



VizLite™ DT
DUAL TECHNOLOGY

**WHEN YOU NEED
TO BE SEEN**

 **Mark's**
COMMERCIAL



VizLite™ DT Products

VizLite Dual Technology is a combination of phosphorescent and reflective technologies and is a revolution in safety.

Currently, Hi-Viz garments rely on fluorescent fabrics to enhance the wearer's visibility in daylight, and retro-reflective materials to reflect back vehicle headlights in darkness.

VizLite™ Dual Technology phosphorescence offers a third level of protection, when there is low light or no light, by giving off an intense glow for up to 8 hours, without the use of batteries. VizLite™ Dual Technology phosphorescence is charged by ultraviolet light after five to ten minutes of exposure.

There is a range of VizLite™ Dual Technology products to meet the needs of the global safety market.



THE THREE LEVELS OF VISIBILITY

FLUORESCENCE

Base Fabrics for daytime conspicuity

This type of technology absorbs and re-emits light energy immediately, to increase visibility in daylight. These bright fabrics make the wearer more conspicuous against the surrounding background. Fluorescence is a type of Photoluminescence similar to Phosphorescence but instead of storing UV energy the molecules in the fabrics absorb light at a specific wavelength and emitting light at a longer wavelength.

REFLECTIVE

Reflective fabric reflects light back to source

Retro-reflective materials use either microscopic glass beads or plastic prisms to reflect light back to the source. The source is usually vehicle headlights. These types of materials will bounce light back at a range of angles to make the wearer visible in the dark. This technology relies on a light source to work. There is a wide range of different VizLite retro-reflective tapes that will work alongside VizLite DT phosphorescent materials.

PHOSPHORESCENCE

Absorbs UV light and re-emits it as an afterglow

VizLite™ DT phosphorescent materials absorb UV light energy from either natural or artificial light, which is then re-emitted as an afterglow in low light and dark conditions. The pigments used in VizLite™ DT phosphorescent have been formulated to a patent-pending recipe to ensure a quick charging time of 5 – 10 minutes, a strong level of afterglow brightness, extensive wash performance, and a long afterglow lasting up to 8 hours.



VizLite™ DT
DUAL TECHNOLOGY

10 REASONS TO USE



1. Increases Visibility

VizLite™ DT offers an extra layer of visibility in areas of low light and darkness unlike normal reflective tape that relies on a secondary light source such as car headlights, VizLite™ DT works when there is no light source.

2. No Batteries Required

VizLite™ DT charges by exposure to UV light, either natural or artificial. It quickly reaches its full charge in 5-10 minutes and will glow for up to eight hours with the first hour being the brightest.

3. Innovation in Safety

This patent pending technology is a real breakthrough in safety. It has been developed and brought to market by a UK company. It is now being used by forward thinking companies in the Rail, Traffic Management, Construction, Aggregates and Police sectors.

4. It's An Award Winner

VizLite™ DT is a multi-award winning product including Winner of the Future Materials award for innovation in Clothing 2015; PPE Innovation of the Year award at Professional Clothing Awards 2016 – V360 Range clothing from Shield360 Incorporating VizLite™ DT Technology; Voted favourite product among visitors to Trust Pet Products Trade Show 2017.

5. Independent Certification

Certified to meet and exceed global standards including the areas of Photo Luminescence, FR Protection, Antistatic, Arc Protection, ANSI 107 and ISO20471 High Visibility, Oeko-Tex with testing undertaken at SATRA, BTTG, ArcWear, UL, Centrocot, VTEC Laboratories Inc. and Shirley Technologies.



10 REASONS TO USE



6. No Ongoing Maintenance

VizLite™ DT has no mechanical or electrical parts that can malfunction and does not rely on users having to carry out maintenance. It is simply ready to go when you are, with no on or off switch!

7. Versatility – It's Not Just For Work Wear

Through collaboration with Branding, Sportswear, Equestrian, Lifestyle and Pet Markets, VizLite™ DT has demonstrated to be a unique safety solution offering the potential to enhance personal safety while taking part in the activities we love.

8. You Can Launder On The Garment

VizLite™ DT has been formulated to meet a range of laundry conditions including domestic wash, tumble dry, dry clean and industrial laundry. It has been independently tested by SATRA to ensure that performance is not affected by the laundry methods commonly used.

9. Evolving Product

Through constant re-evaluation of our customer's performance requirements and ongoing research and development, Viz is developing new VizLite™ DT products to meet the needs of the FR and Industrial Laundry markets.

10. Join The Safety Revolution

VizLite™ DT is far more than a just USP or novelty, it offers a real opportunity to increase the visibility and therefore safety of workers around the world. Come join the safety revolution by adding VizLite™ DT to your products.



