

Fabrics and Flames: Essential Guidelines for Fire Code Compliance

Presented by: Troy Coleman II
On-Site Drapery Cleaners



TOLL FREE: **1-800-465-2082**
onsiteservicegroup.com

Objectives

- 1) What does the Fire Code Require?
WHAT, WHEN, WHICH TEST & WHERE
- 1) Flame Retardant Treatments: Background, Composition, Effectiveness
- 2) Best Practices on Care of Maintenance of Drapery

THE RISKS

- All Drapes are naturally flammable and represent large quantity of combustible material.
- In the past, there have been terrible disasters related to fires in assembled occupancies such as theatres
 - In fact, the deadliest theatre fire on record, Iroquois Theatre in Chicago was caused by an arc light which ignited the curtains. 602 people died.
 - 1942 Coconut Grove fire in Boston, Massachusetts (492 fatalities)
- On theatre stages, the presence of hot lights, props and electrical sparks significantly increases the risk of fire.
- In response, safety standards and codes have been developed to prevent these types of disasters from ever happening again.
- **NFPA first added requirements for textile flame proofing in 1938.**



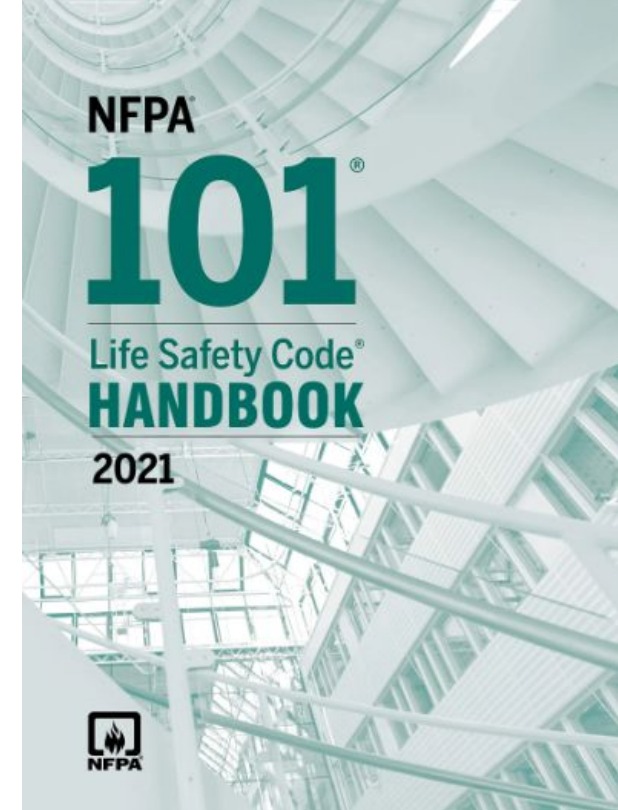
FIRE CODE DECIPHERED: WHAT, WHERE, WHICH TEST & WHEN

WHAT?

Drapes, curtains, netting, and other similar or decorative materials, including textiles and films used in buildings.

WHERE?

- **Assembly Occupancies:** Generally considered any room which has occupancy greater than 100. Most public spaces: schools, churches, theaters, auditoriums.
- **Hallways & Exits:** In Any Public Building
- **Healthcare:** All Healthcare Facilities



WHICH TEST?

New Drapes: NFPA 701 or NFPA 289

Existing Drapes: NFPA advises that flame proofing treatments shall be renewed as often as required to pass NFPA 705

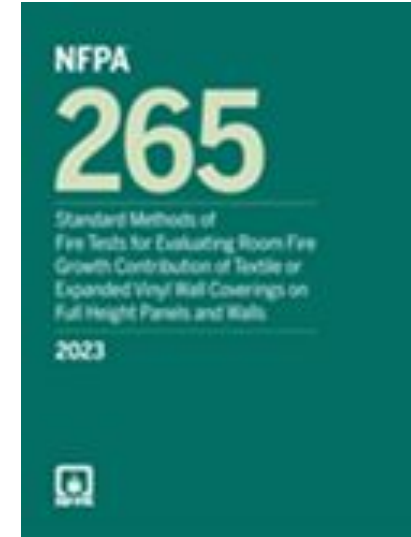
Wall Coverings: NFPA 265

Furniture: NFPA 260, 261, TB-117



NFPA 265

- **NFPA 265, Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls**
 - Uses 12"x12" gas burner placed 2 inches from wall covering material in a burn room.
 - Apply Heat output of 40 kW for 5 minutes, 150 kW for 10 minutes
 - Fail if any two of the following occur:
 - Heat release exceeds 1 MW
 - Heat flux at floor exceeds 20 kW/square meter
 - Average Upper Layer temperature exceeds 600 degrees C
 - Flames Exit Doorway
 - Paper Target on Floor Auto-ignites



NFPA 701

- **NFPA 701 “Standard Methods of Fire Tests for Flame Propagation of Textiles and Films”**
 - Measures flash, after flame, flaming drips, char length, percent mass loss due to burning
 - Test Method #1
 - Designed for plastic or vinyl lined materials
 - 10 samples, 5.9” by 15.8” taken lengthwise only
 - 45 seconds flame exposure
 - Test Method #2:
 - Designed for standard textiles such as drapery
 - 10 samples, 4.9” by 47”- 10 samples, 4 samples of folded
 - 120 seconds of flame exposure
 - **New Drapery: Manufactures Must Provide Current Certificate**
 - **For Existing Drapes 701 is Destructive Testing: Laboratories require a yard of fabric to conduct this test.**



NFPA 705

- **NFPA 705 “Recommended Practice for the Field Flame Test for Textiles and Films”**
 - 1 piece of fabric, minimum of ½” by 4 “ in size
 - 12 seconds of flame exposure
 - Measures flash, after flame, flaming drips. Fails if flashes, burns for 2 seconds or more, or has any drips which continue to burn.
- **Previously known as NFPA 701 Small Scale, was renamed 705 in 1989**
- **Good to Test Existing Drapery: Non-destructive Testing**



WHEN

Existing Drapes: NFPA advises that flame proofing treatments shall be renewed as often as required to pass NFPA 705

Typically, all stage draperies require servicing at least every five years to maintain their flame retardant properties and warranty. IFR drapery can be cleaned only to remove combustible dust, FR drapery requires cleaning and re-application of flame retardant.



