PIENAAR BROS.
SAFETY SPECIALISTS SINCE 1988

MB WORKWEAR®
Safety Obsessed, Quality Driven

FROM THE INNOVATORS AND MARKET LEADERS OF ZEROFLAME ACID GARMENTS

ZERO ARC FLASH BROCHURE

From the team that brought the legacy of Quality Zeroflame and Acid garments we once again bring you the Next Generation of Quality in Arc Garment Solution.

MB Workwear Manufacturing

Zero Arc Flash is MB Workwear's latest offering in their Zeroflame range. Zero Arc garments are made from DuPont™ Nomex® Essential Arc fabric which has an arc rating ATPV12.4cal/cm2.

MB Workwear offers world class manufacturing capabilities due to their long track record, expertise and ISO 9001 accredited process controls. MB Workwear's commitment to superior quality and world class manufacturing practises has been recognised both locally and internationally.

Nomex® Essential Arc fabric is an inherent Flame-Resistant Fabric. This means the very fibres provide Flame Resistant protection for the life of the garment. Unlike treated fabrics, Nomex® Essential fabric protection doesn't wash out.

The purpose of Zero Arc Flash garments is to protect against the thermal hazards created by an arc flash.

Our Partnerships

This is a joined venture of industry experts in manufacturing, distributors and fabric specialist experts.

MB Workwear have partnered with DuPont™ who are the world leaders in developing innovative and specialised materials. DuPont™ has proven expertise in science and innovation to create sustainable solutions for the complex challenges facing our world. Nomex® Essential Arc is an inherent flame-resistant fabric developed by DuPont™ and used to manufacture Zero Arc Flash garments and offers years of brand confidence.

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DUPONT
Nomex®

Our Motivation

MB Workwear as the leaders in the industry with our exciting new ranges and safety innovations. We felt the necessity to provide the South African market with a stylish and well thought through Euro centric garment design, that is suitable for the African market. The new Zero Arc Flash garments are designed to be comfortable to wear, yet still offer the wearer protection against the thermal effects of an electric arc.

The South African workforce no longer view workwear as unappealing and are ready for well designed, stylish garments that they will be proud to wear.

Appropriate Flame-resistant fabrics and handy pockets are for more than just style; your team are far more likely to wear the correct PPE if they're comfortable and the garments are practical while working.

zero arc flash

We're keeping it local

Support South Africa

What is an Arc Flash?

Electric arc flash is one of the most serious and least understood electrical hazards. An electric arc (sometimes referred to as "electrical flashover") is a continuous electric discharge of high current which flows through an air gap between conductors. This generates a very bright ultra-violet light as well as intensive heat. An arc flash is typically caused by a short circuit. This is sometimes due to a technical failure of electrical equipment (e.g. improper installation, dust, corrosion, surface impurities and sometimes simply due to normal wear and tear). However, in the majority of cases, short circuits are the result of a human error (e.g. caused by a worker touching a test probe to the wrong surface or from a slipped tool).

When does Electric Arc Flash Occur?

Electric arc flash can occur whenever and wherever electrical equipment is live. During maintenance or repair, if for any reason the equipment cannot be made "dead", then an electric arc can occur.

What are the Consequences of Electric Arc Flash?

Depending on the severity of the arc flash, a function of arc current and the duration of the arc, and dependent on the distance from the arc, it can lead to:

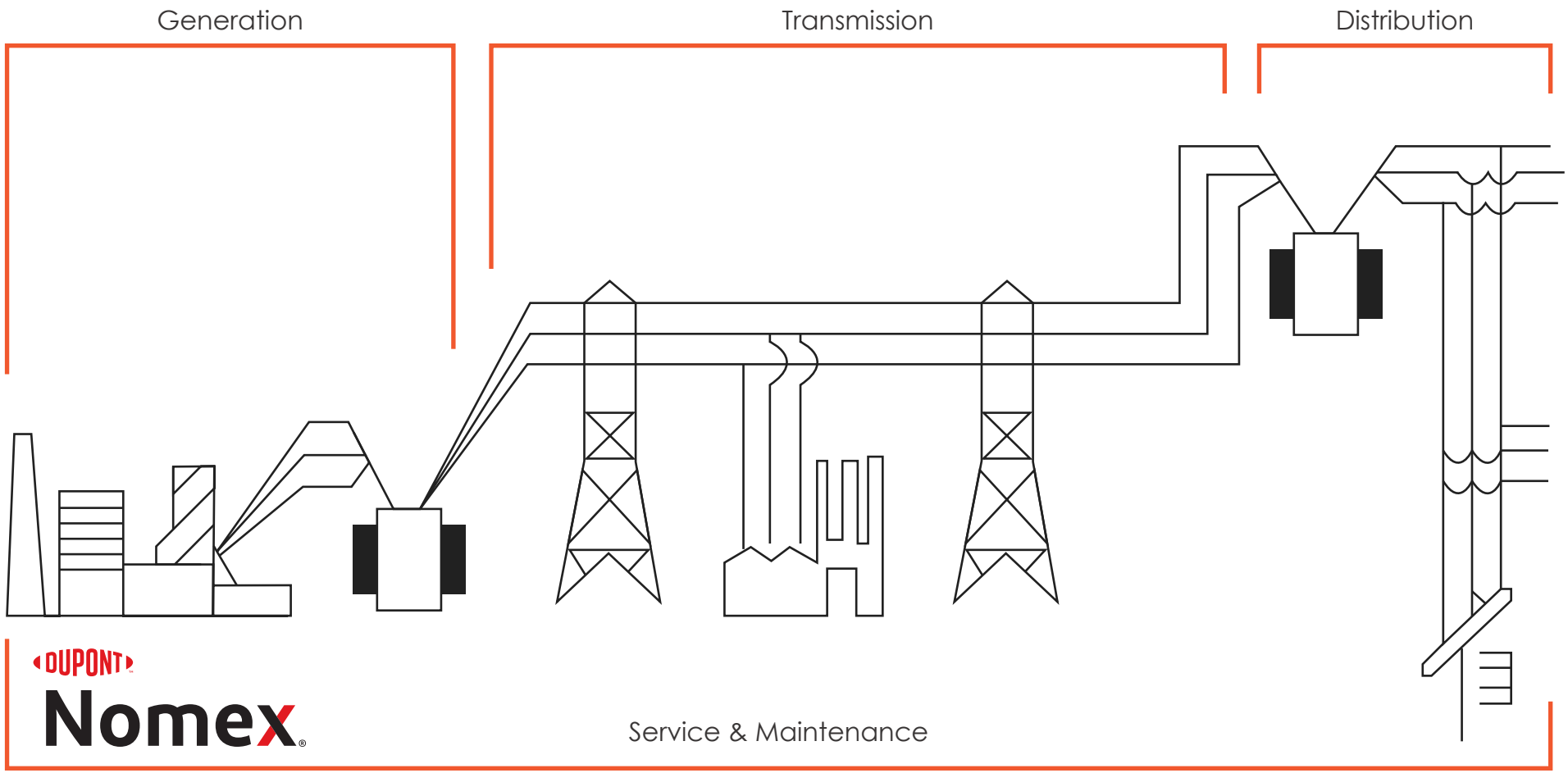
- High heat of the electric arc up to 20,000 °C – causing burns to the skin and body of the worker
- Fire - causing potential injury to the worker as well as damage to the surrounding place of work
- An arc blast (electric arc explosion) with a blast pressure of up to 1000 kg /m2 which expels molten metal particles, remnants of destroyed equipment and related components at high speed - causing injury to the worker
- Sound blast (up to 140dB – as loud as a gunshot) - causing auditory damage to the worker
- Ultra-violet light from the blast – resulting in damage to the eyesight of the worker

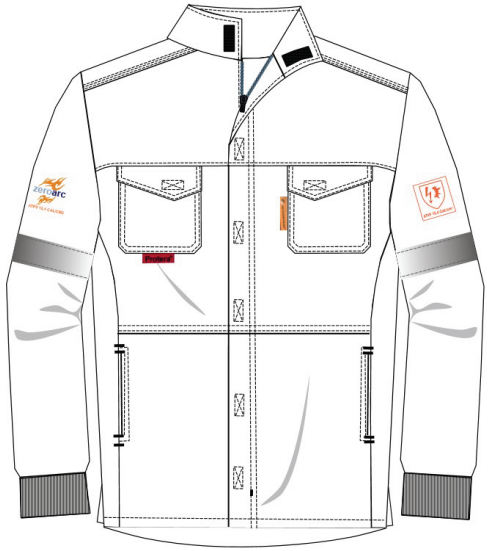
The consequences for people working on or close to energized electric equipment will primarily depend on the amount of Incident Energy received at the body surface, which depends on its distance from the arc.

Industries who Require **Arc Flash**

The latest innovation from DuPont, Nomex® Essential Arc for arc flash clothing offers utility and industrial workers multi-hazard protection, proven comfort and market-leading durability.

Extending the trusted Nomex® brand for Heat & flame protection, Nomex® Essential Arc also protects against arc flash. It is an excellent choice for workers in utilities, mining, chemical, manufacturing, refinery, and other hazardous industrial jobs.





