specialist safety clothing and apparel
ELECTRICAL ARC FLASH AND FR CLOTHING

For electrical maintenance workers and contractors, working hands-on with hazardous and potentially dangerous energy sources, conductors, circuits and other energised parts is a common component of their everyday routine. While there is no substitute for maintaining safe working conditions, accidents - especially electric arcs - can happen in an instant, no matter how experienced a worker may be.

- Tecasafe® plus & Walls® FR Workwear
- Tecasafe® plus & Walls® FR Switching Apparel
- ArcSafe Elvex Faceshields
- BLASTMAT Arc Suppression Blankets

MINING OIL GAS

In the mining, oil and gas industry, the threat of flash fires is a daily concern. While technological innovations have greatly decreased their occurrence, the threat is still very real. Surrounded by massive fuel sources, your workforce is constantly performing it's duties in a potentially explosive atmosphere.

- Tecasafe® plus & Walls® FR Workwear
- Chemtech Chemical Splash & ONESuit Hazmat
- Structural Firefighting

WELDING MOLTEN METAL METAL FABRICATION

Workers in the welding, metal fabrication and molten metal industry work closely with many potentially hazardous ignition sources. Highly-charged machinery and molten metal pose a constant danger that can lead to serious burn injuries or even death.

- Tecasafe® plus & Walls® FR Workwear
- Walls® FR Denim Workwear
- Elliotts Proban and Leather Welding Apparel (See Welding & Workshop Catalogue)
- Elliotts Aluminised Apparel (See Welding & Workshop Catalogue)

ALUMINIUM SMELTING

High ambient-humidity levels. Intense levels of radiant heat exposure. Demanding physical labour. For workers in the aluminium industry, these harsh conditions produce a number of potentially dangerous hazards. Whether it’s smelting, remelting, casting or any combination of these operations, producers of aluminium products and their employees are constantly at risk of being seriously burned.

- ALu-SAFE® Aluminium FR Workwear

FIRE FIGHTING

At Elliotts, we know that firefighters today face a broad range of extreme hazards including: high heat and flame, molten materials, hot surfaces, harsh physical environments and possible exposure to chemicals and blood-borne pathogens.

- Structural Firefighting Suits
- Wildland Firefighting Suits, Rescue Coveralls & Station Wear
- Chemtech Chemical Splash & ONESuit Hazmat

CHEMICAL MANUFACTURING

Today’s chemical manufacturing workers face a range of different hazards and challenges. Despite recent improvements in workplace safety, flash fires still remain a potential threat to the safety and well-being of employees. In addition, exposure to chemicals, chemical intermediaries, waste and by-products are potential ignition sources and greatly increase the chance for a flash fire.

- Chemtech Chemical Splash & ONESuit Hazmat
- Tecasafe® plus & Walls® FR Workwear
- Structural Firefighting

SPECIALISED WET WEATHER

Elliott range of specialised FR Rainwear made from ZETEL® ARCSAFE GR and ZETEL® ZX fabrics offers protection against hazards in the work place including arc flash, flash fire and static. ZETEL® fabrics are breathable, waterproof, high performance fabrics that have been specifically designed for industrial conditions.

- ZETEL® ARCSAFE GR
- ZETEL® ZX
WHY FLAME RETARDANT FR CLOTHING

Every day, workers around the world are risking their lives as they are exposed to the risk of flash fire, electrical arc flash and molten metal splash. In the split second when such a dangerous situation does occur, providing the right FR clothing can make the difference between avoiding a disaster involving serious injury, or death.

In a matter of seconds, a momentary electric arc, flash fire or molten metal splash exposure can surround a worker with searing temperatures that will ignite everyday non-flame resistant workwear instantaneously. Worse yet, non-flame resistant workwear continue to burn even after the source of ignition has subsided. In fact, the majority of severe and fatal burn injuries are due to the ignition of non-flame resistant work clothes - not by the actual exposure to the heat source itself.

Using flame resistant clothing can provide the necessary thermal protection to shield workers at the moment of exposure. Once the source of ignition is removed, flame resistant garments will self extinguish, greatly limiting the severity of a burn. In many cases, they can mean the difference between a minor accident and a tragic fatality.

<table>
<thead>
<tr>
<th>HAZARD RATING LEVELS HRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAZARD RATING</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

**PROTECTIVE APPAREL TO SUIT HRC RATING**

<table>
<thead>
<tr>
<th>0</th>
<th>Natural Fibre Apparel in Cotton/Wool Not Recommended for Arc Flash safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fire Retardant Tecasafe® plus or Walls® FR</td>
</tr>
<tr>
<td>2</td>
<td>Level 2 Rated ArcSafe Apparel or Fire Retardant Tecasafe® plus or Walls® FR</td>
</tr>
<tr>
<td>3</td>
<td>Level 3 Rated ArcSafe Apparel</td>
</tr>
<tr>
<td>4</td>
<td>Level 4 Rated ArcSafe Apparel constructed from Tecasafe® plus or Walls® FR</td>
</tr>
</tbody>
</table>

WORKPLACE HAZARDS

**FIRE, SPARKS AND MOLTEN METAL**

For people working in environments where they are exposed to sparks, molten metal and flash fires face the daily possibility of serious injury or even death.

- Welding & Metal Fabrication
- Mining
- Chemical Manufacturing
- Aluminium Smelting
- Oil and Gas
- Firefighting

**ELECTRICAL STATIC**

For people working in environments where they are exposed to the possibility of static buildup which can lead to fuel ignition and flash fires.

- Mining
- Chemical Manufacturing
- Oil and Gas
- Firefighting

**ARC FLASH**

Arc Flash hazards are a critical and unavoidable safety issue for electrical workers. An Arc Flash is an electrical current that is passed through air when insulation or isolation between electrified conductors is no longer sufficient to withstand the applied voltage.

- Electrical Maintenance
- Electrical Installation
**FR Protective Clothing Levels**

**Primary Protective Clothing** is designed to be worn for work activities where significant exposure to molten substance splash, radiant heat, and flame is likely to occur.

Primary Protective Clothing includes Arc Flash Switching Apparel, Structural Firefighting Apparel, Aluminised Protective Apparel, Hazmat Suits and Chemical Splash Protective Garments. Primary Protective Clothing is designed to be worn over Secondary Protective Clothing.

**Secondary Protective Clothing** is everyday workwear which is designed for continuous wear in designated locations where intermittent exposure to molten substance splash, radiant heat, and flame is possible.

Secondary Protective Clothing is usually worn under Primary Protective Clothing where high levels of protection is required. Secondary Protective Clothing should be worn at all times in a workplace, but it should not be a substitute for primary protective clothing.

The workplace hazards that you are facing every day will determine the level of FR clothing and material combinations you will require.

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**Elliotts Preferred FR Workwear Fabric Solutions**

TenCate Tecasafe® plus is engineered to provide unbeatable electric arc and flash fire protection that lasts longer than FR treated cotton fabrics. Tecasafe® plus is a soft and lightweight fabric providing unmatched comfort with inherent protection will never wash or wear out.

Walls®FR fabrics provides flame resistance that is guaranteed for the life of the garment without sacrificing the soft breathable comfort of cotton. That’s because it’s 88% cotton, with 12% high-tenacity nylon which provides extra garment durability for an excellent value equation.

ALu-SAFE® is a unique high performance workwear fabric developed specifically and especially to protect workers in Primary Aluminium Smelters who are exposed to the hazards and dangers of molten aluminium and cryolite (reduction cell flux) splash. ALu-SAFE® also offers protection from hazards such as radiant and convective heat and electric arc.

