# Technical Sheet

## VizLite™ DT FRA Photo luminescent and Reflective Material

**Product Information**

VizLite™ DT FRA Photo luminescent and Reflective material is intended for use in the PPE market for the inclusion in Fire Retardant PPE and PPE for the protection against heat and flame, and High Visibility Clothing.

**Design Features**

VizLite™ DT FRA material consists of a patent pending formulation of Strontium Aluminate Photoluminescent pigments applied onto a 100% Inherent FR fabric backing. The fabric is 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 unto 8 hours, with the first hour being the brightest. Each time the VizLite™ DT FRA 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 florescent light ten minutes.

It has a top layer of reflective clear beads which gives reflective levels of approximately 50+ candelas.

**Product Performance and Certification**

VizLite™ DT FRA Photo luminescent and Reflective material is certified to meet the following standards.

**EN 469:2020**
**Protective clothing for firefighters, Performance requirements for protective clothing for firefighting**

**6.2.1.6** Heat resistance to 180°C as received and after 50 wash cycles at 60C° with normal heat tumble-drying and after 30 industrial cycles at 75°C with 160°C cabinet finishing after each wash

**6.2.1.1** Limited Flame Spread, after washing as above

**EN ISO 14116:2015**
**Protective clothing -- Protection against heat and flame -- Limited flame spread materials, material assemblies and clothing**

Limited flame spread after washing as above
Pass Index 3

**EN ISO 11611:2015**
**Protective clothing for use in welding and allied processes**

Limited flame spread after washing as above Pass A1
Heat resistance 180°C after washing as above

**EN ISO 11612:2015**
**Protective clothing - Clothing to protect against heat and flame -- Minimum performance requirements**

Limited flame spread after washing as above Pass A1
Heat resistance 180°C after washing as above

**EN 1149-1:2018**
**Protective clothing - Electrostatic properties, Test method for measurement of surface resistivity**

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

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

**EN ISO 15384:2020**
**Protective clothing for firefighters. Performance requirements for wildland firefighting clothing**

Limited flame spread, after washing, as above
Heat resistance, 260°C after 5 wash cycles at 60°C
Heat resistance, 180°C as received
Flame spread – Edge ignition before and after 5 wash cycles at 60°C

VizLite DT FRA has been certified by UL laboratory in the United States to meet the requirements as a trim and finding material to the following standards for,

**NFPA 1971:2018**
**Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting**

**NFPA 1951:2020**
**Standard on Protective Ensembles for Technical Rescue Incidents**

**NFPA 1977:2022**
**Standard on Protective Clothing and Equipment for Wildland Fire Fighting and Urban Interface Fire Fighting**

**NFPA 2112:2023**
**Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Short-Duration Thermal Exposures from Fire**

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**NFPA 1975:2019**
**Standard on Emergency Services Work Clothing Elements**

**CAN/CGSB 155.20 :2017**
**Standard on Workwear for Protection Against Hydrocarbon Flash Fire and Optionally Steam and Hot Fluids**

VizLite™ DT FRA Photo luminescent and Reflective 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 FRA has been certified by Shirley Technologies, England to STANDARD 100 by OEKO TEX. 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)

**PFAS** - VizLite™ DT FRA has been tested by BTTG and has no PFAS type chemicals.

**Product Application**

VizLite™ DT FRA is suitable for use on fire retardant PPE garments, and can be used on its own as a trim or alongside the recommended FR reflective tape VizLite™ 302.

The use on FR garments will enhance the visibility of the wearer in dark or dimly lit environments without effecting the integratory of the FR garment properties.

VizLite™ DT FRA Photo luminescent and Reflective is recommended for use in Fire Retardant garments which will be industrially laundered at 75°C, typically used in emergency services such as Fire and Rescue. And other industries where the wearer is open to risk of molten metal, flame spread, heat exposure etc.

VizLite™ DT FRA can be incorporated into anti-static protective clothing.

**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 FRA fabric can be applied direct to fabric panels before a garment is sewn together.
- Stitching should be at 1mm from the edge of Photo luminescent to avoid fraying or curling of the material.
- When 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/$m^2$ needle size NM80-90 is recommended. For substrates greater than 250g/m2 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 using a rod through the middle of the roll.
- VizLite™ DT FRA fabric should be stored in an area that is cool, dry and with low humidity.
- Precautions should be taken to protect the material from encountering perspiration, strong acids, or compounds containing high levels of sulphur or chlorine. Contamination by these substances may affect the aesthetic appearance of the VizLite™ DT FRA
- During Transportation and Shipping it is best to keep an ambient condition.

**Handling**

- VizLite™ DT FRA 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 phosphorescent qualities of the fabric.

**Wash and Care**

**Industrial Laundry**

VizLite™ DT FRA fabric is suitable for industrial laundry at 75°C with 160°C cabinet finish up to 30 washes.

VizLite™ DT FRA fabric is also designed to be washed at 60°C in a Domestic wash, up to a minimum 50 cycles followed by normal heat tumble dry before the fire-retardant qualities are affected. 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 FRA 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 alkalise immediately with plenty of clean water
- Dispose any material that meets 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 FRA 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 FRA fabric is suitable for Industrial laundry methods

**Drying**

- Line drying is the preferred method of drying
- This product can be tumble dried on a normal heat setting at up to 50 times.
- VizLite DT FRA is suitable for cabinet drying at a temperature of 155°

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**Maintenance issues**

VizLite™ DT FRA fabric's 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.

**Discolouration**

In some cases, the surface of the product can become discoloured. The usual causes are;

- Colour Migration from other darker fabrics
- Excessive exposure to UV light
- Excessive washing over and above the recommended limits.

**It is important to note that discolouration will not affect the glow performance of the technology.**

**General Safety Information**
**Visibility Limits of VizLite™ DT FRA fabric**

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

The VizLite™ DT FRA fabric once fully charged will improve the visibility of the wearer and can be seen as a green afterglow. In Hi Visibility PPE to ensure the highest level of visibility is achieved it is recommended that the VizLite™ DT FRA fabric should be used alongside the appropriate VizLite™ reflective tape in the EN ISO 20471:2013 / ANSI ISEA 107:2010 configuration, thus offering 360° visibility.

VizLite™ DT FRA is available in various widths, as a rule the wider the product the more visibility is enhanced

**Statement on Radio activity**

VizLite™ DT FRA uses phosphorescent technology, the formulation comprises of Strontium Aluminate based pigments along with other components.

Phosphorescent materials store and re-emit light bcause of their unusual property of trapping electrons in a higher state of movement. As light meets the VizLite™ DT FRA 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 photoluminescent 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 radio-active 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. 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.