

STUDY MATERIAL FOR THE  
CERTIFICATE OF FITNESS EXAM  
FOR

# **C-15**

## **SUPERVISE**

### **FLAMEPROOFING**

INSIDE THIS BOOKLET YOU WILL FIND  
THE FOLLOWING:

**NOTICE OF EXAMINATION (NOE)**

This study material will help you prepare for the written examination for the Certificate of Fitness for flameproofing materials used for artistic enhancement in public buildings. This study material includes information taken from the Fire Prevention Code, Board of Standards and Appeals rules, NFPA Standards, and the Fire Prevention Directives of the Bureau of Fire Prevention, NYFD. The study material does not contain all of the information you need to know in order to work efficiently and safely when flameproofing decorative materials. It is your responsibility to become familiar with all applicable rules and regulations of the City of New York, even if they are not covered in this material.

You must pass a multiple choice test to qualify for the Certificate of Fitness. A score of 70% correct is required in order to pass the multiple choice test. All questions on the multiple choice test have four answer options. Only one answer option is correct for each question. If you do not answer a question, or if you mark more than one option, your answer will be scored as incorrect. Read each question carefully before marking your answer. There is no penalty for guessing on the multiple choice test.

### Sample Questions

**1. According to Fire Department regulations, who is responsible for making sure that all Fire Department regulations regarding flameproofing are obeyed in public buildings?**

- A) The Certificate of Fitness holder and the owners of the building.
- B) The owner of the flameproofing facility.
- C) The Certificate of Fitness holder and the Education Supervisor.
- D) The manufacturer of the flameproofing chemicals.

The correct answer is "A". You would press "A" on your touch screen monitor.

**2. Why are materials used for the artistic enhancement of a public building flameproofed?**

- A) To prevent ignition of the materials.
- B) To reduce the threat to life and property in case of fire.
- C) To prevent the spread of a fire if one occurs.
- D) All answers are correct.

The correct answer is "D". You would press "D" on your touch screen monitor.

## Certificate of Fitness for Supervising Flameproofing

Research has shown that combustible decorative materials have been a contributing factor in several disastrous fires and numerous deaths in public buildings. The New York City Fire Department enforces regulations that require all decorations, drapes, curtains, scenery, and other materials used for artistic enhancement inside public buildings to be either noncombustible or flameproofed. These regulations also prohibit the use of flammable materials for artistic enhancement, under any circumstances, inside public buildings. Flammable materials may not be used even when they have been treated with a flameproofing compound. The New York Fire Department regulations **apply to all public buildings** including the following:

- ? Hotels (except guest rooms)
- ? Theaters
- ? Public halls
- ? Department stores
- ? Buildings used for public assembly, amusement or instruction.

The New York Fire Department regulations **do not apply** to the following:

- ? Merchandise displayed for sale
- ? Merchandise displayed at a business shows
- Offices
- ? Works of art in museums
- ? Materials used inside churches and places of religious worship.

The Certificate of Fitness holder is responsible for making sure that the materials used for artistic enhancement in the building meet Fire Department regulations. Fire Department inspectors may conduct unannounced inspections of the premises, and enforcement actions may be taken against the Certificate of Fitness holder when violations are discovered. Enforcement actions may result in fines against the owner and the revocation of the Certificate of Fitness.

**Basic Terms:** Several terms are used when discussing flameproofing of decorative materials. The general meanings of some of these terms are briefly described below:

**Combustible Material:** A material that will ignite and burn when subject to fire (e.g., wood and paper).

**Flammable Material:** A material that will ignite very easily, burn intensely, and/or has a rapid rate of flamespread (e.g., materials covered with a flammable adhesive or a petroleum based coating)

**Noncombustible Materials:** A material that, in the form in which it is to be used, will not ignite and burn when subjected to fire (e.g., certain materials made from glass fibers or materials that are metallic based).

**Flameproofed Material:** A combustible material that has been chemically treated in order to give it resistance to flaming ignition.

**Flameproofing Treatment:** A chemical compound, and its method of application, that will impart flame resistance to combustible materials.

### **Flameproofing of Materials Inside Public Buildings**

A person holding a Certificate of Fitness for flameproofing must flameproof or personally supervise the flameproofing of the materials to be used inside public buildings. The Certificate of Fitness holder is responsible for making sure that the correct procedures are followed during the flameproofing process. All chemicals and application methods used during the flameproofing process must be approved by the Board of Standards and Appeals (BSA) for the Fire Department. Chemicals that have not received BSA approval or Fire Department approval may not be used to flameproof combustible materials.

