

**FLAME SHIELD
STS-05**

WATER BASED FIRE RETARDANT

STAIN SHIELD
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PRODUCT INFORMATION SHEET

PRODUCT NAME: FLAME SHIELD

PRODUCT ID#: STS-05

DESCRIPTION: FLAME SHIELD, is a *halogenated mixture* which when properly applied will impart flame resistance to cellulosic or synthetic substrates, or cellulosic/synthetic combinations.

TECHNICAL SPECIFICATIONS:

Form	Aqueous Solution
Appearance	Water-Like
Color	Clear to Milky White
Odor	Ammonia like
Ph	6.5 - 7.5
Freezing Point	32 deg. F
Shelf life	6-12 months when stored between 55° - 110° F

DIRECTIONS FOR USE:

DILUTION: Dilute to necessary strength (depending on the type of fabric composition). **Flame Shield** can be sprayed, brushed, padded or placed in a bath for immersion. Allow treated fabrics to be air-dried or oven-dried before use. It is suggested that prior to treatment, small samples be treated and tested for suitability of product and for Fire Code that the fabric must pass.

CAUTION: Over application may cause streaking of fabric or chalky residues to appear.

NOTES:

1. **FLAME SHIELD** is registered with the United States Patent and Trademark office in Washington, DC.
2. Approved by **CITY OF NEW YORK, BUREAU OF STANDARD AND APPEALS:**
Calendar # 141-89-SM
3. Approved by the **STATE OF CALIFORNIA, CALIFORNIA STATE FIRE MARSHAL:**
Registration # C-17400.

CONSULT **MATERIAL SAFETY DATA SHEETS (MSDS)** FOR FURTHER INFORMATION. All sales are subject to STAIN SHIELD'S CONDITIONS OF SALE.

DIRECTIONS FOR USE

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FOR TEXTILES:

DILUTION: Dilute one part of *Flame Shield* with three parts of water and mix well. Using a low-pressure spray system which is corrosion resistant, spray fabric until it is slightly wet. Dry using a conventional oven system, or hang until completely dry (4- 24 hours, depending on weight of fabric and other environmental conditions).

NOTES:

1. Some fabrics (synthetics such as, but not limited to, acetate/cotton combinations), require a stronger mixture of Flame Shield. A recommended mixture is one part of Flame Shield to two parts of water for these type fabrics.
2. Care should be taken not to over spray as white streaking or white spotting may occur. Should this condition surface, use straight white vinegar and spray onto affected area. Use white fluffy towel to wipe the area clean.
3. It should be pointed out that Flame Shield may have a tendency to change the hand (stiffen) of a few fabrics. It is highly recommended that a small "test sample" be treated before attempting to treat a whole section of fabric. This test sample can be evaluated for the specific fire retardancy desired as well as for any change in hand, color or any other adverse effect. If testing indicates that a particular fabric will become stiff as a result of the application, then add Fabric-Soft to the formula as per instructions found in the Product Information Sheet of Fabric-Soft.
4. If a fluorochemical treatment and a fire retardant treatment is desired to be applied simultaneously, prepare a solution containing 7% of FS-7550 with 93% water. Then in a separate vessel mix an appropriate amount of this solution with Flame Shield. A typical formulation is illustrated below:

INGREDIENT	PARTS BY WEIGHT
a) Solution of STS-1035 and water	74%
b) FLAME SHIELD	25%
c) Fabric-Soft	<u>1%</u>
Total	100%

This solution must be continuously mixed while in holding tank as it will separate. Solution may not be usable the next day. If needed to make a stronger solution add more Flame Shield and reduce (a) accordingly. Generally (c) remains unchanged.

NOTE: All fire retardants are considered corrosive to metals. FLAME SHIELD has a far less corrosive potential to metals than other fire retardants on the market but caution should be exercised so that FLAME SHIELD does not come into contact with metal surfaces such as, but not limited to, zippers, staples, and nails.

FOR NATURAL WOOD SURFACES:

DESCRIPTION: **FLAME SHIELD** fire retardant is a halogenated water based solution (contains non-toxic and environmentally compliant ingredients). It is an excellent fire retardant for natural wood surfaces and when properly applied will give a Class A fire-rating on wood. Its non-toxic and environmentally-safe qualities make it an extremely desirable product.