Match Flame Test

National Fire Protection Agency
- CODE NFPA 705 -

Recommended Practice
for Field Flame Test
for Textiles and Films



WHERE? ASSESSMENT OF RISK

1) Care, Treatment or Detention Occupancy:

Where: Hospitals:

- Low risk, typically IFR fabrics throughout hospital.
- Window drapes largely replaced with blinds.
- Sprinklers Throughout



Where: Nursing/Long Term Care

- Older Long Term Care facilities may have window and bedside drapery at risk. Also, home-made drapery common.
- Some do not yet have Sprinklers
- Recent Fires in Quebec and Whitby have highlighted sector for enforcement.



WHERE? ASSESSMENT OF RISK

2) Lobby or Exit of Any Public Building

**Where: Hotels, Retirement Homes, Stores,
Condominiums, Businesses, Government Buildings,
Community Centres**

- Decorative elements in public buildings
- Risk that materials used are not IFR.
- Even IFR drapes will fail if dirty .
- Some installations have large windows with large amounts of textiles.
- Risk that materials used were made using residential grade fabrics, not IFR

WHERE? ASSESSMENT OF RISK

3) Assembly Occupancies- More than 100 person load

Where: Theatres, School Stages, Funeral Homes, Banquet Halls, Churches, Private Clubs, Golf Clubs, Restaurants/Nightclubs, Convention/Event Spaces

- Elevated Risk due to large numbers of people assembled at once.

- Hot Lights and Electrical Sparks increase risk on stages

- **Professional Theatres** Typically are aware of Fire Code Certification for Drapery, Theatres however do not typically know that the flame retardant properties will wear off with the accumulation of dust and **must be renewed every 3-5 years.**

- **School Boards:** Elevated risk draperies often in contact with hot lighting.

Most school boards do not have a comprehensive program of testing and re-certification. Even failed results are ignored by schools as the board has not provided funding to re-certify the drapery to the schools. Boards specifying IFR draperies which are failing NFPA 705 testing after less than 1 year and are highly combustible

- In **Banquet and Restaurants** the presence of open flame increases risk.

- **Churches, Private Clubs, Golf Clubs , Restaurants and Nightclubs** often use non-IFR materials when creating decorative elements. Many items imported from the US, contain US certifications only.

- **No regime of testing & re-certification in place- Reactive only.**

WHERE? ASSESSMENT OF RISK

4) Any building with open floor area greater than 1500 square metres

Where: Shopping Malls, Public Buildings, Museums, Arenas, Universities, Indoor Sports Facilities, Community Centres

-Typically few fabrics used in these areas, however, decorative elements, fake plants, netting and seasonal displays can present issues.

- Museum art, quilts, decorative elements can be difficult to treat without affecting look and feel of fabrics, but most can be successfully treated.

THE SOLUTION: PART 1: NFPA 705 TESTING

1) Determine Actual Flammability Today: PASS or FAIL

CERTIFICATE OF NFPA 705: FIELD FLAME TESTING

Date of Testing: January 14, 2014


Location: Montcalm Secondary School
1350 Highbury Lane
London, ON N5W 1B5


Material Tested: Drape Drape
Main Draw Valance
Mid Draw Borders
Legs Rear

Method of Testing: Field Flame Test for textiles and films in accordance with N.F.P.A code 705 flame test procedures. As per Fire Code, Section 2.3.2 Flame Resistance of Textiles.

Test Results: The Test material **MET OR PASSED MINIMUM REQUIREMENTS**

This result is valid as of date of testing only, and should be renewed annually. If materials are washed or become wet, the material must be re-treated immediately.

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Burlington, On L7L 6X6
info@onsiteservicegroup.com
www.onsiteservicegroup.com



CERTIFICATE OF NFPA 705: FIELD FLAME TESTING

Date of Testing: April 15, 2014

Location: Simcoe Muskoka Catholic District School Board
Our Lady of Lourdes School
34 Kerr Street
Elmvale, On L0L 1P0

Material Tested: Drape Style
Main Draw

Method of Testing: Field Flame Test for textiles and films in accordance with N.F.P.A code 705 flame test procedures. As per Ontario Fire Code, Section 2.3.2 Flame Resistance of Textiles.

Test Results: The Test material **FAILED minimum requirements** and should be re-treated.

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2) For those which FAILED, evaluate two options to compliance:

- 1) **Replace** All Draperies with new ones
- 2) or **Clean & Re-New Flame Retardant Treatments on Draperies**

THE SOLUTION: PART 2: KEEP TRACK OF FUTURE RENEWAL DATE

Once we have completed re-treatment, we put a sticker on the drape and enter customer into our system and remind them when there drapes are due for re-treatments

THIS FABRIC HAS BEEN TESTED IN ACCORDANCE WITH
NFPA CODE 705 FLAME TEST PROCEDURES.

