

FIRE DEPARTMENT • CITY OF NEW YORK



**STUDY MATERIAL FOR THE EXAMINATION FOR
CERTIFICATE OF FITNESS
FOR
FLAME RETARDANT TREATMENT
C-15**

ALSO INCLUDED IN THIS BOOKLET YOU WILL FIND THE FOLLOWING:
NOTICE OF EXAMINATION (NOE).

NOTICE OF EXAMINATION

Title: Examination for the Certificate of Fitness for Flame Retardant Treatment C-15

Date of Test: Written tests are conducted Monday to Friday (except legal holidays) 8:00 AM to 2:30 PM.

QUALIFICATION REQUIREMENTS

1. Applicants must be at least 18 years of age.
2. Applicants must have a reasonable understanding of the English language.
3. Applicants must present a letter of recommendation from his/her employer. The letter must be on official letterhead and must state the applicant's full name, character, physical condition, experience, and address of premises where applicant will be employed.
4. Applicant must provide two forms of government issued photo identification, such as a State-issued Drivers' License or Non-Drivers License, or a passport.

RENEWAL REQUIREMENTS

1. Renewal Form.
2. Letter of Employment from employer.

APPLICATION INFORMATION

Application Fees: \$25.00 for originals and \$15.00 for renewals. The fee may be paid by credit card (no debit), in cash, money order, or personal check payable to New York City Fire Department. The \$25.00 fee must be payable by all applicants prior to taking the Certificate of Fitness test. Application forms are available at the Public Certification Unit, 1st floor, 9 Metro Tech Center, Brooklyn, NY 11201.

TEST INFORMATION

Test: The test will be of the written, multiple choice type. A Passing score of at least 70% is required in order to secure a Certificate of Fitness. Call 718-999-1988, or 2504 for additional information and forms.

About the Test

This study material will help you prepare for the written examination for the Certificate of Fitness (Certificate of Fitness) for Flame Retardant Treatment of materials used for artistic enhancement in certain occupancies or portions of occupancies. This study material includes information taken from the Fire Code, NFPA Standards 701, and the Fire Department Rules. The study material does not contain all of the information you need to know in order to work efficiently and safely when treating decorative materials. **It is critical that you read AND understand this booklet to help increase your chance of passing this exam.**

It is your responsibility to become familiar with all applicable rules and regulations of the City of New York. The relevant Fire Code (FC) and Rules are available online. Please refer to Fire Code Chapter 8, and Fire Department rule Section 805-01. These are the Fire Department requirements which govern this certificate, and which are enforced by the FDNY.

http://www.nyc.gov/html/fdny/html/units/fire_prevention/fire_prev_index.shtml. The written test will draw on the Fire Code, the Rules, material presented here, and common work practices in flame retardant application and testing.

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 test. All questions have four answer options. Only **one** answer is correct for each question. If you do not answer a question, or if you mark more than one answer to a single question, your answer to that question will be scored as incorrect. Read each question carefully before marking your answer. There is no penalty for guessing.

Sample Questions

1. Who was the first president of the United States?

- (A) George Washington.
- (B) Madonna.
- (C) Abraham Lincoln.
- (D) Elvis Presley.

The correct answer is "**A**". You would mark "**A**" on your touch-screen terminal.

2. What sports team plays at Madison Square Garden?

- (A) Yankees.
- (B) Jets
- (C) Cardinals.
- (D) Knicks.

The correct answer is "**D**". You would mark "**D**" on your touch-screen terminal.

I. Introduction

Research has shown that non-flame-resistant 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 and other materials used for artistic enhancement in certain occupancies, including public assembly occupancies, to be either inherently flame resistant or treated to be flame resistant.

The New York Fire Department regulations that require curtains, drapes, hangings and decorations to be of a flame-resistant material applies **to all public assembly areas within buildings** including the following:

- Common areas in Group R-2 occupancies (hotels and hotels)(excludes, guest rooms)
- Group A occupancies (public assembly, including theaters and public halls), except places of religious worship.
- Group M occupancies (mercantile, including department stores), except decoration displayed for sale.
- Common areas in Group R-1 occupancies (multiple dwellings)
- Common areas in Group B occupancies (office buildings)
- Group E occupancies (Educational)
- Group I occupancies (Institutional)

The owner of a building subject to these regulations is responsible for making sure that the materials used for artistic enhancement in the building meet Fire Department requirements. Fire Department inspectors may conduct unannounced inspections of the premises, and enforcement action may be taken against a building owner when violations are observed. Enforcement actions may result in fines against the owner, and in the event of misconduct on behalf of the Certificate of Fitness holder, such certificate may be revoked.