APPLICATION TECHNIQUE: **FLAME SHIELD** can be applied to natural wood surfaces by pressure spray, low pressure spray, by brush or by paint roller, or by placing wood in a bath. Since **FLAME SHIELD** is mildly corrosive to metal, equipment must be of corrosive resistant parts (such as, but not limited to, plastic, stainless steel and the like). Since **FLAME SHIELD** will tend to wash off with time when exposed to rain, it is recommended that wood surfaces which will be exposed to the elements, are first treated with **FLAME SHIELD** and then treated with a water repellent finish, such as our **wood finish**.

DILUTION: **FLAME SHIELD** usually is diluted 1 part **FLAME SHIELD** and 3 parts water (by volume). However, because there are many different fire codes and different types of wood it is the responsibility of the end user to determine the proper dilution ratio.

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GUIDELINES FOR TOPICAL APPLICATIONS

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SPRAYER SPECIFICATIONS: Sprayer must be constructed of corrosive resistant and chlorinated solvent resistant materials. Therefore the housing of the sprayer and internal components must be made either out of stainless steel or plastic. **No Components** may be made out of Zinc, Aluminum, Galvanized, or Brass parts or other materials that corrode. This also includes the spray wand and its internal components, the pump and its internal components, and the spray tip. All seals, washers and gaskets must be made out of Viton or equivalent. All hoses must be resistant to chlorinated solvents. The ideal size of the sprayer tip should be a UNIJET (or equivalent) stainless steel # 80001.

MAINTENANCE OF SPRAYER: After completing each job, rinse internal components of sprayer with ½ gallon of clean water or more if needed. Spray the water through the wand to flush it clean. At the end of the day rinse sprayer with 1 gallon of clean water or more if needed. Spray the water through the wand to flush it clean. Follow by spraying 8 ounces of Denatured Alcohol or Isopropyl Alcohol (rubbing alcohol) through the sprayer. Remove spray tip and place it in a solution of household ammonia for overnight storage.

SUMMARY OF SPRAYER REQUIREMENTS: Stainless steel or plastic housing. No galvanized, zinc, or aluminum parts. All internal components must be chlorinated solvent resistant (Viton seals, etc.)

IDENTIFICATION OF FABRIC: It is extremely important to identify the type of fabric you will be treating. This and other information should be kept in your customer's file.

SUITABILITY OF FLAME SHIELD:

- A) The first test to be done is to determine what formulation (dilution ratio) will work on the fabric you want to treat. First obtain a sample of the fabric and dilute one part of **Flame Shield** with three parts of water. Spray a sample of the fabric (typical sample must be 3" X 12"). Allow to dry. Place open flame (such as a match or lighter) on the middle of the 3" section while holding it vertically in a chamber free from drafts. Make sure you have proper ventilation and/or respiratory protection so that you will not be exposed to the smoke. Make sure that the test area is secure, has no flammable or combustible materials, and that a working fire extinguisher is available for immediate use, if necessary. Hold the source of the flame for 12 seconds and remove. If the fabric is on fire it must extinguish itself, without any aids, in two seconds. No "melt" drippings may occur after the two seconds and the "char-length" must be no longer than 6 inches. If that doesn't work it means that you must make a stronger solution of Flame Shield with water and/or didn't apply enough of it. Therefore repeat above procedure by adjusting for a stronger formulation and test accordingly. Alternatively send a sample of treated fabric to be tested for the specific fire code needed to be met to an independent laboratory that is qualified to perform such testing.
- B) Although Flame Shield is safe to use on practically every type of fabric, only the person or persons applying Flame Shield can determine its suitability. To do this, the applicator must obtain a sample of the fabric to be treated and treat such sample. Applicator must then visually inspect the fabric, after Flame Shield has cured, to determine whether or not any adverse effects, such as, but not limited to, color running are present. Use a hair dryer to dry treated sample. Remember, the **Applicator** is responsible for any adverse effects on fabrics, as well as the fabrics complying to the particular fire code needed to be met.