Arc Flash Jacket

Appropriate Flame-resistant fabrics and handy pockets are for more than just style; your teams are far more likely to wear the correct PPE if they're comfortable and the garments are practical while working. Our garments provide the best possible protection; everyday practicality and comfort. Below are some key design features:

- Two breast pockets with stylish asymmetrical flaps and FR Velcro
- Side entry pockets with FR Velcro and double layer material on front, offering extra protection
- Plastic Zip Closure and FR Velcro on Jacket front
- Nomex FR Cuffs
- Side Panels on front and back
- FR Reflective Tape around both arms
- Mandarin collar with FR Velcro closure for neck protection
- Longer Jacket length to offer extra protection for the wearer when bending

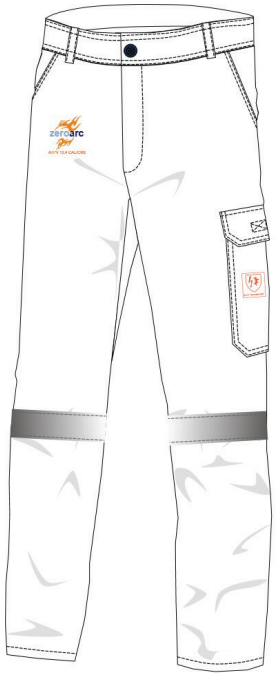
ISO 11612, IEC 61482-1, EN 1149, ASTM F1506, NFPA 2112, ASTM F2621 M-19, SANS724, NFPA 70E
See page 10 for reference.

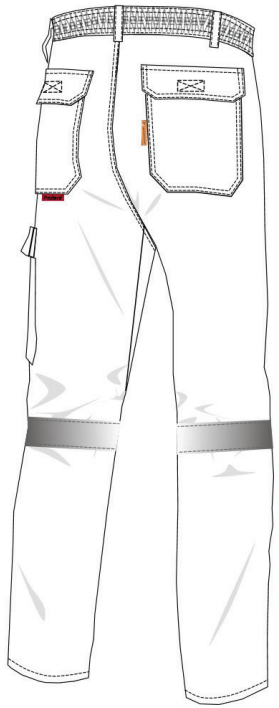
Sizes: 77cm (30 inches) - 177cm (70 inches)

SKU: J0ARC402PRO

zero arc flash

ATPV 12.4 CAL/CM²





Arc Flash Trouser

Appropriate Flame-resistant fabrics and handy pockets are for more than just style; your teams are far more likely to wear the correct PPE if they're comfortable and the garments are practical while working. Our garments provide the best possible protection; everyday practicality and comfort. Below are some key design features:

- Two hip pockets with flaps and FR Velcro on flaps
- One cargo pocket with flap and FR Velcro closure on flap
- Plastic Zip closure and FR Velcro on Trouser front
- Back Elasticated waistband
- FR Reflective Tape around both legs
- 2cm Wide belt loops

ISO 11612, IEC 61482-1, EN 1149, ASTM F1506, NFPA 2112, ASTM F2621 M-19, SANS724, NFPA 70E
See page 10 for standards reference.

Sizes: 77cm (30 inches) - 177cm (70 inches)

SKU: T1ARC402PRO

zero arc flash

ATPV 12.4 CAL/CM²


DuPont™ Arc-Man®
Switzerland
Scan to view Arc-Man Video
or visit bit.ly/3hYV23x

Thermo-Man®

Tested for the hazards you face

Scan to view Thermo-Man Video

or visit bit.ly/2Z8OxUl

Standards For **Material and Garment**

Nomex® fabrics is the latest innovation in electrical worker protection delivering the lightest and durable product in the market meeting and exceeding local and international standards:

ISO 11612, IEC 61482-1, EN 1149, ASTM F1506, NFPA 2112, ASTM F2621 M-19, SANS724, NFPA 70E

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. Information on currently valid national and international standards can be obtained from the SABS Standards Division.

ASTM D6413, Standard Test Method for Flame Resistance of Textiles (Vertical Test).

ASTM F1506, Standard performance specification for flame resistant textile materials for wearing apparel for use by electrical workers exposed to momentary electric arc and related thermal hazards. ASTM F 1891, Standard specification for arc and flame resistant rainwear.

ASTM F1959, Standard test method for determining the arc rating of materials for clothing. ASTM F 2178, Standard test method for determining the arc rating and standard specification for eye and face protective products.

ASTM F2621, Standard practice for determining response characteristics and design integrity of arc rated finished products in an electric arc exposure.

ASTM F2675/F2675M-13, Standard test method for determining arc ratings of hand protective products developed and used for electrical arc flash protection.