TESTING DATE:

RESULT: **PASS**

RE-TEST BY:

**IMPORTANT-DO NOT WASH OR DRY CLEAN:
REMOVES FLAME RETARDANT & VOIDS CERTIFICATE
CONTACT ON-SITE SERVICE GROUP FOR SAFE
CLEANING, RE-TESTING AND RE-CERTIFICATION**



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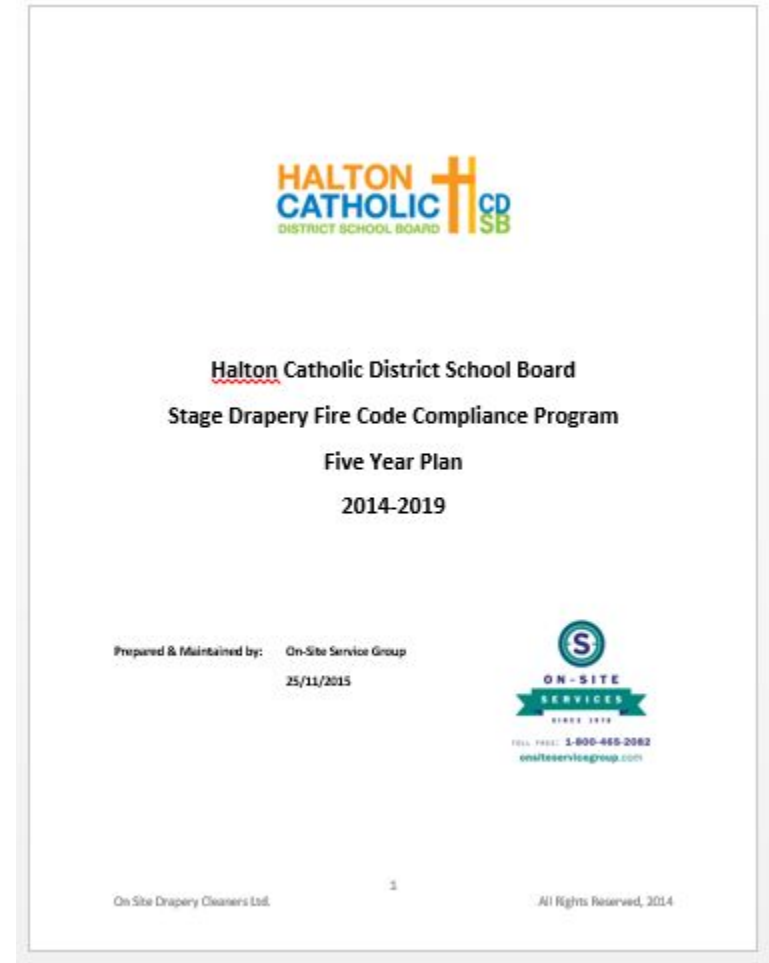
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How Often Should Flame Retardant Treatments be Renewed?

1. For Draperies in Public Buildings, Lobbies, Restaurants, Nursing, Retirement, which are exposed to light, food, liquids and high touch surfaces, we recommend annual re-testing and re-treatment every 3 years.
2. Draperies in Theatre Stages such as Theatres and School Gyms, typically treatments will last 3 years.

THE SOLUTION: PART 3: SCHOOL DISTRICTS WITH MANY SITES

- School districts are high risk, draperies regularly come in contact with hot stage lights, electrical sparks and careless students.
- School districts have literally hundreds of stages. Typically, certificates are lost in the bureaucracy of the school board. Most sites are well over 3 years old and Stage Drapery fire code compliance is often ignored until they are prompted.
- The solution is to have a 3 Year Plan implemented. We test all their sites, then we develop an ongoing plan to keep track of flame retardant treatments and re-testing schedule. Those which Fail are re-treated immediately, then scheduled for re-testing in 3-5 years. Those which Pass are re-tested sooner.
- Helps them to keep track and ensure all draperies have current flame retardant applied.



FABRICS BACKGROUND

RAW FIBRES

Natural: Animal: Wool, Silk

Plant: Cotton, Flax, Jute, Hemp

Mineral: Asbestos, Fiberglass

Synthetic: Petroleum: Nylon, Polyester, Acrylic



PRODUCTION

- **82% of all fibres are synthetic where as in the past, natural ruled.**
- **Asian countries are now the largest producers**
- **Asia is growing their Natural Fibre production**

STAGE DRAPE FABRICS:

- **Types of Fabrics:**
 - **Velours:** Theater Draperies are typically velour fabrics
 - **Commando:** Commando Cloth or Duvetyn
 - **Muslin:** Scrims can be translucent gauze or solid cloth
 - **Wool:** Heavy density make wool good for sound and light absorption
- **Colors:** Black or dark colors which absorb the most light.
- **Composition:** Cotton and wool and lately more synthetic fibres are used.
- **Fullness:** The greater the fullness, the richer and heavier the curtain appears



FABRIC TYPES & FLAMMABILITY:

- The fabric weight and weave will affect flammability of fabrics. Fabrics with a tight weave are less likely to ignite than the same fabric in a looser weave.
- Surface texture also will affect flammability. Long, fluffy pile materials such as nap on a velour drapes are more likely to ignite than a hard tight surface.



FABRIC TYPES & TREATMENTS:



- Drapery Flame Retardants are either Applied (FR) or Inherent (IFR)
- FR- Natural Fibre Drapery is Typically flame-retarded by dipping or spraying
- IFR- Synthetics retardants are Inherent in the fibres, usually costlier
- **If certificate is more than 5 years old, the drapes should be re-tested.** Typically, all drapery should be cleaned & re-certified every 5 years.