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**End User Industry**

<table>
<thead>
<tr>
<th>End User Industry</th>
<th>Tecasafe plus</th>
<th>Walls®FR</th>
<th>ALu-SAFE®</th>
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<tr>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Aluminium Smelting</td>
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<td>✓</td>
<td></td>
</tr>
<tr>
<td>Firefighting</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mining, Oil &amp; Gas</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Welding/ Metal Fabrication</td>
<td></td>
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<td>✓</td>
</tr>
<tr>
<td>Molten Metal</td>
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<td></td>
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<tr>
<td>Chemical Manufacturing</td>
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</tbody>
</table>

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Need more information about FR Workwear and FR Protection

- Arc Energy Basics – Page 36
- What is NFPA 70E - Page 101
- Clothing Standards - Page 100
- Arc Flash Protective Clothing – Page 35
- Flame Retardant Anti-static Wet Weather – Page 55
- Blastmat Arc Suppression Blankets – Page 52

Learn more about Elliotts Specialist Safety Apparel at elliottaustralia.com
Unbeatable Electric Arc Protection
TenCate Tecasafe® plus is an NFPA 70E compliant, comfortable, light-weight fabric with inherent heat and flame retardant properties, that provides durable and affordable electric arc protection to electricians, electrical contractors, and other professionals with potential exposure to electric arc flash.

Unbeatable Flash Fire Protection
TenCate Tecasafe® plus provides durable and affordable flash fire protection for workers in the petroleum, petrochemical, fire service, and other professionals that may be exposed to flash fire.

Unbeatable Bushfire/ Wildland Fire Protection
TenCate Tecasafe® plus is the latest fabric innovation for protection against the hazards of wildland firefighting. It combines inherent FR protection with unbeatable comfort and exceptional durability into a single garment. Specially engineered, this is a light-weight fabric that still meets the rigorous standards of AS/NZS 4824.
TenCate Tecasafe® plus is engineered to provide unbeatable electric arc and flash fire protection that lasts longer than FR treated cotton fabrics. Tecasafe® plus is soft and lightweight fabric providing unmatched comfort. It is also comforting to know that Tecasafe® plus’s inherent protection will never wash or wear out.

- **Inherently flame resistant**: FR properties are built in, and won’t wash or wear out. Exceeds NFPA 70E HRC 2 and NFPA 2112 performance standards.
- **Comfortable to wear**: Soft, flexible and breathable. Specially engineered to provide excellent moisture management properties that keep the wearer cooler by naturally wicking moisture away from the skin.
- **Exceptional durability**: Outstanding abrasion resistance and better strength retention after multiple commercial washes.
- **Excellent value**: Long life cycle and competitive price means lower cost of ownership.
- **High Visibility**: AS/NZS 1906.4, ANSI 107 and CSA Z96 compliant.
- **Earth Friendly**: Made with Lenzing Tencel® environmentally friendly cellulose fibre.
Walls FR® materials incorporate patented flame resistant technology developed specifically to leverage the durability and endothermic properties of nylon for long wear life and improved flame protection.

Walls FR® has changed the way people think about protective clothing, delivering comfort, protection and wear life never before thought possible in a single fabric. In fact, Walls FR® fabrics deliver the best protection combined with the lowest cost per wearing in the industry. Walls FR® now has added softness that delivers the full potential of cotton comfort.

Flame resistance is guaranteed for the life of the garment!
Every Day Work Clothing for Arc Flash and FR Protection

Walls FR® fabrics provide flame resistance that is guaranteed for the life of the garment without sacrificing the soft breathable comfort of cotton. The Walls FR® fabric is a blend of 88% cotton, with 12% high-tenacity nylon which provides extra garment durability.

Walls FR® is one of the only commercially available garment fabrics that can meet the NFPA70E “Electric Arc Exposure” Hazard Risk Categories 0, 1 & 2 as a single layer.

OEKO-TEX CLASS II CERTIFICATION

Walls FR® fabrics have Oeko-Tex Class II Certification. Fabrics tested according to the criteria for the Oeko-Tex Standard 100 guarantee that no substance is present which might be harmful to human health. Only products who comply with the very stringent requirements and who are constantly tested are awarded the Oeko-Tex certificate.
ELECTRICAL ARC FLASH SAFETY

Arc flash safety apparel is critically important in keeping electrical workers safe. Arc flash accidents can cause serious injuries. The casualties resulting from these accidents are almost always devastating to the worker involved and to the worker’s family.

WHAT IS AN ARC FLASH

An Arc Flash is an electrical current that is passed through air when insulation or isolation between electrified conductors is no longer sufficient to withstand the applied voltage. A flash incident is rapid and immediate and as a result, each year, significant numbers of workers worldwide are maimed or killed from Arc Flash exposure.

WHAT STEPS CAN BE TAKEN TO REDUCE THE RISK

Primary Protective Clothing (Arc Flash or Electrical “Switching” Clothing)

AS4836:2011 states that when an Arc flash suit and hood is to be worn it must be rated at a minimum of 40 cal/cm² protection. This requirements aligns with NFPA70E and the HRC4 rating which also specifies a minimum of 40 cal/cm² protection.

Secondary Protective Clothing (Everyday Work Clothing)

AS4836:2011 and NFPA70E state that “Flame Retarded Clothing” must be worn. Australian industry is generally specifying FR Clothing with a minimum ATPV of 8 cal/cm². This falls in line with NFPA70E requirements which specify a minimum ATPV of 8 cal/cm² or HRC2. See page 101.

<table>
<thead>
<tr>
<th>Clothing Levels</th>
<th>AS4836:2011</th>
<th>NFPA70E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Protective Clothing</td>
<td>Arc flash suit and hood rated at a minimum of 40 cal/cm² protection.</td>
<td>Electrical switching clothing with an ATPV greater than 40 cal/cm².</td>
</tr>
<tr>
<td>Electrical Arc Flash “Switching”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>clothing</td>
<td>■ Switching jackets, hoods and trousers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>■ Switching coats, hoods and leggings.</td>
<td></td>
</tr>
<tr>
<td>Secondary Protective Clothing</td>
<td>Flame-retardant clothing covering the full body (including arms and legs)</td>
<td>Flame-retardant clothing covering the full body (including arms and legs)</td>
</tr>
<tr>
<td>Everyday Work Clothing</td>
<td>and not made from conductive material or containing metal threads.</td>
<td>Min ATPV of 8 cal/cm² or HRC2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>■ Shirts, trousers and coveralls</td>
<td></td>
</tr>
</tbody>
</table>

Important Arc Flash Switching Protective Clothing “must haves”

- Ensure that no skin is exposed.
- Ensure that the pant legs (if not connected to boots) completely go down to the boot.
- Ensure that the sleeves of the protective work wear go down to the hand, leaving none of the arm exposed.
- Important, don’t forget your head: Remember that the head is the most vulnerable part of the body. Don’t forget to complete your arc flash protective clothing with suitable head gear of the same ATPV rating as the rest of the work-wear plus high voltage gloves.

WARNING

Arc Flash and Shock Hazard

DANGER

High voltage

36
Arc Flash Protective Clothing Standards

NFPA 70E is the most widely adopted standard, which provides the guidelines on Hazard Category Ratings (HRC ratings) that protective clothing should meet.

Protective clothing should then be independently tested to one of two standards:

Arc Flash Hoods and Faceshields
ASTM F2178-08 standard test method for determining the arc rating and standard specification for eye or face protective products.

Arc Flash Garments and Apparel
ASTM F2621-06 standard test method for determining response characteristics and design integrity of arc rated finished products in an electric arc exposure.

Independent ARC FLASH Garment Testing

The Elliotts ArcSafe HRC4 Arc Flash Clothing has been independently tested by the High Current Laboratory of Kinectrics in Canada.

