

# Technical Sheet

## VizLite™ DT PRO FR Reflective and Photo luminescent FR Material

### Product Information

VizLite DT PRO FR is intended for use in the PPE market for the inclusion in Fire Retardant Hi Visibility PPE such as clothing for Welding, Petro Chemical industries and off shore

### Design Features

VizLite DT PRO FR consists of a segmented retro-reflective layer combined with a photo-luminescent inherent fire-retardant substrate. The segmented design of the top layer allows the phosphorescent material underneath to be visible. Therefore the VizLite DT PRO FR offers two technologies in one product.

Retro-reflectivity and Phosphorescence.

### Retro-reflective Element

Silver reflective element - a segmented FR retro-reflective comprised of microscopic glass beads that reflects light back to the source, usually vehicle headlights.

### Phosphorescent Element

Incorporating a patent pending formulation of Strontium Aluminate photoluminescent pigments applied onto an Inherent type Meta-aramid fabric backing. The Meta-aramid fabric has inherently flame resistance, manufactured with fibres whose innate properties make them naturally flame resistance.

The Photoluminescent material absorbs both UV natural and artificial light through electron excitation which it then emits as an afterglow in low light or zero light. This afterglow will last up to 8 hours, with the first hour being the brightest. Each time the VizLite DT PRO FR material is exposed to UV light it will recharge.

UV light charging times vary depending on the type of light but typically a day light charge will take 5 minutes and a charge in overhead fluorescent light ten minutes.

### Product Performance and Certification

VizLite DT PRO FR is certified to meet the following standards.

#### EN ISO 20471:2013+A1:2016 Hi Visibility Clothing

- 6.1 Retro-reflective performance of new materials
- 6.2 Retro-reflective performance after test exposure – Abrasion, flexing, folding at cold temperature & temperature variation. Under the influence of rainfall, retro-reflectivity after domestic washing (ISO6330,6N), 60°C, with 60°C tumble drying, 50 cycles

#### EN 469:2020

**Protective clothing for firefighters, Performance requirements for protective clothing for firefighting**

- 6.2.1.6 Heat resistance as received
- 6.2.1.1 Limited Flame Spread, after washing as above

#### EN ISO 14116:2008

**Protective clothing -- Protection against heat and flame -- Limited flame spread materials, material assemblies and clothing**

Limited Flame Spread Index, after washing as above

#### EN ISO 11611:2016

**Protective clothing for use in welding and allied processes**

- 6.7 Limited flame spread, after washing, as above
- 6.10 Electrical Resistance, after washing, as above

#### EN ISO 11612:2015

**Protective clothing - Clothing to protect against heat and flame -- Minimum performance requirements**

- 6.2.1.6 Heat resistance, as received
- 6.3 Limited flame spread, after washing, as above

#### EN ISO 15384:2020

**Protective clothing for firefighters. Performance requirements for wildland firefighting clothing**

- 6.1.2 Limited flame spread, after washing, as above
- 6.3 Heat resistance, 260±5°C, 5 min, after washing, as above
- 6.3.2 Heat resistance, 180±5°C, 5 min, as received

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### BS EN 1149-3: Method 2:2004

As received and after 5 wash cycles at 60°C with tumble dry low

VizLite DT PRO FR Photo luminescent material element is tested by RISE Research Institutes of Sweden to the following standard,

### DIN 67510-1:2009 Measure of Photoluminescent Phosphorescent Pigments and Products - Part 1: Measurements and Marking at the producer.

### Ecological Performance

VizLite DT PRO FR has been certified by Shirley Technologies, England to Oeko-Tex Standard 100, product class II and have shown that the above-mentioned goods meet the human-ecological requirements of the standard presently established for products without direct contact with skin. The certified articles fulfil the requirements of Annexe XVII of REACH (incl. the use of azo-dyes, nickel, etc.) as well as the American requirement regarding total content of lead in children's articles (CPSIA)

### Product Application

VizLite DT PRO FR is suitable for use on fire retardant PPE garments that protect against exposure to heat and fire.

The use on this type of garments will enhance the visibility of the wearer. The retro-reflective element will return light back to the source, usually vehicle headlights. and once charged the phosphorescent element will give out an afterglow in dark or dimly lit environments for up to 8 hours.

VizLite DT PRO FR is recommended for use in Fire Retardant garments which will be laundered at 60°C, where the wearer is open to risk of molten metal, flame spread, heat exposure etc.

### Product Usage

#### Cutting

- Suitable for cutting by hand (using very sharp cutting tools) or by guillotine
- Cuts should be made from the phosphorescent surface

#### Recommended Fabrics

- Inherent fire-retardant fabrics such as Nomex™ or another Aramid.
- Not suitable for stretchy fabrics such as Lycra or those containing Lycra as results can be poor.
- All substrate materials should be chosen based on suitability for intended use and laundry properties.

#### Sewing

- VizLite DT PRO FR fabric can be applied direct to fabric panels before a garment is sewn together.
- Stitching should be at a distance of 1mm from the edge of material to avoid fraying or curling of the material.
- Where separate pieces of material meet on a garment, care should be taken to match the visible appearance.
- Full sewing guides are available on the manufacturing instructions document upon request.