II. Definitions

Several terms are used when discussing flame retardant treatment of decorative materials and interior finishes. The definitions of some of these terms are listed below.

CONIFER - Any tree, plant or shrub containing pitch, including hemlock, balsam, pine and fir.

DECORATION - Any item that is used for aesthetic or artistic enhancement of interior space, including draperies, hangings, artwork and decorative greens.

FIRE-RETARDANT COATING - An approved coating that, when applied to the surface of scenery in an approved manner, imparts flame resistance and reduces flame spread.

FLAME-RETARDANT TREATMENT - An approved chemical that, when applied to a material in an approved manner, imparts flame resistance to a material.

FLAME-RESISTANT MATERIAL - Material that meets the criteria for flame-resistance as set forth in NFPA 701, either because it is inherently flame-resistant or because it has been subjected to a flame-retardant treatment.

GENERAL SUPERVISION - Except as otherwise provided in this code, supervision by the holder of any department certificate who is responsible for performing the duties but need not be personally present on the premises at all times.

INTERIOR FINISH - Construction materials that form the exposed interior surfaces of a building and that are part of or affixed to walls, fixed or folding partitions, ceilings, and other construction elements.

NATURAL DECORATIVE GREEN - A bough of a natural tree or part thereof.

NATURAL TREE - Any live tree, plant or shrub, including conifer, that is rooted in soil.

SCENERY - Any or all of those devices ordinarily used on a stage in the presentation of a theatrical, artistic, musical or other similar live performance, such as back drops, side tabs, teasers, borders or scrim, rigid flats, set pieces, and all properties, except costumes.

PERSONAL SUPERVISION - Supervision by the holder of any department certificate who is required to be personally present on the premises, or other proximate location acceptable to the department, while performing the duties for which the certificate is required.

III. Flame Retardant Treatment of Materials

Flame Retardant Treatment of Materials

A person holding a Certificate of Fitness for flame retardant treatment must treat or personally supervise the flame retardant treatment of the materials to be used in affected buildings. The Certificate of Fitness holder is responsible for making sure that the correct procedures are followed during the flame retardant application process. All chemicals and application methods used during the flame retardant must be approved by the NYC Fire Department

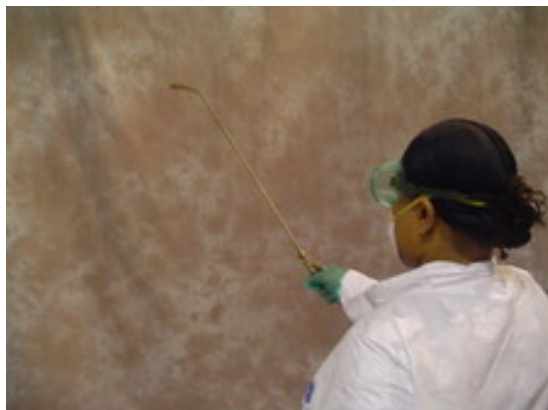
and have a Certificate of Approval number. Chemicals or products that have not received a NYC Fire Department Certificate of Approval may not be used to treat combustible materials to be flame resistive.

Several different types of flame retardant 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. Some treatments lose their effectiveness when exposed to the solvents used in certain dry cleaning operations. Still other treatments have short lived effectiveness and should only be used for short periods of time. It is important to understand that not all materials may be treated to be flame resistive (e.g., hemlock, balsam, Spanish moss, and Christmas trees that contain pitch).

Two basic methods are used to treat materials to be flame resistive: (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 as both methods offer acceptable results.

Examples of fabric being sprayed with a flame retardant chemical





Flame-Retardant Treatments

The Certificate of Fitness holder must determine which flame retardant treatment is best suited to the materials used on the premises by contacting the manufacturer of the flame retardant chemicals. Generally, most fabric materials may be made flame resistive using water-soluble treatments. The Certificate of Fitness holder must use flame retardant chemicals that have been approved by the Fire Department and have a Certificate of Approval number. Enforcement action may be taken against a Certificate of Fitness holder if unapproved flame retardant treatments are used to comply with the Fire Department requirements.