The Elliotts ArcSafe HRC4 hoods have been tested to ASTM F2178 and the garments tested to ASTM F2621-06 which requires that the finished product be exposed to a level as close as possible to the arc rating of the fabric or system.

This testing by an independent third party provides the wearer with the confidence that the hood or garment will provide the protection required in an arc flash event.

Tested by Kinectrics to ASTM F2621-06 Standard Practice for Determining Response Characteristics and Design Integrity of Arc Rated Finished Products in an Electric Arc Exposure.


Learn more about Elliotts Specialist Safety Apparel at elliottaustralia.com
<table>
<thead>
<tr>
<th>ATPV Rating</th>
<th>HRC Rating</th>
<th>ArcSafe System</th>
<th>Material Layers</th>
<th>Material Weight</th>
<th>Material Construction</th>
<th>Product Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 Cal/cm²</td>
<td>2</td>
<td>T9</td>
<td>1 layer</td>
<td>235 gsm (7oz)</td>
<td>Walls® FR</td>
<td>Page 46</td>
</tr>
<tr>
<td>9.6 Cal/cm²</td>
<td>2</td>
<td>W9</td>
<td>1 layer</td>
<td>235 gsm (7oz)</td>
<td>Walls® FR</td>
<td>Page 46</td>
</tr>
<tr>
<td>24.4 Cal/cm²</td>
<td>2</td>
<td>W24</td>
<td>1 layer</td>
<td>442 gsm (13oz)</td>
<td>Walls® FR</td>
<td>Page 46</td>
</tr>
<tr>
<td>40.4 Cal/cm²</td>
<td>4</td>
<td>T40</td>
<td>2 layer</td>
<td>235 gsm (7oz) + Q8 306 gsm (9oz)</td>
<td>Walls® FR</td>
<td>Page 44</td>
</tr>
<tr>
<td>45 Cal/cm²</td>
<td>4</td>
<td>W45</td>
<td>2 layer</td>
<td>306 gsm (9oz) + 442 gsm (13oz)</td>
<td>Walls® FR</td>
<td>Page 42</td>
</tr>
<tr>
<td>89 Cal/cm²</td>
<td>4</td>
<td>W89</td>
<td>4 layer</td>
<td>442 gsm (13oz) + 306 gsm (9oz) + 306 gsm (9oz) + 442 gsm (13oz)</td>
<td>Walls® FR</td>
<td>Page 40</td>
</tr>
</tbody>
</table>
Walls FR® fabrics provide flame resistance that is guaranteed for the life of the garment without sacrificing the soft breathable comfort of cotton.

That’s because it’s 88% cotton, with 12% high-tenacity nylon which provides extra garment durability for an excellent value equation.

TenCate Tecasafe® plus is engineered to provide unbeatable electric arc and flash fire protection that lasts longer than FR treated cotton fabrics.

Tecasafe® Plus is soft and lightweight fabric providing unmatched comfort. Tecasafe® Plus’s inherent protection will never wash or wear out.
FRAS Rainwear Fire Retardant Anti-static

When your job requires you to wear hazard specific clothing to protect you from various risk levels, including FR Clothing or Switching Gear, you also require hazard specific Fire Retardant Anti-static Wet Weather Gear to complete your protective garment system.

The Elliotts Specialist Fire Retardant Anti-static Wet Weather gear offers options for all industries and protection levels required to keep safe in all wet weather situations.

ZETEL® Fire Retardant Anti-static Wet Weather Gear offers increased hazard specific protective performance that was developed to address specific FRAS needs and hazards for Australasian conditions. ZETEL® FRAS clothing is waterproof, breathable, windproof, flame retardant and anti-static.
Workers in the electrical industry are often exposed to hazardous and potentially dangerous workplace conditions while working outdoors in the rain. The Zetel ArcSafe GR wet weather apparel was specifically developed by Elliotts to provide Australia’s leading solution for the protection of workers against electric arc flash in wet weather conditions.

ZETEL® ArcSafe GR Wet Weather Clothing offers increased hazard specific protective performance to address specific needs and hazards in the electrical utility industry for Australasian conditions. ZETEL® ArcSafe GR clothing is highly visible, waterproof, breathable, windproof, flame resistant and offers protection against electric arc hazards.
At Elliotts, we know that firefighters today face a broad range of extreme hazards including: high heat and flame, molten materials, hot surfaces, harsh physical environments and possible exposure to chemicals and bloodborne pathogens.

Elliotts range of protective clothing for firefighters offers protection against the physiological stress created through exposure to these kinds of environments.

A unique feature of the Elliott range is that it strikes the balance between offering protection while limiting stress on the wearer.

Elliotts range of Structural and Wildland Protective Clothing for Firefighters are certified by SAI Global to Structural and Wildland firefighting standards:

- AS/NZS 4967 “Protective clothing for firefighters Requirements and test methods for protective clothing used for structural firefighting”
- AS/NZS 4824 “Protective clothing for firefighters Requirements and test methods for protective clothing used for wildland firefighting”

There are various types of firefighting garments available and having a clear understanding of your needs will help you choose the right garments from Elliotts Quality Safety Gear range.

<table>
<thead>
<tr>
<th>Clothing Type</th>
<th>Description</th>
<th>Standards</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Firefighting</td>
<td>Protective clothing intended to be worn during structural firefighting and associated activities where there is a risk of heat or flame.</td>
<td>AS/NZS 4967</td>
<td>Nomex, Gemini XTL, PBI Gold</td>
</tr>
<tr>
<td>Wildland Firefighting</td>
<td>Protective clothing designed to be worn in Wildland firefighting and associated activities.</td>
<td>AS/NZS 4824</td>
<td>Proban, Tecasafe® Plus</td>
</tr>
<tr>
<td>Stationwear</td>
<td>Protective clothing intended to be worn by firefighters when they are around the station.</td>
<td></td>
<td>Tecasafe® Plus, Walls® FR</td>
</tr>
<tr>
<td>Rescue Coveralls</td>
<td>Protective clothing to be worn in rescue, extrication and urban cleanup operations where the risk of fire exposure is low.</td>
<td></td>
<td>Proban®, Tecasafe® Plus, Walls® FR</td>
</tr>
<tr>
<td>Firefighting PPE</td>
<td>PPE to be worn in addition to primary firefighting apparel.</td>
<td></td>
<td>Protech-8, Nomex, PBI Gold, Aluminised Kevlar</td>
</tr>
</tbody>
</table>
Wildland Firefighting Clothing Construction

Wildland garments are constructed using a single layer of durable FR materials. Wildland garments are unlined and do not incorporate a moisture barrier.

Elliotts Wildland Firefighting garments are constructed from either Tecasafe® plus or Proban® FR Cotton.

Wildland protective clothing is designed to be worn during bushfire or wildland firefighting and associated activities. Wildland Protective Clothing is not intended to provide protection during fire entrapment.

Wildland fire fighting involves work primarily in hot summer temperatures, for many hours in which the firefighter may develop high levels of metabolic heat.

Consequently, the protective clothing should be light, flexible and commensurate with the risks to which the firefighter may be exposed in order to be effective. Wildland clothing should be designed to not only protect, but also assist in managing metabolic heat. It must assist in keeping the firefighter cool, by allowing body heat to escape.
Elliotts recommends that a wildland firefighter’s protective clothing should be comfortable, breathable, lightweight, highly visible, allow the wearer to move freely and offers overall protection in the hazardous fire fighting environment.

Wildlands Firefighting Apparel needs to be able to be worn for long periods of time in rough and unpredictable conditions.

