

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 NFPS 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	000	211	204	2HH	111	000
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 WALLS ³	0 ¹	0 ¹	0 ¹	0 ¹	0 ¹	0 ¹	0	0 ¹	0 ¹	0 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 Flammability 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:

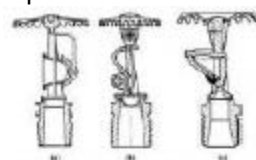


FIGURE 15.4 Three Illustrations of the Common Link and Lower Connections for Class R P-Sprinklers. (a) Female Model 1, and (b) Female Type 5.

Deflector Design

Attached to the frame of the sprinkler is a deflector or divertor for spray which the stream of water is directed and controlled into a spray. The deflector is curved or angled at various angles. The amount of water discharged depends on the flowing water pressure and the size of the sprinkler orifice. A flowing pressure of 7 psi (48 kPa) is generally considered a minimum for developing most of a reasonable spray pattern. At this pressure, a sprinkler having a nominal 1/2-in. (12.7-mm) orifice ($K = 5.6$) at its nominal rating ($R_p = 80$) will discharge approximately 17 gpm (64 L/min). (See *Design Sprinklers with Deflectors* for the design chapter for the definition of K -factor.) At the same 7-psi (48 kPa) pressure, a nominal 3/4-in. (19.0-mm) orifice ($K = 8.0$) at its nominal rating ($R_p = 113$) sprinkler will discharge approximately 21 gpm (79 L/min). (See Figure 15.5 for the quantity of water discharged at various water pressures.)

In order to have more than the minimum design pressure at sprinklers but not more than the point of water rupture, so pipe safety when a number of sprinklers are operating simultaneously, water supply pressures in the range of 70 to 180 psi (4.8 to 12.4 MPa) are commonly provided. The hydraulically calculated systems are designed around the nominal and later water supply volume and pressure.

The distribution of water from a sprinkler is an important factor in determining the size of the frame arms around the spray pattern and the various edges of the deflector create a "lapping" effect. A typical plot of the flow pattern of a standard spray sprinkler is shown in Figure 15.6.

Because the distribution of water from sprinklers is a complex phenomenon, the testing laboratories use fairly recent improvements in this area. For sprinkler and pattern spray solutions, for example, Underwriters Laboratories Inc. (UL) requires a standard test to "determine" the spray pattern. For a sprinkler with an orifice of 1/2 in. ($K = 5.6$) at $R_p = 80$ psi (5.5 kPa), a standard test is required to determine the spray pattern. A standard test is a nominal 1/2 in. (12.7 mm) orifice at 80 psi (5.5 kPa) before the sprinkler is tested at its nominal pressure. A separate "10 gpm" distribution

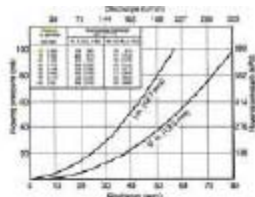


FIGURE 15.5 Water Discharge Rates of Typical Patterned $R = 8.0$ ($K = 8.0$) and $R = 6.0$ ($K = 5.6$) Automatic Sprinklers.

test checks the ability of the flowing sprinkler to coordinate with the other sprinklers in the system. The spray pattern of the sprinkler is determined by the design of the deflector and the size of the orifice. The design of the deflector and the size of the orifice are determined by the design of the sprinkler.

TEMPERATURE RATINGS OF AUTOMATIC SPRINKLERS

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

The temperature rating of a fusible element-type automatic sprinkler is marked on the sprinkler label. For the sprinkler, the temperature rating must be stamped or cast on the body of the sprinkler. Color coding is also used for glass bulbs and the frame arms of the fusible element-type sprinkler.

The most critical element in a sprinkler is the fusible element. The fusible element is the part of the sprinkler that is exposed to the heat of the fire. The fusible element is made of a material that melts at a certain temperature. The temperature at which the fusible element melts is the temperature rating of the sprinkler. The temperature rating of a sprinkler is the temperature at which the fusible element melts. The temperature rating of a sprinkler is the temperature at which the fusible element melts.

The general rule of wetting sprinklers of ordinary (15 to 160°F (5 to 70°C)) temperature rating when temperatures exceed 180°F (82°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 μ m)
- B. 0.017 in. (420 μ m)
- C. 0.018 in. (450 μ m)
- D. 0.019 in. (480 μ m)

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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