IV. Handling, Using and Storage of Flame Retardant Chemicals

The chemicals used during the flame retardant treatment 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 required that Material Safety Data Sheets (MSDS), which describe the nature of the chemicals and how they must be stored and handled, be available on the premises, and should be positioned close to the chemical storage area. 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, skin, or is spilled). 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 United States 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.

V. Flame Resistance Tests

Flame Resistance Tests

All materials (those that are subjected to a flame retardant treatment and those that are already flame resistant) used for the artistic enhancement of public buildings must be certified by a Certificate of Fitness holder as being in compliance with the requirements of NFPA 701. For materials that are subject to a flame retardant treatment to become a flame-resistant material, the Certificate of Fitness holder must use a chemical that has been issued of FDNY certificate of approval and follow the procedures for the application as may be established in the certificate of approval. Certificate of Fitness holders that follow such procedures can then complete the required affidavit of flame-resistant materials after completion. Field flame testing of the flame resistance may be necessary according to manufacturer's recommendation. For materials that are inherently flame resistant, the Certificate of Fitness holder should obtain documentation from the manufacture or other responsible authority that the materials are inherently flame resistant, that is they are capable of passing the NFPA 701 test without the application of a flame retardant treatment. Certificate of Fitness holders that follow such procedures, can then complete the required affidavit of flame-resistant materials.

A Certificate of Fitness holder should not certify an affidavit that a material is inherently flame resistant unless he/she has appropriate documentation from a manufacturer and conducts a field flame test.

If the documentation can not be produced, the Fire Department may authorize a Certificate of Fitness holder to **only** conduct a field flame test.

An owner must file an affidavit prepared by a Certificate of Flame holder with the Fire Department before installing the materials on the premises. In the field, FDNY representatives may conduct a field flame test to verify that the materials are flame resistant. Both tests and the required Certificates of Flame Resistance are briefly described below:

Lab Test

NFPA 701 – Test Method 1 for textiles and films 20 oz per square yard or less; Test Method 2 for textiles and films greater than 20 oz per square yard. Note that some fabric manufacturers list the weight of the fabric per lineal yard. The Fire Department will accept test results only from laboratories accepted by FDNY.

Field Flame Tests

Field flame tests may be conducted by Fire Department inspectors and the holders of Certificates of Fitness for flame resistance to determine the adequacy of a flame retardant treatment or to determine whether a material is inherently non-flammable (e.g., steel, sheetrock, melamine). Generally, the Certificate of Fitness holder conducts a field test since it is not possible for them to conduct a lab test. However, the Fire Department inspector will always conduct an on-site field test of all materials (flame retardant treated and non-flammable) 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.

FDNY recommends the following Field Flame Test:

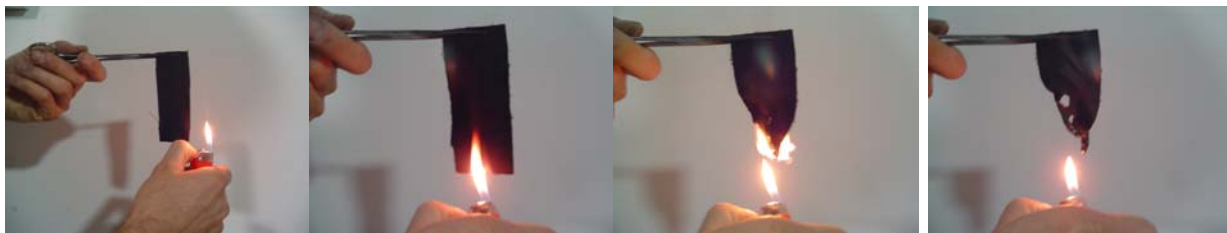
1. The material should be tested by using a sample that is fully cured and dry and, unless impracticable, approximately one and one-half (1½) inches wide by four (4) inches long. The minimum specimen size is ½" x 2-1/2". Note that some flame retardant chemicals require 24 hours to fully cure at room temperature after application. Testing before the chemicals are fully cured may yield a false positive or false negative result.
2. The flame test shall be performed in a draft-free, safe location, within ten (10) feet of a portable fire extinguisher with at least a 10-lb rating.
3. The specimen shall preferably be suspended with tongs or a device to firmly grasp the top of the specimen, and to ensure the safety of the person performing the test with the long axis vertical over a non-combustible surface.
4. The flame shall be not be more than 1" high and be from a common wood kitchen match or common butane lighter. Gas lighters that provide a concentrated jet action similar to a propane torch shall not be used.
5. For polyester or other man made materials which may drip, the distance between the specimen and the non combustible surface should be 1 foot 6" inches.
6. Apply the flame to the center of the edge bottom of the specimen for 12 seconds so that half of the flame extends into the specimen in its initial state. The distance from the flame to the top of the specimen shall remain constant.
7. The sample shall be deemed to be satisfactorily flame-resistant only when all of the following conditions are met by all three specimens:
(A) the flame does not spread over the entire sample; and