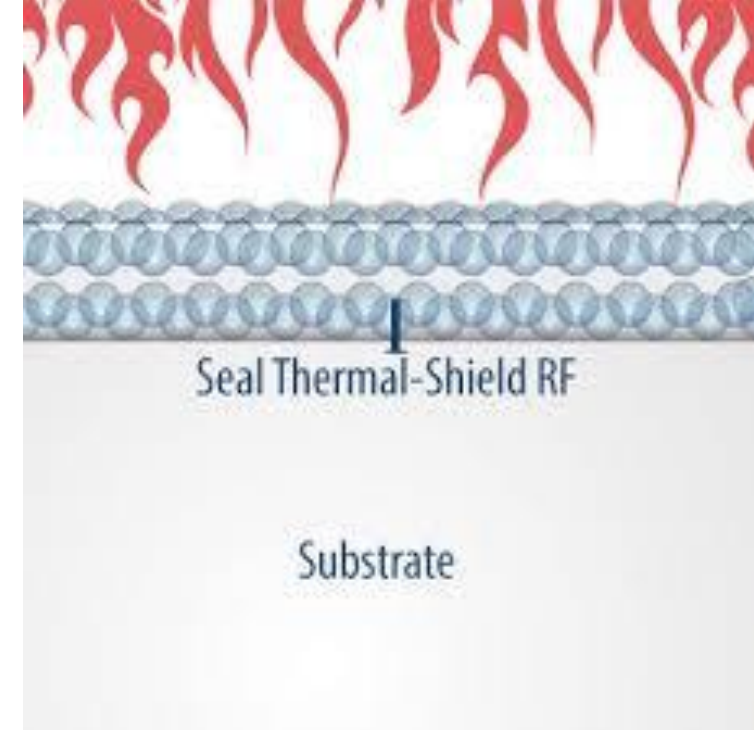
FLAME RETARDANT BASICS

- How it Works
- How is it applied
- Why it wears off
- What happens when wet?
- Chemical Composition
- Environmental & Toxicity Information



FLAME RETARDANT TREATMENTS

- Wide Variety of Chemicals Used to inhibit, suppress or delay combustion of materials. Two primary types:
 - **Halogenated** - Chemically Alter under combustion
 - Includes - Brominate, Chlorine and Nitrogen.
 - **Thermal Shielding** - Non-combustive barrier between the flame and combustible materials.
 - Includes – Phosphorous – most commonly used in textiles, furniture, plastics, electronics and foam.



HISTORY OF FLAME RETARDANTS

The use of flame retardants plays an important role in fire safety.

- Many household goods are made from natural or petrochemical flammable
- California Technical Bulletin TB-117 – 1975 – Defacto National Standard of flame retardants in furniture.
- Retardants were added to a wide variety of consumer goods
 - furniture, plastics, nylons, electronics, appliances, toys and even kids pyjamas.
- One family of these chemicals, the halogenated polymeric brominated compounds (BFRs) have been linked to cancer, can be a neurotoxin and cause thyroid problems.



CURRENT FLAME RETARDANT TREATMENTS

Requirements, Test Procedure and Apparatus for Testing the Smolder Resistance of Materials Used in Upholstered Furniture

In January 2015, TB-117-2013 came into effect.

- Revision
 1. lowered the flame testing standard on individual components and
 2. Focused on the flammability of final assembled item.
- Products manufactured after January 1, 2015 require a label disclosing flame retardants used, if any.
- **IMPORTANT** - TB-117-2013 does not prevent manufacturers from using flame retardants **BUT** makes it possible to manufacture without flame retardant chemicals.

ENVIRONMENTAL AND TOXICITY

- Mineral Based
 - includes salts, phosphors, sulfurs and other mineral based coatings.
- Contain NO Volatile Organic Compounds (VOC's), PCB's or PSDE's therefore non-hazardous.
- The Health, Flammability, Reactivity ratings are all 0
 - Slight hazards listed are related to prolonged skin exposure or eye contact – irritations
 - Ingestion of large quantities may, however, cause gastrointestinal discomfort, so don't drink it.



CARE & MAINTENANCE OF DRAPERY

- Annually:
 - Vacuum with a light brush
 - Or beat with clean broom
 - Keep Stage Area as Free of Dust as possible
 - Repair Any Tears/Rips- A stitch in time does save nine!
 - Test Drapery for Flame Retardancy
- Every 3 Years: Flame Retardant Renewal
 - Typically the Flame Retardancy of Drapery will require renewal every 3 years.
 - For IFR drapery, cleaning them will restore the flame retardant properties as it is the dust which is flammable. IFR draperies do not typically lose their flame retardant properties when dry cleaned.
 - Flame Retardant Treated Materials will require cleaning and re-treatment of drapery. Flame retardants wear off over time and are affected by humid or dry environments. Flame retardant properties are typically removed when washed, dry cleaned or steam cleaned.



DRAPES MUST BE CLEANED PRIOR TO RE-TREATMENT WITH FLAME RETARDANT



Why?

- 1) Flame Retardant will adhere to dust and fall off rapidly.
- 2) Manufacturers Specification: Warrantee is void if applied incorrectly.
- 3) Stains the drapes, sometimes permanently.



HOW DO YOU CLEAN DRAPERIES?

- 1) Wash Them ?
- 2) Have them Dry Cleaned ?
- 3) Steam Clean Them?
- 4) Vacuum Them ?
- 5) Non-Immersion Cleaning ?