ANSI Z 87.1, American National Standard for Occupational and Educational Personal Eye and Face Protection Devices.

EN 166, Personal eye protection – Specifications.

EN 420, General requirements for protective gloves.

IEC 61482-2, Live working – Protective clothing against the thermal hazards of an electric arc – Part 2: Requirements.

SANS 61482-1-1, Live working – Protective clothing against the thermal hazards of an electric arc – Part 1-1: Test methods – Method 1: Determination of the arc rating (ATPV or EBT50) of flame resistant materials for clothing.

ISO 14116, Protective clothing – Protection against flame – Limited flame spread materials, material assemblies and clothing

ISO 15025, Protective clothing – Protection against flame – Method of test for limited flame spread. GS – ET 29, Supplementary requirements for the testing and certification of face shields for electrical works. NFPA 2112:2012, Standard on flame resistant garment for protection of industrial personnel against flash fire.

NFPA 70E, Standard for electrical safety in the workplace.

Incident Energy Analysis and calculation

Once the incident energy has been determined then the appropriate arc rated PPC/E has to be selected. The arc rating of the PPC/E shall either be the same as the calculated value or higher.

When a combination of different arc rated PPC/E is used, the lowest arc rating of any of the components will be assigned as the overall arc rating of the PPC/E. Note: SANS 984, the statistical calculation standard, has been verified for system voltages up to 15 kV.

In the case of higher system voltages, theoretically derived values can be calculated.

When determining the PPC/E selection based on the system and task-based criteria, the following information has to be known:

- Voltage rating of the equipment
- Short circuit current of the system
- Circuit breaker fault clearing time
- Working distance In order to determine whether PPC/E is required based on tasks, refer to NFPA 70E:2018 Table 130.5(C).

Once it has been established that PPC/E has to be worn, the following tables have to be consulted in order to determine the Arc-Flash PPC/E category, NFPA 70E:2018 Table 130.7(C)(15)(a) and Table 130.7(C)(15)(b)

Hazard / Risk Category	Clothing Description (Typical number of clothing layers is given)	Required Minimum Arc Rating
4 HRC	Arc-rated FR shirt and FR pants or FR coverall, and arc flash suit selected so that the system arc rating meets the required minimum **(3 or more layers)**	40cal/cm² +
3 HRC	Arc-rated FR shirt and FR pants or FR coverall, and arc flash suit selected so that the system arc rating meets the required minimum **(2 or 3 layers)**	25cal/cm²
2 HRC	Arc-rated FR shirt and FR pants or FR coverall **(1 or 2 layers)**	8cal/cm²
1 HRC	Arc-rated FR shirt and FR pants or FR coverall **(1 layer)**	4cal/cm²

DUPONT Nomex®

Performance

Nomex® Inherent fabrics.

Every worker has someone depending on them to get back home safely. Nomex® Inherent fabrics offers uncompromising arc flash and FR performance offering workers the protection they need to face their jobs with confidence.

Putting Nomex® Essential Arc to the test

Unlike chemically treated fabrics, Nomex® Essential Arc is inherently flame resistant, providing protection that's built in to the fiber and can't be washed out or worn away.

This helps Nomex® Essential Arc fabric to maintain structural integrity and flexibility after exposure, providing continued protection and the mobility needed to escape.

Inherent FR fabric
Flame-resistant fabric with protection built in (Nomex®)

Non-inherent FR fabric
Flame-resistant fabric that is chemically treated (FRT cotton)

Comfort

More comfortable FR results in:

- More likely to be worn appropriately
- Increased compliance to FR safety regulations
- Increased productivity
- Reduced heat related illness

87% of workers have observed other workers failing to wear their PPE*

Top reason: Too hot and uncomfortable
*Per 2006 National Safety Council Study

Factors of comfort with FR PPE:

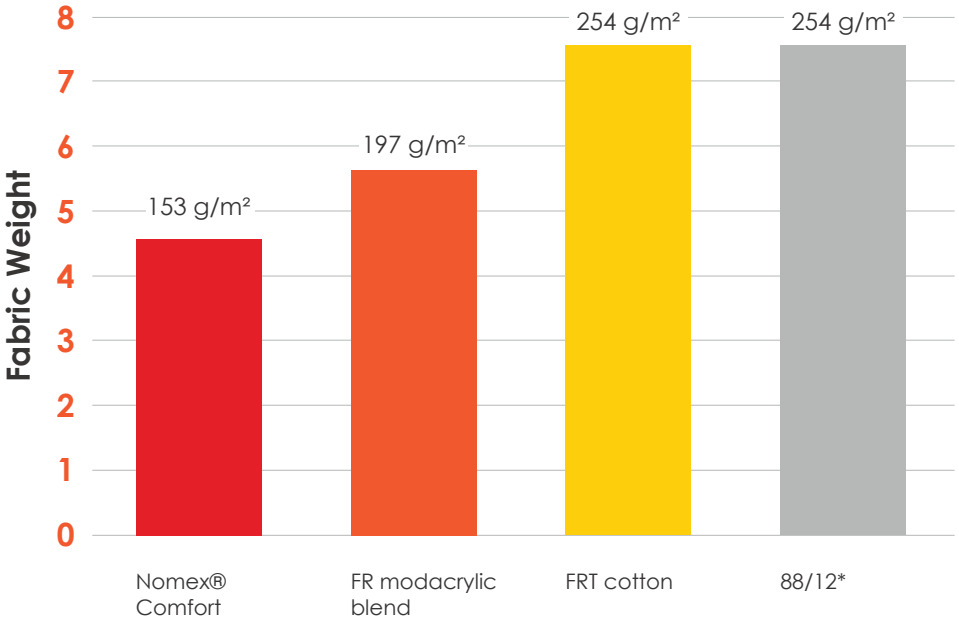
- Appealing touch and feel
- Breathability
- Appropriate fit before and after washing
- Weight
- Manages wicking absorption and drying

Nomex® Inherent Fabric Strength

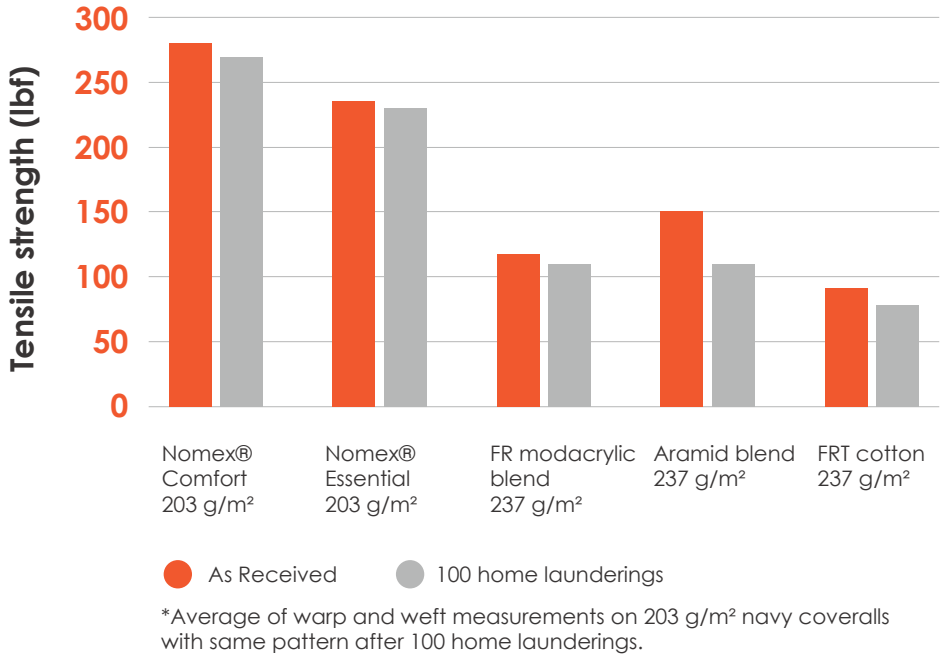
Nomex® Inherent Fabrics is one of the lightest weight PPE solutions on the market with uncompromising and unparalleled protection and comfort.

Lightest Weight FR fabric
NFPA 2112

*88% FR cotton /12% Nylon



Best-in-class fabric strength
Grab Test ASTM D3786



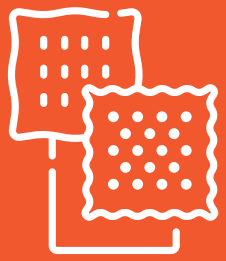
*Average of warp and weft measurements on 203 g/m² navy coveralls with same pattern after 100 home launderings.

Although 100 wash cycles is the standard NFPA 2112/2113 Nomex has a test certification on 200 wash cycles independently. Nomex® Essential Arc material is tested beyond the standards.

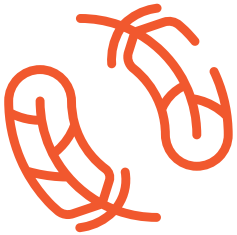
Permanent Quality
for the Life of the Garment
up to 200 washes

Wicking Ability
for Superior Comfort

zero arc flash



Kevlar Thread
for Tensile Strength



Light Material
to Fight Fatigue

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