The Elliotts Wildlands range takes advantage of the latest fabric technologies to create a wildland firefighting system that offers a high level of protection in a lightweight construction.

Our full range of Wildlands Firefighters Protective Clothing is certified to AS/NZS 4824:2006 Requirements and test methods for protective clothing used for Wildlands Firefighting.
Elliott's Structural Firefighting Systems and protective apparel are designed to be comfortable, breathable, lightweight, highly visible, allow the wearer to move freely and offer the highest possible overall protection in the hazardous fire fighting environment.

Elliott's range of Protective Clothing for Structural Firefighters incorporates the latest in fabric technologies from TenCate, PBI and DuPont Nomex.

The Australian based design, construction and structural system features have been created to protect the wearer from the extreme conditions faced by structural firefighters.

Our full range of Structural Firefighters Protective Clothing is certified to AS/NZS 4967:2009 Requirements and test methods for protective clothing used for Structural Firefighting.
**Chem-Tech® Chemical Splash Protective Clothing**

Chem-Tech® is the latest generation of Chemical Splash Suit fabrics with a breathable hydrophilic polytetrafluoroethylene PTFE laminate. Elliot’s range of Chem-Tech® Chemical Splash Protective Clothing is made from a high performance, high quality 5 layer breathable fabric manufactured specifically for the requirements of chemical splash protection.

The Chem-Tech® Standard and FRAS fabrics allows heat vapour to transfer through the fabric while preventing liquid penetration by a variety of chemicals. Chem-Tech® Chemical Splash Protective Clothing allows the body to ‘breathe’, so your perspiration can evaporate reducing the possibility of heat stress and therefore improving wearer comfort.
HAZMAT CHEMICAL

Superior protection for hazardous environments

The Saint-Gobain product line includes our revolutionary single-skin protective ONESuits and ONEGlove that offer lightweight protection without the use of overcovers.

All of our products are certified to NFPA 1991, the most stringent standard for protection from chemical/biological agents, including liquefied gas. Our ONESuit protective suits are lightweight for maximum comfort, and include the ONEGlove Hazmat, the first and only single-piece chemical protective glove certified to NFPA 1991.

The ONESuit range provides the ultimate in safety, comfort and mobility in any type of hazardous situation.
The Chem-Tech® range of fabrics allows vapour to transfer through the fabric while preventing liquid penetration by a variety of chemicals. Chem-Tech® Chemical Splash Protective Clothing allows the body to breathe, so your perspiration can evaporate reducing the possibility of heat stress and therefore improving wear comfort.

### Material Data Specification

<table>
<thead>
<tr>
<th></th>
<th>Chem-Tech® 300D Polyester 100%</th>
<th>Chem-Tech® FRAS 300D Polyester 98% Carbon fibre 2%</th>
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</thead>
<tbody>
<tr>
<td><strong>Outer Fabric</strong></td>
<td>300D Polyester 100%</td>
<td>300D Polyester 98% Carbon fibre 2%</td>
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<tr>
<td><strong>Membrane</strong></td>
<td>An expanded PTFE membrane</td>
<td>An expanded PTFE membrane</td>
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<tr>
<td></td>
<td>providing liquid penetration</td>
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</tr>
<tr>
<td></td>
<td>resistance and moisture</td>
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<td></td>
<td>vapour performance.</td>
<td>vapour performance.</td>
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<tr>
<td><strong>Inner Lining</strong></td>
<td>Tricot knit to provide</td>
<td>Tricot knit to provide additional durability and</td>
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<td></td>
<td>additional durability and</td>
<td>protection of the inner membrane and PU Coating.</td>
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<tr>
<td></td>
<td>protection of the inner</td>
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<td></td>
<td>membrane and PU Coating.</td>
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<td><strong>Fabric Weight</strong></td>
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### Compliance or Certification

<table>
<thead>
<tr>
<th></th>
<th>Chem-Tech</th>
<th>Chem-Tech FRAS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Visibility</strong></td>
<td>AS4602.1999 High visibility safety garment</td>
<td>Certified</td>
</tr>
<tr>
<td></td>
<td>EN471:2008 High visibility clothing for professional use</td>
<td>Compliant</td>
</tr>
<tr>
<td><strong>Anti Static</strong></td>
<td>EN1149-1:1995 Surface Resistivity of Fabric test method</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Flame Resistance</strong></td>
<td>AS2755.1-1985 Textile fabrics - Burning behaviour</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Determination of ease of ignition of vertically oriented specimens</td>
<td>No Ignition</td>
</tr>
</tbody>
</table>

### Liquid Chemicals

AS/NZS ISO 6530-2006 Protection Against Liquid Chemicals
This ISO internationally-recognised test performance method is a measurement of chemical penetration, absorption and repellency for chemical fabrics and materials.

<table>
<thead>
<tr>
<th>Test Liquid</th>
<th>% Penetration</th>
<th>Repellency</th>
<th>Absorption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
<td>Length</td>
</tr>
<tr>
<td>Hydrochloric Acid</td>
<td>37</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Sodium Hydroxide</td>
<td>40</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Jet Fuel A1</td>
<td>100</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Sulphuric Acid</td>
<td>98</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Nitric Acid</td>
<td>50</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

AS3765.1:1990 Resistance to Liquid Penetration(General Purpose)
Appendix A – AS3765.1 testing is terminated at 60min.

<table>
<thead>
<tr>
<th>Test Liquid</th>
<th>Penetration</th>
<th>Repellency</th>
<th>Absorption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulphuric Acid 98% (conc)</td>
<td>&gt;60 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitric Acid 40%</td>
<td>&gt;25 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium Hydroxide 12.5M</td>
<td>&gt;60 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>&gt;30 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetrachloroethylene</td>
<td>&gt;15 minutes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GB12012-1989 Further testing was completed to GB12012-1989 by a Certified Chinese Laboratory to determine extended resistance times.

<table>
<thead>
<tr>
<th>Test Liquid</th>
<th>Penetration</th>
<th>Repellency</th>
<th>Absorption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulphuric Acid 98%</td>
<td>&gt;180 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitric Acid 40%</td>
<td>&gt;160 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrochloric Acid 30%</td>
<td>&gt;157 minutes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Chem-Tech® Barrier Technology

Chem-Tech® Chemical Splash Protective Clothing is made from a high performance, high quality 5 layer breathable fabric manufactured specifically for the requirements of chemical splash protection.

Learn more about Chemtech Chemical Splash Protective Clothing at elliottaustralia.com
SPECIALIST REFERENCE CENTRE

98 ELLIOTTS ONLINE
99 CUSTOMER SERVICE AND CUSTOMISED APPAREL
100 AUSTRALIAN STANDARDS AND CERTIFICATION
101 INTERNATIONAL STANDARDS AND CERTIFICATION
102 TECSAFE PLUS
103 WALLS FR
104 PROBAN
105 TENCATE GEMINI XTL
106 PBI GOLD
107 NOMEX 3D
108 STEDAIR MOISTURE BARRIERS
109 THERMAL LINERS
110 GLOVE SIZING GUIDE
111 APPAREL SIZING CHART

TAKE CARE
Elliotts Online provides a place to learn more about Elliotts Quality Safety Gear.

- Specialist Safety Apparel
- Welding & Workshop Safety
- Gloves and Hand Protection
- Safety Workwear and PPE

We have taken the time to provide you with as much information as we can on designs, materials, standards and safety information to help you make the right choice of quality safety gear.

Register online today to recieve the latest news, product updates and customer service from the Elliotts Team.
ELLIOTTS CUSTOMER SERVICE

For over 40 years, Elliotts has been committed to manufacturing, distributing and supporting world-class quality safety gear. We’ve built a respected and experienced team across our head office, manufacturing and distribution operations with wide industry knowledge and supported by the best information and systems to ensure the very highest standards of advice and service.