RESULTS OF WASHING: NOTICE SHRINKAGE & PULLED SEAMS



RESULTS OF WASHING DRAPES:



HOW DO YOU CLEAN CURTAINS?

2) Dry Cleaning?

- Traditional Dry Cleaners immerse drapes in harsh dry cleaning fluids at high temperatures which cause shrinkage and fabric distortion.
- Drapes are often stretched and pressed to attempt to restore original shape and form.
- Delicate drapery fabric does not stand up well to heat, pressing and harsh chemicals.
- The result - degraded fabric which will never regain its original shape and look.
- Tassels, trim, silk, wool or have a blackout lining, they will be ruined with just one cleaning.
- Further a chemical reaction often occurs with existing flame retardant, can cause permanent staining.
- Majority of dry cleaners are still using perchloroethylene (perc)- classified as a Group 2A carcinogen and linked to Parkinson's. They are being phased out of use in the US, due to its known detrimental effects on both humans and the environment. Replaced with other VOC's.
- A lack of viable alternatives, perc is still widely used.
- Drum diameter of a dry cleaning machine is quite small compared to the size of stage drapes
- Cannot effectively remove the residual perc and unevenly removes the flame retardant, leading to the stains shown below.
- Further, the residual perc stays in the drape until it is hung in the school or theater where the VOC's then off gas into the air, exposing everyone in the theater to a known carcinogen.

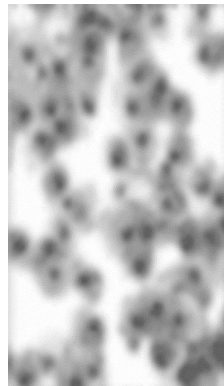


RESULTS OF DRY CLEANING DRAPERIES



Dry Cleaning Results:

In lab tests, under a microscope, fibres in the traditional dry cleaning method sample appeared degenerated, lacked colour, and were matted with grape like clusters of dirt (re-deposition of dirt) throughout.



RESULTS OF STEAM CLEANING

- Using hand held attachments connected to carpet cleaning machines. With minimal suction without a solid surface backing, most of the dirty water is injected deeper into the drape producing mould and mildew as they dry. Drapes are left with limp and wrinkled look .
- Drapes absorb so much water, they can pull tracks right out of the ceiling.
- Use of liquid injection causes flame retardants to be removed.