APPLICATION OF FLAME SHIELD: Only after the suitability and effectiveness of Flame Shield has been determined by the applicator or another qualified person, can the application of the actual fabric proceed.

SUMMARY OF STEPS PRIOR TO TREATING FABRIC:

- (1) Determine what formulation of Flame Shield will work.
- (2) Determine the suitability of Flame Shield.
- (3) Prepare large scale formulation for treatment.

RESPIRATORY PROTECTION: If you are using a formulation consisting of Flame Shield, water, and/or *Fabric-Soft, no respiratory protection is necessary. It is recommended however that you avoid skin contact, eye contact, and that you do not ingest or purposely concentrate and inhale Flame Shield. These precautions are prudent even though the components of FLAME SHIELD are considered non-toxic and hypo-allergenic. * See FABRIC-SOFT information contained herein.

SPRAYING FLAME SHIELD ON FABRICS:

1. Place Flame Shield formulation in sprayer.
2. If using a pump sprayer bring pressure up to 40 psi.
3. If using an electric sprayer turn power source on.
4. Spray in even and slightly overlapping strokes.
5. Saturate fabric but DO NOT make it dripping wet.
6. Allow fabric to completely dry before packing and shipping.

CERTIFICATES: The applicator may be requested to provide a certificate stating that the application passes a certain code. This certificate is normally provided by the applicator, in writing. Currently there are several certificates which are normally requested. They are as follows:

- < **New York City:** Flame Shield has been approved by the government of the City of New York through the Bureau of Standards and Appeals under Calendar Number 141-89-SM. All certificates must specify Flame Shield by name and show the above calendar number.
- < **Boston:** The City of Boston of the Commonwealth of Massachusetts requires that all specimens be submitted to their laboratory for testing under its fire code. Currently a fourteen dollar fee is required for each sample submitted. Samples should be submitted to:
Boston Fire Prevention/ 115 South Hampton Street/Boston, MA 02118/ (617) 343-3527
- < **ASTM-E-84:** This is a complex and expensive test. For a list of qualified laboratories call us. Your customer must bear the cost of such testing.
- < **NFPA-701:** (small scale) - This is very similar to the requirements of the City of New York and is considered one of, if not the toughest fire codes in this country. The applicator's testing procedure described elsewhere in this manual is similar to this test. Flame Shield is geared to pass this test with proper application. It should be noted that there are several other tests, including the FAA, Port Authority of NY, etc. which Flame Shield has passed. 100% Nylon treated with FLAME SHIELD will not pass NFPA-701 but will pass ASTM-E84.

MATERIAL SAFETY DATA SHEET

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PRODUCT ID #: STS-05

DATE PREPARED: 6/17/04

NO. OF PAGES: 5

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: FLAME SHIELD

PRODUCT DESCRIPTION: Water based fire retardant

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24 HR. EMERGENCY CONTACT: (800) 424-9300 (CHEMTREC®)
INTERNATIONAL 24 HR. EMERGENCY CONTACT: (703)527-3887

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	OSHA PEL	ACGIH	TLV	TWA	PERCENT
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NONE

3. HAZARD IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

Dermal-Yes Ingestion- Yes Inhalation-Yes

POTENTIAL HEALTH HAZARD(Acute and Chronic):

EYES: Very mild eye irritant. Direct contact with the solution may cause slight iridal and conjunctival irritation. No permanent damage is anticipated.

SKIN: Can be mildly irritating upon prolonged exposure (liquid stage only).

INGESTION: Can cause gastrointestinal irritation, nausea, vomiting and diarrhea.

INHALATION: Gross over-inhalation may cause symptoms such as, but not limited to, coughing. May aggravate pre-existing lung disorders.

CARCINOGENICITY:

NTP- NO IARC MONOGRAPH- NO OSHA REGULATED- NO

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7. HANDLING AND STORAGE

Avoid contact with eyes. Avoid prolonged and repeated skin contact. Avoid breathing vapors. Use with adequate ventilation. Store in a cool dark place. See other precautions listed elsewhere within this MSDS.

