volume
- B. Store in fire-resistant construction with explosion vents
- C. Store in vessels with an inert atmosphere
- D. There are no special storage requirements

Answer: B

Explanation:

Storage and Handling

Special storage precautions are not required for zirconium castings because of the very high temperatures massive pieces of the metal can withstand without igniting. Zirconium powder, in contrast, is highly combustible; consequently, it is customarily stored and shipped in 1 gal (3.8 L) containers with at least 25 percent water by volume. For specific details, refer to NFPA 484.

Zirconium powder storerooms should be of fire-resistant construction equipped with explosion vents. Cans should be separated from one another to minimize the possibility of a fire in one can spreading to others and to permit checking of the cans periodically for corrosion. Some manufacturers of zirconium have established the practice of disposing of cans containing powder that have been on the shelf for 6 months.

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