Drapes which have been steam cleaned- limp look, patchy flame retardant



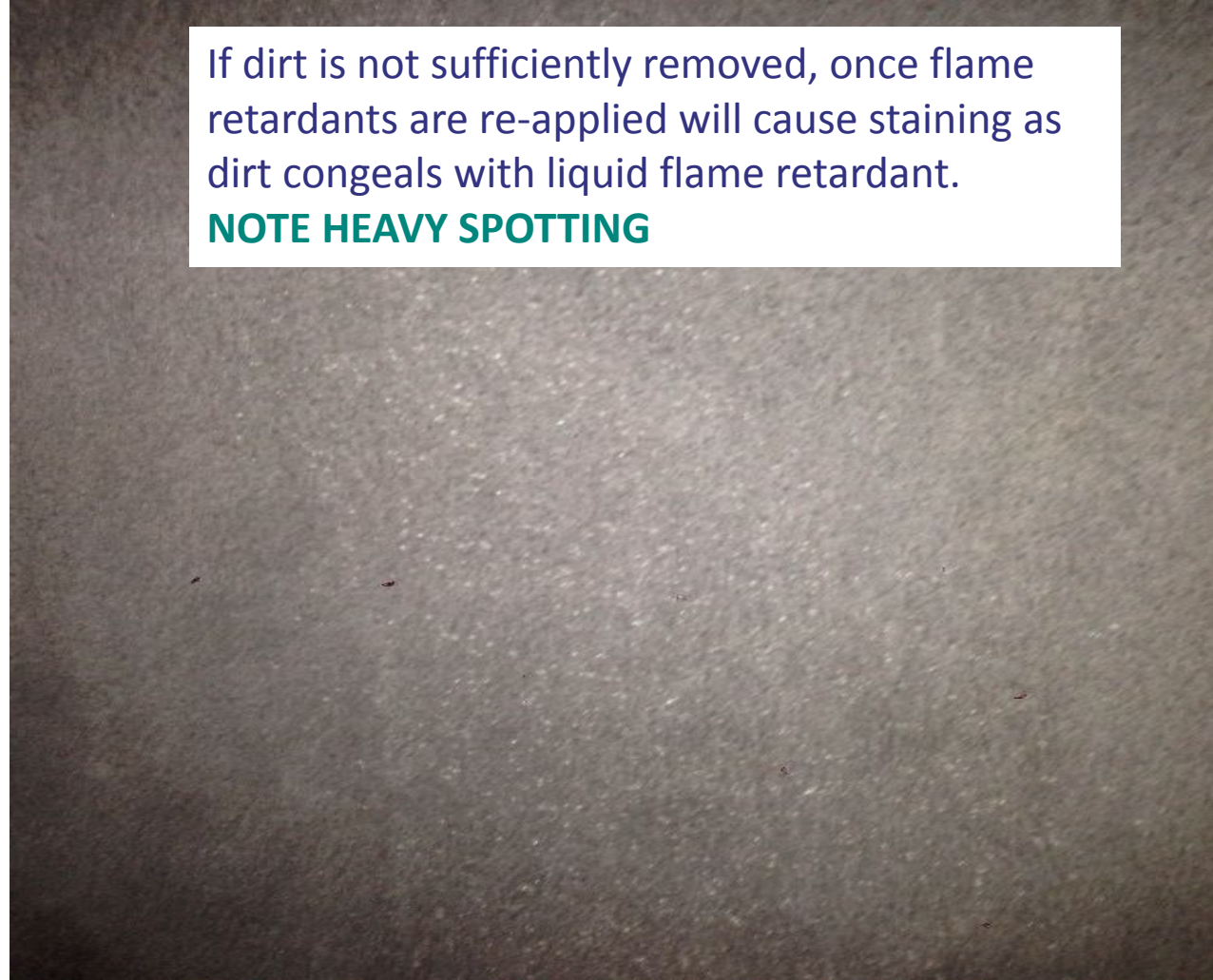
DRAPES CLEANED BY VACUUM ONLY PRIOR TO FLAME RETARDANT APPLICATION

- Vacuuming between deep cleaning cycles will remove surface dust. However, due to the absence of a solid backing, vacuums have difficulty generating sufficient suction to remove embedded dirt.



If dirt is not sufficiently removed, once flame retardants are re-applied will cause staining as dirt congeals with liquid flame retardant.