- (B) the specimen does not continue to burn for more than two (2) seconds after the flame has been withdrawn; and
- (C) the flaming material does not break or drip from the specimen **and** continue to burn on the non-combustible surface.
8. If one specimen does not meet the requirements, an additional specimen may be taken and the process repeated. If the second specimen meets the requirements, the sample may be deemed to pass. If the first or second specimen do not meet the requirements, the sample is deemed to fail.
 9. In addition to the conditions above, if the material melts or curls away from the flame, this shall be deemed acceptable. If the material breaks away from the specimen without flaming, this shall be deemed acceptable.
 10. If the material is a natural/synthetic blend, at least one specimen shall be taken from a direction 90 degrees to the other specimens, unless it can be verified that the specimens are taken in a longitudinal manner to the direction the fabric is used.
 11. If it is not practical to take two specimens from the material, one shall be deemed sufficient.

See photos for specific information:



Field Flame Test on cotton



Field Flame Test on polyester

The field flame test serves as a good indicator of whether the materials are adequately flame resistant or not.

Enforcement action may be taken against the Certificate of Fitness holder if a flame retardant treated 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 field test, the material must be re-treated or removed from the premises.

VI. Affidavits of Flame Resistance

Affidavits of Flame Resistance for Treated Materials:

After the flame retardant treated material has passed a field flame test conducted by the Certificate of Fitness holder, he/she must prepare a sworn Affidavit of Flame Resistance which shall be filed by the building owner or owner of the treated materials with the Fire Commissioner. The certificate should be written on company letterhead and must indicate the following:

- The date of the flame retardant treatment or test.
- The name of the flame retardant chemical used and its Fire Department Certificate of Approval number.
- That the flame retardant treated materials have been tested and they meet the standards established by the Fire Department.
- The Certificate of Fitness holder's name, their Certificate of Fitness number and its expiration date.
- The warranted period of effectiveness of the flame retardant application.

An example of a typical Affidavit of Flame Resistance stating that the materials have been appropriately treated and passed a field test is shown below.

Affidavit of Flame Resistance

Issued to: James Jerk Theater
155 W. 37 St.
New York, NY 10001

Treatment/test date: July 27, 2009
FR Product used: Flam-Comp 789, C of A #1234

This is to certify that in accordance with NYC Fire Code 805 the following items were treated on the date above with a Fire Retardant approved by and registered with the NYC Fire Dept. This chemical is approved for use on the materials listed below:

4 – Lobby Drapes, 8'w x 12'h, 50% full, red velour

Certificate of Fitness for Flame Retardant Treatment

- 1 – Main Curtain, 20'w x 16'h, 75% full, blue velour
- 1 – Painted backdrop, 24'w x 15'h, muslin

The warranted period of effectiveness is up to Three Years in accordance with NYC Fire Rules § 805-01, with annual testing recommended. Any washing, cleaning or alteration of this material will void this certificate.

Bob Brentwood
Certificate of Fitness No. 89999999
Expiration Date 5/14/10

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

Affidavits of Flame Resistance for Registered Materials:

Just as flame retardant chemicals are registered and approved by the Fire Department and have received a Certificate of Approval number, fabrics that are inherently or durably flame retardant are registered and have received a Certificate of Approval number.

When these materials are used, the Certificate of Fitness holder must test these items to verify their continued flame resistance, and issue an Affidavit of Flame Resistance in the same manner as above. The *material's* Certificate of Approval number is listed in place of a flame retardant chemical. Periodic testing is recommended as accumulated dust and dirt may inhibit the effectiveness of the flame retardant chemical mixed in with the threads or finished material during production of the material.