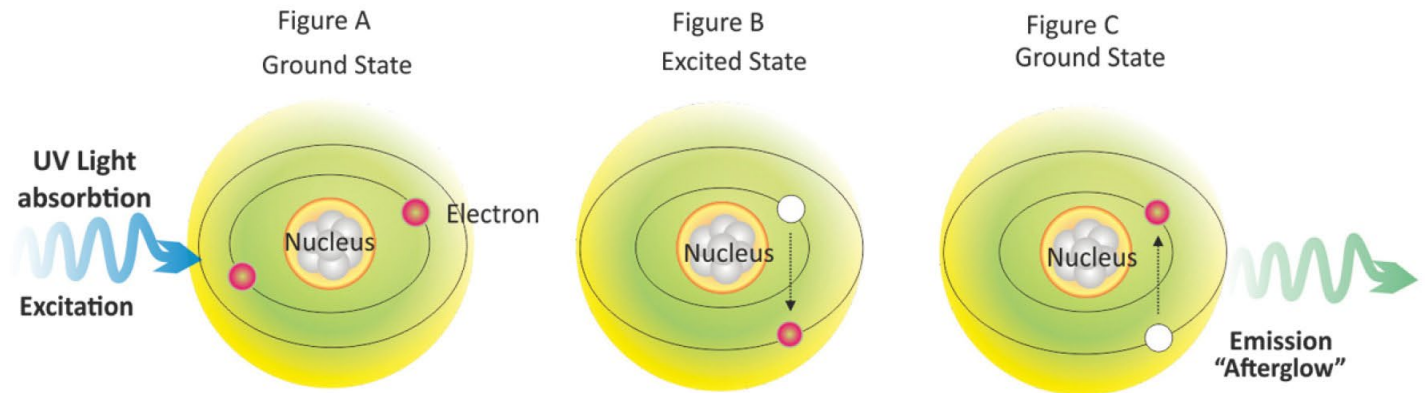


Technical

How does VizLite work?

On an atomic level when the electrons in an atom of phosphorescent pigment are exposed to photon energy in the form of UV light, (Figure A) they enter an excited state and move into a higher spin state. This Excitation of electrons to a higher state is accompanied with the change of a spin state. (Figure B).

Once in a different spin state, electrons cannot relax into the ground state quickly because the re-emission involves quantum mechanically forbidden energy state transitions. At this point the electrons return to the ground state releasing the stored energy as visible light. As these transitions occur very slowly in VizLite DT, absorbed radiation may be re-emitted at a lower intensity for up to eight hours after the original excitation. (Figure C).



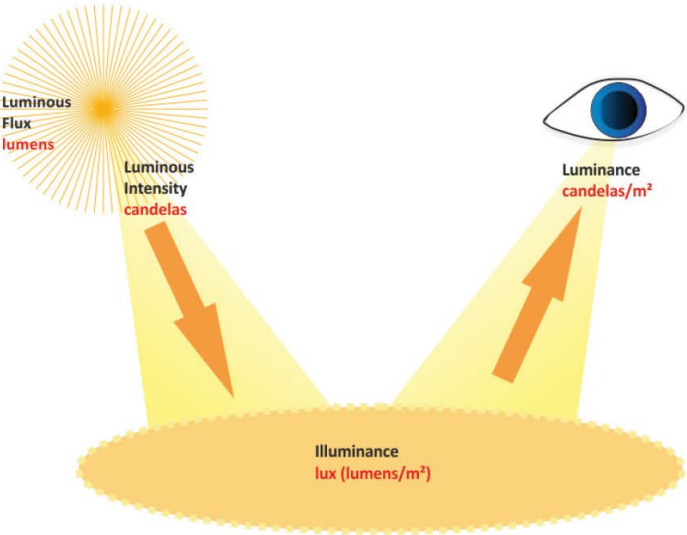


The Strontium Nitrate phosphorescent pigments that are used to produce VizLite DT are formulated to meet our requirements of a quick charge time, a bright “afterglow”, extended “afterglow” period and high laundry performance.

Charging

The following chart shows the different charging times for VizLite DT depending on the light conditions. The light intensity is measured in Lux which is the number of Lumens per square metre.

LIGHT SOURCE	LIGHT INTENSITY (Lux)	Charging Time
Clear Sunlight	>50,000	5 minutes
Cloudy	3,000 - 50,000	5 minutes
Dusk	1,000	8 minutes
Fluorescent Office Lights	500	10 minutes



The amount of light being given off by a particular source, in all directions, is called luminous flux (or “luminous power”) and is a measure of the total perceived power of light.



VARIOUS APPLICATIONS



VizLite™ DT

Domestic wash phosphorescent material

VizLite DT® uses phosphorescent technology that absorbs UV light energy from natural or artificial light which is then emitted as an “afterglow” in low light or no light conditions.

VizLite DT® is available in two standard widths 10mm and 50mm, offering flexibility to the designer. These products can be used with VizLite® reflective tapes or on their own to introduce a new safety element to garments and accessories

The tapes can be sewn on either side of the reflective tape or to just one side for commodity garments such as vests and combat trousers.

Both products are stitch able and suitable for mid weight and heavy weight fabrics including Cotton, Polyester, Poly/Cotton mixes, Canvas and PU coated fabrics. The DT material is suitable for embroidering and screen printing to produce identity badges and logos.