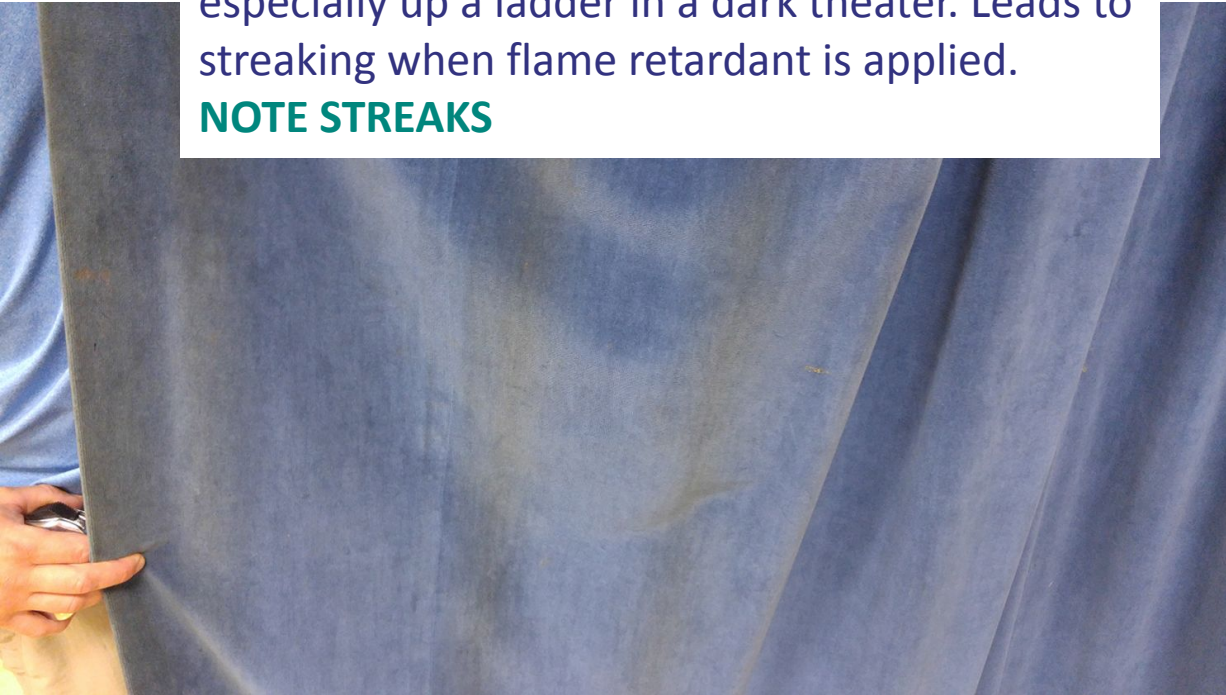
NOTE HEAVY SPOTTING



DRAPES CLEANED BY VACUUM ONLY PRIOR TO FLAME RETARDANT APPLICATION

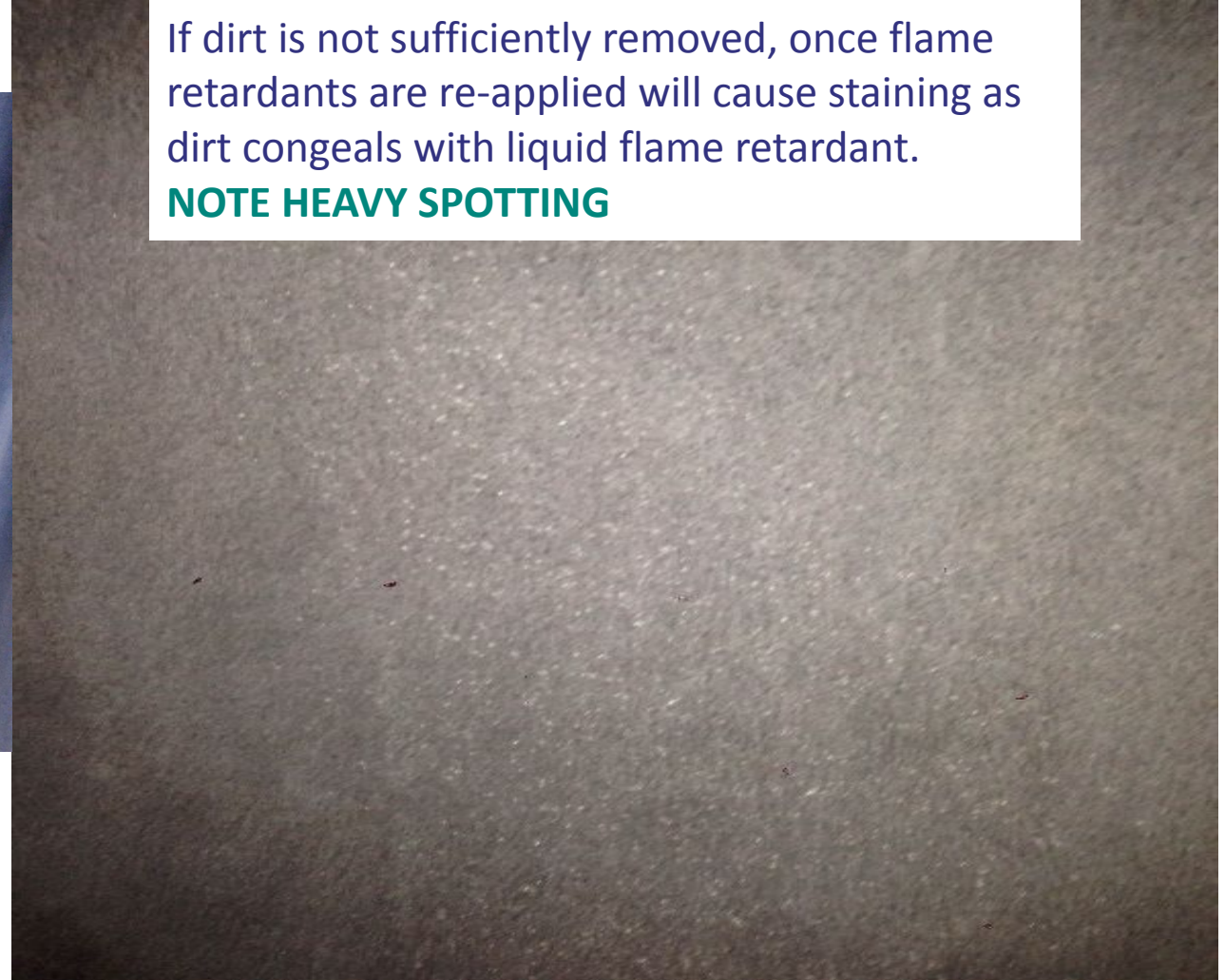
Impossible to clean every square feet evenly especially up a ladder in a dark theater. Leads to streaking when flame retardant is applied.

NOTE STREAKS



If dirt is not sufficiently removed, once flame retardants are re-applied will cause staining as dirt congeals with liquid flame retardant.

NOTE HEAVY SPOTTING



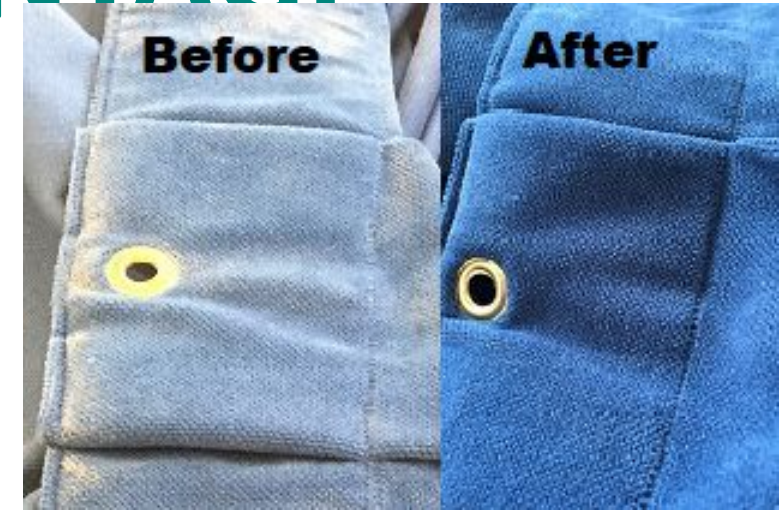
NON-IMMERSION CLEANING

- **Non-Immersion Cleaning:** Preferably, draperies should be cleaned using non-immersion cleaning technology, which does not expose draperies to liquids of any kind.
- Drapes are cleaned using powder, which combined with action of the drum, a powerful forced air extraction process and series of filters effectively removes dirt, odour and soil from drapes.
- Our motor creates 3,000 cubic feet per minute of suction, 30 times that of a vacuum.



THE NON-IMMERSION ADVANTAGE

- **No Shrinkage:** Unlike clothing, drapery fabrics are not pre-washed. When fabric fibres are exposed to liquids of any kind- either water or dry cleaning fluid, they will shrink considerably.
- **No Colour Fade or Bleed:** The colours of your drapery are critical. Why fade them away? Be wary of bleeding of colours, if immersed, dyes will run.
- **No Fabric Damage:** On-Site's non-immersion cleaning method is the gentlest way to clean your drapery. Traditional cleaning methods will lead to damage and distortion of fabric fibres.
- **No Distortion of Pleats and Seams:** Fabrics immersed in liquids will lose their shape resulting in lost pleats and limp looking. To address this, traditional dry cleaners will then use steaming, pressing and re-pleating machines. Heat and pressure degrade your fabric fibres.
- **Gentlest Method. Period.** There is no better method of cleaning drapery. Our proprietary system is so gentle we can even clean delicates, blackout-lined drapes, silks, & embroidered decorative draperies.
- **Won't Remove Flame Retardant:** Since we don't use liquids, we don't affect the flame retardant.