Several different flameproofing treatments are available; however, only a few are widely used because many of the treatments have undesirable properties. For example, some treatments change the color of the material and/or damage the material. The type of treatment used depends on the nature of the materials and how the materials are used. Water soluble treatments are the least expensive and are the most easily applied. However, they lose their effectiveness when washed or exposed to the weather. Other treatments lose their effectiveness when exposed to the solvents used in dry cleaning operations. Still other treatments have short lived effectiveness and should only be used for short periods of time. It is important to note that not all materials may be flameproofed (e.g., hemlock, balsam, Spanish moss, and Christmas trees that contain pitch).

Two basic methods are used to flameproof materials (a) soaking, and (b) coating. Soaking the material in flame-retardant chemicals is considered to be the most effective method. This procedure saturates the material and allows the chemicals to seep into the fibers. Coating is done by simply brushing or spraying the chemicals on to the material. Generally, the most convenient method is used since both methods offer acceptable results.

### **Flameproofing Treatments**

The Certificate of Fitness holder must determine which flameproofing treatment is best suited to the materials used on the premises by contacting the manufacturer of the chemicals. Generally, materials made with natural fibers may be flameproofed using water-soluble treatments. Materials made with man-made fibers should not be flameproofed with water-soluble treatments. Again, the Certificate of Fitness holder must use treatments that have been approved by the Board of Standards and Appeals or Fire Department. Enforcement action will be taken against the Certificate of Fitness holder when non-approved flameproofing treatments are used.

### **Handling and Storage of Flameproofing Chemicals**

The chemicals used during the flameproofing process must be handled with great care. The manufacturer's storage and handling recommendations must be followed carefully to reduce the

likelihood of personal injury and property damage. It is recommended that Material Safety Data Sheet (MSDS), which describes the nature of the chemicals and how they must be stored and handled, be positioned close to the chemicals. The MSDS also lists the potential hazards associated with the chemicals and what steps should be taken in case of an emergency (e.g., what should be done when the compound comes in contact with a person's eye). When there is doubt concerning the nature of the chemicals, the manufacturer should be contacted directly. When handling the chemicals, protective gloves, goggles and masks must be worn when recommended by the manufacturer and/or OSHA. The chemicals should be stored inside clearly labeled containers in a well ventilated room. All required Fire Department permits for this storage location must be secured and posted.

### **Flameproofing Tests**

All materials (flameproofed and noncombustible) used for the artistic enhancement of public buildings must be tested to determine whether they meet Fire Department standards. The Fire Department requirements specify two testing procedures: the Flame test and the Field test. An affidavit must be filed with the Fire Commissioner after a material has passed a flame test and/or a field test. Both tests and the required affidavits are briefly described below:

**Flame Test:** All materials used for the artistic enhancement of a public building must pass a flame test when tested in accordance with the procedures outlined by the Board of Standards and Appeals (Cal. No. 294-40-SR). The flame test must be conducted under the supervision of a Certificate of Fitness holder in an established testing facility. Precise control over room temperature, the amount of oxygen available, and humidity is maintained during the flame test. This control over environmental conditions allows the tester to place great confidence in the accuracy and reliability of the test's results.

Prior to the test, three sample strips (2 in. wide X 12 1/2 in. long) for every 500 sq. ft. of flameproofed material are taken and dried for 24 hours in a room with an average temperature of 70o Fahrenheit and an average humidity of 40%. During the test, the sample strips are suspended vertically inside a testing apparatus and individually exposed to a controlled Bunsen burner flame. The equipment should be adjusted to position the bottom edge of the sample strip approximately 3/4 in. above a 1 1/2 in., luminous Bunsen burner flame. The flame is applied to the sample strip for 12 seconds and then withdrawn. During the test, the effect of the flame on the sample strip is carefully observed and recorded. In order to pass the test, the flameproofed material must meet the follow criteria:

**Flashing:** No flashing shall occur at any time on the length of the test specimen ((flashing due to fuzz or bad edges may be disregarded).

**Duration of the Flame:** The average continuation of the flame shall not exceed more than three seconds.

**Duration of Glow:** The average duration glow at the edge of the charred area shall not exceed an additional 20 seconds after the cessation of flaming. Glow confined t the charred area may be disregarded.

The complete set of instructions for conducting the small scale test may be found in BSA Cal. No. 294-10-SR.

### **Field Tests**

Field tests may be conducted by Fire Department inspectors and the holders of Certificates of Fitness for flameproofing to determine the adequacy of a flameproofing treatment or to determine whether a material is inherently noncombustible. Generally, the Certificate of Fitness holder conducts a field test since it is not possible to conduct a flame test. However, the Fire Department inspector will always conduct an on-site field test of all materials (combustible and noncombustible) used for the artistic enhancement of a public building. This field test must be conducted before materials will be accepted by the Fire Department for use inside public buildings.