The Elliotts Customer Service Promise

We **TAKE CARE** to listen to our customers to ensure we understand their requirements.

We **TAKE CARE** in accurately processing our orders to ensure our customers receive what they want when they want it.

We **TAKE CARE** in offering alternatives & solutions.

We **TAKE CARE** to be accommodating and easy to do business with.

Elliotts Customer Service is tasked with assisting you in finding the best safety product for your business and assisting in every step of the purchasing and procurement process.

Customised Quality Safety Gear

Elliotts manufacturing and design team are constantly working on updating and improving our quality safety gear. Many of our clients use our team to create customised safety apparel to suit their individual requirements for the many industries that our safety gear protects.

Alternately we can create a new garment designed from the ground up from our large range of safety fabrics, construction systems and apparel designs for your specific work environment and project tasks.

With our state of the art manufacturing facilities in Brisbane and Fiji, Elliotts has the capability to design, construct and manufacture the perfect customised garment solution for your safety needs.

Australian made customised Quality Safety Gear.

Learn more about Elliotts Specialist Safety Apparel at elliottaustralia.com
Elliotts is a quality endorsed company with many of its products certified to specific standards applying to protective clothing and equipment. This means our customers are guaranteed superior product performance across our entire range. It also means that workers use our products with confidence and peace of mind.

Critical to ongoing product development is our commitment to manufacturing products to meet the requirements of Australian or International Standards and to have these products certified by an independent third party. Also, on-going dialogue with our end users ensures we remain agile and responsive to ever-changing customer needs.

Elliotts currently have products certified to the following Australian Standards by SAI Global:

**AS/NZS 4967:2009**
Protective clothing for firefighters - Requirements and test methods for protective clothing used for structural firefighting. Elliotts manufacture certified structural firefighting clothing in our Australian manufacturing facility.

**AS/NZS 4824:2006**
Protective clothing for firefighters - Requirements and test methods for protective clothing used for wildland firefighting (ISO 15384:2003, MOD) Elliotts manufacture certified wildland clothing in our Australian and Fijian manufacturing facilities.

**DR AS/NZS 4602.2 CP**
High visibility safety garments - Garments for fire service personnel. This Standard specifies high visibility safety garment requirements without reference to particular types or styles that are used specifically by fire services. At the time of printing this catalogue the standard was in a Draft form.

**AS/NZS 4602.1:2011**
High Visibility Safety Garments Elliotts manufacture certified high visibility safety garments in our Australian, Fijian and Chinese manufacturing facilities.

**AS/NZS 2161:2000**
Occupational protective gloves- we manufacture certified gloves in our Chinese manufacturing facilities.

**AS/NZS 4453.3:1997**
Protective clothing for users of hand-held chainsaws - Protective legwear Elliotts manufacture certified Chainsaw clothing in our Fijian manufacturing facility.

**AS/NZS 3957:2006**
Light-transmitting screens and curtains for welding operations. Elliotts manufacture certified welding screens in our Australian manufacturing facility.
Many of the Elliotts products are certified to specific international standards which are either associated with existing Australian Standards or are certified to globally recognised standards that are specific to certain industries. This means our customers are guaranteed certified product performance across our entire range including extreme specialist apparel.

Elliotts ongoing partnerships with global safety manufacturers ensures that our clients are receiving access to the most advanced safety products available. Many of these products are certified to international standards that ensure that each product is certified to meet safety levels certified by international safety agencies.

Elliotts currently have products certified to the following International Standards:

**NFPA 70E**
The National Fire Protection Agency’s (NFPA) 70E is the Standard for Electrical Safety Requirements for Employee Workplaces. NFPA70E requires employees to wear flame resistant protective clothing wherever there is a possible exposure to electric arc flash. NFPA70E is widely accepted throughout general manufacturing as well as the electrical industries.

**NFPA 2112**
Flame Resistant Garments for Protection of Industrial Personnel Against Flash Fire. The standard is targeted towards workers who are at risk of flash fires, primarily in the petro-chemical industries.

**NFPA1991**
Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies

**NFPA1994**
Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents

**ASTM F1506**
Standard Performance Specification for Textile Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary Arc and Related Thermal Hazards. The Standard was developed to give minimum performance specifications for Protective clothing. The major two requirement of this specification was that the fabric is flame resistant, determined by using the standard vertical flame test (ASTM D6413) and has received an Electric Arc Rating or ATPV

**ASTM F2178-08**

**ASTM F2621-06**
Standard Practice for Determining Response Characteristics and Design Integrity of Arc Rated Finished Products in an Electric Arc Exposure

**ASTM F2676-09**
Standard Test Method for Determining the Protective Performance of an Arc Protective Blanket for Electric Arc Hazards

**ASTM F1959**
Standard Test Method for Determining the Arc Rating of Materials for Clothing

**ASTM F1930-12**
Standard Test Method for Evaluation of Flame Resistant Clothing for Protection Against Fire Simulations Using an Instrumented Manikin

**IMO SOLAS Type II-2**
International Maritime Organisation (IMO). Protection against liquid and airborne chemicals for personnel working within the shipping and naval sector.

Learn more about Australian and International Standards at elliottaustralia.com
Unbeatable Electric Arc and Flash Fire Protection

TenCate Tecasafe® plus delivers superior electric arc and flash fire protection in a comfortable lightweight fabric. It performs to the NFPA 70E and NFPA 2112 standards and lasts longer than FR treated fabrics, making Tecasafe Plus a great value. Unlike other protective fabrics, it is inherently flame resistant. So, the unique FR protection comes built-in, and won't wash out or wear out.

TenCate high performance fabrics provide protection, comfort, durability and excellent value.

Inherently flame resistant
FR properties are built in, and won't wash or wear out. Exceeds NFPA 70E HRC 1, HRC 2, and NFPA 2112 performance standards.

Comfortable to wear
Soft and breathable. Superior moisture management because of special cellulosic fiber content.

Exceptional durability
Outstanding abrasion resistance and better strength retention after multiple commercial washes.

Outstanding laundered appearance
Fabric retains its like-new look and maintains permanent pressed appearance better than other protective fabrics.

Excellent value
Long life cycle and competitive price means lowest cost.

<table>
<thead>
<tr>
<th>PHYSICAL PROPERTIES</th>
<th>Tecasafe® Plus 580</th>
<th>Tecasafe® Plus 700</th>
<th>Tecasafe® Plus 850</th>
<th>NFPA 70E Requirement HRC 1</th>
<th>NFPA 2112 Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (± 5%)</td>
<td>5.8 oz / 195 g</td>
<td>7.0 oz / 235 g</td>
<td>8.5 oz / 285 g</td>
<td>5.0 min / 8.0 min</td>
<td></td>
</tr>
<tr>
<td>Fiber Blend</td>
<td>48% fr-modacrylic 37% lyocell 15% aramid</td>
<td>48% fr-modacrylic 37% lyocell 15% aramid</td>
<td>45% fr-modacrylic 35% lyocell 20% aramid</td>
<td>4.0 max / 2.0 max</td>
<td></td>
</tr>
<tr>
<td>Arc Thermal Performance Value (ATPV) (cal/cm²) ASTM F 1959</td>
<td>6.5</td>
<td>9.0</td>
<td>10.2</td>
<td>6.0 min</td>
<td>6.0 min</td>
</tr>
<tr>
<td>Flame Resistance</td>
<td>ASTM D 6413</td>
<td>6.0 x 0.0</td>
<td>6.0 x 0.0</td>
<td>6.0 max / 6.0 max</td>
<td>4.0 max / 2.0 max</td>
</tr>
<tr>
<td>Thermal Protective Performance (cal/cm²)</td>
<td>9.6 with spacer / 6.6 without spacer</td>
<td>12.3 / 10.9</td>
<td>10.0 / 8.0</td>
<td>6.0 min / 3.0 min</td>
<td>50.0 max</td>
</tr>
<tr>
<td>Flash Fire Exposure (Manikin Test) (% body burn [2 cal/cm²/sec] @ 3 sec)</td>
<td>ASTM F 1930</td>
<td>23%</td>
<td>15%</td>
<td>19%</td>
<td>10.0 max</td>
</tr>
<tr>
<td>Thermal Shrinkage Resistance (% [500°F, 5 minutes])</td>
<td>&lt; 5.0</td>
<td>&lt; 1.0</td>
<td>&lt; 3.0</td>
<td>10.0 max</td>
<td></td>
</tr>
</tbody>
</table>
Over the last decade, Walls FR® has changed the way people think about protective clothing, delivering comfort, protection and wear life never before thought possible in a single fabric. Walls FR® fabrics deliver the best protection combined with the lowest cost per wearing in the industry.