Affidavits of Flame Resistance for Non-Flammable Materials:

The owner of a building that requires flame retardant processes must file an Affidavit of Flame Resistance with the Fire Commissioner before a non-flammable material is used for artistic enhancement in a public building. The Certificate of Flame Resistance should be written on company letterhead and must indicate the following:

- The name of the manufacturer or supplier of the non-flammable material.
- The type of material used.
- The non-flammability 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 of Flame Resistance must be maintained on the premises and made available to Fire Department

Inspectors. When an Affidavit of Flame Resistance has not been filed with the Fire Commissioner, the material must either be treated to be flame resistive, field tested or be 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 Flame Retardant Treated Materials

The effectiveness of flame retardant chemicals may be significantly reduced when the treated materials are dry cleaned, and are usually completely removed if they are washed. The Fire Department requires flame retardant treated materials that have been dry cleaned or washed to be re-tested and, if necessary, to be re-treated, or removed from the premises. After the materials have been tested or re-treated, the Certificate of Fitness holder must provide a new Affidavit of Flame Resistance to the owner who must file it with the Fire Commissioner indicating that the materials meet the flame resistance standards established by the Fire Department. The re-treated materials must also be subjected to a new lab flame test (NFPA 701), or field flame test conducted by a Fire Department inspector.

The Certificate of Fitness holder must check the manufactures statements regarding the impact that washing and/or dry cleaning may have on materials. In certain cases, the materials may need to be retreated. If not required by the manufacture or the Fire Department's Certificate of Approval conditions to be retreated, a field flame test shall be conducted.

Fire Department Acceptance

As stated earlier, the use of non-flammable or flame retardant treated materials for artistic enhancement in certain occupancies or portions of occupancies must meet Fire Department standards. A field flame test must be conducted and an Affidavit of Flame Resistance 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 the maximum time allowed by the manufacturer of the flame retardant chemicals as stated in the flame retardant chemical's Certificate of Approval or until the materials are washed, dry cleaned or the flame resistive properties are otherwise rendered ineffective, with the maximum time allowed being 3 years. This period is officially called the Period of Acceptance. After the Period of Acceptance has expired, the owner of the building or the materials may apply to renew acceptance. Acceptance will only be renewed after the materials have passed a new field flame test and a new Certificate of Flame Resistance is issued by the Certificate of Fitness holder. Acceptance may be renewed for a 3 year time period only, after which time materials must be either re-treated or removed from the premises.

Special Considerations

Under 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.

A SAMPLE FLAME RETARDANT APPLICATION COMPANY
1234 Main Street, New York, NY 10001

CERTIFICATE OF FLAME RESISTANCE

Certificate Holder: _____ Live Theatrical For: _____ The Musical"
Productions, LLC Broadway Theater
Broadway.
New York, NY 10036

Certificate Date: November 5, 2008 Certificate Number: 6436
Expiration Date: November 4, 2009 Original

This is to certify that in accordance with NYC Fire Code 805 and NYC Fire Regulations §805-01, the following items were treated on the Certificate Date above with a fire retardant chemical approved by and registered with the NYC Fire Dept. This chemical is approved for use on the materials listed below:

- Items:
- 1 #1 Border, 51'w x 32'h, painted scrim and polyester strips on cotton scrim netting
 - 1 #2 Border, 51'w x 8'h, painted scrim and polyester strips on cotton scrim netting with dark gray wool felt backing
 - 1 #3 Border, 51'w x 32'h, painted scrim and polyester strips on cotton scrim netting with dark gray wool felt backing
 - 1 #4 Border, 51'w x 32'h, painted scrim and polyester strips on cotton scrim netting

--end of certificate--

Registry No: NYCFD Cert. of Approval #5022

The warranted period of effectiveness is One Year in accordance with NYC Fire Regulations §805-01. The application is valid for up to three years, with annual testing recommended. Any washing, cleaning or alteration of this material will void this certificate.

I, _____, am certified by the City of New York with a Fitness Certificate # _____ which expires on January 12, 2011.

Sworn to before me this day
December 3, 2009

Signed and attested to:

Notary Public, State of New York
No. 01BL6149945
Qualified in Kings County
My Commission Expires July 17, 2010