



# NFPA 70 E (ASTM F1506)

# NFPA 2112

<b>HAZARD</b>	<p><b>ARC FLASH</b></p> <ul style="list-style-type: none"> <li>• Dangerous release of energy created by an electrical fault (very short duration – fraction of a second)</li> <li>• Can reach 35,000°F (19,400°C) – four times hotter than the surface of the sun</li> </ul>	<p><b>FLASH FIRE</b></p> <ul style="list-style-type: none"> <li>• A sudden and intense fire that is caused when a mixture of air and a flammable substance combine to ignite</li> <li>• Extremely high heat, short duration (typically less than 3 seconds), and a rapidly moving flame</li> </ul>
<b>HOW IT OCCURS</b>	<ul style="list-style-type: none"> <li>• High current source with a conductive object can cause electricity to flash over</li> <li>• Dropping a tool or otherwise creating a spark can ignite an arc flash in area around a conductor</li> <li>• Equipment failure</li> <li>• Breaks or gaps in insulation</li> <li>• Dust, corrosion, or other impurities on the surface of the conductor</li> </ul>	<p><b>IGNITION OF A COMBUSTIBLE ATMOSPHERE FLASH FIRES NEED THREE THINGS TO OCCUR:</b></p> <ol style="list-style-type: none"> <li>1. Oxygen</li> <li>2. Ignition Source</li> <li>3. Fuel</li> </ol> <p>Flash fire conditions worsened in confined spaces</p>
<b>CAN PRODUCE</b>	<ul style="list-style-type: none"> <li>• Thermal Radiation</li> <li>• Intense Light</li> <li>• Acoustical Energy</li> <li>• Pressure Wave</li> <li>• Debris</li> </ul>	<ul style="list-style-type: none"> <li>• Very intense, fast moving flame</li> <li>• Pressure waves (in closed environments)</li> <li>• Ignition of surrounding area contents</li> </ul>
<b>INDUSTRIES AFFECTED</b>	<p><b>ELECTRICAL; UTILITY</b></p> <ul style="list-style-type: none"> <li>• Installation, Repair &amp; Maintenance of Electrical Systems</li> </ul>	<p><b>PETROCHEMICAL; OIL &amp; GAS</b></p> <ul style="list-style-type: none"> <li>• Any operations around flammable gases, volatile liquids, or particulate</li> </ul>
<b>KEY TESTS</b>	<ul style="list-style-type: none"> <li>• ASTM D7138 (thread melting resistance): Thread used in garments must be of flame-resistant fiber and not melt at 500oF</li> <li>• ASTM D6413 (vertical flame resistance): When exposed to flame for 12 seconds, garment fabrics must:             <ul style="list-style-type: none"> <li>&gt;&gt; Self-extinguish (after flame) in 2 seconds or less</li> <li>&gt;&gt; Exhibit damage (char length) of 6 inches or less</li> <li>&gt;&gt; No melting or dripping can occur</li> <li>&gt;&gt; Fabric must meet these standards after 25 wash and dry cycles</li> </ul> </li> <li>• ASTM F1959 – Arc Testing: determines how much heat a certain fabric will block from an electric arc BEFORE the onset of second degree burns for the wearer (ATPV or EBT values reported in cal/cm2)</li> </ul>	<ul style="list-style-type: none"> <li>• ASTM D7138 (thread melting resistance): Thread used in garments must be of flame-resistant fiber and not melt at 500oF</li> <li>• ASTM D6413 (vertical flame resistance): When exposed to flame for 12 seconds, garment fabrics must:             <ul style="list-style-type: none"> <li>&gt;&gt; Self-extinguish (after flame) in 2 seconds or less</li> <li>&gt;&gt; Exhibit damage (char length) of 4 inches or less</li> <li>&gt;&gt; No melting or dripping can occur</li> <li>&gt;&gt; Fabric must meet these standards after 100 industrial laundering cycles</li> </ul> </li> <li>• ASTM F2894 (heat resistance): When exposed to 500oF for 5 minutes, garment fabrics must:             <ul style="list-style-type: none"> <li>&gt;&gt; Not ignite, melt, drip, or separate</li> <li>&gt;&gt; Not shrink more than 10%</li> </ul> </li> <li>• ASTM F2700 (heat transfer performance): When exposed to combined convective and radiant heat at 2.0 cal/cm2/sec, garment fabrics must have a HTP rating of 3.0 cal/cm2 or greater (contact) and 6.0 cal/cm2 or greater (spaced)</li> <li>• ASTM F1930 (instrument manikin test): under simulated flash fire condition, predicted 2nd and 3rd degree total body injury is no more than 50% of total body surface area covered by sensors (less head, hands, and feet)</li> <li>• Label Print Durability Test – garment labels must remain legible and in place after 100 industrial laundering cycles</li> </ul>

CONFORMITY ASSESSMENT ON FOLLOWING PAGE >>>



# NFPA 70 E (ASTM F1506)

# NFPA 2112

## CONFORMITY ASSESSMENT DEMONSTRATION OF COMPLIANCE

### SELF-DECLARATION BY GARMENT MANUFACTURER

Garments must have label that states compliance with ASTM F1506 and the following information:

- Manufacturer name
- Identification of fabric
- Garment tracking number or identification code
- Garment size
- Care instructions
- Arc-rating (ATPV or EBT)

Manufacturer must provide information demonstrating compliance upon request of purchaser

### INDEPENDENT THIRD PARTY CERTIFICATION

Certification organization must be accredited to ISO 17065  
Testing must be performed by laboratories accredited to ISO 17025 under supervision of certification organization.

Manufacturers required to have quality assurance program.  
Manufacturers subject to audits at least once a year.

Garments must meet all requirements of standard or use materials or components already recognized by certification organization.

Garment labels must have specific compliance statement and the following information:

- Product name, number or design
- Manufacturer name, address, country of manufacture
- Garment identification number, lot number, or serial number
- Garment size
- Fiber content

Manufacturer must provide user information within information on garment use, care, maintenance, and limitations.

Certification organization must provide updated listing for compliant products.