Walls FR® materials incorporate patented flame retardant technology developed specifically to leverage the durability and endothermic properties of nylon for long wear life and improved flame protection. This blend of 88% cotton with 12% high tenacity nylon eliminates the need to wear undergarments to achieve industry standards for flame and electric arc protection.

What is the difference between Walls FR and other FR products?
- Walls FR is patented FR 88% cotton 12% nylon fabric
- Walls FR is certified to Oeko-TEx Class II
- Combines the comfort of cotton with the durability of nylon
- Walls FR patented technology has been tested and passes for flame resistance requirements at more than 200 industrial launderings

How does Walls FR fabric work?
Walls FR fabrics are treated with a technically advanced flame resistant chemical that is permanently bonded to the fiber and certified to the strictest standards in the industry. When exposed to a flame, this chemically bonded treatment suppresses and extinguishes the flame by both chemical and physical means within the fabric microstructure.

How long does the treatment last in Walls FR garments?
Walls FR fabrics have been tested for flame resistance in excess of 200 launderings. This demonstrates that the technically advanced chemical treatment, which is permanently bonded to the fabric fibers, will last for the life of the garment.

<table>
<thead>
<tr>
<th>WALLS FR MATERIAL PROPERTIES</th>
<th>Walls FR 5.8 oz</th>
<th>Walls FR 7.0 oz</th>
<th>Walls FR 9.0 oz</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (ASTM D3776)</td>
<td>oz/(sq yd)</td>
<td>grams/(sq metre)</td>
<td>oz/(sq yd)</td>
<td>grams/(sq metre)</td>
</tr>
<tr>
<td>Fibre Blend</td>
<td>5.8oz 195 gsm</td>
<td>7.0oz 235 gsm</td>
<td>9.0oz 305 gsm</td>
<td>Requirements</td>
</tr>
<tr>
<td>HRC Value</td>
<td>88% Cotton 12% Nylon</td>
<td>88% Cotton 12% Nylon</td>
<td>88% Cotton 12% Nylon</td>
<td></td>
</tr>
<tr>
<td>ATPC Value (Cal/cm²) ASTM F 1959</td>
<td>6.4 10.2 12.7</td>
<td>100mm 2.0 sec</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flame Resistance ASTM D 6413</td>
<td>Char Length After Flame (Secs)</td>
<td>92mm 0</td>
<td>8.2 8.3</td>
<td>8.7 5.7</td>
</tr>
<tr>
<td>Thermal Protective Performance (cal/cm²) NFPA 2112-Section 8.2 with spacer without spacer</td>
<td>27.1% 19.6%</td>
<td>Max 50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flash Fire ASTM F1930 (3 Sec burn)</td>
<td>-0.7% -1.3</td>
<td>Max -10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Thermal Shrinkage (NFPA 2112-Section 8.4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Walls FR test results and data supplied by Walls FR

Learn more about Elliotts Specialist Safety Materials at elliottaustralia.com
PROBAN® is a chemically treated Cotton fabric designed to protect the wearer from a range of workplace hazards such as arc flash, flash fire, molten ferrous metal splash, exposure to welding and wildland firefighting.

The PROBAN® process ensures the fabrics are guaranteed for flame resistance for the life of the garment, provided recommended wet laundering or dry cleaning procedures are followed.


**The PROBAN® Chemical Process**

PROBAN® is both a chemical and a quality controlled technological process, treatment takes place at the finishing stage of cotton and cotton blended textile manufacture.

The PROBAN® process involves chemical impregnation. Drying and curing with ammonia gas using Rhodia’s patented licensed technology followed by oxidation and finally neutralisation.

The process of polymer formation is irreversible. The polymer can only be removed by powerful oxidising agents, particularly in the presence of metal ions. See wash factors to be avoided.

**THE PROBAN® Process**

1. Proban molecules are sufficiently small and linear to penetrate the internal areas of the cotton fibre. Some chemical will be present in the spaces between the fibres.

2. Drying removes excess moisture and prepares the fabric for curing.

3. Dried fabric is cured with ammonia gas. This causes the small molecules to cross link and form a polymer. The polymer is then physically trapped and fixed in the core of each fibre.

4. A final oxidation and neutralisation treatment completes polymer fixation and removes any residual by-products.

**Lifelong protection**

PROBAN® finished fabrics retain their flame retardant properties for the lifetime of the garment. Fabrics acquire their flame retardant properties from the polymer which is embedded into the fabric. It can only be removed by powerful oxidising agents. See wash factors to be avoided.

**Flame performance**

When exposed to flame, PROBAN® fabrics form an insulating char, this stays in place and helps protect the wearer. PROBAN® fabrics do not smoulder, have no afterglow, do not melt and the flame doesn’t spread outside the charred area.

**PROBAN® is used by Elliotts for the following safety apparel and accessories:**

- Wildlands Firefighting Apparel
- Rescue Coveralls
- Welding Safety Apparel
- Wakatac Welding Safety Apparel
Innovative PBI Fabric from TenCate

Gemini XTL is the latest PBI Fabric combining 60% Para-aramid for high strength blended with 40% PBI for thermal stability.

The Gemini XTL is reinforced with a propriety high strength grid to give you the most innovative firefighting PBI option providing the high performance you need when it counts most.

Fabric Name: TENCATE® GEMINI XTL
Weight gm²: 205gm² (6.0oz)
Composition: 60% Para-aramid fiber / 40% PBI
Weave/Knit: Modified Plain
Description: Tencate Gemini XTL
Attributes: Water / Tear Resistant
Compliance: Meets outer shell requirements of EN 469:2005, AS/NZS 4967:2009 and Amendments

TenCate high performance fabrics provide protection, comfort, durability and excellent value.

Tencate Gemini XTL features a high strength grid to give you the most innovative PBI option that provides strength, reduces abrasion and eliminates puckering.

The superior durability of Tencate Gemini XTL remains strong and flexible after thermal exposure.

Tencate Gemini™ offers an advanced protection outer shell:

- Tencate Gemini XTL offers high tear strength and tensile characteristics. Certified to ISO 13934-1 and ISO 4674-1 Method B
- Tencate Gemini XTL flame resistant properties make the material a perfect outer shell solution for firefighting. Certified to ISO 15025:200A and ISO 15025:2000B
- Meets the outer shell requirements of AS/NZS 4967:2009

Learn more about TenCate® Gemini XTL Materials and Applications through the Elliotts Online Reference Centre elliottaustralia.com
Protective clothing made with PBI flame resistant fibres withstands the increasing dangers associated with firefighting, arc flash, and flash fire.

