



FLASH FIRE DEFINED - NFPA and CGSB

A rapidly moving flame front, which can be a combustion explosion. A flash fire may occur in an environment where fuel and air become mixed in adequate concentrations to combust. A flash fire has a heat flux of approximately 84 kW/m² for relatively short periods of time, typically less than 3 seconds.



WESTEX DELIVERS ON THE NFPA 2112 FLASH FIRE STANDARD

The Need

In the oil, gas, chemical and petrochemical industries, the threat of flash fire exposures has necessitated the use of flame resistant clothing. Flame resistant clothing will minimize burn injury and provide the worker a few seconds of escape time. Non-flame resistant clothing can ignite in a flash fire exposure providing an additional fuel source and dramatically increasing the burn injury percentage and severity well beyond that of the initial exposure.

The Standard

In 2000, the National Fire Protection Association (NFPA) developed NFPA 2112 — an industry standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire. NFPA 2112 provides minimum performance criteria and sets clear guidelines for testing on instrumented thermal manikins. The standard calls for flash fire testing to be conducted at three seconds with a pass/fail rate of 50% total body burn under ASTM F1930 (Standard Test Method for Evaluation of Flame Resistant Clothing for Protection Against Flash Fire Simulations Using an Instrumented Manikin) testing protocols.

The Solution

When evaluating fabrics for an FR clothing program to comply with NFPA 2112, Westex UltraSoft® and UltraSoft AC® are excellent options. With our proprietary, market-proven technology, you can have flame resistance that is guaranteed for the life of the garment without sacrificing the soft, breathable comfort of cotton. Additionally, both UltraSoft® and UltraSoft AC® are a blend of 88% cotton and 12% high tenacity nylon, which provides extra garment durability.

The NFPA 2112 flash fire standard requires that all manikin testing be conducted at three seconds. The enclosed samples of UltraSoft® and UltraSoft AC® meet the requirements of NFPA 2112 and, more importantly, provide superior flash fire protection when compared to other industry-leading FR synthetic fabrics, such as Nomex® IIIA. Companies globally are making UltraSoft® fabrics their new choice for flash fire protection because they provide an uncompromising blend of protection, comfort and value.

AN UNCOMPROMISING BLEND OF PROTECTION, COMFORT AND VALUE

For ultimate peace of mind, specify the fabric first — choose Westex.



STYLE	DESCRIPTION	ATPV	CONTENT	WEIGHT
301	Shirt/Lt. Wgt. Coverall	8.7	88% Cotton 12% High Tenacity Nylon	7 oz. (237 g/m²)
451	Pant/Jacket Coverall	12.4	88% Cotton 12% High Tenacity Nylon	9 oz. (305 g/m²)

Westex UltraSoft AC®

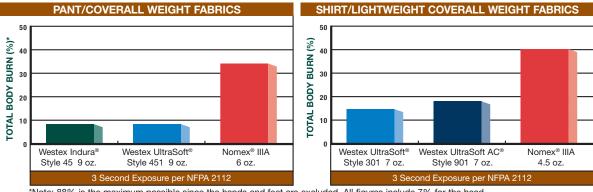
STYLE	DESCRIPTION	ATPV	CONTENT	WEIGHT
901	Shirt/Lt. Wgt. Coverall	8.3	88% Long-Staple Cotton 12% High Tenacity Nylon	7 oz. (237 g/m²)
951	Pant/Jacket Coverall	11.7	88% Long-Staple Cotton 12% High Tenacity Nylon	9 oz. (305 g/m²)

FLASH FIRE PROTECTION

PROTECTION FROM FLASH FIRE EXPOSURE: CHART DATA

LABORATORY TESTING PROTOCOL

- · Independent university laboratory testing
- · Adherence to ASTM F1930 standard test method
- · Identically sized and styled 42 regular coveralls
- All coveralls tested over 100% cotton T-shirts and briefs



*Note: 88% is the maximum possible since the hands and feet are excluded. All figures include 7% for the head.



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Although three seconds has been established as the time frame to analyze the performance of secondary clothing, additional exposure times in the range of 1.5 to 4.0 seconds were examined to more completely profile fabric protective performance. The charts are highlighted up to three seconds and below 50% body burn in accordance with NFPA and CGSB standards and definitions. Within these parameters, Westex fabrics have a protective advantage over Nomex® IIIA throughout the entire range of the burn curve. The issue of relevance in comparing secondary protective clothing fabrics above these levels should be carefully considered. If your exposure potential is four to five seconds or produces body burns near or over 50%, Westex highly recommends protective clothing systems of multiple flame resistant layers or primary protective clothing such as turnout gear.



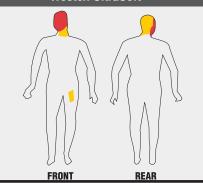
COMPARING FLASH FIRE PERFORMANCE

What is Relevant for Secondary Protective Clothing?

- NFPA 2112 test exposure is set at three seconds.
- Secondary protective clothing is designed to provide the worker "a few seconds' escape time."
- CGSB defines a flash fire as "typically three seconds or less."
- NFPA 2112 sets failure above 50% total body burn.

PANT/COVERALL WEIGHT COMPARISON

Westex UltraSoft®



THE UNIVERSITY OF ALBERTA Protective Clothing and Equipment Research Facility

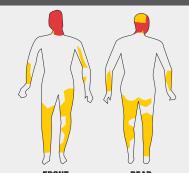
Fire Protective Clothing Evaluation System 5-15-2007 451 Westex UltraSoft® 9 oz

Test Type Flash Fire Simulation
Exposure Time 3.06 sec.
Measurement Time 60.0 sec.

Second-Degree Burn 5.15%
Third-Degree Burn 4.00%

TOTAL BURN 9.15%

Nomex® IIIA



THE UNIVERSITY OF ALBERTA Protective Clothing and Equipment Research Facility

Fire Protective Clothing Evaluation System 4-24-2007 Nomex® IIIA 6 oz

Test Type Flash Fire Simulation
Exposure Time 3.06 sec.
Measurement Time 60.0 sec.

• Second-Degree Burn 28.65%

• Third-Degree Burn 6.80%

TOTAL BURN 35.45%
BURN NUMBER 00505

Note: 88% is the maximum possible since the hands and feet are excluded. All figures include 7% for the head.

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WHEN IT COMES TO WE ARE ALL IN













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The information in this brochure is based on testing conducted by or conducted on behalf of Westex, Inc., an entity of Milliken & Company, and represents our analysis of the test results. It is not intended to substitute for any testing that may be unique and necessary for your facility for you to determine the suitability of our products for your particular purpose. Because we cannot anticipate all variations in end-user conditions, Westex, Inc. makes no warranties and assumes no liability whatsoever in connection with any use of this information. All test results reported are based on standard laboratory tests related to exposure to arcs, flames and heat. The results reported should not be used to predict garment performance in actual fire situations. All sales are exclusively subject to our standard terms of sale posted at www.milliken.com/terms (all additional/different terms are rejected) unless explicitly agreed otherwise in a signed writing. Consult with the fabric supplier, garment manufacturer and launderer for recommendations of proper cleaning techniques.