#### Stitching

- A double lock stitch with a maximum 5 stitches per cm is recommended.
- For substrates up to 250g/m<sup>2</sup> needle size NM80-90 is recommended. For substrates greater than 250g/m<sup>2</sup> a larger needle size would be required.
- A Teflon™ coated needle and Pressure foot is recommended to enable a smooth fabric transition.
- Thread tension should be kept to a minimum.
- Tension on both upper and lower threads must be matched to ensure there is no puckering.
- Thread should be matched to the substrate i.e., Flame retardant.
- All threads should be shrink proof and be suitable for sewing at higher speeds.

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### Storage and shipping

- Rolls should be stored in the packaging they are supplied in.
- Cut pieces should be stored flat
- Opened rolls should either be stored in their original packaging or suspended by the use of a rod through the middle of the roll.
- VizLite DT PRO FR fabric should be stored in an area that is cool, dry and with low humidity.
- Precautions should be taken to protect the material from coming into contact with perspiration, strong acids, or compounds containing high levels of sulphur or chlorine. Contamination by these substances may affect the aesthetic appearance of product.
- During Transportation and Shipping it is best to keep an ambient condition.

### Handling

- VizLite DT PRO FR fabric should be handled carefully in hot and humid conditions.
- The area in which the materials are handled may need the need of cooling or dehumidifying equipment to keep the area cool and dry.
- Avoid the contamination of the product with dirt, grease, or solvents as this could produce staining that will affect the qualities of the fabric.

### Wash and Care

#### Domestic Laundry

VizLite DT PRO FR fabric is designed to be washed at 60°C in a Domestic wash, up to 50 cycles followed by 60°C tumble drying. However, the following domestic washing instructions should be closely followed;

- Do not pre-soak
- Do not use a pre-wash program
- Recommended wash program is for coloured clothing wash
- Maximum Program time 50 minutes
- Maximum wash time at highest wash temperature 12 minutes
- Domestic washing powders for delicate and coloured fabrics are recommended

### Stain removal

- VizLite DT PRO FR material should be tested for wash conditions before using the material. This can be achieved by mixing a solution of detergent and water and applying with a sponge or cloth to the material. For stain removal of grease or mineral oils, use a clean cloth dipped into white spirits. Wipe clean with water afterwards.
- Chemical splashes should be removed with a clean dry cloth.
- Neutralise splashes of strong acid or alkalis immediately with plenty of clean water
- Dispose any material that comes into contact with toxic or harmful substances in a safe and responsible manner.

Do not use the following types of products to clean/treat stains on this garment;

- Heavy duty products or stain removal products with a high alkaline content.
- Micro-emulsions or high pH-products
- Bleaches
- Aromatic solvents

**The use of the above will affect the lifespan of the VizLite DT PRO FR material.**

### Ironing

- Iron on reverse of material if possible
- Iron using medium heat setting.
- Do not use steam

### Specialist cleaning and dry cleaning

- VizLite DT PRO FR fabric is not suitable for Industrial laundry methods or dry cleaning

### Drying

- Line drying is the preferred method of drying
- This product can be tumble dried on a 60°C heat setting at up to 40 times.

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### Maintenance issues

VizLite DT PRO FR's retro-reflective and photo luminescent properties will be affected by any of the following treatments;

- Coating or spraying the garment with oils, protective waxes, paints, or inks.
- Application of products such as leather spray or waxes.
- Harsh physical application of abrasive wire brushes or sand paper.

### General Safety Information

#### Visibility Limits of VizLite™ DT PRO FR fabric

There are various uncontrollable environmental factors that will affect visibility; these include smoke, hail, snow, mist, dust and fog.

The VizLite DT PRO FR fabric once fully charged will improve the visibility of the wearer and can be seen as a green afterglow.

### Statement on Radio activity

VizLite DT PRO FR uses phosphorescent technology, the formulation comprises of Strontium Nitrate based pigments along with other components.

Phosphorescent materials store and re-emit light because of their unusual property of trapping electrons in a higher state of movement. As light comes in contact with the VizLite DT PRO FR material, light photons are transferred to the material and give some of their energy to the electrons within it, causing the electrons to move to a higher energy state around their nucleus. While most photo luminescent materials allow their excited electrons to quickly return to a ground state, phosphorescent materials trap their electrons in a higher energy state for minutes or even hours.

It is the chemical reactions within phosphorescent materials that allow the light to be stored and re-emitted as a glow. These long persistent phosphors are not radioactive and do not contain any radioactive elements.

### Important notice to Purchaser / Converter / Wearer

Because of the unlimited variety of potential applications for products, BEFORE product use the converter and/ or product manufacturer must determine that the products are suitable for the intended use and are compatible with other component materials. are suitable for the intended use and are compatible with other component materials including any potential colour bleed transfer from other (for example) non-dope-dyed fabrics.

The Purchaser is solely responsible for determining the proper amount and placement of products. While this product will enhance visibility, no single product can ensure visibility on safety under all possible conditions. Neither Viz Reflectives or any Viz Reflectives authorised converter shall be liable for any incidental, special or consequential damages relating to the use or inability to use the products regardless of legal theory used.