The fabric does not shrink, become brittle, or break open under extreme heat and flame exposure, providing firefighters and industrial workers with superior protection.

**PBI Fibres**

PBI® (polybenzimidazole) stable fibre is an organic fibre that provides thermal stability for a wide range of high temperature applications. PBI® fibre will not burn in air, it does not melt or drip and it will retain its strength and flexibility after exposure to flame.

**Fabric Name:** MELBA ENFORCER® PBI Gold®

**Weight gm²:** 220gm²

**Composition:** 40% PBI / 60% Kevlar

**Weave/Knit:** Twill Ripstop

**Description:** 220 gsm PBI Gold®

**Attributes:** Water / Oil Repellant

**Compliance:** Meets outer shell requirements of AS/NZS 4967:2009 and Amendments

Melba ENFORCER® is made from a blend of PBI® fibre and Kevlar®. This blend is recognised worldwide as a leader in outer shell technology and has been developed to be sympathetic to Australia’s harsh conditions.

The Melba ENFORCER® blend utilises finer yarn counts to offer lighter outer shell technology. These finer yarns ensure Melba ENFORCER® has a better ‘cover factor’. That is, it is woven tighter – offering exceptional thermal resistance and in tandem with our patented water-repellent finish that offers additional protective performance against chemical splash and liquid penetration.

**Melba ENFORCER® is the outer shell of first choice:**

- Exceptional thermal performance Melba ENFORCER® thermal exposure. It will remain supple and retain its strength characteristics.

- Melba ENFORCER® offers high tear strength and tensile characteristics. Even in such demanding environment it has the durability to last the distance.

- Melba ENFORCER® rip-resist weave adds to the level of durability and high abrasion resistance

- Chemical Resistance Super durable water-repellent finish, Melba ENFORCER® ensures you stay drier longer.

- Meets the outer shell requirements of AS/NZS 4967:2009

- Tested to EN 469 Safety Requirements (Test Data Available online)

Learn more about Melba ENFORCER® PBI Gold® Materials and Applications through the Elliotts Online Reference Centre elliottaustralia.com
Protective clothing made with PBI flame resistant fibres withstands the increasing dangers associated with firefighting, arc flash, and flash fire. The fabric does not shrink, become brittle, or break open under extreme heat and flame exposure, providing firefighters and industrial workers with superior protection.

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<table>
<thead>
<tr>
<th>Fabric Name:</th>
<th>MELBA ENFORCER® PBI Gold®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight gm²:</td>
<td>220gm²</td>
</tr>
<tr>
<td>Composition:</td>
<td>40% PBI / 60% Kevlar</td>
</tr>
<tr>
<td>Weave/Knit:</td>
<td>Twill Ripstop</td>
</tr>
<tr>
<td>Description:</td>
<td>220 gsm PBI Gold®</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Water / Oil Repellant</td>
</tr>
<tr>
<td>Compliance:</td>
<td>Meets outer shell requirements of AS/NZS 4967:2009 and Amendments</td>
</tr>
</tbody>
</table>

Melba ENFORCER® is made from a blend of PBI® fibre and Kevlar®. This blend is recognised worldwide as a leader in outer shell technology and has been developed to be sympathetic to Australia’s harsh conditions. The Melba ENFORCER® blend utilises finer yarn counts to offer lighter outer shell technology. These finer yarns ensure Melba ENFORCER® has a better ‘cover factor’. That is, it is woven tighter – offering exceptional thermal resistance and in tandem with our patented water-repellent finish that offers additonal protective performance against chemical splash and liquid penetration.

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- Melba ENFORCER® offers high tear strength and tensile characteristics. Even in such demanding environment it has the durability to last the distance.
- Melba ENFORCER® rip-resist weave adds to the level of durability and high abrasion resistance.
- Chemical Resistance Super durable water-repellent finish, Melba ENFORCER® ensures you stay drier longer.
- Meets the outer shell requirements of AS/NZS 4967:2009
- Tested to EN 469 Safety Requirements (Test Data Available online)

Learn more about Melba ENFORCER® PBI Gold® Materials and Applications through the Elliotts Online Reference Centre elliottaustralia.com

NOMEX® is a revolutionary, heat and flame resistant fibre that provides protection to millions of people worldwide. Firefighters and emergency personnel around the world have relied on flame resistant turnout gear, Emergency Services wear, Stationwear and accessories made of NOMEX® brand fibres for over 40 years.

<table>
<thead>
<tr>
<th>Fabric Name:</th>
<th>MELBA FORTRESS® 3D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight gm²:</td>
<td>220gm²</td>
</tr>
<tr>
<td>Composition:</td>
<td>93% Nomex® / 5% Kevlar® / 2% Antistatic fibre</td>
</tr>
<tr>
<td>Weave/Knit:</td>
<td>3D</td>
</tr>
<tr>
<td>Description:</td>
<td>220 gsm NOMEX® IIIA producer dyed</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Water / Oil Repellant</td>
</tr>
<tr>
<td>Compliance:</td>
<td>Meets outer shell requirements of AS/NZS 4967:2009 and Amendments</td>
</tr>
</tbody>
</table>

Fires are unpredictable and situations can change in an instant with temperatures reaching over 1000°C leaving workers vulnerable to serious injury.

So for hazards like flash fire and pool fire, DuPont created Nomex® III A. A blend of 93% Nomex® with 5% Kevlar® and 2% antistatic fiber, this innovative fabric helps minimize break-open, and expands to form a stable and inert barrier between the fire and skin. This gives wearers the valuable seconds they need to escape from the hazard.

In collaboration with DuPont, MELBA FORTRESS® 3D has been developed to make significant fabric improvements providing lighter weights, wicking finishes, and breathability.

Additional Nomex® MELBA FORTRESS® 3D fabric Considerations:
- Widely used by petroleum, petrochemical, chemical, and utility industries, as well as firefighters
- Inherent thermal protection that cannot be washed away
- Durable and resistant to abrasion, tears, and chemicals
- Meets the outer shell requirements of AS/NZS 4967:2009
- Meets the NFPA 1975 standard for firefighters’ stationwear
- Meets the ASTM F1506 standard for workers’ apparel as protection from electric arc exposure
- Complies with NFPA 70E Standard for Electrical Safety in the Workplace
- Complies with NFPA 2112 Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire

Learn more about Melba FORTRESS® 3D Materials and Applications through the Elliotts Online Reference Centre elliottaustralia.com
As a world leader, Stedfast Inc. provides the Fire Service industry with products that meet and exceed the requirements of Fire brigades around the world. STEDAIR® 3000e and STEDAIR® 3000d Moisture Barriers have been developed to meet and exceed the technical requirements of EN469, the European for Fire-Fighters' Protective Clothing and AS/N254967: 2009, the Australian/New Zealand standard.

The enhanced bi-component membrane is comprised of an expanded PTFE (Teflon) matrix having a continuous hydrophilic and oliophobic coating that is impregnated into the matrix. This provides improved adherence of the seam tape and superior quality for seam protection. The moisture barrier meets and exceeds all the requirements of EN 469 Level 2. Also including viral penetration resistance, blood borne pathogen penetration resistance and chemical penetration resistance.