VizLite DT HA

Heat applied phosphorescent film

VizLite DT HA is a phosphorescent and reflective heat applied film that offers an innovative solution to garment branding.

This product uses phosphorescent technology that absorbs UV light from natural or artificial light which is then emitted as an “afterglow” in low or no light conditions. It also incorporates a layer of microscopic glass beads, that produce retro-reflective effects measuring up to 90 candelas.





VARIOUS APPLICATIONS

VizLite DT PSA

Self-adhesive phosphorescent material



VizLite DT® PSA is a phosphorescent self-adhesive material that can be used to produce self-adhesive stickers, badges, marking tapes and signage. VizLite DT® PSA uses phosphorescent technology that absorbs UV light from natural or artificial light which is then emitted as an “afterglow” in low or no light conditions.



VizLite DT® PSA film is suitable for screen printing or digital printing. It can be cut to produce shapes, logos and text. VizLite DT® PSA is available with a clear overlay film to protect the product from UV degradation and contamination.

VizLite DT® PSA uses adhesive suitable to use on a variety of substrates including, Laminate, Aluminium, Glass, Metal, Plastic, Foam Board, UVPC, Corrugated Plastic

Suitable applications include Marking Tapes, Car Park Signage, Security Tapes, Fire Safety Signs, Evacuation Signs, Stickers, Decals and Badges.

VizLite DT FRA

Aramid based flame resistant phosphorescent material



DT-FRA is a 100% Aramid™ inherent fabric making the materials suitable for use in the production of flame resistant garments and accessories that are required to meet the international standards listed.

VizLite DT® FRA can be laundered up to 50 times at 60°C in a domestic washing machine or 30 times in an industrial laundry without affecting FR or Glow performance.



This product can also be screen printed to produce identification tapes and badges. For more information on use and application please refer to the product data sheet and manufacturing instructions.

Suitable applications: Structural Fire Fighter clothing, Urban Search and Rescue, Emergency services, Police Public Order PPE, Marine Fire Fighting Kit, FR compatible Tools and accessories, Arc Protection Clothing, Hot Processing, Oil and Gas, Military.



VARIOUS APPLICATIONS



VizLite DT FRC

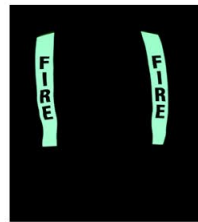
Proban® treated flame resistant phosphorescent material

DT-FRC is a 100% cotton substrate with a Proban® treatment making the materials suitable for use in the production of flame resistant garments and accessories that are required to meet the international standards listed.

VizLite DT®-FRC can be laundered up to 50 times in a domestic machine at 40°C without affecting FR or Glow performance.

This product can also be screen printed to produce identification tapes and badges. For more information on use and application please refer to the product data sheet and manufacturing instructions.

Suitable applications Fire Fighter Turn Out Gear, Arc Protection, Welding, Hot Processing, Search and Rescue, Oil and Gas, Military.



VizLite DT 7050

Polycotton based phosphorescent material with reflective tape

VizLite DT 7050 is certified to meet the EN 20471:2013, ANSI 107:2010 and can be used as retro-reflective material on garments which are to be certified to those standards.

Use of this configuration of phosphorescent and reflectivity ensures the wearer is visible from all sides, which is often referred to as 360° visibility, when used to encircle the torso, sleeves and trouser legs.

VizLite DT 7050 tapes are supplied with a single stitch line attaching each strip of the 10mm photo luminescent to the reflective tape. For instructions on how to apply this product please refer to the manufacturing instructions and the product data sheet.





SAFETY COMPLIANCE

BLACK CLOTHING

2" reflective material in 4" contrasting tape
meets WCB/Worksafe/DOT configuration.

Fully compliant with: CSA Z96-15, Class 1, Level 2.

BC MOT Safety Apparel T-09/05 Revised 03/2006.



SAFETY COMPLIANCE

ORANGE, LIME/YELLOW CLOTHING

2" reflective material in 4" contrasting tape
meets WCB/Worksafe/DOT configuration.

Fully compliant with: CSA Z96-15, Class 2, Level 2.

BC MOT Safety Apparel T-09/05 Revised 03/2006.



SAFETY STANDARDS / COMPLIANCE

VizLite™ DT Photo luminescent material is suitable for use in the PPE market alongside retro reflective materials for the inclusion in High Visibility Warning clothing such as EN ISO 20471:2013 and ANSI 107:2010 Jackets and Waistcoats to enhance visibility in low light and night time conditions. VizLite™ DT is used to give a garment photo luminescence properties which can increase the visibility of the wearer and is suitable for inclusion in Sportswear, Corporate Clothing, Equestrian and general PPE.

VizLite™ DT 7050 Photo luminescent is tested by VTEC laboratories, New York to the following standard, ISO 17398:2004 "Safety Colours and Safety Signs – Classification, Performance and Durability of Safety Signs" Clause 7.11.