FOR INDUSTRIAL/PROFESSIONAL USE ONLY.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION:	None required if ventilation is adequate to keep below TLV (if any are listed herein).
LOCAL EXHAUST:	Recommended to keep air contaminant concentration below the OSHA's PEL and ACGIH's TLV (if any are listed herein).
MECHANICAL EXHAUST:	General ventilation system should be provided.
PROTECTIVE GLOVES:	Neoprene rubber gloves.
EYE PROTECTION:	Safety goggles.
OTHER PROTECTIVE EQUIPMENT:	Eyewash equipment. Apron, coveralls, boots as necessary to prevent skin contact. Safety shower.
WORK/HYGIENIC PRACTICES:	Wash hands thoroughly before handling foodstuffs, liquids, or tobacco products.
OTHER HEALTH HAZARDS:	If TLV of any component of the product is exceeded, a NIOSH/MSHA jointly approved respirator must be supplied to personnel and used in accordance with OSHA Regulations. Respiratory protection programs must be in accordance with 29CFR 1910.134.

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT:	(deg. F): ND
VAPOR PRESSURE:	(68 deg. F) < 1
VAPOR DENSITY:	(Air=1.0) SAME AS WATER
SOLUBILITY IN WATER:	Soluble
SPECIFIC GRAVITY:	(₂ O=1) - 1.2
VOLATILE BY VOLUME:	H 67%
VOC CONTENT:	None
VOC EXEMPT COMPONENTS:	100% (water)
EVAPORATION RATE:	(Ether=1) <1
APPEARANCE:	Clear to Milky white
ODOR:	Slight ammonia like odor.
Ph:	6.5 - 7.5

NA=Not Applicable

N/A=Not Available

ND=Not Determined

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10. STABILITY AND REACTIVITY

STABILITY(CONDITIONS TO AVOID): None known.

INCOMPATIBILITY(MATERIALS TO AVOID): None known.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Thermal decomposition can produce CO₂, CO and possible traces of HBr and HF.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

No information available.

12. ECOLOGICAL INFORMATION

No information available.

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with Federal, State, and Local Regulations .

14. TRANSPORT INFORMATION

PROPER SHIPPING NAME:

NON-HAZARDOUS LIQUID, N.O.I.

UN NUMBER:

NA

15. REGULATORY INFORMATION

FLAME SHIELD has no ingredients subject to reporting requirements of SARA 313 and 40 CFR 372.

NA=Not Applicable

N/A=Not Available

ND=Not Determined

16. OTHER INFORMATION**IMPORTANT NOTICE**

The information presented in this publication is believed to be accurate. However, **NO WARRANTY OF FITNESS OR MERCHANTABILITY** or of any kind, either expressed or implied, is made regarding the product described herein or the information or recommendations contained herein. Since the conditions of use, handling and storage of this product are not within **STAIN SHIELD'S** control, **STAIN SHIELD** assumes no liability or responsibility with respect to personal injury or property damage resulting therefrom or with respect to results obtained from use of **FLAME SHIELD**.

NOTICE

KEEP CONTAINERS TIGHTLY CLOSED, KEEP CONTAINERS COOL, DRY, AND AWAY FROM SOURCES OF IGNITION. USE AND STORE THIS PRODUCT WITH ADEQUATE VENTILATION AND/OR RESPIRATORY PROTECTION. AVOID INHALATION OF VAPORS AND PERSONAL CONTACT WITH THE PRODUCT. USE GOOD PERSONAL HYGIENE PRACTICE. "EMPTY" CONTAINERS RETAIN RESIDUE (LIQUID AND/OR VAPOR) AND CAN BE DANGEROUS. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION. "EMPTY" DRUMS SHOULD BE COMPLETELY DRAINED, PROPERLY BUNGED AND PROMPTLY SHIPPED TO THE SUPPLIER OR A DRUM RECONDITIONER. ALL OTHER CONTAINERS SHOULD BE DISPOSED OF IN AN ENVIRONMENTALLY SAFE MANNER AND IN ACCORDANCE WITH GOVERNMENTAL REGULATIONS.