<table>
<thead>
<tr>
<th>Specification</th>
<th>STEDAIR® 3000d International System</th>
<th>STEDAIR® 3000e International System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Resistance ISO 17493:2000 (180oC)</td>
<td>&lt;1.5%</td>
<td>&lt;1.5%</td>
</tr>
<tr>
<td>Dimensional Change ISO 5077:2007</td>
<td>W: -3.0%</td>
<td>W: -3.0%</td>
</tr>
<tr>
<td></td>
<td>F: -3.0%</td>
<td>F: -3.0%</td>
</tr>
<tr>
<td>Total Heat Loss NFPA 1971-2007</td>
<td>205 to 315 W/m2</td>
<td>205 to 315 W/m2</td>
</tr>
<tr>
<td>Thermal Protection Performace NFPA 1971-2007</td>
<td>35 to 60 cal/cm2</td>
<td>35 to 60 cal/cm2</td>
</tr>
<tr>
<td>Liquid Penetration Resistance NFPA 1971-2007</td>
<td>No Penetration</td>
<td>No Penetration</td>
</tr>
<tr>
<td>Viral Penetration Resistance NFPA 1971-2007</td>
<td>No Penetration</td>
<td>No Penetration</td>
</tr>
<tr>
<td>Resistance to Water Penetration EN20811:1992</td>
<td>&gt;20 KPa</td>
<td>&gt;20 KPa</td>
</tr>
<tr>
<td>Resistance to Water Penetration Seams EN20811:1992</td>
<td>&gt;20kPa</td>
<td>&gt;20kPa</td>
</tr>
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### Specification

<table>
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<th>Stedair 3000d</th>
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<td>No Penetration</td>
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</tr>
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<td>&gt;20kPa</td>
<td>&gt;20kPa</td>
</tr>
<tr>
<td>Water Vapour Resistance</td>
<td>Composite: &lt;30m².Pa/W</td>
<td>Composite: &lt;30m².Pa/W</td>
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<tr>
<td></td>
<td>Barrier Only: &lt;6m².Pa/W</td>
<td>Barrier Only: &lt;6m².Pa/W</td>
</tr>
</tbody>
</table>

Nomex spunlace substrate with polymer spacer dots laminated to a breathable PTFE Membrane

**STEDAIR® 3000d Benefits:**
- Compliant to AS/NZS 4967:2009
- Waterproof
- Compliant to EN 469 Level 2
- Resistant to viral penetration
- Compliant to NFPA 1971-2007
- Fire Resistant
- Resistant to chemical penetration
- High breathability
- High THL
- Resistant to heat and thermal

**STEDAIR® 3000e Benefits:**
- Compliant to AS/NZS 4967:2009
- Waterproof
- Compliant to EN 469 Level 2
- Resistant to viral penetration
- Compliant to NFPA 1971-2007
- Fire Resistant
- Resistant to chemical penetration
- High breathability
- High THL
- Resistant to heat and thermal

TenCate Caldura is a leader in thermal barrier fabric, has a smooth, slick face cloth that allows you to move in and out of your gear with ease. Utilising batts blended from DuPont Kevlar and Nomex, TenCate Caldura allows you to select the proven protection and performance that best suits the need of you department.

TenCate high performance fabrics provide protection, comfort, durability and excellent value
- Comfortable, thin and flexible
- Excellent total heat loss (THL) for greatest heat stress relief
- Slick Face Cloth - For easier donning and doffing.
- Durable - Resistant to snagging, pilling and abrasion.
- Wickwell Plus - Unmatched wickability moves perspiration away from the body and spreads moisture for improved dissipation, keeping you drier and more comfortable.

**ADVANCED THERMAL PROTECTION FOR FIREFIGHTING**

**T-Gard I Plus and T-Gard II Plus**
- Light weight, durable Nomex/ FR Viscose 50/50 face cloth.
- Rip-resist weave on face cloth for added durability and strength.
- Incorporates 1or 2 layer of DuPont Sontara E89.
- Thinnest, lightweight thermal protection available resulting in reduced bulk.
- Excellent tear and tensile strength performance with non-slump feature.
- Multi-layered construction traps more air for excellent thermal protection.

**T-Gard I Runner - Nomex Runner Quilted to Sontara E89**
- Allows movement inside the garment when reaching, extending quickly.
- Moisture Management System ensures the moisture from your body is removed quickly and efficiently keeping you drier and more comfortable.
- Sleek texture for easier donning and doffing.
- Rip-resist weave for added durability and excellent resistance to pilling.
- Excellent tear and tensile strength performance.

Learn more about Elliotts Specialist Safety Materials at elliottaustralia.com
GLOVE SIZING

Elliotts GLOVE Measuring Guide

Check measurements against chart and use the larger measurement size for the best glove fit.

A Length Measure from the tip of the middle finger to the wrist crease.

B Width Measure around the hand across the knuckle with a closed fist.

<table>
<thead>
<tr>
<th>Size</th>
<th>Size</th>
<th>Length</th>
<th>Width</th>
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<tbody>
<tr>
<td>XS</td>
<td>7</td>
<td>18cm</td>
<td>22.5cm</td>
</tr>
<tr>
<td>S</td>
<td>8</td>
<td>19cm</td>
<td>23.0cm</td>
</tr>
<tr>
<td>M</td>
<td>9</td>
<td>20cm</td>
<td>23.5cm</td>
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<tr>
<td>L</td>
<td>10</td>
<td>21cm</td>
<td>24.0cm</td>
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<tr>
<td>XL</td>
<td>11</td>
<td>22cm</td>
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<tr>
<td>XXL</td>
<td>12</td>
<td>23cm</td>
<td>25.0cm</td>
</tr>
</tbody>
</table>

WELDING GLOVES

All Elliotts welding gloves come as a large size and can be worn over a cotton inner if required.

Big Red Gloves are available in Small, Medium, Large and X-large

HEAT CONTACT GLOVES

Come standard as a large mitt or as a X-large cover mitt which can be worn over a welding glove as a replacement for a glove saver.

HEAT RADIANT GLOVES

All Elliotts radiant heat gloves come standard as a large size and can be worn over a cotton inner if required.

These gloves come as an aluminised back and kevlar or treated leather palm.

TECHNICAL & NITRILE GLOVES

All Elliotts technical and nitrile gloves are made to be worn as a snug fit for better dexterity.

Technical and Nitrile gloves come in a range of sizes to ensure that you have the best fit.

RIGGER AND WORK GLOVES

Rigger and Work gloves are made to highly durable for tough conditions.

These gloves allow some breathing space and are available in multiple sizes as listed.

PROTECH 8 FIREFIGHTING

Protech 8 Firefighting gloves are designed to service multiple areas in the fire and rescue industry.

Gloves include water and thermal barriers as well as ultra durable rescue and extrication gloves.
**Elliotts GLOVE Measuring Guide**

For the best glove fit, check measurements against chart closed fist. Width measure around the hand the wrist crease. Length measure from the tip palm.

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**HEAT RADIANT GLOVES**

Come standard as a large size and can be worn over a welding or as a x-large cover mitt which come standard as a large size and can be worn as a snug fit for technical and nitrile gloves. All Elliotts welding gloves are made to be worn as a snug fit for technical and nitrile gloves.

**HEAT CONTACT GLOVES**

These gloves allow some breathing space and are available in multiple sizes as listed.

**RIGGER AND WORK GLOVES**

Rigger and work gloves are made for highly durable for tough conditions. These gloves include water and thermal barriers as well as ultra durable in the fire and rescue industry.

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**ArcSafe Switching Bib and Brace Trousers**

**ArcSafe Switching Jacket 900mm length & Coat 1300mm length**

**Technique & Nitrile Gloves**

Come in a range of sizes to ensure that you have the best fit.

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**Elliotts safety Apparel Measuring Guide**

**C - Hip Measure**

Measure around the hip with a comfortable fit.

**D - Sleeve Measure**

Measure from the point of the shoulder to wrist.

**E - Inside Leg Measure**

Measure from the crotch to the top of shoe heel.

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**Learn more about Elliotts Specialist Safety Apparel at elliottaustralia.com**