Three sample strips, at least 1 1/2 inches wide by 4 inches long, must be tested individually in a safe and draft free location. The material must be suspended with the long axis vertical (ideally the sample strip should be suspended using a steel tongs). Then the flame from a common wooden match must be applied to the center of the bottom edge of the sample strip for 12 seconds. The effect of the flame on the sample strip must be carefully observed and recorded. In order to pass the field flame test, the material must meet the following criteria:

- ? The flame must not spread rapidly over the entire sample
- ? The sample must not continue to burn for more than 2 seconds after the match has been removed
- ? Flaming materials must not break or drip from the sample and continue to burn when they reach the floor

Although the field test is not as accurate or as reliable as the small scale test, it serves as a good indicator of whether the materials are adequately flameproofed or noncombustible. Enforcement action may be taken against the Certificate of Fitness holder if a material fails a field test conducted by a Fire Department Inspector. Enforcement actions may include fines and/or the revocation of the Certificate of Fitness. When a material fails the flameproofing test, the material must be re-flameproofed or removed from the premises.

**Affidavits for Flameproofed Materials:** After the material has passed a flame or field test conducted by the Certificate of Fitness holder, he/she must prepare a sworn affidavit which shall be filed by the building owner with the Fire Commissioner. The affidavit should be written on company letterhead and must indicate the following:

- ? The date of the flameproofing treatment.
- ? The name of the flameproofing treatment used and its Board of Standards and Appeals approval number and/or its Fire Department Approval number.
- ? That the flameproofing procedures have been tested and they meet the standards established by the Board of Standards and Appeals and/or the Fire Department.
- ? The Certificate of Fitness holder's name and his CoF number and its expiration date.
- ? The warranted period of the flameproofing effectiveness.

An example of a typical affidavit stating that the materials have passed a flameproofing test is shown below.

I, Joe Bloggs, do hereby certify that the rayon drapes at the Diamond Theater were flameproofed on 5/28/92 using Roscoflamex C26, which is manufactured by the Rosco Company with the approval of the Board of Standards and Appeals of the City of New York under Calendar Number 1287-80-SM in accordance with Section C 27-4265 of the Administrative Code of New York. The flameproofed drapes have satisfactorily passed the flameproofing test. The flameproofing is warranted for a period of six months and is invalid if said drapes are washed, dry cleaned or altered in any way so as to reduce their flameproofed properties.

Joe Bloggs  
Certificate Of Fitness No. 61279623  
Expiration Date 5/14/93

A copy of the affidavit must be maintained on the premises and made available to Fire Department inspectors.

**Affidavits for Noncombustible Materials:** The owner of a public building must file an affidavit with the Fire Commissioner before a noncombustible material is used for artistic enhancement in a public building. The affidavit should be written on company letterhead and must indicate the following:

- ? The name of the manufacturer or supplier of the noncombustible material.
- ? The type of material used.
- ? The non-combustibility characteristics of the material.

It is the owner's responsibility to obtain the required information from the manufacturer of the material. A copy of the affidavit must be maintained on the premises and made available to Fire Department Inspectors. When an affidavit of noncombustibility has not been filed with the Fire Commissioner, the material must either be flameproofed or removed from the premises. In such cases, violations may be issued and enforcement action taken against the owner of the building.

### **Dry Cleaning and Washing of Flameproofed Materials**

The effectiveness of flameproofing materials is significantly reduced when the flameproofed materials are dry cleaned or washed. The Fire Department requires flameproofed materials that have been dry cleaned or washed to be re-flameproofed or removed from the premises. After the materials have been re-flameproofed, the Certificate of Fitness holder must file a new affidavit with the Fire Commissioner indicating that the materials meet the flameproofing standards established by the Board of Standards and Appeals. The flameproofed materials must also be subjected to a new field test conducted by a Fire Department inspector. The dry cleaning and washing of the flameproofed materials must be recorded and made available to Fire Department inspectors upon request.

## **Fire Department Acceptance**

As stated earlier, the use of noncombustible or flameproofed materials for artistic enhancement in a public building must meet Fire Department standards. A field flame test must be conducted and an affidavit submitted to the fire commissioner before acceptance can be obtained. When the materials have been accepted, they may be used on the premises for a period of up to 12 months or until the materials are washed, dry cleaned or otherwise rendered ineffective. This 12-month period is officially called the period of acceptance. After the period of acceptance has expired, the owner of the building may apply to renew acceptance. Acceptance will only be renewed after the materials have passed a new field flame test. Acceptance may be renewed for two years, after which time materials must be either re-flameproofed or removed from the premises.

## **Special Considerations**

Under very special circumstances, the Fire Commissioner may waive or modify regulations related to the use of materials for the artistic enhancement of a public building. Each situation will be reviewed on a case-by-case basis by the Fire Commissioner. The decision to waive or modify the Fire Department regulations is entirely at the discretion of the Fire Commissioner.