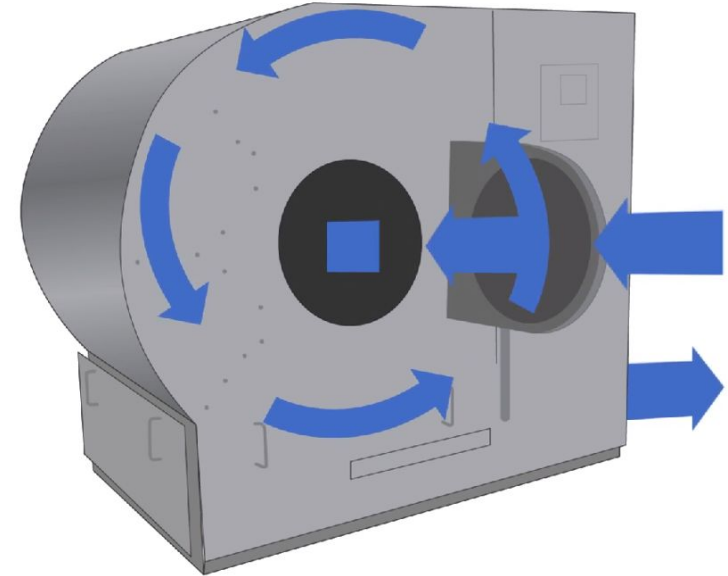
ON-SITE ADVANTAGES

Only Process which does not Remove Flame Retardant

- Most Flame Retardants are water soluble and will wash out completely if washed, steamed or dry-cleaned. In addition, harsh chemicals combined with heat can burn stains from flame retardant permanently into your drapes.
- On-Site's non-immersion cleaning method does not use liquids, therefore will not remove the existing flame retardant. Once cleaned, On-Site will provide Certification for Fire Code Compliance

Largest Drum in the Business:

- High Capacity: We can process significantly more draperies in a day than our competitors. For you, that means less down-time. In most cases, we can complete even large cleaning projects in the SAME DAY.
- Less Crowding: Traditional cleaners have much smaller cleaning drums, forcing them to cram drapery into their machines. This leads to excessive wrinkling and inconsistent cleaning results. On-Site has the biggest drum in the business which means your drapes do not get wrinkled or bound up and our cleaning results are even, not patchy.



ENVIRONMENTALLY FRIENDLY

- The Greenest- Especially since our competitors are still using perchloroethylene- a know carcinogen
- Non-immersion process means no toxic Dry- Cleaning Fluids to be disposed of **and** no waste water
- No Energy wasted making hot water
- On-site's waste is completely non-toxic
- No trace of residual toxins on your drapes

TOTAL SAVINGS LAST YEAR ALONE:

- 120,000 Gallons of hot water saved or
- 40,000 fewer Gallons of perchloroethylene Toxic Dry Cleaning Fluid to be disposed of



SUMMARY

1) Drapes are naturally highly flammable unless treated with flame retardant. Flame Retardant needs to be renewed.

HOW OFTEN: Flame Retardant wears off within 3-5 years or if fabric gets wet or is immersed in liquids.

2) Fire Code Requirements: **WHAT, WHICH TEST, WHERE**

WHAT: Drapes, Curtains, Textiles, Banners, Flags and Wall Coverings

WHICH TEST:

New Drapes: CAN/ULC S-109 Certification Required

Existing Drapes: Fire Code requires flame proofing treatments shall be renewed as often as required to pass NFPA 705

WHERE: Healthcare Facilities, Lobbies & Exits, Assembled Occupancies

WHEN: Fire Code says “as often as required”

3) The Solution: **REGULAR TESTING**

PART 1: Establish current flammability

PART 2: Track Re-Testing and Re-Treatment Dates

PART 3: For Multi-Site Clients Such as School Boards- Establish 5 Year Plan

SUMMARY

4) Fabric Types & Flammability Treatments:

Dipped or Woven (IFR)

All fabrics must be cleaned prior to re-application of flame retardant

Typically Flame Retardant Needs to be re-applied ever 3-5 years

5) Drapery Cannot be Safely Washed or Dry Cleaned without removing flame retardant

Non-Immersion Cleaning is best

6) Drapery can be Cleaned and Re-Treated for a Fraction of the Cost of Replacement

7) On-Site Service Group is a specialist in this field offers the following services:

- Testing & Re-Certification
- Cleaning
- Flame Retardant Re-Application
- Tracking of Re-Testing & Re-Application dates
- Implementation of 5 Year plans for multi-site clients such as school boards

IF YOU ARE IN DOUBT OF THE COMPLIANCE OF ANY FACILITY, SIMPLY HAVE THEM CONTACT US.



Don't Miss Your Curtain Call
1 833 579-0727
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- ⑤ SAME DAY SERVICE
- ⑤ WE BRING THE DRAPERY CLEANING PLANT TO YOU
- ⑤ NO FABRIC DAMAGE, SHRINKAGE OR FADING
- ⑤ FIRE CODE CERTIFICATION
- ⑤ ENVIRONMENTALLY FRIENDLY



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ADVANTAGES:

SUPERIOR TECHNOLOGY: Proprietary Non-Immersion System Delivers Outstanding Cleaning Results.

COST EFFECTIVE: Restore Your Curtains for a Fraction the Cost of Replacement.

LARGE CAPACITY: Our Extra Large Drum Means We Clean a Lot of Curtains, Fast. *This is Not a Guy With a Vacuum.*

PROVEN: Let Our 40 Years of Experience work for you.

WORRY FREE: Software automatically tracks the expiration dates of your flame certificates & we will remind you when its time to re-apply.



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